



Ref: Date: TIFR/PD/CA21-158/211059/ Corrigendum-1

04.12.2021

To  
Vendor/Bidder,

**Sub: Corrigendum No. -1 against tender no. TIFR/PD/CA21-158/211059 dated on 22.11.21 for Supply, Installation, Testing & Commissioning of HVAC System and other related works for Animal Facility in Hanger Building-2, at TIFR, Plot-B, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.**

Ref Our tender ID No.: 2021\_TIFR\_634158\_1

Dear Sir,

Please refer to the subject tender published on 22.11.2021, the following amendments to the subjected tender is being issued

**A) Amendment of Eligibility criteria.**

“The Agencies/Contractors should have average annual turnover of Rs.32 Lakhs during three previous financial years ending March 31, 2021 instead of Rs.9.4 lakhs (Page No.10, Eligibility Criteria, clause 3)”.

**B) Amendment of BOQ.**

Tender BOQ S.No.	Original BOQ		Revised BOQ		Remarks
	Work Description	Qty	Work Description	Qty	
1.0	SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, mounted on a base channel, Draw through type, Two tier, Once through unit with 100% fresh air, EN 779:G4 pre filters fitted to heavy duty fresh air louvers, Cooling Coil section with 8 Row Deep DX cooling coil, insulated SS304 drain Pan, Fan section along with EC fans 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch & View Glass. Manually operated VCDs with extruded	NA	SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, mounted on a base channel, Draw through type, Two tier, Once through unit with 100% fresh air, EN 779:G4 pre filters fitted to heavy duty fresh air louvers, 2 no. Cooling Coil section with 8 Row Deep DX cooling coil (Coil placing one after the other) in the AHU section. <b>One coil need to be connected to working VRF ODUs as explained below and second coil will be stand by coil and stand by VRF ODUs will be installed and connected by client in</b>	NA	

	<p>aluminum aerofoil design for supply air outlet. AHU shall be designed with sufficient space between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>The second tier for exhaust air section shall be with EN 779:G4 pre filters &amp; blower section having EC fans 2nos (1 working + 1 standby), view glass &amp; access doors etc.,</p> <p>Probes for differential pressure measurement across filters &amp; fans with Magnehelic Guages.          Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%.          DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.</p> <p>Note: AHU coil leaving temperature shall be less than 47 deg. F.</p>		<p><b>future.</b> Insulated SS304 drain Pan, Fan section along with <b>direct driven plug fans</b> 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch &amp; View Glass. Manually operated VCDs with extruded aluminum aerofoil design for supply air outlet. AHU shall be designed with sufficient space between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>The second tier for exhaust air section shall be with EN 779:G4 pre filters &amp; blower section having <b>direct driven plug fans</b> 2nos (1 working + 1 standby), view glass &amp; access doors etc.</p> <p>Probes for differential pressure measurement across filters &amp; fans with Magnehelic Guages. Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.</p> <p>Note:</p> <ul style="list-style-type: none"> <li>• AHU coil leaving temperature shall be less than 47 deg. F.</li> <li>• <b>Working and stand by fans shall be interchanged from BMS automatically as per the schedule.</b></li> </ul>		
1.1	AHU-2 [MICE BREEDING & HOLDING ROOM-1 and QUARANTINE ROOM] 17.0TR / 1750CFM at 125MMWG static. Exhaust fan (650CFM at 40MMWG static). AHU shall be connected to 2nos. 12HP VRF Heat pump models for cooling in summer & heating in winter.	1	AHU-2 [MICE BREEDING & HOLDING ROOM-1 and QUARANTINE ROOM] 17.0TR / 1750CFM at 125MMWG static. Exhaust fan (650CFM at 40MMWG static) AHU shall be connected to 2 nos. 12HP VRF Heat pump models for cooling in summer & heating in winter. <b>VRF ODUs shall be connected to coil independently.</b>	1	
1.2	AHU-3 [MICE BREEDING & HOLDING ROOM-2, DIAGNOSIS & AUTOPSY ROOM, FEED & BEDDING STORAGE] 22.6TR / 2500CFM at 125MMWGstatic. Exhaust fan (1800CFM at 40MMWG static) AHU shall be connected to (12HPx1no + 16HPx1no) VRF Heat pump models for cooling in summer & heating in winter.	1	AHU-3 [MICE BREEDING & HOLDING ROOM-2, DIAGNOSIS & AUTOPSY ROOM, FEED & BEDDING STORAGE] 22.6TR / 2500CFM at 125MMWG static. Exhaust fan (1800CFM at 40MMWG static) AHU shall be connected to (12HPx1no + 16HPx1no) VRF Heat pump models for cooling in summer & heating in winter. <b>VRF ODUs shall be connected to coil independently.</b>	1	
1.3	AHU-4 [MICE BREEDING & HOLDING ROOM-3, EXPERIMENT OR BEHAVIOR & WILD MICE ROOM] 13.5TR / 1500CFM at 125MMWG static. Exhaust fan (850CFM at 40MMWG static) AHU shall be connected to 2nos. 10HP VRF Heat pump models for cooling in summer & heating in winter.	1	AHU-4 [MICE BREEDING & HOLDING ROOM-3, EXPERIMENT OR BEHAVIOR & WILD MICE ROOM] 13.5TR / 1500CFM at 135MMWG static. Exhaust fan (850CFM at 40MMWG static) AHU shall be connected to 2nos. 10HP VRF Heat pump models for cooling in summer & heating in winter. <b>VRF ODUs shall be connected to coil independently.</b>	1	
2	"SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and	NA	SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm	NA	

	<p>0.8mm precoated GI sheet outside, mounted on a base channel, Draw through type, Thermal Break profile with mixing box for return air &amp; fresh air, pre filter section EN 779:G4 filters with frame, Cooling Coil section with 6 Row Deep DX cooling coil, insulated SS304 drain Pan, Fan section along with EC fans 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch &amp; View Glass. Manually operated VCDs with extruded aluminum aerofoil design for fresh air, return air, bleed air &amp; supply air outlet. AHU shall be designed with sufficient space between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>Probes for differential pressure measurement across filters &amp; fans with Magnehelic Guages.        Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%.        DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.</p>		<p>precoated GI sheet outside, mounted on a base channel, Draw through type, Thermal Break profile with mixing box for return air &amp; fresh air, pre filter section EN 779:G4 filters with frame, 2 no. Cooling Coil section with 6 Row Deep DX cooling coil (<b>Coil placing one after the other</b>) in the <b>AHU section. One coil need to be connected to working VRF ODUs as explained below and second coil will be stand by coil and stand by VRF ODUs will be installed and connected by client in future.</b> Insulated SS304 drain Pan, Fan section along with <b>direct driven plug fans</b> 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch &amp; View Glass. Manually operated VCDs with extruded aluminum aerofoil design for fresh air, return air, bleed air &amp; supply air outlet. AHU shall be designed with sufficient space between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>Probes for differential pressure measurement across filters &amp; fans with Magnehelic Guages. Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller. <b>Working and stand by fans shall be interchanged from BMS automatically as per the schedule.</b></p>		
2.1	<p>AHU-1 [CHANGE &amp; AIRSHOWER, CORRIDOR-1, AIRLOCK, CORRIDOR-2 and CLEAN MAINTAIN STORAGE &amp; CAGE PREP. AREA]          11.1TR / 2700CFM at 125MMWG static.          AHU shall be connected to 1no. 10HP &amp; 1no. 12HP VRF Heat pump models for cooling in summer &amp; heating in winter.</p>	1	<p>AHU-1 [CHANGE &amp; AIRSHOWER, CORRIDOR-1, AIRLOCK, CORRIDOR-2 and CLEAN MAINTAIN STORAGE &amp; CAGE PREP. AREA]          11.1TR / 2700CFM at 135MMWG static.          AHU shall be connected to 1no. 10HP &amp; 1no. 12HP VRF Heat pump models for cooling in summer &amp; heating in winter. <b>VRF ODUs shall be independently connected to the coil.</b></p>	1	
6.2	4.0 TR - For "Dirty Cage, Scrap, Wash & DD Autoclave" area	1	4.0 TR - For "Dirty Cage, Scrap, Wash & DD Autoclave" area	R/O	
8.1	Corded type	2	Corded type	1	
27	<p>SITC of floor mounted 40±2kg density PUF insulated, 40mm thick, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, Draw through type, Double skin Exhaust Air Handling Units (EAU), Horizontal, EN 779 : G4 pre filter, Fan section along with EC fan with anti vibration mountings etc. Fan section should have limit switch and light along with View Glass and access door. Probes for Differential pressure measurement across filter &amp; fan. Manually operated VCDs with extruded aluminum aerofoil blade at outlet.</p>	NA	<p>SITC of floor mounted 40±2kg density PUF insulated, 40mm thick, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, Draw through type, Double skin Exhaust Air Handling Units (EAU), Horizontal, EN 779 : G4 pre filter, Fan section along with <b>direct driven plug fans</b> 2nos (1 working + 1 standby), with anti-vibration mountings etc.. Fan section should have limit switch and light along with View Glass and access door. Probes for Differential pressure measurement across filter &amp; fan. Manually operated VCDs with extruded aluminum aerofoil blade at outlet. Working and stand by fans shall be interchanged from BMS automatically as per the schedule</p>	NA	

37	Supply, installation, testing and commissioning of Outdoor wall mounted / floor mounted electrical panels for AHUs. Panels shall have power supply provision for Supply Air & Exhaust Air EC Fans, Pan Humidifier, Electric Heater module, IVC Exhaust EC Fans, VRF ODUs & UV Light. Panels shall have all provisions for BMS integration and shall have auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of EC fans. EC fans shall be switched on / off individually from panel / IBMS. EC fans shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. Complete switchgear shall be selected for continuous operation.		Supply, installation, testing and commissioning of Outdoor wall mounted / floor mounted electrical panels for AHUs. Panels shall have power supply provision for <b>2 no. supply air, 2 no. Exhaust Air Direct Driven Plug Fans</b> , Pan Humidifier, Electric Heater module, IVC Exhaust Fans ( <b>number of fans as mentioned below</b> ), VRF ODUs & UV Light. Panels shall have all provisions for BMS integration and shall have auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and <b>capacity of fans</b> . Fans shall be switched on / off individually from panel / IBMS. <b>Direct Driven Plug Fans</b> shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. Complete switchgear shall be selected for continuous operation. <b>All supply air Direct Driven Plug fans, exhaust air Direct Driven Plug fans and IVC exhaust fans shall be provided with VFD starters and BMS compatibility for varying the speed and air quantity from BMS automatically.</b>		
37.1	For AHU-2, 3 & 4	3	<b>For AHU-2 with 4 no. IVC Exhaust Fans</b>	1	
			<b>For AHU-3 with 2 no. IVC Exhaust Fan</b>	1	
			<b>For AHU-4 with 4 no. IVC Exhaust Fans</b>	1	
38	Supply, installation, testing and commissioning of Outdoor wall mounted electrical panels for AHU. Starter panels shall have power supply provision for Supply Air EC Fans, Pan Humidifier, Electric Heaters, VRF ODUs & UV Light provisions for BMS integration, auto manual switch etc., Actual Kw ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of EC fans. EC fans shall be switched on / off individually from panel / IBMS. EC fans shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire.	NA	Supply, installation, testing and commissioning of Outdoor wall mounted electrical panels for AHU. Starter panels shall have power supply provision for Supply Air <b>Direct Driven Plug Fans</b> , Pan Humidifier, Electric Heaters, VRF ODUs & UV Light provisions for BMS integration, auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of <b>Direct Driven Plug fans</b> . <b>Direct Driven Plug fans</b> shall be switched on / off individually from panel / IBMS. <b>Direct Driven Plug Fans</b> shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. <b>All supply air fans shall be provided with VFD starters and BMS compatibility for varying the speed and air quantity from BMS automatically.</b>	NA	
46			"SITC of Double skin 50mm thick Ceiling Suspended Air Handling Unit 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm pre-coated GI sheet outside, mounted on a base channel. Thermal Break profile with mixing box for return air, pre filter section EN 779:G4 filters with frame, Cooling Coil section with 6 Row Deep DX cooling coil in the AHU section. insulated SS304 drain Pan, Fan section along with direct driven plug fan, Fan section should have limit switch & View Glass. Manually operated VCDs with extruded aluminium aerofoil design for return air & supply air outlet. The fan outlet air velocity shall not exceed		<b>Additional Item</b>



**TATA INSTITUTE OF FUNDAMENTAL RESEARCH**  
(Autonomous Institution of the Department of Atomic Energy, Government of India)  
Survey No.36/P, Gopanpally Village, Serilingampally Mandal,  
Ranga Reddy District, Hyderabad-500046, Telangana

			9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM & 400 FPM respectively. Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.		
46.1			4 TR / 2000 CFM For "Dirty Cage, Scrap, Wash & DD Autoclave" area	1	
47			Supply, installation, testing and commissioning of Outdoor wall mounted electrical panels for ceiling suspended AHU. Starter panels shall have power supply provision for Supply Air Fans and VRF ODUs, BMS integration, auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of fans. Fans shall be switched on / off individually from panel / IBMS. Fans shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. Supply air fan shall be provided with VFD starters and BMS compatibility for varying the speed and air quantity from BMS automatically.	1	<b>Additional Item</b>

**Note:**

A complete revised BOQ is attached hence may requested to ignore the original BOQ.

**C) Amendment of due date for submission**

"The due date for submission of Tender is amended as 13-12-2021 by 13:00 Hrs instead of 06.12.2021 by 13:00 Hrs."

All other terms & conditions of subject tender shall remain unchanged. This Corrigendum-I is an integral part of the subject tender and a copy of the same must be submitted along with the tender duly signed and stamped.

**TATA INSTITUTE OF FUNDAMENTAL RESEARCH**  
Sy.No.36/P, Gopanpally Village, Serilingampally Mandal,  
Ranga Reddy District, Hyderabad - 500 046 Telangana  
Tel: +91(0)40 2020 3010  
Email: [rajasekharr@tifrh.res.in](mailto:rajasekharr@tifrh.res.in)

Please contact if any clarification is required in this regard (9966010705/krishnaae@tifrh.res.in)



**SECTION-VII**

**FINANCIAL BID**

Ref: Date: TIFR/PD/CA21-158/211059/ Corrigendum-1

04.12.2021

**INVITATION OF BIDS FOR**

**Supply, Installation, Testing and Commissioning of HVAC System and other related works for Animal Facility in Hanger Building-2, at TIFR, Plot-B, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.**

**PART II**

**SCHEDULE OF QUANTITIES**

S.No	WORK DESCRIPTION	Unit	Qty (A)	Supply Rate (B)	GST ..... (C)	Supply Amount (D=B+C)	Total Supply Amount (E=A*D)	Installation Rate (F)	GST ..... (G)	Installation Amount (H=F+G)	Total Installation Amount (I=A*H)	Sub Total (J=E+I)
1.0	SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, mounted on a base channel, Draw through type, Two tier, Once through unit with 100% fresh air, EN 779:G4 pre filters fitted to heavy duty fresh air louvers, 2 no. Cooling Coil section with 8 Row Deep DX cooling coil (Coil placing one after the other) in the AHU section. One coil need to be connected to working VRF ODUs as explained below and second coil will be stand by coil and stand by VRF ODUs will be installed and connected by client in future. Insulated SS304 drain Pan, Fan section along with direct driven plug fans 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch & View Glass. Manually operated VCDs with extruded aluminium aerofoil design for supply air outlet. AHU shall be designed wih sufficient space											



between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM & 400 FPM respectively.

The second tier for exhaust air section shall be with EN 779:G4 pre filters & blower section having Direct Driven Plug fans 2nos (1 working + 1 standby), view glass & access doors etc.

Probes for differential pressure measurement across filters & fans with Magnehelic Guages. Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.

Note:

- AHU coil leaving temperature shall be less than 47 deg. F.
- Working and stand by fans shall be interchanged from BMS automatically as per the schedule.



1.1	<p>AHU-2 [MICE BREEDING &amp; HOLDING ROOM-1 and QUARANTINE ROOM] 17.0TR / 1750CFM at 125MMWG static.          Exhaust fan (650CFM at 40MMWG static)          AHU shall be connected to 2 nos. 12HP VRF Heat pump models for cooling in summer &amp; heating in winter. VRF ODUs shall be connected to coil independently.</p>	Nos.	1												
1.2	<p>AHU-3 [MICE BREEDING &amp; HOLDING ROOM-2, DIAGNOSIS &amp; AUTOPSY ROOM, FEED &amp; BEDDING STORAGE] 22.6TR / 2500CFM at 125MMWG static.          Exhaust fan (1800CFM at 40MMWG static)          AHU shall be connected to (12HPx1no + 16HPx1no) VRF Heat pump models for cooling in summer &amp; heating in winter. VRF ODUs shall be connected to coil independently.</p>	Nos.	1												
1.3	<p>AHU-4 [MICE BREEDING &amp; HOLDING ROOM-3, EXPERIMENT OR BEHAVIOR &amp; WILD MICE ROOM] 13.5TR / 1500CFM at 135MMWG static.          Exhaust fan (850CFM at 40MMWG static)          AHU shall be connected to 2nos. 10HP VRF Heat pump models for cooling in summer &amp; heating in winter. VRF ODUs shall be connected to coil</p>	Nos.	1												



	independently.											
2.0	<p>SITC of Double skin 50mm thick Air Handling Unit, floor mounted 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, mounted on a base channel, Draw through type, Thermal Break profile with mixing box for return air &amp; fresh air, pre filter section EN 779:G4 filters with frame, 2 no. Cooling Coil section with 6 Row Deep DX cooling coil (Coil placing one after the other) in the AHU section. One coil need to be connected to working VRF ODUs as explained below and second coil will be stand by coil and stand by VRF ODUs will be installed and connected by client in future. Insulated SS304 drain Pan, Fan section along with direct driven plug fans 2nos (1 working + 1 standby), Fine filter section with EN 779:F9 fine filters along with frame. Fan section should have limit switch &amp; View Glass. Manually operated VCDs with extruded aluminum aerofoil design for fresh air, return air, bleed air &amp; supply air outlet. AHU shall be designed with sufficient space between sections with access door across. AHU shall be provided with canopy sheets. The fan outlet air velocity shall not exceed 9.5 mt./sec. Air velocity across</p>											



	<p>Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>Probes for differential pressure measurement across filters &amp; fans with Magnehelic Guages. Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller. Working and stand by fans shall be interchanged from BMS automatically as per the schedule.</p>											
2.1	<p>AHU-1 [CHANGE &amp; AIRSHOWER, CORRIDOR-1, AIRLOCK, CORRIDOR-2 and CLEAN MAINTAIN STORAGE &amp; CAGE PREP. AREA] 11.1TR / 2700CFM at 135MMWG static.</p> <p>AHU shall be connected to 1no. 10HP &amp; 1no. 12HP VRF Heat pump models for cooling in summer &amp; heating in winter. VRF ODU's shall be independently connected to the coil.</p>	Nos.	1									
3	<p>Supply, Installation, Testing &amp; Commissioning of IAQ UVGI system in supply duct to generate necessary UV-C light to achieve kill rate of minimum 99% in single pass. UV lamps shall be fixed with necessary frame work and shall be installed inside the supply duct. By-products should not be CO2 / O3. UV lamps shall be suitable for</p>											



	the following air quantities. UV C dosage shall be minimum 3000 uW-sec/cm <sup>2</sup> . Required intensity shall be calculated based on the air velocity and duct size. UVGI system shall be integrated to IBMS system.											
3.1	AHU-1 with 2700cfm for [CHANGE & AIRSHOWER, PASSAGE-1, AIRLOCK, PASSAGE-2 and CLEAN MAINTAIN STORAGE & CAGE PREP. AREA]	Nos	1									
3.2	AHU-2 with 1750cfm for [MICE BREEDING & HOLDING ROOM-1 and QUARANTINE ROOM]	Nos	1									
3.3	AHU-3 with 2500cfm for [MICE BREEDING & HOLDING ROOM-2, DIAGNOSIS & AUTOPSY ROOM, FEED & BEDDING STORAGE]	Nos	1									
3.4	AHU-4 with 1500cfm for [MICE BREEDING & HOLDING ROOM-3, EXPERIMENT OR BEHAVIOR & WILD MICE ROOM]	Nos	1									
	Supply, Installation, Testing and Commissioning of Variable Refrigerant Flow Out Door package consisting of compressors, condensers, R 410 A refrigerant, fans, control panels, etc. as per specs of following capacities. The following capacities shall be actual delivered capacity considering the actual operating conditions. Minimum efficiency of VRF needs to be in line with ASHRAE standards. Minimum COP of VRF ODUs shall be 4.0. The											



	units selected shall be summer cooling and winter heating (Heat pump model) type. Units shall be selected for ambient temperature of 50 deg. C. The following capacities shall be the actual delivered capacities at 50 deg. C ambient temperatures.											
4.1	20 HP Out Door Unit	Nos	R/O									
4.2	16 HP Outdoor Unit	Nos	1									
4.3	14 HP Outdoor Unit	Nos	R/O									
4.4	12 HP Outdoor Unit	Nos	5									
4.5	10 HP Outdoor Unit	Nos	3									
4.6	6 HP Outdoor Unit	Nos	R/O									
5	Supply & Installation of civil foundation supporting system for weight distribution, improved installation, etc. for VRF ODU's located in the ground floor with vibration isolation etc.,	Lot	9									
6	SITC of VRF - Ceiling Mounted Indoor Ductable Units as per specifications and of the following capacities. The following capacities shall be actual delivered capacity considering the actual operating conditions. Indoor unit shall be switched off on receipt of fire signal from fire alarm control module. Wiring from control module shall be considered.											
6.1	1.0 TR - For Corridor & Stairs	Nos	1									



6.2	4.0 TR -	Nos	R/O									
7	SITC of VRF Indoor Hi wall type units of the following capacities including shifting, remotes, supports, etc. Indoor unit shall be switched off on receipt of fire signal from fire alarm control module. Wiring from control module shall be considered.											
7.1	1.0 TR - For Office, Staff & Chemical room each	Nos	3									
7.2	1.5 TR - For Kitchen area	Nos	1									
8	SITC of Remote Controls for the above indoor units											
8.1	Corded type	Nos	1									
8.2	Cordless	Nos	4									
9	SITC of Central Monitoring Unit suitable for monitoring and controlling of all indoor units. Total number of Central Monitoring units shall be capable of connecting to all the above indoor units. Central monitoring unit shall be of I Touch manager type. Unit should be capable of Auto Switch over in case of Working Unit fails.	Lot	1									
10	SITC of Bacnet IP integrator for VRF system for integrating with third party IBMS including wiring, etc.	Lot	1									
11	SITC of Refnet Joints for all Indoor units	Lot	1									
12	Supply, installation, testing and commissioning of initial Charge of	Lot	1									



	refrigerant gas - R 410 A											
<b>13</b>	SITC of copper refrigerant piping of various sizes with 18 SWG hard drawn copper piping necessary supports, fittings and clamps, insulation with 19 mm thk class 'O' nitrile rubber insulation. Copper piping shall be of VRF grade with 100% eddy current testing. All wall crossings with proper PVC sleeve. Exposed insulation shall be glass cloth lamination and painted with two coats of UV resistant paint. Low / nill VOC adhesive shall be used.											
13.1	2/8 inch dia.	Rmt	20									
13.2	3/8 inch dia.	Rmt	60									
13.3	4/8 inch dia.	Rmt	20									
13.4	5/8 inch dia.	Rmt	70									
13.5	6/8 inch dia.	Rmt	35									
13.6	7/8 inch dia.	Rmt	10									
13.7	1 inch dia.	Rmt	R/O									
13.8	1 1/8 inch dia.	Rmt	20									
13.9	1 3/8 inch dia.	Rmt	30									
13.10	1 5/8 inch dia.	Rmt	R/O									
<b>14</b>	SITC 3C * 1.5 sq. mm. unarmoured copper cable in 20 mm dia FRLS PVC conduit for communication between	Rmt	150									

	indoor and outdoor units of VRF system											
15	SITC 3C * 1.5 sq. mm. unarmoured copper cable in 20 mm dia FRLS PVC conduit between indoor unit and corded remote.	Rmt	20									
16	SITC of CPVC drain piping with supports, GI Tray, clamps and insulation with 9 mm thk class 'O' nitrile rubber insulation of the following sizes. Insulation shall be FM Approved. Low / nill VOC adhesive shall be used.											
16.1	25 mm dia	Rmt	15									
16.2	32 mm dia	Rmt	30									
16.3	40 mm dia	Rmt	20									
16.4	50 mm dia	Rmt	30									
16.5	65 mm dia	Rmt	R/O									
17	SITC of GSS made volume control damper with opposed blades as per the tender specification, frame shall be made of 18G and blades shall be made of 20G. Blades shall be aerofoil double skin low leakage type and volume control of 0-100% complete with neoprene rubber gasket, nuts, bolts, screws linkages, flanges etc.,	Sqmt	R/O									



<b>18</b>	SITC of fusible link and limit switch type 16 G galvanised sheet fire damper. The damper shall have fire rating of 90 minutes as per UL 555 listed & stamped and shall be installed at all wall crossings in SA / RA ducts & AHU inlet. Size of the fire damper shall be less than 0.5 sq.ft.	Nos	16.0									
<b>19</b>	SITC of powder coated Extruded Aluminium 4-way diffusers in accordance with the approved shop drawings and specifications. The diffuser Neck size shall be as per approved shop drawings and outer size shall be standard size. Diffuser shall be removable core type. Color code shall be match to the interior design.	Sqmt	3.0									
<b>20</b>	SITC of uninsulated flexible ducting, complete with connecting worm clips, supports for following											
20.1	150 mm dia (for Toilets)	Rmt	10									
<b>21</b>	SITC of Exhaust Valves (disc Valves) for Toilet Exhaust, shall be made with extruded aluminium with powder coated as per specifications along with spigot dampers & approved shop drawings for the following sizes.											
21.1	150 mm dia (for Toilets)	Nos	6									

22	Supply, Installation of supporting arrangement for external ducting with MS iron complete with angles/channels, foundation, grouting, nuts, bolts, neoprene rubber gasket, threaded rods, welding etc., also painting to the satisfactory levels of the client.	Kgs	250									
23	SITC of pan humidifiers with actuator, SS tank, fresh water connection, overflow connection, drain connection, humidistat for controlling the RH with in $\pm 5\%$ , supports, etc., of the following capacities. Pan humidifier shall be suitable for BMS integration.											
23.1	2 kW pan humidifier for AHU-2, AHU-3 & AHU-4	Nos.	3									
24	SITC of Aluminum powder coated Fresh air louvers of non vision type with nylon mosquito net etc. as per approved drawings	Sqmt	R/O									
25	SITC of factory made fire retardant canvas cloth for connecting the AHU inlets & outlets to duct connection with GI strip, nut, bolts & accessories as required.	Sqmt	4									
26	SITC of Duct mounted electric type strip heater module with control & wiring to maintain the RH of the following capacities to be accommodated in the Supply air duct. Control panel shall have isolators, safety thermostat, 2-stage humidistat											



	for switching ON the heaters in 2-stages. Heater bank shall be suitable for BMS integration.											
26.1	Heater Capacity : 5.0 kW x 3nos	Nos.	1									
26.2	Heater Capacity : 2.5 kW x 3nos	Nos.	1									
26.3	Heater Capacity : 3.0 kW x 3 nos	Nos.	1									
26.4	Heater Capacity : 2.0 kW x 3 nos	Nos.	1									
27	SITC of floor mounted 40±2kg density PUF insulated, 40mm thick, 0.8mm thick GI plain sheet inside and 0.8mm pre-coated GI sheet outside, Draw through type, Double skin Exhaust Air Handling Units (EAU), Horizontal, EN 779 : G4 pre filter, Fan section along with direct driven plug fans 2nos (1 working + 1 standby), with anti vibration mountings etc.. Fan section should have limit switch and light along with View Glass and access door. Probes for Differential pressure measurement across filter & fan. Manually operated VCDs with extruded aluminum aerofoil blade at outlet. Working and stand by fans shall be interchanged from BMS automatically as per the schedule.											
27.1	Exhaust Air Unit (EAU) - 1000 CFM - Cabinet type & Static Pressure 40 mmWG for IVC AHU in Mice room-1	Nos.	1									
27.2	Exhaust Air Unit (EAU) - 500 CFM - Cabinet type & Static Pressure 40	Nos.	2									



	mmWG for IVC AHU in Mice room-2 & 3											
27.3	Exhaust Air Unit (EAU) - 125 CFM - Cabinet Type with 40mmWG static pressure for Wild mice room	Nos.	1									
27.4	Exhaust Air Unit (EAU) - 75 CFM - Cabinet Type with 25mmWG static pressure for Quarantine room	Nos.	1									
28.0	SITC of propeller fans as per the specification along with the gravity louvers											
28.1	Exhaust Air Unit (EAU) - 225CFM	Nos.	R/O									
<b>29</b>	Supply, installation, testing and commissioning of Round Inline fan of following capacities including, supports, canvas connections, motor, etc. Fan shall be installed with five speed fan regulator for changing the speed. Model shall be MTD Silent Series.											
29.1	225 CFM @ 10 mm SP for Wash Room Exhaust	Nos.	2									
<b>30</b>	Supply & fixing of Supply Air HEPA filter mini pleat type, false ceiling type, fabricated out of GI Powder Coated with gear operated damper EN 1822 H13 standard HEPA Filter for following sizes:											
30.1	HEPA Filter Size: 610mm x 610mm x 150mm Ht (For Supply Module) - 800cfm capacity	Nos.	14									
30.2	HEPA Filter Size: 305mm x 305mm x 150mm Ht (For Supply Module) -	Nos.	6									



	200cfm capacity											
<b>31</b>	Design, Supply, Installation of perforated type Supply Air Grilles made of 20G SS 304 for HEPA filters of following sizes:											
31.1	Grille Size: 750 x 750 MM (Outer / Outer)	Nos.	14									
31.2	Grille Size: 450 x 450 MM (Outer / Outer)	Nos.	6									
<b>32</b>	Design, Supply, Installation of perforated type Return Air Grilles made of 20G SS 304 complete with provision for fixing / holding the Pre-Filter (EN 779 : G4).											
32.1	Grill Size: 750 x 400 MM (Outer/Outer)	Nos.	9									
32.2	Grill Size: 450 x 400 MM (Outer/Outer)	Nos.	19									
<b>33</b>	Supply, installation, testing and commissioning of Digital Guages indicating the Temperature / RH as display for HOLDING ROOM-1,2&3(2nos for each room)	Nos.	6									
33.1	Supply, installation, testing and commissioning of Magnehelic Gauge with SS box with nozzles and tubes for rooms.	Nos.	8									
<b>34</b>	Supply, Installation, Testing and Commissioning of <b>Hiwall Split</b> air conditioners including compressor, condenser, supports, with cordless remote controller, refrigerant gas,											



	sequential controller, ODU stand, etc as per the specifications of the following capacities. 5 star rating. Refrigerant shall be of R410a / R407C.											
34.1	1.0 TR for Bacterial Equipment (Std.By)	Nos	1									
35	Supply, Installation, Testing and Commissioning of 20 SWG soft copper piping with 13 mm thk. nitrile tube insulation for cassette & Hi wall units of the following sizes including supports, clamping, fittings, etc. Both the pipelines shall be insulated with nitrile tubular insulation, shall be of Class "O". Insulation. Exposed piping insulation shall be finished with self adhesive black glass cloth and shall be painted with two coats of UV resistance paint.											
35.1	2/8" dia	Rmt	30									
35.2	4/8" dia	Rmt	30									
36	SITC of PVC insulated armoured copper cable between indoor unit and outdoor unit with supports, clamping, end terminations, etc. of the following sizes.											
36.1	4C x 2.5 sq.mm or as required	Rmt	50									



37	<p>Supply, installation, testing and commissioning of Outdoor wall mounted / floor mounted electrical panels for AHUs. Panels shall have power supply provision for 2 no. supply air, 2 no. Exhaust Air Direct Driven Plug Fans, Pan Humidifier, Electric Heater module, IVC Exhaust Fans (number of fans as mentioned below), VRF ODUs &amp; UV Light. Panels shall have all provisions for BMS integration and shall have auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of fans. Direct driven Plug fans shall be switched on / off individually from panel / IBMS. Fans shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. Complete switchgear shall be selected for continuous operation. All supply air fans, exhaust air fans and IVC exhaust fans shall be provided with VFD starters and BMS compatibility for varying the speed and air quantity from BMS automatically.</p>										
37.1	For AHU-2 with 4 no. IVC Exhaust Fans	No	1								



37.2	For AHU-3 with 2 no. IVC Exhaust Fan	No	1									
37.3	For AHU-4 with 4 no. IVC Exhaust Fans	No	1									
<b>38</b>	Supply, installation, testing and commissioning of Outdoor wall mounted electrical panels for AHU. Starter panels shall have power supply provision for Supply Air Direct driven Plug Fans, Pan Humidifier, Electric Heaters, VRF ODUs & UV Light provisions for BMS integration, auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB. Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of Direct driven Plug fans. Direct driven Plug Fans shall be switched on / off individually from panel / IBMS. Fans shall be monitored individually in the IBMS. Also suitable for shunt trip 24V DC to trip in case of fire. All supply air fans shall be provided with VFD starters and BMS compatibility for varying the speed and air quantity from BMS automatically.											
38.1	For AHU-1	No	1									
<b>39</b>	SITC of power isolators for VRF odu units, Isolators shall be Indoor/Outdoor as required with	No	9									





	required necessary metal box, ELCB isolators of required capacities etc.											
40	SITC of power socket with switch, metal box etc., for single phase ventilation fans.	No	2									
41	SITC of 2runs of 2.5 Sqmm copper wire in 20mm dia FRLS PVC conduit for single phase ventilation fans.	Rmt	20									
42	SITC of the following sizes of XLPE PVC armoured copper cable from isolator / stater panel to the equipment											
42.1	3.5 C x 16 sq.mm	Rmt	20									
42.2	4 C x 10 sq.mm	Rmt	60									
42.3	4 C x 4 sq.mm	Rmt	25									
43	SITC of Hot dip galvanized perforated cable tray of below specified sizes for to run the cable from Isolator / electrical panels to units. All necessary supports & accessories are included. Cable tray shall be of 1.6 mm thk. and shall be 50 mm height.											
43.1	100 mm Wide	Rmt	20									
43.2	150 mm Wide	Rmt	20									
44	SITC of copper earthing with 8 SWG wire with supports, clamps, etc.	Rmt	200									



45	<p><b>VALIDATION AND DOCUMENTATION:</b>          Commissioning of total job with validation reports comprising of</p> <ul style="list-style-type: none"> <li>• Duct Smoke Test</li> <li>• Velocity check with velocity meter</li> <li>• Differential Pressure cascades and Room Air Change Rates</li> <li>• Room Particle count</li> <li>• HEPA filter Integrity Test</li> <li>• Temperature and Humidity ranges</li> </ul> <p>Three sets of DQ, IQ and OQ with maintenance manual (Soft and Hard Copy)</p>	Lot	1									
46	<p>"SITC of Double skin 50mm thick Ceiling Suspended Air Handling Unit 40±2kg density PUF insulated, 0.8mm thick GI plain sheet inside and 0.8mm precoated GI sheet outside, mounted on a base channel. Thermal Break profile with mixing box for return air, pre filter section EN 779:G4 filters with frame, Cooling Coil section with 6 Row Deep DX cooling coil in the AHU section. insulated SS304 drain Pan, Fan section along with direct driven plug fan, Fan section should have limit switch &amp; View Glass. Manually operated VCDs with extruded aluminum aerofoil design for return air &amp; supply air outlet. The fan outlet air velocity shall not exceed 9.5</p>											



	<p>mt./sec. Air velocity across Coil and filter shall not exceed 500 FPM &amp; 400 FPM respectively.</p> <p>Vibration Isolators for AHU shall be provided with vibration isolation efficiency 95%. DX type cooling coils shall be suitable for connecting the VRF coil kit along with controller.</p>											
46.1	4 TR / 2000 CFM For "Dirty Cage, Scrap, Wash & DD Autoclave" area	Nos.	1									
47	<p>Supply, installation, testing and commissioning of Outdoor wall mounted electrical panels for ceiling suspended AHU. Starter panels shall have power supply provision for Supply Air Fans and VRF ODUs, BMS integration, auto manual switch etc., Actual kW ratings shall be considered as per the equipment selection. Incoming switch shall be MCCB.</p> <p>Related cables shall be included. Panel shall have required incoming MCCB and required number of outgoing switches to suit the number and capacity of fans. Fans shall be switched on / off individually from panel / IBMS. Fans shall be monitored individually in the IBMS. Also suitable</p>	No	1									

