

**IFB: GAPL/TENDER/CAP/001/2019-2020/  
DT. 04.04.2019**

**PRICE SCHEDULE SECTION VI**



	<p>HDPE wire mesh.  <b>Note:1) All Fans &amp; Motors to be sized for a capacity of 110% of rated air flow. 2) Fan Efficiency shall be not less than 70%</b></p>										
<p><b>G-4 pre filter (10 μ)</b>   <b>Inlet / Mixing Section</b></p>	<ul style="list-style-type: none"> <li>• Low Leakage extruded aluminum aerofoil opposed blade type fresh air damper considering the total volume of 10% from the total CFM with double HDPE wire mesh.</li> <li>• Flanged type G-4 Pre filters .</li> <li>• Leak Proof Hinged service doors</li> <li>• Pressure Measurement nozzles across G-4 filter with Magnehelic Gauge (0-300 Pa) and PU Tube tubing. Magnehelic Guage to be properly enclosed in SS304 box made from 24 guage thick sheet.</li> <li>• Temperature Measurement nozzles with proper sealing should be provided to take manual reading of temperature in this section.</li> </ul> <p>Note :</p> <ul style="list-style-type: none"> <li>• Air Face Velocities across G-4 filters should not exceed 2.5 m/s.</li> </ul>										

<p><b>F-6 pre filter (5µ)</b> <b>F-6 filter section</b></p>	<ul style="list-style-type: none"> <li>• Flanged type F-6 pre filter.</li> <li>• Leak Proof Hinged service door.</li> <li>• Pressure Measurement ports across F-6 filter with Magnehelic Gauge (0-300 Pa) and PU Tube tubing. Magnehelic Gauge to be properly enclosed in SS304 box made from 24 gauge thick sheet.</li> </ul> <p><b>Note :</b></p> <ul style="list-style-type: none"> <li>• Air Face Velocities across F-6 filters should not exceed 2.5m/s.</li> </ul>														
<p><b>Cooling Coil Section</b></p>	<ul style="list-style-type: none"> <li>• DX Coil (inter less) with all accessories for connection between condensing units &amp; the coil such as thermal expansion valves, solenoid valves, distributor etc.</li> <li>• 4 Bend Moisture Eliminator</li> <li>• 18 gauge SS-304 insulated (minimum 8 mm insulation) condensate tray with drain pipe &amp; U trap</li> <li>• Hinged service door/Removable Panel with handles</li> <li>• Standalone Thermostat and Humidistat has to be considered to control the Temperature &amp; RH.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Air Face Velocities across DX coil should not exceed 2.5 m/s..</li> <li>• Sinewave fins shall be install &amp; fins spacing shall be 12 fins per inch</li> <li>• Bypass section to be designed for the same</li> </ul>														



<p>tion ( Bot tom Dec k)</p>	<p>Note : • Air Face Velocities across F-9 filters should not exceed 2.5 m/s.</p>										
<p>H-14 HEPA filters (0.3 µ)</p>	<p><b>-Class 10000 area</b> <b>Pre-filter(G4), microvee filters (F6) superfine filters(F9) are located in AHU &amp; HEPA filters (H-14) at terminal.</b> <b>-Class 100000 area</b> <b>Pre-filter(G4), microvee filters (F6) superfine filters(F9) and (H-14) HEPA filters are located at AHU.</b></p>										
<p>1.1</p>	<p><b>AHU 02 (Class 10000 area)</b>  Supply/Return Air Blower Fan Capacity, CFM : 6545 Cooling Load,TR : 25.5 Total Blower Static, Pa : 1500 Heater Capacity Kw : 15. Note : • Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control. • Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly</p>	<p>Set</p>	<p>1</p>								

	<p>mentioning the make and pressure drop (initial and final in case of filters) across them.</p> <ul style="list-style-type: none"> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>									
1.2	<p><b>AHU 04 (Class 10000 area)</b>  Supply/Return Air Blower  Fan Capacity, CFM : 1200  Cooling Load,TR : 5.5,  Total Blower Static, Pa : 1250  Heater Capacity Kw : 4.5  Note :  • Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU.  Heater Banks shall be decided based on temp and RH control.  • Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.  • Total Static pressure to be reconfirmed by Vendor before ordering the AHU  • Do refer to the technical specification in chapter 2.4</p>	Set	1							

1.3	<p><b>AHU 05 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 2500  Cooling Load,TR : 12.75  Total Blower Static, Pa : 1250  Heater Capacity Kw : 10</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1								
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1.4	<p><b>AHU 06 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1250  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 4.5</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1							
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1.5	<p><b>AHU 10 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1350  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 3.</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1								
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1.6	<p><b>AHU 11 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1250  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 4.5</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1							
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1.7	<p><b>AHU 12 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1250  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 4.5</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1							
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1.8	<p><b>AHU 13 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 2300  Cooling Load,TR : 11,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 10</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1							
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1.9	<p><b>AHU 15 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1450  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 3</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1								
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1.1 0	<p><b>AHU 16 (Class 10000 area)</b></p> <p>Supply/Return Air Blower  Fan Capacity, CFM : 1250  Cooling Load,TR : 5.5,  Total Blower Static, Pa :  1250  Heater Capacity Kw : 4.5</p> <p>Note :</p> <ul style="list-style-type: none"> <li>• Heaters should be provided with proper Heater plenum inside the AHU and the control system wiring for Heater / DX coil to Thermostat and Humidistat should be included in AHU. Heater Banks shall be decided based on temp and RH control.</li> <li>• Vendor to submit Technical Data sheets for filters,fans with fan curves,dampers, Cooling coil clearly mentioning the make and pressure drop (initial and final in case of filters) across them.</li> <li>• Total Static pressure to be reconfirmed by Vendor before ordering the AHU</li> <li>• Do refer to the technical specification in chapter 2.4</li> </ul>	Set	1							
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**Note : Considering the installation site, double decker HVAC system may be accepted with appropriate justification.**









	<p>indication &amp; trip status lamps, with cable alleys, necessary contactors and control switchgears with necessary arrangement for supply to heaters, chilled water valves &amp; VFD. This panel shall be provided with ventilation fan for VFD &amp; shall be installed near to AHU and an compatible with Building Management System i.e. Auxiliary Connection 3 No.s DI for motor ON/OFF/STATUS , 1 NO of DO for Motor start/ stop, 1NO of DO for motor emergency stop , 1NO of DO for Auto/Manual switch. Panel shall be provided with appropriate earth bus/connection provisions for providing the required earthing. Emergency push buttons with mushroom head to be provided. Fault level shall be 25 kA for all the units</p> <p>Note: Vendor to seek approval from client / consultant on all SLD &amp; GA drawings before fabrication.</p>										
5.1	AHU 02	No. s	1								
5.2	AHU 04	No. s	1								
5.3	AHU 05	No. s	1								
5.4	AHU 06	No. s	1								
5.5	AHU 10	No. s	1								



	<p>wherever specified, cutting of the cable as per actual measurement/cable schedule, Teasing and Clamping of Cable on cable tray Velcro tap of minimum 20mm width or clamping materials in Aluminum or PVC cable tie as per site hygiene level and hardware etc., supply &amp; providing cable tags made out of Aluminum strip and 75x20 mm in size with cable number and size punched on it.</p> <p>Cable tags shall be tied to cables at every 10 meter interval and at both the ends. Supports provided for clamping of cables upto individual motors and push-buttons/ Equipment panel shall be paid extra as per item rate for SS fabrication work. Unused cables &amp; Empty cable drums shall be returned to stores. In case of laying unlisted cables, rate of cable whose outer dia is closest to the cable sizes quoted shall be applicable. The same shall hold good for cable termination also. The installation rates quoted shall be for laying in trays, cable trenches (indoor and outdoor), pipes, etc. For buried cables, the excavation work will be included under the heading "Excavation &amp; Back filling."</p>									
6.1	3C x 4 mm <sup>2</sup> LT XLPE	RM	500							



<p>specifications, drawings, standard engineering practice and as per the direction of Engineer-In-Charge. The Contractor's scope is inclusive of lifting &amp; placing of trays on supports at different levels, aligning, joining of trays with couplers, clamping/ fastening to the support of the vertical portions and wherever required as per specs/ drawings. All the necessary bends (horizontal/ vertical), tees, cross, elbows, reducers, etc., as shown in the drawing and as per the site</p>										
<p>condition/ requirement are to be fabricated out of standard length of trays and as per standard &amp; good engineering practice, Gas cutting of cable trays at site is not permitted. If any welding is to be done on cable trays applying of two coats of zinc rich primer and one coat of Silver paint at the modified/ repaired area/ portions and erection of the same. The running rate shall include bends , T section and couplers. Cable tray supports shall be paid extra under the head of Structural steel. All the necessary modifications, addition, removal of supports, brackets, cleats, etc., minor civil works for grouting and entries are to be</p>										

<p>carried out as and where required as a part of this item work but the measurement and payment will be made against similar item appearing elsewhere in this BOQ. Without limiting to the above, the work is to be completed in all respects end to end of each route as per the specs, drawings and the direction of the Engineer-In-Charge.</p> <p>The scope of work includes transportation of materials from owner's issue point to actual place of work by contractor's own lifting and transportating arrangement. Tray route identification details as per the drawings are to be marked with stencil at appropriate places as per site requirement/ instructions of the Engineer-In-Charge</p>														
<p>Cable tray shall be hot dipped galvanized and minimum thickness of GI coating is 90 to 100 Microns. Thickness of perforated cable tray sheet steel for 50 mm to 300 mm cable tray = 2.0 mm thick and minimum height of the perforated cable Tray is 35 mm. Thickness of perforated cable tray sheet steel for 450 mm to 900 mm cable tray = 2.5 mm thick and minimum Height of the perforated cable tray is 75 mm. Thickness of Ladder</p>														





9.1	Supply and Installation of Control cabling for VFD, transmitter, thermostat, Humidistat etc., Note: The vendor should envisage all the control cabling requirements while bidding to make the Air handling systems running effectively	Lot	1								
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<b>10</b>	<b>TESTING, ADJUSTMENT, BALANCING, VALIDATION &amp; DOCUMENTATION</b>										
	Vendor to conduct the following tests and validate the HVAC system										
	1. Duct Leakage Testing with Pressurization (As per SMACNA Air Duct Leakage Standards). This process to be documented.										
	2.HVAC Testing, Adjusting and Balancing as per ASHRAE standard										
	3.Checking and Recording all the parameters in TAB format for the equipments like: Air Handling Units. This to includes Electrical measures (Frequency, Power factor & Kw.), Hydronic flow measures, Pressures across heat exchangers (Water & Air), Airflow measures, Motor RPM measures & Thermal	Lot	1								



1) Quantities of measureable items are indicative and payment shall be made on basis of actual measurement at site.			
2) All the items covered in this B.O.Q. have to be provided with prices.			
3) The quoted rates shall be inclusive of all the applicable Govt. levies and taxes such as custom duty/excise duty/entry tax/VAT/Octroi/service tax etc. and no claim over and above quoted rates on this account shall be payable.			

**Total amount in words :** \_\_\_\_\_

**Delivery schedule : Within 60 days from the date of release of LOI/PO.**

**Note :** 1) The column may be filled as is applicable in each case  
2) List of optional accessories with rate to be attached to price bid as separate sheet.

**Date :**

**Seal and Signature of the bidder**