



SAST/CLPC/ACU-AHRC/ **30** /2025-26

23.06.2025

### **TENDER NOTIFICATION**

The Head, CLPC, Sri Adichunchanagiri Shikshana Trust invites closed tenders from eligible tenderers or bonafide licensed manufacturer (OEM) or their authorized local supplier/ dealer/ distributor in the state of Karnataka for the Renovation of Civil, Electrical, Biomedical & HVAC works at Neuro Surgery Department, AHRC, BG Nagara as per section I & II.

01	Name of the work	Procurement of HVAC works at Neurosurgery Department, AHRC
02	Last Date for Tender Submission	On or before 28.06.2025 <b>within 5:30pm.</b>

### **Section-1**

#### **Instructions to Tenderers**

- 1) The Tenderer shall submit the bids (Technical & Financial bids) through the mail id: **clpchead@bgscet.ac.in** on or before the last date of tender submission (for any or all list of items) on professional business letterheads only. The details to be printed on the letter head is as follows
  - i) Tender for Procurement of HVAC works at Neurosurgery Department, AHRC, BG Nagara
  - ii) Tender Reference number **ACU/AUTY/CLPC/258 Dated on 05/02/2025, AHRC/ACU/U-356/2024-25**
  - iii) Address to "The HEAD, CLPC, Sri Adichunchanagiri Shikshana Trust, BGSCET Campus, Mahalakshmpuram, Bengaluru - 560086"
  - iv) The tenderer shall submit the original documents to this office on the last day of submission for verification who prefers to submit the tender through Post can dispatch the same through Registered post / Speed post or Couriers as to reach the above address on or before the due date and time specified in the Tender Notice. Tenders received after the due date and time, for what so ever reasons will not be considered and the authority, Head of CLPC will not be liable or responsible for the same.
- 2) **Tender Currency:** Prices shall be quoted in Indian Rupees only.
- 3) **AMC/CMC (IF ANY)** is subject to the Sri Adichunchanagiri shikshana trust's norms.
- 4) **Warranty:** 3 Years
- 5) **Amendment of tender documents:** At any time prior to the deadline of submission of tenders the trust may, for no reason, whether as its own initiative or otherwise modify the tender documents by amendment. Sri Adichunchanagiri Shikshana Trust reserves all the rights to accept, reject, incorporate changes and re-tender without giving any reasons.
- 6) **Documents Comprising the Tender:** Shall attach Brochure, Certification of the product, Bank/account details, PAN, GSTIN, Good Standing Certificate and 02 years of ITR



declaration inside the envelope and the company contact details with email id on the in the below mention format in annexure -

- 7) **Tender Prices:** Prices indicated on the price schedule shall be entered separately I.e. the price of the goods, quoted (ex-works, ex-factory, ex-showroom, ex-warehouse, or off-the-shelf, as applicable), including all duties and sales and the other taxes already paid or payable. Any Indian duties, sales and other taxes which will be payable on the goods if the contract is awarded. Conditional tenders will not be considered. The bidder has to give the quotation in the below enclosed format in annexure - 2.
- 8) **Validity of the Bid:** 90 days from the last date of submission of bid.
- 9) **Corrupt or Fraudulent practices:** Sri Adichunchanagiri Shikshana Trust requires that the tenderers, observe the highest standard of ethics during the procurement and execution of such contracts. In purchase of this policy:
  - a) Will reject a proposal for award if it determines the tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
  - b) Will declare a firm ineligible, either indefinitely or for the stated period of time, to be awarded a university contract if it any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a trust contract.
- 10) **Process to be confidential:** Information relating to the examination, clarification, evaluation, and comparison of tenders and recommendations for the award of contract will not be disclosed to tenderers or any other persons not officially concerned with such process until the award to the successful tenderer has been announced. Any effort by a tenderer to influence the employer's processing of tenders or award decisions may result in rejection of his tender.
- 11) **Clarification of Tenders:** To assist in the examination, evaluation, and comparison of tenders the employer may, at his discretion, ask and tenderer for clarification of his tender, including breakdowns of unit rates. The request for clarification and the response shall be writing or by cable, but no change in the price or substance of the tender shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the employers in the evaluation of the tenders.
- 12) **Delivery:** The successful BIDDER should commence the service as per the tender document/work or purchase order. For any queries or assistance, please write to [clpchead@bgscet.ac.in](mailto:clpchead@bgscet.ac.in) or telephone to +91- 9448270489.
- 13) **Penalty Clause:** Non-execution of supply order – for the reasons of failure to supply partially or completely within the stipulated time or any event of breach of contract. In case at any following stages
  - a) For the delayed supply (3 days of grace period) – 5% deduction
  - b) Quantity issues – 5 % deduction
  - c) Quality issues – 10% deduction





## Section-2

Sl.no	Description	Unit	Qty
<b>1</b>	Refrigerant Piping for VRF system		
	Supply & Installation of interconnecting following sizes of one end expanded refrigerant copper pipe work, insulated with 13mm thick ( pipe size upto 19.1mm dia) & 19mm thick (pipe size above 19.1mm dia) closed cell electrometric nitrile rubber tubular insulation between each set of indoor & outdoor units with outer mechanical protection of aluminum cladding for all exposed pipes as per specification. All piping inside the room shall be properly fixed/supported with suitable size of clamp/ M.S. hanger and all external piping shall run in M.S. painted cable tray etc. as reqd.		
<b>1.1</b>	41.3 mm dia with 19mm thick nitrile rubber insulation	Mtrs.	
<b>1.2</b>	34.9 mm dia with 19mm thick nitrile rubber insulation 1 3/8	Mtrs.	R/O
<b>1.3</b>	28.6 mm dia with 19mm thick nitrile rubber insulation 1 1/8	Mtrs.	15
<b>1.4</b>	22.2 mm dia with 19mm thick nitrile rubber insulation 7/8	Mtrs.	R/O
<b>1.5</b>	19.1 mm dia with 13mm thick nitrile rubber insulation 3/4	Mtrs.	R/O
<b>1.6</b>	15.9 mm dia with 13mm thick nitrile rubber insulation 5/8	Mtrs.	R/O
<b>1.7</b>	12.7 mm dia with 13mm thick nitrile rubber insulation 1/2	Mtrs.	15
<b>1.8</b>	9.5 mm dia with 13mm thick nitrile rubber insulation 3/8	Mtrs.	R/O
<b>1.9</b>	6.4 mm dia with 13mm thick nitrile rubber insulation 1/4	Mtrs.	
<b>2</b>	Drain Piping		
	Providing & fixing of PVC Pipe complete with fittings, supports as per specifications and duly insulated with 9 mm thickness of closed cell nitrile rubber as required & as per specifications.		
<b>2.1</b>	32 mm dia with 9 mm thick insulation	Mtrs.	10
	Supplying, installation, testing & commissioning of Propeller type fans for following capacities complete with electric motor suitable for operation on 220 V $\pm$ 10%, 50 Hz, 1 phase AC supply fitted with speed regulator, 15 Amp plug and wiring between the fan and the socket, mountings, frames, louvers and bird screen etc.		
<b>3.1</b>	100 CFM	Nos.	R/O



4	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.		
4.1	24 G DUCTING	SQM.	100
5	Supply, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc, as per specifications.	Sqmt.	0.5
6	Supplying, installation, testing and commissioning of fire dampers with fusible link	Sqmt.	0.5
7	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers as per specifications.	SQM.	1
8	Supplying & fixing of powder coated extruded aluminium Return Air/Exhaust Air Grills with louvers but without volume control dampers complete as required.	SQM.	0.5
9	<b>THERMAL INSULATION WITHOUT ALUMINIUM FOIL</b>		
	Thermal insulation of the sheet metal duct with closed cell elastomeric insulation of Class 'O' material with density of 40 - 55 kg/cum as per the thickness mentioned below, with fire retardant adhesive and joints sealed with 3mm thick, 50mm wide nitrile rubber self adhesive tape. Insulation shall be provided with Aluminium Foil for mechanical protection.	Sqmt.	100
10	<b>OPERATION THEATRE AIR HANDLING UNITS FOR OUTDOOR APPLICATION</b>		
	Operation Theatre Air handling units with 14 TR DX coil connected to 2 nos of DX Condensing Unit ( 1W+ 1S ) to maintain the temperature between 18 deg. C to 27 deg. C.		





	Supplying, installing, testing and commissioning of factory built Floor mounted double skin type air handling units made of 50 mm thick panels consisting of pre plasticized G.I. casing of thickness 0.8 mm outside layer and 0.8 mm plane inside layer with polyurethane foam (PUF) insulation of density 32 kg/m <sup>3</sup> factory injected between them by injection moulding machine, complete with blower section with blower DIDW backward curved centrifugal fan of 125mm WC static pressure, 6 row deep Dx- type cooling coil with complete with accessories , corded remote, fittings & required cable to connect indoor unit to socket.Refrigerant Pipe size and gas quantity should suit to the copper pipe length at actual.The capacity guarantee should be ensured by the vendor,suitable to run with DX type out door unit , section with aluminium finned copper tubes ,4 KW Heater box , filter sections with 50 mm thick washable synthetic type Pre filters having efficiency 90% down to 10 micron and Fine filters having efficiency 99% down to 5 micron, Motor suitable for 415 ± 10% volts, 50 Hz, 3 phase, A.C supply, complete with drain connections with drain valve, stainless steel drain pan , necessary vibration isolation arrangement etc, complete as per specifications of following capacities:		
	Equipment Description		
10.1	OT-AHU-01 to 12 DX Coil - 17 TR (10.2 HP + 10.2 HP) Supply Air Fan - 4000 CFM / 100mm TSP <b>(Reference taken from above Sl No. 5.1)</b>	Nos.	1
11	Supply & installation of 17 tr ahu condenser coil	Nos.	1
12	Miscellaneous spares for ahu (for existing unit)	<b>Lot</b>	1
	Equipment Description		
13	<b>AIR COOLED DX OUTDOOR UNITS</b>		
	Air cooled out door condensing units comprising of semi-hermetic / hermetic rotoray / scroll compressors with matching air cooled condenser provided with necessary controls. The outdoor unit shall have necessary condenser coil, fan, fan motor, Rotary / Scroll type compressor, HP/LP cutouts, in-built electrical panel with necessary starter, relays, controls, etc., And the complete unit shall be suitable for outdoor application (Bangalore). The unit shall be with non-ozone depleting refrigerant R410A.		
	The units shall be suitable for input power supply of 3 Phase, 440volts, 50hz.		
	The cooling capacity mentioned shall be actual capacity to be delivered by the equipment suitable for total of 25m length of refrigerant copper piping between AHU and outdoor units inclusive of 6m of vertical drop downwards from the AHU, and at an outdoor temperature of 36 deg C. The cost shall be inclusive of pressure		



	testing, vaccumissing.		
13.1	10.2 HP	Nos	2
13.2	6.6 HP	Nos	0
14	Structural Stand for positioning condenser units with necessary vibration isolating serrated rubber pads. Also the supplier to ensure that all support stands are of hot dipped galvanised frame with two 12.5 mm thick neoprene vibration isolators under the whole unit. Also rubber pads should be placed under the condenser units. The GI stand to be painted with two coats of primer and two coats of epoxy paint of Black Colour.	Nos	2
15	Structural Stand for positioning PLENUM with necessary supports and accessories	Nos	R/O
16	Supply and fixing Drier Filter	Nos.	2
17	Supply and fixing of Expansion valve	nos	2
18	Piping for <b>FRESH AIR SYSTEM</b>		
	Providing & fixing of PVC Pipe complete with fittings, supports as per specifications		
18.1	140 mm dia	Mtrs.	
18.2	100mm dia	Mtrs.	15
19	<b>LADDER TYPE CABLE TRAY</b>		
	Ladder type cable tray for laying of copper refrigerant pipes with supports and Cover . Heat resistant gromets to be used to hold the copper pipes. Metal to metal contact should be eliminated.		
19	300 mm (W) x 50mm (D) x 1.6mm (T)	Rmt	18
20	<b>ALUMINIUM DUCT</b>		





	Supply, Fabrication, installation and testing of Aluminium sheet metal ducts (Machine made) in accordance with the approved shop drawings complete with all accessories like vanes, flanges, suspension rods , anchor bolts, GI bolts & nuts, canvas connections , duct dampers & splitter dampers etc., and as required by the specifications. The zinc coating for the sheets to be at <b>120gsm</b> . All OT & IVF zone ducts to be constructed out of aluminium.		
20.1	22G. Ducting	Sqmt.	R/0
21	Supply and charging of Refrigerant R-410 A ( Top Up )	kgs	18
<b>22</b>	Supply & Fixing of FRP( Fiber Reinforce Plastic ) insulation on exposed Ducts	Sqmt.	100
23	<b>CABINET FAN -EXHAUST AIR FAN</b>		
	Single skin type floor / Ceiling mounted units complete with (23±2 mm) insulated with CFC free polyurethane foam (PUF) panels of 42 Kg/cum density. Sandwiched between 0.6 mm thick G.I. Sheets. Outer skin shall be pre plasticized G.I. sheet and internal skin shall be powder coated G.I. sheet. The unit shall be provided with forward curved blower, IE-2 Motor, drive set & guard, spring isolator to avoid transmission of vibration, etc. The motor shall be with IP21 protection, class 'F' insulation.		
24	100 CFM Circular Inline fan (self exhaust )		3
25	<b>VARIABLE FREQUENCY DRIVE STARTER PANEL</b>		
	Starter panel shall have necessary power and control contactors for fans (3.7KW), isolators for DX ODUs (10KW), heaters (6 KW - 3 stages) with thermistars, overload relays, internal power and control wirings. The starter panel shall be supplied with VFDs. The starter panel shall be with <b>IP 65</b> protection. The finish of the box shall be similar to the unit cabinet finish. The starter panel shall be provided with a switch to ON/OFF the compressor. The variable frequency drive (VFD) shall be supplied with IP 21 protection, digital display and with necessary active harmonic filter to prevent the injection of harmonics into the electrical system. The VFD shall be capable of regulating the speed of the fan from 120 % to 20% of rated fan speed at the specified rated flow & static. The VFD shall be capable of hooking up to the third party BMS system through ModBUS open protocols, for remote operation and monitoring. The VFD capacity shall be as per the actual motor selection of the fan. VFD shall have necessary in-built capacitors		



	for power factor corrections to achieve 0.95 as power factor. All VFDs shall have by-pass arrangement.		
	The Electrical starter panel shall comprise incoming MPCB, VFD, by-pass starters with all <b>type-2 contactors</b> , relays, single phase prevention, voltage imbalance protection, phase indicators with key switch, ON / OFF / TRIP indicators, digital ammeter & voltmeter with selector switches, Auto-OFF-Manual selector switch, Earth leakage relays. The panels shall be with necessary relays and potential free contacts required for complete control & monitoring from the third party BMS system as per the I/O summary.		
	The VFD shall able to operate based on 0 to 10V / 2 to 20mA signal from temperature sensor.		
	VFD bypass starter panel of capacity as mentioned in Equipment Schedule		
25.1	3.7 KW - for OT AHUs		1

THE HEAD  
CLPC, ACU  
Mahalakshmiapuram,  
Bengaluru - 560 086.





## Annexure – 1

### PARTICULARS OF THE BIDDER

Sr. No	Description	Details (to be filled by the responder to the Bid)
1	Name of the company	
2	Official address	
3	Phone No. And Fax No.	
4	Corporate Headquarters Address	
5	Phone No. And Fax No.	
6	Web Site Address	
7	Details of Company's Registration (Please enclose copy of the company registration document)	
8	Name of Registration Authority	
9	Registration Number and Year of Registration	
10	ISO certifications and its validity	
11	GST registration No.	
12	Permanent Account Number (PAN)	
13	Company's Revenue for last 3 years (Year wise)	
14	Company's net worth for the last year	
15	Bank Details (Name, Account no., Branch, IFSC, MICR)	



## Annexure – 2

The Bidder has to quote the rate in the Item Data available online with this bid. Details to be filled up for price bid are as below:

Sl No	Description	Amount (Excl. of GST)
1	Procurement of HVAC works at Neurosurgery Department	
Sub Total Amount		
GST @		
Total Amount in INR (Incl. of GST)		
Amount in words		

Cost related to the works as per Items mentioned in the Compliance sheet for technical proposal.

THE HEAD  
CLPC, ACU  
Mahalakshmiapuram,  
Bengaluru - 560 086.





Sl no	Description	Unit	Qty	Rate		Amount	
				Supply	Installation	Supply	Installation
1	Refrigerant Piping for VRF system						
	Supply & Installation of interconnecting following sizes of one end expanded refrigerant copper pipe work, insulated with 13mm thick ( pipe size upto 19.1mm dia) & 19mm thick (pipe size above 19.1mm dia) closed cell electrometric nitrile rubber tubular insulation between each set of indoor & outdoor units with outer mechanical protection of aluminum cladding for all exposed pipes as per specification. All piping inside the room shall be properly fixed/supported with suitable size of clamp/ M.S. hanger and all external piping shall run in M.S. painted cable tray etc. as reqd.						
1.1	41.3 mm dia with 19mm thick nitrile rubber insulation	Mtrs.					
1.2	34.9 mm dia with 19mm thick nitrile rubber insulation 1 3/8	Mtrs.	R/O				
1.3	28.6 mm dia with 19mm thick nitrile rubber insulation 1 1/8	Mtrs.	15				
1.4	22.2 mm dia with 19mm thick nitrile rubber insulation 7/8	Mtrs.	R/O				
1.5	19.1 mm dia with 13mm thick nitrile rubber insulation 3/4	Mtrs.	R/O				
1.6	15.9 mm dia with 13mm thick nitrile rubber insulation 5/8	Mtrs.	R/O				

*[Signature]*



1.7	12.7 mm dia with 13mm thick nitrile rubber insulation 1/2	Mtrs.	15				
1.8	9.5 mm dia with 13mm thick nitrile rubber insulation 3/8	Mtrs.	R/O				
1.9	6.4 mm dia with 13mm thick nitrile rubber insulation 1/4	Mtrs.					
2	Drain Piping						
	Providing & fixing of PVC Pipe complete with fittings, supports as per specifications and duly insulated with 9 mm thickness of closed cell nitrile rubber as required & as per specifications.						
2.1	32 mm dia with 9 mm thick insulation	Mtrs.	10				
	Supplying, installation, testing & commissioning of Propeller type fans for following capacities complete with electric motor suitable for operation on 220 V $\pm$ 10%, 50 Hz, 1 phase AC supply fitted with speed regulator, 15 Amp plug and wiring between the fan and the socket, mountings, frames, louvers and bird screen etc.						
3.1	100 CFM	Nos.	R/O				
4							
	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.						





4.1	24 G DUCTING	SQM.	100				
5	Supply, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc, as per specifications.	Sqmt.	0.5				
6	Supplying, installation, testing and commissioning of fire dampers with fusible link	Sqmt.	0.5				
7	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers as per specifications.	SQM.	1				
8	Supplying & fixing of powder coated extruded aluminium Return Air/Exhaust Air Grills with louvers but without volume control dampers complete as required.	SQM.	0.5				
9	<b>THERMAL INSULATION WITHOUT ALUMINIUM FOIL</b>						
	Thermal insulation of the sheet metal duct with closed cell elastomeric insulation of Class 'O' material with density of 40 - 55 kg/cum as per the thickness mentioned below, with fire retardant adhesive and joints sealed with 3mm thick, 50mm wide nitrile rubber self adhesive tape. Insulation shall be provided with Aluminium Foil for mechanical protection.	Sqmt.	100				
10	<b>OPERATION THEATRE AIR HANDLING UNITS FOR OUTDOOR APPLICATION</b>						

*[Signature]*



Operation Theatre Air handling units with 14 TR DX coil connected to 2 nos of DX Condensing Unit ( 1W+ 1S ) to maintain the temperature between 18 deg. C to 27 deg. C.						
Supplying, installing, testing and commissioning of factory built Floor mounted double skin type air handling units made of 50 mm thick panels consisting of pre plasticized G.I. casing of thickness 0.8 mm outside layer and 0.8 mm plane inside layer with polyurethane foam (PUF) insulation of density 32 kg/m3 factory injected between them by injection moulding machine, complete with blower section with blower DIDW backward curved centrifugal fan of 125mm WC static pressure, 6 row deep Dx-type cooling coil with complete with accessories , corded remote, fittings & required cable to connect indoor unit to socket.Refrigerant Pipe size and gas quantity should suit to the copper pipe length at actual.The capacity guarantee should be ensured by the vendor,suitable to run with DX type out door unit , section with aluminium finned copper tubes ,4 KW Heater box , filter sections with 50 mm thick washable synthetic type Pre filters having efficiency 90% down to 10 micron and Fine filters having efficiency 99% down to 5 micron, Motor suitable for 415 $\pm$ 10% volts, 50 Hz, 3 phase, A.C supply, complete with drain connections with drain valve, stainless steel drain pan , necessary vibration isolation arrangement etc, complete as per specifications of following capacities:						
Equipment Description						





10.1	OT-AHU-01 to 12 DX Coil - 17 TR (10.2 HP + 10.2 HP) Supply Air Fan - 4000 CFM / 100mm TSP <b>(Reference taken from above SI No. 5.1)</b>	Nos.	1				
11	Supply & installation of 17 tr ahu condenser coil	Nos.	1				
12	Missalaneous spares for ahu (for existing unit)	<b>Lot</b>	1				
	Equipment Description						
13	<b>AIR COOLED DX OUTDOOR UNITS</b>						
	Air cooled out door condensing units comprising of semi-hermetic / hermetic rotoray / scroll compressors with matching air cooled condenser provided with necessary controls. The outdoor unit shall have necessary condenser coil, fan, fan motor, Rotary / Scroll type compressor, HP/LP cutouts, in-built electrical panel with necessary starter, relays, controls, etc., And the complete unit shall be suitable for outdoor application (Bangalore). The unit shall be with non-ozone depleting refrigerant R410A.						
	The units shall be suitable for input power supply of 3 Phase, 440volts, 50hz.						



	The cooling capacity mentioned shall be actual capacity to be delivered by the equipment suitable for total of 25m length of refrigerant copper piping between AHU and outdoor units inclusive of 6m of vertical drop downwards from the AHU, and at an outdoor temperature of 36 deg C. The cost shall be inclusive of pressure testing, vacuumizing.						
13.1	10.2 HP	Nos	2				
13.2	6.6 HP	Nos	0				
14	Structural Stand for positioning condenser units with necessary vibration isolating serrated rubber pads. Also the supplier to ensure that all support stands are of hot dipped galvanised frame with two 12.5 mm thick neoprene vibration isolators under the whole unit. Also rubber pads should be placed under the condenser units. The GI stand to be painted with two coats of primer and two coats of epoxy paint of Black Colour.	Nos	2				
15	Structural Stand for positioning PLENUM with necessary supports and accessories	Nos	R/O				
16	Supply and fixing Drier Filter	Nos.	2				
17	Supply and fixing of Expansion valve	nos	2				
18	Piping for <b>FRESH AIR SYSTEM</b>						
	Providing & fixing of PVC Pipe complete with fittings, supports as per specifications						
18.1	140 mm dia	Mtrs.					





18.2	100mm dia	Mtrs.	15				
<b>19</b>	<b>LADDER TYPE CABLE TRAY</b>						
	Ladder type cable tray for laying of copper refrigerant pipes with supports and Cover. Heat resistant gromets to be used to hold the copper pipes. Metal to metal contact should be eliminated.						
<b>19</b>	300 mm (W) x 50mm (D) x 1.6mm (T)	Rmt	18				
<b>20</b>	<b>ALUMINIUM DUCT</b>						
	Supply, Fabrication, installation and testing of Aluminium sheet metal ducts (Machine made) in accordance with the approved shop drawings complete with all accessories like vanes, flanges, suspension rods, anchor bolts, GI bolts & nuts, canvas connections, duct dampers & splitter dampers etc., and as required by the specifications. The zinc coating for the sheets to be at <b>120gsm</b> . All OT & IVF zone ducts to be constructed out of aluminium.						
20.1	22G. Ducting	Sqmt.	R/0				
21	Supply and charging of Refrigerant R-410 A ( Top Up )	kgs	18				
<b>22</b>	Supply & Fixing of FRP( Fiber Reinforce Plastic ) insulation on exposed Ducts	Sqmt.	100				
<b>23</b>	<b>CABINET FAN -EXHAUST AIR FAN</b>						

*[Signature]*



	Single skin type floor / Ceiling mounted units complete with (23±2 mm) insulated with CFC free polyurethane foam (PUF) panels of 42 Kg/cum density. Sandwiched between 0.6 mm thick G.I. Sheets. Outer skin shall be pre plasticized G.I. sheet and internal skin shall be powder coated G.I. sheet. The unit shall be provided with forward curved blower, IE-2 Motor, drive set & guard, spring isolator to avoid transmission of vibration,etc. The motor shall be with IP21 protection, class 'F' insulation.					
24	100 CFM Circular Inline fan (self exhaust )	3				
25	<b>VARIABLE FREQUENCY DRIVE STARTER PANEL</b>					
	Starter panel shall have necessary power and control contactors for fans (3.7KW), isolators for DX ODU's (10KW), heaters (6 KW - 3 stages) with thermistars, overload relays, internal power and control wirings. The starter panel shall be supplied with VFDs. The starter panel shall be with IP 65 protection. The finish of the box shall be similar to the unit cabinet finish. The starter panel shall be provided with a switch to ON/OFF the compressor. The variable frequency drive (VFD) shall be supplied with IP 21 protection, digital display and with necessary active harmonic filter to prevent the injection of harmonics into the electrical system. The VFD shall be capable of regulating the speed of the fan from 120 % to 20% of rated fan speed at the specified rated flow & static. The VFD shall be capable of hooking up to the third party BMS					





	system through ModBUS open protocols, for remote operation and monitoring. The VFD capacity shall be as per the actual motor selection of the fan. VFD shall have necessary in-built capacitors for power factor corrections to achieve 0.95 as power factor. All VFDs shall have by-pass arrangement.					
	The Electrical starter panel shall comprise incoming MPCB, VFD, by-pass starters with all <b>type-2 contactors</b> , relays, single phase prevention, voltage imbalance protection, phase indicators with key switch, ON / OFF / TRIP indicators, digital ammeter & voltmeter with selector switches, Auto-OFF-Manual selector switch, Earth leakage relays. The panels shall be with necessary relays and potential free contacts required for complete control & monitoring from the third party BMS system as per the I/O summary.					
	The VFD shall able to operate based on 0 to 10V / 2 to 20mA signal from temperature sensor.					
	VFD bypass starter panel of capacity as mentioned in Equipment Schedule					
25.1	3.7 KW - for OT AHUs		1			
<b>SUB-TOTAL (BASIC)</b>						
<b>TOTAL BASIC AMOUNT</b>						

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