

Notice Inviting Tender

For

Supply & Installation of

LABORATORY FURNITURE, FUMEHOOD

AND EXHAUST SYSTEM



NIT No : J-11019(033)/2015-16/S&P

Issue Date : 20-06-2016

Pre-Bid Meeting : 04-07-2016

Last Date of Submission : 25-07-2016, 12.00 NOON

Tender opening date (Technical bid): 25-07-2016, 3.00 PM

All India Institute of Medical Sciences,
Bhubaneswar

Website: www.aiimsbhubaneswar.edu.in

Chapter I- Instruction to bidders

Notice Inviting Tender

All India Institute of Medical Sciences, Bhubaneswar

Email: info@aiimsbhubaneswar.edu.in
www.aiimsbhubaneswar.edu.in

All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha, an Apex Healthcare Institute, established by an Act of Parliament under aegis of Ministry of Health & Family Welfare, Government of India, invites sealed tenders in two-bid system for supply of the following items at the Institute. Intending Tenderers are requested to quote their best offer along with the complete details of specifications, Terms & Conditions.

S.No.	Item Description	Quantity	Tender Fee	EMD Amount
1.	LABORATORY FURNITURE, FUMEHOOD AND EXHAUST SYSTEM	As per Specification	₹ 2,000/-	₹ 3,00,000/-

(Refer Details as per chapter-‘III’)

Tender(s) should be sealed and Superscribed with Tender Number and Address to:

“Administrative Officer”

All India Institute of Medical Sciences,
Patrapada, Sijua
Bhubaneswar- 751019

The sealed Tender(s) should reach the Institute, latest by dt. at 1200 hrs and the Technical Bid will be opened on the same day at 03:00 PM in the Administrative Office, AIIMS, Bhubaneswar of the Institute. The bidder(s) or their authorized representative(s) may remain present at the scheduled date and time. In case the appointed date is declared Holiday the next date of opening of the Office shall be applicable for Opening of Tender.

The tender is in two- bid system i.e. Technical Bid & Financial Bid .The Technical Bid will be opened on the designated date by the Purchase Committee. The Name of the technically qualified bidders shall be hoisted in the website of AIIMS, Bhubaneswar. No paper publication shall, however, be made for this.

Schedule of Tender

Issue Date	:	Dt. 20-06-2016
Last date and time of receipt of tender	:	Dt. 25-07-2016 , at 12:00 PM
Tender Fee (non refundable)	:	Rs. 2,000/- (Rupees Two Thousand only)
Amount of Earnest Money Deposit (EMD)	:	Rs. 3,00,000/- (Rupees Three Lakh only)
Date & time of opening of tender	:	Dt. 25-07-2016 , at 03.00 PM
Venue	:	All India Institute of Medical Sciences Bhubaneswar - 751019

Chapter-II- Conditions of Contract

General Terms and Conditions

Terms & Conditions:

1. Tender Fee : The bidder shall be required to submit the Tender Fee (Non-Refunded) for an Amount of Rs.2,000/- (Rupees Two Thousand Only)) drawn in favour of the “AIIMS Bhubaneswar” in shape of Demand Drafts only, Payable at Bhubaneswar.

2. Earnest Money Deposit: The bidder shall be required to submit the Earnest Money Deposit (EMD)/ Bid Security for an amount of ₹ 3,00,000/- (Rupees Three Lakh only) In shape of FDR/BG only with Technical Bid (TENDERS NOT ACCOMPANIED WITH TENDER FEES AND EMD/BID SECURITY ALONGWITH THE TECHNICAL BID SHALL BE SUMMARILY REJECTED).

The EMD of the successful bidder shall be returned after the successful completion of contract / order and it would be returned to the unsuccessful bidders after award of the contract. No claim shall lie against the Government/AIIMS, Bhubaneswar in respect of erosion in the value or interest on the amount of Earnest Money Deposit / Security deposit.

(i) The firms who are registered with National Small Industries Corporation (NSIC) / OR Small Scale Industries (SSI) Units having NSIC Registration also are exempted to submit the EMD (Copy of valid Registration Certificate must be provided along with).

(ii) The original documents of the bidders qualified in the Technical Bid shall be subject to verification at the appointed date & time.

3. Rate: Rates should be quoted in Indian Rupees (INR) on F.O.R Basis at AIIMS, Bhubaneswar, Odisha, Inclusive of all the Charges, with break-up as:

- Basic Cost.
- VAT /CST as applicable.
- Total Cost (F.O.R at AIIMS Bhubaneswar).

4. Validity: The quoted rates must be valid for a period for 180 days from the date of closing of the tender. The overall offer for the assignment and bidder(s) quoted price shall remain unchanged during the period of validity. If the bidder quoted the validity shorter than the required period, the same will be treated as unresponsive and it may be rejected.

In case the tenderer withdraws, modifies or changes his offer during the validity period, bid is liable to be rejected and the Earnest Money Deposit shall be forfeited without assigning any reason thereto. The Tenderer should also be ready to extend the validity, if required, without changing any terms, conditions etc. of their original Tender.

5. Warranty / Guarantee: Bid must be quoted with Three (03) year comprehensive on-site warranty / guarantee and it will be started from the date of the satisfactory installation / commissioning of goods, against the defect of any manufacturing,

workmanship and poor quality of the goods or components thereof. Warranty would be followed by 5 year CMC (Comprehensive Maintenance Contract with spares) @ 3% of the cost of the Equipment with 5% increase every year. Vendor would submit list of Consumables required for running of the machine along with its cost. During the warranty and CMC period the supplier/ company should provide a minimum of 04 (four) preventive maintenance as routine services. After sales services must be provided in the city of installation. In situations requiring service or repair of the unit outside the city of installation, the expenditure on that account will have to be borne by the supplier.

6. Buy-Back Offer : In case of a availability of a new Version of the existing Equipment, Institute may go for the same for replacement on Buy-Back offer basis. The Tenderer should mention his offer for buy back of the Equipment/Machinery /Plant / Instruments/ Apparatus stating the percentage of Basic cost of the old Equipment and other condition if any.

7. Uptime guarantee: The firm should provide uptime guarantee of 95% during warranty and CMC period, with acceptance of the penalty clause in case of failure to do so.

8. Downtime penalty Clause : During the comprehensive warranty period, the uptime guarantee of 95% of 365 days will be ensured. In case the down time exceeds the 5% limit, penalty of extension of guaranty period by two days for each additional day of down time will be enforced. The vendor must undertake to supply all spares for optimal upkeep of the equipment for at least FIVE YEARS after handing over the unit to the Institute.

If accessories/other attachment of the system are procured from the third party, the vendor must produce cost of accessory/other attachment and the CMC from the third party separately along with the main offer and the third party will have to sign the CMC with the Institute if required.

The principal supplier or their service partners are required to submit a certificate that they have satisfactory service arrangements and fully trained staff available to support the uptime guarantee.

9. Risk Purchase : In case the tenderer on whom the supply order has been placed, fails to made supplies within the delivery schedule and the purchaser has to resort to risk purchase, the purchaser (AIIMS, Bhubaneswar) may recover from the tenderer (from the payment on account of subsequent supply or performance security as the case may be) the difference between the cost calculated on the basis of risk purchase price and that calculated on the basic of rates quoted by tenderer. In case of repeated failure in supplying the order goods the supply order may be cancelled and Bid/EMD/Performance security deposit will be forfeited.

10. FALL CLAUSE : If, at any time, during the said period, the supplier reduce the said prices of such Stores/Equipment or sales such stores to any other person/organization/Institution at a price lower than the chargeable, he shall forthwith notify such reduction or sale to the Director, All India Institute of Medical Sciences

(AIIMS) Bhubaneswar and the price payable for the Stores supplied after the date of coming into force of such reduction or sale shall stand correspondingly reduced.

The supplier shall furnish the following certificate to Administrative Officer, AIIMS, Bhubaneswar.

"I/We certify that the Stores of description identical to the Stores supplied to the government under the contract against Tender herein have not been offered/sold by me/us to any other person/organization/Institution upto date of bill/the date of completion of supplies against all supply orders placed during the currency of the tender/rate contract at the price lower than the institute under contract /against tender".

11. Delivery & Installation: All the goods ordered shall be delivered within **4 (Four)** week from the date of issue of supply order/ acceptance letter. All the aspects of safe delivery shall be the exclusive responsibility of the supplier. The acceptance of the Supply order (invariably sent by E-Mail) should be furnished with 7 (seven) days from the date of issue failing which it shall be treated that the firm has accepted the Supply Order.

If the supplier fails to deliver, install and commission of the goods on or before the stipulated date, then Late Delivery charges at the rate of 0.5% per week or part thereof exceeding 3 days of the total order value shall be levied subject to maximum of 10% of the total order value. (Excluding the date of issue of Supply Order / acceptance letter and date of delivery). Purchaser may also resort to termination of the Supply Order & even Tender at any time after expiry of the allowable period for supply of materials.

12. Performance Security: (a) The successful tenderer will be required to furnish a Performance Security Deposit of 10% of tender amount in the form of Fixed Deposit Receipt or Bank Guarantee from any Scheduled Bank duly pledged in the name of the "All India Institute of Medical Sciences, Bhubaneswar". The security deposit can be forfeited by this Institute in the event of any breach or negligence or non-observance of any condition of contract or for unsatisfactory performance or non-observance of any condition of the contract.

Performance Security should be kept valid upto 60 days after completion of obligations (including warranty period) under the contract.

(b) The Tenderer shall have to execute a Contract Agreement with AIIMS, Bhubaneswar while accepting the Supply order.

13. Payment Term:

- 70% payment of the total order value shall be released after the successful installation/ Commissioning of the ordered goods against the submission of the test report & on furnishing of Performance security & execution of Contract Agreement.
- Balance 30% of the order value shall be released after one month of successful installation of the item and basing upon the report of satisfactory functioning to be furnished by the User Department.

14. Bidder shall submit the Tender document and addenda thereto, if any, with each page signed and with seal to confirm the acceptance of the entire Terms & Conditions as mentioned in the tender enquiry document.
15. Compliance sheet of the Technical Specification of the goods under due signature & Seal with Technical printed literature must be enclosed with the bid.
16. After due evaluation of the bid(s) Institute will award the contract to the responsive tenderer who has quoted the lowest Cost.
17. Conditional Bids will be treated as unresponsive and therefore may be rejected.
18. ***The Institute reserves the right to accept in part or in full or reject any or more Tender / offer without assigning any reasons or cancel the tendering process and reject all Tender at any time prior to award of contract, without accepting any liability, whatsoever.***

19. TENDER EVALUATION

Tenders evaluation will be done in **two stages**:

- a. Technical bid and
- b. Financial bid.

Each bid to be submitted in separate sealed envelopes super-scribed "Technical Bid" and "Financial Bid" respectively mentioning therewith the name of Goods/Services. All these 2 envelopes should be put in another envelope marked as **"Tender for Laboratory Furniture Fume hood and Exhaust System for AIIMS, Bhubaneswar"** sealed with sealing wax.

A) TECHNICAL BID:

The firm should submit the technical bid in a sealed cover separately super-scribed **"Technical Bid for Laboratory Furniture Fume hood and Exhaust System"** along with Name and address of the Bidder. Technical bid should contain information and copy of documents as required in Chapter – IV.

The Committee constituted by the Competent Authority shall evaluate the Technical Bid on the basis of Specification as per Chapter-III & documents/ information furnished as per Chapter-IV, Make/Brand quoted; literature enclosed, sample submitted wherever asked, Demo displayed wherever required, the authorisation letter from manufacturer for the item etc. The items accepted in Technical Bid will only be considered for evaluation of Financial bid. Price should not be quoted with Technical Bid, otherwise the tender will be rejected without any correspondence.

B) FINANCIAL BID:

Should be submitted in a separate sealed envelope super-scribed the word **"Financial Bid for Laboratory Furniture Fume hood and Exhaust System"** along with Name and address of the Bidder.

The price should indicate cost on mentioned at Para /clause 3 above. Offers with price variation clause will not be accepted. The rates quoted in ambiguous terms such as "Freight on actual basis" or "Taxes as applicable extra" or "Packing forwarding extra" will render the bid liable for rejection. The Taxes of the successful bidder must be in order.

20. Applicable Law:

- The contract shall be governed by the laws and procedures established by Government of India, within the framework of applicable legislation and enactment made from time to time concerning such Commercial dealings / processing.
- Any disputes are subject to exclusive jurisdiction of Competent Court and Forum in Bhubaneswar, Odisha, India only.
- The Arbitration shall be held in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and the venue of arbitration shall be at Bhubaneswar. The decision of the Arbitrator shall be final and binding on both the parties.
- Force Majeure: Any delay due to Force Majeure will be attributable to the supplier.
Unless provide through recordal evidence.

TECHNICAL SPECIFICATION FOR LABORATORY FURNITURE, FUMEHOOD AND EXHAUST SYSTEM

INDEX

SL.	CHAPTER NAME	DESCRIPTION
1	CHAPTER-01	LABORATORY FURNITURE SPECIFICATION
2	CHAPTER-02	FUMEHOOD SPECIFICATION
3	CHAPTER-03	EXHAUST SYSTEM SPECIFICATION

CHAPTER-01

LAB FURNITURE SPECIFICATIONS

DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE

1. Section Includes:

- a. 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.
- b. 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 to the appropriate contractor.
- c. Furnish and deliver, for installation by the mechanical contractor, 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.
- d. 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.
- e. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by others, leaving the premises broom clean and orderly.

1.01 BASIS OF WORK

Laboratory Furniture as the standard of construction for steel laboratory furniture. The construction standards of this product line shall provide the basis for quality and functional installation.

a. CABINET STYLE:

Steel:

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

b. DRAWER AND DOOR STYLE:

The outer drawer and door head shall have a channel formation on all four sides to eliminate sharp raw edges of steel and the top front corners shall be welded and ground smooth. Drawer and door, when closed, shall be recessed to create an overall flush face, and with optional pull.

c. MATERIALS

General Requirements:

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

Steel:

Cold Rolled Steel:

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

2. Glass:

Glass used for framed sliding and swinging doors shall be 1/8" float glass. Glass used for unframed sliding doors, shall be 1/4" float glass. Glass used in fume hoods or other hazardous locations shall be 7/32" laminated safety float glass, except the glass shielding fluorescent lights in fume hoods shall be tempered glass to provide greater resistance to heat and impact.

3. Drawer and Door Pulls:

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

4. 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 two 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.

5. Locks:

Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity for 2000 primary key changes. Master key one level with the potential of 10 different, non-interchangeable master key groups.

6. Positive Catch:

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

7. Elbow Catches:

Elbow catches and strike plates shall be used on left hand doors of double door cases

where locks are used, and are to be burnished cast aluminum, with bright brass finish.

8. Shelf Adjustment Clips:

Shelf adjustment clips shall be nickel-plated steel.

9. Base Molding:

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

10. Sink Supports:

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

d. CONSTRUCTION

Steel Base Cabinet Construction:

a. General:

- i. 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.
- ii. 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.
- iii. 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.
- iv. Case openings shall be rabbetted on all four sides for both hinged and sliding doors to provide a dust resistant case.
- v. 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.

b. Steel Gauges:

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

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

c. Base Cabinets:

- i. End uprights shall be formed into not less than a channel formation at top, bottom, back and front. The front edge shall further offset to form a strike for doors and drawers, and shall be perforated for the support of drawer channels, intermediate rails and hinge screws. Upright filler shall be screwed in place in all cupboard units to close the back of the channel at front of the upright and to provide a smooth interior for the cupboard to facilitate cleaning. The upright filler shall be perforated with shelf adjustment holes at not more than 2" centers painted prior to assembly. The inside front of the upright shall be further reinforced with a full height 16 gauge hinge reinforcement angle.
- ii. Top horizontal rail on base cabinets shall interlock within the flange at top of end panels for strength, but shall be flush as face of unit. Top rail shall have a full width rabbet for swinging doors and drawers. Reinforcements shall be provided at all front corners for additional welded strength between vertical and horizontal case members.
- iii. Intermediate rails shall be provided between doors and drawers, but shall not be provided between drawers unless made necessary by locks in drawers. When required, intermediate rails shall be recessed behind doors and drawer fronts, and designed so that security panels may be added as required.
- iv. 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.
- v. Cabinet bottom, and bottom rail shall be formed of one piece of steel except in corner units and shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop.

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

- xiii. Steel Drawer/door assemblies shall be painted prior to assembly. Both shall be punched for attaching drawer pulls. Likewise, inner pan formation of door and drawer body shall be indented for in-field installation of locks when required.
- xiv. Doors shall be readily removable and hinges easily replaceable. Hinges shall be applied to the cabinet and door with screws. Welding of hinges to either cabinet or door will not be acceptable.
- xv. Knee space panels, where shown or specified, shall be 20 gauge, finished same as casework cabinets, and easily removable for access to mechanical service areas.

Steel Swinging Door Upper Cabinet Construction:

- d. Swinging door storage cabinets shall have a completely finished interior same as exterior.
- e. End uprights shall be formed at the front in a 1" channel formation with the inside flange formed to provide a 31/32" x 1/2" door recess. The back of the upright shall be formed to a 2-1/2" formation. 16 gauge hinge reinforcement, same as specified for BASE CABINETS, shall be welded to inner side of front uprights.
- f. Cabinet tops shall be formed into a 1" x 1-3/16" channel shape at front, with a 31/32" x 1/2" offset for door recess, and with flange at rear and sides for electro-welding cabinet top to cabinet back and ends.
- g. Cabinet flush bottoms shall be formed with a 1" wide front fascia and a 13/16" channel shape formation at front edge flanged back and up to create a door recess rabbet for dust stop.
- h. Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be set in a channel formation in cabinet back and enclosed by end uprights.
- i. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- j. Glazed swinging doors shall be 3/4" thick and consist of an inner and outer door pan welded to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, pierced for a glass opening in center of the door, with 16 gauge hinge reinforcements welded in place. Doors shall be glazed with 1/8" float glass, held

in place by a rubber or vinyl gasket around the entire edge of the glass. Outer door pan shall be pierced for a recessed flush pull

- k. Door assembly (two-piece) for solid panel swinging doors shall consist of an inner and outer door pan. Outer door pan shall be formed into a channel or flanged shape at all four sides. The corners on the pull side of the outer door pan shall be welded and ground smooth to prevent exposure of sharp edges of steel at these critical points. Inner door pan shall be flanged at all four sides with hinge reinforcements welded in place. The door assembly shall be 3/4" thick and contains sound deadening material.

11. Steel Swinging Door Full Height Cabinet Construction:

- a. Swinging door full height storage cabinets shall have a completely finished interior same as exterior.
- b. End uprights shall be formed at the front in a 1" channel formation with the inside flange formed to provide a 31/32" x 1/2" door recess. The back of the upright shall be formed to a 2-1/2" formation. A 16 gauge hinge reinforcement, same as specified for BASE CABINETS, shall be welded to inner side of front uprights.
- c. Cabinet tops shall be formed into a 1" x 1-3/16" channel shape at front, with a 31/32" x 1/2" offset for door recess, and with flange at rear and sides for electro-welding cabinet top to cabinet back and ends.
- d. Cabinet bottoms for storage cabinets shall be formed down on sides and back to create a square edge transition welded to cabinet end panels, and front edge shall be offset to create a seamless drawer and door recess rabbet for dust stop. Cabinet bottoms shall be formed to provide a flush 1" face rail with a return flange to give a 9/16" deep x 5" high toe space.
- e. Cabinet backs shall be welded to the top, bottom and ends. Backs shall be perforated for shelf adjustment holes on not more than 1" centers. Holes shall be set in a channel formation in cabinet back and enclosed by end uprights.
- f. Adjustable shelves shall be formed down 3/4", returned back 7/8" and up 1/4" into a channel formation front and rear, formed down 3/4" at each end, shelves over 42" long shall be further reinforced with a channel formation welded to underside of shelf.
- g. Toe space rails shall interlock in back of bottom rail and with end panel to provide a welding plate, and shall extend to the floor with a flange turned back 1-1/2" and turned up 3/8" for support.
- h. Glazed swinging doors shall be 3/4" thick and consist of an inner and outer door pan welded to form a single unit. Outer door pan shall be 18 gauge steel, formed into a channel or flanged shape at all four sides. It shall be pierced and formed to

create a 3" wide frame with a beveled edge around the glass opening in the center of the door. Inner door pan shall be 18 gauge steel, flanged at all four sides, pierced for a glass opening in center of the door, with a 16 gauge hinge reinforcements welded in place. Doors shall be glazed with 1/8" float glass, held in place by a rubber or vinyl gasket around the entire edge of the glass. Outer door pan shall be pierced for a recessed flush pull.

Solid panel swinging doors (two-piece) shall consist of an inner and outer pan formation, mechanically assembled after painting. All exterior surfaces shall be welded and ground smooth. Inner door pan shall be flanged for mechanical assembly. Door shall have a 14 gauge hinge reinforcement welded at hinge slot; as well as a full-height channel formation welded to inner pan. Doors shall be 3/4" thick and contains sound deadening material.

STEEL SWINGING DOOR FULL HEIGHT CABINET FOR CHEMICAL STORAGE:

The height of unit will be of 84" & Depth 22". It will have 2" dia hole in the top & until false ceiling for venting and will be connected to exhaust ducting.

Door front panel will have Louvers at Equal distance for air circulation. Each unit will have 5 nos adjustable perforated shelves.

e. PERFORMANCE REQUIREMENTS

Steel Casework Construction Performance:

- i. Base cabinets shall be constructed to support at least a uniformly distributed load 200 lbs. per square foot of cabinet top area, including working surface without objectionable distortion or interference with door and drawer operation.
- j. Base cabinet corner gussets with leveling bolts shall support 500 lbs. per corner, at 1-1/2" projection of the leveling bolt below the gusset.
- k. Each adjustable and fixed shelf 4 ft. or shorter in length shall support an evenly distributed load of 40 lbs. per square ft. up to a maximum of 200 lbs., with nominal temporary deflection, but without permanent set.
- l. Drawer construction and performance shall allow 13-5/8" clear when in an extended position and suspension system shall prevent friction contact with any other drawer or door during opening or closing. All drawers shall operate smoothly, a minimum of 10,000 cycles with an evenly distributed load of 150 lbs.
- m. Swinging doors on floor-mounted casework shall support 200 lbs. suspended at a point 12" from hinged side, with door swung through an arc of 160 degrees. Weight load test shall allow only a temporary deflection, without permanent distortion or twist. Door shall operate freely after test and assume a flat plane in a closed position.

12. Steel Paint System Finish and Performance Specification:

Steel Paint System Finish:

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

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

The completed finish system in standard colors shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS.

1. Performance Test Results (Chemical Spot Tests):

- **Testing Procedure:**

Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° ±3° F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.

- **Test Evaluation:**

Evaluation shall be based on the following rating system.

Level 0 – No detectable change.

Level 1 – Slight change in color or gloss.

Level 2 – Slight surface etching or severe staining.

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

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

- **Test Reagents**

Test No.	Chemical Reagent	Test Method
1.	Acetate, Amyl	Cotton ball & bottle
2.	Acetate, Ethyl	Cotton ball & bottle
3.	Acetic Acid, 98%	Watch glass
4.	Acetone	Cotton ball & bottle
5.	Acid Dichromate, 5%	Watch glass
6.	Alcohol, Butyl	Cotton ball & bottle
7.	Alcohol, Ethyl	Cotton ball & bottle
8.	Alcohol, Methyl	Cotton ball & bottle
9.	Ammonium Hydroxide, 28%	Watch glass
10.	Benzene	Cotton ball & bottle
11.	Carbon Tetrachloride	Cotton ball & bottle
12.	Chloroform	Cotton ball & bottle
13.	Chromic Acid, 60%	Watch glass
14.	Cresol	Cotton ball & bottle
15.	Dichlor Acetic Acid	Cotton ball & bottle
16.	Dimethylformamide	Cotton ball & bottle
17.	Dioxane	Cotton ball & bottle
18.	Ethyl Ether	Cotton ball & bottle
19.	Formaldehyde, 37%	Cotton ball & bottle
20.	Formic Acid, 90%	Watch glass
21.	Furfural	Cotton ball & bottle
22.	Gasoline	Cotton ball & bottle
23.	Hydrochloric Acid, 37%	Watch glass
24.	Hydrofluoric Acid, 48%	Watch glass
25.	Hydrogen Peroxide, 3%	Watch glass
26.	Iodine, Tincture of	Watch glass
27.	Methyl Ethyl Ketone	Cotton ball & bottle
28.	Methylene Chloride	Cotton ball & bottle
29.	Mono Chlorobenzene	Cotton ball & bottle
30.	Naphthalene	Cotton ball & bottle
31.	Nitric Acid, 20%	Watch glass
32.	Nitric Acid, 30%	Watch glass
33.	Nitric Acid, 70%	Watch glass
34.	Phenol, 90%	Cotton ball & bottle
35.	Phosphoric Acid, 85%	Watch glass
36.	Silver Nitrate, Saturated	Watch glass
37.	Sodium Hydroxide, 10%	Watch glass
38.	Sodium Hydroxide, 20%	Watch glass
39.	Sodium Hydroxide, 40%	Watch glass
40.	Sodium Hydroxide, Flake	Watch glass
41.	Sodium Sulfide, Saturated	Watch glass
42.	Sulfuric Acid, 33%	Watch glass
43.	Sulfuric Acid, 77%	Watch glass
44.	Sulfuric Acid, 96%	Watch glass

- | | | |
|-----|---|----------------------|
| 45. | Sulfuric Acid, 77% and
Nitric Acid, 70%, equal parts | Watch glass |
| 46. | Toluene | Cotton ball & bottle |
| 47. | Trichloroethylene | Cotton ball & bottle |
| 48. | Xylene | Cotton ball & bottle |
| 49. | Zinc Chloride, Saturated | Watch glass |

* Where concentrations are indicated, percentages are by weight.

2. Performance Test Results (Heat Resistance):

Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

3. Performance Test Results (Impact Resistance):

A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.

4. Performance Test Results (Bending Test):

An 18 gauge steel strip, finished as specified, when bent 180° over a 1/2" diameter mandrel, shall show no peeling or flaking off of the finish.

5. Performance Test Results (Adhesion):

Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1/16" apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine under 100 foot-candles of illumination. Note: This test is based on ASTM D2197-68, "Standard Method of Test for Adhesion of Organic Coatings".

6. Performance Test Results (Hardness):

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

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

Table Tops:

The tabletops shall be of 18/19mm Jet black Granite of a even surface and the level

Tolerance less than 1 mm. The front edge of the granite shall be chamfered at an angle of 28 deg and smoothened. The back splash for the wall bench shall be granite 18/19mm thick material for an height of 4" from the finished table top level.

Polypropylene Molded Sinks:

The sinks should be injection molded from Poly propylene co-polymer resin. Polypropylene to have very high resistance to attack from a wide range of chemicals and the ability to withstand temperatures up to 100 deg C. The impact resistance should be high which will minimize damage during and after installation. The sinks should be with self draining base and should be suitable for mounting on top or underside of the work benches. The sinks should be compatible to a vast number of acids, alkalis and reagents. The size of the sink is 560Lx355Dx245Hmm and Bowl size is 500Lx293Dx245Hmm. This sinks shall have bottle trap with reducing coupler of size 51x31mm and with 38mm polypropylene pipe of one foot length.

LABORATORY SERVICE FIXTURES

I. General

A. All laboratory service fixtures shall have the construction and shall meet the performance requirements set forth in this specification. Fixture types shall be as indicated in the fixture schedule or fixture details included in either the project drawings or these specifications.

B. All laboratory service fixtures and safety equipment shall be the product of one service fixture manufacturer to assure uniform appearance and ease of maintenance of the laboratory facility. Remote control valves and fittings furnished with fume hoods shall be the product of the same fixture manufacturer.

C. All service fixtures shall be factory assembled (including the assembly of valves and shanks to turrets, flanges and other mounting accessories), and each fixture shall be individually factory tested. Fixtures shall be tested in the manner and at the pressures set forth below.

D. Except as otherwise indicated, faucet and valve handles shall be forged brass Nylon type and shall have a color coded screw-on index disc. Color code requirements for indexing service fixtures shall follow DIN Standard 12920:1995.

II. Finish

A. General

1. Laboratory service fixtures and safety equipment shall be furnished with a powder coated finish to enhance the appearance of the fitting and to protect against corrosion. Coating material shall be a blend of epoxy and polyurethane. The hybrid blend shall ensure a finish coating with an optimum combination of chemical resistance, mar and abrasion resistance and resistance to fading under ultraviolet (UV) light.

2. Fittings inside fume hoods shall have an epoxy finish color-coded to match the fixture service index color. Coating material shall be free flowing epoxy powder with a particle size of 35-70 microns. Surfaces to be coated shall be (a) polished or sandblasted to produce a uniform fine-grained surface and (b) immersed in a phosphoric acid cleaning solution to remove thoroughly all oil, grease and other foreign substances. Following cleaning, coating material shall be electro statically applied to all exposed surfaces. After application, coating shall be fully baked to permit curing. Surfaces shall have a minimum coating thickness of 2 mils.

2. Mar and Abrasion Resistance

Finishes shall have a pencil hardness of 2H-4H with adhesion substantial enough to withstand both direct and reverse impacts of 160 inch pounds. Finish shall have excellent mar resistance and be capable of withstanding scuffing, marring and other ordinary wear.

3. Reparability

Finish shall be capable of surface repair in the event that a fixture is scratched or a surface rupture occurs. The service fixture manufacturer shall have available an air-drying aerosol coating, specially formulated to match the existing epoxy coating color, which may be applied in the field to repair coated surfaces.

III. Water Faucets and Valves

A. All faucets and valves for water service shall have a renewable unit containing all

working components subject to wear, including a stainless steel replaceable seat and an integral adjustable volume control (designated by the suffix "AC"). The renewable unit shall be interchangeable among all faucets and valves for water service. The renewable unit shall be broached for position locking in the valve body. The unit shall have a high durometer thermoplastic valve disc and a molded TFE stem packing. The unit shall be capable of being readily converted from compression to self-closing, and vice versa, without disturbing the faucet body.

B. Goosenecks shall have a separate outlet coupling with a 3/8" IPS female thread securely brazed to the gooseneck for attachment of serrated hose ends, aspirators and other outlet fittings. Rigid goosenecks shall have a 3/8" IPS male inlet thread and be threaded directly into the faucet body so as to be absolutely rigid. Swing goosenecks shall utilize a TFE packing with an externally adjustable packing nut.

C. All fixtures for water service shall meet the requirements of ANSI/ASME A112.18.1M-1989 and be certified by the Canadian Standards Association (CSA) under Standard CAN/CSA B.125.M89.

D. Water faucets and valves shall be fully assembled and individually tested at 80 pounds per square inch (PSI) water pressure.

AIR SHOWER

Air Showers (self contained chambers) to be installed at entrances to laboratory.

Main Features:

- High velocity shower jets in excess of 20 m/s to ensure efficient scrubbing action to remove particulate matter.
- Operating modes should be programmable in the field.
- Microprocessor controlled.
- Mini-pleated HEPA filtration that achieves > 99.99% typical efficiency at 0.3 micron particles.
- A disposable pre-filter with 85% arrestance apart from main filter.
- An emergency stop button should be mounted on both sides of the shower.
- Indicator lights mounted on both sides of the air shower to regulate traffic.
- Permanently lubricated direct drive centrifugal blowers should be provided in conjunction with stainless steel air nozzles.

APPLICABLE CODES & STANDARDS

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

CHAPTER-02

FUMEHOOD SPECIFICATIONS

1.00 SUMMARY AND SCOPE

- A. Section Includes:
Furnish and install all fume hoods, work tops, and understructures as shown on drawings.
- B. Accessorization:
Furnishing and delivering all service outlets, accessory fittings, electrical receptacles and switches as listed in these specifications, equipment schedules or as shown on drawings. Fittings attached to the fume hood superstructure shall be mounted at the factory.
- C. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the fume hoods to an on-site container provided by others, leaving the premises clean and orderly.

1.02 STANDARD FUME HOOD PERFORMANCE REQUIREMENTS

- A. Fume hoods shall be of complete airfoil design to insure maximum operating efficiency. Foil sections at the front facias of the hood shall minimize eddyding of air currents at the hood face and the rear baffle system shall minimize turbulence in the upper portion of the hood interior.
- B. Standard Fume Hood Type Variable Air Volume:
The fume hoods shall be of the variable air volume type in which the exhaust air volume varies proportionally to the hood opening when used with a hood face velocity controller system. The air bypass shall be RESTRICTED AS PER THE VAV Manufacturer's recommendation.

2.01 MATERIALS AND CONSTRUCTION

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

B. Fume Hood Interior Walls:

Double wall ends, not more than 4" wide, shall be provided to maximize interior working area. The area between the double wall ends shall be closed to house the remote control valves. The front vertical facia section shall have a full 135 degree 1" radius at the front leading edge to provide a streamlined section and insure smooth even flow of air into the hood. The vertical facias shall contain the required service controls, electrical switches and receptacles. The hood interior end panels and sash track shall be flush with the facia to prevent eddy currents and back flow of air.

C. Fume Hood Airfoil:

A streamlined airfoil shall be integral at the bottom of the hood opening on bench and distillation hoods. This foil shall provide a nominal 1" open space between the foil and the top front edge of the work surface to direct an air stream across the work surface to prevent back flow of air. The airfoil shall extend back under the sash, so that the sash does not close the 1" opening. The foil shall be removable to allow large equipment into the hood. The foil shall be of 12-gauge steel to resist denting and flexing. Walk-in hoods shall have a stop located at the bottom of the sash track that will ensure a nominal 1" opening between the bottom of the sash and the floor.

D. Fume Hood Top Panel:

Restricted Bypass Configuration:

The top front panel shall be of the same material as the exterior facia.

E. Fume Hood Baffles :

A stable, non-adjustable baffle with three fixed horizontal slots shall be provided to aid in distributing the flow of air into and through the hood. The baffle shall be spaced out 2-1/4" from the back liner. The baffle shall be removable for cleaning

F. Fume Hood Duct Collar :

A 12" diameter polyethylene bell-mouthed duct collar shall be located in the top of the hood plenum chamber. Coated common steel duct collars are not acceptable

G. Fume Hood Lighting:

A one-tube, energy-efficient, T-5 fluorescent light fixture of the size given below shall be provided in the hood roof. Illumination at 13" above the worksurface shall be at least 100 foot-candles.

Hood Size, Ft.

5

Nominal Fixture Length, Ft.

4

The light fixtures shall be isolated from the hood interior by a 1/4" thick tempered glass panel sealed from the hood cavity.

H. Fume Hood Sash:

Combination Sash:

A combination sash shall be provided. The sash shall have horizontal sliding glass panels in a vertical rising steel frame. The bottom of the sash frame shall have a full length metal handle. The sash track shall be a neutral colored polyvinyl chloride set flush with the interior liner panels to minimize turbulence. The sash shall be counterbalanced with a single weight to prevent tilting and binding during operation. The glass panels shall be 1/4" laminated safety float glass mounted on metal rollers in an aluminum track.

I. Fume Hood Electrical Service:

The hood superstructure shall be pre-wired and contain wire gauge, connections, fixtures and wire color coding. Wiring electrical services shall consist of two duplex receptacles and a light switch. 4 nos of 5/15 Amps (Make: North West), 230 Volt AC, and 3-wire polarized grounded with ground fault interruption. The receptacles shall be of specification grade, side wired only, to insure a positive connection. The light switch shall be 5 Amps. 230 volt AC and 3-wire polarized grounded. Wiring shall terminate in one 6" x 6" x 4" service junction box located on the fume hood roof

J. Hood Work Surface:

Black Granite:

Hood worksurface shall be 1-1/4" thick jet black granite made in the form of a watertight pan, not less than 3/8" deep to contain spillage with a 8" & 6" wide safety ledge across the front edge. A cup drain flush with the recessed worksurface shall be provided. The worksurface and cup drain shall be available in black.

K. Access Opening:

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

L. Fume Hood Finish:

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

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

The completed finish system in standard colors shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS.

M. Performance Test Results (Chemical Spot Tests):

- **Testing Procedure:**
Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° ±3° F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.
- **Test Evaluation:**
Evaluation shall be based on the following rating system.

Level 0 – No detectable change.
Level 1 – Slight change in color or gloss.
Level 2 – Slight surface etching or severe staining.
Level 3 – Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

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

- **Test Reagents**

Test No.	Chemical Reagent	Test Method
1.	Acetate, Amyl	Cotton ball & bottle
2.	Acetate, Ethyl	Cotton ball & bottle
3.	Acetic Acid, 98%	Watch glass
4.	Acetone	Cotton ball & bottle
5.	Acid Dichromate, 5%	Watch glass

6.	Alcohol, Butyl	Cotton ball & bottle
7.	Alcohol, Ethyl	Cotton ball & bottle
8.	Alcohol, Methyl	Cotton ball & bottle
9.	Ammonium Hydroxide, 28%	Watch glass
10.	Benzene	Cotton ball & bottle
11.	Carbon Tetrachloride	Cotton ball & bottle
12.	Chloroform	Cotton ball & bottle
13.	Chromic Acid, 60%	Watch glass
14.	Cresol	Cotton ball & bottle
15.	Dichlor Acetic Acid	Cotton ball & bottle
16.	Dimethylformamide	Cotton ball & bottle
17.	Dioxane	Cotton ball & bottle
18.	Ethyl Ether	Cotton ball & bottle
19.	Formaldehyde, 37%	Cotton ball & bottle
20.	Formic Acid, 90%	Watch glass
21.	Furfural	Cotton ball & bottle
22.	Gasoline	Cotton ball & bottle
23.	Hydrochloric Acid, 37%	Watch glass
24.	Hydrofluoric Acid, 48%	Watch glass
25.	Hydrogen Peroxide, 3%	Watch glass
26.	Iodine, Tincture of	Watch glass
27.	Methyl Ethyl Ketone	Cotton ball & bottle
28.	Methylene Chloride	Cotton ball & bottle
29.	Mono Chlorobenzene	Cotton ball & bottle
30.	Naphthalene	Cotton ball & bottle
31.	Nitric Acid, 20%	Watch glass
32.	Nitric Acid, 30%	Watch glass
33.	Nitric Acid, 70%	Watch glass
34.	Phenol, 90%	Cotton ball & bottle
35.	Phosphoric Acid, 85%	Watch glass
36.	Silver Nitrate, Saturated	Watch glass
37.	Sodium Hydroxide, 10%	Watch glass
38.	Sodium Hydroxide, 20%	Watch glass
39.	Sodium Hydroxide, 40%	Watch glass
40.	Sodium Hydroxide, Flake	Watch glass
41.	Sodium Sulfide, Saturated	Watch glass
42.	Sulfuric Acid, 33%	Watch glass
43.	Sulfuric Acid, 77%	Watch glass
44.	Sulfuric Acid, 96%	Watch glass
45.	Sulfuric Acid, 77% and Nitric Acid, 70%, equal parts	Watch glass
46.	Toluene	Cotton ball & bottle
47.	Trichloroethylene	Cotton ball & bottle
48.	Xylene	Cotton ball & bottle
49.	Zinc Chloride, Saturated	Watch glass

* Where concentrations are indicated, percentages are by weight.

N. Performance Test Results (Heat Resistance):

Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a

rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

O. Performance Test Results (Impact Resistance):

A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of steel panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.

P. Performance Test Results (Bending Test):

An 18 gauge steel strip, finished as specified, when bent 180° over a 1/2" diameter mandrel, shall show no peeling or flaking off of the finish.

Q. Performance Test Results (Adhesion):

Ninety or more squares of the test sample shall remain coated after the scratch adhesion test. Two sets of eleven parallel lines 1/16" apart shall be cut with a razor blade to intersect at right angle thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush. Examine under 100 foot-candles of illumination. Note: This test is based on ASTM D2197-68, "Standard Method of Test for Adhesion of Organic Coatings".

R. Performance Test Results (Hardness):

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

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

S. Fume Hood Dimensions

Double wall end panel thickness shall not exceed 4". Interior clear working height shall be not less than 41-3/4" at any location in the interior of the hood on bench hoods and 76" on walk-in and distillation hoods. Interior depth from the back of the sash to the front of the rear baffle shall not be less than 25-1/4". The sash opening shall be not less than 28" in height above the worksurface on bench hoods and 60" on walk-in and distillation hoods.

T. Fume Hood Liners :

Interior liner panels shall be 1/4" thick fiberglass reinforced polyester sheet. Interior liner panels shall be fastened using stainless steel screws with plastic covered heads.

Q. Liner Tests – Chemical Spot Tests – 24 Hours

1. Chemical spot test shall be made by applying 10 drops (approximately 1/2 cc) of each reagent to the surface to be tested. Each reagent (except those marked **) shall be covered with a 1-1/2" diameter watch glass, convex side down to confine the reagent. Spot tests of volatile solvents marked ** shall be tested as follows: A 1" or larger ball of cotton shall be saturated with the solvent and placed on the surfaces to be tested. The cotton ball shall then be covered by an inverted 2-ounce, wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire 24-hour test period and at a temperature of 77degrees F. $\pm$ 3degrees F.
2. At the end of the test period, the reagents shall be flushed from the surfaces with water and the surface scrubbed with a soft bristle brush under running water, rinsed, and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Spots where dyes have dried shall be cleaned with a cotton swab soaked in alcohol to remove the surface dye. The test panel shall then be evaluated immediately after drying.

RESULTS:	1	2	3	4	5
1. Acetic Acid 98%	A	B	B	B	A
2. Acetone **	A	D	A	A	A
3. Acid Dichromate	A	A	A	A	A
4. Ammonium Hydroxide ** 28%	A	A	B	B	A
5. Amyl Acetate **	A	A	A	A	A
6. Benzene **	A	A	A	A	A
7. Butyl Alcohol **	A	A	A	A	A
8. Carbon Tetrachloride **	A	A	A	A	A
9. Chloroform **	A	D	A	A	A
10. Chromic Acid 60%	B	B	C	C	A
11. Cresol	A	A	A	A	A
12. Dichloroacetic Acid	A	D	B	A	A
13. Dimethylformamide	A	A	A	A	A
14. Dioxane **	A	A	A	A	A
15. Ethyl Acetate **	A	A	A	A	A
16. Ethyl Ether **	A	A	A	A	A
17. Ethyl Alcohol **	A	A	A	A	A
18. Formaldehyde	A	A	A	A	A
19. Formic Acid 90%	A	A	A	A	A
20. Furfural **	B	B	A	A	C
21. Gasoline **	A	A	A	A	A
22. Hydrochloric Acid 37%	A	A	B	B	A
23. Hydrofluoric Acid 48%	B	D	D	D	A
24. Hydrogen Peroxide 30%	A	A	A	A	A

25. Methyl Ethyl Ketone **	A	A	A	A	A
26. Methyl Alcohol **	A	A	A	A	A
27. Methylene Chloride **	A	D	A	A	A
28. Monochlorobenzene **	A	A	A	A	A
29. Naphthalene **	A	A	A	A	A
30. Nitric Acid 20%	B	A	B	A	A
31. Nitric Acid 30%	B	A	B	A	A
32. Nitric Acid 70%	B	D	B	A	A
33. Phenol ** 85%	A	C	A	A	A
34. Phosphoric Acid 85%	A	A	B	A	A
35. Silver Nitrate	B	C	A	A	C
36. Sodium Hydroxide 40%	A	D	A	A	A
37. Sodium Hydroxide 20%	A	D	A	A	A
38. Sodium Hydroxide 10%	A	D	A	A	A
39. Sodium Hydroxide Flake	A	B	A	A	A
40. Sodium Sulfide	A	B	A	A	A
41. Sulfuric Acid 77%	A	A	C	A	A
42. Sulfuric Acid 96%	C	D	C	A	C
43. Sulfuric Acid 33%	A	A	C	A	A
44. Tincture of Iodine	A	C	B	B	A
45. Toluene **	A	A	A	A	A
46. Trichlorethylene **	A	A	A	A	A
47. Xylene **	A	A	A	A	A
48. Zinc Chloride	A	A	B	A	A
49. Nitric 70%/Sulfuric Acid 77%*	B	B	B	A	A

* Equal parts of Nitric Acid 70% and Sulfuric Acid 77%.

** Indicates these solvents tested with cotton and jar method

s. Fume Hood Base Cabinets

1. Standard Steel

- Unless otherwise indicated base units under hoods shall be fabricated of cold rolled prime grade roller leveled furniture steel. Gauges of steel used in construction shall be 18 gauge except as follows:
- Corner gussets for leveling bolts and apron corner braces, 12 gauge.
- Hinge reinforcements, 14 gauge.
- Top and intermediate front horizontal rails, apron rails and reinforcement gussets, 16 gauge.
- Door assemblies and adjustable shelves, 20 gauge.
- Performance of the painted surfaces shall match that of the fume hood outer panels.

2.0 MATERIAL OF CONSTRUCTION

Fume Hood superstructure	: 18 gauge CRC Sheets, Electrode position Powder coated 80-100 micron
Table top	: 32 mm Jet Black Granite Table top
Electrical sockets	: PVC
Gas fixtures	: Brass Lacquer Coated
Internal piping	: SS304
Vacuum Fixtures	: Brass Lacquer Coated
Water fixtures	: Brass Lacquer Coated
Electrical cables	: Copper wire with PVC Sheath

3.0 APPLICABLE CODES & STANDARDS:

ASHRAE Standard 110.1995	- Method of Testing Performance of Laboratory Fume Hoods
NSF STD#49	- Photometric Method of Testing
NIH03-112C	- National Institute of Health Specification
UL	- Underwriters Laboratories
ASTM D552	- Bending Test
NFPA-45	- National Fire Protection Association

Note: VENDOR MUST HAVE ASHRAE TESTING FACILITY AT MANUFACTURING PLANT & ABLE TO CONDUCT THE SAME IN THE SITE.

CHAPTER-03

EXHAUST SYSTEM SPECIFICATIONS

MEDIUM PRESSURE CENTRIFUGAL BLOWERS:

The exhaust fans supplied and installed shall be of 'Centrifugal Corrosion Resistant' type and shall be capable of delivering the design flow rate against designed pressure drop.

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

Fans selected shall be silent and vibration free when running and suitable for outdoor use and shall not exceed designed impeller speed.

Aerodynamic performance of the fan shall be tested and comply 'ISO 5801' standards.

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

The casing shall be of self-supporting design, thermoformed (size 400 and below), welded by machine (automatically welded for size 400 and below). The material of construction shall be **fire retardant polypropylene (PPs)** for fire safety and suitable for use against corrosive 'medium' and a maximum allowable operating temperature of 70°C. No metal parts shall be exposed and in contact with the airstream.

Impeller material of construction shall be **fire retardant polypropylene (PPs)** for fan size up to 400 (polypropylene {PP} for fan size 450 and above) suitable for use against corrosive 'medium' and a maximum allowable operating temperature of 70°C. It shall consist of 20 forward curved blades injection molded up to size 710 (thermoformed blades, automatically welded from 800). The impeller balancing shall be tested in accordance to **VDI 2060, Q6.3** standards.

Each impeller above size 450 shall be tested in an over speed test stand above its nominal rate and dynamically balanced on two levels in accordance to **VDI 2060, Q6.3** standards.

Electro-galvanized stand shall be used to support the fan and the motor for fan sizes up to 400 in view of the corrosive environment. Sturdy metal galvanized steel stand shall be used from fan size 450 onwards.

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

SPECIFICATIONS FOR MOTOR AND ACCESSORIES

Use an electric motors built to IEC standards foot mounted (B5) or Flange mounted (B3), also in ex-protected or multistage versions, for the drive. The impeller hub is coated with aluminum. Power transmission from motor to impeller by means of an impeller directly fixing on the motor shaft in direct driven application. The impeller is fixed on to a flange bearing and the tightening adopter system guarantees secure mechanical connection.

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

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

SPECIFICATIONS FOR PP/FRP DUCTING AND ACCESSORIES

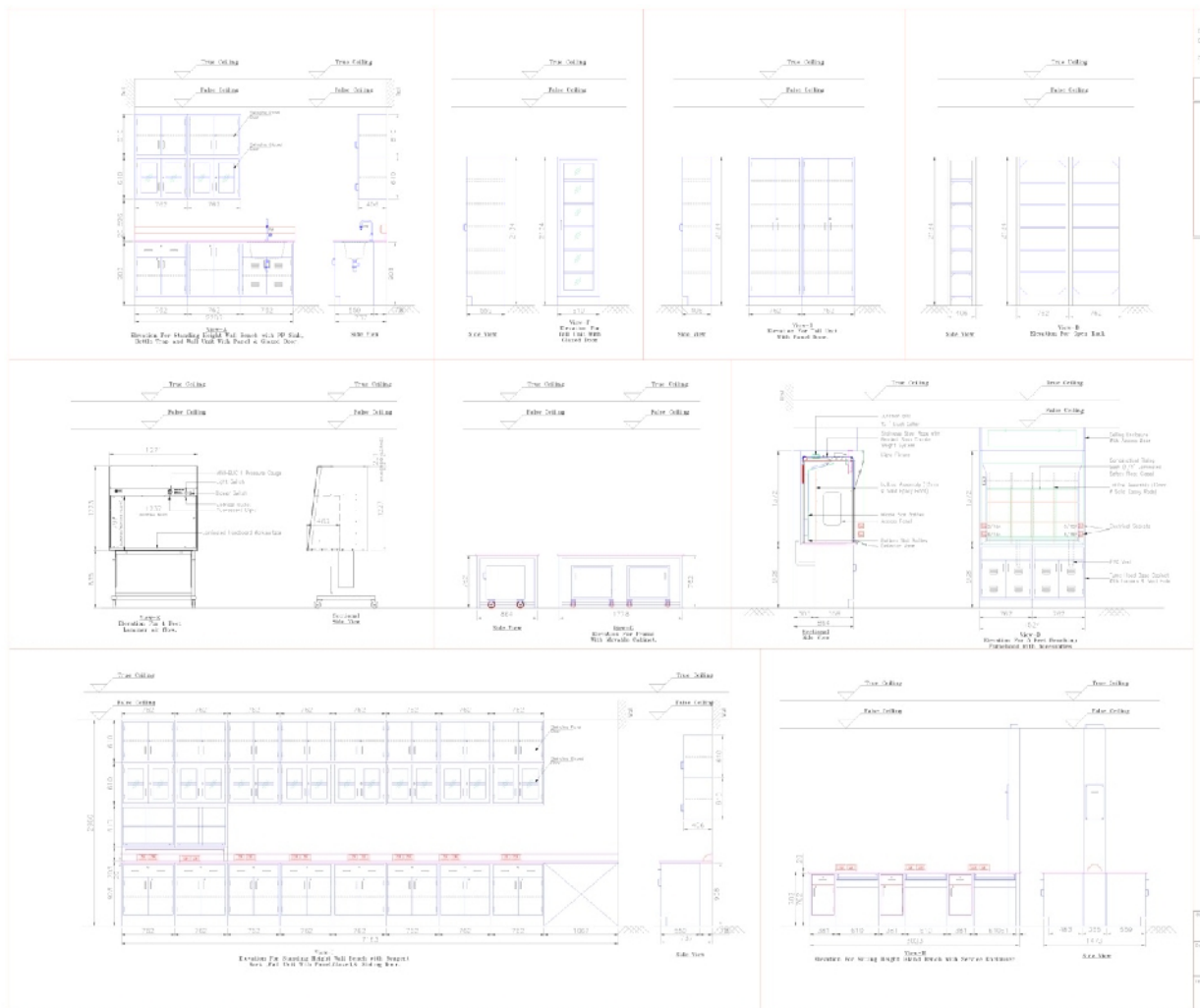
Technical Specification for PP/FRP Ducting:

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

Drawing of floor/ furniture plan



Drawing of elevation



Bill of Quantities

Description of items required with their quantities

1. Furniture & accessories
2. Laminar air flow & accessories
3. Bill of quantities for fumehood& accessories
4. Bill of quantities for exhaust system & accessories
5. Air Shower

1. FURNITURE & ACCESSORIES

SL NO	DESCRIPTION	UNIT	QTY
1	6/16A SOCKET WITH SWITCH	Nos.	334
2	APRON RAIL - 04Hx02Dx21L	Nos.	108
3	APRON RAIL - 04Hx02Dx24L	Nos.	24
4	APRON RAIL - 04Hx02Dx30L	Nos.	24
5	KNEE SPACE PANEL - 24Hx00Dx24L	Nos.	22
6	KNEE SPACE PANEL - 24Hx00Dx30L	Nos.	2
7	KNEE SPACE PANEL - 30Hx00Dx21L	Nos.	54
8	KNEE SPACE PANEL - 30Hx00Dx30L	Nos.	11
9	PEDESTAL ASSY LEFT - 29Hx22Dx02L	Nos.	3
10	PEDESTAL ASSY LEFT - 36Hx16Dx02L	Nos.	8
11	PEDESTAL ASSY LEFT - 36Hx22Dx02L	Nos.	1
12	PEDESTAL ASSY RIGHT - 29Hx22Dx02L	Nos.	2
13	WORKTOP SUPPORT FRAME - 01Hx22Dx24L	Nos.	20
14	WORKTOP SUPPORT FRAME - 01Hx22Dx30L	Nos.	2
15	AIR SHOWER OF SIZE: 49.6(W)x39.3(D)x80.7(H)	Nos.	1
16	CORNER FILLER - 36Hx00Dx06L	Nos.	1
17	CORNER FILLER - 36Hx00Dx08L	Nos.	1
18	END SCRIBE - 30Hx00Dx06L	Nos.	1
19	END SCRIBE - 30Hx00Dx14L	Nos.	3
20	END SCRIBE - 30Hx00Dx22L	Nos.	1
21	END SCRIBE - 36Hx00Dx01L	Nos.	1
22	END SCRIBE - 36Hx00Dx02L	Nos.	1
23	END SCRIBE - 36Hx00Dx03L	Nos.	1
24	END SCRIBE - 36Hx00Dx04L	Nos.	3
25	END SCRIBE - 36Hx00Dx05L	Nos.	1
26	END SCRIBE - 36Hx00Dx06L	Nos.	1
27	END SCRIBE - 36Hx00Dx15L	Nos.	6
28	REAR SCRIBE - 30Hx00Dx07L	Nos.	7
29	REAR SCRIBE - 30Hx00Dx14L	Nos.	2
30	REAR SCRIBE - 30Hx00Dx17L	Nos.	2
31	REAR SCRIBE - 36Hx00Dx07L	Nos.	4
32	REAR SCRIBE - 36Hx00Dx14L	Nos.	8
33	BENCH MOUNTED TRIPLE-WAY WATER FITTING WITH RIGID/SWING GOOSENECK FOR RAW WATER	Nos.	8
34	BENCH MOUNTED 1-WAY WATER FITTING WITH 8" RIGID/SWING GOOSENECK FOR RAW WATER	Nos.	16
35	BASE UNIT 1 DOOR 24x22x19.,B3-CASTORS WITH BRAKE IN THE FRONT AND WITHOUT BRAKE IN THE REAR,X=WITH TOP CLOSED	Nos.	3

36	BASE UNIT 1 DOOR 24x22x19.,B3-CASTORS WITH BRAKE IN THE FRONT AND WITHOUT BRAKE IN THE REAR,X=WITH TOP CLOSED	Nos.	5
37	BASE UNIT 2 DOOR - 30Hx22Dx36L.,X=ONE SOCKET WITH SWITCH INSIDE. K1=WITH LOCK & SINGLE KEY FOR SIMILLAR CABINETS	Nos.	22
38	BASE UNIT 1 DOOR - 36Hx16Dx15L., K2=WITH LOCK & SINGLE KEY FOR SIMILLAR CABINETS	Nos.	48
39	BASE UNIT 1 DOOR - 36Hx22Dx15L.,K=WITH LOCK	Nos.	6
40	BASE UNIT 2 DOOR - 36Hx22Dx30L.,K=WITH LOCK	Nos.	4
41	CABLE MANAGER DIA 2.5	Nos.	24
42	BASE UNIT 1 DOOR 1 DRAWER - 30Hx22Dx15L.,K=WITH LOCK	Nos.	22
43	BASE UNIT 1 DOOR 1 DRAWER - 30Hx22Dx18L.,K=WITH LOCK	Nos.	1
44	BASE UNIT 1 DOOR 1 DRAWER - 30Hx22Dx18L.,K=WITH LOCK	Nos.	1
45	BASE UNIT 1 DOOR 1 DRAWER - 30Hx22Dx24L.,K=WITH LOCK	Nos.	1
46	BASE UNIT 1 DOOR 1 DRAWER - 30Hx22Dx24L.,K=WITH LOCK	Nos.	1
47	BASE UNIT 2 DOOR 1 DRAWER - 30Hx22Dx30L.,K=WITH LOCK	Nos.	2
48	BASE UNIT 1 DOOR 1 DRAWER - 36Hx22Dx24L.,K=WITH LOCK	Nos.	1
49	BASE UNIT 2 DOOR 1 DRAWER - 36Hx22Dx30L.,K=WITH LOCK	Nos.	29
50	BASE UNIT 2 DOOR 1 DRAWER - 36Hx22Dx36L.,K=WITH LOCK	Nos.	5
51	DOUBLE SIDE SOCKET BOX 12x8x4	Nos.	37
52	METAL ELECTRICAL RACEWAY, 3x5	Inch	2,436
53	SINGLE SIDE SOCKET BOX 12x4x4	Nos.	19
54	BASE MOLDING 4 FT.	Nos.	348
55	CORNER CLIP	Nos.	292
56	KEY BOARD TRAY 24x12	Nos.	22
57	BASE UNIT SINK 2 DOOR - 36Hx22Dx30L	Nos.	3
58	BASE UNIT SINK 2 DOOR - 36Hx22Dx36L	Nos.	3
59	BASE UNIT SINK 2 DOOR - 36Hx22Dx60L.,X=WITHOUT DUMMY PANEL & WITH FULL DOOR TO KEEP WATER CAN'S OF 24" HEIGHT.	Nos.	3
60	BASE UNIT CORNER 1 DOOR - 30Hx22Dx14L	Nos.	4
61	BASE UNIT CORNER SINK 1 DOOR - 30Hx22Dx14L	Nos.	1
62	BASE UNIT CORNER SINK 1 DOOR - 36Hx22Dx14L	Nos.	2
63	BASE UNIT VACUUM PUMP - 36Hx22Dx30L, X=6/16A SOCKET INSIDE AND SWITCH OUTSIDE WITH INTERNAL WIRING	Nos.	3
64	REAGENT GRANITE SUPPORT 08x39	Nos.	4
65	REAGENT GRANITE SUPPORT 08x45	Nos.	4
66	REAGENT GRANITE SUPPORT 08x46	Nos.	2
67	REAGENT GRANITE SUPPORT 08x56	Nos.	2
68	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 30Hx08L	Nos.	48
69	FLOOR STANDING WORKTOP SUPPORT OF SIZE: 36Hx08L	Nos.	15
70	FOUR LEGGED BENCH UNIT 31Hx34Dx70L, X= WITH FOOT REST(FRONT AND BACK OPEN)	Nos.	5
71	WALL MOUNTED WORKTOP SUPPORT ANGLE, 2Dx2Hx12L	Nos.	24
72	18/19mm THK. LAMINATE WORKTOP	Sft.	210
73	OPEN RACK OF SIZE: 84Hx6Dx30L	Nos.	9
74	PP SINK 304Lx304Dx152Hmm(Outer dimension)AND BOWL SIZE: 236Lx236Dx152Hmm	Nos.	15
75	PP SINK, SIZE: 560Lx355Dx245Hmm AND BOWL SIZE: 500Lx293Dx245Hmm	Nos.	7
76	PP BIG SINK, SIZE: 711Lx355Dx245Hmm AND BOWL SIZE: 651Lx293Dx245Hmm	Nos.	2
77	WASTE, 1 1/2" BSP X 76mm.	Nos.	9
78	ANTI SIPHON BOTTLE TRAP.	Nos.	9

79	REDUCING COUPLER IN PP 51 X 31MM + PP PIPE LENGTHS - ONE FEET LENGTH - DIA. 38MM	Nos.	9
80	TALL UNIT SWINGING GLAZED - 84Hx16Dx24L.,K=WITH LOCK	Nos.	1
81	TALL UNIT SWINGING GLAZED - 84Hx16Dx24L.,K=WITH LOCK	Nos.	1
82	TALL UNIT SWINGING PANEL - 84Hx16Dx30L.,K=WITH LOCK	Nos.	4
83	TALL UNIT SWINGING PANEL WITH VENT HOLE AND LOUVERS - 84Hx16Dx36L	Nos.	1
84	SERVICE ENCLOSURE FOR CENTRE BENCH 12x6x112	Nos.	7
85	REAGENT RACK UPRIGHT, SIZE: 8(H)x10(W)x2(D)	Nos.	9
86	WALL UNIT SLIDING PLATE GLASS - 24Hx13Dx30L.,K=WITH LOCK	Nos.	2
87	WALL UNIT SWINGING GLAZED - 24Hx16Dx30L K=WITH LOCK	Nos.	62
88	WALL UNIT SWINGING GLAZED - 24Hx16Dx36L.,K=WITH LOCK	Nos.	2
89	WALL UNIT SWINGING PANEL - 24Hx16Dx30L K=WITH LOCK	Nos.	62
90	WALL UNIT SWINGING PANEL - 24Hx16Dx36L.,K=WITH LOCK	Nos.	2
91	GRANITE REAGENT SHELF 12x39	Nos.	4
92	GRANITE REAGENT SHELF 12x45	Nos.	4
93	GRANITE REAGENT SHELF 12x46	Nos.	2
94	GRANITE REAGENT SHELF 12x56	Nos.	2
95	18/19mm THK. GRANITE WORKTOP	Sft.	1,470
96	GRANITE SKIRTING. 4x1	Rft.	470

2. LAMINAR AIR FLOW & ACCESSORIES

SL NO	DESCRIPTION	UNIT	QTY
1	VERTICAL LAMINAR FLOW WORKSTATION-230 VAC - (EXTERIOR DIMENSIONS- L= 1219mm X D= 730mmX H= 933mm)	Nos.	1
2	MANUAL ADJUSTABLE FIXED BASE STAND - (EXTERIOR DIMENSIONS L= 1225mm X D= 730mm X H= ADJUSTABLE 762mm – 915mm)	Nos.	1
3	UV LAMP AND CLOSURE	Nos.	1
4	SOLID EPOXY WORKTOP 1219mm(L) x 733mm(D) x 25mm(T)	Nos.	1
	TOTAL OF LAMINAR AIR FLOW & ACCESSORIES		

3. FUMEHOOD & ACCESSORIES

SL NO	DESCRIPTION	UNIT	QTY
	5 FEET BENCH TOP FUMEHOOD		
1	5 FT BENCHTOP FUMEHOOD, COMBINATION SASH, RESTRICTED BYPASS, 54H x 36D x 60L.	Nos.	1
2	FUME HOOD CEILING ENCLOSURE 5FT WITH ACCESS	Nos.	1
3	FUMEHOOD ELECTRICAL SYSTEM 5/15A SOCKETS 2+2 NOS	Nos.	1
4	REAR SCRIBE - 29Hx00Dx04L	Nos.	1
5	REAR SCRIBE - 36Hx00Dx12L	Nos.	1
6	REAR SCRIBE - 54Hx00Dx04L	Nos.	1
7	BASE UNIT 2 DOOR - 36Hx22Dx30L, X=WITH VENT HOLE AND LOUVERS	Nos.	2
8	FUMEHOOD GRANITE WORKTOP 60x31, WITHOUT CUPSINK CUTOUT	Nos.	1
9	LATTICE ASSMBLY FOR 5' BENCH TOP FUMEHOOD	Nos.	1

4. EXHAUST SYSTEM & ACCESSORIES

SL NO	DESCRIPTION	UNIT	QTY
A	CENTRIFUGAL BLOWER & ACCESSORIES		
1	Medium Pressure Direct Driven Centrifugal Blowers for Fume Hood (For 800cfm @ 35 WG Static pressure) including suitable clamp adapter, Electro galvanized stand and fasteners like bolts, nuts and washers. base frame, vibration isolators, for Cluster-1 Centrifugal Blowers	No	1
2	Motor 0.75KW /4P(1HP/4P) TEFC B5 / Flange mounted 3phase 50Hz, 415Volts IP-55 Protection Class F. For outdoor application. Terminal box should be on top side.	No	1
2.1	Weather cowl Dia 300 mm , (1.1Sqmts).	No.	1
2.2	Stack support (Kg:-55 Kgs).	No.	1
2.3	Motor Guard with accessories for 1HP/4P	Set	1
B	Variable Frequency Drive (VFD)		
1	Variable Frequency Drive- 0.75 KW	No.	1
C	PP/FRP DUCTING & ACCESSORIES		
1	PP/FRP ducting using 3mm thick PPGL sheets with 2mm thick FRP lining using polyester resin including flanges & bends.	Sq. mts.	30
2	PP/FRP 12" dia. single leaf Butterfly Manual damper, manually operated for Fumehood.	Nos	1
3	PP/FRP 8" dia. single leaf Butterfly Manual damper, manually operated for Bypass	No	1
4	12" Dia flexible hose with 14" Dia. Clips for Fume hood (Considered 1 mt as 1 No)	Rm.mts	20
5	Fume Hood base cabinet ducting with accessories	Sets	1

5. AIR SHOWER

SL NO	DESCRIPTION	UNIT	QTY
1	AIR SHOWER WITH HIGH VELOCITY SHOWER JETS	Nos.	1

Chapter – IV

Inviting of sealed Tender(s) for supply and installation of Laboratory Furniture Fume hood and Exhaust System at AIIMS, Bhubaneswar

Sl no.	Details / Particulars	Submitted (Yes/No)	Page No
A	Name & Address of Tenderer with phone number, email, name and telephone/mobile(Mention in Letter head)		
B	Specify you are Company /Proprietorship / Partnership firm(Mention in Letter head)		
C	Name of Proprietor /Partner/Managing Director/Director.		
D	Name, Address & designation of the authorized person for signing the bid documents. (Authorization should be made in Letter head of the Organisation)		
E	Name, Address, Phone & Fax No. of Service Centre at Bhubaneswar or nearby.		
F	Whether the firm is a Registered firm 'yes/no'(attached copy of certificate)		
G	PAN No. (enclose the attested copy of PAN Card)		
H	Please Provide last 02 year IT Return copy (2013-14, 14-15)		
I	Service Tax No. (enclose the attested copy of Service Tax Certificate)		
J	Sales Tax /VAT No. (enclose the attested copy of Sales Tax / VAT Certificate)		
K	Details of the Earnest Money Deposit (EMD) Rs. 3,00,000/- (Rupees Three lakh only) , FDR/BG No.____ / dt.____		
L	Details of the Tender Fee worth Rs.2,000/-(Rupees Two thousand only), Non refundable. (DD No. __, dt. ____)		
M	Whether the Firm/Agency has signed each and every page of Tender/NIT		
N	Whether the firm is a registered firm under MSEs, SSI or NSIC (attached copy of certificate). And also to be mentioned it is owned by SC/ST Entrepreneurs		
O	Have you previously supplied these items to any government /reputed private organization? If yes, attach the relevant poof. <i>Please provide a notarized affidavit on Indian Non Judicial stamp paper of Rs.10/- that you have not quoted the price higher than previously supplied to any Government Institute / Organisation / reputed Private Organisation or DGS&D rate in recent past. If you don't fulfil these criteria, your tender will be out rightly rejected.</i>		

P	Please submit a notarised affidavit on Indian Non judicial stamp paper of Rs.10/- that (i) no case is pending the police against the Proprietor / partner or the Company (Agency).Indicate any convictions if any against the Company/firm/partner. (ii) proprietor/firm has never blacklisted by any organization.		
Q	List of Major Customer may be given on a separate sheet and proof of previous satisfactory supply, if any		
R	The name of items with specification and makes/brands of the items, indigenous or imported with name of manufacturer & address must be enclosed		
S	Please provide full list of consumables & Catalogue of Equipment		
T	Whether the items quoted is as per specification, if not the statement of deviation (Parameter wise) from the tender technical specification must be enclosed.		
U	Undertaking for providing CMC for 5 years after 3 years Warranty		
V	Undertaking by manufacturer of equipment for servicing the equipment & supply of spare parts whenever required at least for 5 years after completion of warranty/Guaranty.		
W	Any other information, if necessary		

Note:

- Page number/serial number may be given to each and every page of Tender Documents and photocopies of the attested documents attached. Mention Page number, wherever the copy (ies) of the document(s) is kept.
- The tenderer should furnish specific answers to all the questions/issues mentioned in the Checklist. In case a question/issue does not apply to a tenderer, the same should be answered with the remark "Not Applicable".
- Wherever necessary and applicable, the tenderer shall enclose certified copy as documentary proof/ evidence to substantiate the corresponding statement. In case a tenderer furnishes a wrong or evasive answer against any of the question/issues mentioned in the Checklist, its tender will be liable to be rejected.
- In case of non-fulfilment of any of the above information/ document(s), the Tender will be summarily rejected without giving any notice.

Date:

Place:

(Signature of the bidder with seal)

Chapter-V- Financial Bid

(To be submitted on the letterhead of the company / firm)

Sl. No	Name of Item	Quantity	Rate Per Unit	Vat/Taxes etc.	Amount (including All Taxes)
1.	<u>Laboratory Furniture Fume hood and Exhaust System</u>				

1. I/We have gone through the Terms & Conditions as stipulated in the Tender enquiry document and confirm to accept and abide the same.
2. No other charges would be payable by the Institute.
3. That I/We shall supply the items of requisite quality.
4. That I/We undertake that the information given in this tender are true and correct in all respects.

Signature of the bidder with seal.

Date:

Place:

Chapter – VI

CONTRACT AGREEMENT

Contract Agreement No. :-

This agreement is made at **Bhubaneswar** on _____ 2015 between **Director, AIIMS, Bhubaneswar, AIIMS Bhubaneswar**, having its office at **Sijua, Patrapada, Bhubaneswar-751019** (hereinafter called “Client” which expression shall, unless repugnant to the context or meaning thereof be deemed to mean and include its successors, legal representatives and assigns) of the **First Party**.

Between

M/s _____ (hereinafter called the “Supplier/Contractor” which expression unless repugnant to the context shall mean and include its successors-in-interest assigns etc.) of the **Second Party**.

Whereas AIIMS, Bhubaneswar is desirous that certain Supplies to be made/ installed for use by AIIMS, BBSR i.e. _____ hereinafter called the “The Supply” and has accepted a Bid submitted by the Supplier/contractor for the execution and completion of such Supply/Installation as well as guarantee of such works and the remedying of defects therein.

Now this agreement witnesses as follows:-

1. In this agreement words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this agreement Viz.
 - (a) Notice Inviting Tender, Eligibility Criteria & Instruction to Bidders (NIT, Eligibility Criteria & ITB).
 - (b) General Conditions of Contract (GCC).
 - (c) Special Condition of Contract.
 - (d) Technical Specification.
 - (e) Technical and Financial Bid.
 - (f) Clarifications of Pre Bid queries during first call and amendment/ corrigendum during first call, if any
 - (g) Financial Bid amendment / corrigendum on technical specifications.
 - (h) All the correspondence till award of contracts i.e. Notification of Award, Performance Bank Guarantee etc.
 - (i) Supply order
 - (j) Payment Term : as per Terms & Condition of the Tender document clause No.13
 - (K) Uptime guarantee & Downtime penalty Clause :as per Terms & Condition of the Tender document clause No.07 &08
3. In consideration of the payment to be made by AIIMS, Bhubaneswar to the Contractor as hereinafter mentioned, the Contractor hereby covenants with AIIMS,

Bhubaneswar to execute and complete the Work by _____ from the date of commencement i.e. _____ and remedying any defects therein in conformity in all respects with the provisions of the Contract.

4. AIIMS, Bhubaneswar hereby covenants to pay the Contractor in consideration of the execution and completion of the Work and remedying of defects therein, the total Contract Price of Rs. _____ (Rupees _____ only) being the sum stated in the **Supply Order** subject to such additions thereto or deductions there from as may be made under the provisions of the Contract at the time and in the manner prescribed by the Contract.

5. Obligation of the Contractor.

(a) The Contractor shall ensure full compliance with tax laws of India with regard to this Contract and shall be solely responsible for the same. The contractor shall keep AIIMS, Bhubaneswar fully indemnified against liability of tax, interest, penalty etc. of the Contractor in respect thereof, which may arise.

(b) In witness of whereof the parties hereto have caused their respective common seals to be hereunto affixed / (or have hereunto set their respective hands and seals) the day and year first above written.

For and on behalf of

the Contractor

Signature of the
Authorized Official

Name of the Contractor
Stamp / Seal of the Contractor

SIGNED, SEALED AND DELIVERED

By the said

On behalf of the Contractor in the
In the Presence of

Witness _____
Name _____
Address _____

For and on behalf of

Director, AIIMS, Bhubaneswar

Signature of the
Authorized Official

Name of the official
Stamp / Seal

By the Said

On behalf of the Director
AIIMS, Bhubaneswar in the
presence of

Witness _____
Name _____
Address _____