



भारतीय प्रौद्योगिकी संस्थान तिरुपति

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Tender No. IITT/EU/2023-24/17

30th October 2023.

**NOTICE INVITING TENDER FOR SUPPLY, INSTALLATION, TESTING, AND  
COMMISSIONING OF LABORATORY FURNITURE-II**

**(E-PROCUREMENT MODE ONLY)**

Indian Institute of Technology Tirupati (IIT Tirupati) invites online bids (e-tender) in Two bid systems from eligible Class-I & Class-II Local suppliers in line with Government Public Procurement order No.P-45021/2/2017-BE-II dated: 04.06.2020 for the following:

Tender Item No	Description of item	Quantity
1	Fume hood (6 feet) with exhaust system	32 Nos.
2	Fume hood (5 feet) with exhaust system	06 Nos.
3	Fume hood (4 feet) with exhaust system	04 Nos.
4	Island Tables with under storage cabinet & reagent shelves Type-1: 4570 mm (L) x 1770 mm (W)	04 Nos.
5	Island Tables with under storage cabinet & reagent shelves Type-2: 6550 mm (L) x 1530 mm (W)	06 Nos.
6	Island Tables with under storage cabinet & reagent shelves Type-3: 8535 mm (L) x 1800 mm (W)	03 Nos.
7	Island Tables with under storage cabinet & reagent shelves Type-4: 4572 mm (L) x 1520 mm (W) x 914 mm (H)	03 Nos.
8	Bio-Safety cabinet	03 Nos.
9	Spot extractor with blower and ducting facility with exhaust system	09 Nos.
10	6 feet Ductless Fume hood	04 Nos.
11	5 feet Ductless Fume hood	01 Nos.

**“Splitting of items is not allowed. Bidders should quote for all the items”**

**Note: \*\*\* The bidder has to quote for all the items, otherwise the bid will be summarily rejected. The tender is not to be awarded in piecemeal and item-wise to the firm. The Commercial Evaluation will be based on the total value.**

The Tender Document can be downloaded from Central Public Procurement (CPP) Portal <http://eprocure.gov.in/eprocure/app> and [www.Iittp.ac.in/tenders/](http://www.Iittp.ac.in/tenders/)

**bid is to be submitted online only through the same portal up to the last date and time of submission of tender.**

**Critical Dates of Tender:**

1	Date and time of Online Publication/Download of Tenders	30-10-2023	18.00 hrs
2	Clarifications start date	30-10-2023	18.00 hrs
3	Clarifications end date	06-11-2023	15.00 hrs
4	Bid submission start date & time	07-11-2023	16.00 hrs
5	Bid submission close date & time	20-11-2023	15.00 hrs
6	Opening of Technical bids	21-11-2023	15.00 hrs

All Technical and Specification-related queries may be forwarded to Email ID:

**hod\_cy@iittp.ac.in** copy to **eutenders@iittp.ac.in** & **purchase@iittp.ac.in** before the clarifications end date as per the format provided in the Annexure-X.

**1. About IIT TIRUPATI:**

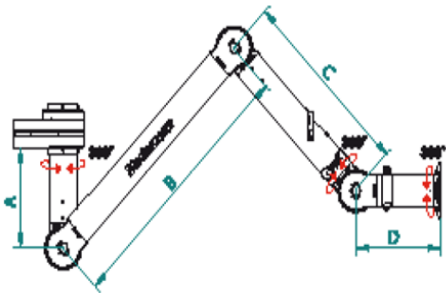
Indian Institute of Technology Tirupati (IIT Tirupati) is an Autonomous Institute under the Ministry of Education, Govt. of India.

**2. Technical Specifications: Schedule of requirement**

**LIST OF FURNITURE**

Fume hoods, bio-safety cabinet, Spot extractor, Island tables.

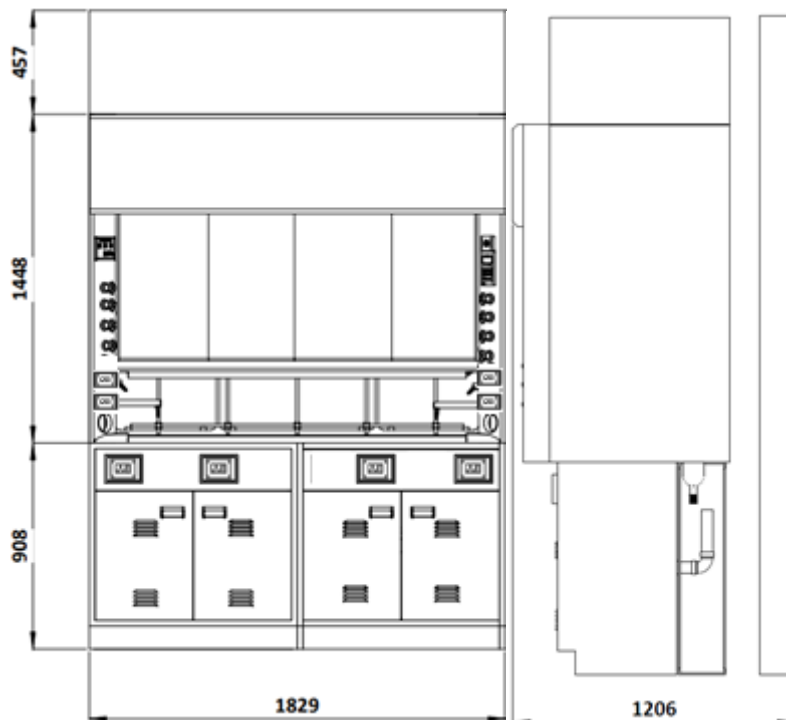
S.N o.	Description	Measurement	CY + CH + Civil + P	Total Nos
1	Fume hood with exhaust system	6 feet Fume hood Laminated safety sash glass with combination sash Granite worktop Acid + Solvent Base Cabinet 4+4 Socket 1+1 Service port 1+1 Cup sinks CHI-1, CHO-1, RW-1, CA-1, Ar-2, N2-2, VA-2 Lattice assembly Airflow monitor <b>VAV</b> System	24 + 03+ 00 + 05	32
2	Fume hood with exhaust system	5 feet Fume hood	03 + 00 + 03 + 00	06
3	Fume hood with exhaust system	4 feet Fume hood	00 + 00 + 04 + 00	04

4	Island Tables with under storage cabinet & reagent shelves	<b>Type-1:</b> 4570 mm (L) x 1770 mm (W)	04 + 00 + 00 + 00	04
5	Island Tables with under storage cabinet & reagent shelves	<b>Type-2:</b> 6550 mm (L) x 1530 mm (W)	06 + 00 + 00 + 00	06
6	Island Tables with under storage cabinet & reagent shelves	<b>Type-3:</b> 8535 mm (L) x 1800 mm (W)	03 + 00 + 00 + 00	03
7	Island Tables with under storage cabinet & reagent shelves	<b>Type-4:</b> 4572 mm (L) x 1520 mm (W) x 914 mm (H)	00 + 00 + 03 + 00	03
8	Bio-Safety cabinet	4 feet bio-safety cabinet with standard specifications	01 + 02 + 00 + 00	03
9	Spot extractor with blower and ducting facility with exhaust system	 <p>A - 250 mm, B - 700 mm, C - 500 mm, D - 250mm. Length - 1500mm, Diameter - 75mm</p>	00 + 00 + 05 + 04	09
10	Ductless Fume hood	6 feet	02 + 00 + 00 + 01 (01 for Mechanical Engineering)	04
11	Ductless Fume hood	5 feet	01 + 00 + 00 + 00	01

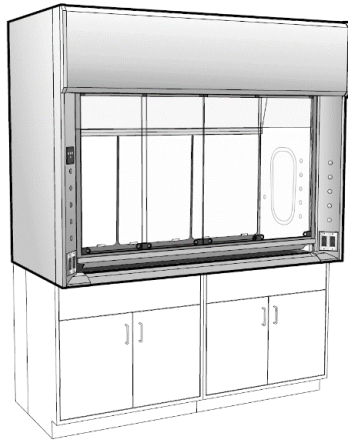
## TECHNICAL SPECIFICATIONS

### **1. Item 1, 2 and 3: Fume hoods with exhaust system:**

The fume hood requirement with ducting is most important for all the departments with wet labs.



**Fig. 1.** Model diagram showing the dimensions of the 6 feet fume hood with accessories. All the fume hoods (6 feet, 5 feet and 4 feet fume hoods) should have the similar type of accessories.



**Fig. 2.** Showing the fume hoods for chemistry and chemical engineering departments with combination sash (horizontal and vertical sash).

**General Instructions:**

The design details of the fume hood, blower, and scrubber to be submitted as part of the technical bid.

The bidder shall place a demo unit of their proposed bench top fume hood of 6 feet size with all the specs (with an acid storage cabinet (3 feet) and a solvent storage cabinet (3 feet)).

The bidder shall also place a mockup of an island table with one sink and accessories as described in the BOQ as part of the technical specifications.

The furniture with fume hood shall be installed within 60 days from the date of approval / issue of the purchase order.

Samples of all the hardware used in the furniture and fume hood to be submitted for approval before procurement and installation.

A 3D diagram of the lab with all the furniture and details of each individual table and fume hoods including the ducting part should be shown in the layout with the scrubber and blower to be submitted as part of the technical bid.

**Standards applicable:**

All the components shall conform to the relevant up to date Indian standard specifications, wherever existing irrespective of whether explicitly mentioned or not.

All the electrical work shall be carried out in accordance with the provision of Indian Electricity Act 2003 and Indian Electricity Rules 1956, amended to date.

All lab fixtures shall conform to relevant international standards or guidelines and should provide documentary evidence to this effect wherever applicable. These include the following.

1. SEFA 3 – Scientific Equipment and Furniture Association for Work surface.
2. SEFA 8M - Scientific Equipment and Furniture Association for Steel Caseworks.
3. SEFA 8 - Scientific Equipment and Furniture Association.
4. NFPA 30 - National Fire Protection Association for flammable storage.
5. NFPA 45- National Fire Protection Association for flammable storage.
6. UL - Underwriters Laboratories.
7. ASTM D522 - Bending Test or ASTM D3359-02 Paint Adhesion Test.
8. ASHRAE 110-2016 or 1995R.
9. FM – Flammable and Combustible liquids certificate for storage cabinets.
10. NIH03 – 112C – National Institute of Health Specification. Required option of NSF/ANSI.
11. ASHRAE Standard 110. 2016 or 1995R – Method of Testing Performance of Laboratory Fume Hoods.
12. BS EN 1363 – Fume hood Liner Fire Resistance Test Certificate for 60 minutes.

#### **Technical Specifications:**

Furnishing and installing Fume hood, base cabinets (one acid unit with vent connection to the hood & one flammable solvent storage cabinet for each fume hood, ceiling cover panels, filler panels as shown in the drawings above.

1. **6 feet fume hood** having the laminated combination sash (both vertical and horizontal sash) with base cabinets: **3.0 feet acid/base + 3.0 feet solvent/flammable storage cabinets** should be supplied and installed (for Item 1).
2. **5 feet fume hood** having the laminated combination sash (both vertical and horizontal sash) with base cabinets: **2.5 feet acid/base + 2.5 feet solvent/flammable storage cabinets** should be supplied and installed (for Item 2).
3. **4 feet fume hood** having the laminated combination sash (both vertical and horizontal sash) with base cabinets: **2.0 feet acid/base + 2.0 feet solvent/flammable storage cabinets** should be supplied and installed (for Item 3).
4. The vertical sash should also contain the horizontal window for easy handling.
5. A 1-1/4" black granite top specially designed to contain any spillage with the help of safety ledge from the front edge.
6. A total of **8 power sockets** (total 4 numbers: Two nos on each side panel; remaining 4 nos on the bottom panel, as shown in the image) must be provided.

7. **Two cup sinks** with water lines must be provided on the inner bottom corners. A nozzle for chilled water inlet and outlet should be provided.
8. The Epoxy lattice framework to connect the clamps must be at least **6 to 8 inches away from the back panel** to comfortably connect with the condensers etc.,
9. Gas lines for Argon, Nitrogen, vacuum (**two numbers each**), one line for compressed air and one line for water should be provided along the side panel of the fume hood with internal piping up to 150 mm above the fume hood.
10. The acid/base cabinets must be **Teflon coated/Phenolic Resin Liner/Polyethylene** inside completely to avoid corrosion due to chemicals.
11. The fume hood should have an **air flow monitor** to efficiently detect the suction flow. An alarm should also be provided to detect the changes in the air flow.
12. **Constant air volume system** should be provided.
13. All the gas lines required for each fume hood should be provided by the vendor.
14. **Laminated glass panels** should be provided to the sash to avoid the scattering of glass due to accidental breakage.

## **PART I - MATERIAL OF CONSTRUCTION**

### **Fume Hood Superstructure Frame:**

A free-standing rigid frame structure of steel angle shall be provided to support the exterior panels and interior liner and baffle panels. To allow for maintenance and replacements, the interior liner panels shall be removable without disassembly of the frame structure and outer steel panels. Likewise, the exterior steel panels shall be removable without disassembly of the frame structure and inner liner panels. Fume hoods that require disassembly of the superstructure for liner replacement are not acceptable.

### **Fume Hood Interior Walls:**

Double wall ends, not more than 100 mm wide, shall be provided to maximize interior working area. The area between the double wall ends shall be closed to house the remote-control valves. The front vertical fascia section shall have a full 135-degree 25 mm radius at the front leading edge to provide a streamlined section and insure smooth even flow of air into the hood. The vertical facial shall contain the required service controls, electrical switches and receptacles. The hood interior end panels and sash track shall be flush with the fascia to prevent eddy currents and back flow of air.

### **Fume Hood Airfoil:**

A streamlined airfoil shall be integral at the bottom of the hood opening on bench and distillation hoods. This foil shall provide a nominal 25 mm open space between the foil and the top front edge of the work surface to direct an air stream across the work surface to prevent back flow of air. The airfoil shall extend back under the sash, so that the sash does not close the 25mm opening. The foil shall be removable to allow large equipment into the hood. The foil shall be of 12-gauge 2.6mm thk steel to resist denting and flexing. Walk-in hoods shall have a stop located at the bottom of the sash track that will ensure a nominal 25mm opening between the bottom of the sash and the floor.

**Fume Hood Liners:**

Interior liner panels shall be 6mm thick fiberglass reinforced polyester sheet **OR** 6 mm thick poly resin sheet **OR** shall be 6mm thick made from a compression molded cellulose fiber reinforced phenolic resin core with integrally cured white melamine surfaces. Interior liner panels shall be fastened using stainless steel screws with plastic covered heads.

**Fume Hood Baffles:**

A stable, non-adjustable baffle with three fixed horizontal slots shall be provided to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out 60mm from the back liner. The baffle shall be removable for cleaning. Baffle to be manufactured with the same material specification of interior liner.

**Fume Hood Duct Collar:**

A 250mm to 300mm diameter polyethylene bell-mouthed duct collar shall be in the top of the hood plenum chamber. PP coated steel duct collars can be accepted has an alternative. Epoxy Coated common steel duct collars are not acceptable.

**Fume Hood Lighting:**

A one-tube, energy-efficient, LED light fixture of the size given below shall be provided in the hood roof. Illumination at the work surface shall be at least 500 Lux.

Hood Size, MM.	Nominal Fixture Length, MM.
1200	900
1500	1200
1800	1200
2100 00	900 (2 Fixtures)

The light fixtures shall be isolated from the hood interior by a 6mm thick tempered glass panel sealed from the hood cavity. Fixture shall be UL labelled.

**Fume Hood Sash:** Combination Sash (Both vertical and horizontal).

A combination sash shall be provided. The sash shall have horizontal sliding glass panels in a vertical rising steel frame. The bottom of the sash frame shall have a full-length metal handle. The sash track shall be a neutral-coloured polyvinyl chloride set flush with the interior liner panels to minimize turbulence. The sash shall be counterbalanced with a single weight to prevent tilting and binding during operation. The glass panels shall be 6mm laminated safety float glass mounted on metal rollers in an aluminium track.

**Fume Hood Plumbing Services:**

All Utility services shall consist of remote-control valves as selected located within the end panels, controlled by extension rods projecting through the control panels of the hood, and with color coded plastic handles. All plumbing fittings shall be installed and piped up to 150mm above the Fume hood top. All the Plumbing shall be SS 304 hard / flexible tubes as per media specification.



**Fume hood Valves/Outlet manufacturers** shall be certified to **ISO 9001 / EN 29001 / BS 5750 Part 1**, or equivalent.

The manufacturer should guarantee the availability of spare parts and replacement products for a period of a minimum of 10 years.

All external surfaces of the valve shall be surface treated with a chemical resistant **polyester powder coating** that shall be highly resistant to most chemicals and provides excellent light fastness. The minimum thickness of the coating shall be **50µm**.

The handles of the valves must be mounted with **"zero gap"** on the spindle of the headwork. The handle should be made of metal and the handle must have a clear closing/opening indication.

The valve and outlets should be delivered with an "easy-to-mount" inlet connection, wherever possible to connect hoses, Cu-, SS-, or PEX pipes directly into the inlet of the valve, depending on the applications.

Both valves and outlets should be delivered with **color and media indication in accordance with EN 13792:2002**.

**Every fitting** should be **leak-tested** before leaving the factory.

#### **Fume Hood Valves for water**

The valves must be supplied with a 2x360° open/close function rubber headwork for fine regulation. The sealing must be made of EPDM and the lubrication must be silicone-based. The valves should be capable of operating at the **maximum operating pressure of 10 bar (145 psi)**. Handle of the fittings to be metal.

#### **Fume hood Outlets for water**

The sealing of the water outlets must be made of EPDM and the lubrication must be silicone-based. The water outlets should be delivered with rear wall connection (RWC) for compact installation. **It should be possible for the outlet to be removed from outside without demounting the Fume hood panel.**

The outlets must be equipped with a hose nozzle according to DIN 12898. Depending on user requirement and preferences, the hose nozzle can be made of polypropylene or powder coated brass and to be of a removable type.



#### **Fume hood valves for Cooling Water**

The valves must be supplied with a 2x360° open/close function rubber headwork for fine regulation. The sealing must be made of EPDM and the lubrication must be silicone-based. The valves should be capable of operating at **maximum operating pressure of 10 bar (145 psi)**.

The outlets must be supplied with 1 LPM flow fix for flow restriction. Handle the fittings to be metal.

#### **Fume hood Outlets for Cooling Water**

The sealing of the chilled water outlets must be made of EPDM and the lubrication must be silicone-based. The water outlets should be delivered with rear wall connection (RWC) for compact installation. **It should be possible for the outlet to be removed from outside without demounting the Fume hood panel.** The hose nozzle should be made of polypropylene or powder coated brass and to be of a removable type.

#### **Non-burning 2.0 Gases**

The valves must be supplied with a fine regulating needle headwork having 3x360 degrees open/close operation for fine regulation of media flow. The sealing must be made of FKM/FPM and the lubrication must be Perfluoropolyether based. The valves should be capable of operating at **maximum operating pressure of 16 bar (232 psi)**. Handle of the fittings to be metal.

#### **Non-Burning 2.0 Gases/Vacuum Outlets**

The sealing of the outlets for non-burning 2.0 gases / vacuum must be made of FKM/FPM and the lubrication must be Perfluoropolyether based. The non-burning 2.0 gas / vacuum outlets should be delivered with rear wall connection (RWC) for compact installation. **It should be possible for the outlet to be removed from outside without demounting the Fume hood panel.** Handle of the fittings to be metal.

The outlets must be equipped with a hose nozzle according to DIN 12898. Depending on user requirement and preferences, the hose nozzle should be made of polypropylene or powder coated brass and to be removable type.

#### **Fume Hood Electrical Services**

The hood superstructure shall be pre-wired and contain a UL label certifying acceptable wire gauge, connections, fixtures, and wire colour coding. Wiring electrical services shall consist of 4 X 4 6/16 Amps Socket & Switch and a light switch. All Wiring shall terminate in one 150mm x 150mm x 100mm service junction box located on the fume hood roof. Final wiring and circuit dedication shall be by others. The control panel should be in the front face panel of the fume hood for easy accessibility for maintenance.

**Electric Hatch** – There shall be two hatches, one in each vertical front side of the fume hood near worktop level which will allow passage of the electric wires of the equipment being used in the chamber to be guided through and connected to the electric power points.

#### **B. Fume Hood Work Top:**

##### **Black Granite:**

Hood work surface shall be 1-1/4" thick jet black granite made in the form of a watertight pan, not less than 3/8" deep to contain spillage with a 6" wide safety ledge across the

front edge. A cup sink flush with the recessed work surface shall be provided. The work surface and cup sink shall be available in black.

**C. Access Opening:**

The interior end liner panels shall be furnished with an opening that provides access to the service piping and valves to facilitate installation and maintenance. The openings shall be covered with a removable panel with rounded corners. Panels that require tools to remove are not acceptable. The panel shall provide an overlapping seal on all edges.

**D. Fume Hood Finish:**

After the component parts have been completely welded together and before finishing, they shall be given a pre-paint treatment to provide excellent adhesion of the finish system to the steel and to aid in the prevention of corrosion. Physical and chemical cleaning of the steel shall be accomplished by washing with an alkaline cleaner, followed by a spray treatment with a complex metallic phosphate solution to provide a uniform fine-grained crystalline phosphate surface that shall provide both an excellent bond for the finish and enhance the protection provided by the finish against humidity and corrosive chemicals.

After the phosphate treatment, the steel shall be dried, and all steel surfaces shall be coated with a chemical and corrosion resistant, environmentally friendly, electrostatically applied powder coat finish. All components shall be individually painted, ensuring that no area be vulnerable to corrosion due to lack of paint coverage. The coating shall then be cured by baking at elevated temperatures to provide maximum properties of corrosion and wear resistance.

The completed finish system in standard colours shall meet the performance test requirements specified under PERFORMANCE REQUIREMENTS.

**A. Fume Hood Acid / Alkalis Storage Cabinets:**

FM approved Acid storage fume hood cabinets shall utilize the same thickness of steel and construction features as other base cabinets except they shall be completely lined with a one- piece Polyethylene corrosion resistant liner, pull out shelves. The liner shall be 6mm thick, molded into a seamless tub, including top, sides and bottom, with a 25mm lip at the bottom front to contain spills. Each door shall have a set of louvers at the top and bottom and have a 3mm sheet polyethylene liner. Where specified, each cabinet shall be vented into the fume hood with a 40mm vent pipe. It should provide a positive airflow directly into the fume hood exhaust system. Where specified or shown on drawings, epoxy coated wire shelf supported by integral brackets shall be built into the Polyethylene liner.

**PART 2: PERFORMANCE REQUIREMENTS**

**A. Testing Procedure:**

Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 30mm dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 60ml wide mouth bottle to retard evaporation. All spot tests shall be

conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° ±3° F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.

B. Test Evaluation:

Evaluation shall be based on the following rating system.

Level 0 – No detectable change.

Level 1 – Slight change in colour or gloss.

Level 2 – Slight surface etching or severe staining.

Level 3 – Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

After testing, the panel shall show no more than three (3) Level 3 conditions.

A. Test Reagents

Performance Test Results (Heat Resistance):

Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 180 per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

B. Performance Test Results (Impact Resistance):

A one-pound ball (approximately 50mm diameter) shall be dropped from a distance of 300 mm onto the finished surface of a steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.

C. Performance Test Results (Bending Test):

A 1.2 mm thick steel strip, finished as specified, when bent 180° over a 12.5 mm diameter mandrel, shall show no peeling or flaking off of the finish.

D. Performance Test Results (Adhesion):

Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1.5 mm apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine under 100 foot-candles of illumination. Note: This test is based on ASTM D2197 68, "Standard Method of Test for Adhesion of Organic Coatings".

E. Performance Test Results (Hardness):

The test sample shall have a hardness of 4 H using the pencil hardness test. Pencils, regardless of their brand are valued in this way: 8 H is the hardest, and next in order of diminishing hardness are 7 H, 6 H, 5 H, 4 H, 3 H, 2 H, F, HB, B (soft), 2 B, 3 B, 4 B, 5 B (which is the softest).

The pencils shall be sharpened on emery paper to a wide sharp edge. Pencils of increasing hardness shall be pushed across the paint film in a chisel like manner until one is found that will cut or scratch the film. The pencil used before that one, that is, the hardest pencil that will not rupture the film, is then used to express, or designate the hardness.

### PART 3 – EXECUTION SITE EXAMINATION

Bidders are requested to examine the site and installation work shall be taken up as per site availability and as per installation schedule approved by the Engineer in charge.

#### INSTALLATION

**A. Preparation:**

Prior to beginning installation of fume hood, check and verify that no irregularities exist that would affect the quality of execution of work specified.

**B. Coordination:**

Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.

**C. Performance:**

Install fume hoods, plumb, level, rigid, securely anchored to building and adjacent furniture in proper location, in accordance with manufacturer's instructions and the approved shop drawings. Provide filler panels between top of hood and ceiling. Securely attach access panels but provide for easy removal and secure reattachment. Do not install any damaged units.

**D. Adjust and Clean:**

1. After installations are complete, adjust all moving parts for smooth operation.
2. Remove all packing materials and debris resulting from this work and turn over the fume hoods to the Owner clean and polished both inside and out.
3. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.

**E. Protection:**

1. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.
2. Advise owner and/or his representative of procedures and precautions for protection of material, install laboratory casework and fixtures from damage by work of other trades.

**F. Certification:**

1. Fume Hood Manufacturer shall field test a random sample of 10% of the installed units using ANSI/ASHRAE 110-1995 to a control level of AI 0.01 ppm or better and witnessed by the IIT Tirupati representative.
2. Project substantial completion shall be withheld until all required fume hood certification letters, tests, and reports have been submitted to and approved by the Consultant.

**G. Integration:**

Fume hood exhaust needs to be integrated with the supply of conditioned/fresh air required, balancing of air and testing, demonstration and commissioning complete as per site conditions and as per direction of Engineer in charge. The quoted rates as per BOQ items shall include the integration and nothing extra shall be payable for the same.

### **FUME HOOD WORKS BOQ INSTRUCTIONS**

**The Following points to be read in conjunction with BOQ & understand before Quoting.**

**Refer the above tender specification for all the line items mentioned in the Lab Furniture Fume Hood BOQ & quote accordingly.**

Providing and supply of Bench Top Variable Air Volume type Fume Hood and accessories complete as per enclosed drawings and as per approved final sample consisting of:

#### **Walls & Panels:**

Double wall construction: outer wall of **1.2 mm thick** CRCA / GI sheet high chemical resistance epoxy powder coated to 60 to 80 microns thickness / 80 to 100 microns Polyurethane powder coating; inner wall lined with 6 mm Thick Reinforced Phenolic Resin Lining. A free-standing rigid frame structure of steel angle to be provided to support exterior panels and interior liner and baffle panels. To allow for maintenance and replacements, the interior liner panels shall be removable without disassembly of the frame structure and outer steel panels. Likewise, the exterior steel panels shall be removable without disassembly of the frame structure and inner liner panels.

#### **Fume Hood Sash:**

A combination sash to be provided. The sash shall have horizontal sliding glass panels in a vertical rising steel frame. The sash shall be counterbalanced with a single weight to prevent tilting and binding during operation. The glass panels shall be 6mm laminated safety toughen glass mounted on metal rollers in a powder coated aluminum track.

#### **Fume Hood Baffles:**

A stable, Solid Lattice assemble baffle with three fixed horizontal slots shall be provided to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out minimum 50mm from the back liner. The baffle shall be removable for cleaning. Baffle to be manufactured with the same material specification of interior liner.

#### **Fume Hood Damper & Duct Collar:**

PP FRP 300 mm Dia Single Leaf Manual Butterfly / Sliding Damper with both sides Flanges for Fume Hood 300 mm diameter polyethylene bell-mouthed duct collar shall be located in the top of the hood plenum chamber. Damper with Graduation to be provided. Face Velocity monitor system to be considered.

**Service Port:** - 80mm Dia Circular Service Port to be provided on either side of the Fume hood Fascia panel. Emergency Stop Switch

**Note:** All the Fume Hood accessibility shall be from the Front side.

Air flow controllers for constant air volume which shall be of Plastic material (Polystyrene) classified M1 & galvanized steel for sleeves. Operating temperature shall be 5 to 60 deg C. The air is forced to pass through predetermined space in which a flap can change the position according to the specified air flow. The requested airflow is fixed by a

screwdriver. CAV is fixed in a Vertical / Horizontal duct using a lip seal which ensures tightness. Any accessories required for fixing the CAV shall be included. Rate is inclusive of all materials and operations described above specifications. Fume hood shall be manufactured in the best aesthetic design and sample of the Fume hood to be approved before taking up mass scale production. All items required to be provided in the fume hood need to be integrated in the design, tested and commissioned.

The final documentation includes commissioning reports, warranty / guarantee certificates, 6 sets of as-built drawing hard copies & soft copy in DVD. O&M manuals & Handling over documents to be submitted.

All Drawings, Technical submittals & installation procedure should be as per Good engineering practices. Drawings & material approval must be obtained before fabrication.

List of Makes approved by M/s. IIT Tirupati are listed below (Refer materials whichever are applicable for the scope of work). Approved equivalent materials of any other specialized firms are not acceptable in case it is established that the brands specified below are not available in the market subject to approval of the alternate brand by the M/s. IIT Tirupati.

<b>S.No.</b>	<b>MATERIALS</b>	<b>MANUFACTURER/SUPPLIER/MAKE</b>	<b>VENDOR CONFIRMATION</b>
1	STEEL	TATA STEEL, JINDAL STEEL, EQUIVALENT FOR IMPORTED PRODUCTS	
2	POWDER COATING	KANSAI NEROLAC, BERGER PAINTS, ASIAN PAINTS, EQUIVALENT	
3	EMERGENCY DEVICES, WATER FAUCETS AND GAS VALVES, FUME HOOD UTILITY FITTINGS	BROEN-LAB/WATER SAVER/ ILA.	
4	SWITCHES AND SOCKETS	NORTHWEST / LEGRAND/ MK / SCHNEIDER	
5	FUME HOOD LINERS	TRESPA / DURCON / FUNDERMAX/ EQUIVALENT	
6	WORK SURFACE	TRESPA / DURCON / FUNDER MAX/ EQUIVALENT	
7	FUME HOOD FACE VELOCITY MONITOR	SCHNIDER ELECTRONIC	
8	LIGHT FIXTURE	CROMPTON, PHILIPS, WIPRO, EQUIVALENT	

9	REMOTE CONTROL VALVES	BROEN-LAB, WATERSAVER, ILA	
10	LT 1.1 KV FRLS FLEXIBLE CABLE	KEI / RR CABLE / HAVELS / LAPP / FINOLEX/ PLOYCAB	
11	INTERNAL WIRING (FIRE RESISTANT LOW SMOKE WIRES (FRLS))	KEI / RR CABLE / HAVELS / LAPP / FINOLEX/ POLYCAB	
12	DB'S AND MCB'S	SCHNEIDER / LEGRAND / HAGER / SIEMENS	
13	TERMINALS	MULTI / BRACO / CONNECTWELL / DOWELLS	
14	DRAINPIPE	VULCATHENE / GODAVARI / ARSTAL/ PREMIER EQUIVALENT	
15	CHEMICAL CABINETS/ PHARMACY CABINETS/ TALL CABINETS	FM APPROVED WITH CERTIFICATION	
16	EYEWASH	WATER SAVER / BROEN LAB / ILA	
17	CONSTANT AIR VOLUME (CAV)	SYSTEMAIR / ALDES / TROX	

## **Technical Specifications for the PP Moulded Blowers:**

### **Centrifugal PP Exhaust Fan**

The exhaust fans supplied and installed shall be of 'Centrifugal Corrosion Resistant' type and shall be capable of delivering the design flow rate against all duct losses.

The fans shall be robust in construction and suitable for continuous duty operation. It shall be mounted with ease of maintenance and shall be installed with proper vibration isolators to minimize vibration transmission to ductwork and support structure.

Fans selected shall be silent and vibration free when running and suitable for outdoor use and shall not exceed 3000 rpm.

Aerodynamic performance of the fan shall be tested and comply 'ISO 5801' standards. Sound level shall be tested and comply with 'ISO 5136.2' standards.



The casing shall be of self-supporting design, thermoformed welded by machine. The material of construction shall be polypropylene (PP) and suitable for use against corrosive 'medium' and a maximum allowable operating temperature of 70 °C.

No metal parts shall be exposed and in contact with the airstream.

Impeller material of construction shall be polypropylene (PP) and suitable for use against corrosive. And a maximum allowable operating temperature of 70 °C. It shall consist of 20 forward curved blades injection molded up to size 710 (thermoformed blades, automatically welded from 800). The impeller balancing shall be tested in accordance to VDI 2060, Q6.3 standards.

Electro-galvanized stand shall be used to support the fan and the motor in view of the corrosive environment.

A standard hub seal shall be fitted onto the impeller hub to prevent the corrosive 'medium' from contacting the shaft.

### **List of Approved makes for the Lab Fume Extraction & Scrubbing system:**

<b>Sl.No.</b>	<b>Description</b>	<b>Approved Makes</b>
1.	PP MOULDED EXHAUST BLOWER	COLASIT / PLASTIFER
2.	BLOWER MOTOR	ABB / SIEMENS / CROMPTON GREAVES
3.	WET SCRUBBER WITH RECIRCULATION PUMP	CK AIRTECK / LIFE LINE / UNIVERSAL AIR CONTROL / CORROSION CONTROL
4.	PP SHEETS FOR EXHAUST DUCTING	MANDHANI / DUGAR / KHANNA / SIMONA / BECK
5.	ISOPHTHALIC RESIN	MECHEMCO / KAYSYNTH / ORSYN / SIMONA / CREST COMPOSITE
6.	DAMPERS	CK AIRTECK / LIFE LINE / UNIVERSAL AIR CONTROL / CORROSION CONTROL
7.	FLEXIBLE DUCT	FINOLEX / GIBBON
8.	ANCHOR FASTENERS	HILTI / FISCHER
9.	FASTENERS & WASHERS	TVS / UNBRAKO
10.	PPR / PPH PIPER	SANGIR / PRIME
11.	MINERAL WOOL	UP TWIGA / LLYODS / ROCK INSUL

### **SPECIFICATIONS FOR MOTOR AND ACCESSORIES:**

Use an electric motor built to IEC standards foot mounted (B5), also in ex-protected or multistage versions, for the drive. The impeller hub is coated with aluminum. Power transmission from motor to impeller by means of an impeller directly fixing on the motor shaft in direct driven application. The impeller is fixed on to a flange bearing and the tightening adopter system guarantees secure mechanical connection.

Motor Standard IEC three-phase motors in accordance with IEC. Mounting B5.

Available in motor-mounted (IP55) or cabinet-mounted versions.

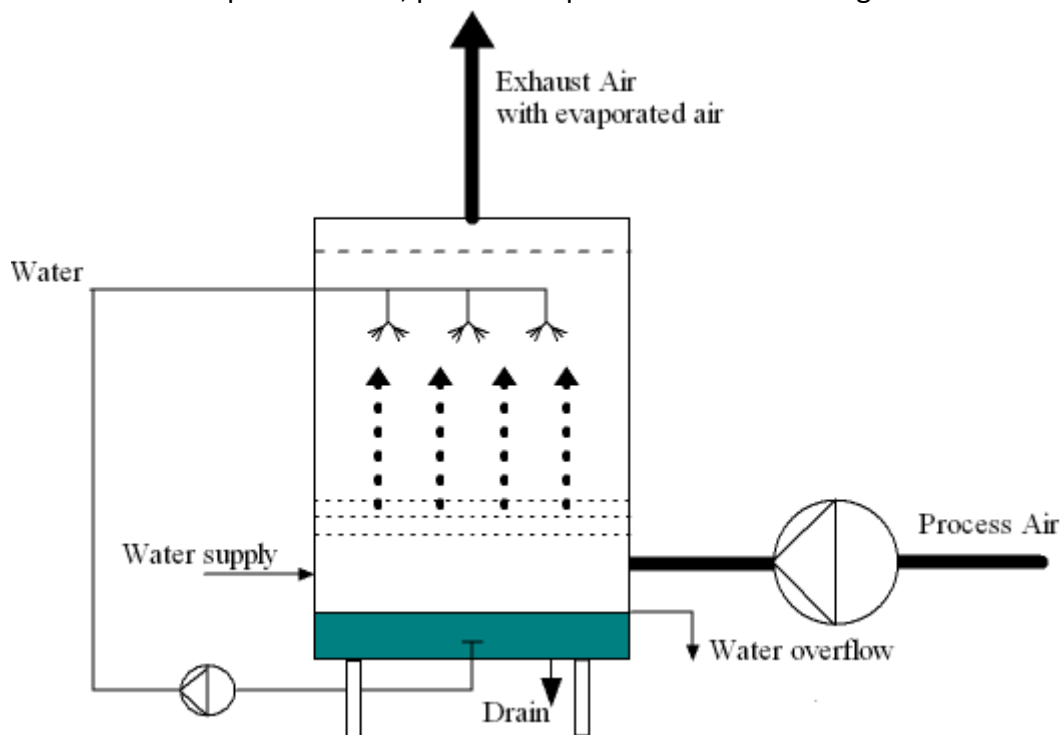
The fan shall be driven by a standard TEFC electric motor with class 'F' insulation and class 'B' temperature rise. Motor shall be suitable for outdoor installation with IP55 protection and suitable for operation with 415V/3Ph/50Hz electrical supply. Motor supplied shall be in accordance to IEC standards.

## FUME WET SCRUBBER SPECIFICATION

1. These fume wet scrubbers should have one or two stages. Stage One removes the bulk of the contaminant from the air stream and may be continuously wetted to prevent plugging. The second stage should be a mist eliminator.
2. The Wet Scrubber's shall be manufactured of Polypropylene with FRP lining. Units are hydrostatically tested at the factory. The maximum temperature rating for polypropylene units is 60° Fahrenheit.
3. The Wet Scrubber shall be provided with access ports / doors to allow limited access to the internals of the unit. The Scrubber shell has flanged pipe connections or female NPT connections for introducing makeup and drain water as well as recirculation liquid connections.
4. The wet scrubbers should be equipped with random-dumped pall ring packing.
5. The Wet Scrubber should be equipped with a high efficiency (95% @ 15 micron and larger) mist eliminator. Material for the mist eliminator is PVC.

The proposed wet scrubbers should be furnished complete with auxiliaries and options described herein. The system shall include the following:

- All scrubber internals necessary to provide adequate process capture and to achieve the designed performance.
- Mist eliminator to achieve entrained liquid separation.
- Only Flanged connections for all external water fill, water makeup and drain piping as required.
- Self-contained recirculation system with all manual valve wherever requires along with scrubber pump.
- Ladder for sample collection, periodic inspection and monitoring



### SPECIFICATIONS FOR DUCTING AND ACCESSORIES

#### TECHNICAL SPECIFICATION for PP/FRP DUCTING:

- a. PP means PPGL: One side smooth & glassy finish and other end is mat finish.
  - The smooth surface should be the inner surface of the duct.

- On mat side, FRP lining to be done.
  - 25 mm x 25 mm Stitch welding is done on inner surface and continuous welding on outer surface with 5 mm welding thickness.
- b. FRP Lining to be done on the outer surface of PPGL I.e. on mat side.
    - One-layer FRP is one mm.
    - The final layer should be with fine mat to have smooth and good finish.
    - While making the lining, there should not be any air pockets or any sort of uneven finish.
    - There should be time gap between the FRP layers, allowing each layer to be got dried.
  - c. Isothelic resin to be used. (Fire resistant 20 Seconds).
  - d. The make of PPGL sheet should be Reliance - Mumbai / Ducar - Ahmedabad.
  - e. The flange thickness should be 1.5 times of the duct thickness up to 750 mm and 2 times above 750 mm ducting.
  - f. All flanges are to be matched with M8, GI fasteners and flat washers on both the sides.
  - g. All the flanges should have fasteners at the 4 corners.
  - h. All the fasteners to be fixed at a pitch distance of between 125 mm to 150mm.
  - i. All the flanges should be properly ground and dressed.
  - j. Duct support distance should not be more than 2500 mm.
  - k. Any duct length should not be more than 3600 mm.
  - l. All square / rectangular ducts with more than 1800 mm length should have a brazing frame at the center on the external surface.
  - m. Provide 40 x 40 flanges up 750 mm duct size and 50 x 50 above 750 mm.
  - n. The finish paint should be admiral grey unless specified.
  - o. 5 mm Thick Neoprene gasket to be used between the flanges.

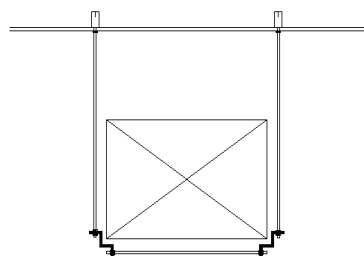
### **Duct Construction**

The fabricated duct dimensions should be as per approved drawings and all connecting sections are dimensionally matched to avoid any gaps.

Duct Sizes In mm	Thickness of PP	Thickness of FRP
0-750mm	3 mm	3 mm
750-1500mm	5 mm	5 mm
1500-2000mm	5 mm	8 mm

### **Support System**

A completely supporting system consisting of fully threaded rods, double L bottom brackets nuts, Washers, clamps for circular ducts and anchor bolts as supplied.



S.No.	Maximum Duct Size(mm)	Hanger Rod Diameter	Interval (mm)
1	Up to - 750	6 mm	2000
2	750 - 1500	8 mm	2000
3	1500 - 2000	10 mm	2000
4	Above 2000	12 mm	2000

To provide the required thermal brake effect, Neoprene or equivalent material of suitable thickness shall be used between duct joints.

**Installation Practice**

- a. All necessary allowances and provision should be made for the beams, pipes, or other obstructions in the building whether or not the same are shown on the drawings. Where there is interference/ fouling with other beams, structural work, plumbing and conduits, the ducts shall be suitably as per actual site conditions.
- b. Ducting over false ceiling shall be supported from the slab or from beams. In no case shall any duct be supported from false ceilings hangers or be permitted to rest on false ceiling. All Sheet work in dead or furred down spaces shall be erected in time to occasion no delay to other contractor's work in the building.
- c. All ducts shall be totally free from vibration under all conditions of operation. Whenever ductwork is connected to fans that may cause vibration in the ducts, ducts shall be provided with a flexible connection, located at the unit discharge.

**Dampers and Flexible Hose**

**General**

Volume control damper sets shall be provided where specified according to the specifications in the offer BOQ. Dampers shall be double thickness heavier than the thickness of the large duct & shall be rigid in construction.

The volume control dampers shall be of an approved type, lever operated & complete with locking devices which will permit the dampers to be adjusted & locked in any positions.

Construct blades of 3 mm thick PP MOC, provide heavy-duty molded self-lubricating nylon bearings, 13mm (1/2") diameter Plastic axles spaced on 225mm (9") centers. Construct frame of 300 mm diameter outer with Flange for fitting minimum 6 bolts and nuts. The outer shell body shall be a transparent material of Poly propylene.

Automatic manual volume opposed blade shall be not over 225mm wide. The dampers for fresh air inlet shall additionally provide with fly mesh screen, on the outside of 0.8mm thickness with fine mesh.

**Manually Adjustable Damper Sets:**

Damper sets should be arranged in substantial supporting frames and each blade should be mounted on a shaft, which turns in sintered bronze bearings. All damper blades shall be interconnected by means of a suitable bar linkage for ganged operation.

All dampers shall be arranged with spindle horizontal and should be sized to handle the air quantities shown on the drawings. Where manually adjustable damper sets are installed in ductwork or other accessible locations the operating shafts should also be extended through the duct with a lockable quadrant fitted.

**Bird Screens:**

Galvanized woven mesh or weld mesh bird screens in rigid galvanized iron frames should be installed behind all Bypass exhaust air openings to the outside of the building.

### **Flexible Connections**

Provide flexible duct connections wherever ductwork connects to vibration isolated equipment and on all exhaust final connections to spot extractor and as indicated on the drawings. Construct flexible connections of neoprene-coated flameproof fabric crimped into duct flanges for attachment to duct and equipment. Make air-tight joint. Provide adequate joint flexibility to allow for thermal, axial, transverse and torsional movement and also capable of absorbing vibrations of connected equipment.

Flexible connections shall be air tight and resistant to water and fire.

Flexible connections shall be fitted to isolate fans from equipments and/or ductwork. The connections shall be arranged to permit the renewal of the connection without disturbing the duct work or the plant. The metal parts of connected equipment shall be separated by not less than six inches and installed with sufficient slack to compensate for free movement of fans or spring vibration isolators.

### **Joint Measurements:**

The following procedure for measurement shall be followed for the purpose of billing in case of items subject to variation in quantities.

### **Ducting:**

Payment for ducting shall be based on the external surface area of the ducting.

The rate per square meter of the external surface shall include flanges, gaskets for joints, bolts and nuts, duct supports and hangers, vibration isolation pads or suspenders, flexible connections, inspection doors, dampers, turning vanes, straightening vanes, and any other item which will be required to complete the duct installation.

The external area shall be calculated by measuring the over-all width and depth (including the corner joints) in the centre of the duct section and over-all length of each duct section from flange face to flange face in case of duct lengths with uniform cross section.

Total area will be arrived at by adding up the areas of all duct sections.

In case of taper pieces average width and depth will be worked out as follows:

W1 = Width of small cross section

W2 = Width of large cross section

D1 = Depth of small cross section

D2 = Depth of large cross section

$$\text{Average Width} = (W1 + W2)/2$$

$$\text{Average Depth} = (D1 + D2)/2$$

Width and depth in the case of taper pieces shall be measured at the edge of the collar of the flange for duct/sections. Face to face length for taper piece shall be the mean of the lengths measured face to face from the centre of width and depth flanges.

For special pieces like bends, branches, and tees, etc., the same principle of area measurement as for linear lengths shall be adopted, except for bends and elbows, the length of which shall be the average of the lengths of inner and outer periphery along with curvature of angle of the piece.

# Bill of Quantities

## a. Fume Hoods

SL NO.	DESCRIPTION	UNIT	QTY
<b>4 FEET BANCHTOP HUMEHOOD</b>			
1	4 FEET BENCHTOP HOOD S=SWINGING TYPE FRONT PANEL COMBINATION SASH, SASH OPENING 28", 30" INTERNAL DEPTH, 48" LENGTH, PHENOLIC RESIN LINER, WITH INSERT TYPE WORKTOP	Nos.	4
2	PP CUPSINK 3x6x4	Nos.	8
3	REAR SCRIBE-18Hx00Dx5L, HEIGHT UP TO FALSE CEILING	Nos.	8
4	REAR SCRIBE-35Hx00Dx18L	Nos.	8
5	REAR SCRIBE - 57Hx00Dx05L	Nos.	8
6	BASE MOLDING 4 FT.	Nos.	4
7	FUMEHOOD ELECTRICAL SYSTEM-4+4 NOS 6/16A SOCKETS WITH SWITCH, NON-FLAME PROOF LIGHT FIXTURE ALONG WITH LED & 15 INTENSITY WITH 3 COLOR SETTINGS CONTROL SWITCH, FUMEHOOD DB AND INTERNAL WIRING WITHIN THE HOOD	Nos.	4
8	FUME HOOD MICROPROCESSOR BASED AIRFLOW MONITOR AND ALARM -VERTICAL - C/W SM7 SENSOR, SUITABLE POWER ADAPTOR	Nos.	4
9	FUMEHOOD FRONT CONTROL VALVE FOR ARGON	Nos.	8
10	FUMEHOOD FRONT CONTROL VALVE FOR COMPRESSED AIR	Nos.	4
11	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER IN	Nos.	4
12	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER OUT	Nos.	4
13	FUMEHOOD FRONT CONTROL VALVE FOR NITROGEN	Nos.	8
14	FUMEHOOD FRONT CONTROL VALVE FOR RAW WATER	Nos.	4
15	FUMEHOOD FRONT CONTROL VALVE FOR VACUUM	Nos.	8
16	FUMEHOOD SS304 INTERNAL TUBING UNTIL 150MM ABOVE THE HOOD WITH CAPPED END (1/2 FOR RW, VA, 1/2 WITH INSULATION CWI,CWO, 1/4 FOR N2,CA)	Nos.	40
17	BASE UNIT FH SOLVENT 1 DOOR-35Hx202x24L, PROVISION TO MOUNT 4 NOS ELECTRICAL SOCKETS.	Nos.	4
18	BASE UNIT FH ACID 1 DOOR-35Hx22Dx24L, PROVISION TO MOUNT 4 NOS ELECTRICAL SOCKET.	Nos.	4
19	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 35Hx08L	Nos.	8
20	4 FT FUME HOOD CEILING ENCLOSURE WITH ACCESS DOOR, SIZE:18H x 30D x 48L, FOR COMBINATION SASH HOOD, HEIGHT UP TO FALSE CEILING	Nos.	4
21	EPOXY LATTICE ASSMBLY FOR 4' BENCHTOP FUMEHOOD	Nos.	4
22	4 FEET BENCH TOP FUME HOOD INSERT TYPE GRANITE WORKTOP.	Nos.	4
<b>5 FEET BANCHTOP FUMEHOOD</b>			
1	5 FEET BENCHTOP HOOD S=SWINGING TYPE FRONT PANEL COMBINATION SASH, SASH OPENING 28", 30" INTERNAL DEPTH, 60" LENGTH, PHENOLIC RESIN LINER, WITH INSERT TYPE WORKTOP	Nos.	6
2	PP CUPSINK 3x6x4	Nos.	12
3	REAR SCRIBE-18Hx00Dx5L, HEIGHT UP TO FALSE CEILING	Nos.	12

4	REAR SCRIBE-35Hx00Dx18L	Nos.	12
5	REAR SCRIBE - 57Hx00Dx05L	Nos.	12
6	BASE MOLDING 4 FT.	Nos.	12
7	FUMEHOOD ELECTRICAL SYSTEM-4+4 NOS 6/16A SOCKETS WITH SWITCH, NON-FLAME PROOF LIGHT FIXTURE ALONG WITH LED & 15 INTENSITY WITH 3 COLOR SETTINGS CONTROL SWITCH, FUMEHOOD DB AND INTERNAL WIRING WITHIN THE HOOD	Nos.	6
8	FUME HOOD MICROPROCESSOR BASED AIRFLOW MONITOR AND ALARM -VERTICAL - C/W SM7 SENSOR, SUITABLE POWER ADAPTOR	Nos.	6
9	FUMEHOOD FRONT CONTROL VALVE FOR ARGON	Nos.	12
10	FUMEHOOD FRONT CONTROL VALVE FOR COMPRESSED AIR	Nos.	6
11	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER IN	Nos.	6
12	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER OUT	Nos.	6
13	FUMEHOOD FRONT CONTROL VALVE FOR NITROGEN	Nos.	12
14	FUMEHOOD FRONT CONTROL VALVE FOR RAW WATER	Nos.	6
15	FUMEHOOD FRONT CONTROL VALVE FOR VACUUM	Nos.	12
16	FUMEHOOD SS304 INTERNAL TUBING UNTIL 150MM ABOVE THE HOOD WITH CAPPED END (1/2 FOR RW, VA, 1/2 WITH INSULATION CWI,CWO, 1/4 FOR N2,CA)	Nos.	60
17	BASE UNIT FH SOLVENT 2 DOOR-35Hx22Dx30L	Nos.	6
18	BASE UNIT FH ACID 2 DOOR-35Hx22Dx30L	Nos.	6
19	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 35Hx08L	Nos.	18
20	5 FT FUME HOOD CEILING ENCLOSURE WITH ACCESS DOOR, SIZE:18H x 30D x 60L, FOR COMBINATION SASH HOOD, HEIGHT UP TO FALSE CEILING	Nos.	6
21	EPOXY LATTICE ASSMBLY FOR 5' BENCHTOP FUMEHOOD	Nos.	6
22	5 FEET BENCH TOP FUME HOOD INSERT TYPE GRANITE WORKTOP.	Nos.	6
<b>6 FEET BANCHTOP FUMEHOOD</b>			
1	6 FEET BENCHTOP HOOD S=SWINGING TYPE FRONT PANEL COMBINATION SASH, SASH OPENING 28", 30" INTERNAL DEPTH, 72" LENGTH, PHENOLIC RESIN LINER, WITH INSERT TYPE WORKTOP	Nos.	32
2	PP CUPSINK 3x6x4	Nos.	64
3	REAR SCRIBE-18Hx00Dx5L, HEIGHT UP TO FALSE CEILING	Nos.	64
4	REAR SCRIBE-35Hx00Dx18L	Nos.	64
5	REAR SCRIBE - 57Hx00Dx05L	Nos.	64
6	BASE MOLDING 4 FT.	Nos.	64
7	FUMEHOOD ELECTRICAL SYSTEM-4+4 NOS 6/16A SOCKETS WITH SWITCH, NON-FLAME PROOF LIGHT FIXTURE ALONG WITH LED & 15 INTENSITY WITH 3 COLOR SETTINGS CONTROL SWITCH, FUMEHOOD DB AND INTERNAL WIRING WITHIN THE HOOD	Nos.	32
8	FUME HOOD MICROPROCESSOR BASED AIRFLOW MONITOR AND ALARM -VERTICAL - C/W SM7 SENSOR, SUITABLE POWER ADAPTOR	Nos.	32
9	FUMEHOOD FRONT CONTROL VALVE FOR ARGON	Nos.	64
10	FUMEHOOD FRONT CONTROL VALVE FOR COMPRESSED AIR	Nos.	32
11	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER IN	Nos.	32

12	FUMEHOOD FRONT CONTROL VALVE FOR CHILLED WATER OUT	Nos.	32
13	FUMEHOOD FRONT CONTROL VALVE FOR NITROGEN	Nos.	64
14	FUMEHOOD FRONT CONTROL VALVE FOR RAW WATER	Nos.	32
15	FUMEHOOD FRONT CONTROL VALVE FOR VACUUM	Nos.	64
16	FUMEHOOD SS304 INTERNAL TUBING UNTIL 150MM ABOVE THE HOOD WITH CAPPED END (1/2 FOR RW, VA, 1/2 WITH INSULATION CWI,CWO, 1/4 FOR N2,CA)	Nos.	320
17	BASE UNIT FH SOLVENT 2 DOOR-35Hx22Dx36L	Nos.	32
18	BASE UNIT FH ACID 2 DOOR-35Hx22Dx36L	Nos.	32
19	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 35Hx08L	Nos.	96
20	6 FT FUME HOOD CEILING ENCLOSURE WITH ACCESS DOOR, SIZE:18H x 30D x 72L, FOR COMBINATION SASH HOOD, HEIGHT UP TO FALSE CEILING	Nos.	32
21	EPOXY LATTICE ASSMBLY FOR 6' BENCHTOP FUMEHOOD	Nos.	32
22	6 FEET BENCH TOP FUME HOOD INSERT TYPE GRANITE WORKTOP.	Nos.	32

**b. Exhaust System:**

SI. NO.	DESCRIPTION	UNIT	QTY
<b>CHEMICAL ENGINEERING BLOCK</b>			
<b>A</b>	<b>CENTRIFUGAL BLOWER &amp; MOTOR</b>		
1	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-100mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	3
2	Motor 1.5KW/2P(2HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	3
<b>B</b>	<b>WET SCRUBBERS &amp; ACCESSORIES</b>		
1	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is <b>850-1500 CFM</b> and made up of PP+FRP material. The approximate size shall be 700 mm dia & 2500mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 46 Lpm flow, 1HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	3
<b>C</b>	<b>PP-FRP DUCTING &amp; ACCESSORIES</b>		



1	PP-FRP ducting using 3mm thick PPGL sheets 3mm thick FRP lining using isothelic resin including flanges & bends, gasket, support with threaded rod, clamps, anchor fasteners, washer nuts and bolts including UV resistant painting.	Sqm	85
2	MS Support for Ducts like threaded rod, anchor bolts, c-channel, clamps, angles, bolts & nuts. Inside lab, within Shaft & outside the building.	Kg.	120
3	PP moulded 300mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	3
4	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	3
5	PP moulded 100mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	6
6	PVC Coated Collapsible hose 300mm Dia with 350mm Dia Clips.	Rm	3
7	PVC Coated Collapsible hose 100mm Dia with 150mm Dia Clips.	Rm	12
8	Fumehood Base cabinet vent connection & Accessories	Set	3
8.1	40 mm PP Slip x Slip x Slip Tee	No.	3
8.2	40mm CTS Slip x MPT Male Adapter 50mm with Chuck Nut	No.	6
8.3	40mm CTS 90-Degree Slip x Slip Elbow	No.	6
8.4	40mm. x 2500mm PP Exhaust Pipe	No.	3
<b>TOTAL OF CHEMICAL ENGINEERING BLOCK</b>			
<b>SI. NO.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QTY</b>
<b>CHEMISTRY LAB BLOCK</b>			
<b>A</b>	<b>CENTRIFUGAL BLOWER &amp; MOTOR</b>		
1	Medium Pressure Direct Driven PP Centrifugal Blower (4050-5500cfm @ 40-120mm static) with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
2	Motor 7.5KW/4P(10HP/4P) TEFC B3/Foot mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation.	No.	1
3	Medium Pressure Direct Driven PP Centrifugal Blower (2650-4000cfm @ 40-120mm static) with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	5
4	Motor 5.5KW/4P(7.5HP/4P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation.	No.	5
5	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-60mm static) with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	2
6	Motor 1.1KW/2P(1.5HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation.	No	2
<b>B</b>	<b>SCRUBBERS &amp; ACCESSORIES</b>		

1	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is 3250-4200 CFM and made up of PP+FRP material. The approximate size shall be 1200 mm dia & 4000mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 117 Lpm flow, 2HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	5
2	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is 4250-6000 CFM and made up of PP+FRP material. The approximate size shall be 1350 mm dia & 4250mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 148 Lpm flow, 2HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	1
<b>C</b>	<b>PP-FRP DUCTING &amp; ACCESSORIES</b>		
1	PP-FRP ducting using 3mm thick PPGL sheets 3mm thick FRP lining using isophthalic resin including flanges & bends, gasket, support with threaded rod, clamps, anchor fasteners, washer nuts and bolts including UV resistant painting.	Sqm	415
2	MS Support for Ducts like threaded rod, anchor bolts, c-channel, clamps, angles, bolts & nuts. Inside lab, within Shaft & outside the building.	Kg.	465
3	PP moulded 300mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	27
4	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	4
5	PP moulded 100mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	16
6	PP moulded 400mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	6
7	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	2
8	PVC Coated Collapsible hose 300mm Dia with 350mm Dia Clips.	Rm	27
9	PVC Coated Collapsible hose 100mm Dia with 150mm Dia Clips.	Rm	32
10	Fume hood Base cabinet vent connection & Accessories	Set	27
10.1	40 mm PP Slip x Slip x Slip Tee	No.	27
10.2	40mm CTS Slip x MPT Male Adapter 50mm with Chuck Nut	No.	54
10.3	40mm CTS 90-Degree Slip x Slip Elbow	No.	54
10.4	40mm. x 2500mm PP Exhaust Pipe	No.	27
	<b>TOTAL OF CHEMISTRY LAB BLOCK</b>		

SI. NO.	DESCRIPTION	UNIT	QTY
<b>CIVIL AND ENVIRONMENTAL ENGG. BLOCK</b>			
<b>A CENTRIFUGAL BLOWER &amp; MOTOR</b>			
1	Medium Pressure Direct Driven PP Centrifugal Blower (2650-4000cfm @ 40-120mm static) with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
2	Motor 3.7KW/4P(5HP/4P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation.	No.	1
3	Medium Pressure Direct Driven PP Centrifugal Blower (1150-1600cfm @ 30-130mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
4	Motor 2.2KW/2P(3HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	1
5	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-100mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
6	Motor 1.5KW/2P(2HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	1
7	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-100mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	2
8	Motor 1.1KW/2P(1.5HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	2
<b>B WET SCRUBBERS &amp; ACCESSORIES</b>			
	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is 2550-3200 CFM and made up of PP+FRP material. The approximate size shall be 1000 mm dia & 3750mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 95 Lpm flow, 1HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	1

	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is <b>850-1500 CFM</b> and made up of PP+FRP material. The approximate size shall be 700 mm dia & 2500mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 46 Lpm flow, 1HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	2
<b>C</b>	<b>PP-FRP DUCTING &amp; ACCESSORIES</b>		
1	PP-FRP ducting using 3mm thick PPGL sheets 3mm thick FRP lining using isophthalic resin including flanges & bends, gasket, support with threaded rod, clamps, anchor fasteners, washer nuts and bolts including UV resistant painting.	Sqm	200
2	MS Support for Ducts like threaded rod, anchor bolts, c-channels, clamps, angles, bolts & nuts. Inside lab, within Shaft & outside the building.	Kg.	280
3	PP moulded 300mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	7
4	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	2
5	PP moulded 150mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	3
6	PP moulded 100mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	12
7	PP moulded 300mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	1
8	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	1
9	PP moulded 150mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	2
10	PVC Coated Collapsible hose 300mm Dia with 350mm Dia Clips.	Rm	7
11	PVC Coated Collapsible hose 100mm Dia with 150mm Dia Clips.	Rm	24
11.1	Fume hood Base cabinet vent connection & Accessories	Set	7
11.2	40 mm PP Slip x Slip x Slip Tee	No.	7
11.3	40mm CTS Slip x MPT Male Adapter 50mm with Chuck Nut	No.	14
11.4	40mm CTS 90-Degree Slip x Slip Elbow	No.	14
	40mm. x 2500mm PP Exhaust Pipe	No.	7
	<b>TOTAL OF CIVIL AND ENVIRONMENTAL ENGG. BLOCK</b>		

SI. NO.	DESCRIPTION	UNIT	QTY
	<b>PHYSICS LAB BLOCK</b>		
<b>A</b>	<b>CENTRIFUGAL BLOWER &amp; MOTOR</b>		
1	Medium Pressure Direct Driven PP Centrifugal Blower (2650-4000cfm @ 40-120mm static) with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1

2	Motor 5.5KW/4P(7.5HP/4P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation.	No.	1
3	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-100mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
4	Motor 1.5KW/2P(2HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	1
5	Medium Pressure Direct Driven PP Centrifugal Blower (650-1100cfm @ 30-60mm static), with clamp adapter, Electro galvanized stand base frame and fasteners, weather cowl, stack support, motor guard, bird mesh, inlet and outlet flexible hose connections. Refer Cluster details.	No	1
6	Motor 1.1KW/2P(1.5HP/2P) TEFC B5/Flange mounted 3phase 50Hz, IE2.Terminal box should be on top side. Motor Shall be compatible for VFD Operation. Refer Cluster details.	No.	1
<b>B</b>	<b>WET SCRUBBERS &amp; ACCESSORIES</b>		
	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is 3250-4200 CFM and made up of PP+FRP material. The approximate size shall be 1200 mm dia & 4000mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 117 Lpm flow, 2HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	1
	Vertical single stage packed bed scrubber with integrated water tank. The scrubber capacity is <b>850-1500 CFM</b> and made up of PP+FRP material. The approximate size shall be 700 mm dia & 2500mm ht, complete with packing material, mist eliminator, inspection window, marine light with external switch and FRP coated MS ladder with handrail. Provision for Makeup Water connection with control Valve, Water Level Indicator, provision for Drain connection with Control Valve, Overflow Pipe with float valve. Scrubber Recirculation Pump with inlet Flange with Y-Strainer, ball valves, Outlet Flange with NRV, Ball Valve. Complete recirculation piping with suitable supports. Inlet and outlet flange for duct connections with gasket and Bolt Nuts. Vertical Seal less Scrubber Pump with enclosure suitable for 46 Lpm flow, 1HP, 3phase 50Hz, 415Volts. Provision for Dosing connection if any with Valve, Scrubber Mounting Bolt & Nuts with Anti Vibration Pads. The operating Temperature is upto 60deg C (max.) and Pressure drop across the scrubber shall not be more than 600Pa (approx.).	No	1
<b>C</b>	<b>PP-FRP DUCTING &amp; ACCESSORIES</b>		
1	PP-FRP ducting using 3mm thick PPGL sheets 3mm thick FRP lining using isophthalic resin including flanges & bends, gasket, support with threaded rod, clamps, anchor fasteners, washer nuts and bolts including UV resistant painting.	Sqm	175
2	MS Support for Ducts like threaded rod, anchor bolts, c-channels, clamps, angles, bolts & nuts. Inside lab, within Shaft & outside the building.	Kg.	200
3	PP moulded 300mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	5

5	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	1
7	PP moulded 100mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No.	5
8	PP moulded 400mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	1
10	PP moulded 200mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	1
11	PP moulded 150mm dia. single leaf Butterfly Manual damper with Both side flanges. Refer drawing.	No	1
12	PVC Coated Collapsable hose 300mm Dia with 350mm Dia Clips.	Rm	5
13	PVC Coated Collapsable hose 100mm Dia with 150mm Dia Clips.	Rm	10
14	Fume hood Base cabinet vent connection & Accessories	Set	5
14.1	40 mm PP Slip x Slip x Slip Tee	No.	5
14.2	40mm CTS Slip x MPT Male Adapter 50mm with Chuck Nut	No.	10
14.3	40mm CTS 90-Degree Slip x Slip Elbow	No.	10
14.4	40mm. x 2500mm PP Exhaust Pipe	No.	5
	<b>TOTAL OF PHYSICS LAB BLOCK</b>		

## **2. Item No: 4, 5, 6, and 7: Island Tables**

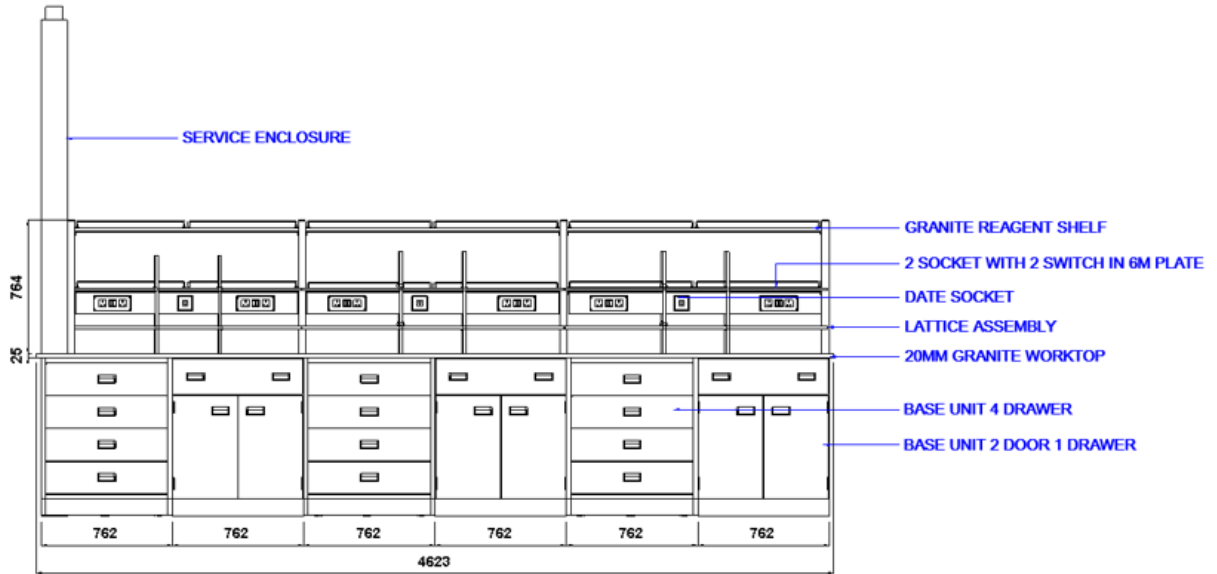
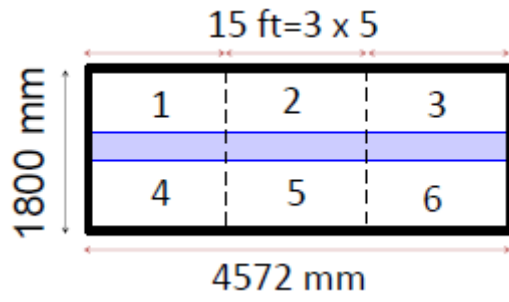
### Technical Specifications

1. A 18/19 mm Jet Black Granite as the worktop for the work benches. The front edge of the granite must be chamfered properly at an angle of 28 degrees and should be properly smoothed. The work bench (wall bench) should be provided with the back splash for a height of 4'' from the finished tabletop level.
2. The column-based reagent rack, with two column assemblies, work surface frame and Granite work surface shelf should be provided with all round SS316 Retaining rod.
3. **Reagent Rack:** The work top should be provided with 12''/9'' wide and 36''/24'' height vertical racks. Granite top should be provided for the reagent rack also.
4. +/- 20 mm is accepted in all types of Island tables and side tables and other laboratory furniture.

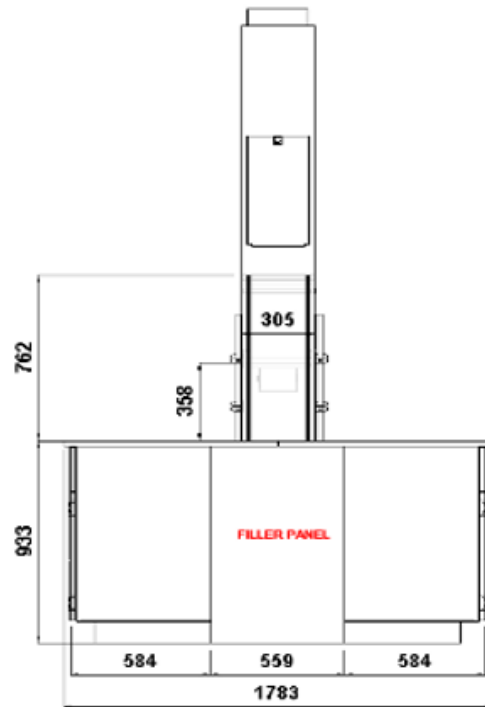
### **Item 4:**

#### **Measurements: ± 20 mm**

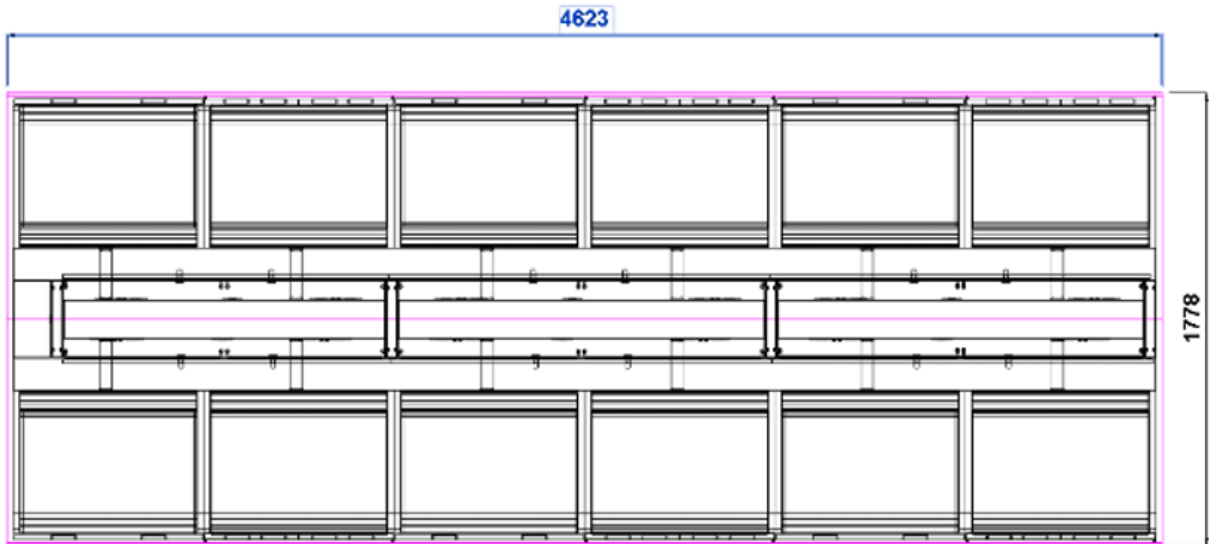
- **04 numbers of 4570 mm (L) x 1800 mm (W) x 910 mm (H)** Island workbenches with fixed reagent racks should be supplied and installed. All the workbenches must be provided with the storage cabinets below.



**FRONT VIEW**



**SIDE VIEW**

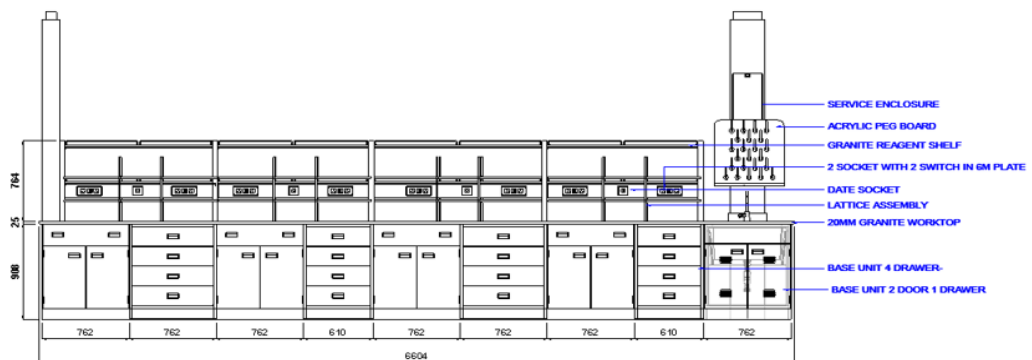
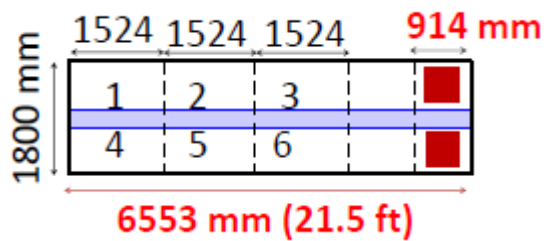


## PLAN VIEW

### Item 5:

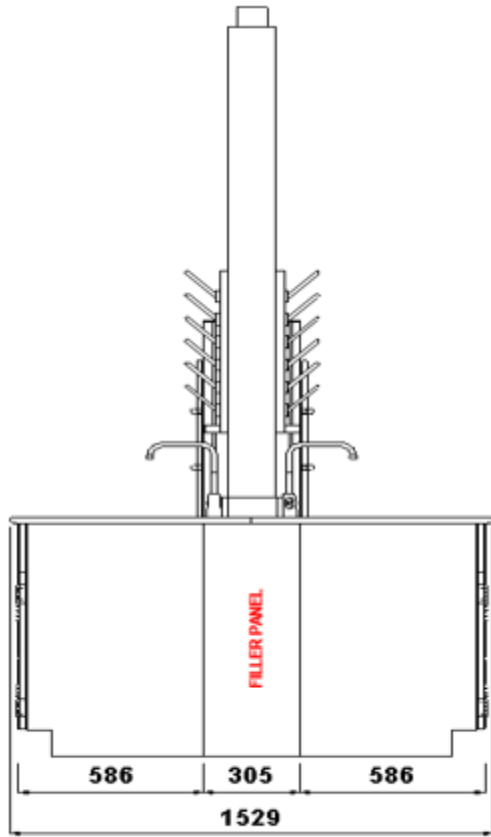
Measurements:  $\pm 20$  mm

- **06 numbers of 6550 mm (L) x 1530 mm (W) x 910 mm (H)** Island workbench with reagent racks and two sinks on one side should be supplied and installed. All the workbenches should have the under-bench storage cabinets.



## FRONT VIEW





**SIDE VIEW**

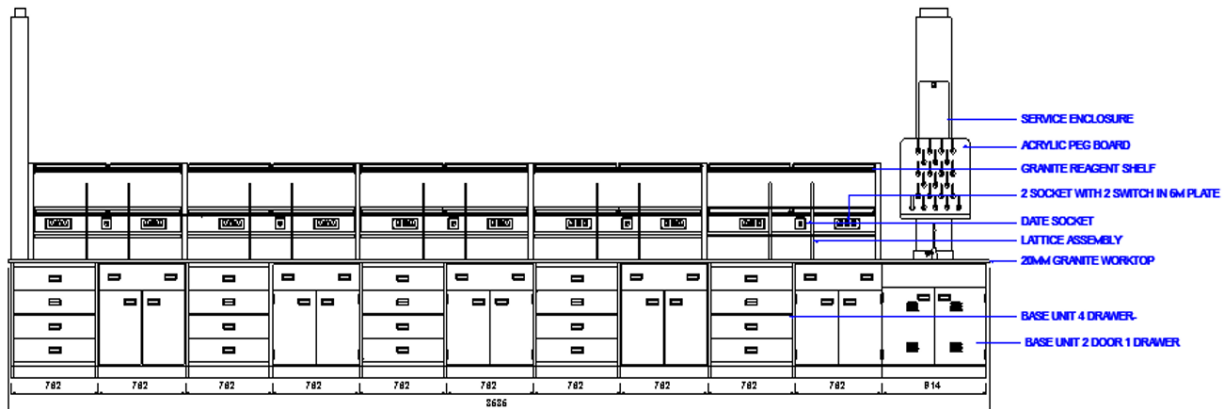
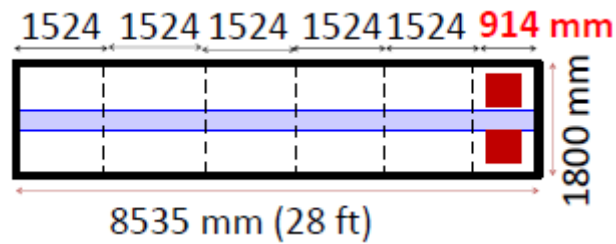


**PLAN VIEW**

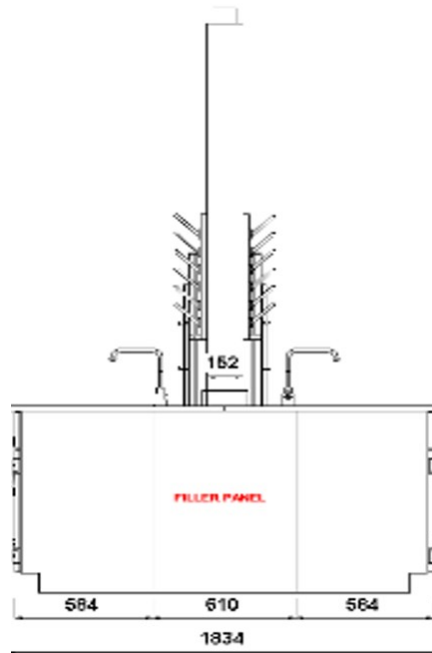
## Item 6:

Measurements:  $\pm 20$  mm

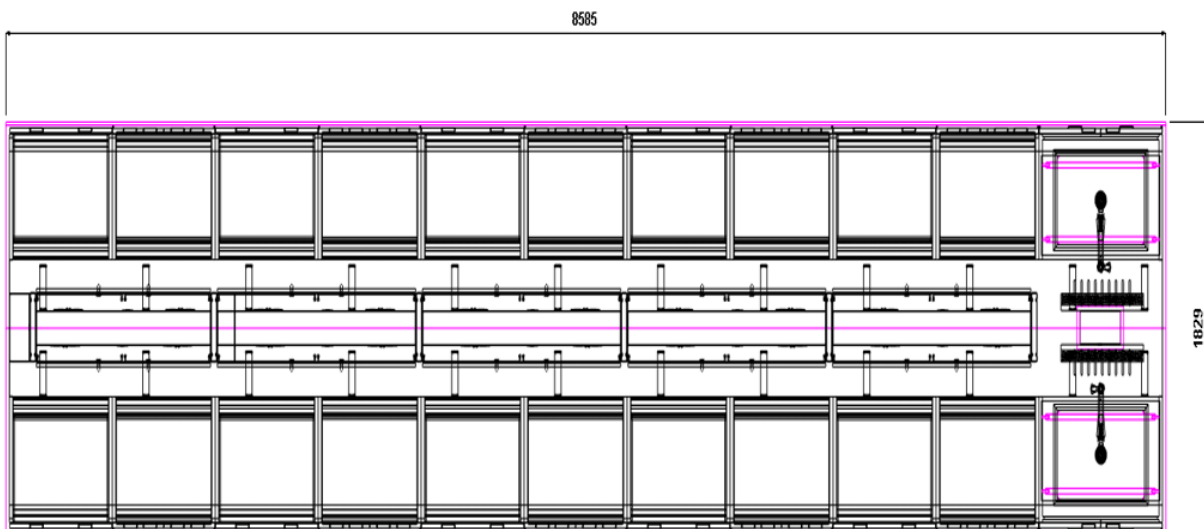
- 03 numbers of 8530 mm (L) x 1800 mm x 910 mm (H) Island workbench with reagent racks and two sinks on one end of the table should be supplied and installed. All the workbenches should have the under-bench storage cabinets.



FRONT VIEW



**SIDE VIEW**

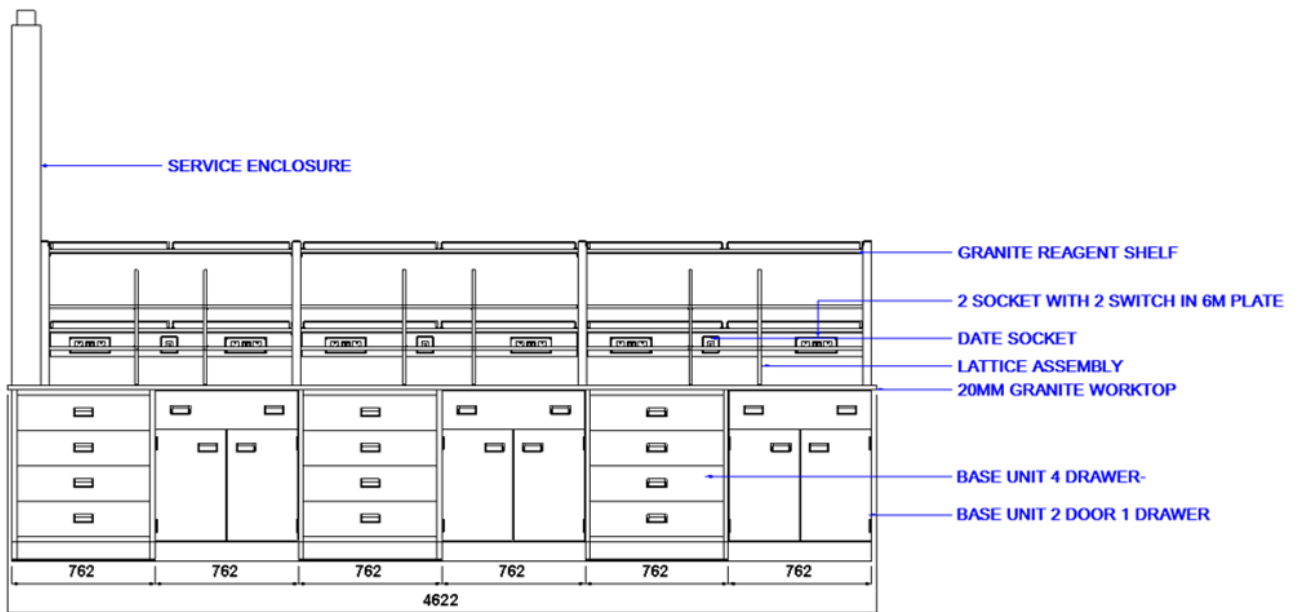
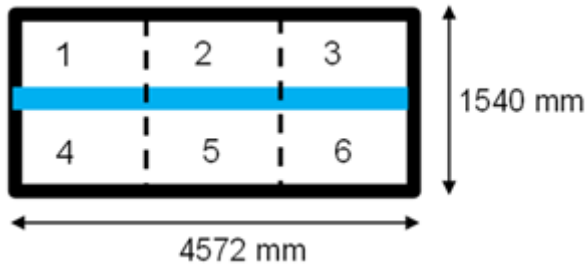


**PLAN VIEW**

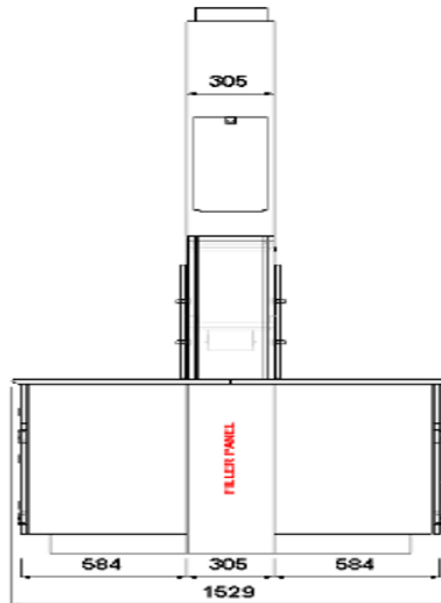
**Item 7:**

**Measurements: ± 20 mm**

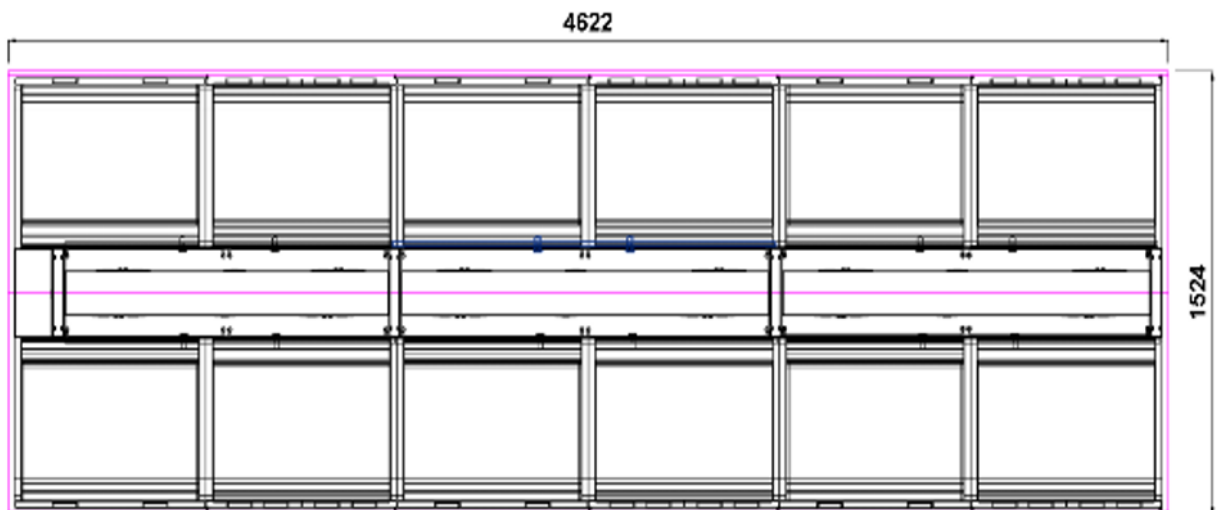
- **03 numbers 4500 mm (L) x 1520 mm x 910 mm (H) Island workbench** with reagent racks should be supplied and installed. All the workbenches should have the under-bench storage cabinets.



**FRONT VIEW**



**SIDE VIEW**



**PLAN VIEW**

CABINET STYLE:

**Steel:**

Cabinet bodies, drawer bodies, shelves, drawer heads and door assemblies shall be fabricated from Cold Rolled Steel.

DRAWER AND DOOR STYLE:

**Overlay – Square Edge**

Drawer and door, when closed, shall rest against the face of the cabinet shell, creating a 3/4" overlay front with 1/8" reveal. The outer drawer and door head shall have a channel formation on all four sides to eliminate sharp raw edges of steel. The top front corners of the

door shall be welded and ground smooth. Cabinet shall be available with 5-knuckle, semi-concealed or concealed hinges and optional pulls.

## MATERIALS

### A. **General Requirements:**

It is the intent of this specification to provide a high-quality steel cabinet specifically designed for the laboratory environment.

### B. **Steel:**

Cold Rolled Steel:

Cold rolled sheet steel shall be prime grade 12, 14-, 16-, 18- and 20-gauge U.S. Standard; roller levelled and shall be treated at the mill to be free of scale, ragged edges, deep scratches or other injurious effects.

### C. **Drawer and Door Pulls:**

Pull shall be of modern design, offering a comfortable handgrip, and be securely fastened to doors and drawers with screws. All pulls shall be satin finish aluminium, with a clear, lacquer finish. Two pulls shall be required on all drawers over 24" long. Use of plastic pulls (moulded or extruded), or a design not compatible for usage by the specially abled people will not be acceptable.

### D. **Hinges:**

#### **Overlay 5-Knuckle Hinges:**

5-Knuckle hinges made of Type 304 stainless steel .089 thick, 2-1/2" high, with brushed satin finish, and shall be the institutional type with a five-knuckle bullet-type barrel. Hinges shall be attached to both door and case with two screws through each leaf. Welding of hinges to the door or case will not be accepted. Doors under 36" in height shall be hung on one pair of hinges, and doors over 36" in height shall be hung on three hinges.

### E. **Positive Catch:**

A two-piece heavy-duty cam action positive catch shall be provided on all base cupboard doors and shall be positioned near the pivoting edge of the door to provide a clean unobstructed opening. Main body of the catch shall be confined within an integral cabinet divider rail, while the latching post shall be mounted on the hinge side of the door. Nylon roller type catches are not acceptable. Optional.

### F. **Elbow Catches:**

Elbow catches and strike plates shall be used on left hand doors of double door cases where locks are used, and are to be burnished cast aluminium, with bright brass finish or Equivalent.

### G. **Shelf Adjustment Clips:**

Shelf adjustment clips shall be nickel-plated steel.

### H. **Base Molding:**

Base Molding shall be provided on all table legs, unless otherwise specified, to conceal leveling device. Shoes shall be a pliable, black vinyl material. Corner clip should be provided to hold the base molding firmly. Use of a leg shoe, which does not conceal levelling device, will not be acceptable.

### I. **Sink Supports:**

Sink supports shall be the hanger type, suspended from top front and top rear horizontal rails of sink cabinet by four 1/4" dia. rods, threaded at bottom end and offset at top to hang from two full length reinforcements welded to the front and rear top rails. Two 3/4" x 1-2/2" x 12-gauge channels shall be hung on the threaded rods to provide an adjustable sink cradle for supporting sinks. When sink capacity exceeds 3,750 cu. in., the sink supports shall be suspended from full-length reinforcements welded to the two end rails. Two 1" x 2" x 10-gauge full-length channels shall be hung from the four 1/4" dia. rods to provide an alternate sink cradle.

## CONSTRUCTION

### A. Steel Base Cabinet Construction:

#### 1. General:

- a. The steel furniture shall be of modern design and shall be constructed in accordance with the best practices of the Scientific Laboratory Equipment Industry. First class quality casework shall be insured by the use of proper machinery, tools, dies, fixtures and skilled workmanship to meet the intended quality and quantity for the project.
- b. All cabinet bodies shall be flush front construction with intersection of vertical and horizontal case members, such as end panels, top rails, bottoms and vertical posts in the same plane without overlap. Exterior corners shall be spot welded with heavy back up reinforcement at exterior corners. All face joints shall be welded and ground smooth to provide a continuous flat plane.
- c. Each cabinet shall be complete so that units can be relocated at any subsequent time without requiring field application of finished ends or other such parts.
- d. Case openings shall be rabbeted on all four sides for both hinged and sliding doors to provide a dust resistant case.
- e. All cabinets shall have a cleanable smooth interior. Bottom edges shall be formed down on sides and back to create easily cleanable corners with no burrs or sharp edges, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop.

#### 2. Steel Gauges:

Gauges of steel used in construction of cases shall be 18 gauge, except as follows:

- a. Corner gussets for leveling bolts and apron corner braces, 12 gauge.
- b. Case and drawer suspension channels, 14 gauge.
- c. Top and intermediate front horizontal rails, table aprons, hinge reinforcements, and reinforcement gussets, 16 gauge.
- d. Drawer assemblies, door assemblies, bottom, bottom back rail, toe space rail, and adjustable shelves, 20 gauge.

#### 3. Base Cabinets:

- a. End uprights shall be formed into not less than a channel formation at top, bottom, back and front. The front edge shall further offset to form a strike for doors and drawers and shall be perforated for the support of drawer channels, intermediate rails and hinge screws. An upright filler shall be screwed in place in all cupboard units to close the back of the channel in front of the upright and to provide a smooth interior for the cupboard to facilitate cleaning. The upright filler shall be perforated with shelf adjustment holes at not more than 2" centers painted prior to assembly. The inside front of the upright shall be further reinforced with a full height 16-gauge hinge reinforcement angle.
- b. Top horizontal rail on base cabinets shall interlock within the flange at top of end panels for strength but shall be flush as face of unit. Top rail shall have a full width rabbet for swinging doors and drawers. Reinforcements shall be provided at all front corners for additional welded strength between vertical and horizontal case members.
- c. Intermediate rails shall be provided between doors and drawers but shall not be provided between drawers unless made necessary by locks in drawers. When required, intermediate rails shall be recessed behind doors and drawer fronts, and designed so that security panels may be added as required.
- d. Intermediate vertical uprights shall be furnished to enclose cupboards when used in a unit in combination with a half width bank of drawers. However, to allow storage

of large or bulky objects, no upright of any type shall be used at the center of double door cupboard units.

- e. Cabinet bottom, and bottom rail shall be formed of one piece of steel except in corner units and shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop.
- f. Toe space rail shall extend up and forward to engage bottom rail to form a smooth surfaced fully enclosed toe space, 3" deep x 5" high. Whenever toe space base is omitted for units to set on building bases on separate steel bases, then the toe space rail shall extend back 4-1/2".
- g. Back construction shall consist of a top and bottom rail, channel formed for maximum strength and welded to back and top flange of end uprights, open for access to plumbing lines.  
Cupboard units only shall be provided with removable back panels.
- h. Die-formed gussets, with multiple ends for strength, shall be furnished in each bottom corner of base units to insure rigidity, and a 3/8"-16 levelling bolt, 3" long, and shall engage a clinch nut in each gusset. Access to the levelling bolts shall be through plug buttons in the bottom pan. Each levelling bolt and gusset shall be capable of supporting 500 lbs. Access to levelling bolts through toe space or levelling bolts requiring special tools to adjust are not acceptable.
- i. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear; formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- j. Drawer bodies shall be made in one-piece construction including the bottom, two sides, back and front. They shall be fully coved at interior bottom on all four sides for easy cleaning. The top front of the inner drawer body shall be offset to interlock with the channel formation in the drawer head providing a 3/4" thick drawer head.
- k. Drawer suspension assembly shall consist of 2 sections providing a quiet, smooth operation on ball bearing nylon rollers. All drawers shall be self-closing from a point 5" open. Cabinet channels shall maintain alignment of the drawer and provide an integral drawer stop, but the drawer shall be removable without the use of tools. Drawers shall provide 13-5/8" front to back clearance when fully extended. Drawers shall rise when opened thus avoiding friction with lower drawers and/or doors. Drawer suspension system shall incorporate a double stop, lock open feature. Case suspension channels shall be Galvanized Steel, drawer suspension channels shall be Cold Rolled Steel. Drawer suspension channels on Stainless Steel Cabinets shall be zinc plated after they are formed.
- l. Steel Door assembly (two-piece) for solid pan swinging doors shall consist of an inner and outer door pan. Outer door pan shall be formed at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges of steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material.
- m. Steel Drawer/door assemblies shall be painted prior to assembly. Both shall be punched for attaching drawer pulls. Likewise, inner pan formation of door and drawer body shall be indented for in-field installation of locks when required.
- n. Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the cabinet and door with screws. Welding of hinges to either cabinet or door will not be acceptable.



- o. Knee space panels, where shown or specified, shall be 20 gauge, finished same as casework cabinets, and easily removable for access to mechanical service areas.

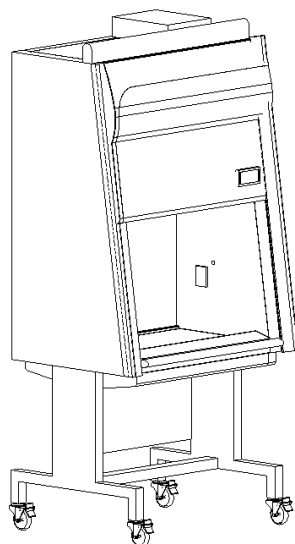
### BOQ for Island tables

<b>Type-1: 4570 mm (L) x 1770 mm (W)</b>			
1	6/16A (RAW POWER) 2 SOCKET WITH 2 SWITCH IN 6M PLATE	Nos.	48
2	REAR SCRIBE-35Hx00Dx22L	Nos.	8
3	CAT 6A INFORMATION OUTLETS WITH POLYCARBONATE I/O FACE PLATE (DATA)	Nos.	24
4	BASE UNIT 4 DRAWER-35Hx22Dx30L	Nos.	24
5	BASE UNIT 2 DOOR 1 DRAWER-35Hx22Dx30L	Nos.	24
6	DOUBLE SIDED METAL ELECTRICAL RACEWAY, 05Hx06D	Inch	664
7	BASE MOLDING 4 FT.	Nos.	48
8	CORNOR CLIP	Nos.	24
9	REAGENT WORKTOP SUPPORT 12x51, REFER DRAWING	Nos.	8
10	REAGENT WORKTOP SUPPORT 12x58, REFER DRAWING	Nos.	16
11	BENCH MOUNT 12" DOUBLE SIDED COLUMN, SIZE: 30Hx12Dx02L, POWDER COATED ACCENT STRIP & BENCH MOUNTED, PROVISION TO MOUNT LATTICE ASSEMBLY.	Nos.	16
12	GRANITE REAGENT SHELF 12x51, SS 316L RETAINING ROD.	Nos.	8
13	GRANITE REAGENT SHELF 12x58, SS 316L RETAINING ROD.	Nos.	16
14	18/19mm THK. GRANITE WORKTOP IN SFT	Sqft	364
15	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 35Hx08L	Nos.	48
16	2 HORIZONTAL AND 4 VERTICAL LATTICE ASSEMBLY FOR REAGENT RODS, 24H, 66L, O MOUNT ON BOTH SIDE UPRIGHT WITH FIXING SUPPORTS AND ACCESSORIES.	Nos.	24
17	SERVICE ENCLOSURE -12x6x112	Nos.	4
18	GRANITE SKIRTING. 4x1	Rft	20
<b>Type-2: 6550 mm (L) x 1530 mm (W)</b>			
1	6/16A (RAW POWER) 2 SOCKET WITH 2 SWITCH IN 6M PLATE	Nos.	96
2	ACRYLIC PEG BOARD WITH 23 PEGS WITH SS 316L TRAY, 610L x 610mm(H) WITH 90 DEGREE BEND TUBE UPTO SINK	Nos.	12
3	REAR SCRIBE-35Hx00Dx12L	Nos.	12
4	BENCH MOUNTED 1-WAY WATER FITTING WITH 8" RIGID/SWING GOOSENECK WITH AERATOR FOR RAW WATER	Nos.	12
5	CAT 6A INFORMATION OUTLETS WITH POLYCARBONATE I/O FACE PLATE (DATA)	Nos.	48
6	BASE UNIT 4 DRAWER-35Hx22Dx24L	Nos.	24
7	BASE UNIT 4 DRAWER-35Hx22Dx30L	Nos.	24
8	BASE UNIT 2 DOOR 1 DRAWER-35Hx22Dx30L	Nos.	48
9	DOUBLE SIDED METAL ELECTRICAL RACEWAY, 05Hx06D	Inch	1272
10	DECK MOUNTED DOUBLE HEAD EYE WASH/DRENCH	Nos.	6
11	BASE MOLDING 4 FT.	Nos.	88
12	CORNOR CLIP	Nos.	30
13	REAGENT WORKTOP SUPPORT 12x51, REFER DRAWING	Nos.	12
14	REAGENT WORKTOP SUPPORT 12x52, REFER DRAWING	Nos.	24
15	REAGENT WORKTOP SUPPORT 12x58, REFER DRAWING	Nos.	12
16	BENCH MOUNT 12" DOUBLE SIDED COLUMN, SIZE: 30Hx12Dx02L, POWDER COATED ACCENT STRIP & BENCH MOUNTED, PROVISION TO MOUNT LATTICE ASSEMBLY.	Nos.	30
17	BASE UNIT SINK 2 DOOR-35Hx22Dx30L, 1P=WITH PP TRAY	Nos.	12

18	GRANITE REAGENT SHELF 12x51, SS 316L RETAINING ROD.	Nos.	12
19	GRANITE REAGENT SHELF 12x52, SS 316L RETAINING ROD.	Nos.	24
20	GRANITE REAGENT SHELF 12x58, SS 316L RETAINING ROD.	Nos.	12
21	18/19mm THK. GRANITE WORKTOP IN SFT	Sqft	680
22	SINK SUPPORT KIT FOR 30" CABINET	Nos.	12
23	2 HORIZONTAL AND 4 VERTICAL LATTICE ASSEMBLY FOR REAGENT RODS, 24H, 65L	Nos.	48
24	PP SINK, SIZE: 600Lx450Dx315Hmm AND BOWL SIZE: 550Lx400Dx315Hmm	Nos.	12
25	WASTE, 1 1/2" BSP X 76mm	Nos.	12
26	ANTI SIPHON BOTTLE TRAP	Nos.	12
27	REDUCING COUPLER IN PP 51 X 31MM + PP PIPE LENGTHS - ONE FEET LENGTH - DIA. 38MM	Nos.	12
28	SERVICE ENCLOSURE -12x6x112	Nos.	12
29	GRANITE SKIRTING. 4x1	Rft	30
<b>Type-3: 8535 mm (L) x 1800 mm (W)</b>			
1	6/16A (RAW POWER) 2 SOCKET WITH 2 SWITCH IN 6M PLATE	Nos.	60
2	ACRYLIC PEG BOARD WITH 23 PEGS WITH SS 316L TRAY, 610L x 610mm(H) WITH 90 DEGREE BEND TUBE UPTO SINK	Nos.	6
3	REAR SCRIBE-35Hx00Dx24L	Nos.	6
4	BENCH MOUNTED 1-WAY WATER FITTING WITH 8" RIGID/SWING GOOSENECK WITH AERATOR FOR RAW WATER	Nos.	6
5	CAT 6A INFORMATION OUTLETS WITH POLYCARBONATE I/O FACE PLATE (DATA)	Nos.	30
6	BASE UNIT 4 DRAWER-35Hx22Dx30L	Nos.	30
7	BASE UNIT 2 DOOR 1 DRAWER-35Hx22Dx30L	Nos.	30
8	DOUBLE SIDED METAL ELECTRICAL RACEWAY, 05Hx06D	Inch	844
9	DECK MOUNTED DOUBLE HEAD EYE WASH/DRENCH	Nos.	3
10	BASE MOLDING 4 FT.	Nos.	52
11	CORNOR CLIP	Nos.	20
12	REAGENT WORKTOP SUPPORT 12x51, REFER DRAWING	Nos.	6
13	REAGENT WORKTOP SUPPORT 12x58, REFER DRAWING	Nos.	24
14	BENCH MOUNT 12" DOUBLE SIDED COLUMN, SIZE: 30Hx12Dx02L, POWDER COATED ACCENT STRIP & BENCH MOUNTED, PROVISION TO MOUNT LATTICE ASSEMBLY.	Nos.	18
15	BASE UNIT SINK 2 DOOR-35Hx22Dx36L, WITH PP TRAY	Nos.	6
16	GRANITE REAGENT SHELF 12x51, SS 316L RETAINING ROD.	Nos.	6
17	GRANITE REAGENT SHELF 12x58, SS 316L RETAINING ROD.	Nos.	24
18	18/19mm THK. GRANITE WORKTOP IN SFT	Sqft	530
19	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 35Hx08L	Nos.	72
20	SINK SUPPORT KIT FOR 36" CABINET	Nos.	6
21	2 HORIZONTAL AND 4 VERTICAL LATTICE ASSEMBLY FOR REAGENT RODS, 24H, 65L	Nos.	30
22	PP BIG SINK, SIZE: 700Lx450Dx315Hmm AND BOWL SIZE: 650Lx400Dx315Hmm	Nos.	6
23	WASTE, 1 1/2" BSP X 76mm	Nos.	6
24	ANTI SIPHON BOTTLE TRAP	Nos.	6
25	REDUCING COUPLER IN PP 51 X 31MM + PP PIPE LENGTHS - ONE FEET LENGTH - DIA. 38MM	Nos.	6
26	SERVICE ENCLOSURE -12x6x112	Nos.	6
27	GRANITE SKIRTING. 4x1	Rft	30
<b>Type-4: 4572 mm (L) x 1520 mm (W) x 914 mm (H)</b>			

1	6/16A (RAW POWER) 2 SOCKET WITH 2 SWITCH IN 6M PLATE	Nos.	36
2	REAR SCRIBE-35Hx00Dx12L	Nos.	6
3	CAT 6A INFORMATION OUTLETS WITH POLYCARBONATE I/O FACE PLATE (DATA)	Nos.	18
4	BASE UNIT 4 DRAWER-35Hx22Dx30L	Nos.	18
5	BASE UNIT 2 DOOR 1 DRAWER-35Hx22Dx30L	Nos.	18
6	DOUBLE SIDED METAL ELECTRICAL RACEWAY, 05Hx06D	Inch	498
7	BASE MOLDING 4 FT.	Nos.	40
8	CORNOR CLIP	Nos.	20
9	REAGENT WORKTOP SUPPORT 12x51, REFER DRAWING	Nos.	6
10	REAGENT WORKTOP SUPPORT 12x58, REFER DRAWING	Nos.	12
11	BENCH MOUNT 12" DOUBLE SIDED COLUMN, SIZE: 30Hx12Dx02L, POWDER COATED ACCEENT STRIP & BENCH MOUNTED, PROVISION TO MOUNT LATTICE ASSEMBLY.	Nos.	12
12	GRANITE REAGENT SHELF 12x51, SS 316L RETAINING ROD.	Nos.	6
13	GRANITE REAGENT SHELF 12x58, SS 316L RETAINING ROD.	Nos.	12
14	18/19mm THK. GRANITE WORKTOP IN SFT	Sqft	240
15	2 HORIZONTAL AND 4 VERTICAL LATTICE ASSEMBLY FOR REAGENT RODS, 24H, 66L, TO MOUNT ON BOTH SIDE UPRIGHT WITH FIXING SUPPORTS AND ACCESSORIES.	Nos.	18
16	SERVICE ENCLOSURE -12x6x112	Nos.	10
<b>TOTAL OF ANNEXURE</b>			

### **3. Item No. 8: 4 feet Bio-Safety Cabinet:**



**4 Feet Biosafety cabinet**

Size: Four Feet biosafety cabinet for cell culture activities. Working with commercially available mammalian cells such as live cells (HepG2), neuronal cells (SH-SY5Y cells), etc.

#### ***Design and Performance Criteria***

- A. Biological safety cabinets equipped for work with low to moderate risk agents as defined in Biosafety levels 1, 2 or 3. Biosafety level 4 with proper personal protective equipment. Must meet or exceed all NSF/ANSI 49 standards.
- B. Design as defined by NSF standard 49.

Class II A2: shall be designed and constructed to function properly and operate in a safe manner, minimize contamination, provide personnel, product and environmental protection. Shall be capable of being cleaned and decontaminated.

### ***Submittals***

- A. Shop Drawings: Submit complete shop fabrication and installation drawings, including plans, elevations, sections, details, fittings and thimble connections (if applicable).
- B. Informational Submittals
  - 1. Provide piping, wiring, and control diagrams. Include all connection locations and sizes. Detail inflow and down flow velocity, static pressure, voltage and amperage. Indicate service requirements, loads, and rough-in locations of all piped services and electrical connections.
  - 2. Certificates:
    - a. Provide factory test results indicating cabinet meets or exceeds NSF 49 requirements.
    - b. Cabinets shall be field tested per NSF 49 standards before being placed into services by NSF accredited certifier and test report shall be made available. Field test is the responsibility of the owner.
    - c. Operation and maintenance data
      - Description of equipment operation and control, motor control and alarm systems.
      - Wiring diagrams showing separate circuits for outlets, lights and blowers.
      - User's manual and factory test report for each Class II A2 unit by serial number.
      - Each cabinet shall carry a one- year comprehensive warranty from the installation date.

### ***Quality Assurance***

Cabinet shall be U.L. and C.U.L. listed for electrical safety and integrity.

### ***Materials***

- A. Work surface: 16 guage, type 304 stainless steel with no.4 finish.
- B. Cabinet Interior: 16 guage, type 304 SS with no. 4 finish.

- C. Cabinet Exterior: 16 guage and 12 guage cold rolled steel minimum, exterior coating shall be VOC free, acid resistance powder coat finish.
- D. Glass: ¼” laminated safety glass with no frame. No permanent etching on glass.
- E. Airfoil: 16 guage, type 304 SS with no. 4 finish.
- F. Armrest: Aluminum extruded oval comfort shaped armrest is standard.

#### Construction

- i. Interior walls shall be single piece construction with coved corners for ease of cleaning.
- ii. Work surface shall be single piece construction, dished with coved corners, lift up handles and anchoring pins.
- iii. Exterior removable panels shall be made of 16 guage cold rolled steel, and shall be removable for access to service connections.
- iv. Each cabinet shall be fully welded. All gaskets shall be closed cell neoprene type providing a gas and soap bubble-tight seal.
- v. All ducts and side walls shall be constructed of 16 guage cold rolled steel with double wall construction maintaining containment area under negative pressure.
- vi. Drain pan 16 guage type 304 SS, shall be capable of holding at least one gallon, all corners shall be radiused for ease of cleaning. Stainless steel ball valve shall be included for drainage.
- vii. Plenum shall be telescoping allowing unvarying airtight seal of HEPA filters, gaskets shall be close cell neoprene type.
- viii. Service fittings shall be offset. Primary service fittings forward positioned 3½” from front.
- ix. Sash operation shall be easily removable with simple tools.
- x. Wire rope is not acceptable.
- xi. Controls – cabinet shall have full colour VGA monitor, fully programmable to ensure operator safety. Monitor located on lower portion of front panel. Monitor will display continuous “remaining filter capacity” and “face velocity” readouts at all times during operation. Cabinet shall have audible and visual alarms to alert user of unsafe sash height, unsafe filter loads, and unsafe face velocity, including pre-programed user thresholds for warning, alarms and UV operation indicating remaining lamp life and UV use timers. Alarm mute feature shall be provided to allow brief equipment loading. Audible alarm will resume after 5 minutes.

***UV Germicidal lamp: 2 nos***

Lighting – Cabinet shall have externally mounted T5 fluorescent lamp with solid state ballasts.

Filters - (a) Front loading, HEPA 99.99% efficient on all particles 0.3 microns by DOP test (both exhaust and supply). Filters shall be metal framed with metal protective screen for additional filter protection. HEPA filters will be removable without disassemble of control panel or view screen assembly. (b) Or ULPA filters which operate at a typical efficiency of > 99.999% at 0.1- to-0.3-micron sizes.

***HEPA or ULPA filters: 4 no's***

Bag in Bag out filter replacement not acceptable.

Calculated Air Velocity – 105 fpm nominal through 10" NSF certified sash opening with audible and visual alarms if sash is not in correct position.

Electrical Requirements - A dedicated 115V, 20-amp, 60 Hz single phase circuit shall be required. Two GFCI outlets in the work area protected by an independent self-resetting breaker.

Gaskets - Closed cell Neoprene gasket to form airtight seal at positive pressure plenum.

Airfoil – 16 guage, type 304 SS with no. 4 finish.

Armrest: Aluminum extruded oval comfort shaped armrest is standard.

Base stand - 16 guage cold rolled steel minimum fully welded assembly with modesty panel and levelling guides. Coating shall be VOC free, acid resistance powder coat finish.

***Standard Accessories***

Base stand: (a) Telescoping fully welded steel assembly with modesty panel and levelling glides. Stand shall be adjustable in 1" increments from 28" to 33". Or (b) Electrically adjustable fully welded steel assembly with modesty panel and leveling glides. Range of motion 28" to 33".

VGA monitor: Full colour monitor with two continuous displays while cabinet is in operation, remaining filter capacity and face velocity.

T5 Fluorescent lamp - located outside of cabinet under front panel. Easily removable from the front.

Armrest.

***Optional Accessories***

- a. Casters (Duratex Phenolic wheel), with front locking wheels
- b. UV Germicidal lamp
- c. Canopy or Thimble connection

- d. Ergonomic footrest
- e. Ergonomic adjustable height stool
- f. Service fittings
- g. IV pole

Applicable codes and standards for Bio-safety cabinet

- a. SEFA 3 – Scientific Equipment and Furniture Association
- b. SEFA 8 – Scientific Equipment and Furniture Association
- c. NEPA 30 – National Fire Protection Association
- d. NEPA 45 – National Fire Protection Association
- e. UL – Underwriters Laboratories
- f. ASTM D552 – Bending Test

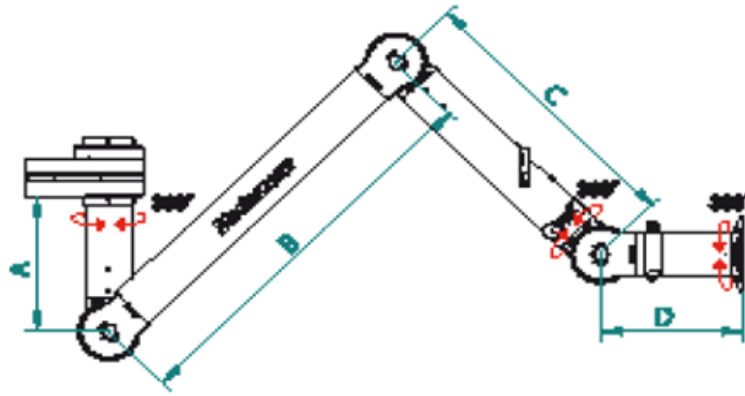
**BOQ for Bio-safety cabinet**

SL NO.	DESCRIPTION	UNIT	QTY
<b>4 FEET BIOSAFETY CABINET</b>			
1	BIO SAFETY INTERNAL PIPING FOR 1NO SERVICE	Nos.	3
2	THE INTERCEPTOR CLASS II, A2 BIOLOGICAL SAFETY CABINET WITH MECHANICAL STAND SIZE: L=1100MM, D=815MM, H=1610MM WITH 1+1 NO 230 V ELECTRICAL SOCKETS WITH FLAP	Nos.	3
3	BIOSAFETY CABINET CASTER SET 102MM (40) (DURATEX PHENOLIC WHEEL WITH FRONT LOCKING WHEELS)	Nos.	3
4	BIOSAFETY CABINET UV GERMICIDAL LIGHT	Nos.	3
5	PANEL MOUNTED SERVICE FITTING FOR GAS	Nos.	3

**4. Item No. 9: Spot extractor with blower and ducting facility with exhaust system:**

Dimensions: A - 250 mm, B - 700 mm, C - 500 mm, D - 250mm. Length - 1500mm, Diameter - 75mm

**Technical specifications:**



Arm sections must be thin-walled anodized aluminium sections with a very good corrosion resistance. Swivel joint with 360 ° rotation is to be provided to the arm section.

Joints equipped with the adjustment knobs on the friction joints should be supported by ball-bearings.

The first joint should be supported by a spring. All joints and adjustable knobs should be made of PP with glass fibre reinforcement.

The Mini hood should be supplied together with the arm and is also interface to the multi-purpose and metal hood.

The arms can be mounted on ceilings, walls and floors or fixed to tables. By using an extension profile the arm's operational reach must be increased.

All the arms should be provided with dampers, tight down to an under pressure of 3500 Pa. Air temperature -10 °C to 70 °C.

All required components are to be provided. All required components are to be provided by the manufacturer.

Mounting type: ceiling mounting - 3 step - dome.

Dimensions

Connection Direction	Diameter (mm)	A (mm)	B (mm)	C (mm)	D (mm)	Length (mm)
Up	75	250	700	500	250	1500

**Blower:**

- The exhaust fans supplied and installed shall be of 'Centrifugal Corrosion Resistant' type and shall be capable of delivering the design flow rate against all duct losses
- Fans selected shall be silent and vibration free when running and suitable for outdoor use and shall not exceed 3000 rpm.
- Aerodynamic performance of the fan shall be tested and comply 'ISO 5801' standards



- Sound level shall be tested and comply with 'ISO 5136.2' standards

**Ducting:**

The material of construction shall be polypropylene (PP) and suitable for use against corrosive 'medium' and a maximum allowable operating temperature of 70°C.

Sufficient ducting must be provided as per the drawing.

**CAV Constant Air Volume.**

Air flow controllers for constant air volume shall be of Plastic material (Polystyrene) classified M1 & galvanized steel for sleeves. Operating temperature shall be 5 to 60 deg C. The air is forced to pass through predetermined space in which a flap can change the position according to the specified air flow. The requested airflow is fixed by a screwdriver. CAV is fixed in a Vertical /Horizontal duct using a lip seal which ensures tightness.

**BOQ for Spot Extractor**

SPOT EXTRACTOR			
1	CEILING BRACKET FOR SPOT EXTRACTOR 4x4x38	Nos.	9
2	CEILING MOUNTED PP SPOT EXTRACTOR WITH 15 DIA PP HOOD	Nos.	9

**5. Item. No. 10: Double wall Ductless fume hood and Accessories:  
04 number**

**Size:** Six feet double wall construction ductless fume hood (with pre and carbon filters)

**Valves:** Vacuum, Nitrogen and Raw water needs to be considered and 4 electrical sockets for each Ductless Fume hood.

External Dimensions: 1828 mm (W) x 762 mm to 900 mm (D) x 1527 mm or standard (H)

Internal Dimensions: 1676 mm (W) x 635 mm (D) x 914 (H).

The Green Fume hood shall be with high performance with the construction material as Polypropylene (for Base/work surface, Outer shell, Baffle and Front sash with the face velocity of 60 - 100 LFM. The fume hood must be equipped with inline - Brushless & Sparkless Blowers & Vapor Proof Fluorescent light. It shall have smart hood embedded electronic intelligence and shall be with fume hood monitoring software for real time filtration performance monitoring technology.

Certification: UL and CSA certified.

## **6. Item. No. 11: Double wall Ductless fume hood and Accessories:**

### **01 number**

**Size:** Five feet double wall construction ductless fume hood (with pre and carbon filters)

**Valves:** Vacuum, Nitrogen and Raw water needs to be considered and 4 electrical sockets for each Ductless Fume hood.

External Dimensions: 1524 mm (W) x 762 mm to 900 mm (D) x 1527 mm or standard (H)

Internal Dimensions: 1476 mm (W) x 635 mm (D) x 914 (H).

The Green Fume hood shall be with high performance with the construction material as Polypropylene (for Base/work surface, Outer shell, Baffle and Front sash with the face velocity of 60 - 100 LFM. The fume hood must be equipped with inline - Brushless & Sparkless Blowers & Vapor Proof Fluorescent light. It shall have smart hood embedded electronic intelligence and shall be with fume hood monitoring software for real time filtration performance monitoring technology.

Certification: UL and CSA certified.

### **BOQ for Ductless Fume Hood:**

SL NO.	DESCRIPTION	UNIT	QTY
<b>LAB FUMEHOOD 5FT DUCTLESS AND ACCESSORIES</b>			
1	60" wide ductless polypropylene fume hood with AirSafe automatic safety controller, folding sash, and vapor proof fluorescent light. Hood requires a minimum of four like filters for operation, not included in price. 220V AC	Nos	1
2	Multipurpose bonded carbon filter	Nos	4
3	220V, Electrical sockets with internal wiring	Nos	4
4	H Frame structure of 35H x 30D x 60L.; WC- without connecting Bar in front side; B3- Heavy duct castor with Brake in front and without break in rear.	Nos	1
5	Granite worktop Flat edge and 30mm thickness; 32D x 62L	Nos	1
6	EPOXY LATTICE ASSMBLY FOR 5' DUCTLESS FUMEHOOD	Nos.	1
<b>LAB FUMEHOOD 6FT DUCTLESS AND ACCESSORIES</b>			
1	72" wide Endeavour ductless polypropylene fume hood with AirSafe automatic safety controller, vertical safety glass sliding sash and vapor proof fluorescent light. Hood requires a minimum of four like filters for operation, not included in price. 220V AC	Nos	4
2	Multipurpose bonded carbon filter	Nos	16
4	Service fixtures for N2.	Nos	4
5	Service fixtures for VA.	Nos	4
7	Service fixtures for RW	Nos	4
8	Fume hood Internal Piping	Nos	12
9	230V Electrical Sockets (1+1) along with internal wiring	Nos	2

10	H Frame structure of 35H x 30D x 72L.; WC- without Connecting Bar in front side; B3- Heavy duct castor with Brake in front and without break in rear.	Nos	4
11	Granite worktop Flat edge and 30mm thickness; 32D x 74L	Nos	4
13	EPOXY LATTICE ASSMBLY FOR 6' DUCTLESS FUMEHOOD (ACPT6000S220)	Nos.	4

1. Cluster Details for Fume hoods, spot extractors:

**Chemistry labs**

Floor Level	Lab / Room Name	Equipment Description	Type of System	Total Eq Qty	Max Exhaust Volume	Total Exhaust Volume	Actual Exhaust volume	Blower Selected capacity		Blower Model Details	Discharge Velocity	Fan speed	Motor Power	VFD	Scrubber	Scrubber Pump
								Exhaust in cfm	Static in mm of wg							
			CAV/VAV	in no.	in cfm	in cfm	Max in cfm				in m/s	in rpm	in kw	in Kw		in Kw
Third Floor	Chemistry Lab-1	6' Fume Hood	CAV	4	840	3360	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
Third Floor	Chemistry Lab-2	6' Fume Hood	CAV	4	840	3360	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
Third Floor	Chemistry Lab-1	Tall unit	CAV	4	70	280	560	800	50	PP Blower	12.0	2590	1.1KW/2P/50Hz	1.1 KW	NA	NA
	Chemistry Lab-2	Tall unit	CAV	4	70	280										
Third Floor	Chemistry Lab-3	6' Fume Hood	CAV	4	840	3360	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
Third Floor	Chemistry Lab-4	6' Fume Hood	CAV	4	840	3360	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
Third Floor	Chemistry Lab-5	6' Fume Hood	CAV	4	840	3360	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
Third Floor	Chemistry Lab-3	Tall unit	CAV	4	70	280	560	800	50	PP Blower	12.0	2590	1.1KW/2P/50Hz	1.1 KW	NA	NA
	Chemistry Lab-4	Tall unit	CAV	4	70	280										
Third Floor	UG Chemistry lab	6' Fume Hood	CAV	4	840	3360	5430	6000	120	PP Blower	17.8	1516	7.5KW/4P/50Hz	7.5 KW	SSPBS-1350	1.5 KW
		5' Fume Hood	CAV	3	690	2070										

<b>CHEMICAL ENGINEERING LABS</b>																
Third Floor	Nicolas Lab	6' Fume Hood	CAV	1	840	840	980	1000	120	PP Blower	15	2586	1.5KW/2P/50Hz	1.5 KW	SSPBS-700	0.75KW
		Tall unit	CAV	2	70	140										
Third Floor	Thiele Lab	6' Fume Hood	CAV	1	840	840	980	1000	120	PP Blower	15	2586	1.5KW/2P/50Hz	1.5 KW	SSPBS-700	0.75KW
		Tall unit	CAV	2	70	140										
Third Floor	Langmur Lab	6' Fume Hood	CAV	1	840	840	980	1000	120	PP Blower	15.0	2586	1.5KW/2P/50Hz	1.5 KW	SSPBS-700	0.75KW
		Tall unit	CAV	2	70	140										
<b>CIVIL &amp; ENVIRONMENTAL LABS</b>																
Second Floor	UG and PG lab	5' Fume Hood	CAV	2	690	1380	2440	3000	120	PP Blower	11.3	1527	3.7 KW/4P/50Hz	3.7 KW	SSPBS-1000	0.75KW
		4' Fume Hood	CAV	1	530	530										
	Geoenviromental Lab	4' Fume Hood	CAV	1	530	530										
Second Floor	UG and PG lab	Tall unit	CAV	2	70	140	460	600	70	PP Blower	9.0	2609	1.1 KW/2P/50Hz	1.1 KW	NA	NA
	Microbiology Lab	Spot extractor	CAV	1	90	90										
		Tall unit	CAV	1	70	70										
	Geoenviromental Lab	Spot extractor	CAV	1	90	90										
		Tall unit	CAV	1	70	70										
Second Floor	Water quality lab	4' Fume Hood	CAV	2	530	1060	1060	1500	120	PP Blower	14.4	2350	2.2 KW/2P/50Hz	2.2 KW	SSPBS-700	0.75KW
Second Floor	Water quality Lab	Spot extractor	CAV	2	90	180	480	600	70	PP Blower	9.0	2609	1.1KW/2P/50Hz	1.1KW	NA	NA
		Tall unit	CAV	1	70	70										
	Analytical Insrtrumental lab	Spot extractor	CAV	1	90	90										

	Air quality research Lab	Tall unit	CAV	2	70	140										
Ground floor	H2 N2 Plant	5' Fume Hood	CAV	1	690	690	690	1000	120	PP Blower	15.0	2586	1.5KW/2P/50Hz	1.5KW	SSPBS-700	0.75KW
<b>PHYSICS LABS</b>																
Third Floor	Quantum & Multifunctional materials Lab	6' Fume Hood	CAV	2	840	1680	3360	3500	120	PP Blower	13.1	1555	5.5 KW/4P/50Hz	5.5 KW	SSPBS-1200	1.5KW
	Common facility	6' Fume Hood	CAV	1	840	840										
	PG Physics lab-3	6' Fume Hood	CAV	1	840	840										
Ground floor	Magnetism & Super conductivity Lab	6' Fume Hood	CAV	1	840	840	840	1000	120	PP Blower	15.0	2586	1.5 KW/2P/50Hz	1.5 KW	SSPBS-700	0.75KW
Ground floor	Plasma processing Lab	Spot extractor	CAV	4	90	360	430	600	70	PP Blower	9.0	2609	1.1 KW/2P/50Hz	1.1 KW	NA	NA
	Magnetism & Super conductivity Lab	Tall unit	CAV	1	70	70										

## APPROVED MAKE LIST

### 1. FUME HOOD

Sr No	Item	MAKE
1	Fume hood	Waldner/ Kotterman/Equivalent
2	Fume Hood Valves	Water saver/Broen/Equivalent
3	Air flow Monitor	TEL, UK/Equivalent
4	Work Surface - Fume Hood	Granite
5	Fume hood Base Cabinet	Waldner/ Kotterman/Equivalent
6	PP Sink	Indigenous /Equivalent
7	Electrical / Data / Voice Sockets	Northwest/ MK/Equivalent

### 2. FURNITURE

Sr No	Item	MAKE
1	Furniture	Waldner/ Kotterman/Equivalent
2	Work Surface - Benches	18/19mm Thick Jet Black Granite
3	PP Sink	Indigenous /Equivalent
4	Water Tap	Water saver/ Broen/Equivalent
5	Bench Mounted Valves	Water saver/ Broen/Equivalent
6	Spot Extractor	Fumex /Equivalent
7	Eye Wash	Guardian / Broen/Equivalent
9	Electrical / Data / Voice Sockets	Northwest/ MK/Equivalent

### 3. EXHAUST

Sr No	Item	Approved Makes
1	Blower	Colasit/Plastifer
2	Blower Motor	ABB / CG
3	Wet Scrubber	Corrosion control/Airflow tech/FED
4	PP Sheets for exhaust ducting	Mandhani/Dugar/Khanna/Simona/beck
5	Isophthalic resin	Mechemco/Kaysnth/Orsyn/Simona/crest composite

### Important Instruction:

- **“Splitting of items is not allowed. Bidders should quote for all the items”** The bidder must quote for all the items otherwise the bid will be summarily rejected. The tender is not to be awarded in piecemeal and item-wise to the firm. The Evaluation will be based on the total value.
- **All offered products' technical Specifications and Brochures are to be submitted along with the Technical Bid.**
- **The detailed scope of coverage of the Warranty & CAMC shall be provided in the compliance statement -Annexure-VII.**

### 3. BID SECURITY DECLARATION DETAILS:

#### 3.1 Bid Security Exemption:

I) **Micro and Small Enterprises (MSEs):**

Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) **for goods produced and services rendered**, are exempted from Bid Security. However, they must enclose **valid self-attested registration certificate(s)** and the tender to this effect.

Accordingly, MSEs shall be required to submit valid **Udyam Registration Certificate** for availing benefit under MSE Procurement Policy.

**The benefit as above to MSEs shall be available only for Goods produced and services rendered by MSEs. However, traders are excluded from the purview of MSE Procurement Policy.**

II) **Startup (s):**

Startup(s) as recognized by **Department for Promotion of Industry and Internal Trade (DPIIT)**, Govt. of India, are exempted from Bid Security. However, they have to enclose **valid self-attested registration certificate(s)** along with the tender to this effect.

**Eligible MSE and startup bidders who seeks exemption from Bid Security as per clause no. (c) above, if they withdraw or modify their bids during the period of validity, or if they are awarded the contract and they fail to sign the contract, or to submit a performance security before the deadline defined in the request for bids document, they will be suspended for the period of three years or as decided by the competent authority from being eligible to submit bids for contracts with the entity that invited the bids.**

#### 3.2 Other than eligible MSE and Startup bidders, Bid Security Declaration:

**Bidders should have to submit the Bid Security Declaration (As per the format attached in annexure-II) in duly filled and signed condition.**

### 4. ELIGIBILITY CRITERIA

#### 4.1 Other Important Documents (OIDs)



**Firm Incorporation Certificate, PAN details, GST details are to be provided.**

**4.2. Statutory Documents:**

- I) The Bidder should give self-declaration certificate for acceptance of all terms & conditions of tender documents. A duly completed certificate to this effect is to be submitted as per the Annexure-I.
- II) The firm should not be in active debarred list by any Central / State Government / Public Undertaking / Institute and no criminal case registered / pending against the firm or its owner / partners anywhere in India. A duly completed certificate to this effect is to be submitted as per Annexure-III.

**III) Experience and Past Performance:**

The Bidder should submit list of clientele to whom identical or similar furniture have supplied during past five financial years **i.e. during 2018-19 to 2022-23 in India to CFTI Institutions like IITs, IISERs, IISc etc.** with their contact details along with documentary evidence such as Purchase Orders executed along with technical specifications, completion certificates from the client, etc. are to be submitted as per the **Annexure-IV.**

(On-going works will not be considered for the Technical evaluation )

At least in any one of the calendar years (2018-2023), the number of items supplied should be more than items mentioned in tender enquiry (Pl. submit the proof of supply of identical or similar furniture).

The bidder should attach a list of Purchase Order / Work Order where the similar type of work executed during the past 5 years from the date of publication of tender supported with work completion certificate and satisfactory performance certificate from the End User.

- IV) The Annual Turnover should be at least **Rs. 2 Crores** and be profitable during each of the previous three financial years **i.e. during 2018-19 to 2020-21 or 2019-20 to 2021-22.** Audited financial Statements or Financial Statements showing turnover duly signed by a Chartered Accountant are to be submitted as per the **Annexure-V.**
- V) **The Bidder should be a Class-I / Class-II Local Supplier meeting minimum 20% local content clause in line with the Public Procurement (Preference to Make in India) Order 2017 No. P-45021/2/2017-PP (BE-II) dated 04 Jun 2020 as amended from time to time. A Self-Declaration Certificate regarding “Class-I/Class-II Supplier” for the tendered items as per the Annexure-V is to be submitted.**

**As per the OM of Department of Promotion for Industry and Internal Trade No. P-45021/102/2019-BE-II-Part(1) dated: 04.03.2021. The bidders**

**can't claim themselves as Class-I local suppliers/Class-II local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training and after sales service support like CAMC etc. as local value addition.**

- a. 'Local Content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent.
  - b. 'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50% as defined under this order.
  - c. 'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has minimum local content of 20% but less than 50%, as defined under this order.
  - d. 'Non-local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than 20%, as defined under this order.
  - e. Complaint redressal mechanism: In case any complaint received by the procuring agency or the concerned Ministry/Department against the claim of a bidder regarding local content/domestic value addition in an electronic product, the same shall be referred to STQC.
  - f. The Bidder shall be required to furnish the necessary documentation in support of the domestic value addition claimed in an electronic product to STQC. If no information is furnished by the Bidder, such laboratories may take further necessary action, to establish the bonafides of the claim.
  - g. A complaint fee of Rs. 2 lakh or 1% of the value of the domestically manufactured products being procured (subject to a maximum of Rs.5 lakh), whichever is higher, to be paid by Demand Draft to be deposited with STQC. In case, the complaint is found to be incorrect, the complaint fee shall be forfeited. In case, the complaint is upheld and found to be substantially correct, deposited fee of the complainant would be refunded without any interest.
  - h. False declarations will be in breach of the Code of Integrity under Rule 175 (1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
- VI) The Bidder should be OEM or OEM authorized Dealers / Channel partners / Distributors of reputed brand having authorization for sales and after

sales support. Valid OEM authorization letter is required to participate in this tender.

**VII) Prior Registration and / or Screening of bidders:**

Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the Bidder registered with the competent authority. **The concerned Bidder (s) are required to attach the relevant valid Registration Certificate along with the bid for consideration.**

“Bidder” (including the term ‘tenderer’, consultant or service provider in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

“Bidder from a country which shares a land border with India” for the purpose of this Order means :-

- An entity incorporated, established or registered in such a country; or
- A subsidiary of an entity incorporated, established or registered in such a country or
- An entity substantially controlled through entities incorporated, established; or registered in such a country; or
- An entity whose beneficial owner is situated in such a country; or
- An Indian (or other) agent of such an entity; or
- A natural person who is a citizen of such a country; or
- A consortium of joint venture where any member of the consortium or joint venture falls under any of the above.

The detailed terms & conditions issued from time to time in this regard by Government of India will be applicable.

**VIII) Authorized Representatives:**

Bids of bidders quoting as authorised representative of a principal manufacturer would also be considered to be qualified, provided:

- (i) Their principal manufacturer meets all the criteria above without exemption, and
- ii) The principal manufacturer furnishes a legally enforceable tender-specific authorisation assuring full guarantee and warranty obligations as per the general and special conditions of contract;  
and

- iii) The Bidder himself should have been associated, as authorised representative of the Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar item for past three years ending on bid opening date.

IX) **The bidder should have valid below mentioned certification and the same should be supported with the technical Bid.**

1. SEFA 3 – Scientific Equipment and Furniture Association for Work surface.
2. SEFA 8M - Scientific Equipment and Furniture Association for Steel Caseworks.
3. SEFA 8 - Scientific Equipment and Furniture Association.
4. NFPA 30 - National Fire Protection Association for flammable storage.
5. NFPA 45- National Fire Protection Association for flammable storage.
6. UL - Underwriters Laboratories.
7. ASTM D522 - Bending Test or ASTM D3359-02 Paint Adhesion Test.
8. ASHRAE 110-2016 or 1995R.
9. FM – Flammable and Combustible liquids certificate for storage cabinets.
10. NIH03 – 112C – National Institute of Health Specification. Required option of NSF/ANSI.
11. ASHRAE Standard 110. 2016 or 1995R – Method of Testing Performance of Laboratory Fume Hoods.
12. BS EN 1363 – Fume hood Liner Fire Resistance Test Certificate for 60 minutes.

#### 4.3 TECHNICAL CRITERIA

Bidders should comply the specification of the tendered item in all respect. The detailed format is attached at Annexure-VII. The Bidder is to complete the same in all respect and submit accordingly

#### 5. FINANCIAL BID DETAILS

- 5.1 Financial bid i.e. BOQ given with tender (in **Excel format**) to be downloaded first and uploaded after filling all relevant information strictly as per the format failing which the offer is liable for rejection. Kindly quote your offer on FOR IIT Tirupati (inclusive of all taxes and charges). **Vendor should quote prices in BOQ only, offers indicating rates anywhere else shall be liable for rejection.**

#### 6. TIME SCHEDULE:

1	Date and time of Online Publication/Download of Tenders	30-10-2023	18.00 hrs
2	Clarifications start date	30-10-2023	18.00 hrs
3	Clarifications end date	06-11-2023	15.00 hrs
4	Bid submission start date & time	07-11-2023	16.00 hrs
5	Bid submission close date & time	20-11-2023	15.00 hrs
6	Opening of Technical bids	21-11-2023	15.00 hrs

## 7. AVAILABILITY OF TENDER

The tender document can be downloaded from <http://eprocure.gov.in/eprocure/app> and be submitted only through the same website.

## 8. BID VALIDITY PERIOD

The bid will remain valid for **120 days** from the date of opening as prescribed by IIT Tirupati. A bid valid for a shorter period shall be rejected, being non-responsive.

## 9. BID SUBMISSION

### 9.1 Instruction to Bidder

- I) Bidders are required to enrol on the e-Procurement module of the **Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>)** by clicking on the link "**Online Bidder Enrolment**" on the CPP Portal. **The registration is completely free of charge.**
- II) Possession of a valid Class II/III DSC in the form of smart card / e-token is a prerequisite for registration and participating in the bid submission activities. DSCs can be obtained from the authorised certifying agencies recognized by CCA India (e.g. Sify/TCS/nCode/eMudhra etc).
- III) Bidders are advised to register their valid email addresses and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- IV) A bidder should register only one valid DSC. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
- V) The Bidders are required to log in to the site through the secured log-in by entering their respective user ID / password and the password of the DSC.

VI) The CPP portal also has user manuals with detailed guidelines on enrolment and participation in the online bidding process. The user manuals can be downloaded for reference.

## 9.2 TENDER CLARIFICATION

- I) In case the bidders require any clarification regarding the tender documents, they are requested to contact our office Ph. no: 0877-2503572, Email ID: [purchase@iittp.ac.in](mailto:purchase@iittp.ac.in) on or before due date.
- II) Technical and Specifications related Clarifications contact our office No: 0877-2503602 , Email ID: [hod\\_cy@iittp.ac.in](mailto:hod_cy@iittp.ac.in) copy to [eutenders@iittp.ac.in](mailto:eutenders@iittp.ac.in) & [purchase@iittp.ac.in](mailto:purchase@iittp.ac.in) on or before due date.
- III) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.

## 9.3 ONLINE BID SUBMISSION PROCEDURE

**Cover-1 (Technical Bid):** The file should be saved in a PDF version numbered sequentially and should comprise of the following items:

### **Packet-1:**

Duly Completed Scanned PDF copy of, PAN, GST, Firm Registration certificate and Annexure-I to VIII with relevant supporting documents  
**Only the relevant documents as per the tender clauses are to be uploaded along with duly completed checklist as per the annexure-IX. Uploading of other than the required documents may liable for rejection of the bid.**

### **Cover-2 (Financial Bid):**

A standard BOQ format has been provided in excel format. Bidders are required to download the BOQ excel file and fill their financial offer on the same BOQ format. After filling the same, submit it online in excel format, without changing the financial template format.

### **Note:**

If the bid is incomplete and / or non-responsive it will be rejected during technical evaluation. The Bidder may not be approached for clarifications during the technical evaluation. So, the bidders are requested to ensure that they provide all necessary details in the submitted bids.

## 10. BID OPENING

10.1 Technical Bids will be opened on **21.11.2023 @ 15.00 Hrs.**

- 10.2 Financial Bids of the eligible bidders will be opened on a later date. The date and time for the opening of Financial Bids will be announced later.
- 10.3 **Bids should be summarily rejected, if tender is submitted other than through online or original Bid security declaration are not submitted within stipulated date / time.**

## 11. BID EVALUATION

- I) **Stage-I Evaluation (Pre-qualification criteria):** In this stage, the received bids will be evaluated by the committee as per the eligibility criteria, terms and conditions of the tender. Only the shortlisted bidders in this stage will be informed for sample piece submission. The shortlisted bidders will have to submit the sample pieces at IIT Tirupati Transit Campus, Yerpedu Mandal, Venkatagiri Road, Tirupati District, Andhra Pradesh – 517619 within 15 days of the receipt of mail from IIT Tirupati. The samples received after **15 days** will not be considered for evaluation.
- II) **Stage-II Evaluation (Sample Piece Evaluation):** In this stage, the expert committee will evaluate the received sample pieces as per the tender specifications, terms, and conditions. Bidders whose samples are accepted by the Institute will be treated as technically qualified bidders for consideration of their price bids.
- III) Opening of the Financial bid will be preceded by the evaluation of the Pre-qualification criteria (Stage-I) & Sample evaluation (Stage-II). Financial comparison will be made on the basis of item-rate tender i.e. total offered cost of all line items (including CAMC charges beyond the normal warranty period) will be considered. Normal warranty period will be one year and beyond this, comprehensive onsite AMC will be for four years. According price bid should be filled-in. Price for all line items (including CAMC charges for four years beyond the one year warranty period) must be given, otherwise financial bid will be treated as non-responsive and will be not processed further.
- IV) The Commercial Bid with the lowest price will be the highest evaluated bid. Financial bids of the successful bidders will only be opened and orders placed on L1 basis.
- V) The shortlisted Bidder will have to submit the samples for the following:  
The following are the list of furniture items to be provided as sample for stage II technical evaluation.
- (1) Item no.1: 6 feet Fume hood
  - (2) Item no. 8: Bio-Safety cabinet
  - (3) Item no. 11: Ductless Fume hood
- VI) The L1 bidder should visit the site and take actual measurements of the rooms and have a combined meeting with end user for the better understanding.



- VII) The L1 bidder should submit the room wise furniture layout as per the site conditions( details will be given after award of work).
- VIII) After the site visit should submit the shop drawing for the furniture layout room wise with in 7 days and it should be approved by IIT Tirupati for the further process of manufacturing.
- IX) After receiving the Shop drawing approval from IIT Tirupati L1 bidder should produce the sample within 15 days at their factory for inspection and clearance from IITT before manufacturing of bulk quantity
- X) From the date for factory vist sample confirmation you delivery time will start.

## 11.1 Purchase Preference

### I) Micro and Small Enterprises (MSEs):

Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) **for goods produced and services rendered**, may be provided following purchase preference:

Item wise Quantity	Price Quoted by MSE	How the tender shall be finalized
Cannot be split	L1	Full Order on MSE
Cannot be split	Not L1 but within L1 + 15%	Full Order on MSE subject to matching L1 Price

### II) Preference to Make in India

- a) In procurement goods or works which are covered under by para 3(b) of the extant Public Procurement (Preference to Make in India) Order 2017 dated 04 June 2020 and which are **divisible** in nature, the “Class-I Local Supplier” shall get purchase preference over “Class-II Local Supplier” as well as “Non-Local Supplier” as per following procedure:
  - i) **Among all qualified bids, the lowest bid will be termed as L1. If L1 is “Class-I Local Supplier”, the contract for full quantity will be awarded to L1.**
  - ii) **If L1 bid is not a “Class-I Local Supplier”, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest Bidder among the “Class-I Local Supplier” will be invited to match L1 price for the remaining 50% quantity subject to the Class-I Local Supplier’s quoted price falling within the margin of L1 + 20%, and contract for that quantity shall be awarded to such “Class-I Local Supplier” subject to matching the L1 price. In case such lowest eligible “Class-I Local Supplier” fails to match L1 price or**



accepts less than the offered quantity, the next higher “Class-I Local Supplier” within the margin of L1 + 20% shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local suppliers, then such quantity may be ordered on the L1 Bidder.

b) In procurement goods or works which are covered under by para 3(b) of the extant Public Procurement (Preference to Make in India) Order 2017 dated 04 June 2020 and which are **not divisible** in nature, and in procurement of services where the bid is evaluated on price alone, the “Class-I Local Supplier” shall get purchase preference over “Class-II Local Supplier” as well as “Non-Local Supplier” as per following procedure:

- i) **Among all qualified bids, the lowest bid will be termed as L1. If L1 is “Class-I Local Supplier”, the contract will be awarded to L1.**
- ii) **If L1 is not a “Class-I Local Supplier”, the lowest Bidder among the Class-I Local Supplier, will be invited to match the L1 price subject to Class-I Local Supplier’s quoted price falling within the margin of L1 + 20%, the contract shall be awarded to such Class-I Supplier subject to matching the L1 price.**
- iii) **In case such lowest eligible Class-I Local Supplier fails to match the L1 price, the “Class-I Local Supplier” with the next higher bid within the margin of L1 + 20% shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the of Class-I Local Supplier within the margin of L1 + 20%, the contract may be awarded to the L1 Bidder.**
- iv) **Class-II Local Supplier will not get purchase preference.**

## 12. PAYMENT TERMS

No advance payment will be made in any case. Bills in Duplicate should be sent and the payment towards 70% of the total value of the purchase order will be released only after the successful delivery of the correct items at the site and inspection by the IITT committee. Remaining 30% payment will be made after the completion of the installation and acceptance by IITT committee and completed the entire work within the stipulated delivery schedule. If any item is found defective, or not of the desired quality etc., the same should be replaced by the firm(s) immediately for which no extra payment shall be made.

After completion of warranty period, CAMC charges will be paid once in every six months after completion of six-months CAMC period, subject to a report of satisfactory performance by the user department of IIT Tirupati.

Payment will be subject to deduction of TDS as per rules/laws.

### **13. WARRANTY OF QUALITY AND QUANTITY**

13.1 The awardee shall give **minimum 1-year comprehensive onsite warranty for all items** on successful completion of supply, and acceptance of supplied items by IIT. Warranty should cover for the maintenance charge for lab furniture, Fume hoods, Electrical works, Exhaust system and gas piping (for all the items).

13.2 Along with warranty, the vendor should also provide CAMC for a period of 4 years from the date of expiry of 1 year warranty period. Scope of CAMC should be complete maintenance charge for lab furniture, fume hoods, electrical works, exhaust system and gas piping (for all the items).

13.3 The awardee shall give warranty that all items are as per specification(s), conforming to the specified design and there are no defects in the process of manufacturing, packaging, transportation and delivery.

13.4 Upon receipt of notice from IIT Tirupati for defective material, the firm shall **within 15 days** of receipt of the notice, replace the defective material, free of cost at the destination. The firm shall take over the defective material at the time of their replacement. No claim whatsoever shall lie on IIT Tirupati for the replaced goods thereafter. Suppose the firm fails to replace the defective goods within a reasonable period. In that case, IIT Tirupati may take such remedial actions as necessary, at the company's risk and expense.

### **14. LIQUIDATED DAMAGES**

In case of delay in Supply by the stipulated date, IIT Tirupati reserves the right of imposing penalty @0.5% per week on the value of the undelivered items subject to maximum 10% of the cost of undelivered items.

### **15. DELIVERY SCHEDULE**

**15.1** The successful Bidder should execute the order successfully i.e. Supply, Installation of the ordered item within 16 weeks ( 112 days) at IIT Tirupati Permanent campus (Department block-1, Venkatagiri Road, Yerpedu Mandal, Tirupati District from the date of sample approved at the factory. In case of any damage/Broken/Expired items found, the item(s) should be replaced **within 15 days** at IIT Tirupati. The Bidder has to make own arrangement for unloading and positioning of items at the desired location of IIT.

- 15.2 The bidders is responsible for the delivery, installation at desired locations floor wise.

## 16. PERFORMANCE SECURITY DETAILS

- The successful bidder(s), on whom order will be placed, has to submit a performance security of 10% of the total order value at the earliest as per Purchase Orders (PO) terms within two weeks from the date of PO. Performance security has to be submitted in the form of RTGS / NEFT / Bank Guarantee/Demand Draft/FDR from any Nationalized/Scheduledcommercial Bank in India (as per RBI list) in favour of the Registrar, IIT Tirupati.
- Performance security should remain valid for a period of three months beyond the date of completion of all contractual obligations (including warrant and AMC period) of the successful bidder(s). No interest will be payable by IIT Tirupati on the Performance Security deposited. In case the contractor fails to provide satisfactory service or supply, the Performance Security submitted by the bidder(s) is liable to be forfeited. An undertaking to this is to be submitted.

## 17. INTEGRITY PACT:

- a. The integrity pact (IP) envisages an agreement between the prospective bidders/ vendors with the buyer committing the persons/ officials of both the parties with the aim not to exercise any corrupt influence on any aspect of the contract. **Only those bidders/ vender who are willing to enter into such an integrity pact with the purchase would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification. The bidder should give self-declaration certificate for acceptance** and compliance with the Integrity Agreement as per **Annexure XI**.
- b. Any violation of the Integrity Pact would entail disqualification of the bidders and exclusion from future business dealings, as per the existing provisions of GFR, 2017, PC Act, 1988, and other Financial Rules/Guidelines, etc. as may be applicable to the organization concerned
- c. The integrity pact would be effective from the date of invitation of bids till the complete execution of the contract.
- d. The model format of Integrity Pact(IP) is at **Annexure-XII**
- e. As per the directives of the Central Vigilance Commission, IIT Tirupati appointed Independent External Monitors (IEMs). The details of the same are mentioned below.
  - 1) Shri Aditya Prakash Mishra,  
Flat No.24, ASTER-1, Vatika City,  
Sohna Road, Sector-49, Gurgaon-122003.  
Email Id: [apmishra52@gmail.com](mailto:apmishra52@gmail.com)

- 2) Shri Debal Kumar Gayen,  
Tower-5, Flat 5E, South City Garden,  
61.B.L.Saha Road, Kolkata-700053 (W.B)  
Email Id: [gayen.dk@gmail.com](mailto:gayen.dk@gmail.com)

## **18. TERMS AND CONDITIONS**

### **18.1 Termination for Insolvency**

- I) The IIT Tirupati may at any time terminate the Contract by giving a written notice to the awarding firm, without compensation to the firm, if the firm becomes bankrupt or otherwise insolvent as declared by the competent Court, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the department.
- II) IIT Tirupati and/or the firm are entitled to withdraw/cancel the rate contract by serving one-month notice on each other. However, once a purchase order is placed on the supplier for supply of a definite quantity in terms of the rate contract during the validity of the rate contract, that purchase order becomes a valid and binding contract.
- III) The courts of Tirupati alone will have the jurisdiction to try any matter, dispute or reference between the parties arising out of this purchase. It is specifically agreed that no court outside and other than Tirupati Court shall have jurisdiction in the matter

### **18.2 Force Majeure**

- I) Should any force majeure circumstances arise, each of the contracting parties be excused for the non-fulfilment or for the delayed fulfilment of any of its contractual obligations, if the affected party within 15 days of its occurrence informs in a written form the other party.
- II) Force Majeure shall mean fire, flood, natural disaster or other acts such as war, turmoil, sabotage, explosions, epidemics, quarantine restriction, strikes, and lockouts i.e. beyond the control of either party.

### **18.3 Arbitration**

- I) All disputes of any kind arising out in connection with the executing the order shall be referred by either party (IIT TIRUPATI or the Bidder) after issuance of 30 days' notice in writing to the other party clearly mentioning the nature of dispute to a single arbitrator acceptable to both the parties. The venue for arbitration shall be IIT TIRUPATI India. The jurisdiction of the courts shall be Tirupati,

#### 18.4 Other Conditions

- I) The Bidder has to upload the relevant & readable files only as indicated in the tender documents. In case of any irrelevant or non-readable files, the bid may be rejected.
- II) IIT Tirupati will not be liable for any obligation or supplies made unless the Official Purchase Order has been placed by the Purchase Department.
- III) IIT Tirupati reserves the right to accept or reject any or all the tenders in part or in full or may cancel the tender, without assigning any reason thereof.
- IV) IIT Tirupati reserves the right to relax / amend / withdraw any of the terms and conditions contained in the Tender Document without assigning any reason thereof. Any inquiry after submission of the quotation will not be entertained.
- V) IIT Tirupati reserves the right to modify/change/delete/add any further terms and conditions prior to issue of purchase order.
- VI) **Repeat Order:** IIT Tirupati reserves the right to place repeat order up to 100% of the quantities within a period of 12 months from the date of successful completion of purchase order at the same rates and terms subject to the condition that there is no downward trend in prices.

***To take care of any change in the requirement during the currency of the contract, a plus/minus option clause for 25 per cent is incorporated in the tender document, reserving purchaser's right to increase or decrease the quantity of the required goods up to that limit without any change in the terms and conditions and prices quoted by the tenderers.***

- VII) In case the bidders/successful bidder(s) are found in breach of any condition(s) at any stage of the tender, Performance Security shall be forfeited.
- VIII) False declaration/documents will be in breach of the Code of Integrity under Rule 175(1) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
- IX) Conditional tenders will not be considered in any case.
- X) In case of doubt in material, the expenditure on testing of equipment will be borne by the tenderer.
- XI) Institute reserve the right to increase/decrease the order quantity at any period of times during the validity of the contract.

**XII) IIT Tirupati may issue amendment/corrigendum to tender documents before due date of submission of bid. Any amendment/corrigendum to the tender document if any, issued by IIT Tirupati will be posted on CPP Portal. For the bidders, submitting bids on downloaded tender document, it is 'bidders' responsibility to check for any amendment/corrigendum on the website of IIT Tirupati or check for the same CPP Portal before submitting their duly completed bids.**

**UNDERTAKING**

To  
**The Registrar,**  
Indian Institute of Technology  
Yerpedu – Venkatagiri Road, Yerpedu Post,  
Tirupati District, Andhra Pradesh.  
Pincode - 517619.

Tender No. IITT/EU/2023-24/17 dated: 30.10.2023

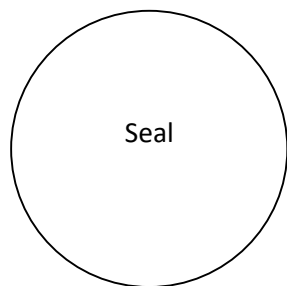
**Name of the Tender/Supply:** Notice Inviting Tender for Supply, installation, testing and Commissioning of laboratory furniture- II.

Sir,

I /we hereby submit our bid for Supply, installation, testing and Commissioning of laboratory furniture- II.

1. I / We hereby reconfirm and declare that I / We have carefully read, understood & complying the above referred tender document including instructions, terms & conditions, scope of work, schedule of quantities and all the contents stated therein. I / We also confirm that the rates quoted by me / us are inclusive of all taxes, duties etc., applicable as on date.
2. I /we have gone through all terms and conditions of the tender document before submitting the same.

**Date:**  
**Place:**



**Authorized Signatory**

**Name:**

**Designation:**  
**Contact No :**

**On Company Letter Head**

**Bid Security Declaration**

To  
**The Registrar,**  
Indian Institute of Technology  
Yerpedu – Venkatagiri Road, Yerpedu Post,  
Tirupati District, Andhra Pradesh.  
Pincode - 517619.

Tender No. IITT/EU/2023-24/17 dated: 30.10.2023

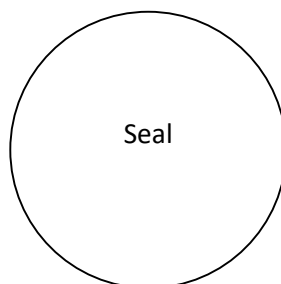
**Name of the Tender/Supply :** Notice Inviting Tender for Supply, installation, testing and Commissioning of laboratory furniture- II.

Sir,

We, the undersigned declare that

1. We understood that, according to the tender conditions, bids must be supported by a Bid Security Declaration.
2. We accept that we will automatically be suspended from being eligible for bidding in any contract with the Institute for the period of **3 years** starting from the bid closing date, if we are in breach of our obligation(s) under the bid conditions, because we;
  - (a) have withdrawn our bid during the period of bid validity specified in the letter of bid; or
  - (b) having been notified of the acceptance of our bid by the Institute during the period of bid validity, (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the performance security, in accordance with the tender conditions.

**Date:**  
**Place:**



**Authorized Signatory**

**Name:**

**Designation:**  
**Contact No :**

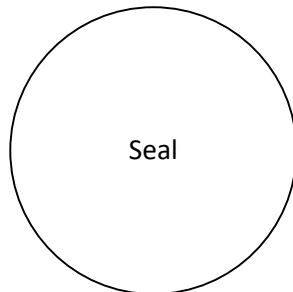


**CERTIFICATE**  
**(To be provided on letter head of the firm)**

I hereby certify that the above firm not in active debarred list by any Central/State Government/Public Undertaking/Institute and no criminal case registered / pending against the firm or its owner / partners anywhere in India.

I also certify that the above information is true and correct in every respect and in any case at a later date it is found that any details provided above are incorrect, any contract given to the above firm may be summarily terminated and the firm may be blacklisted.

**Date:**



**Place:**

**Authorized Signatory**

**Name:**

**Designation:**

**Contact No.:**

**ANNEXURE – IV**

**a) Experience: (As per tender Clause No.4.2 (III))**

Year	Name of the Item with Specification (Technical specification brochure to be attached)	Purchase Order No. & Date (Copy of the Orders to be attached)	Date of successfully completion of SITC of ordered Item (copy of report from client to be attached)	Contact Details of Client
2018-19				
2019-20				
2020-21				
2021-22				
2022-23				

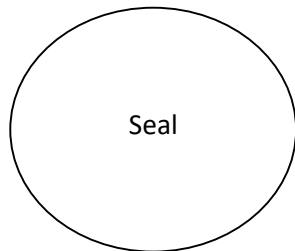
**b) Past Performance: (As per tender Clause No.4.2 (III))**

Sl No.	Financial Year (April 2018 – March 2023)	Quantity of similar furniture in Nos	Purchase Order No with No	Work Completion Certificate details with Page No	Contact Address of the Client	Remarks
1.						
2.						
3.						

Date :

Authorized Signatory

Place :



Name:  
Designation

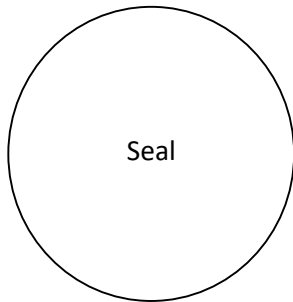
Contact No.:

**ANNEXURE – V**

**Annual Turnover Details:**

Evaluation Criteria			Remark	Specific page no. where the proof of documents are enclosed
<b>Bidder's Annual Turnover for last five financial years</b>	<b>Financial Year</b>	<b>Turnover in Rs.</b>		-
	<b>2021-22</b>			
	<b>2020-21</b>			
	<b>2019-20</b>			
	<b>2018-19</b>			

Date:



Place:

Authorized Signatory:

Name:

Designation:

Contact No.:

**Format for Self-Declaration under preference to make in India order**

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II date. 15.06.2017 & P-45021/2/2017-PP (BE-II) dated: 04 June 2020. We hereby certify that we M/s. \_\_\_\_\_ (supplier name) are **CLASS-I/Class-II (Please specify clearly)** supplier meeting the requirement of local content more than 20% as defined in above orders for the material against Enquiry No. IITT/EU/2023-24/17 dated: 30.10.2023

Details of location at which local value addition will be made as follows: (Complete address to be mentioned)

\_\_\_\_\_  
\_\_\_\_\_

Percentage of Local Content: \_\_\_\_\_

***(As per the OM of Department of Promotion for Industry and Internal Trade No. P-45021/102/2019-BE-II-Part(1) dated: 04.03.2021. The bidders can't claim themselves as Class-I local suppliers/Class-II local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training and after sales service support like CAMC etc. as local value addition)***

We also understand, false declarations will be in breach of the Code of Integrity under rule 175 (1) (i) (h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and signature of Supplier

Date :

Place :

## Technical Compliance statement

Item Description	Qty (In Nos.)	Complied (Yes/No)	Remarks, if any	Offered Make & Model	% of Local Content as per Tender Clause No.4.2(V)	Country of Origin
<b>Tender item no.1:</b> Fume hood (6 feet) with Exhaust System as per the tender clause 2.1	32 Nos.					
<b>Tender item no.2:</b> Fume hood (5 feet) with Exhaust System as per the tender clause 2.1	06 Nos.					
<b>Tender item no.3:</b> Fume hood (4 feet) with Exhaust System as per the tender clause 2.1	04 Nos.					
<b>Tender item no.4:</b> Island Tables with under storage cabinet & reagent shelves Type-1: 4570 mm (L) x 1770 mm (W) as per the tender clause 2.2	04 Nos.					
<b>Tender item no.5:</b> Island Tables with under storage cabinet & reagent shelves <b>Type-2:</b> 6550 mm (L) x 1530 mm (W) as per the tender clause 2.2	06 Nos.					
<b>Tender item no.6:</b> Island Tables with under storage cabinet & reagent shelves <b>Type-3:</b> 8535 mm (L) x 1800 mm (W) as per the tender clause 2.2	03 Nos.					
<b>Tender item no.7:</b> Island Tables with under storage cabinet & reagent shelves <b>Type-4:</b> 4572 mm (L) x 1520 mm (W) x 914 mm (H) as per the tender clause 2.2	03 Nos.					
<b>Tender item no.8:</b> Bio-Safety cabinet as per the tender clause 2.3	03 Nos.					
<b>Tender item no.9:</b> Spot Extractor with blower and ducting facility with Exhaust System connected to fume hood as per the tender clause 2.4	09 Nos.					
<b>Tender item no.10:</b> 6 feet Ductless Fume hood as per the tender clause 2.5	04 Nos.					

<b>Tender item no.11: 5 feet Ductless Fume hood as per the tender clause 2.6</b>	<b>01 No.</b>					
<b>Onsite warranty : 01 year onsite warranty for all items.</b>						
<b>Detailed scope of warranty</b>						
<b>CAMC : 04 years CAMC after expiry of warranty for all items</b>						
<b>Detailed scope of CAMC</b>						
<b>Spares and service support availability: Minimum 05 years should be provided.</b>						

## COMPANY DETAILS

<b>Name of the Bidder</b>		
<b>Date of Incorporation /</b>		
<b>PAN Number</b>		
<b>GST Registration Number</b>		
<b>Bidder's Bidding Capacity for the tendered items (As a Manufacturer/ Trader/ dealer / channel partner / system integrator, etc.)</b>		
<b>Bank Details</b>	<b>Account Number</b>	
	<b>IFS Code</b>	
	<b>Bank Name</b>	
	<b>Branch Name</b>	
<b>Registered Office Address</b>		
<b>Authorized Signatory Details (Company/Firm Authorization by the competent authority, to be attached)</b>	<b>Name</b>	
	<b>Designation</b>	
	<b>Email</b>	
	<b>Phone</b>	
<b>Details of Contact other than Authorized Signatory</b>	<b>Name</b>	
	<b>Designation</b>	
	<b>Email</b>	
	<b>Phone</b>	

Date:  
Tenderer:

Signature and Seal of the

Place:

Name in Block Letter:

Designation:

Contact no.

**CHECKLIST FOR BIDDERS TO BE SUBMITTED IN DULY FILLED AND SIGNED**

<b>Tender Clause No.</b>	<b>Name of the Document</b>	<b>Comply (Yes/No)</b>	<b>Submitted (Yes/No)</b>	<b>Page No. of the attached Document</b>
3.4	Bid security Declaration (Annexure-II)			
3.3	Valid EMD Exemption Certificate			
4.1.	PAN Card			
	Incorporation/Registration certificate of company			
	GST Registration copy			
4.2.(I)	Tender acceptance letter (Annexure I)			
4.2.(II)	Non-Blacklisting undertaking (Annexure III)			
4.2.(III)	The Bidder should submit list of clientele to whom identical or similar furniture have supplied during past five financial years i.e. during 2018-19 to 2022-23 in India to CFTI Institutions like IITs, IISERs, IISc etc. with their contact details along with documentary evidence such as Purchase Orders executed along with technical specifications, completion certificates from the client, etc. are to be submitted as per the Annexure-IV. (On-going works will not be considered for the Technical evaluation)			
	At least in any one of the calendar years (2018-2023), the number of items supplied should be more than items mentioned in tender enquiry (Pl. submit the proof of supply of identical or similar furniture).			
	The bidder should attach a list of Purchase Order / Work Order where the similar type of work executed during the past 5 years from the date of publication of tender supported with work completion certificate and satisfactory performance certificate from the End User.			
4.2.(IV)	The Annual Turnover should be at least <b>Rs. 2 Crores</b> and be profitable during each of the previous three financial years i.e. <b>during 2018-19 to 2020-21 or 2019-20 to 2021-22</b> . Audited financial Statements or Financial Statements showing turnover duly signed by a Chartered Accountant are to be submitted as per the <b>Annexure-V</b> .			



Tender Clause No.	Name of the Document	Document Particulars	Submitted (Yes/No)	Page No. of the attached Document
4.2.(V)	The Bidder should be a <u>Class-I/Class-II Local Supplier</u> meeting minimum 20% local content clause in line with the Public Procurement (Preference to Make in India) Order 2017 No. P-45021/2/2017-PP (BE-II) dated 04 Jun 2020. A Self-Declaration Certificate regarding “Class-I & Class-II Supplier” for the tendered items as per the Annexure-VI is to be submitted.			
4.2.(VI)	The Bidder should be OEM or OEM authorized Dealers / Channel partners / Distributors of reputed brand having authorization for sales and after sales support. Valid OEM authorization letter is required to participate in this tender.			
4.2.(VII)	Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the Bidder registered with the competent authority. The concerned Bidder (s) are required to attach the relevant valid Registration Certificate along with the bid for consideration.			
4.3	Technical Compliance Statement : Annexure-VII.			
4.2 (IX)	The Bidder should have submit below mentioned certificates			
	SEFA 3 – Scientific Equipment and Furniture Association for Work surface.			
	SEFA 8M - Scientific Equipment and Furniture Association for Steel Caseworks.			
	SEFA 8 - Scientific Equipment and Furniture Association.			
	NFPA 30 - National Fire Protection Association for flammable storage.			
	NFPA 45- National Fire Protection Association for flammable storage.			

	UL - Underwriters Laboratories.			
	ASTM D522 - Bending Test or ASTM D3359-02 Paint Adhesion Test.			
	ASHRAE 110-2016 or 1995R.			
	FM – Flammable and Combustible liquids certificate for storage cabinets.			
	NIH03 – 112C – National Institute of Health Specification. Required option of NSF/ANSI.			
	ASHRAE Standard 110. 2016 or 1995R – Method of Testing Performance of Laboratory Fume Hoods.			
	BS EN 1363 – Fume hood Liner Fire Resistance Test Certificate for 60 minutes.			
11.1 (I)	Purchase Preference: (if applicable) Micro and Small Enterprises (MSEs):			
11.2 (II)	Purchase Preference: Make in India			
12	Payment Term: 70% against delivery and balance 30% after successful completion and handing over of the project (Except AMC charges)			
13.	<b>Onsite Warranty: 01 Year comprehensive onsite warranty for all the items</b>			
	AMC: Four years Comprehensive onsite AMC after the expiry of warranty period			
15	<b>Delivery: within 16 weeks (112 days) from the date of sample approved by the committee at the factory.</b>			
8	Bid validity: 120 days from the date of opening of the tender.			
	Company details : Annexure-VIII			

**Note: Submission of tender without the documents mentioned above will lead to rejection/disqualification of the tender.**

Signature of the Bidder with stamp

**ANNEXURE-X**

**Format for submitting the queries through email to IIT Tirupati**

QUERIES RELATED TO THE TENDER DOCUMENT MAY BE FORWARDED TO [hod\\_cy@iittp.ac.in](mailto:hod_cy@iittp.ac.in) and copy to [eutenders@iittp.ac.in](mailto:eutenders@iittp.ac.in) & [purchase@iittp.ac.in](mailto:purchase@iittp.ac.in) AS PER THE BELOW FORMAT OF ANNEXURE-X

Tender No. IITT/EU/2023-24/17 dated: 28.10.2023

**Name of the Tender/Supply:** Notice Inviting Tender for Supply, installation, testing and Commissioning of laboratory furniture-II.

<b>S No</b>	<b>Tender Clause No</b>	<b>Bidder(s) queries</b>	<b>IIT Tirupati response</b>

**Signature and Seal of the Tenderer:**

**Name in Block Letter:**

**Designation:**

**Full Address:**

**Contact no.:**

**Date:**

**INTEGRITY PACT**

**To,**

The Registrar,  
Indian Institute of Technology,  
Tirupati.

**Sub:** Submission of Tender for the \_\_\_\_\_ at  
Indian Institute of Technology, Tirupati.

**Sir/ Madam,**

I/We acknowledge that the Indian Institute of Technology, Tirupati is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by Indian Institute of Technology, Tirupati. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, Indian Institute of Technology, Tirupati shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid in accordance with terms and conditions of the tender/ bid.

Yours faithfully,

(Duly authorized signatory of the Bidder)

**INTEGRITY PACT**

This **INTEGRITY PACT** is made and executed at..... on this day of..... , 2023

BETWEEN

**The Registrar, Indian Institute of Technology Tirupati**, an autonomous body of the Department of Higher Education, Ministry of Education, Govt, of India having its office located at Yerpedu – Venkatagiri Road, Yerpedu Post, Tirupati District, Andhra Pradesh - 517619 (hereinafter referred to as “**The Principal**” which terms or expression shall, unless excluded by or repugnant to the subject or context, mean and include its successor-in-office, administrators or permitted assignees) of the **First Part**;

And

M/s..... a company incorporated under the Companies Act,..... through its representative/authorized signatory (insert name and designation of the officer) vide resolution dated ..... passed by the Board of Directors, having its office at .....(hereinafter referred to as “**The Bidder/Contractor**” which term or expression shall, unless excluded by or repugnant to the subject or context, mean and include its successor-in-office, administrators or permitted assignees) of the **Second Part**.

**Preamble**

The Principal intends to award, underlaid down organizational procedures, contract/s for \_\_\_\_\_ The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidders) and / or Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

**Section 1 - Commitments of the Principal**

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

- a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
- b. The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
- c. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there is a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition, can initiate disciplinary actions.

## **Section 2 - Commitments of the Bidder(s)/ Contractor(s)**

(1) The Bidder(s)/ Contractor(s) commit themselves to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commit themselves to observe the following principles during participation in the tender process and during the contract execution.

a. The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b. The Bidders(s)/ Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

c. The Bidder(s)/ Contractor(s) will not commit any offense under the relevant IPC/PC Act; further the Bidders(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s)/ Contractors(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the Bidder(s)/Contractors(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only

e. The Bidder(s)/ Contractor(s) will, when presenting their bid, disclose any and all payments made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f. Bidder(s) /Contractor(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.

(2) The Bidders)/ Contractors) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

## **Section 3 - Disqualification from tender process and exclusion from future contracts**

If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put their reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of business dealings.

## **Section 4 - Compensation for Damages**

(1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

### **Section 5 - Previous transgression**

(1) The Bidder declares that no previous transgressions occurred in the last three years with any other Company in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify his exclusion from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

### **Section 6 - Equal treatment of all Bidders / Contractors / Subcontractors**

(1) In the case of Sub-contracting, the Principal Contractor shall take the responsibility for the adoption of the Integrity Pact by the Sub-contractor.

(2) The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate this provisions.

### **Section 7 - Criminal charges against violating Bidder(s) / Contractors) / Subcontractor(s)**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

### **Section 8 - Independent External Monitor**

(1) The Principal appoints a competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all Contract documents, whenever required. It will be obligatory for him/her to treat the information and documents of the Bidders/Contractors as confidential. He/she reports to Secretary, MoE.

(3) The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his/her request and demonstration of a valid interest,

unrestricted and unconditional access to their project documentation. The same is applicable to Sub-contractors.

(4) The Monitor is under contractual obligation to treat the information and documents of the Bidders)/ Contractor(s)/ Sub-contractor(s) with confidentiality. The Monitor has also signed declarations on 'Non-Disclosure of Confidential Information and of 'Absence of Conflict of Interest'. In case of any conflict of interest arising at a later date, the IEM shall inform Secretary, D/o Higher Education.

(5) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

(6) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(7) The Monitor will submit a written report to the Secretary, D/o Higher Education within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

(8) If the Monitor has reported to the Secretary, D/o Higher Education, a substantiated suspicion of an offence under relevant I PC/ PC Act, and the Secretary, MoE has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

(9) The word '**Monitor**' would include both singular and plural.

## **Section 9 - Pact Duration**

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealing.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Secretary, D/o Higher Education.

## **Section 10 - Other provisions**

(1) This agreement is subject to Indian Law. The place of performance and jurisdiction is the Office of the Principal, i.e. New Delhi.

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.



(4) Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement with their original intentions.

(5) Issues like Warranty / Guarantee etc. shall be outside the purview of IEMs.

(6) In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in the Integrity Pact will prevail.

(7) The actions stipulated in this Integrity Pact are without prejudice to any other legal action(s) that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

**IN WITNESS WHEREOF**, the parties hereunto set their hands and seals and executed this INTEGRITY PACT as of the day/month/year first above written:

For and on behalf of

**THE REGISTRAR,  
Indian Institute Technology Tirupati (First Party)**

SIGNED, SEALED, AND DELIVERED by

**Name:**.....

**Designation:**.....

**Address:**.....

**Authorized Signatory**

For and on behalf of

**M/s.....(Second Party)**

SIGNED, SEALED AND DELIVERED by

Name\_\_\_\_\_

Designation:.....

Address:.....

**Representative/authorized signatory**

**Vide resolution dated..... passed by the Board of Directors**

**In the presence of Witness:**

1.

2.