

	<p>INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036</p> <p>Telephone: (044) 2257 4108 E-mail: guhanj@iitm.ac.in</p>	
---	--	---

Prof. Guhan Jayaraman
Coordinator

Ref: BT/GUHA/2020/007/SPL
Dated: 12.11.2020

Limited Tender No: BT/GUHA/2020/007/SPL

Due Date: 02.12.2020, 5:00pm

Technical Bid opening Due Date: 02.12.2020, 5:00pm

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of **“Design, supply, installation & commissioning of lab furniture”** conforming to the specifications given in (Annexure-I). **Terms and Conditions of Limited Tender furniture**

1. **Preparation of Bids:** - The Limited tenders should be submitted under **Two bid system** (i.e.) Technical- and -Financial bid.
2. **Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier (duly sealed and super scribed on the envelope with the reference No and due date) so as to reach the following address before the due date and time specified in our Schedule:

Shantanu Pradhan
Assistant Professor
Department of Biotechnology,
Bhupat and Jyoti Mehta
School of Biosciences IIT-M
Chennai, India 600 036

- A. The bidders will be asked to provide physical specimens of the furniture items for visual inspection during technical bid opening (point 12, page 2).
- B. The bidders will include the general furniture quality assurance as part of catalogue (point 5, page 2).

3. **Price:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to **Department of Biotechnology**.
 - a. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.
 - b. In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP (stating the Cost, Insurance, Freight separately) and indicating the mode of shipment.

4. **Terms of Delivery:** - The item should be supplied to our Departments as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.
5. **Catalogue:** Original catalogue (not any photocopy) of the quoted model duly signed must accompany the quotation in the Technical bid
6. **Late offer:** - The offers received after the due date and time will not be considered
7. **Payment:** - No Advance payment will be made for Indigenous purchase. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).
8. **Advance Payment:** - No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a Nationalized Bank of India equal to the amount of advance payment.
9. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within number of days (as prescribed by PI's) from the date of receipt of the item at site of IIT Madras.
10. **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment.
11. **Validity:** Validity of Quotation not less than 60 days from the due date of tender
12. **Technical Bid Opening:** The technical bid will be opened on **02.12.2020 5:00pm** at the Department of **Biotechnology**, IIT Madras and the **financial bids** of those tenders who are technically qualified will be opened at a **later date under intimation to them**.
13. **Performance Security:-**The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply within 14 days from the issue of work/purchase order. The Performance Security should be furnished in the form of an Account Payee DD / FD Receipt from the commercial bank (or) Bank Guarantee from any nationalized bank in India.
14. **Accept /Reject:** IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.
15. **Settlement of Disputes:** Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.
16. **Risk Purchase Clause:** - In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
17. **Unsolicited offers:** "This notice is being published **for information only** and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected registered suppliers. Unsolicited offers are liable to be ignored. However, suppliers who desire to participate in such tenders in future may apply for registration as per procedure." The Website for Registration of vendors is <http://web.iitm.ac.in/supplier/> and the mail address for queries is "workflow@rt.iitm.ac.in".

Yours sincerely,

Prof. Guhan Jayaraman,
Department of Biotechnology
IIT Madras
Chennai - 600 036

TECHNICAL SPECIFICATIONS FOR LIMITED TENDER
DEPARTMENT OF BIOTECHNOLOGY, BT BLOCK 2, ROOM 204, IIT MADRAS
SHANTANU PRADHAN

DEPARTMENT OF BIOTECHNOLOGY, BT BLOCK 2, ROOM 204, IIT MADRAS				
SL NO.	DESCRIPTION	REF NO.	UNIT	QTY
Design, supply, installation & commissioning of lab furniture as follows:				
CELL CULTURE ROOM				
A	WALL WORK BENCH			
	Work bench with jet black granite table top of 20mm thickness. The overhang of granite is of 25 mm at front and side of understructure. The granite will be of high chemical resistance, high scratch & wear resistance, and good cleaning ability. Under bench furniture made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness) and should have double wall construction for side walls with sound dampening technology. Under bench modules to have one drawer, two shutters with one adjustable shelf, drawers must be fully opening type, fitted with air dampening technology rails, to ensure soft and soundless closing and opening as shown in the drawing.			
A1	Wall work bench of black granite with 20mm thickness, 787mm (w) x 762mm (d) x 914mm (h) as shown in the drawing.	POS. 1	Nos.	2
B	OVERHEAD WALL CABINET			
	Wall mounted cabinets with two open shelves (without shutters) made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness), smooth and polished finish, no sharp edges as shown in the drawing.			
B1	Wall mounted cabinets with open shelves, 762mm (w) x 330mm (d) x 635mm (h) as shown in the drawing.	POS. 1	Nos.	2
C	METAL FRAME TABLE			
	Cold rolled sheet steel table with jet black granite table top of 20mm thickness. The overhang of granite is of 25 mm at front and side of understructure. The granite will be of high chemical resistance, high scratch & wear resistance, and good cleaning ability. The table should have vibration absorbing isolation, levelling guides and leg shoes as shown in the drawing.			
C1	Steel frame table with granite table top, 813mm (w) x 610mm (d) x 914mm (h) as shown in the drawing.	POS. 2	Nos.	1
C2	Lab Swivel Chair with adjustable height and strong back support	POS. 1	Nos.	4

ANTE ROOM				
D	TALL STORAGE CABINET			
D1	Tall storage cabinet with solid shutter and lock, 914mm (w) x 559mm (d) x 2134mm (h), with 5 adjustable shelves as shown in the drawing.	POS. 3	Nos.	1
MAIN LAB				
E	TALL STORAGE CABINET			
E1	Tall storage cabinet with solid shutter and lock, 762mm (w) x 559mm (d) x 2134mm (h), with 5 adjustable shelves as shown in the drawing.	POS. 4	Nos.	1
F	ANTI-VIBRATION TABLE			
	Anti-vibration table with 12mm rubber pad and worktop of high chemical resistance preferably granite table top with 50mm thickness. Frame made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness) as shown in the drawing.			
F1	Anti-vibration table of black granite with 50mm thickness 914mm (w) x 762mm (d) x 914mm (h) as shown in the drawing.	POS. 5	Nos.	2
F2	Lab Swivel Chair with adjustable height and strong back support	POS. 5	Nos.	2
G	WALL WORK BENCH WITH SINK			
	Work bench with jet black granite table top of 20mm thickness. The overhang of granite is of 25 mm at front and side of understructure. The granite will be of high chemical resistance, high scratch & wear resistance, and good cleaning ability. Under bench furniture made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness) and should have double wall construction for side walls with sound dampening technology. Under bench modules to have one drawer, two shutters with one adjustable shelf, drawers must be fully opening type, fitted with air dampening technology rails, to ensure soft and soundless closing and opening. Sink will have Sink Unit, Tap, Eye wash Peg Board and Service Connection as shown in the drawing.			
G1	Wall work bench of black granite with 20mm thickness, 762mm (w) x 559mm (d) x 914mm (h) as shown in the drawing.	POS. 6	Nos.	7
G2	Wall work bench of black granite with 20mm thickness (with one left shutter), 610mm (w) x 762mm (d) x 914mm (h) as shown in the drawing.	POS. 7	Nos.	1

G3	Wall work bench of black granite with 20mm thickness (with one right shutter), 610mm (w) x 762mm (d) x 914mm (h) as shown in the drawing.	POS. 8	Nos.	2
G4	Sink Unit with acrylic partition and Peg board 762mm (w) x 762mm (d) x 457mm (h)	POS. 9	Nos.	1
H	OVERHEAD WALL CABINET			
	Wall mounted cabinets with two open shelves (without shutters) made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness), smooth and polished finish, no sharp edges as shown in the drawing.			
H1	Wall mounted cabinets with open shelves, 762mm (w) x 330mm (d) x 635mm (h) as shown in the drawing.	POS. 6	Nos.	5
I	ISLAND BENCH			
	Island Bench with Worktop of High Chemical Resistance granite table top with 20mm thickness. Under Bench Furniture made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness and should have double wall construction for side walls with sound dampening technology. Reagent shelves of 254mm (d) x 724mm (h) metal case work treated with chemically resistant and with slip lip for sides and back of reagent shelf, Electrical sockets, Internal wiring from lab DB and Service Connection as shown in the drawing.			
I1	Island Bench of Granite table top with 20mm thickness. 3150mm (w) x 1524mm (d) x 914mm (h) with additional connections of Reagent Rack, service drop and electrical sockets as shown in the drawing.	POS. 10	Nos.	1
I2	Lab Swivel Chair with adjustable height and strong back support	POS. 10	Nos.	8
J	FLAMMABLE STORAGE CABINET			
	Flammable Storage Cabinets (FM approved) for liquid and solid flammables in accordance with NFPA code 30, static grounding bolt. 45 gallons, 3 point self-latching standard (non-sparking) 2-door, Double wall construction with 1 ½" air space, Finished in 2-part urethane paint, Galvanized steel shelving, Two 2" vents with flash arrestors, Flush mounted locking handle as per manufacturer's specification, Leak proof sill 2" deep, Reinforced 18-gauge all-welded construction, Adjustable zinc plated leveling legs & having Large Warning label on the external side of the doors.			
	Flammable Storage Cabinet with 914mm (w) x 660mm (d) x 914mm (h) as shown in the drawing.	POS. 11	Nos.	2

K	SAFETY SHOWER WITH EYEWASH			
	Floor mounted safety shower with eyewash with powder coated finish	POS. 10	Nos.	1

A. WORK DESCRIPTION

1. Furnish all cabinets and casework, including tops, ledges, supporting structures. Include delivery to the building, set in place, level, and scribe to walls and floors as required. Furnish and install all filler panels, knee space panels and scribes as shown on drawings.
2. Furnish and deliver all utility service outlet accessory fittings, electrical receptacles and switches identified on drawings as mounted on the laboratory furniture. All plumbing and electrical fittings, not preinstalled in equipment, will be packaged separately and properly marked for delivery.
3. Furnish and deliver, for installation all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system as shown on drawings if included in BOQ/Bill of Quantities.
4. Furnish service strip supports where specified, and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the drawings if included in BOQ/Bill of Quantities.
5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by customer / others, leaving the premises broom clean and orderly.

B. GENERAL FURNITURE QUALITY ASSURANCE

1. The furniture contractor shall provide worktops all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.
2. The furniture contractor shall provide SEFA Approved Independent Test Lab certification that furniture shall meet the performance requirements described in SEFA 8M – Latest version.
3. The bidder needs to submit sample of SEFA tested cabinet as per configuration given by the purchaser. The sample may be kept onsite till full inspection is completed & project installed.
4. Complete SEFA 8M tested 3rd party report to be submitted in advance as a pre-qualification for quoting the tender.
5. The bidder needs to have completed at least 2 projects in India with SEFA tested furniture. Enclose purchase order copies / completion certificate.

C. DETAILED REQUIREMENTS FOR LAB FURNITURE QUALITY AND DESIGN

1. MATERIALS

Cold rolled sheet steel: Steel grade must comply with ASTM A366. Components must be properly leveled, treated and conditioned to be free of scale or visible imperfections. Material thickness for all gauges must meet the standards. Cold rolled sheets shall be prime furniture grade 11,12,14,18, and 20 gauge.

Hardware & Trim:

Hinges: Hinges shall be 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 three screws through each leaf. Welding of hinges to door or case will not be accepted. Doors under 36" in height shall be hung on one pair of hinges, and doors over 36" high shall be hung on 3 hinges.

Shelf clips: Die formed steel, zinc plated, designed to engage in shelf adjustment holes without the use of tools.

2. DOORS AND DRAWERS

- 2.1 Doors and drawers to be inset into the case body with adjusted clearance between doors/drawers and case body to not exceed 2.5 mm evenly spaced. Flush inset construction with all front surfaces above the toe space in the same plane. All exposed corners and seams shall be welded closed and ground smooth prior to paint. No open seams, joints, or butt lines will be accepted.
- 2.2 Pulls on doors shall be mounted vertically and pulls on drawers shall be mounted horizontally. These are to be attached to the outer pan only and that attachment screws not be visible from the inside of the door or drawer.
- 2.3 All tall cases shall be provided with toe space to match base units regardless of depth of unit.

3. CABINET DESIGN AND PERFORMANCE

- 3.1 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.
- 3.2 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 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.
- 3.3 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.
- 3.4 Case openings shall be rebuted on all four sides for both hinged and sliding doors to provide a dust resistant case.
- 3.5 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.
- 3.6 Each exterior corner shall be die formed to a clean joint, and welded smooth, filled and polished prior to finish at all exterior corners exposed to view. The resulting finished appearance shall provide a finished product of all components within a single plane from the toe space bottom to top of cabinet. Cabinet interior at face will be smooth opening with no visible holes not used for that specific cabinet design.
- 3.7 All units shall have a cleanable smooth interior. Front and rear posts, reinforcing members or channel uprights shall be enclosed full heights on all cabinet openings. End panels shall be formed on all four edges.

- 3.8 Vertical uprights shall be properly aligned and securely welded in all four corners of each case body. The edge of the vertical uprights shall be formed to provide a strike for doors and drawers. Uprights shall be each perforated for the support of drawer channels, intermediate rails and shelving. Each unit shall be constructed of modular spacing to allow for reconfiguration of doors and drawers from standard components. Pre-punched holes for hinge or slide attachment visible when the doors or drawers are opened are not allowed.
- 3.9 A gravity fitting removable upright rear removable back shall be provided in all cupboard units. The back panel shall be formed of 18 gauge material and have a toolless removal capability.
- 3.10 A rear upright center mullion shall be provided for all units 30 inches and over, perforated with shelf adjustment holes which will properly align with front uprights. Mullion will allow for interior divisions within the cabinet for multiple configurations.
- 3.11 Case structural bottom and bottom rail shall be formed of one piece of metal except in specialty units and shall have both sides and back formed down and shall be offset in front to provide a door and drawer recess rabbet. Bottom of case shall be either integral to offset face rabbet, folded down at sides and spot welded to case and front toe space rail as an integral part of the case.
- 3.12 Toe space rail shall extend up and forward to engage bottom rail to form a smooth surfaced toe space.
- 3.13 Cabinet back shall consist of a top and bottom rail, channel formed for maximum strength and welded to back and top flange of end uprights, with space between left open for access to plumbing lines. Access panels shall be gravity fitting with upper reverse flange for ease of removal without tools
- 3.14 Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the case and door with screws. Welding of hinges to either case or door will not be acceptable.
- 3.15 Door and drawer heads (metal) shall be a two piece sheet steel assembly of $\frac{3}{4}$ inch (19 mm) overall thickness to consist of an inner pan and an outer pan having a channel formation on all four sides welded and ground to eliminate exposure of sharp raw edges, and the interior space filled with a sound deadening material at the time of assembly. Door pans and drawer heads shall be painted inside and out prior to assembly. Drawer fronts are to be independent to the drawer body and applied with four screws.
- 3.16 Drawer bodies shall be made in one piece construction including the bottom, two sides, back and inner front. They shall be fully covered at interior bottom on all four sides for easy cleaning. Sides shall be full height. Drawers shall be a minimum of 18 inches front to back, in a standard 22" deep cabinet.
- 3.17 Drawer stops shall be provided to insure smooth, quiet operation at point of contact with cabinet front.
- 3.18 Top horizontal rail will be provided on base cabinets such that rail shall interlock within the flange at top of end panels for strength, but shall be flush at face of unit. Reinforcements shall be provided at all front corners for additional welded strength between vertical and horizontal case members. At completion of assembly the top and vertical rail intersection shall be ground smooth.
- 3.19 Intermediate rails will be provided on base cabinets such that 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.

- 3.20 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.
- 3.21 Knee space service strip cover panels where specified, shall be 18 gauge (1.3 mm thick) steel, of the same finish as cabinets, and shall be furnished at open spaces under counter top where no cabinets occur. They shall be easily removable and shall cover piping from underside of top of service ledge to floor.
- 3.22 Provide filler panels where required between cabinets, at corner intersections of cabinets, between cabinets and walls and wherever else required for a complete finished installation. For tall cabinets, filler panels shall be provided for vertical face and top. For wall cabinets, filler panels shall be provided for vertical face, top and bottom.
- 3.23 Base cabinets shall be constructed to support a uniformly distributed load of 200 lbs. minimum per square foot (1000 kg/m²) of cabinet top area (total maximum of 2000 lbs. (900 kg), including working surface without objectionable distortion or interference with door and drawer operation.
- 3.24 Base cabinet corners where leveling bolts intersect horizontal gussets shall support 500 lbs. (225 kg) per corner, at 1½ inch (38 mm) projection of the leveling bolt below the gusset.
- 3.25 Each adjustable and fixed shelf 4 feet (1219 mm) or shorter in length shall support an evenly distributed load of 40 lbs. per square foot (200 kgf/m²) up to a maximum of 200 lbs. (90 kg), with nominal temporary deflection, but no permanent set.
- 3.26 Drawer assemblies shall automatically maintain alignment in cabinet opening and shall not bind during opening or closing of the drawer so as to minimize glass breakage and damage to fragile parts.
- 3.27 Swinging doors mounted on base units shall support a 250 lb. (113 kg) load located at a test point 14 inches (356 mm) measured horizontally from hinge along the top edge of door through a swing of 180 degrees. Weight test shall allow nominal temporary deflection, but no permanent distortion. Door assembly shall be twist resistant and rigid, and shall close in a flat plane against the cabinet to permit the door catch at top of door to function properly.

4. STEEL GAUGES

- 4.1 Case body members shall be 18 gauge.
- 4.2 Bottom case shall be full width 14 gauge sub bottom, double formed and fabricated to 11 gauge equivalent, welded to case body understructure and reinforced with 3/8-16 threaded weld nuts as level receivers.
- 4.3 Hinge reinforcement of 14 gauge steel shall be provided.
- 4.4 Drawer suspension channels shall be 14 gauges.
- 4.5 Cabinet shall be fabricated from a complete formed 14 gauge top frame flanged and welded to case body all four sides. Table aprons and reinforcement gussets shall be 14 gauge.
- 4.6 Vertical support uprights shall be 14 gauge.
- 4.7 Drawer assemblies and door assemblies shall be 20 gauge.
- 4.8 Shelves shall be 16 gauge. A hat channel reinforcement will be added for any unit 36" or over in width.

5. METAL-FRAMED LABORATORY TABLES AND APRONS

- 5.1 Provide a continuous wide bead of clear silicone sealant to the top of all supporting rails for vibration absorbing isolation. Allow complete cure before attachment of the work surface.
- 5.2 Where indicated on the drawings provide cutouts for electrical receptacles with cord and plug.
- 5.3 Each leg other than those fitted with casters, shall have leveling glides and leg shoes. Leveling glides will be 2" (48 mm) diameter, two-piece pivot construction, steel housing, non-marring, phenolic or translucent plastic insert, ½" (12 mm) diameter, minimum 1 ½" (36 mm) long zinc plated stems. Each glide shall have a load bearing capacity of 150 lbs. Leg shoe will be black covered vinyl or rubber leg shoe, 2 inches (50 mm) in height. Rails shall not be less than 1½ inch x 4½ inch 16 gauge (38 x 114 x 1.6 mm) channel steel sections, reinforced as necessary for leg attachment. Legs shall not be less than 2 inch x 2 inch 16 gauge (50 x 50 x 1.6 mm) square tubular steel sections. Leg rails and spreader rail shall not be less than 1¼ inch x 2½ inch 16 gauge (32 x 63 x 1.6 mm) steel sections, reinforced as necessary for leg attachment.
- 5.4 Apron shall not be less than 1½ inch (38 mm) x 4 inch (114 mm) 16 gauge (x 1.6 mm thick) channel steel sections, reinforced as necessary for leg attachment. Legs shall not be less than 2 inch (50 mm) x 2 inch (50 mm) 16 gauge (x 1.6 mm thick) square tubular steel sections. Leg rails shall not be less than 1¼ inch (32 mm) x 2½ inch (63 mm) 16 gauge (x 1.6 mm thick) steel sections, reinforced as necessary for leg attachment. Each leg shall have a recessed leveling screw and a black, covered vinyl or rubber leg shoe, 2 inches (50 mm) in height. Where indicated on the drawings, provide apron support rails; drawer unit, hardware and suspension as specified for base unit drawers.

6. WORK SURFACE

Work surface to be made of granite 20 mm thick high quality granite in Jet black colour with the edges having round profiles of Radius / chamfer on top side. The overhang of granite will be 25 mm at front side of understructure or as per requirement. It has good chemical resistance, high scratch & wear resistant and good cleaning ability.

7. SINK AND WATER TAPS

Good quality chemical resistance PP / Ceramic / SS sink will be provided. The lab tables to be supplied with PP moulded sinks, black in colour and with integral 50mm pipe threaded drain outlet as a one piece unit. Sink shall be injection moulded from pure polyolefins/ co-polymer material with inside corners covered, under counter mounted with all necessary fittings-such bottle traps, couplings etc. and fitted properly with sealants. PVC pipe lengths as required to connect to floor drain pipe at floor. Work includes making connections, checking connections at pressure of 2kg for 24 hours and making water tight joints. Water Drain inlet shall be minimum 25mm internal dia .Sink will be supplied along with tap for raw water supply as per the specified make. The sink unit will have 3-way (02 straight + 1 swan neck) water tap made up of brass with powder-coated finish.

8. PEG BOARD

Peg boards on sink will be of white colour Acrylic (10mm thick) with white colored 28 nos. of pegs having a drip tray and flexible tube of at least 600 mm length to drain the

excess liquid from glass wares to sink. Pegboards shall be fixed on wall or on furniture at accessible height as per drawings and prevalent site situation. Size of peg board will be as per manufacturer's specs.

9. EYE WASH

Eye-wash on sink will be single eye-wash with brass body and having anti-corrosive epoxy coating, inclined and flexible, complying to ANSI standard and regulated spray, working on 1.5 bar pressure. All eye showers are delivered with water regulating devices ensuring 11.5 L/min for eye wash, constant adequate water flow regardless of high water pressure and to be fitted with back flow preventer.

10. SAFETY SHOWER

Safety shower will be floor- mounted, powder-coated finish complying with ANSI standard. It will be delivered with water regulating device ensuring 75 lit/min for shower, constant adequate water flow regardless of high water pressure and to be fitted with back flow preventer.

11. ANTI-VIBRATION TABLE

Finish of top should match to lab table top. Trunking to be extended from edge to edge. The top will be 18+1 mm thick and supported by fixed legs and having adjustable leveling screws.

12. FLAMMABLE CABINET STORAGE

Flammable storage cabinets will be FM approved for liquid and solid flammables in accordance with NFPA code 30, static grounding bolt. 45 gallons, 3 point self-latching standard (non-sparking) 2-door, Double wall construction with 1 ½" air space, Finished in 2 part urethane paint, Galvanized steel shelving, Two 2" vents with flash arrestors, Flush mounted locking handle as per manufacturer's specification, Leak proof sill 2" deep, Reinforced 18-gauge all-welded construction, Adjustable zinc plated leveling legs & having Large Warning label on the external side of the doors.

13. ELECTRICAL FITTINGS

Each electrical module consists of 16 Amp 3/5 pin socket and Industrial sockets with MCB as per IP-55. Configuration of switch sockets: For Standing table: 2 nos of 230 V, 6+16 A, 3 pin sockets with MCB at every 1.5 meter length center to center. For Sitting Table: 4 nos. of 230 V, 6+16 A, 3 pin sockets with MCB at every 1.5 meter length center to center.

14. SERVICE LINES

Service lines will be provided with inlet, outlet for water supply, drainage lines, pneumatic lines which runs as per requirement. Service lines (water line, and drainage line) below the Reagent shelf having 4/5 levels stand to provide support for service lines from supply point to the required workstation.

Water supply line for laboratory is as per below: -

- a. From over head tank up to Laboratory 1" thick
- b. Inside the Laboratory the pipe line laid in 15 mm thick pipeline
- c. The water supply pipeline from the ground to tap in wash basin should be 1/2" flexible hose

TECHNICAL SPECIFICATIONS FOR LIMITED TENDER

DEPARTMENT OF BIOTECHNOLOGY, BT BLOCK 2, LAB in ROOM 303 , IIT MADRAS

NIRAV PRAVINBHAI BHATT

FLOOR 3, LABORATORY FURNITURE 303				
SL NO	DESCRIPTION	TABLE REF NO	UNIT	QTY
	Design,supply & installation and commissioning of Lab furniture as follows:			
A	WALL WORK BENCH WITH SINKS			
	Work Bench with Worktop of high Chemical Resistance, high scratch and wear-resistant Granite table top with 20mm thickness. Under Bench Furniture made of galvanised steel with chemical resistance epoxy powder coating (80 to 100-micron thickness and should have double-wall construction for sidewalls with sound dampening technology. Under bench modules to have one adjustable shelf, drawers must be fully opening type, fitted with air dampening technology rails, to ensure soft and soundless closing and opening, with two sink units, acrylic partitions, Tap, Eyewash (ANSI standard) and Service Connection as shown in the drawings 1-3.			
A1	Wall WorkBench of Black granite with 20mm thickness 7770(w) mm x 762(d) mm x 762(ht) mm with service drop as shown in the drawing with two sinks as shown in drawings 1-3.	POSNO. 1	No	1
A2	Lab Swivel Chair with adjustable height and strong back support	POSNO. 1	Nos	3
B	ISLAND WORKBENCHS			
	Workbench with Worktop of high Chemical Resistance, high scratch and wear-resistant Granite table top with 20mm thickness. Under Bench Furniture made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness and should have double wall construction for side walls with sound dampening technology. Under bench modules to have one adjustable shelf, drawers must be fully opening type, fitted with air dampening technology rails, to ensure soft and soundless closing and opening, with Service Connection as shown in the drawings 1-3.			

B1	Island Bench of high Chemical Resistance, high scratch and wear resistant Granite table top with 20mm thickness. 2083(w) mm x 762(d) mm x 914(ht) mm with additional connections of Reagent Rack (203 mm (d) and 724 mm (h)) with cover panel service drop and electrical sockets as shown in the drawing.	POSNO. 2	No	1
B3	Island Bench of high Chemical Resistance, high scratch and wear resistant Granite table top with 20mm thickness. 1930(w) mm x 1524(d) mm x 914(ht) mm with additional connections of Reagent Rack (254 mm (d) and 724 mm (ht)) service drop and electrical sockets as shown in the drawings 1-3.	POSNO. 3	No	1
C	OVERHEAD CABINETS			
C1	Wall mounted cabinets (762 mmLx330mm (d) x630mm(d)) as shown in the drawing with wall cabinet solid shutter made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness), smooth and polished finish, no sharp edges as shown in the drawings 1-3.	POSNO. 4, 5 POSNO. 7 (extreme end cabinets)	Nos	2+1+2
C2	Wall mounted cabinets (914mm Lx330mm (d) x630mm(d)) as shown in the drawing with wall cabinet solid shutter made of galvanised steel with chemical resistance epoxy powder coating (80 to 100 micron thickness), smooth and polished finish, no sharp edges as shown in the drawings 1-3.	POSNO. 6 (middle ones)	Nos	5

For all dimensions, please refer to the drawings provided with the bid. The bidders may be asked to provide or keep the sample(s) onsite for full inspection as a part of the technical evaluation. Work description, general quality assurance and detailed requirements for lab furniture quality and design are given as follows.

A. WORK DESCRIPTION

1. Furnish all cabinets and casework, including tops, ledges, supporting structures. Include delivery to the building, set in place, level, and scribe to walls and floors as required. Furnish and install all filler panels, knee space panels and scribes as shown on drawings.
2. Furnish and deliver all utility service outlet accessory fittings, electrical receptacles and switches identified on drawings as mounted on the laboratory furniture. All plumbing and electrical fittings, not preinstalled in equipment, will be packaged separately and properly marked for delivery.
3. Furnish and deliver, for installation all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system as shown on drawings if included in BOQ/Bill of Quantities.
4. Furnish service strip supports where specified, and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the drawings if included in BOQ/Bill of Quantities.
5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by customer / others, leaving the premises broom clean and orderly.

B. GENERAL FURNITURE QUALITY ASSURANCE

1. The furniture contractor shall provide worktops all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.
2. The furniture contractor shall provide SEFA Approved Independent Test Lab certification that furniture shall meet the performance requirements described in SEFA 8M – Latest version.
3. The bidder needs to submit sample of SEFA tested cabinet as per configuration given by the purchaser. The sample may be kept onsite till full inspection is completed & project installed.
4. Complete SEFA 8M tested 3rd party report to be submitted in advance as a pre-qualification for quoting the tender.
5. The bidder needs to have completed at least 2 projects in India with SEFA tested furniture. Enclose purchase order copies / completion certificate.

C. DETAILED REQUIREMENTS FOR LAB FURNITURE QUALITY AND DESIGN

1. MATERIALS

Cold rolled sheet steel: Steel grade must comply with ASTM A366. Components must be properly leveled, treated and conditioned to be free of scale or visible imperfections. Material thickness for all gauges must meet the standards. Cold rolled sheets shall be prime furniture grade 11,12,14,18, and 20 gauge.

Hardware & Trim:

Hinges: Hinges shall be made of Type 304 stainless steel .089 thick, 2-1/2” high, with brushed satin finish, and shall be the institutional type with a fiveknuckle bullettype barrel. Hinges shall be attached to both door and case with three screws through each leaf. Welding of hinges to door or case will not be accepted. Doors under 36" in height shall be hung on one pair of hinges, and doors over 36" high shall be hung on 3 hinges.

Shelf clips: Die formed steel, zinc plated, designed to engage in shelf adjustment holes without the use of tools.

2. DOORS AND DRAWERS

1. Doors and drawers to be inset into the case body with adjusted clearance between doors/drawers and case body to not exceed 2.5 mm evenly spaced. Flush inset construction with all front surfaces above the toe space in the same plane. All exposed corners and seams shall be welded closed and ground smooth prior to paint. No open seams, joints, or butt lines will be accepted.

2. Pulls on doors shall be mounted vertically and pulls on drawers shall be mounted horizontally. These are to be attached to the outer pan only and that attachment screws not be visible from the inside of the door or drawer.

3. All tall cases shall be provided with toe space to match base units regardless of depth of unit.

3. CABINET DESIGN AND PERFORMANCE

1. 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.

2. 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 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.
3. 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.
4. Case openings shall be rebuted on all four sides for both hinged and sliding doors to provide a dust resistant case.
5. 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.
6. Each exterior corner shall be die formed to a clean joint, and welded smooth, filled and polished prior to finish at all exterior corners exposed to view. The resulting finished appearance shall provide a finished product of all components within a single plane from the toe space bottom to top of cabinet. Cabinet interior at face will be smooth opening with no visible holes not used for that specific cabinet design.
7. All units shall have a cleanable smooth interior. Front and rear posts, reinforcing members or channel uprights shall be enclosed full heights on all cabinet openings. End panels shall be formed on all four edges.
8. Vertical uprights shall be properly aligned and securely welded in all four corners of each case body. The edge of the vertical uprights shall be formed to provide a strike for doors and drawers. Uprights shall be each perforated for the support of drawer channels, intermediate rails and shelving. Each unit shall be constructed of modular spacing to allow for reconfiguration of doors and drawers from standard components. Pre-punched holes for hinge or slide attachment visible when the doors or drawers are opened are not allowed.
9. A gravity fitting removable upright rear removable back shall be provided in all cupboard units. The back panel shall be formed of 18 gauge material and have a toolless removal capability.
10. A rear upright center mullion shall be provided for all units 30 inches and over, perforated with shelf adjustment holes which will properly align with front uprights. Mullion will allow for interior divisions within the cabinet for multiple configurations.
11. Case structural bottom and bottom rail shall be formed of one piece of metal except in specialty units and shall have both sides and back formed down and shall be offset in front to provide a door and drawer recess rabbet. Bottom of case shall be either integral to offset face rabbet, folded down at sides and spot welded to case and front toe space rail as an integral part of the case.
12. Toe space rail shall extend up and forward to engage bottom rail to form a smooth surfaced toe space.
13. Cabinet back shall consist of a top and bottom rail, channel formed for maximum strength and welded to back and top flange of end uprights, with space between left open for access to plumbing lines. Access panels shall be gravity fitting with upper reverse flange for ease of removal without tools
14. Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the case and door with screws. Welding of hinges to either case or door will not be acceptable. Door and drawer heads (metal) shall be a two piece sheet steel assembly of 3/4 inch (19 mm) overall thickness to consist of an inner pan and an outer pan having a channel formation on all four sides welded and ground to eliminate exposure of sharp raw edges, and the interior space filled with a sound deadening material at the time of assembly. Door pans and drawer heads shall be painted inside and out prior to assembly. Drawer fronts are to be independent to the drawer body and applied with four screws.
15. Drawer bodies shall be made in one piece construction including the bottom, two sides, back and inner front. They shall be fully covered at interior bottom on all four sides for easy cleaning. Sides shall be full height. Drawers shall be a minimum of 18 inches front to back, in a standard 22" deep cabinet.

16. Drawer stops shall be provided to insure smooth, quiet operation at point of contact with cabinet front.
17. Top horizontal rail will be provided on base cabinets such that rail shall interlock within the flange at top of end panels for strength, but shall be flush at face of unit. Reinforcements shall be provided at all front corners for additional welded strength between vertical and horizontal case members. At completion of assembly the top and vertical rail intersection shall be ground smooth.
18. Intermediate rails will be provided on base cabinets such that 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.
19. 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.
20. Knee space service strip cover panels where specified, shall be 18 gauge (1.3 mm thick) steel, of the same finish as cabinets, and shall be furnished at open spaces under counter top where no cabinets occur. They shall be easily removable and shall cover piping from underside of top of service ledge to floor.
21. Provide filler panels where required between cabinets, at corner intersections of cabinets, between cabinets and walls and wherever else required for a complete finished installation. For tall cabinets, filler panels shall be provided for vertical face and top. For wall cabinets, filler panels shall be provided for vertical face, top and bottom.
22. Base cabinets shall be constructed to support a uniformly distributed load of 200 lbs. minimum per square foot (1000 kg/m²) of cabinet top area (total maximum of 2000 lbs. (900 kg), including working surface without objectionable distortion or interference with door and drawer operation.
23. Base cabinet corners where leveling bolts intersect horizontal gussets shall support 500 lbs. (225 kg) per corner, at 1½ inch (38 mm) projection of the leveling bolt below the gusset.
24. Each adjustable and fixed shelf 4 feet (1219 mm) or shorter in length shall support an evenly distributed load of 40 lbs. per square foot (200 kgf/m²) up to a maximum of 200 lbs. (90 kg), with nominal temporary deflection, but no permanent set.
25. Drawer assemblies shall automatically maintain alignment in cabinet opening and shall not bind during opening or closing of the drawer so as to minimize glass breakage and damage to fragile parts.
26. Swinging doors mounted on base units shall support a 250 lb. (113 kg) load located at a test point 14 inches (356 mm) measured horizontally from hinge along the top edge of door through a swing of 180 degrees. Weight test shall allow nominal temporary deflection, but no permanent distortion. Door assembly shall be twist resistant and rigid, and shall close in a flat plane against the cabinet to permit the door catch at top of door to function properly.

4. STEEL GAUGES

1. Case body members shall be 18 gauge.
2. Bottom case shall be full width 14 gauge sub bottom, double formed and fabricated to 11 gauge equivalent, welded to case body understructure and reinforced with 3/8-16 threaded weld nuts as level receivers.
3. Hinge reinforcement of 14 gauge steel shall be provided.
4. Drawer suspension channels shall be 14 gauges.
5. Cabinet shall be fabricated from a complete formed 14 gauge top frame flanged and welded to case body all four sides. Table aprons and reinforcement gussets shall be 14 gauge.
6. Vertical support uprights shall be 14 gauge.
7. Drawer assemblies and door assemblies shall be 20 gauge.
8. Shelves shall be 16 gauge. A hat channel reinforcement will be added for any unit 36" or over in width.

5. METAL-FRAMED LABORATORY TABLES AND APRONS

1. Provide a continuous wide bead of clear silicone sealant to the top of all supporting rails for vibration absorbing isolation. Allow complete cure before attachment of the work surface.
2. Where indicated on the drawings provide cutouts for electrical receptacles with cord and plug.
3. Each leg other than those fitted with casters, shall have leveling glides and leg shoes. Leveling glides will be 2" (48 mm) diameter, two-piece pivot construction, steel housing, non-marring, phenolic or translucent plastic insert, ½" (12 mm) diameter, minimum 1 ½" (36 mm) long zinc plated stems. Each glide shall have a load bearing capacity of 150 lbs. Leg shoe will be black coved vinyl or rubber leg shoe, 2 inches (50 mm) in height. Rails shall not be less than 1½ inch x 4½ inch 16 gauge (38 x 114 x 1.6 mm) channel steel sections, reinforced as necessary for leg attachment. Legs shall not be less than 2 inch x 2 inch 16 gauge (50 x 50 x 1.6 mm) square tubular steel sections. Leg rails and spreader rail shall not be less than 1¼ inch x 2½ inch 16 gauge (32 x 63 x 1.6 mm) steel sections, reinforced as necessary for leg attachment.
4. Apron shall not be less than 1½ inch (38 mm) x 4 inch (114 mm) 16 gauge (x 1.6 mm thick) channel steel sections, reinforced as necessary for leg attachment. Legs shall not be less than 2 inch (50 mm) x 2 inch (50 mm) 16 gauge (x 1.6 mm thick) square tubular steel sections. Leg rails shall not be less than 1¼ inch (32 mm) x 2½ inch (63 mm) 16 gauge (x 1.6 mm thick) steel sections, reinforced as necessary for leg attachment. Each leg shall have a recessed leveling screw and a black, coved vinyl or rubber leg shoe, 2 inches (50 mm) in height. Where indicated on the drawings, provide apron support rails; drawer unit, hardware and suspension as specified for base unit drawers.

6. WORK SURFACE

Work surface to be made of granite 20 mm thick high quality granite in Jet black colour with the edges having round profiles of Radius / chamfer on top side. The overhang of granite will be 25 mm at front side of understructure or as per requirement. It has good chemical resistance, high scratch & wear resistant and good cleaning ability.

7. SINK AND WATER TAPS

Good quality chemical resistance PP / Ceramic / SS sink will be provided. The lab tables to be supplied with PP moulded sinks, black in colour and with integral 50mm pipe threaded drain outlet as a one piece unit. Sink shall be injection moulded from pure polyolefins/ co-polymer material with inside corners covered, under counter mounted with all necessary fittings-such bottle traps, couplings etc. and fitted properly with sealants. PVC pipe lengths as required to connect to floor drain pipe at floor. Work includes making connections, checking connections at pressure of 2kg for 24 hours and making water tight joints. Water Drain inlet shall be minimum 25mm internal dia .Sink will be supplied along with tap for raw water supply as per the specified make. The sink unit will have 3-way (02 straight + 1 swan neck) water tap made up of brass with powder-coated finish.

8. PEG BOARD

Peg boards on sink will be of white colour Acrylic (10mm thick) with white colored 28 nos. of pegs having a drip tray and flexible tube of at least 600 mm length to drain the excess liquid from glass wares to sink. Pegboards shall be fixed on wall or on furniture at accessible height as per drawings and prevalent site situation. Size of peg board will be as per manufacturer's specs.

9. EYE WASH

Eye-wash on sink will be single eye-wash with brass body and having anti-corrosive epoxy coating, inclined and flexible, complying to ANSI standard and regulated spray, working on 1.5 bar pressure. All eye showers are delivered with water regulating devices ensuring 11.5 L/min for eye wash, constant adequate water flow regardless of high water pressure and to be fitted with back flow preventer.

10. FLAMMABLE CABINET STORAGE

Flammable storage cabinets will be FM approved for liquid and solid flammables in accordance with NFPA code 30, static grounding bolt. 45 gallons, 3 point self-latching standard (non-sparking) 2-door, Double wall construction with 1 ½" air space, Finished in 2 part urethane paint, Galvanized steel shelving, Two 2" vents with flash arrestors, Flush mounted locking handle as per manufacturer's specification, Leak proof sill 2" deep, Reinforced 18-gauge all-welded construction, Adjustable zinc plated leveling legs & having Large Warning label on the external side of the doors.

11. ELECTRICAL FITTINGS

Each electrical module consists of 16 Amp 3/5 pin socket and Industrial sockets with MCB as per IP-55. Configuration of switch sockets: For Standing table: 2 nos of 230 V, 6+16 A, 3 pin sockets with MCB at every 1.5 meter length center to center. For Sitting Table: 4 nos. of 230 V, 6+16 A, 3 pin sockets with MCB at every 1.5 meter length center to center.

12. SERVICE LINES

Service lines will be provided with inlet, outlet for water supply, drainage lines, pneumatic lines which runs as per requirement. Service lines (water line, and drainage line) below the Reagent shelf having 4/5 levels stand to provide support for service lines from supply point to the required workstation.

Water supply line for laboratory is as per below: -

- a. From over head tank up to Laboratory 1" thick
- b. Inside the Laboratory the pipe line laid in 15 mm thick pipeline
- c. The water supply pipeline from the ground to tap in wash basin should be 1/2" flexible hose