Department of Botany

University of Delhi

GENERAL INFORMATION ABOUT TENDER NOTICE

A tender document has been uploaded on the DU website *http://www.du.ac.in/du/index.php?page=tenders-quotations* for commissioning of laboratory furniture and associated items to be installed in teaching laboratories. The document contains 21 pages and two separate layouts for laboratories 26 and 22.

Financial bid is to be submitted in the provided format and the links to the format are available in the document (see page no. 4).

Please remember to enclose two Bankers Cheques as follows:

a) 2000 Rs. in favour of the Registrar, University of Delhi, Delhi to cover the cost of tender document and
b) 50000 Rs. to cover the unrest money deposit in favour of the Registrar, University of Delhi, Delhi.

OPENING DATE FOR TENDER: 27 NOVEMBER 2014

CLOSING DATE FOR TENDER: 26 DECEMBER 2014

Department of Botany

University of Delhi

November 27, 2014

TENDER NOTICE

The Department of Botany invites sealed tenders under a two-bid system from eligible manufacturers/authorized dealers for the establishment of a complete laboratory set-up (including modular laboratory furniture, PP sinks, chemical storage cabinet, fume hood, ventilated chemical storage cabinet) as per the specifications and attached layout plan in Laboratory Nos. 26 and 22 of the Department of Botany, University of Delhi, Delhi. The vendors intending to bid may download the format for the Financial bid, specifications, terms and conditions and other details from the University website (http://www.du.ac.in/du/index.php?page=tenders-quotations) and submit their bid to **Head, Department of Botany, University of Delhi, Delhi-110007** within 28 days of this call.

TERMS AND CONDITIONS OF THE TENDER

TENDER COST:

The cost of the tender document is INR 2000 and bidders should enclose a banker's cheque/demand draft in favor of "Registrar, University of Delhi" along with their bids. Tenders not furnishing the tender cost will be rejected. The tender cost is non-refundable.

SUBMISSION AND PERIOD OF THE TENDER:

Filled tender document should be submitted to Room No.1, Department of Botany, University of Delhi Main Campus, Chattra Marg before 5.30 p.m. on December 26, 2014.

EARNEST MONEY DEPOSIT (EMD):

An earnest money deposit of INR 50,000 should be enclosed along with the bids. The banker's cheque/demand draft should be made in favor of "Registrar, University of Delhi". The EMD of the unsuccessful tenders will be refunded. EMD of the successful bidder will be

returned after furnishing of the performance bank guarantee (PBG) by the bidder. The validity of the EMD must be 60 days beyond the bid validity period.

PERFORMANCE BANK GUARANTEE (PBG):

The vendor, to whom order is placed, shall furnish a performance bank guarantee (issued by a scheduled bank) equaling to 10% of the total cost of the purchase order. The performance guarantee shall remain valid for the entire tenure of warranty period plus additionally for another 60 days.

WARRANTY PERIOD AND POST-WARRANTY SERVICE REQUIREMENT:

The material or goods are to be warranted for a period of at least 3 years after installation and commissioning against manufacturing defect and bad workmanship. The warranty period specified will commence from the date of handing over the items. Moreover, it should be certified that parts and servicing of the installed items would be available (on a chargeable basis) for at least another 15 years after the lapse of warranty period.

PAYMENT TERMS:

Up to 30% of the total purchase order will be released against an equivalent bank guarantee (BG). Additional 50% payment will be released on the supply of the material. Remaining 20% will be released after successful installation and completion of work. BG furnished for the 30% advance payment will be released after satisfactory progress of the work and on the recommendation of the committee. The BG should be furnished in favor of "Registrar, University of Delhi" from a scheduled bank.

AGREEMENT CLAUSE:

Successful firm will be required to enter into an agreement with University of Delhi. The agreement will be executable of a non-judicial paper of INR 100 stamp value.

TIMELINES AND SCHEDULES:

Total period of completion of the work is 150 days from the date of issue of the purchase order as shown below:

Supply of material: Within 90 days from the date of issue of purchase order/work order.

Complete Installation: Within 60 days of supply of material.

Disclaimer: *All efforts will be made by the Department to ensure that laboratories are available to initiate installation. However, in case the labs are not available because of the teaching schedule, Purchase Committee would adequately extend the time required for installation.*

LIQUIDATED DAMAGE CLAUSE:

The firm/dealer to whom the order will be placed should strictly stick to the timelines and a delay in supply would attract liquidated damage clause applicable @0.5%/week and maximum of 10% of the purchase order value of the material not delivered in time. The decision of the department purchase committee will be final.

PENALTY CLAUSE:

In case the successful bidder is not able to finish the installation in the stipulated time (as communicated by the Purchase Committee) a penalty @1% of the invoice value will be levied per week subject to a maximum of 10% of the order value. The decision of the department purchase committee will be final.

FORFEITURE CLAUSE:

1) If the firm fails to commence the work within a reasonable period, EMD shall be forfeited.
2) In case the firm to whom contract is awarded fails to perform its part of obligation till expiry of the warranty period, the PBG furnished by the firm will be forfeited.

TERMINATION CLAUSE:

University of Delhi is empowered to terminate the contract if the progress/workmanship is found unsatisfactory till the completion of the project. Under no circumstances, the material supplied/used will be returned to the vendor.

RISK PURCHASE CLAUSE:

In the event of the contractor has not completed the entire work or if any balance work is left over, University will complete the leftover work through risk purchase clause.

SETTLEMENT OF DISPUTE THROUGH ARBITRATION:

Vice-Chancellor will have an absolute authority to appoint an arbitration committee to settle the dispute.

JURISDICTION CLAUSE:

Any disputes should be settled under the Delhi Jurisdiction.

FINANCIAL BIDS:

Financial bids of only the vendors whose technical bids meet the specifications mentioned in the tender document will be opened. Financial bid should be placed in a separate sealed envelope. Financial bid should be made in INR and should contain Bill of Quantity (BOQ). The format for the BOQs for Labs 22 and 26 are provided as excel files and can be downloaded by clicking the following links:

a) Link for downloading BOQ for Lab No. 22
b) Link for downloading BOQ for Lab No. 26

The bidder is required to fill in the rate and value of the material mentioned in the BOQ and enclose it along with the Financial Bid. The rates quoted for the items should be kept firm for the entire period of the contract. No revision or enhancement or escalation will be allowed in any case.

V. P. Singh
Professor and Head
Department of Botany
University of Delhi Main Campus
Chattra Marg
Delhi-110007

GENERAL INSTRUCTIONS

The bidders will have to quote all the items together, partial quotes will not be considered.

Quantity, make, model and technical specifications of each item should be mentioned clearly. Any alteration/overwriting should be initialized. The bidders must fulfill the eligibility conditions given below and submit documentary evidence in support of their fulfilling these conditions along with the Technical Bid. Financial bids of only the vendors whose technical bids meet the specifications mentioned in the tender document will be opened. Financial bid should be a separate document and should be placed in a separate sealed envelope.

ELIGIBILITY CRITERIA:

a. The bidder should be an ISO 9001 – 2008, ISO 14001 – 2004 and OHSAS 18001:2007 (For Manufacturing, Supply and installation of fume hood systems, Equipment's & Laboratory Furniture) certified manufacturer or authorized dealer for the supply and installation of complete laboratory facilities including furniture, sinks, stools, storage cabinets and fume hoods. Bidders/vendors should attach proof of their ISO/OHSAS certification and specify each item for which they have the certifications.
b. **The bidder should have manufacturing facilities within country or abroad for at least last 20 years with focus and experience on related business, as on 31-10-2014**. However in case when bidder is an authorized dealer of any manufacturing concern, the above clause is applicable for that manufacturing concern for which bidder is authorized dealer. **The manufacturer should also have a minimum average annual turnover of Rs. Twenty crores over the last three years**. Supporting documentary evidences must be attached.
c. The bidder should have prior experience in the establishment/installation of similar facilities in reputed public and/or private educational/research institutions. They should clearly indicate the nature of the work executed along with names of the institution(s). Proof of recent purchase orders for supply of similar items is to be attached.
d. The bidder should clearly specify their identity (with documentary evidence) – whether the bidder is a manufacturer or an authorized dealer.

e. The bidder should mention whether service backup could be provided in Delhi/NCR?
f. The bidder should submit the latest **Income Tax and VAT certificates**.
g. Technical bids must include technical specifications and printed technical brochures/catalogs and product leaflets with complete details.
h. The Financial bid should contain particulars like name and address of the bidder. The net rate including all taxes and other statutory levies with a proper break up for the same should be clearly indicated. The financial bid should also clearly state that the charges for delivering the material up to the point of installation and any applicable levies. The bid should be formulated so as to provide maximum educational discounts and other applicable discounts.
i. Warranty terms and conditions, delivery time and Installation time required should be clearly specified. The period of warranty will start only after successful installation and satisfactory operation.
j. The rates of the quoted items should be kept firm for **the entire contract period** from the last date of tender submission. No revision in rates/prices will be allowed.
k. The rate should be quoted for each item with specification and model if applicable and should be indicated clearly both in words and figures.
l. After acceptance of the tender, the bidder will have no right to withdraw his tender or claim a higher price. Tenders with incomplete information will be summarily rejected.

Supply and Installation:

a. The supply and installation of furniture and other accessories should be made strictly in accordance with the specifications as mentioned in the techno-commercial bid. The supply and installation should be as per the delivery schedule specified in bid. The guarantee period takes effect from the date of satisfactory installation. The bidder shall be liable to make good the loss by replacing the furniture or other accessories found defective during the guarantee period. The equipment hardware should be installed in the premises of the University at the cost and risk of the bidder. University should not be held responsible for accidents involving personnel/property during furniture unloading and installation. In case University's property is damaged during furniture unloading or installation, it will be bidder's responsibility to bear the cost of repair.
b. Documents such as operation manuals, user manuals and circuit diagrams and other relevant materials shall be provided by the bidder along with equipment, free of cost.

c. If the supply, installation and commissioning of the items are not effected before the specified period from the date of purchase order, the University shall have the authority to cancel the order and to take any such action which will be deemed fit in the circumstances.
d. If any manufacturing or other technical defects are found within the specified months from the date of installation, commissioning and handing over the system to the Department of Botany, the same will have to be rectified or replaced free of cost by the supplier.
e. Any electrical wiring or plumbing work required for installation of the furniture would be borne by the bidder. Repairs of damage to existing infrastructure of the Department during the installation would be the responsibility of the bidder. The electricity and the water connections will be provided to the nearest point.

PRE-QUALIFICATION CRITERIA

1) The laboratory fume hoods must confirm to the following regulations and standards.
   a) ASHRAE 110-1995, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Method of Testing Performance of Laboratory Fume Hoods.
   b) EN-14175, The European Standard EN *14175*:2003, Method of Testing Performance of Laboratory Fume Hoods.
2) The bidder should have in house ASHRAE 110: 1995 and EN 14175:2003 fume hood test facility. Past ASHRAE and EN test reports and photographs of this test facility must be attached to the technical bid. Such facility might be visited by any/team of senior officials of the organization.
3) At least 3 Customer feedback forms stating the quality of work and overall feedback of Project Values of at least Rupees 1 Crore for one project and Rupees 40 Lakhs each for the remaining two projects.
4) Bidder/parent Company should have SEFA (Scientific Equipment and Furniture Association) Membership Certificates for Last three years on a continuous basis.
5) Bidder/parent company has to submit:
   a) Test Report: Fume Hood to be type-tested as per EN 14175 by a third-party.
   b) Test Report: Fume Hood to be type-tested as per ASHRAE 110 by a third-party.
   c) Test Report: Furniture module as per SEFA standard by third party. All certificates need to be attached by bidder.
6) The bidder or its parent company in India or abroad should have a well-established (their own) in-house manufacturing unit for the steel lab furniture and fume hood, quality management system as per International standards. The bidder or its parent company in India or abroad should possess the current/valid approval for such items manufacturing facility by a statutory certifying authority, like factory inspector etc. Manufacturers should have 100% modern and sophisticated manufacturing facility having strict quality checks at every level.
7) 1000 hour salt spray test report (by third party) for powder coating quality assurance must be submitted.
8) Material of construction for the Fume hood should be GI (Galvanized Iron) 1-1.3mm.
9) Bidder/parent Company will have to submit a “No Deviation” compliance sheet, any deviation from the technical specification will lead to cancellation.

SPECIFICATIONS

SPECIFICATIONS FOR THE LAB NO. 26

The furniture in the lab is to be designed as per the attached drawing/figure in the annexure. The lab in the drawing/figure is indicated as "Lab No.-26". All the benches (including island, wall, sink unit, teacher bench) and fume hood should be made on C-frame. This lab will contain the following:

a) 4 Island benches (labeled as 3,4,5 and 6) with reagent rack
b) 2 Wall benches (labeled as 2 and 7)
c) 1 Safety shower and one sink unit table (labeled as 1)
d) 1 Fume hood and chemical storage cabinet with ducting
e) 6 Wall storage units and 4 full heighted file storage cabinets
f) 2 Slotted angle racks, and,
g) 1 Teacher sitting bench

The laboratory workbench should be made of epoxy based powder coated/epoxy coated (thickness of 70-90 micron) prime-grade GI steel with black granite top as per the configuration shown in the annexure drawing. The modules should be provided in CKD (completely knocked down) and should be erected at site as per the layout. The steel should be appropriately treated to be free of ragged edges, scratches or other injurious surfaces. The gauge of the GI sheet should be of at least the following thickness:

SIDES, TOP, BOTTOM, BACK, SHELVES, DRAWERS, END COVER PANELS	1 mm
SHUTTERS, DRAWER FRONTS, STIFFENERS	1 mm
HINGE PLATES, SHELF BRACKETS	1.6 mm
C-Frame	30 x 60 x1.5 mm

All steel surfaces should be coated with a corrosion-resistant finish, at all places that are accessible to moisture, using epoxy based powder coating or epoxy coating process. Surfaces to be coated include the inside of cabinet doors and drawer heads, behind all cross rails, all inside surfaces underneath the cabinet interior bottom panel, inside front and rear posts, inside of sub-base members, and behind adjustable shelf front and back edges. Baking at elevated temperatures to provide maximum resistance to corrosion and wear

should be done to cure the coating. The tabletops should be of 18/19mm Jet-black Granite of an even surface. The front edge of the granite should be chamfered and smoothened. Granite should have a groove on the bottom surface to prevent spillage of chemical over the furniture.

Sink Unit Table (Labeled 1 in annexure drawing):

This table consists of only a sink unit. The table will have an under bench sink unit and the sink size will be of size 800 mm x 450 mm x 325 mm (LxBxD). There will be a pegboard (along with a collection tray) mounted on the table. Three-way water tap should be provided on the sink unit. A under bench sink module of dimension 900 mm x 570 mm x 675 mm should also be provided.

Island laboratory workbenches (Labeled 3-6 in the annexure drawing)

Four island benches are to be designed as per the drawing (in annexure). Each of these benches is without any modules. A reagent rack should be given on each table. Size of the benches will be approximately 5680 mm x 750 mm x 900 mm (LxBxH). The height of the bench should be 900 mm inclusive of the granite thickness. Each table should be provided with a reagent rack for the entire length of the table. Reagent racks should be designed as per annexure drawing and are to be fixed on the workbench. Each Reagent racks will have 16 numbers of 6/16 Ampere sockets with tiny MCB of reputed make.

Reagent Rack

A single tier reagent rack should be provided for the entire length of all the 4 island benches. It should be made of GI sheet, with both sides coated with epoxy based powder coating. The height and depth of the rack should be 400 mm x 300 mm. A polypropylene sheet should also be provided for each rack so that reagent bottles can be placed on the sheet rather than on the rack directly. The electrical sockets should be placed on the face of the rack.

Wall laboratory instrument bench (Labeled 2 and 7 in the drawing)

The wall laboratory bench numbered 2 will have 5 modules, 2 sink units and 4 spaces for legs. The dimension of the table is 6360 mm x 750 mm x 900 mm (LxBxH). There will be pegboard-mounted on/above both the sinks. The size of the pegboards will be 750 mm x

750 mm (LxB) and each will have 30 pegs with a stainless steel collection tray. One of the sinks will have portable eyewash unit with a single output.

The wall laboratory bench numbered 7 will have 5 modules and 5 spaces for legs. The dimension of the table is 5310 mm x 750 mm x 900 mm (LxBxH). The height of the tables should be inclusive of the granite thickness. CED coated self-closing hinges should be provided on all cupboard doors and should be installed near the pivoting edge of the door. Welding of hinges to door or case will not be accepted. The sizes of the modules and overhead storage will be as follows:

Wall Bench No.	**Total Size of the table (LxBxH in mm)**	**Size of the Modules**	**Number of the Modules**	**Leg Space distance (mm)**	**Format of the Modules**
Wall bench # 2	6360 x 750 x 900	a) 450 mm x 570 mm x 675 mm b) 600 mm x 570 mm x 675 mm	4 1	600	1 drawer + 1 cupboard (Cupboard with 1 adjustable shelf)
Wall bench # 7	5310 x 750 x 900	a) 450 mm x 570 mm x 675 mm	5	600	1 drawer + 1 cupboard (Cupboard with 1 adjustable shelf)

Electrical duct should be provided on entire wall laboratory instrument bench with 8 numbers of electrical points on it. Each electrical point includes two 5 pin sockets of 16 A (amperes) + 6 A and two tiny trip MCB (16 ampere).

Teacher Table (Labeled No. 8 in drawing):

The Teacher Table labeled no. 8 in annexure drawing will have 2 modules and 2 spaces for legs. The dimension of the table is 2160 mm x 750 mm x 800 mm (LxBxH). Modules dimensions are 450 mm x 570 mm x 525 mm (LxDxH). The height of the tables should be inclusive of the granite thickness. CED coated self-closing hinges should be provided on all cupboard doors and should be installed near the pivoting edge of the door. Welding of hinges to door or case will not be accepted.

Slotted Angle Racks:

Two number of slotted angle racks are to be placed in the lab as per the drawing. They should be made up of GI and coated with epoxy based powder coating or epoxy. The dimensions of each rack are 1000 mm x 450 mm x 1800 mm (LxBxH).

Polypropylene molded sinks:

The sinks should be injection molded from Polypropylene polymer resin. They should have a self-draining base and should be suitable for mounting on the top or underside of workbenches. The dimensions of the sink are 550 mm x 450 mm x 300 mm (LxBxH). The sinks should be at least 6 to 7 mm thick and should not distort. The sinks should be provided with a bottle trap. It should have good tensile strength, ductility and abrasion resistance and should be stable over the range of temperatures normally encountered in research laboratories. Molded polyethylene cup drains should be molded in one piece of acid resistant polyethylene. The drainpipe used should be resistant to chemicals used in research laboratories.

Specifications for the ducted Fume Hood:

A ducted fume hood of 1800 mm x 900 mm x 2400 mm (LxWxH) dimensions should be supplied for the laboratory. The working bench height of the hood should be 900 mm. The fume hood superstructure should be made of GI sheet with 70-90 micron epoxy based powder coating or GI sheets with pure epoxy coating of 50-70 microns. The interior liner panels should be removable without disassembly of the frame structure and outer steel panels. Likewise the exterior steel panels should be removable without disassembly of the frame structure and inner liner panels. The ceiling enclosure should be made of minimum 1.25 mm thick GI sheet. This should be epoxy-based powder/epoxy coated on all sides. The tabletop should be made of 18±1 mm granite and skirting of 15 mm from all sides for no chemical spillage. The sash frame should be made of stainless steel (SS 304). A combination sash made of at least 5 mm toughened glass should be provided and it should be operated by counterweight mechanism. The sash guides and the pulley system should be made of corrosion resistant material. The airflow of the hood should be low constant volume (LCV) type. A stable non-adjustable baffle should be provided to aid in distributing the flow into and through the hood. The baffle should be removable for cleaning. The fume hood lining

on the inside should be of phenolic resin laminate (PRL) sheet. The liner should have a proper punching and coordination with the remaining pieces of the assembled fume hood superstructure. At least two Fluorescent lights (40 watt each) with vapor-proof fitting for proper illumination (Intensity of approximately 400 lux at the worktop level), should be provided. The hood superstructure should be pre-wired and contain wire guard, connections, fixtures and wire color-coding. Six 6/16-ampere electrical sockets and 16 A tiny MCB of reputed make should be provided. A DOL (direct online) starter should be provided for the blower motor. The wiring should terminate in a service junction box located on the fume hood roof. Remotely operated color codes service valves SS breaded flexible hose and brass fittings and spouts should be fitted in the hood. A damper should be provided at the outlet of hood to regulate the airflow. The fume hood worktop should be provided with an oval shape 100 mm x 200 mm PP cup sink. Base cabinet for chemical storage should be provided under the fume hood. The base cabinet should be on castors. The storage units should be epoxy/epoxy based powder coated and in attractive color combinations. These units should have shutters, one fixed shelf with FRP or PP trays. The complete base cabinet should be coated with either 3 mm fiber reinforced vinyl ester or 3 mm PP. Connections are required for N_2, air and vacuum in the hood. Service line for water should be provisioned (the water line will supplied to the nearest possible point). All utilities should be provided as asked.

The fume hood should be ducted with chemical resistant PP + FRP (3 mm + 2 mm) rigid and flexible ductwork. It should be originate from fume hood up to the exhaust stack point with weatherproof canopy. Total ducting should be both with horizontal and vertical members, flanges, bends, bracketed supports and gooseneck exhaust stack.

The centrifugal blower should be SISW type and made of chemical and heat resistant PP material. It should have a FRP blower with aerodynamically balanced PP impeller and a drain plug. The air suction capacity should be 700 CFM confirming to international face velocity norms and as per safe fume hood airflow pattern. The motor used should be 'Crompton/LHP/Other Reputed' make, 1.5 HP-3 Phase TEFC, IP 55, Class F, continuous rating as per IS 325. The fume hood should be tested for face velocity at the site after installation.

Ventilated Chemical Storage Cabinet:

Overall dimensions of ventilated chemical storage cabinet should be 1000 mm L x 450 mm D x 1800 mm H. External body should consist of a powder coated aluminum frame. On three

sides of the cabinet a sheet of phenolic resin laminate (PRL) should be enclosed in the frame. On the front a glass shutter should be enclosed in the frame. Total number of shelves should be five and thickness of PRL shelves should be at least 6 mm thick with load carrying capacity of up to 50 Kg. Tray made up of PRL is to be designed at bottom to collect spoilage and one PP drain pipe should be connected to all 5 shelves for spoilage collection. Cabinet should be connected to the nearest duct pipe with a flexible hose on the top to suck the fumes along with air. A manual setting BFV should be provided to control the flow of air. A suitable blower should be provided based on location & other factors.

Full Height Storage cabinets:

Floor Mounted Full Height File/Glass Storage Cabinets (Float Glass Door) should be made of GI and epoxy based powder/epoxy coated. The cabinet should consist of two shutters with four adjustable and one fixed shelf. The size of the cabinet should be of the dimensions 1000 mm x 450 mm x 1800 mm (LxWxH).

Wall Mounted Storage cabinets:

Wall Mounted File/Glass Storage Cabinets (Float Glass Door) should be made of GI and epoxy based powder/epoxy coated. The cabinet should consist of two shutters with one adjustable shelf. The size of the cabinet should be of the dimensions 750 mm x 370 mm x 750 mm (LxWxH).

Emergency Shower and Eye wash Unit

The bidder should also provide an emergency shower and eye wash unit. The unit should be floor mounted open type and made of GI pipes.

Peg Boards

Peg Boards of 750 mm L x 750 mm H made up of acrylic sheet at least of 10-15 mm thickness with 30 pegs of pegs should be supplied. A SS collection tray should be provided. All the pegboards are to be mounted on the table.

SPECIFICATIONS FOR LAB NO. 22

The furniture in the lab is to be designed as per the attached drawing/figure in the annexure. The lab in the drawing/figure is indicated as "Lab No.-22". All the benches (including island, wall, sink unit, teacher bench) and fume hood should be made on C-frame. This lab will contain the following:

a) 2 Island benches (labeled as 3 and 4) with reagent rack
b) 2 Wall benches (labeled as 2 and 5)
c) 1 Safety shower and one sink unit table (labeled as 1)
d) 1 Fume hood and Inflammable Chemical Storage cabinet
e) 6 Wall storage units and 4 full heighted file storage cabinets
f) 2 Slotted angle racks, and,
g) 1 Teacher sitting bench

The laboratory workbench should be made of epoxy based powder coated/epoxy coated (thickness of 70-90 micron) prime-grade GI steel with black granite top as per the configuration shown in the annexure drawing. The modules should be provided in CKD (completely knocked down) and should be erected at site as per the layout. The steel should be appropriately treated to be free of ragged edges, scratches or other injurious surfaces. The gauge of the GI sheet should be of at least the following thickness:

SIDES, TOP, BOTTOM, BACK, SHELVES, DRAWERS, END COVER PANELS	1 mm
SHUTTERS, DRAWER FRONTS, STIFFENERS	1 mm
HINGE PLATES, SHELF BRACKETS	1.6 mm
C-Frame	30 x 60 x1.5 mm

All steel surfaces should be coated with a corrosion-resistant finish, at all places that are accessible to moisture, using epoxy based powder coating or epoxy coating process. Surfaces to be coated include the inside of cabinet doors and drawer heads, behind all cross rails, all inside surfaces underneath the cabinet interior bottom panel, inside front and rear posts, inside of sub-base members, and behind adjustable shelf front and back edges. Baking at elevated temperatures to provide maximum resistance to corrosion and wear should be done to cure the coating. The tabletops should be of 18/19mm Jet-black Granite of an even surface. The front edge of the granite should be chamfered and smoothened.

Granite should have a groove on the bottom surface to prevent spillage of chemical over the furniture.

Sink Unit Table (Labeled 1 in annexure drawing):

This table consists of only a sink unit. The table will have an under bench sink unit and the sink size will be of size 800 mm x 450 mm x 325 mm (LxBxD). There will be a pegboard (along with a collection tray) mounted on the table. Three-way water tap should be provided on the sink unit. A under bench sink module of dimension 900 mm x 570 mm x 675 mm should also be provided.

Island laboratory workbenches (Labeled 3 and 4 in the annexure drawing)

Two island benches are to be designed as per the drawing (in annexure). Each of these benches is without any modules. A reagent rack should be given on each table. Size of the benches will be approximately 8000 mm x 750 mm x 900 mm (LxBxH). The height of the bench should be 900 mm inclusive of the granite thickness. Each table should be provided with a reagent rack for the entire length of the table. Reagent racks should be designed as per annexure drawing and are to be fixed on the workbench. Each Reagent racks will have 24 numbers of 6/16 Ampere sockets with tiny MCB of reputed make.

Reagent Rack

A single tier reagent rack should be provided for the entire length of all the two island benches. It should be made of GI sheet, with both sides coated with epoxy based powder coating. The height and depth of the rack should be 400 mm x 300 mm. A polypropylene sheet should also be provided for each rack so that reagent bottles can be placed on the sheet rather than on the rack directly. The electrical sockets should be placed on the face of the rack.

Wall laboratory instrument bench (Labeled 2 and 5 in the drawing)

The wall laboratory bench numbered 2 will have 3 modules, 2 sink units and 3 spaces for legs. The dimension of the table is 4710 mm x 750 mm x 900 mm (LxBxH). There will be pegboard-mounted on/above both the sinks. The size of the pegboards will be 750 mm x 750 mm (LxB) and each will have 30 pegs with a stainless steel collection tray. One of the sinks will have portable eyewash unit with a single output.

The wall laboratory bench numbered 5 will have 4 modules and 3 spaces for legs. The dimension of the table is 3660 mm x 750 mm x 900 mm (LxBxH). The height of the tables should be inclusive of the granite thickness. CED coated self-closing hinges should be provided on all cupboard doors and should be installed near the pivoting edge of the door. Welding of hinges to door or case will not be accepted. The sizes of the modules and overhead storage will be as follows:

Wall Bench No.	**Total Size of the table (LxBxH in mm)**	**Size of the Modules**	**Number of the Modules**	**Leg Space distance (mm)**	**Format of the Modules**
Wall bench # 2	4710 x 750 x 900	a) 450 mm x 570 mm x 675 mm	3	600	1 drawer + 1 cupboard (Cupboard with 1 adjustable shelf)
Wall bench # 5	3660 x 750 x 900	a) 450 mm x 570 mm x 675 mm	4	600	1 drawer + 1 cupboard (Cupboard with 1 adjustable shelf)

Electrical duct should be provided on entire wall laboratory instrument bench with 8 numbers of electrical points on it. Each electrical point includes two 5 pin sockets of 16 A (amperes) + 6 A and two tiny trip MCB (16 ampere).

Teacher Table (Labeled No. 6 in drawing):

The Teacher Table labeled no. 6 in annexure drawing will have 2 modules and 2 spaces for legs. The dimension of the table is 2160 mm x 750 mm x 800 mm (LxBxH). Modules dimensions are 450 mm x 570 mm x 525 mm (LxDxH). The height of the tables should be inclusive of the granite thickness. CED coated self-closing hinges should be provided on all cupboard doors and should be installed near the pivoting edge of the door. Welding of hinges to door or case will not be accepted.

Slotted Angle Racks:

Two number of slotted angle racks are to be placed in the lab as per drawing. They should be made up of GI and coated with epoxy based powder coating or epoxy. The dimensions of each rack are 1000 mm x 450 mm x 1800 mm (LxBxH).

Polypropylene molded sinks:

The sinks should be injection molded from Polypropylene polymer resin. They should have a self-draining base and should be suitable for mounting on the top or underside of workbenches. The dimensions of the sink are 550 mm x 450 mm x 300 mm (LxBxH). The sinks should be at least 6 to 7 mm thick and should not distort. The sinks should be provided with a bottle trap. It should have good tensile strength, ductility and abrasion resistance and should be stable over the range of temperatures normally encountered in research laboratories. Molded polyethylene cup drains should be molded in one piece of acid resistant polyethylene. The drainpipe used should be resistant to chemicals used in research laboratories.

Specifications for the ducted Fume Hood:

A ducted fume hood of 1800 mm x 900 mm x 2400 mm (LxWxH) dimensions should be supplied for the laboratory. The working bench height of the hood should be 900 mm. The fume hood superstructure should be made of GI sheet with 70-90 micron epoxy based powder coating or GI sheets with pure epoxy coating of 50-70 microns. The interior liner panels should be removable without disassembly of the frame structure and outer steel panels. Likewise the exterior steel panels should be removable without disassembly of the frame structure and inner liner panels. The ceiling enclosure should be made of minimum 1.25 mm thick GI sheet. This should be epoxy based powder/epoxy coated on all sides. The tabletop should be made of 18±1 mm granite and skirting of 15 mm from all sides for no chemical spillage. The sash frame should be made of stainless steel (SS 304). A combination sash made of at least 5 mm toughened glass should be provided and it should be operated by counterweight mechanism. The sash guides and the pulley system should be made of corrosion resistant material. The airflow of the hood should be low constant volume (LCV) type. A stable non-adjustable baffle should be provided to aid in distributing the flow into and through the hood. The baffle should be removable for cleaning. The fume hood lining on the inside should be of phenolic resin laminate (PRL) sheet. The liner should have a proper punching and coordination with the remaining pieces of the assembled fume hood superstructure. At least two Fluorescent lights (40 watt each) with vapor-proof fitting for proper illumination (Intensity of approximately 400 lux at the worktop level), should be provided. The hood superstructure should be pre-wired and contain wire guard, connections, fixtures and wire color-coding. Six 6/16-ampere electrical sockets and 16 A tiny

MCB of reputed make should be provided. A DOL (direct online) starter should be provided for the blower motor. The wiring should terminate in a service junction box located on the fume hood roof. Remotely operated color codes service valves SS breaded flexible hose and brass fittings and spouts should be fitted in the hood. A damper should be provided at the outlet of hood to regulate the airflow. The fume hood worktop should be provided with an oval shape 100 mm x 200 mm PP cup sink. Base cabinet for chemical storage should be provided under the fume hood. The base cabinet should be on castors. The storage units should be epoxy/epoxy based powder coated and in attractive color combinations. These units should have shutters, one fixed shelf with FRP or PP trays. The complete base cabinet should be coated with either 3 mm fiber reinforced vinyl ester or 3 mm PP. Connections are required for N_2, air and vacuum in the hood. Service line for water should be provisioned (the water line will supplied to the nearest possible point). All utilities should be provided as asked.

The fume hood should be ducted with chemical resistant PP + FRP (3 mm + 2 mm) rigid and flexible ductwork. It should be originate from fume hood up to the exhaust stack point with weatherproof canopy. Total ducting should be both with horizontal and vertical members, flanges, bends, bracketed supports and gooseneck exhaust stack.

The centrifugal blower should be SISW type and made of chemical and heat resistant PP material. It should have a FRP blower with aerodynamically balanced PP impeller and a drain plug. The air suction capacity should be 700 CFM confirming to international face velocity norms and as per safe fume hood airflow pattern. The motor used should be 'Crompton/LHP/Other Reputed' make, 1.5 HP-3 Phase TEFC, IP 55, Class F, continuous rating as per IS 325. The fume hood should be tested for face velocity at the site after installation.

Inflammable Chemical storage cabinets:-

Yellow Safety Cabinets for Flammables should have manual closing type 2 doors. It should be of approved listing/regulations - FM, N, O, U (see below)

Capacity should be approximately 170 liters with external dimensions- 65" H x 43" W x 18" D (1651 mm x 1092 mm x 457 mm) and should have two Adjustable Shelves.

Abbreviation:

FM – FM Global tested and approved

N – Designed in accordance with National Fire Protection Association (NFPA) code 30 regulation

O – Complies with OSHA Regulations

U – Complies with either the International Fire Code or NFPA 1, Uniform Fire Code

Designed to meet OSHA and NFPA standards, cabinets should be sturdy and constructed of all-welded, 18-gauge (1mm), double-walled steel with 1.5" (38mm) of insulating air space for fire resistance. Fail-safe, 3-point self-latching system should be provided for easy, positive door closure. Three durable stainless steel bullet latches should be provided for optimum longevity with increased heat resistance. The handle should be pad lockable and the cabinet should have galvanized steel spill slope shelves.

Full Height Storage cabinets:

Floor Mounted Full Height File/Glass Storage Cabinets (Float Glass Door) should be made of GI and epoxy based powder/epoxy coated. The cabinet should consist of two shutters with four adjustable and one fixed shelf. The size of the cabinet should be of the dimensions 1000 mm x 450 mm x 1800 mm (LxWxH).

Wall Mounted Storage cabinets:

Wall Mounted File/Glass Storage Cabinets (Float Glass Door) should be made of GI and epoxy based powder/epoxy coated. The cabinet should consist of two shutters with one adjustable shelf. The size of the cabinet should be of the dimensions 750 mm x 370 mm x 750 mm (LxWxH).

Emergency Shower and Eye wash Unit

The bidder should also provide an emergency shower and eye wash unit. The unit should be floor mounted open type and made of GI pipes.

Peg Boards

Peg Boards of 750 mm L x 750 mm H made up of acrylic sheet at least of 10-15 mm thickness with 30 pegs of pegs should be supplied. A SS collection tray should be provided. All the pegboards are to be mounted on the table.