

BACTERIOLOGY LAB – CLEAN ROOM WITH NEGATIVE PRESSURE ROOMS

TECHNICAL SPECIFICATIONS

1. The area has to be maintained at Class 100000 cleanliness level with room temperature at $24 \pm 2^\circ\text{C}$ using an once through AHU that will be installed in the AHU room on the same floor as shown in the sketch.
2. The existing Toilet & Office Room have to be modified to make it AHU room where AHU and other utilities have to be located. Civil work related to the above work have to be carried out by the Contractor.
3. All Bidders are requested to visit the site and inspect, to know the exact quantum of work, before quoting. Vague and ambiguous offers are liable to be rejected.
4. Entry to the Lab is through the Entry Air-lock and Exit through a Separate Exit Airlock. Provisions have to be made in the doors to ensure that Exit is not possible through the Entry route.
5. The Main Lab has to be maintained at a Negative pressure with respect to the adjoining rooms and the air flow should always be directed towards the Main Lab from the Outer Corridor. Fresh air is supplied to the room through the Grilles/Diffusers at terminal positions in the False ceiling and Exhaust is by the Biological Safety Cabinets installed in the Main Lab. Though the Biological Safety Cabinets ensure negative pressure in the Main Lab, an additional Exhaust AHU (with HEPA filtration) with sensors and reliable switching mechanism is required to ensure negative pressure even when all the Biosafety Cabinets fail to exhaust sufficient air. The lab has to be at a "Fail-safe Negative Pressure". A Power back-up with inverter, auto change over, has to be provided to keep the Exhaust AHU On for 15 minutes when the EB & Generator power are Off, this will help in completing the work and exiting without Compromise in Safety. The Contractor has to explain the working of the system he proposes to install. As an option a Virus Burn Out unit may be quoted to heat the exhaust air to 100°C . Room Pressure Monitors with alarm have to be provided to alert the personnel.
6. Modular Wall and Ceiling Panels made for Clean Room application, with 0.5mm PCGI sheets with PUF insulation ($40 \pm 2 \text{ Kg/m}^3$) has to be installed along the outer walls, partitions and false ceiling to create an impervious shell which is fully sealed. These panels must have pre-coated finish with guard film & good aesthetic appeal as well and have to be easily maintainable. Exhaust from the room is through the embedded Risers that are installed within the Wall Panels in such a way that pick up of air from the room is at 8" from floor level. The Ceiling panels must have minimum joints, a single panel along the width (shorter side) of the Lab is recommended. All 90° joints between Wall-Ceiling-floor have to be rounded off using extruded aluminium coving, to facilitate cleaning, with separate Corner Coving pieces. Clean Room Doors, View Panels, Lighting, Epoxy floor, Concealed wiring, plumbing, LPG line, Fire alarm, have to be arranged.
7. All civil works such as Pedestals and supports for AC Condensers/AHU, breaking wall to make way for AC ducts, Cables, Pipes, doors, concealing, plumbing etc. and sealing off and painting these after work completion have to be done by the Contractor
8. We will provide a 3 Phase Switch Fuse Unit with earthing, as required, on the same floor, from where Cabling & earthing have to be done by you. All other electrical work required for completion and functioning of the entire job has to be done by you.
9. Though we have given the complete technical details, the Contractor has to assure himself that the Technical details are sufficient for achieving the requirements. If the Contractor feels fit he may also quote his details for achieving the requirements.

Manufacturing process for Modular Wall & Ceiling Panels

Modular Wall & Ceiling panels have to be Pre-engineered and Pre-fabricated sandwich panels with 0.5mm thick Pre-coated GI sheets on both sides and Poly Urethane Foam (PUF) insulation sandwich in between these sheets. The PUF density should be $40 \pm 2 \text{ Kg/m}^3$, and **MUST BE CFC & HCFC free**. The Blowing agent has to be Pentane/Eq., with **Zero Ozone Depleting Potential**. Relevant Test certificate from Central Govt. Lab for important parameters has to be produced with the Bid. To ensure this the entire production has to take place in a Continuous line which is automated with minimum human intervention to ensure minimum errors and impeccable finish. For proper and perfect adhesion of PUF to the GI sheet, Corona treatment has to be done to remove all dirt and dust from the surface. Width of each panel has to be 1000mm. For Ceiling panels, the length of the panel should be equal to the width of the room (smaller side) i.e. there should be joints only along the length of the room. Joints should be minimum. A guard film has to be provided which has to be peeled off after completion of Installation. To establish the superiority of the Panels, we might also visit the factory.

Available Data:

Total Area : 480 SqFt Ht. of False ceiling: 8ft. Room Temperature required: $24 \pm 2^\circ\text{C}$ & RH $60 \pm 5 \%$
Cleanliness level: Class 100000 Filtration level: 5μ & 0.3μ filters

Approved Makes of Sub-components:

Air Conditioner	: Voltas / Blue Star	Air Handling Unit	: Zeco / AMClean / Boopathy
Motor	: ABB / Crompton	Blowers	: Kruger / Nicotra
Filters	: EMW / Impec /Microstar	Electrical Cables	: Universal / Mardia / ISI
Insulation	: Superlon /	Duct sheets	: TATA / SAIL
Dampers & Grilles	: Dynamic Air / Air Breeze	Switchgears	: L&T / Siemens
VFD Drives	: Honeywell / Allen Bradley	Modular Panels	: Metecno / Lloyds / Beardsell
Clean Room Doors	: Metaflex / Sakthimet/ MPP	Thermo/Humidistat:	Honeywell
Modular Switches	: Anchor Roma / MK		

SI No	System Description	Rate Rs.	Qty	Amount Rs.
1	Air Handling Unit: Double skin air handling unit constructed out of 24 SWG GI sheets with 25mm PUF section in between and comprising of following sections: Pre Filter section with 10 Micron filters. Cooling coil section with coils for Direct Expansion. Heater section, Blower section with blower, Motor, drive set etc. Filter sections with 5µ coarse filters & 0.3µ HEPA filters. Common base frame with Vibration isolation pads. Suitable inspection doors for filter, coil & blower sections. As per Clean Room Standards. Capacity: 3000CFM for 18.5TR AC		1 No	
2	Air-cooled condensing unit complete with copper piping, refrigerant gas, HP and LP cutouts, microprocessor based control panel with suitable control cabling etc. Thermostatic expansion valves, thermostats for tripping the compressors after reaching the temperature in conditioned area and with suitable insulation of the suction line. Air cooled Condenser coil with suitable size fan and motor along with angle frame for mounting the unit Capacity of unit 18.5 TR (2 X 5.5TR & 1No. X 8.5TR)		1 Set	
2a.	Double Skin Exhaust HEPA AHU constructed out of 24 SWG GI sheets with 25mm PUF section of capacity 3000 cfm with HEPA filters, blower with Room pressure sensors, inverter & battery for 15 minutes back-up		1 Set	
3	a. Ducting made out of GI sheet with neoprene rubber gasketing, supports made of MS angles, rods etc (Angle iron frames will be provided wherever required as per the duct sizes and as per standards.) 22/24 Gauge b. GI Dampers 18G with Geared Volume Control Dampers c. Extruded Al. Grilles with leak free Collar Dampers		950 Sq.ft. 22 SqFt. 22 SqFt.	
4	Duct thermal insulation with Nitrile Foam 13mm for Supply & covered with Al. foil where exposed to sun 9mm for Exhaust		800 Sq.ft. 700 Sq.ft.	
5	Supply and installation of digital pressure gauges to observe the Room pressure with necessary PVC tubing with 1set of Visible / Audible alarm to alert the users		5 Nos.	
6	Electrical wiring for Air Conditioning & AHU Control Panel, Lighting DB, Light fittings and 12Nos. additional Modular power points on the wall panels for Lab Equipments (15/5A) & all other electrical works for the functioning of the equipments.		1 Lot	
7	Clean Room Electrical Lightings (24" X 12") with 2 Nos. fluorescent lamps in each		8 Nos	
8.	Modular Ceiling – 50mm thick, Double Skin Walk-on panels made of Pre-coated GI sheets with PUF insulation, supported from the RCC roof including all cutouts for light and Grilles All joints are sealed with silicone sealant after fitment to make it air tight.		480 SqFt.	
9.	a. Modular Wall Panels –100mm thick, Double Skin panels made of Pre-coated GI sheets with PUF insulation with embedded conduits for wiring, utilities etc. b. Modular Wall Panels with Embedded Exhaust Risers - 100mm thick, Double skin GI panels with PUF insulation		580 270 SqFt.	

10.	Wall to ceiling / Wall to wall / Wall to floor Aluminium Extruded Coving (2" radius)		150 R M	
11	Flooring - Supply and applying the Epoxy Flooring – 2mm thick		460 Sq.ft.	
12	Clean Room Doors without any crevices. Metallic, painted with Double glazed view glass, door closer, SS handles, lock etc. Size 1000 X 2100mm		6 Nos	
13	Ducting For Biosafety Cabinet - Approx 25 Feet made of 6" dia. PVC pipes and fittings		4 Units	
14	Vertical Laminar Airflow Unit; Workspace: 3'W X 2'D X 2'H Material of Construction :-GI-Powder Coated, SS table, Mini-pleat HEPA filter, Prefilter, UV lamp, Fluorescent Lamp, Sliding type Front Door with Polycarbonate Sash, Magnehelic gauge, side glass, tubular stand, leveling lugs, air flow regulator		1 No	
Steel Lab Furnitures MOC : CRCA Powder Coated, in 2-colour finish with Granite Top				
15	Work Table Complete with – One Drawer Dimension: L3' x W3' x H3' - Double door cabinet		2 Nos	
16	Instrument Table Complete with – One Drawer Dimension L5'6" x W 3' x H 3' - Double door cabinet		1 No	
17	Wall Table Complete with – One Drawer Dimension L9' x W 2' x H 3' - Double door cabinet		1 No	
18	Sink Unit - Dimension: L 2' x W 2' x H 3' with sink (24"x18"X9") made of FRP or SS		1 No	
19	Island Table – 2-Tier Reagent Racks 2Nos. (48"X12"X30") above table and a Service Rack under the table with 4Power points of 5A/15A Modular switches-sockets Size:L8'XW5'XH3' Complete with – One Drawer & one Double door cabinet		1 No	
20	Chairs Medium size with castor wheels, cushion arm rest & back		5 Nos	
21	Shoe Rack - Dimension: 2'X1'3"X3'; 2 Tier GI powder coated		1 No	
22	Garment Cubicle - Dimension: W 2.5' x D 1.5' x H6' with HEPA filtration, UV lamp, hangers and aluminium-glass doors, Metallic powder coated construction		1 No	
23	Civil Works Scope of Work a Removing the existing Door and relocating the same b Removing the Water Closet & closing/sealing the same and painting on the wall & tiles to make it AHU room c Wall opening for AC Ducts, cabling etc. d Civil works related to AHU mounting e Breaking the wall for Door Openings & Plastering f Plastering the wall wherever necessary related to the above work		1 Lot	
24	Plumbing Line - Water inlet and outlet for sink connection Water inlet through ½" dia. PVC pipe and outlet through 1.5" dia. PVC pipe Approximately 10 mtrs		1 Lot	
25	Gas Line - LPG gas piping in GI with necessary fixtures and hardwares upto 8 points only provision is made Burners, LPG cylinder etc. not in our scope.		1 Lot	
26	Interlocking for doors with electromagnetic catches		2 Sets	
27	Double Glazed View Panel of size 800mm X 1000mm on the wall panel with 5mm thick toughened glass on both sides installed on a frame in such a way the glasses are flush with the outer walls of the panel		1 No.	
28	Air Curtains for 1000mm wide door to prevent insects and other visible dust entering the Labs through air from Corridor Limit switch is provided to activate the Air curtain when door is opened		2 Nos.	
29	Smoke Detectors & Fire alarm arrangement for the Culture Rooms and Instruments Room		1 Set	
30	Validation DOP test, Particle Count, Air Velocity, Airflow pattern, Room Pressure & documentation as required – 2 times		1 Lot	
31	Option – Virus Burn Out unit to heat the air from Exhaust AHU to 100°C with temperature indication using strip heaters		1 Set	