CORNELL UNIVERSITY
FACILITIES CONTRACTS
121 HUMPHREYS SERVICE BUILDING
ITHACA, NEW YORK 14853-3701

TANG HALL BASEMENT
LABORATORY FIT-OUT

ADDENDUM NO. 1

December 8, 2025

This Addendum contains changes to the requirements of the Contract Documents and Specifications. Such changes are to be incorporated into the Construction Documents and shall apply to the work with the same meaning and force as if they had been included in the original document. Wherever this Addendum modifies a portion of a paragraph of the specifications or a portion of any Drawing, the remainder of the Paragraph or Drawing shall remain in force.

NOTE: Provisions of all Contract Documents apply.

General Requirements

Item 1. Section 01 77 00 Project Closeout: Part 1.3, FINAL CLEAN UP, B.

DELETE Section 01 77 00 in its entirety.

REPLACE with revised Section 01 77 00 attached.

Removed all notes related to clean up work of mechanical ducts and equipment in paragraph B.

Technical Specifications

Item 2. Section 087100 Finish Hardware: Paragraph 3.04, A

REPLACE HARDWARE SET #3 & #3A with the following:

HARDWARE SET #3 - Each to have:

	Hinges	McKinney (see description) x US26D
1	Passage Set	Sargent 8215 x LNL x US26D
1	***Closer***	***Sargent 351 series x 689***
1	***Concealed Overhead Stop***	***Dorma 710S series x US26D***
1	Kick Plate	Burns (see description) x US32D
1	Mop Plate	Burns (see description) x US32D
1	***set Seals***	***NGP 106N jambs/head***
1	***Door Bottom***	***NGP 320N***

HARDWARE SET #3A - Each to have:

	Hinges	McKinney (see description) x US26D
1	Passage Set	Sargent 8215 x LNL x US26D
1	***Closer***	***Sargent 351 series x 689***
1	***Concealed Overhead Stop***	***Dorma 710S series x US26D***
1	Kick Plate	Burns (see description) x US32D
1	Mop Plate	Burns (see description) x US32D
1	***set Seals***	***NGP 106N jambs/head***
1	***Door Bottom***	***NGP 320N***

Item 3. Section 087100 Finish Hardware: Paragraph 3.04, A

ADD the following subparagraph:

HARDWARE SET #4 - Each to have:

	Hinges	***McKinney (see description) x US26D***
1	***Electric Hinge***	***McKinney 6 wire to match x US26D***
1	***set Automatic Flush Bolts***	***Burns 7842 x US26D***
1	***Dustproof Strike***	***Burns 545 x US26D***
1	***Electric Lock***	***Sargent 8271-RX x LNL x US26D***
1	***Temporary Core***	***Sargent (to suit)***
1	***Permanent Core***	***Sargent (to suit) x US26D***
1	***Coordinating Closer***	***Dorma TS93GSR x 689***
1	***Wall Stop***	***Burns 575 x US32D***
2	***Kick Plate***	***Burns (see description) x US32D***
2	***Mop Plate***	***Burns (see description) x US32D***
1	***set Smoke Seals***	***NGP 2525C jambs/head***
2	***Astragal Seals***	***NGP 137N***
1	***Power Supply***	***(by security vendor)***
2	***Door Contacts***	***(by security vendor)***
1	***Card Reader***	***(by security vendor)***

Item 4. Section 115313 - High Performance Laboratory Fume Hoods: Paragraph 2.01, A

DELETE "RFV2"

REPLACE with **"SAFEGUARD"**

Item 5. Section 123553 - Laboratory Casework: Paragraph 2.02, A

DELETE "Clear Quarter-sawn Northern White Oak"

REPLACE with **"Stained Maple"**

Item 6. Section 123553 Laboratory Casework: Paragraph 2.03, A

DELETE "Clear Quarter-sliced Northern White Oak"

REPLACE with "**by Mott Manufacturing: Stained (Cashew 002), Plain-sliced, Maple**"

Item 7. Section 233716

DELETE in its entirety.

REPLACE with revised Specification 233716, attached.

Drawings

Item 8. Drawing A-721 - Miscellaneous Details, Overhead service platform detail

DELETE Drawing A-721 in its entirety.

REPLACE with revised Drawing A-721R, attached.

Added the premix gas turret at the overhead service platform to serve the equipment below. See Item 13 for description.

Item 9. Drawing A-900, – Enlarged Floor Plan,

DELETE in its entirety.

REPLACE with revised Drawing A-900R, attached.

General notes:

ADD note #16 "See Drawing A-920 for Abbreviations and Symbols".

Item 10. Drawing A-900R, at Lab B95:

Revised new 3'x6' Test Bench and new 5ft Desk to **"Owner furnished, owner installed test bench and desk."**

Item 11. Drawing A-900R, Plan at Lab B99

DELETE two new desks

REPLACE with **"Owner furnished, Owner installed desks"**

Item 12. Drawing A-900R, at Labs B97 & B99

DELETE new whiteboards

REPLACE with "**O.F.C.I. (Owner furnished, Contractor installed) whiteboards"**

Item 13. Drawing A-900R, at Lab B97

DELETE the premix gas service at wall

ADD the premix gas turret at overhead service platform.

Item 14. Drawing A-900R, Finish Schedule

REPLACE primary paint color of ceiling with "**accent"** paint color.

Item 15. Drawing A-910 - Interior Elevations

DELETE in its entirety.

REPLACE with revised Drawing A-910R, attached.

At Elevation at Lab B97:

DELETE premix gas turret at wall. See Item 13 for reference.

Item 16. Drawing A-910R, all lab tables shown at Lab B97, B99 & B99B to match plan drawing

REPLACE notes in elevations to indicate all lab tables to be "**O.F.C.I."** (Owner furnished, Contractor installed), to match plan drawing A-900.

Item 17. Drawing A-910R, whiteboards

REPLACE note in elevations to clarify whiteboards to be "**O.F.C.I"**. (Owner furnished, Contractor installed). See Item 12 for description.

Item 18. Drawing A-920 – Lab Casework Schedule and Details

DELETE in its entirety.

REPLACE with revised Drawing A-920R, attached.

At new whiteboard detail:

DELETE new whiteboard detail. See Item 12 for description.

Item 19. Drawing A-920R, Movable lab table

DELETE movable table detail from lab casework schedule. See Item 16 for description.

Item 20. Drawing P-100 – Basement Floor Plan - Plumbing

DELETE in its entirety.

REPLACE with revised Drawing P-100R, attached.

Item 21. Drawing M-100 – Basement Floor Plans - HVAC

DELETE in its entirety.

REPLACE with revised Drawing M-100R, attached.

Item 22. Drawing M-400 – Details - HVAC

DELETE in its entirety.

REPLACE with revised Drawing M-400R, attached.

Item 23. Drawing M-401 – Details and Piping Schematic - HVAC

DELETE in its entirety.

REPLACE with revised Drawing M-401R, attached.

Item 24. Pre-bid Sign-in Sheet attached for Contractors' reference only

Item 25. RFI Questions and Clarifications

See attached RFI Log Items (1 – 10)

Attachments: Specification 017700
Specification 087100
Specification 115313
Specification 123553
Specification 233716
Drawing A-721R
Drawing A-900R
Drawing A-910R
Drawing A-920R
Drawing P-100R
Drawing M-100R
Drawing M-400R
Drawing M-401R
Pre-bid Sign in Sheet
RFI Log items (1 – 10)

Note: Any specified materials, equipment, systems, etc., shall have "or equal to" added to the description if not already there. Contractors should note any substitutions in their bid submission.

******END OF ADDENDUM******

SECTION 01 77 00 PROJECT CLOSEOUT

1.0 GENERAL

1.1 INSPECTIONS

A. Substantial Completion:

1. Within a minimum of five (5) days prior to substantial completion, when the Work has reached such a point of completion that the building or buildings, equipment and apparatus can be occupied and used for the purpose intended, the Contractor shall conduct a detailed inspection of the Work to ensure that all requirements of the Contract have been met and that the Work is complete and is acceptable. Contractor shall prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

2. After receipt of the Contractor's initial punch list, the Architect will make an inspection of the Work to determine that the Work is substantially complete and that requirements of the Contract have been met and that the Work is sufficiently complete and is acceptable for use. The Architect will submit a marked-up list of items to be completed and/or corrected, inclusive of the Contractor's punch list, with an estimated dollar value for each item.

3. The Architect shall prepare a Certificate of Substantial Completion, template provided by the Owner, on the basis of an inspection, when the Architect has determined that the Work is substantially complete.

4. A copy of the report of the inspection will be furnished to the Contractor as the inspection progresses so that the Contractor may proceed without delay with any part of the Work found to be incomplete or defective.

5. All work performed under a Fire Protection System Installation/Alteration Operating Permit shall be inspected by the Ithaca Fire Department, or if so delegated by the Ithaca Building Department and the Owner's Environmental Health and Safety Department.

    a. A member of the Ithaca Fire Department shall witness all acceptance or reacceptance testing of work performed under a Fire Protection System Installation Operating Permit. All testing and inspections shall be in compliance with the applicable NFPA codes as referenced by Section 906.1 of the Fire Code of NYS.

    b. Work classified as a 'Repair' under the Existing Building Code does not require the Ithaca Fire Department to witness the testing of the affected systems. Systems that have been repaired must still be tested as required by the Fire Code of NYS and NFPA.

    c. The Ithaca Fire Department Shall Witness the Acceptance or Reacceptance Testing for the Following Conditions:

- Testing of any new installation of a fire alarm, fire suppression, or fire detection system as required by the Fire Code of New York State.

- Hydrostatic testing of sprinkler system where the modification affects more than twenty (20) sprinkler heads and the modified area can be isolated from the rest of the system

- Installation or replacement of a fire pump or drive elements of the fire pump.

- A Fire Alarm System with added or deleted components.

- A Fire Alarm System where the wiring or control circuits have been modified.

- A Fire Alarm System where the control unit (Fire Alarm Panel) has been replaced or the control unit software has been replaced.

- A smoke control system where the master control unit, individual fan control unit, or fan drive unit has been replaced or modified.

- An alternative fire suppression system that has been replaced or the actuation elements have been modified. Except: fusible link replacement.

- A modification or extension of the piping fur a fire standpipe system where a hydrostatic test is required by NFPA 14.

B. Final Acceptance:

1. When the items appearing on the report of inspection have been completed or corrected, the Contractor shall so advise the Architect. After receipt of this notification and Contractor's certified list of completed items, the Owner's Representative will inform the Contractor of the date and time of final inspection. A copy of the report of the final inspection containing all remaining contract exceptions, omissions and incomplete Work will be furnished to the Contractor.

2. After receipt of notification of completion and all remaining contract exceptions, omissions and incomplete Work from the Contractor, the Architect will make an inspection to verify completion of the exception items appearing on the report of final inspection.

1.2 SUBMITTALS

A. Contractor's List of Incomplete Items: Initial punch list submittal at Substantial Completion.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listing by room or space number. Organize items applying to each space by major element, including categories for individual exterior face elevations, ceilings, individual walls, floors, doors, roof levels, casework, equipment, and building systems.

B. Contractor's Certified List of Completed Items: Final signed punch list submittal at Final Completion.

C. Certificates of Release: Occupancy permits from authorities having jurisdiction.

1.3 FINAL CLEAN UP

A. Upon completion of the Work covered by the Contract the Contractor shall leave the completed Project ready for use and occupancy without the need of further cleaning of any kind and with all Work in new condition and in perfect order. In addition, upon completion of all Work, the Contractor shall remove from the vicinity of the Work all plant, buildings, rubbish, unused materials, concrete forms and other materials belonging to him or used under its direction during construction or impairing the use or appearance of the property and shall restore such areas affected by the Work to their original condition, and, in the event of its failure to do so, the same shall be removed by the Owner at the expense of the Contractor, and the Contractor and/or its surety shall be liable therefore. Final clean-up shall include but not be limited to the following:

1. All finished surfaces shall be swept, dusted, washed and polished. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective sections of the specifications.

2. Roofs, utility tunnels, manholes and pipe trenches and spaces between the new and existing Work shall be left thoroughly cleaned.

3. Finished flooring shall be thoroughly cleaned in accordance with the manufacturer's recommendations.

4. Where the finish of floors has been marred or damaged in any space or area, the entire floor of that space or area shall be refinished as recommended by the manufacturers of the flooring.

5. All equipment shall be in an undamaged, bright, clean, polished and new appearing condition.

6. All new glass shall be washed and polished, both sides. The Contractor shall be responsible for all breakage of glass in the area of the Work from the commencement of its activities until the building is turned over to Owner. The Contractor shall replace all broken glass and deliver the entire building with all glazing intact and clean.

7. Provide new filters for all fan convectors after final cleaning.

8. Refer to exterior clean up. Remove paint and glazing compound from surfaces.

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by construction operations. Return adjacent areas to condition existing before construction operations began.

~~*Cleaning of Renovated Duct Systems and Existing Duct Systems in Renovated Areas:*~~

~~*1. Cleaning work shall be performed by firm which has minimum three (3) years' experience in mechanical cleaning of air systems. Work shall be done by skilled mechanics, technicians and experienced supervisors.*~~

~~*2. Clean dirt, dust and debris from air units, associated equipment air ducts; sanitize same. Cleaning shall include:*~~

~~*a. Cleaning of air unit's supply, return and exhaust sections including coils, fans, filter racks, outdoor air intake shaft, and interior surfaces.*~~

~~*b. Cleaning of dampers, heating coils, humidifiers, and similar devices in ductwork.*~~

~~*c. Marking of duct-mounted damper settings, prior to cleaning, and returning dampers to marked positions after cleaning. This includes fire dampers, zone dampers, balancing dampers and volume dampers.*~~

~~*d. Cleaning of terminal supply, return and exhaust grilles, registers and diffusers.*~~

~~*e. Cutting of access holes in ductwork for cleaning process, as well as sealing and patching of same.*~~

~~*f. Removal of portions of duct system which cannot otherwise be thoroughly cleaned, and replacement thereof.*~~

~~*g. Sealing of lined duct systems, upon completion.*~~

~~*h. Removal and reinstallation of ceiling panels, tiles, ceiling support tracks, and other ceiling construction, as required to facilitate cleaning.*~~

~~*i. Providing access doors required to facilitate cleaning.*~~

~~*3. Cleaning shall meet National Air Duct Cleaners Association (NADCA) Standards, capable of verification by NADCA Vacuum Test. Cleanliness shall be subject to Architect's visual review; provide re-cleaning as necessary to satisfy Architect*~~

~~*a. Cleaning methods may include vacuuming, brushing, mechanical brushing, scraping, or air washing. Use method best suited for locations involved.*~~

~~*b. Do NOT use methods which could damage the system or the building.*~~

~~*c. Remove dirt, dust, lint and other accumulations by HEPA filtered air machine capable of minimum 6000 cfm. Air machine shall operate to obtain 1250 fpm across the workspace. Use brushes, mechanical agitators or air whips to dislodge contaminants to be collected by the air machine.*~~

~~*d. Cleaning shall begin at the furthest point of the return system and at the outdoor air intake. Cleaning shall proceed toward the air handling equipment. Cleaning shall finish at the furthest point of the supply ductwork.*~~

1.4 MAINTENANCE STOCK

A. Turn over to Owner's Representative the maintenance stock specified. Contractor shall obtain signed receipt from Owner's Representative for all maintenance stock.

2.0 PRODUCTS – NOT USED

3.0 EXECUTION – NOT USED

*****END OF SECTION 01 77 00*****

SECTION 087100

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. The required hardware items for doors are indicated in hardware sets shown herein. Should any opening be omitted, hardware shall be provided as specified for other doors of similar locations, function, quality and design.

1.02 RELATED SECTIONS

A. Section 081113: Metal doors and frames.

B. Section 081416: Wood doors and frames.

1.03 SUBMITTALS

A. General: Submit the following in accordance with the provisions of the general contract documents.

B. Product Data: Submit two (2) copies of the manufacturer's data for each item of hardware. Include whatever information may be necessary to show compliance with requirements.

C. Hardware Schedule: Submit three (3) copies of the hardware schedule. Follow Door and Hardware Institute (DHI) guidelines for scheduling. At the end of the schedule list each door number with appropriate heading number and hardware set number. Furnish initial draft of schedule at the earliest possible date, in order to facilitate the fabrication of other work. Furnish final schedule after samples, manufacturer's data sheets have been approved.

D. Keying Schedule: A key schedule showing all key numbers and spaces to which each permits entry, shall be provided. Consult with OWNER before submitting final key schedule. After final approval has been received, the schedule along with the key gathering envelopes containing keys for each lock endorsed with lock number and space designation shall be turned over to the OWNERS.

E. Samples: Prior to submittal of the final hardware schedule and prior to delivery of hardware, submit one (1) sample of each exposed hardware unit. Sample will be reviewed by the ARCHITECT for design, color and texture only. Compliance with other requirements is the exclusive responsibility of the CONTRACTOR. Samples approved by the ARCHITECT shall be turned over to the OWNER to be used as attic stock.

1.04 QUALITY ASSURANCE

A. Standards: All finish hardware shall conform to one or all the following standards:

1. Testing Laboratories: Underwriters Laboratory (UL) and or Warnock Hersey Fire Laboratories Division: All fire rated doors shall have hardware assemblies approved by one of the listed laboratories.
2. National Fire Protection Association: NFPA 80 and NFPA 101.
3. Builders Hardware Manufacturers Association (BHMA).
4. American National Standards Institute (ANSI).

5. American Disabilities Act (ADA).

B. Supplier: Finish hardware shall be furnished by those having a minimum of 5 years of builder's hardware experience and shall have in their employ at least one certified Architectural Hardware Consultants (AHC) to correctly interpret the plans, detailed drawings and specifications. It is imperative that all Finish Hardware items be furnished by a factory authorized contract hardware distributor for each of the specified products.

1.05 PRODUCT HANDLING

A. Handle, store, distribute, protect and install in accordance with the manufactures instructions. Deliver packaged material in original containers with seals unbroken and labels intact. Deliver assemblies completely identified and with adequate protection for storage, handling and installation.

B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control the handling and installation of hardware which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses; both before and after installation.

1.06 PROJECT CONDITIONS

A. Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated and as necessary for proper installation and function. Deliver packaged hardware items to the proper locations for installation.

B. Furnish hardware templates to each fabricator of doors, frames and other work to be factory prepared for the installation of hardware.

1.07 WARRANTIES

A. The hardware manufacturers shall provide full replacement warranty as listed below. Replacement warranty shall not include any labor cost.

1.	Surface Closers	10 years.
2.	Locksets etc.	2 years
3.	Balance of hardware	2 years

PART 2 - PRODUCTS

2.01 MATERIALS AND FABRICATION

A. Hand of Door: The drawings show the swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of the door swing shown.

B. Base Metals: Produce hardware units of the basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness but in no case of
lesser quality material.

C. Fasteners: Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware, which has been prepared for self- tapping sheet metal screws.

D. Screws: Furnish screws for installation, with each hardware item. Finish exposed screws to match the hardware finish.

E. Tools for Maintenance: Furnish a complete set of specialized tools as needed, for the OWNERS continued maintenance, removal and replacement of hardware.

F. Concealed Fasteners: Provide concealed fasteners for hardware units which are exposed when the door is closed except to the extent no standard manufacturer's units are available with concealed fasteners. Use thru bolts only where necessary to adequately fasten hardware to the door.

2.02 HINGES

A. All hinges shall be full mortise five knuckle ball bearing type, template, with non-rising loose pins. All outswing doors shall be furnished with non-removable pins (NRP).

B. All hinges for 1-3/4" thick doors shall be 4-1/2" wide in the open position. For other thickness doors, hinges shall be of a width to permit unobstructed swing of the doors.

C. Size and weight of hinges shall conform to the following:

Up to 36" ----------4-1/2" heavy weight
Over 36" to 44" --------5" heavy weight
Over 44" --------continuous hinges

E. Quantity of hinges shall be provided to conform to the following:

Doors up to 60" in heights ----------2 hinges
Doors 60" to 90" in height ----------3 hinges
Doors 90" and over ---------I hinge every 30" in height

F. All hinges shall be the products of one manufacturer.

2.03 LOCKSETS, LATCHSETS ETC.

A. Unless otherwise noted, all locksets and latchsets shall conform to ANSI A156.13 Series 1000 Grade 1. Furnish wrought steel box strikes (M17) and curved lip strikes (SA114) with proper lip lengths as required.

2.04 KEYS, KEYING, AND CYLINDERS

A. Keys: shall be nickel silver. Furnish a quantity of keys as follows.

1.	Grand Master Keys	5 each per group
1.	Master Keys	5 each per group
2.	Change Keys	3 each per cylinder
3.	Control Keys	5
4	Construction Keys	5

B. Keying: All locks shall be construction keyed and great grand master keyed to the existing keying system. Hardware supplier to meet with the Owner to establish keying requirements.

C. Cylinders: All cylinders shall be removable core with visual key control. Furnish brass construction cores. Plastic cores will not be accepted.

2.05 DOOR CLOSING DEVICES

A. All surface closers shall meet ANSI A156.4 Grade 1 requirements, barrier free.

B. All closers shall be installed so that closer bodies are positioned on room side of doors to and from corridors, i.e., in-swing doors shall be regular arm. Out-swing doors shall have a parallel arm. Regular arm shall be used in connecting doors between rooms.

C. Furnish all required brackets, filler plates and any others items required to insure proper installation and operation.

2.06 DOOR STOPS

A. Unless otherwise noted, all door stops shall be Trimco 1270WV wall mounted door stops. Where a wall stop will not function properly, use a Trimco W1211 floor stop.

PART 3 - EXECUTION

3.01 GENERAL

A. Approval: As soon as practical after award of Contract and before a hardware schedule is prepared, and before any hardware is ordered or delivered to the project, the CONTRACTOR shall submit to the ARCHITECT for his written approval, copies of sample list, listing each of the different items of builders hardware and catalog cuts of each item.

B. Templates: As soon as the hardware schedule is approved the hardware supplier shall furnish to the various fabricators, required templates for fabrication purposes. Templates shall be made available not more than (1O) days after receipt of the approved hardware schedule.

C. Packaging and Marking: All hardware shall be shipped with proper fastenings for secure application. Each package of hardware shall be legibly marked indicating the part of the work for which it is intended. Markings shall correspond with the item numbers shown on the approved hardware schedule. Keys shall be tagged within each package set and plainly marked on the face of the envelope with the key control number, door designation and all identification as necessary.

D. Delivery: Delivery shall be made to the project site to the attention of the GENERAL CONTRACTOR. Where delivery of special hardware is required at any fabricators plant, the hardware supplier shall make such delivery.

3.02 INSTALLATION

A. Mount hardware units at heights recommended in "Recommended Locations for Builders Hardware" by BHMA, unless otherwise noted or directed by the ARCHITECT.

B. Install each hardware unit in compliance with the manufacturer's recommendations.

3.03 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer. Replace units that cannot be adjusted.

B. Wherever hardware installation is made more than one (1) month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance make a final check, and adjust all hardware items in such space or area. Adjust door control devices and compensate for final operation of heating and ventilating equipment.

C. Instruct OWNERS personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

3.04 HARDWARE SETS

A. The following is a general listing of hardware requirements and is not intended for use as a final hardware schedule. Any items of hardware required by established standards or practices, or to meet state and local codes or proper door operation shall be furnished specifically called out in the following listed groups.

HARDWARE SET #1

Each to have:

	Hinges	McKinney (see description) x US26D
1	Storeroom Lock	Sargent 8205 x LNL x US26D
1	Temporary Core	Sargent (to suit)
1	Permanent Core	Sargent (to suit) x US26D
1	Wall Stop	Burns 575 x US32D
1	Mop Plate	Burns (see description) x US32D
1	set Sound Seals	NGP 106N jambs/head
1	Door Bottom	NGP 520N

HARDWARE SET #1A

Each to have:

	Hinges	McKinney (see description) x US26D
1	Storeroom Lock	Sargent 8205 x LNL x US26D
1	Temporary Core	Sargent (to suit)
1	Permanent Core	Sargent (to suit) x US26D
1	Closer w/stop	Sargent PS351 series x 689
1	Closer Mounting Bracket	NGP 75P

1	Mop Plate	Burns (see description) x US32D
1	set Sound Seals	NGP 106N jambs/head
1	Door Bottom	NGP 520N

HARDWARE SET #1B

Each to have:

	Hinges	McKinney (see description) x US26D
1	Storeroom Lock	Sargent 8205 x LNL x US26D
1	Temporary Core	Sargent (to suit)
1	Permanent Core	Sargent (to suit) x US26D
1	Surface Overhead Stop	Dorma 700S series x US26D
1	Mop Plate	Burns (see description) x US32D
1	set Sound Seals	NGP 106N jambs/head
1	Door Bottom	NGP 520N

HARDWARE SET #2

Each to have:

	Hinges	McKinney (see description) x US26D
1	set Automatic Flush Bolts	Burns 7842 x US26D
1	Dustproof Strike	Burns 545 x US26D
1	Classroom Lock	Sargent 8237 x LNL x US26D
1	Temporary Core	Sargent (to suit)
1	Permanent Core	Sargent (to suit) x US26D
1	Coordinating Closer	Dorma TS93GSR x 689
2	Kick Plate	Burns (see description) x US32D
2	Mop Plate	Burns (see description) x US32D
2	Silencers	Burns 500

HARDWARE SET #3

Each to have:

	Hinges	McKinney (see description) x US26D
1	Passage Set	Sargent 8215 x LNL x US26D
1	***Closer***	***Sargent 351 series x 689***
1	***Concealed Overhead Stop***	***Dorma 710S series x US26D***
1	Kick Plate	Burns (see description) x US32D
1	Mop Plate	Burns (see description) x US32D
1	***set Seals***	***NGP 106N jambs/head***
1	***Door Bottom***	***NGP 320N***

HARDWARE SET #3A

Each to have:

	Hinges	McKinney (see description) x US26D
1	Passage Set	Sargent 8215 x LNL x US26D
1	***Closer***	***Sargent 351 series x 689***
1	***Concealed Overhead Stop***	***Dorma 710S series x US26D***
1	Kick Plate	Burns (see description) x US32D
1	Mop Plate	Burns (see description) x US32D
1	***set Seals***	***NGP 106N jambs/head***
1	***Door Bottom***	***NGP 320N***

HARDWARE SET #4

Each to have:

	Hinges	***McKinney (see description) x US26D***
1	***Electric Hinge***	***McKinney 6 wire to match x US26D***
1	***set Automatic Flush Bolts***	***Burns 7842 x US26D***
1	***Dustproof Strike***	***Burns 545 x US26D***
1	***Electric Lock***	***Sargent 8271-RX x LNL x US26D***
1	***Temporary Core***	***Sargent (to suit)***
1	***Permanent Core***	***Sargent (to suit) x US26D***
1	***Coordinating Closer***	***Dorma TS93GSR x 689***
1	***Wall Stop***	***Burns 575 x US32D***
2	***Kick Plate***	***Burns (see description) x US32D***
2	***Mop Plate***	***Burns (see description) x US32D***
1	***set Smoke Seals***	***NGP 2525C jambs/head***
2	***Astragal Seals***	***NGP 137N***
1	***Power Supply***	***(by security vendor)***
2	***Door Contacts***	***(by security vendor)***
1	***Card Reader***	***(by security vendor)***

END OF SECTION

SECTION 115313 HIGH PERFORMANCE LABORATORY FUME HOODS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. High performance, variable air volume, bench-top laboratory fume hoods.

2. Work tops within fume hoods.

3. Service fixtures and fittings in fume hoods.

4. Piping and wiring within fume hoods for service fittings, light fixtures, fan switches, and other electrical devices included with fume hoods.

5. Fume hood shall be non-combustible or Class 1, per FM Global.

B. Related Sections:

1. Plumbing, HVAC and Electrical drawings for installing service fittings in fume hoods, including piping and wiring within fume hoods, and for other wiring in fume hoods, including connecting light fixtures, fan switches, and other electrical devices included with fume hoods.

2. Plumbing, HVAC and Electrical drawings for connecting service utilities at back of fume hoods. Piping and wiring within fume hoods are specified in this Section.

3. HVAC drawings for Testing, Adjusting, and Balancing for HVAC for field quality control testing of fume hoods.

1.02 PERFORMANCE REQUIREMENTS

A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110 at a release rate of 4.0 L/min.:

1. Average Face Velocity: 75 fpm (0.51 m/s) plus or minus 10 percent with sashes fully open.

2. Face-Velocity Variation: Not more than 10 percent of average face velocity.

B. Static-Pressure Loss: Not more than 1/2-inch wg (124 Pa) at 100-fpm (0.51-m/s) face velocity when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

C. Delegated Design: Design fume hoods, including comprehensive engineering analysis by a qualified professional engineer, using seismic performance requirements and design criteria indicated.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For laboratory fume hoods. Include plans, elevations, sections, details, and attachments to other work.

1. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports.

2. Indicate locations and types of service fittings together with associated service supply connection required.

3. Indicate duct connections, electrical connections, and locations of access panels.

4. Include roughing-in information for mechanical, plumbing, and electrical connections.

C. Samples: For fume hood exterior finishes interior lining and work top material], in manufacturer's standard sizes.

D. Product Test Reports: Showing compliance with specified performance requirements for as manufactured containment and static pressure loss based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.

E. Field quality-control reports.

1.04 QUALITY ASSURANCE

A. Product Designations: Drawings indicate sizes, types, and configurations of fume hoods by referencing designated manufacturer's catalog numbers. Other manufacturers' hoods of similar sizes, types, and configurations, and complying with the Specifications, may be considered. See Division 01 Section "Product Requirements."

B. Product Standards: Comply with SEFA 1, "Laboratory Fume Hoods - Recommended Practices. Provide fume hoods UL listed and labeled for compliance with UL 1805.

C. Safety Glass: Products complying with testing requirements in 16 CFR 1201 for Category II materials.

1. Permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide Mott Manufacturing, Ltd.; *SAFEGUARD* or approved equal. FUME HOODS SHALL CLOSELY MATCH THOSE INSTALLED ELSEWHERE IN THE RECENTLY COMPLETED TANG HALL. Fume hood shall be non-combustible or Class 1, per FM Global.

2.02 MATERIALS

A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.

B. Glass-Fiber-Reinforced Polyester: Polyester laminate with a chemical-resistant gel coat on the exposed face and having a flame-spread index of 25 or less per ASTM E 84.

C. Epoxy: Factory molded, modified epoxy-resin formulation with smooth, nonspecular finish.

1. Physical Properties:

a. Modulus of Elasticity: Not less than 2,000,000 psi (1400 MPa).

b. Hardness (Rockwell M): Not less than 100.

c. Water Absorption (24 Hours): Not more than 0.02 percent.

d. Heat Distortion Point: Not less than 260 deg F (127 deg C).

e. Flame-Spread Index: 25 or less per ASTM E 84.

2. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:

a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.

b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).

3. Color: As selected by Architect from manufacturer's full range.

D. Glass: Clear, laminated tempered glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Class I, Quality-Q3with clear, polyvinyl butyral interlayer.

E. Fasteners: Provide stainless-steel fasteners where exposed to fumes.

2.03 FABRICATION

A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations. Fume hoods shall be capable of being partly disassembled as necessary to permit movement through a 35-by-79-inch (889-by-2007-mm) door opening.

B. Steel Exterior: Fabricate from steel sheet, not less than 0.0478 inch (1.2 mm) thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.

C. Ends: Fabricate with double-wall end panels without projecting corner posts or other obstructions to interfere with smooth, even airflow. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.

D. Splay top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.

E. Interior Lining:

1. Polypropylene, not less than 1/4 inch (6.35 mm) thick.

F. Lining Assembly: Unless otherwise indicated, assemble with stainless-steel fasteners or epoxy adhesive, concealed where possible. Seal joints by filling with chemical-resistant sealant during assembly.

1. Fasten lining components together with [stainless-]steel cleats or angles to form a rigid assembly to which exterior panels are attached.

2. Fasten lining components to a rigid frame assembly fabricated from stainless steel and to which exterior panels are attached.

3. Punch fume hood lining side panels to receive service fittings and remote controls. Provide removable plug buttons for holes not used for indicated fittings.

G. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom for airflow through hood. Secure baffle to cleats at rear of hood with stainless-steel screws. Fabricate baffle for easy removal for cleaning behind baffle.

1. Provide preset baffles.

2. Provide epoxy-coated, stainless-steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.

H. Exhaust Plenum: Full width of fume hood and with adequate volume to provide uniform airflow from hood, of same material as hood lining, and with duct stub for exhaust connection.

1. Duct-Stub Material: Stainless steel.

I. Sashes: Provide vertically operating sashes.

1. Fabricate from 0.050-inch nominal thickness stainless steel. Form into four-sided frame with bottom corners welded and finished smooth. Make top member removable for glazing replacement. Set glazing in chemical-resistant, U-shaped gaskets.

2. Counterbalance vertical-sliding sash with sash weight and stainless-steel cable system to hold sash in place regardless of position. Provide ball-bearing sheaves, plastic glides in stainless-steel guides, and stainless-steel lift handles. Provide rubber bumpers at top and bottom of each sash unit.

K. Airfoil: Unless otherwise indicated, provide airfoil at bottom of fume hood face opening with 1-inch space between airfoil and work top. Sash closes on top of airfoil, leaving 1-inch opening for air intake. Airfoil directs airflow across work top to remove heavier-than-air gases and to prevent reverse airflow.

1. Fabricate airfoil from stainless steel.

L. Light Fixtures: Provide vaporproof, LED light fixtures, of longest practicable length. Shield fixtures from hood interior with 1/4-inch- thick laminated glass or 3-mm-thick tempered glass, sealed into hood with chemical-resistant rubber gaskets.

1. Provide fixtures with color temperature of 3500 K and minimum color rendering index of 85.

2.04 BASE CABINETS, BASE STANDS, WORK TOPS, SINKS AND SERVICE FITTINGS

A. Flammable Liquid Storage Cabinets: Flammable storage cabinets shall conform to the construction, details and dimensions as set forth in NFPA 30 "Flammable and Combustible Liquids Code", and shall be FM-Approved.

1. Minimum Metal Thickness: Bottoms, tops, sides, fixed backs, and doors minimum 0.048- inch (1.21 mm) thick.

2. Construction: Double walled with a 1-1/2 inch (38 mm) air space, all welded construction.

3. Doors: Self-closing with fusible link. Auto-latch and door synchronizer incorporated as an integral function of the cabinet. Provide doors with a three-point locking arrangement.

4. Spill Containment Pan: Cabinet floor with 2 inch (51 mm) deep liquid-tight spill containment pan.

5. Markings: Each storage cabinet shall be marked "FLAMMABLES – KEEP FIRE AWAY" in letters not less than 2 inches (51 mm) height and in color contrasting with the background.

6. Cabinet width: as indicated.

7. Locations: As indicated.

   a. Provide mobile base cabinets on locking casters at accessible fume hoods.
   b. Provide fixed base cabinets at non-accessible fume hoods.

B. Chemical (Acid) Storage Base Cabinets:

1. Minimum Metal Thickness: Back panels, doors, and shelves: 0.036 inch (0.91 mm). For shelves more than 36 inches (900 mm) long, use 0.048-inch (1.21 mm) thick metal or provide suitable reinforcement.

2. Acid Storage-Cabinet Lining: 1/4-inch (6 mm) thick, polyethylene or polypropylene.

3. Markings: Each storage cabinet shall be marked "ACID" in letters not less than 2 inches (51 mm) height and in color contrasting with the background.

4. Cabinet: Width: as indicated.

5. Locations: As indicated.

   a. Provide mobile base cabinets on locking casters at accessible fume hoods.
   b. Provide fixed base cabinets at non-accessible fume hoods.

6. Cabinet Vents: Provide cabinets with rigid polyolefin or flexible reinforced PVC vent pipes for venting to behind baffle at rear of fume hood.

C. Vacuum Pump Base Cabinets:

1. Width: as indicated

2. Provide louvered doors with sound absorption foam.

3. Provide internal pull-out tray and removable access panel at back of cabinet to match material of cabinet, internal pump hose connection, and internal 120V/20amp duplex receptacle. Provide on/off switch at front panel.

4. Locations: as indicated.

D. Work Tops:

1. Work Tops, General: Provide units with smooth surfaces free of defects. Make exposed edges and corners straight and uniformly beveled. Where acid storage cabinets are indicated beneath fume hoods, provide holes in work tops as need to accommodate cabinet vents.

2. Resin Work Tops: Provide front overhang of 1 inch (25 mm), with continuous drip groove on underside 1/2 inch (13 mm) from edge.

   a. Work Top Material: Solid epoxy composition.
   b. Work Top Configuration: Raised (marine) edge, 1-1/4 inches (32 mm) thick at raised edge, with beveled or rounded edge and corners.

3. Cup Sinks: Epoxy, 3-by-6-inch (75-by-150-mm) oval.

   a. Provide with polypropylene strainers and integral tailpieces.

E. Adjustable-Height Work Surface: Work surface supported by electro-hydraulic mechanism with electric motor for adjustment of work surface height from 30 inches (762 mm) to 37 inches (940 mm).

F. Service Fittings: Comply with requirements in Section 123553 "Laboratory Casework."

1. Plumbing Fittings: Provide service fittings with exposed surfaces, including fittings, escutcheons, and trim, of finish complying with requirements in SEFA 7 for corrosion- resistant finishes.

   a. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by WaterSaver Faucet Company or comparable products from the following: Chicago Faucet Company (The); a Geberit Company.
   b. Laboratory Gases: Flange-type fitting(s) with angled outlet, remote-control needle valves, and bonnet handle: Basis-of-Design: WaterSaver Faucet Company, Colortech CT740N-R with CT022WSA.

c. Water Faucets: Remote-control, rigid, gooseneck faucets with vacuum breaker, removable serrated outlet, and bonnet handle. Basis-of-Design: WaterSaver Faucet Company, Colortech CT740W-9VB with CT071VB-WSA.
d. Provide front-loaded plumbing fittings.
e. Provide fittings for types of services as indicated in 'Fume Hood Schedule'.
f. Unless indicated otherwise, provide fittings for mounting on right side of fume hoods.
g. For fittings inside the hood, provide color-coded powder-coat or baked-on coating finish.
h. For control handles outside the hood, provide escutcheons with satin chrome with clear epoxy finish, with color-coded handles.

2. Electrical Outlets: Duplex GFCI receptacles.

2.05 CHEMICAL-RESISTANT FINISH

A. Preparation: Clean steel surfaces, other than stainless steel, of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

B. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply fume hood manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2. Colors for Fume Hood Finish: As selected by Architect from manufacturer's full range.

2.05 ACCESSORIES

A. Variable Volume Controller, Operation, Indicators and Alarms: Division 23 Controls Contractor shall furnish face velocity monitors, sash position sensors, and operator display panel to fume hood manufacturer for installation at the fume hood manufacturer's factory. Provide pathways for wiring to sash position sensor, face velocity monitors and operator display panel. Coordinate all requirements with Division 23 contractor.

1. Airflow Indicator: Each fume hood shall be provided with airflow indicator of the thermal anemometer type that measures fume hood face velocity and displays data as digital readout.

2. Airflow Alarm: Each fume hood shall be provided with audible and visual alarms that activate when airflow sensor reading is outside of preset range:

a. Thermal-anemometer airflow sensor.

b. Reset and test switches.

c. Switch that silences audible alarm and automatically resets when airflow returns to within preset range.

3. Fume hoods shall be provided with audible and visual alarm that activates when sash is opened beyond preset position, with silence and test switches.

B. Sash Stops: Provide fume hoods with sash stops to limit hood opening to 18". Basis of design is 60 fpm at 18" vertical sash opening. Sash stops can be manually released to open sash fully for cleaning fume hood and for placing large apparatus within fume hood.

2.06 SOURCE QUALITY CONTROL TESTING OF FUME HOODS

A. Submit a test report for the standard product previously tested, if the product is identical to equipment being provided for this project.

B. Evaluation of standard product shall have been conducted in accordance with the method prescribed in NIH Fume Hood Testing Protocol. Hood tests shall be performed by one of the independent, third party, testing agencies listed below:

1. Exposure Control Technologies (www.labhoodpro.com), Cary, NC, (919) 319.4290.

2. SAFELAB (www.safelab.com), Indianapolis, IN, (317) 872.6600.

3. Technical Safety Services (www.techsafety.com), Berkeley, CA, (800) 877.7742.

4. Micro-Clean (www.microcln.com), Lehigh Valley, PA, (610) 867.5302.

C. Testing shall be performed at an independent site, not the manufacturer's test lab.

D. Hoods shall achieve a rating of 5.0 AM 0.01 or better for all tests with an average face velocity of 60 FPM through the 18" vertically open sash.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install fume hoods level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Comply with requirements in Division 12 Section "Laboratory Casework" for installing fume hood base cabinets, work tops, and sinks.

C. Comply with requirements in Divisions 22 and 26 Sections for installing water and laboratory gas service fittings and electrical devices.

1. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink and work top-mounted fittings in sealant recommended by manufacturer of sink or work top material. Securely anchor fittings to fume hoods unless otherwise indicated.

3.02 FIELD QUALITY CONTROL

A. Field test installed fume hoods according to "Flow Visualization and Velocity Procedure" requirements in ASHRAE 110.

1. Test one installed fume hood, selected by Architect, for each type of hood installed, according to ASHRAE 110. If tested hood fails to meet performance requirements, field test additional hoods as directed by Architect.

B. Field test installed fume hoods according to ASHRAE 110 to verify compliance with performance requirements.

1. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.

1. After making corrections, retest fume hoods that failed to perform as specified.

3.03 TRAINING

A. Upon completion of the installation of the fume hoods, Manufacturer must conduct a training seminar for the Owner's users at the job site discussing proper operation of the fume hood, fume hood features and best use practices. Training session must be at least 30 minutes in length, not including a question and answer session. Training session must be scheduled within 30 days on completion of the installation.

3.04 WARRANTY

A. Manufacturer must offer a minimum five-year warranty on parts and labor to fix defects in materials and workmanship for fume hoods and casework.

END OF SECTION

SECTION 123553 LABORATORY CASEWORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. The Contract Forms, and Conditions of the Contract as provided by the Construction Manager, and applicable parts of Division 1 - GENERAL REQUIREMENTS, shall be included in and made a part of this Section.

B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.02 SUMMARY

A. Section Includes:

1. Clear finish, full overlay, architectural woodwork and wood laboratory and miscellaneous casework including but not limited to fixed laboratory base cabinets; movable and/or adjustable height tables; tall storage cabinets; wall cabinets; wall shelving on standards and brackets; fillers and countertop supports.

2. Casework countertops of molded epoxy resin.

3. Casework hardware.

4. Shop applied casework finishes.

5. Molded epoxy resin bench sinks.

6. Laboratory service fixtures, fittings and service plates.

7. Cylinder strap holders and cylinder racks.

8. Clear finish and stained trim.

9. Metal laboratory furniture, umbilicals, stainless steel shelving, suspended exhaust snorkels, test lead holders, and other purchased laboratory furniture and equipment not specified elsewhere.

10. Shop applied metal finishes.

11. Blocking, nailers, furring, grounds, rough hardware, and accessories necessary to install architectural woodwork.

B. Related Sections:

1. Product Requirements – Section 016000.

2. Carpentry - Section 062000.

3. Caulking between laboratory casework and any wall, floor, or ceiling joints - Section 079200.

4. Wood Doors - Section 082150.

5. Glass and Glazing - Section 088000.

6. Painting and Finishing - Section 099000, for field finishing of architectural woodwork.

7. Visual Display Surfaces – Section 101100.

8. Laboratory Fume Hoods - Section 115313.

9. Plumbing – Division 22.

10. Heating, Ventilating and Air Conditioning - Division 23.

11. Electrical - Division 26.

12. Communications – Division 27.

1.03 REFERENCES

A. The following standards are cited in this Section. They govern the work of this Section only to the extent specified in each citation.

B. Architectural Woodwork Institute (AWI): "Quality Standards" of AWI shall apply and by reference are hereby made part of this Section. References to Premium in the Specification shall be as defined in the latest edition of the AWI Quality Standards. Any item not given a specific quality grade shall be premium.

C. U.S. Department of Commerce Commercial Standards (CS): CS236-66 Mat-Formed Wood Particleboard.

D. U.S. Product Standards (PS):

1. PS 1, Construction and Industrial Plywood.

2. PS 20, American Softwood Lumber Standard.

3. PS 51, Hardwood and Decorative Plywood.

4. PS 58, Basic Hardwood.

E. American National Standards Institute (ANSI):

1. A156.9 Cabinet Hardware.

2. A156.11 Cabinet Locks.

3. A208.1 Mat-Formed Particleboard.

F. Federal Specifications (FS):

1. FF-N-105B (3) Nails, Brads, Staples, and Spikes: Wire, Cut, and Wrought.

2. FF-S-325 Shield, Expansion, and Nail, Drive Screw (Devices, Anchoring, Masonry).

G. National Electrical Manufacturers Association (NEMA): LD3 High Pressure Decorative Laminates.

1.04 PERFORMANCE REQUIREMENTS

A. Counters, low case tops, and stools shall support a 200-pound concentrated load at mid-span without noticeable springiness or finish/trim separation or overstress of anchorage or supports. Railings shall be designed to resist loads per Connecticut State Building Code.

B. Work shall accommodate changes in temperature and humidity without separation of joints, warping, binding of moving parts, wood veneer delamination, or overstress.

1.05 SUBMITTALS

A. Comply with Section 013300 requirements.

B. Shop Drawings: Shall be prepared by the manufacturer of the architectural woodwork, and shall:

1. Show dimensioned plans, elevations, profiles, and full or large-scale details. Identify details and key them to elevations.

2. Show relation to adjoining construction, including (but not limited to) provisions for fitting and trimming work to accommodate allowable tolerances in adjoining construction. Identify structural support furnished and installed under this and other Sections.

3. Show construction of all parts of the work: materials, thickness, and finishes; joining methods; details of field connections and anchorage; and provisions for moisture and thermal movement.

4. Show other information necessary to establish conformance to specified requirements and to fabricate, install, and coordinate work with affected trades.

C. Product Data: Manufacturers printed, descriptive data and catalog cuts for cabinet hardware, service fixtures and other manufactured items.

D. Samples:

1. Transparent-finished Wood Veneer: See PART 1: QUALITY ASSURANCE.

2. Transparent and stain finished Lumber Samples: Duplicate pairs of finished lumber of each species and cut. Each pair shall show the extremes of the range of variable appearance characteristics of lumber proposed for production work.

3. High-Pressure Decorative Laminate Samples: Two 2 x 3-inch (min.) size samples for each NEMA grade/color/pattern/finish combination.

4. Finished custom shelf bracket.

5. Surfacing materials: Two 4” x 4” (min) size for each type.

6. All casework hardware.

E. Certificates:

1. Fire Retardant-Treated Wood: Treater's certificate and Contractor's affidavit for treated wood products.

1.06 QUALITY ASSURANCE

A. Woodworker Qualifications: Work shall be done by a pre-qualified architectural woodworker regularly engaged in fabricating, shop-finishing, and installing custom woodwork of the kind and quality required for the Project. The Architect reserves the right to approve the manufacturer selected to produce laboratory casework.

B. Transparent-Finished Wood for Exposed Surfaces:

1. Display: Collect and display a leaf sample of the specified veneer from which the Architect can select wood veneers for transparent-finished work. Make finished samples from Architect-selected veneers.

2. Samples: Submit duplicate pairs of transparent-finished veneered panels. Each panel shall be 24 x 24 inches or larger, as required to show veneer face panel assembly. Each pair of panels shall show extremes of the range of variable appearance characteristics proposed for production work. Similarly, submit duplicate pairs of 6" x 2" x 24" transparent finished solid wood.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 016000 requirements.

B. Do not deliver products until storage and installation areas are dry enough to eliminate damage caused by excessive moisture and changes in moisture content.

C. Deliver products in closed vans. Bundle loose materials to prevent loss and damage.

D. Store products in a clean, protected space in the Project, under specified environmental conditions.

1.08 PROJECT CONDITIONS

A. Environmental Conditions: HVAC system shall be operating, and ambient occupancy conditions attained.

B. Adjoining Work: Constructed to specified tolerances and where applicable, to guaranteed dimensions.

C. Field Measurements: Fabricate work to field measurements. If field measurements cannot be made without delaying the Work, the Contractor shall provide guaranteed dimensions and coordinate work of affected trades/Sections to assure proper execution of adjoining work. The casework manufacturer is responsible for details and dimensions that result from field conditions and shall indicate on shop drawings all required field measurements.

1.09 SEQUENCING/SCHEDULING

A. The Woodwork Contractor shall coordinate delivery and installation of products furnished and/or installed under the work of this and other Sections/trades so that:

1. Locations of anchor plates, openings, and recesses for architectural woodwork are provided in time to be incorporated in drywall construction.

2. Access shall be provided for installation and testing of electrical work built into or concealed by architectural woodwork.

PART 2 - PRODUCTS

2.01 APPROVED CASEWORK MANUFACTURERS

A. Wood laboratory casework shall be manufactured by, and other products of this section shall be the responsibility of Mott Manufacturing, 452 Hardy Road, Brantford, Ontario CA N3T 5L8 (304-497-2115) represented by Scientifix 37-24 24th Street, Long Island City, NY 11101 (718-669-7050), or approved equal. NOTE: LABORATORY CASEWORK SHALL CLOSELY MATCH THAT IN THE RECENTLY COMPLETED TANG HALL PROJECT.

2.02 LUMBER MATERIALS

A. Hardwood Lumber: PS 58; clear and free from defects; graded in accordance with AWI requirements; maximum moisture content of 6 percent; of the following species and grade for ***stained*** finish:

1. Exposed exterior parts: ***Stained, Plain-sliced, Maple***, AWI Lumber Grade I.

2. Semi-exposed parts: ***Stained Maple***, AWI Lumber Grade II.

2.03 SHEET MATERIALS

A. Hardwood Lumber Core Plywood: Balanced 5-ply construction consisting of a solid hardwood staved core, hardwood cross plies, and hardwood face veneers, glued with water-resistant resin adhesives. Lumber core shall comply with product standards of PS 51 and ANSI/HPMA HP; with veneers of the following species, grade and face veneer cuts for ***stained*** finish:

1. Exposed exterior parts ***by Mott Manufacturing: Stained (Cashew 002), Plain-sliced, Maple***, AWI face grade AA.

2. Semi-exposed parts ***by Mott Manufacturing: Stained (Cashew 002), Maple,*** AWI face grade A.

B. Hardwood Veneer Core Plywood: Balanced 7-ply (min.) construction consisting of 5-ply (min.) hardwood veneer core plywood and hardwood face veneers, glued with water resistant resin adhesives. Veneer core shall comply with product standards of PS 51 and ANSI/HPMA HP; with veneers of the species, grade and face veneer cuts as described above for hardwood lumber core plywood.

C. Particleboard Core Plywood: Balanced 3-ply construction consisting of 45-pound density particleboard core and hardwood face veneers glued with water resistant resin adhesives. Particleboard core shall comply with product standards of PS 51 and ANSI/HPMA HP; with veneers of the species, grade and face veneer cuts as described above for hardwood lumber core plywood.

D. Fire-Retardant Treated Medium Density Fiberboard: UL listed wood fiberboard (FX MDF) with 20 Flame Spread and 25 Smoke Developed surface burning characteristics.

E. Tempered Hardboard: Pressed wood fibers with resin binder, tempered grade. Use ¼" thick tempered hardboard perforated with 1/8" dia. holes on a 1" x 1" grid for pegboards.

F. High Pressure Plastic Laminate: FS L-P-508H, .050-inch thick, matte finish, manufactured by Formica, or approved equal. See drawings for colors.

G. Backing Sheets: .020-inch thick high pressure paper base laminate without decorative finish.

2.04 ACCESSORIES

A. Glue: Water-resistant type as recommended by manufacturer for application.

B. Nails: Size and type to suit application.

C. Bolts, Nuts, Washers, Lags, Screws: Of size and type to suit application; chrome plated brass or stainless steel finish in exposed locations; carbon steel in concealed locations.

D. Glass for cabinets: 1/4-inch thick (or as indicated on drawings) laminated safety glass, complying with ANSI Z97.1 performance requirements for safety glass, consisting of two lights of 3 mm annealed clear float glass bonded to 0.06" polyvinyl butyryl interlayer. Float glass shall comply with ASTM C1036 requirements for Type I, Q3. PVB Interlayer shall be translucent or clear, depending on the application, as noted on drawings. Refer to Interior Glass and Glazing Section 088000 and the Architectural Drawings for additional glass types and requirements.

2.05 GENERAL FABRICATION REQUIREMENTS

A. Fabricate all items in accordance with AWI Quality Standards for Premium Grade, transparent finish, as amended in this Section.

1. Transparent-Finished Wood: Select wood for uniform appearance in each assembly and among all assemblies in the same space. Distribute to best advantage the characteristics and defects allowed by specified AWI Quality Grade.

2. Matched Lumber and Veneer: Where required appearance match (after finishing) cannot be obtained with the same species, obtain the Architect's approval to change lumber species or to substitute veneered solid core assembly for lumber.

3. Scribing Trim: Where not otherwise shown or specified, match species, cut, and finish of work scribing trim is used with.

4. Panel Products: 3-ply construction with 3/4" thick core where not otherwise specified, with face veneers specified for each category of work. Use FX MDF core for all wall paneling, and for any cabinets to be installed in corridors or lobbies. Use MDF core where core edges are to be sanded and finished; use MDF or particleboard core elsewhere.

B. Panel Product Locations: Use 3/4" thick (min.) cores where not otherwise indicated, with face veneers specified for each category of work. Locations for various core types specified shall be as follows:

1. Cabinet doors and drawer fronts shall be hardwood lumber core plywood. At the woodworker's option, particleboard cores with flush solid lumber inserts at hinge

attachment locations may be substituted for lumber core. Drawer sides, backs and fronts of drawer boxes shall be ½" 9-ply or solid hardwood.

2. Cabinet sides and backs, and wall shelves shall be hardwood veneer core plywood.

3. Wall paneling, trim, and for any cabinets or other woodwork to be installed in corridors, lobbies or public assembly spaces shall be FX MDF core, or fire-resistant particleboard core plywood.

C. Fit plywood and particleboard shelf, drawer front, fin and door edges with 3/16-inch matching hardwood edgebands, unless otherwise noted. Use full-length pieces only.

D. Use concealed fasteners wherever possible. Obtain prior approval for any exposed fasteners.

E. Provide access to electrical junction boxes and plumbing valves. Coordinate with other trades and indicate locations and means of access on shop drawings.

F. Provide concealed continuous stiffeners to the underside of any countertop spanning 4'-0" or more.

G. No particleboard or plywood shall be in contact with flooring. Cabinet bases shall be 4-inch (min.) high x ¾-inch (min.) thick solid clear, Select Northern White Maple lumber.

H. Cabinet Hardware: Factory-install cabinet hardware. Remove it as required for shipping. Package field-installed hardware with the assembly to which it is fitted.

I. Built-ins:

1. Cut/drill openings for fixtures, specialties, accessories, and other built-ins per template/instructions furnished by the manufacturer.

2. Cut/drill openings necessary to accommodate conduit, cable, wiring, and wiring devices. Provide wire access grommets for wire holes in exposed surfaces.

J. Assembly:

1. Trial-assemble all work. Permanently assemble work in the largest units that meet shipping and Project conditions.

2. Field Joints in Counters: Make counters in one-piece for-length where possible. Where field joints are unavoidable, prepare work for assembly with Flush Joint Fasteners.

2.06 SHOP APPLIED WOODWORK SEALING AND FINISHING

A. Transparent finish for exposed and semi-exposed surfaces: AWI Finish System TR-5, catalyzed vinyl, dull rubbed effect.

B. Sealing: Seal unfinished wood surfaces to prevent moisture gain. Seal immediately all bare wood that is exposed by field fabrication and fitting.

2.07 CASEWORK HARDWARE

A. Casework hardware includes, but is not limited to, the following:

1. Pulls:

    a. Wire Pulls for laboratory casework: Lamp by Sugatsune KC-S640/S, stainless steel, satin finish. Pulls shall be inset 1-1/2 inch from door or drawer edges. Mount door pulls vertically and drawer pulls horizontally.

    b. Edge pulls: Lamp by Sugatsune SN-70/S stainless steel, satin finish.

    c. Recessed: Lamp by Sugatsune HH-F-2 Series stainless steel, satin finish.

2. Hinges: Grass Nexis, concealed self-closing hinges. For doors up to 24 inches wide, weighing up to 20 lbs., provide 2 hinges; for doors up to 24 inches wide, weighing 20-40 lbs., provide 3 hinges.

3. Drawer and shelf slides:

    a. Box and file drawers over 4 inches deep: Accuride 7434, full extension (plus one inch) steel ball bearing, 100 lbs./pair capacity, with rail mounting system and closed position hold-in detent, bright zinc.

    b. Lateral files: Accuride 4034, full extension (plus one inch) steel ball bearing, 150 lbs./pair capacity, with rail mounting system and closed position hold-in detent, bright zinc.

    c. Pullout shelves/drawers: Accuride 322 full extension steel ball bearing, 100 lbs/pair capacity, bright zinc.

4. Locks: Use at locations noted on drawings.

    a. Cabinet Locks: Lamp Sugatsune #7810 Lock, master keyed. Stainless steel finish. Locks shall be separately keyed and two (2) keys shall be furnished for each lock. Supply six (6) master keys.

    b. Locker Locks: Re-settable combination lock with three dials, key override function and code scrambling. Mastercombi Built-In Combination Locker Lock. Combi-Lock 1153, vertical orientation, Hafele 231.16.312. Provide two Combi-code Codefinders, Hafele 231.16.999. With Hafele 231.14.300 handle and Hafele 231.16.706 strike plate.

5. Shelf Standards/Brackets:

    a. Wall Standards: Custom, 16-gauge steel, as detailed, double-slotted type where shelf sections meet, matching single-slotted type at ends of shelf sections. Brackets paint color to be selected, semi-gloss enamel.

    b. Shelf brackets for Wall Standards: Custom, 16-gauge steel with three blade hooks as detailed. Shelves shall be screwed to brackets. Brackets paint color to be selected, semi-gloss enamel.

    c. Standards/Brackets for Corridor Display Cabinets: Extruded aluminum Rakks Wall C-Standards, and BR2-16 shelf support brackets, by Ragine Corporation, Needham, MA (800-826-6006), or www.rakks.com.

6. Adjustable, dual-wheel swiveling locking casters: 3" (75mm) swivel lock/wheel brake with double row ball bearing swivels. Hard gray rubber tires. 200 lb capacity. Medium-Duty Dual-Wheel Casters by Jilson Group Caster Products Division (800) 969-5400.

7. Furniture levelers: Zinc-plated steel leg levelers and mounting brackets for bottoms of base cabinets.

8. Cable sets: Two-part with spring closure in top, 80 mm. Hafele 429.99.548. Color to be selected by Architect.

9. Three-point latches for flammable storage cabinets: Similar to Hafele Espagnolette Lock, but with lever handle.

10. Grilles for vented cabinets and radiators: Aluminum bar grille linear diffuser with mounting frame and integral access doors; CT-540 x Type 3 concealed fastening mounting frames), 4" wide, by Titus Products.

11. Mobile Casework Drawer Slides: Heavy-duty full-extension ball bearing drawer slide with interlock & anti-tilt function. Side mount. Load capacity: Dynamic up to 200 lbs.

12. Shelf Support Pin: Nickel plated metal. Required at all fixed cabinets with adjustable shelves.

2.08 MOVABLE AND ADJUSTABLE HEIGHT TABLES

A. Movable tables with 1-1/2" apron front, 4" sides and back; 1" dia. tubular stainless steel telescoping legs fitted within a 2" x 2" metal leg; adjustable non-marring floor glides with 1" adjustment capability. Moveable tables shall have the ability to be adjusted in height from 31" to 37" in 1" increments inclusive of 1" thick countertop. Movable tables shall be installed at height indicated on Drawings. Fixed section of leg shall be set at height appropriate for a 31" high tabletop and adjustable portion of leg shall be stainless steel, drilled at 1" increments, and concealed within each metal table leg. Movable tables 7ft - 8ft long shall be reinforced with a deep welded steel channel frame of a gauge appropriate for the load bearing requirements and concealed by wood elements. Load capacity of tables shall be 1,000 lb. uniformly loaded and support a 250 lb. concentrated load at mid-space with deflection not to exceed 1/8". Provide a countersunk metal slide plate with groves at underside of each leg and provide chain for each pin support. Tops are epoxy resin.

2.09 WORK SURFACES AND COUNTERTOPS

A. Laboratory bench tops: Molded chemical and abrasion resistant epoxy resin, one inch thick. Provide top mounted end curb where worksurfaces abut walls, fume hoods, etc. Furnish with separate (non-integral) backsplashes (wall benches), and cutouts for sinks, piping, etc., manufactured by Durcon, 206 Allison Drive, Taylor, Texas 76754, or approved equal.

1. Color: Match existing in recently completed Tang Hall Project.

2.10 SINKS

A. Lab Bench Sinks: Molded epoxy resin sinks. Sinks shall be furnished with 1-1/2" outlets, open end overflow 2" shorter than depth of sink, and swivel sink strainer adapter with gasket. Sinks shall be Durcon 24" long x 16" wide x 12" deep, 24" long x 16" wide x 5-1/2" deep ADA, or as indicated on drawings. Color: Same as countertop. Install in accordance with manufacturer's

recommendations, with support straps, assembly kit, and acid resistant putty compound to seal sink rim, etc.

2.11 LABORATORY SERVICE FITTINGS AND SAFETY EQUIPMENT

A. Laboratory service fittings shall be products of Water Saver Faucet Co., unless otherwise noted. Finish of all service fittings shall be Satin Chrome with Clear Epoxy Coating. Fittings include the following:

1. Compressed/filtered compressed air (A), Argon (Ar) and Nitrogen (N2): L4880F-225WSA Needle Valve Assembly, Panel Mounted.

2. Vacuum: L4200-158FT Laboratory Ball Valve Assembly, Panel Mounted Single, Floating Escutcheon.

3. Water mixing valve: Deck-mounted at lab bench sinks (HW-CW): L2212VB-127BH with swing gooseneck and vacuum breaker, blade handle, removable aerator.

2.12 EXHAUST SNORKELS

A. Movex ME 100, 4" dia. fume extractor, 0.25" pressure drop at 75 cfm, ceiling mounted. Provide hood, bracket and escutcheon plate.

2.13 CYLINDER RACKS

A. Furnish and install wall mounted cylinder racks, constructed as indicated on the Drawings. The specific series and gauge required for each component shall be as indicated on the Drawings along with associated accessories. Channels and parts shall be furnished to laboratory furniture manufacturer in a plain state in order to allow them to weld and paint the finished assemblies with their standard acid resistant epoxy powder coat finish. Color to be selected by Architect.

2.19 OTHER METAL MANUFACTURED ITEMS

A. Umbilicals: 18-guage perforated and unperforated sheet metal with collars at top and bottom to be attached to ceiling and work surfaces. Perforation pattern shall be 1/8-inch diameter holes on 3/32-inch staggered centers. Umbilicals shall be factory-finished in baked enamel, color to be selected by the Architect. Removable sections lift up and off to disengage 3 (min.) hooks per side, as detailed.

B. Service Plates: 11-gauge Type 304 stainless steel escutcheon plates with factory-drilled holes for use at wall-mounted service fixtures. Plates are fastened to blocking installed behind gypsum wallboard surface, or expansion-anchored to CMU partitions.

C. Drying Racks: Drying racks shall be fabricated of stainless steel. Pegboards shall be furnished with removable rounded-tip white polypropylene pegs, stainless steel drip trough, 1/4" diameter drip trough outlet and flexible tubing between drip trough outlet and sink (cut as required). Pegboard size and configuration shall be as indicated on the Drawings.

D. Corner Guards: Custom fabricated 2-1/2" x 2-1/2" x 1/8" corner guards of Type 304, 16-gage stainless steel with No. 4 finish, in lengths indicated on drawings.

H. Stainless Steel Wire Shelving: Type 304, 18-gauge stainless steel solid shelves and posts in the configurations indicated on the drawings. Super Erecta Shelf Wire Shelving Stainless Steel Shelving by InterMetro Industries Corporation (570-825-2741).

I. Test Lead Holders: Pomona Electronics, in lengths indicated on drawings. Colors selected by Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Comply with Section 016000 requirements.

3.02 PREPARATION

A. Protecting Building Surfaces: Install work without damaging building surfaces and with all evidence of drilling, cutting, and anchorage concealed by installed work.

3.03 INSTALLATION

A. Comply with AWI requirements for Installation of Architectural Woodwork (Interior), as amended by the following.

B. Install work plumb, level and true to line and plane as measured from established lines and levels. Provide blocking, grounds, shims, supports, and rough hardware necessary for installation. Anchor work securely in place.

C. Cutting, Fitting, and Placement: Do all cutting, drilling, and fitting required for installation of the work.

D. Scribing Trim:

1. Cut and fit scribing trim closely and accurately to building surfaces. Use one-piece-for-length scribing trim wherever possible.

2. Make joints tight; back end joints with splicers/splines.

3. Secure scribes with concealed fasteners.

E. Anchors and Fasteners:

1. Face Nailing: Confine face nailing to inconspicuous locations. Set nails. Fill holes in exposed and semi-exposed surfaces to conceal nail locations.

2. Anchorage to Drywall Construction: Anchor work to framing/anchor plates with toggle bolts or tapping sheet metal screws; space screws to limit loads to 50 pounds withdrawal or 80 pounds shear per anchor. Where fastening to unreinforced gypsum board is necessary, limit loads to 20 pounds withdrawal or 40 pounds shear per anchor.

3. Anchorage to Concrete: Anchor work with bolts and expansion shields.

3.04 ADJUSTING, CLEANING, AND PROTECTION

A. Correct nonconforming, poorly fitting, and damaged work. Remove and replace work that cannot be satisfactorily corrected at the Project.

B. Cover casework for protection during remainder of construction period. Remove covering at completion of construction, inspect, and make any required final repairs.

END OF SECTION

SECTION 233716 TEXTILE AIR DISPERSION SYSTEM

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Provide labor, materials, equipment and services required for the complete installation designed in Contract Documents.

1.2 QUALITY ASSURANCE:

A. Building Codes and Standards:

1. Product must be Classified by Underwriter's Laboratories in accordance with the 25/50 flame spread / smoke developed requirements of NFPA 90-A and UL 2518. Also Classified by UL-C (Canada) S102.2, BS 5867 Part 2, 1980; GB8624-2006.

2. All product sections must be labeled with the logo and classification marking of Underwriter's Laboratories.

B. Design & Quality Control

1. Manufacturer must have documented design support information including duct sizing; vent, orifice, and/or nozzle location; vent, orifice, and/or nozzle sizing; length; and suspension. Parameters for design, including maximum air temperature, velocity, pressure and textile permeability, shall be considered and documented.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications on materials and manufactured products used for work of this section.

B. Building Code Data: Submit UL file number under which product is Classified by Underwriter's Laboratories for both NFPA 90-A and UL 2518.

C. Provide detailed drawings confirming configuration of Textile Dispersion System (diameter, lengths, airflow, pressure, and textile permeability) for each room.

D. Provide detailed installation instructions for components to be installed.

E. Provide warranty and maintenance documentation.

1.4 WARRANTY:

A. Manufacturer must provide a 1 Year Product Warranty for products supplied for the fabric portion of this system as well as a Design and Performance Warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

A. Subject to compliance with requirements, choose one of the following:

1. DuctSox, Prihoda, Fabric Air.

2.2 TEXTILE AIR DISPERSION SYSTEM:

A. Design Parameter: The system shall be designed based on an inlet pressure of 0.25 inches water gauge.

B. Hoops (IHS) System: Air diffusers shall be constructed with internal retention system.

1. System shall consist of an internal 360 degree hoop system, spaced maximum 5' on center.

2. System shall be installed with a one row suspension system located 1.5" above top-dead-center of the textile system.

3. System attachment to suspension system shall be made using Gliders spaced 12 inches.

C. One row, suspension system:

1. U-Track Suspension System: Hardware to include 8'-0" sections of aluminum track, aluminum splice connectors, track endcaps, and vertical cable supports. Vertical cable supports to include:

a. Cable Material: Stainless steel.

b. Cable Length: 5'-0"

D. Shape: Round, Half Round or Quarter Round, refer to drawings.

E. Microbe-X Fabric

1. Textile Construction: Filament / filament twill polyester with antimicrobial treatment proven to remain effective after 30 laundering cycles and fire retardant in accordance with UL 2518.

2. Air Permeability: CFM/ft2 per ASTM D737 to meet design inlet pressure, airflow, shape and size.

a. The air permeability of the fabric must NOT be created by perforating the fabric. Air dispersion accomplished by permeable fabrics only.

b. The air permeability must be confirmed by third party testing to eliminate the formation of condensate on the fabric.

c. Basis of Design Air Permeability as follows:

1) Lab B95 and B97: Blend of 13 and 29 CFM/ft2.

~~1)~~2) Lab B99 and B99B: 29 CFM/ft2.

3. Weight by permeability, to be greater than 6.2~~9~~ ounces / square yard

4. Color: Custom to be selected by architect during submittals

F. Basis of Design: DuctSox Hoops (IHS) with Microbe-X Fabric.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install chosen suspension system in accordance with the requirements of the manufacturer. Instructions for installation shall be provided by the manufacturer with product. Rough in or install per reflected ceiling plan or in location instructed by Owner's Representative.

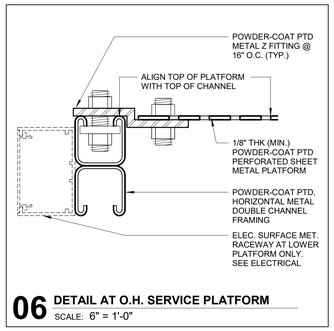
3.2 CLEANING AND PROTECTION

A. Clean air handling unit and ductwork prior to the DuctSox system unit-by-unit as it is installed. Clean external surfaces of foreign substance which may cause corrosive deterioration of facing.

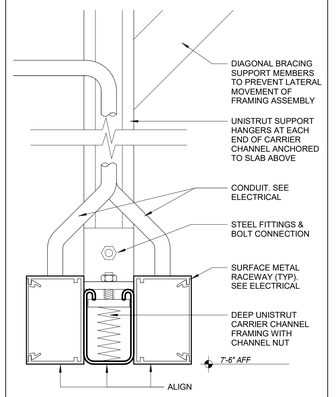
B. Temporary Closure: At ends of ducts which are not connected to equipment or distribution devices at time of ductwork installation, cover with polyethylene film or other covering which will keep the system clean until installation is completed.

C. Seal If DuctSox systems become soiled during installation, they should be removed and cleaned following the manufacturers' standard terms of laundry.

END OF SECTION

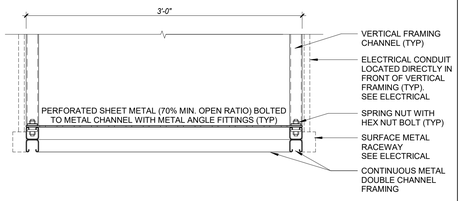


06 **DETAIL AT O.H. SERVICE PLATFORM**
SCALE: 6" = 1'-0"

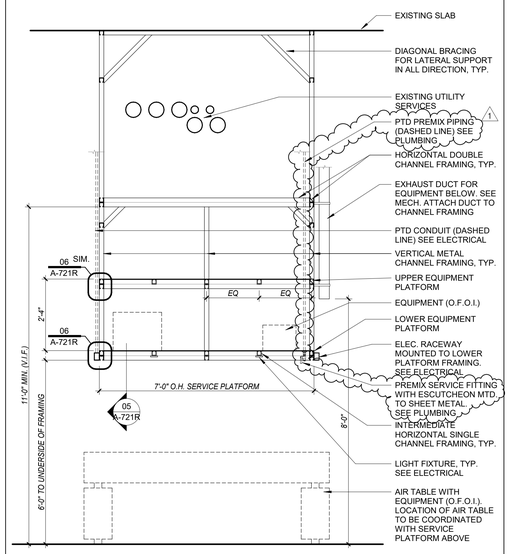


03 **SECTION DETAIL @ OVERHEAD SERVICE CHANNEL**
SCALE: 6" = 1'-0"

NOTES:
1) COORDINATE WITH ALL TRADES FOR INTERFERENCE ABOVE BY NEW CONSTRUCTION.
2) SECURE CHANNEL FRAMING SYSTEM TO EXISTING STRUCTURAL SLAB.
3) COORDINATE ALL VERTICAL CHANNEL LOCATIONS ABOVE WITH SPACE AVAILABILITY.
4) PROVIDE BRACING SUPPORT TO PREVENT LATERAL MOVEMENT IN ANY DIRECTION OF OVERHEAD SERVICE PLATFORM SYSTEM.
5) PROVIDE END CAPS AT ALL EXPOSED ENDS OF FRAMING.

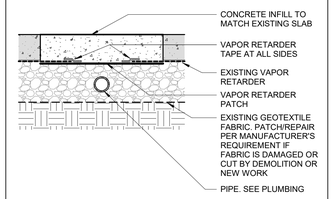


05 **SECTION DETAIL AT O.H. SERVICE PLATFORM**
SCALE: 1 1/2" = 1'-0"



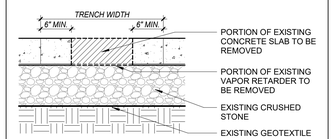
04 **SECTION AT O.H. SERVICE PLATFORM**
SCALE: 1/2" = 1'-0"

NOTE:
1. CONTRACTOR TO COMPLY WITH THE INSTALLATION REQUIREMENTS BY THE EXISTING VAPOR RETARDER MANUFACTURER FOR VAPOR RETARDER PATCHING WORK.
2. CONCRETE INFILL MATERIAL TO MATCH EXISTING CONCRETE SLAB MATERIAL.

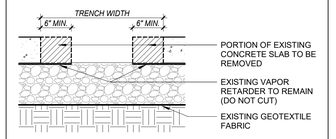


02 **SLAB INFILL & PATCHING DETAIL AT TRENCH**
SCALE: 1" = 1'-0"

NOTE:
STEP 1 THEN STEP 2 MUST BE COMPLETED IN SEQUENCE.



SLAB / VAPOR RETARDER REMOVAL - STEP 1



SLAB REMOVAL - STEP 2

01 **SLAB CUT DEMOLITION DETAIL FOR NEW TRENCH**
SCALE: 1" = 1'-0"

CORNELL UNIVERSITY

ARCHITECT:
Mitchell Giurgola
Mitchell Giurgola Architects LLP
630 Ninth Avenue, Suite 711
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212 663 4000

MEP ENGINEER:
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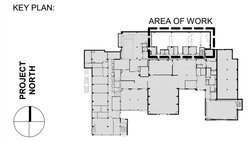
REGISTERED ARCHITECT JAMES R. BRADDOCK 015807 STATE OF NEW YORK

ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/25	ADDENDUM 01

KEY PLAN:



PROJECT:

TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:

MISCELLANEOUS DETAILS

PROJECT NO: 250800	**DATE: 11/07/2025**
PHASE: BID SET	**SCALE: As indicated**

A-721R

GENERAL NOTES:

1. PATCH ALL CORES W/ CONCRETE WHERE EXISTING PIPES ARE REMOVED, TYPICAL. PATCH & LEVEL PER FLOORING MANUFACTURER'S RECOMMENDATIONS.
2. PATCH & REPAIR FINISHES WHERE EXISTING PIPE HANGERS & APPURTENANCES HAVE BEEN REMOVED.
3. PATCH & REPAIR EXISTING WALLS FINISHES WHERE PARTITIONS HAVE BEEN REMOVED
4. PATCH/REPAIR ANY EXISTING WALLS TO REMAIN PRIOR TO APPLICATION OF FINISH MATERIALS OR PAINT.
5. REPAIR, PATCH, AND FIRESTOP EXISTING OPENINGS IN RATED PARTITIONS AND SLABS.
6. FIRESTOP ALL PENETRATIONS THROUGH RATED CONSTRUCTION. COORDINATE W/ MEP DRAWINGS.
7. CONTRACTOR TO PROVIDE SUPPORT BLOCKING IN NEW AND EXISTING WALLS AS REQUIRED FOR WALL MOUNTED CASEWORK, SHELVING AND EQUIPMENT.
8. ALL EQUIPMENT TO BE O.F.O.I. UNLESS OTHERWISE NOTED. SEE DWG G-004 FOR EQUIPMENT LIST.
9. SEE DWG A-720 FOR WALL TYPES AND DOOR TYPES.
10. NEW DATA AND POWER CONDUIT SHALL BE CONCEALED WITHIN THE WALL. DO NOT SURFACE MOUNT.
11. REPAIR/REPLACE EXISTING FINISH CEILING AFFECTED BY MEP WORK.
12. REPAIR, PATCH, AND FIRESTOP EXISTING OPENINGS IN RATED PARTITIONS AND SLABS.
13. INFILL OPENINGS IN EXISTING WALLS TO MATCH EXISTING AT CONSTRUCTION AT DUCT REMOVAL LOCATIONS.
14. RELOCATION OF ALL EXISTING LAB CASEWORK TO THE PROJECT SPACE ARE BY THE CONTRACTOR. RELOCATIONS TO BE COORDINATED WITH CORNELL UNIVERSITY.
15. ANY EXISTING DOOR OR FRAME DAMAGED DURING DEMOLITION AND/OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT THEIR OWN EXPENSE.
16. SEE DWG A-920 FOR ABBREVIATIONS AND SYMBOLS. 1

LEGEND

- EXISTING CONSTRUCTION NOT IN CONTRACT
- NEW PAINTED GYPSUM BOARD PARTITIONS
- EXISTING DOOR
- NEW DOOR

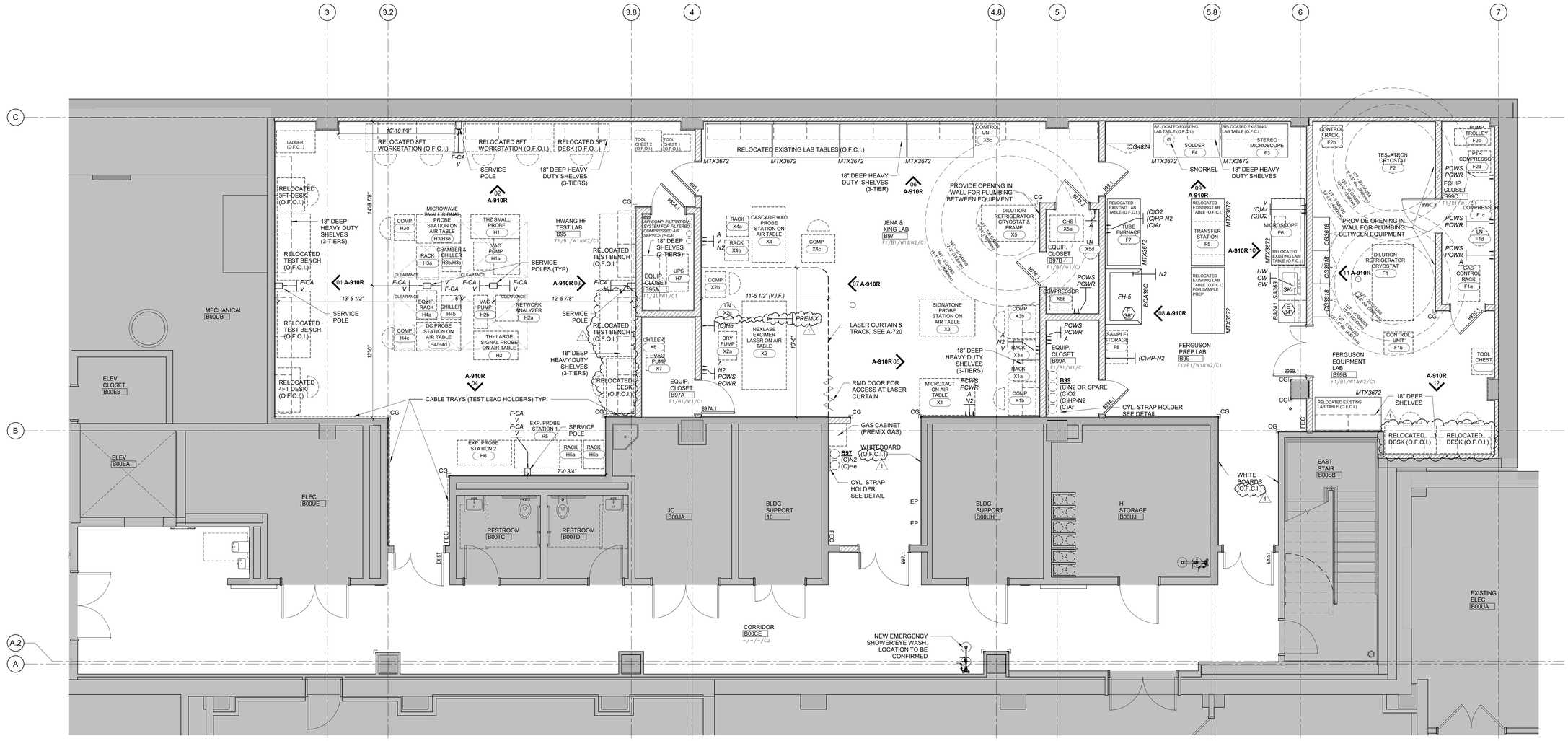
FINISH SCHEDULE

FLOORING :
F0 EXISTING
F1 ESD LINOLEUM

BASE:
B0 EXISTING
B1 RUBBER BASE

WALLS (SEE ELEVATIONS FOR LOCATIONS)
W1 PRIMARY EPOXY PAINT
W2 ACCENT EPOXY PAINT

CEILING:
C1 OPEN CEILING, PAINT SLAB AND ALL APPURTENANCES (ACCENT PAINT COLOR, MATTE FINISH) 1
C2 ACOUSTICAL CEILING TILES (2'X6')



01 ENLARGED FLOOR PLAN - BASEMENT LEVEL
SCALE: 1/4" = 1'-0"

CORNELL UNIVERSITY

ARCHITECT:
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Mitchell Giurgola Architects LLP
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MEP ENGINEER:
ENGINEERING is now Salas O'Brien
Consulting and Engineering Group of New York, Inc.
Salas O'Brien Consulting and Engineering Group of New York, Inc.
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REGISTERED ARCHITECT JAMES R. BRADDOCK 015807 STATE OF NEW YORK

ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/25	ADDENDUM 01

KEY PLAN:

PROJECT:

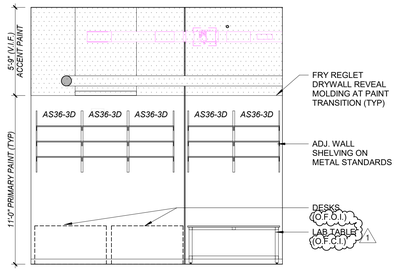
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:

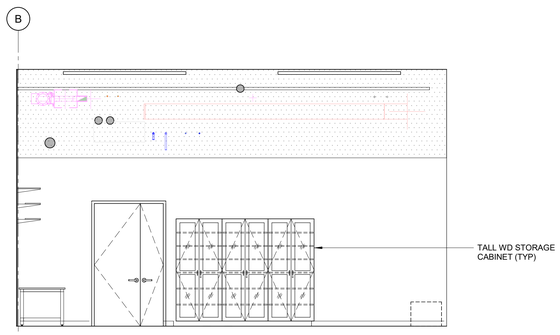
ENLARGED FLOOR PLAN

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: 1/4" = 1'-0"

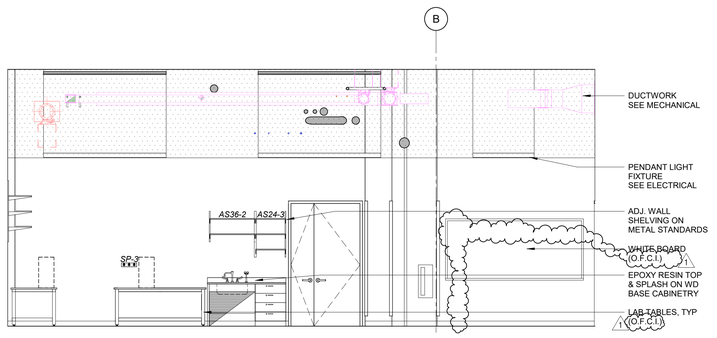
A-900R



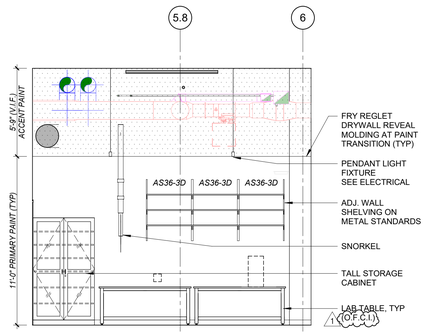
12 SOUTH ELEVATION - LAB B99B
SCALE: 1/4" = 1'-0"



11 WEST ELEVATION - LAB B99B
SCALE: 1/4" = 1'-0"



10 EAST ELEVATION - PREP LAB B99
SCALE: 1/4" = 1'-0"



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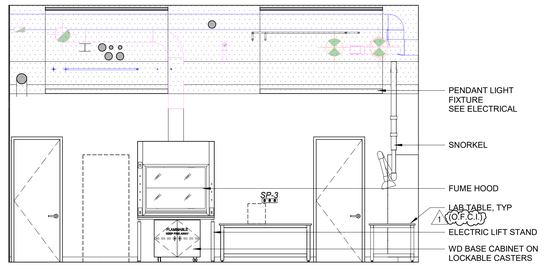

08 WEST ELEVATION - PREP LAB B99
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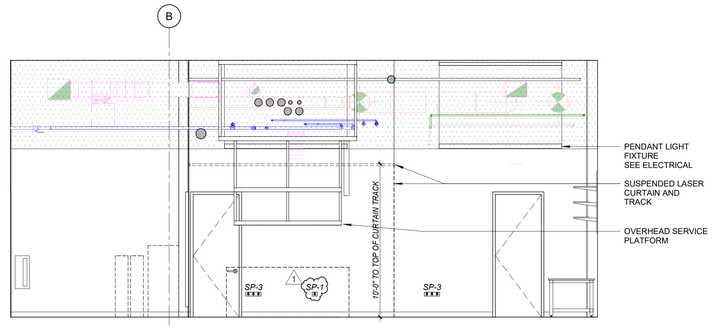
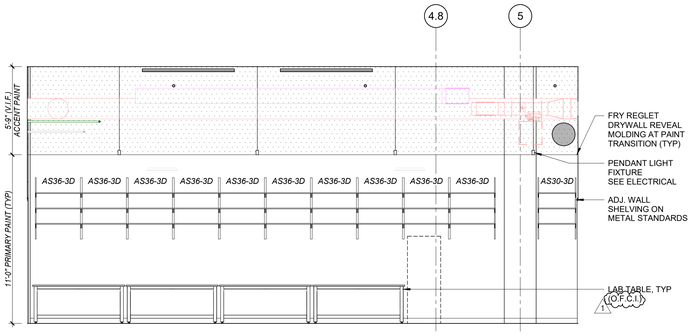
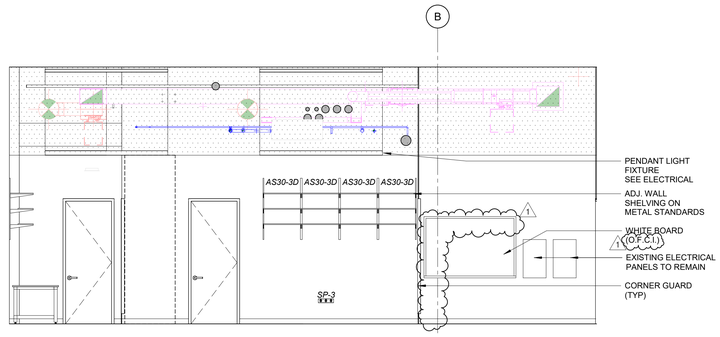


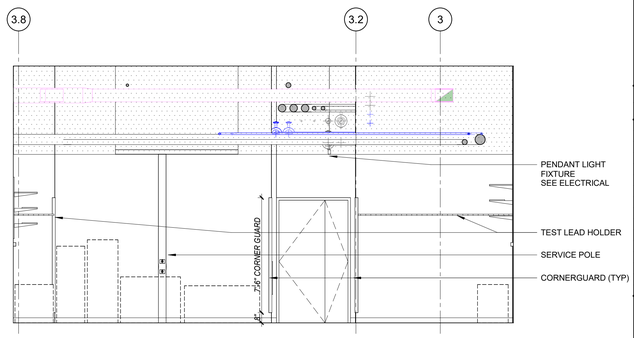
07 WEST ELEVATION - LAB B97
SCALE: 1/4" = 1'-0"



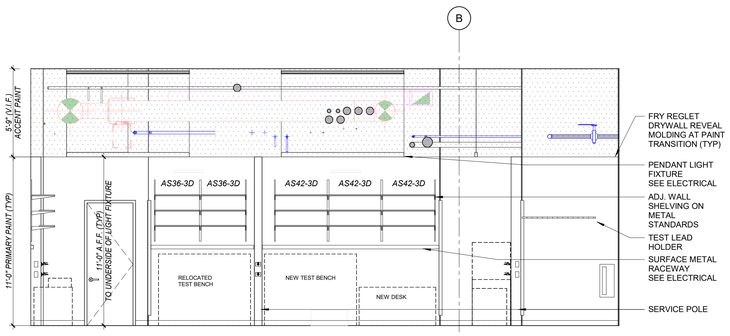
06 NORTH ELEVATION - LAB B97
SCALE: 1/4" = 1'-0"



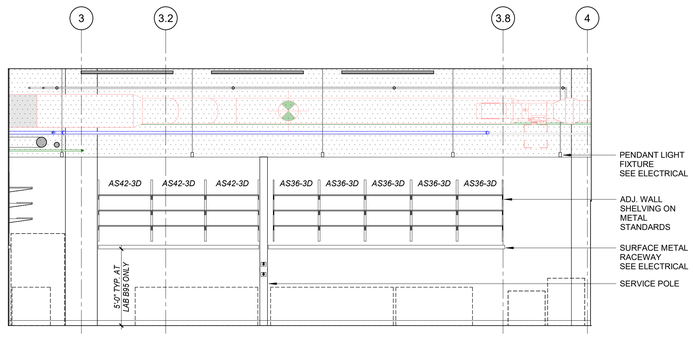
05 EAST ELEVATION - LAB B97
SCALE: 1/4" = 1'-0"



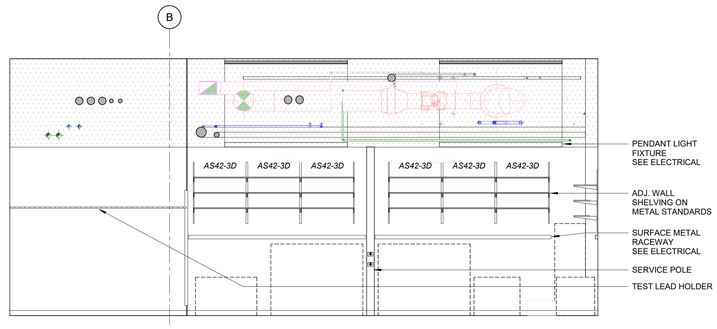
04 SOUTH ELEVATION - LAB B95
SCALE: 1/4" = 1'-0"



03 EAST ELEVATION - LAB B95
SCALE: 1/4" = 1'-0"



02 NORTH ELEVATION - LAB B95
SCALE: 1/4" = 1'-0"



01 WEST ELEVATION - LAB B95
SCALE: 1/4" = 1'-0"

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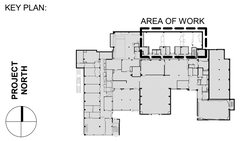
NO.	DATE	COMMENTS
1	12/08/25	ADDENDUM 01

KEY PLAN:



PROJECT:

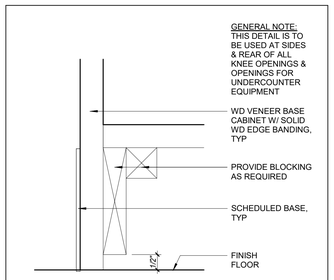
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:

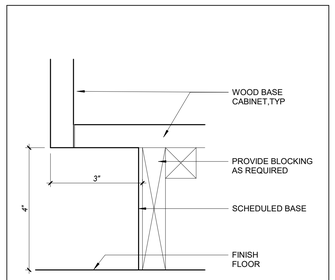
INTERIOR ELEVATIONS

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: 1/4" = 1'-0"

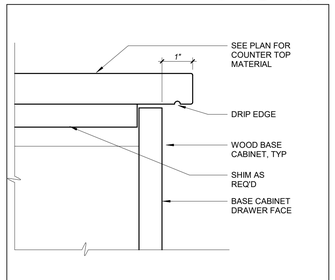
A-910R



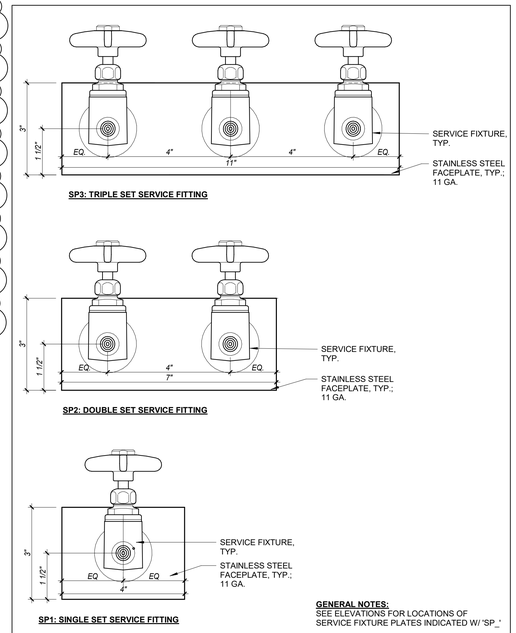
09 TYPICAL CABINET EXPOSED SIDE BASE DETAIL
SCALE: 6" = 1'-0"



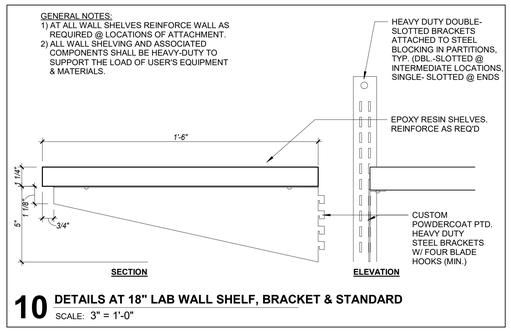
08 TYPICAL CABINET FRONT BASE DETAIL
SCALE: 6" = 1'-0"



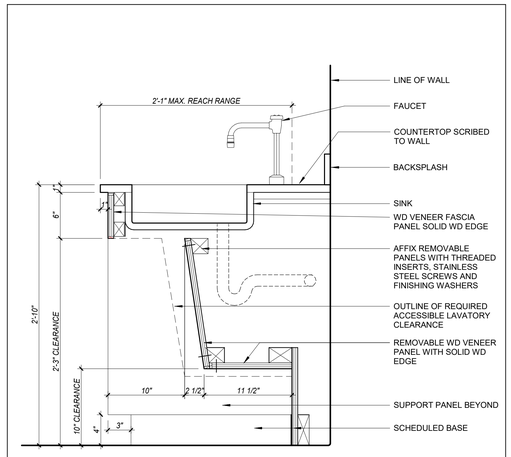
07 TYP. LAB BENCH EDGE DETAIL AT BASE CAB.
SCALE: 6" = 1'-0"



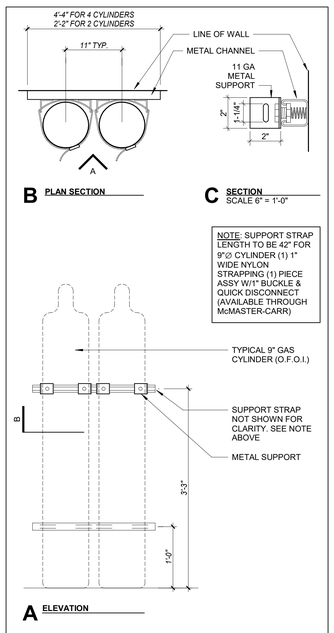
06 WALL MOUNTED SERVICE FIXTURE PLATES
SCALE: 6" = 1'-0"



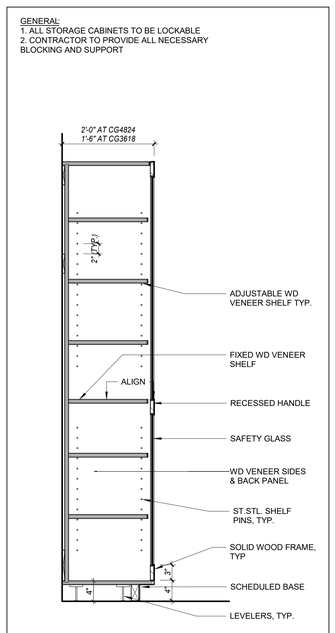
10 DETAILS AT 18" LAB WALL SHELF, BRACKET & STANDARD
SCALE: 3" = 1'-0"



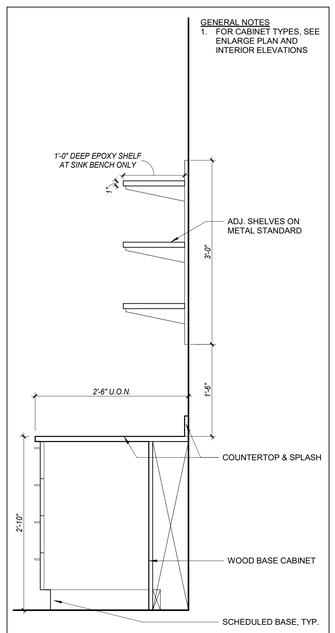
05 BARRIER-FREE SINK STATION DETAIL
SCALE: 1 1/2" = 1'-0"



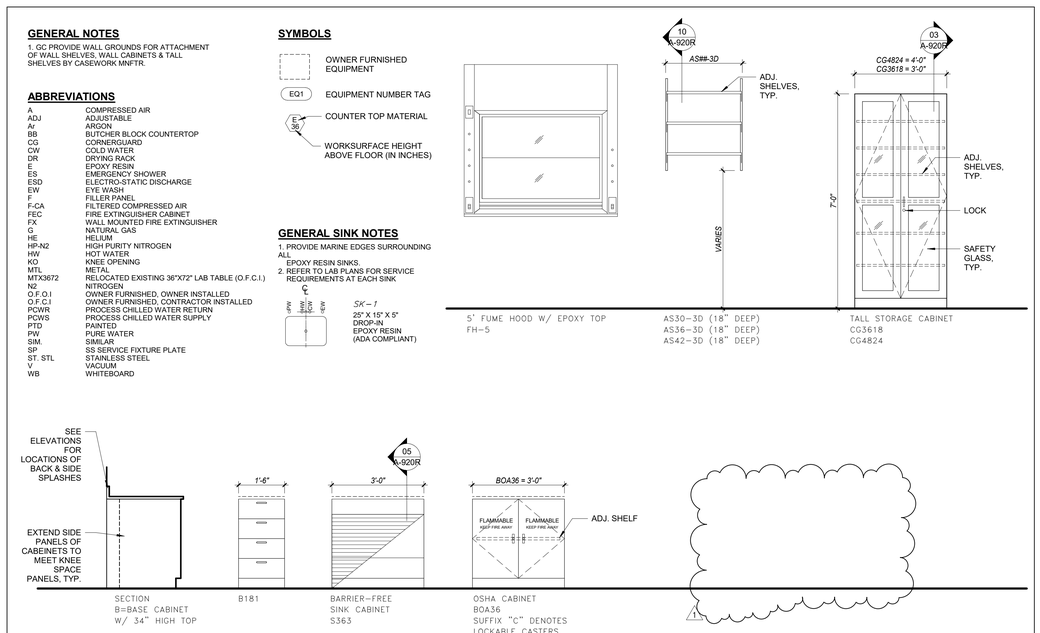
04 CYLINDER STRAP HOLDER DETAILS
SCALE: 1" = 1'-0"



03 SECTION @ TALL STORAGE CABINET
SCALE: 1" = 1'-0"



02 SECT. AT TYP. LAB WALL BENCH W/ SHELVES
SCALE: 1" = 1'-0"



01 LAB CASEWORK SCHEDULE
SCALE: 1/2" = 1'-0"

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ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/25	ADDENDUM 01

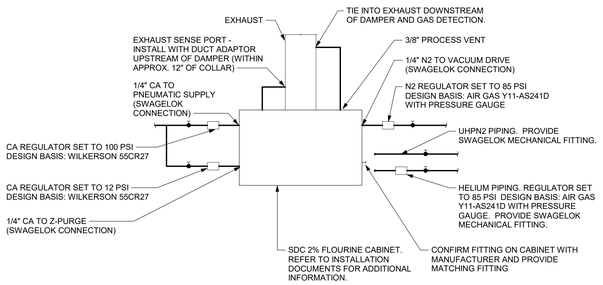
KEY PLAN:
AREA OF WORK
PROJECT NORTH

PROJECT:
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:
LAB CASEWORK SCHEDULE AND DETAILS

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: As indicated

A-920R

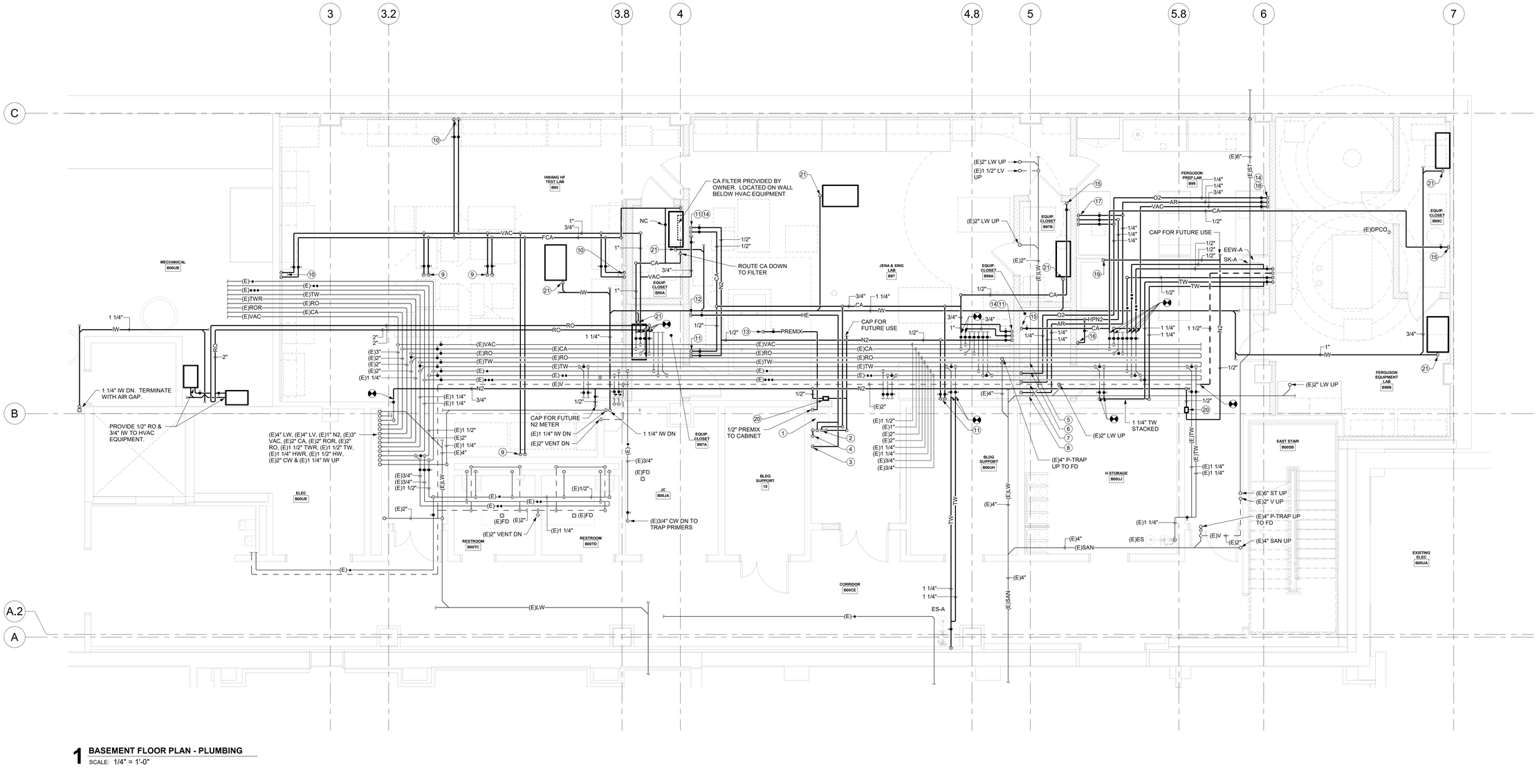


2 GAS CABINET CONNECTION DETAIL

SCALE: 1/4" = 1'-0"

ⓧ DRAWING NOTES:

1. PROVIDE 2% FLUORINE GAS CABINET. DESIGN BASIS SDC, QOUTE NUMBER - Q20964, REV. 2.
2. PROVIDE N2, CA, UHPN2 & HE TO CABINET AS REQUIRED. REFER TO GAS CABINET INSTALLATION MANUAL FOR FURTHER REQUIREMENTS. ⚠1
3. HELIUM CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12ASN245D580-AG WITH WALL MOUNT Y15QMB1 - AG) WITH HARD PIPED STAINLESS STEEL TUBING.
4. ULTRA HIGH PURITY NITORSGEN CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12N245D580-AG WITH WALL MOUNT Y158RMWB1FCVN2-AL) WITH HARD PIPED STAINLESS STEEL TUBING.
5. NITORGEN CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12N245D320-AG WITH WALL MOUNT Y15MBH320-AG) WITH HARD PIPED STAINLESS STEEL TUBING.
6. OXYGEN CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12N245D580-AG WITH WALL MOUNT Y151MBH580-AG) WITH HARD PIPED STAINLESS STEEL TUBING.
7. HIGH PURITY NITROGEN CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12N245D580-AG WITH WALL MOUNT Y158RMWB1FCVN2-AL) WITH HARD PIPED STAINLESS STEEL TUBING.
8. ARGON CYLINDER LOCATION. PROVIDE WALL MOUNTED REGULATOR (DESIGN BASIS: AIRGAS Y12N245D580-AG WITH WALL MOUNT Y151MBH580-AG) WITH HARD PIPED STAINLESS STEEL TUBING.
9. PROVIDE 1/2" FCA & 3/4" VAC DOWN TO (2) WALL MOUNTED CA TURRETS & (2) WALL MOUNTED VAC TURRETS. TURRETS PROVIDED BY OTHERS. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS. REMOVE SERRATED OUTLET ON TURRET AND PROVIDE SWAGELOCK FITTING AT OUTLET.
10. PROVIDE 1/2" FCA & 3/4" VAC DOWN TO WALL MOUNTED TURRETS. TURRETS PROVIDED BY OTHERS. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS. REMOVE SERRATED OUTLET ON TURRET AND PROVIDE SWAGELOCK FITTING AT OUTLET.
11. PROVIDE 1/2" CA & 1/2" N2 DOWN WITH A SWAGELOK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON NITROGEN DROP (DESIGN BASIS: AIR GAS Y11-AS241D). PROVIDE POINT OF USE REGULATOR ON COMPRESSED AIR DROP (DESIGN BASIS: WILKERSON 55CR27). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
12. PROVIDE 1/2" HE DOWN WITH A SWAGELOK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON HELIUM DROP (DESIGN BASIS: AIR GAS Y11-AS241D). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
13. PROVIDE 1/2" PREMIX DOWN WITH A SWAGELOK COMPRESSION FITTING. COORDINATE ELEVATION OF FITTING WITH SERVICE PLATFORM. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
14. PROVIDE 3/4" VAC DOWN TO WALL MOUNTED TURRET. TURRET PROVIDED BY OTHERS. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
15. PROVIDE 1/2" CA WITH A SWAGELOK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON COMPRESSED AIR DROP (DESIGN BASIS: WILKERSON 55CR27). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
16. PROVIDE 1/4" HPN2 DOWN WITH A SWAGELOCK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON HIGH PURITY NITROGEN DROP (DESIGN BASIS: AIR GAS Y11-AS241D). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
17. PROVIDE 1/4" HPN2 DOWN WITH A SWAGELOCK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON HIGH PURITY NITROGEN DROP (DESIGN BASIS: AIR GAS Y11-AS241D). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
18. PROVIDE 1/4" HPN2 DOWN WITH A SWAGELOCK COMPRESSION FITTING. PROVIDE POINT OF USE REGULATOR ON HIGH PURITY NITROGEN DROP (DESIGN BASIS: AIR GAS Y11-AS241D). LOCATE FITTING 5'-0" ABOVE FINISHED FLOOR. REFER TO 'A' DRAWINGS FOR FINAL LOCATION AND FURTHER REQUIREMENTS.
19. 1/2" N2 TO ADA FUME HOOD. REFER TO DETAIL A ON P-000 AND 'A' DRAWINGS FOR FUSTHER REQUIREMENTS.
20. PROVIDE N2 METER. PROVIDE STAINLESS STEEL STANDARD LAB GAS TUBING 1'-0" BEFORE AND AFTER METER. DESIGN BASIS: SIERRA READY COMPACT. PRODUCT ODER CODE GCR-6397QXZ4 FOR ADDITIONAL INFORMATION. ⚠1
21. PROVIDE 3/4" IW TO HVAC EQUIPMENT. PROVIDE PUMP POP-1. REFER TO DETAIL 6 & 7 ON P-000 FOR FURTHER REQUIREMENTS.



1 BASEMENT FLOOR PLAN - PLUMBING

SCALE: 1/4" = 1'-0"

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NO.	DATE	COMMENTS
1	12/08/2025	ADDENDUM 01

KEY PLAN:

PROJECT NORTH · TRUE NORTH

PROJECT:

TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:

BASEMENT FLOOR PLAN - PLUMBING

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: 1/4" = 1'-0"

P-100R

GENERAL NOTES:

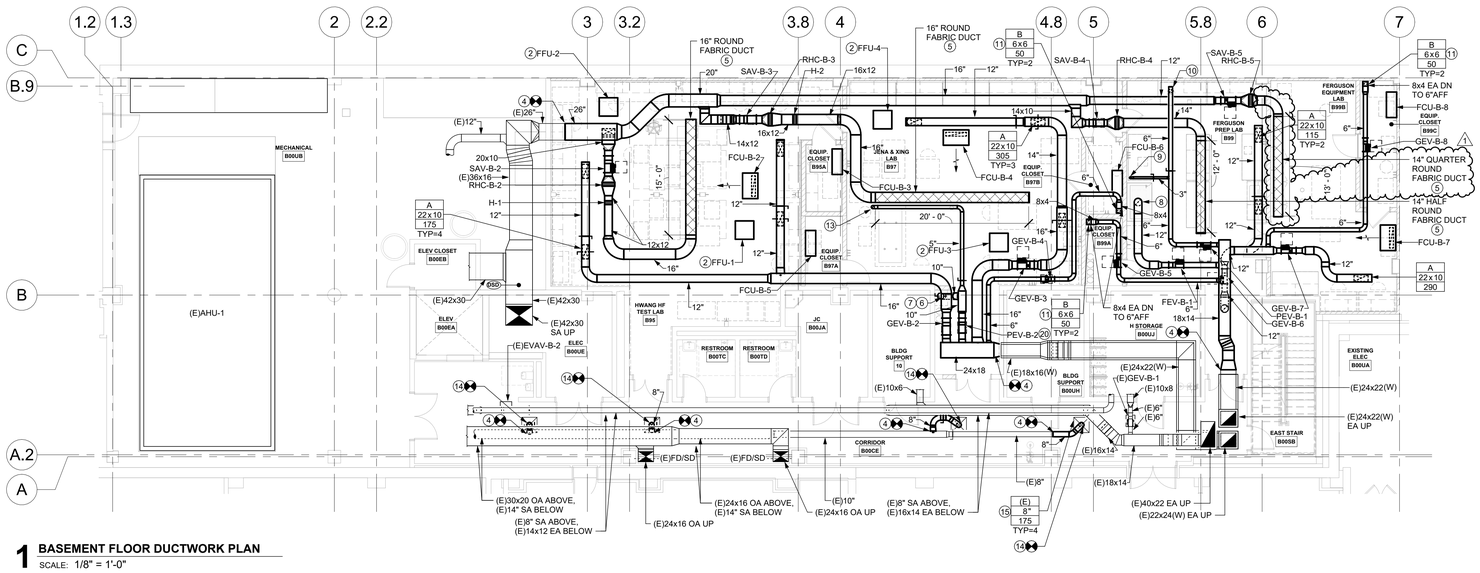
A. ALL CEILING, DUCT MOUNTED EXHAUST GRILLES SHALL HAVE CUSTOM COLOR FINISH TO MATCH PAINT FOR DUCTWORK.

B. UNLESS INDICATED OTHERWISE, THE DUCTWORK AT THE AIR VALVE INLET AND OUTLET SHALL MATCH THE SIZES SHOWN ON THE EQUIPMENT SCHEDULE.

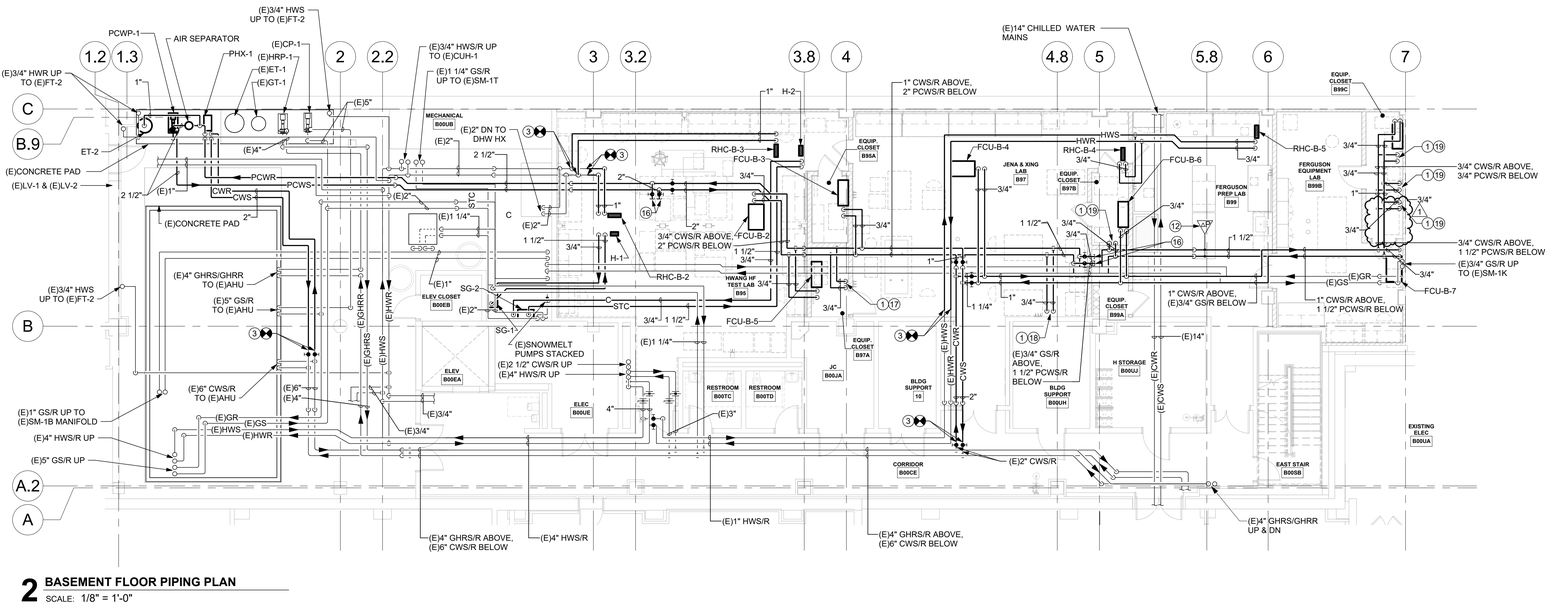
C. UTILITIES ARE EXPOSED IN ALL SPACES, PREPARE DUCTWORK AND PIPING FOR PAINTING.

ⓧ DRAWING NOTES:

1 PROVIDE 3/4" PROCESS CHILLED WATER MANIFOLD. TERMINATE AT ELEVATION NOTED; CONFIRM ELEVATION WITH OWNER PRIOR TO INSTALL. REFER TO DETAIL FOR FURTHER REQUIREMENTS.
2 MOUNT UNIT 8'-0" AFF. EACH FAN FILTER UNIT SHALL BE WIRED TO THE (1) ONE WALL MOUNTED SPEED CONTROLLER PROVIDED FOR THE LAB.
3 TIE PIPING INTO EXISTING. PROVIDE ALL PIPING MODIFICATIONS AS REQUIRED TO MAKE THE CONNECTION.
4 TIE DUCTWORK INTO EXISTING. TRANSITION AS REQUIRED TO MAKE THE CONNECTION.
5 PROVIDE TEXTILE DISPERSION AT LENGTH NOTED. REFER TO SPECIFICATIONS FOR PRODUCT REQUIREMENTS.
6 TIE DUCTWORK INTO GAS CABINET. PROVIDE BLAST GATE AT 3'-0" ABOVE TOP OF GAS CABINET. BALANCE TO 300 CFM, CONFIRM AIRFLOW BASED ON APPROVED SUBMITTAL.
7 INSTALL TUBING FURNISHED WITH GAS CABINET. REFER TO TOXIC GAS MONITORING SYSTEM DRAWINGS (TGMS) FOR THE INSTALLATION DETAILS AND REQUIREMENTS.
8 TIE DUCTWORK INTO ADJUSTABLE ADA FUME HOOD. REFER TO DETAILS FOR CONNECTION REQUIREMENTS.
9 3" PROCESS EXHAUST DROP. BLAST GATE SHALL BE MOUNTED 7'-0" AFF. TERMINATE 6" ABOVE CASEWORK OPEN-ENDED DUCT AND AN INSECT SCREEN. PROVIDE CONNECTIONS FOR ONE PIECE OF EQUIPMENT AND ONE FUTURE CONNECTION. CONNECTION SHALL START 18" ABOVE CASEWORK AND FACE NORTH. BALANCE OPEN ENDED TERMINATION TO 30 CFM. REFER TO DETAILS FOR FURTHER REQUIREMENTS.
10 TIE DUCTWORK INTO SNORKEL. SNORKEL SHALL BE PROVIDED WITH THE LAB CASEWORK. BALANCE TO 100 CFM.
11 MOUNT (1) ONE EXHAUST GRILLE 6" AFF AND (1) ONE 10'-0' AFF.
12 PROVIDE DIFFERENTIAL PRESSURE SENSOR FOR PCWP-1 AT LOCATION SHOWN.
13 PROVIDE 5" EXHAUST DROP WITH BLAST GATE AT 10'-0" AFF. TRANSITION TO 4" AND TERMINATE WITH 4" DUCT COLLAR, 6" IN LENGTH AT 8'-6" AFF. BALANCE TO 40 CFM.
14 PROVIDE BRANCH TAKEOFF, VOLUME DAMPER AND DUCTWORK TO REINSTALL EXISTING DIFFUSER INTO THE CEILING GRID.
15 REBALANCE EXISTING DIFFUSER TO INDICATED AIRFLOW.
16 PROVIDE PROCESS CHILLED WATER BRANCH TAPS WITH ISOLATION VALVES FOR FUTURE CONNECTION. TAPS SHALL BE TOP TAPS.
17 PROCESS CHILLED WATER MANIFOLD SHALL BE LOCATED IN B97A AT 8'-0" AFF. PIPING SHALL PENETRATE THE WALL AND TERMINATE AT 7'-0" AFF WITHIN B97 FOR OWNER FINAL CONNECTION.
18 PROCESS CHILLED WATER MANIFOLD FILTER AND PIPING TERMINATIONS SHALL BE LOCATED AT 8'-0" AFF.
19 PROCESS CHILLED WATER MANIFOLD FILTER AND PIPING TERMINATIONS SHALL BE LOCATED AT 4'-0" AFF.
20 PEV-B-2 DUCTWORK SHALL BE STAINLESS STEEL, WELDED CONSTRUCTION FROM CONNECTION AT MAIN TO TERMINATION AT EQUIPMENT.



1 BASEMENT FLOOR DUCTWORK PLAN
SCALE: 1/8" = 1'-0"



2 BASEMENT FLOOR PIPING PLAN
SCALE: 1/8" = 1'-0"

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ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/2025	ADDENDUM 01

KEY PLAN:

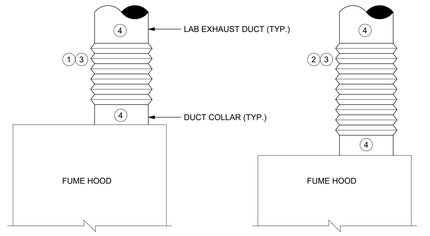
PROJECT NORTH
TRUE NORTH

PROJECT:
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:
BASEMENT FLOOR PLANS - HVAC

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: 1/8" = 1'-0"

M-100R



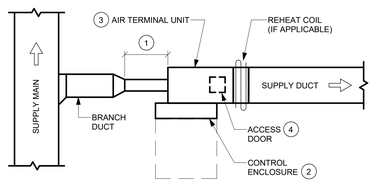
FUME HOOD WITH WORK SURFACE AT NON-ADA HEIGHT, 36" A.F.F.

FUME HOOD WITH WORK SURFACE AT ADA HEIGHT, 30" A.F.F.

KEYED NOTES:

1. ROUND FLEXIBLE EXHAUST DUCT CONNECTION, SHOWING FULLY COMPRESSED TO ACCOMMODATE 36" WORK SURFACE HEIGHT.
2. ROUND FLEXIBLE EXHAUST DUCT CONNECTION, SHOWING FULLY EXTENDED TO ACCOMMODATE 30" WORK SURFACE HEIGHT.
3. PROVIDE FLEXIBLE PVC EXHAUST HOSE PER SPECIFICATION 233100 - SHEET METAL AND DUCTWORK ACCESSORIES CONSTRUCTION. SIZE SHALL MATCH FUME HOOD CONNECTION.
4. QUICK RELEASE CLAMP AT CONNECTION TO FUME HOOD AND DUCTWORK.

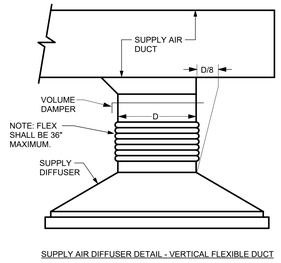
1 ADA FUME HOOD INSTALLATION DETAIL
SCALE: NOT TO SCALE



KEYED NOTES:

1. RIGID STRAIGHT DUCTWORK UPSTREAM OF THE TERMINAL UNIT SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET. NOT TO EXCEED 5'-0" TOTAL IN LENGTH.
2. MAINTAIN MINIMUM 1'-6" SERVICE CLEARANCE IN FRONT OF ENCLOSURE TO ALLOW FOR SERVICE/ACCESS.
3. COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION VAPOR BARRIER AS SPECIFIED.
4. ACCESS DOOR TO BE LOCATED AT THE BOTTOM OF THE UNIT. CONTRACTOR TO COORDINATE COIL AND CONTROL ENCLOSURE HANDING. ROTATING UNIT IN FIELD SUCH THAT ACCESS DOOR IS ON TOP OF UNIT IS NOT ACCEPTABLE.

2 VAV BOX DETAIL
SCALE: NOT TO SCALE



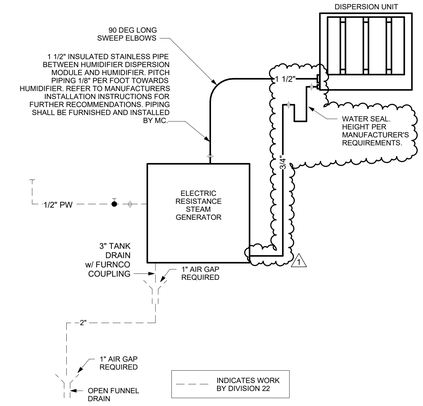
SUPPLY AIR DIFFUSER DETAIL - VERTICAL FLEXIBLE DUCT

DETAIL NOTES:

A. DUCT AND DIFFUSER SIZE AND TYPE AS SHOWN ON DRAWINGS.

B. VOLUME DAMPER SHALL BE MINIMUM OF 4'-0" FROM DIFFUSER.

3 SUPPLY AIR DIFFUSER DETAIL
SCALE: NOT TO SCALE



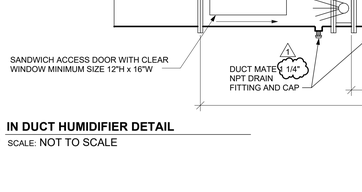
DETAIL NOTES:

A. INSTALL IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

B. COORDINATE INSTALLATION WITH DIVISION 22.

C. CONDENSATE PIPING SHALL BE TERMINATED AT FACTORY KNOCKOUT ON STEAM GENERATOR.

4 ELECTRIC TO STEAM HUMIDIFIER DETAIL
SCALE: NOT TO SCALE



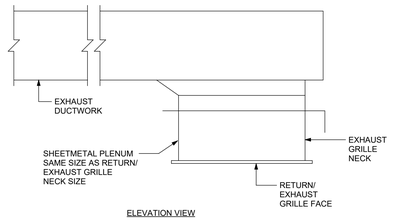
KEYED NOTES:

1. KF25 PORT FOR EQUIPMENT CONNECTION.
2. TERMINATE OPEN ENDED EXHAUST DUCT WITH INSECT SCREEN, 6" ABOVE TOP OF CASEWORK
3. MARK THE BLAST GATE WITH THE DAMPER POSITION REQUIRED FOR BALANCING. DAMPER SHALL BE USED FOR BOTH BALANCING AND ISOLATION.

5 PROCESS EXHAUST DETAIL
SCALE: NOT TO SCALE

DIM.	OVER	"W" 19" D UNDER
A	2 1/4" R	1" R
B	4 1/4" R	2" R
C	6 3/8"	2 7/8"
D	2 1/4"	1 1/8"
E	3 1/4"	2 1/8"

6 VANED ELBOW DETAIL
SCALE: NOT TO SCALE

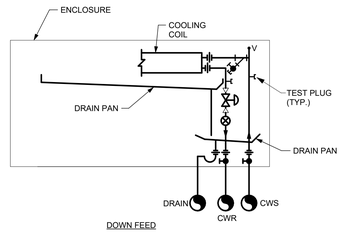


ELEVATION VIEW

7 EXHAUST GRILLE PLENUM DETAIL
SCALE: NOT TO SCALE

8 CHEMICAL POT FEEDER DETAIL - 1 QUART
SCALE: NOT TO SCALE

9 IN DUCT HUMIDIFIER DETAIL
SCALE: NOT TO SCALE



DOWN FEED

DETAIL NOTES:

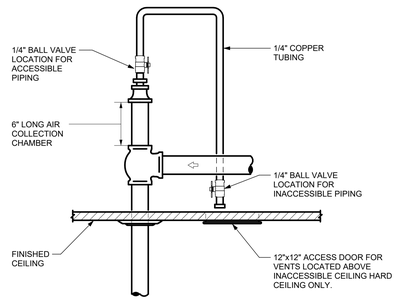
A. ARRANGE PIPING TO ALLOW INSTALLATION OF PIPE INSULATION. PIPES ARE NOT TO COME IN CONTACT WITH EACH OTHER OR CABINET. VALVES AND SPECIALTIES CAN BE INSTALLED EXPOSED WITHIN SPACE.

B. DRAIN PIPING BY THE PLUMBING CONTRACTOR.

C. UP FEED CONFIGURATION IS SIMILAR.

D. THE FOLLOWING ARE NOT ALLOWED: DIELECTRIC UNIONS, AUTOMATIC FLOW CONTROL VALVES, COMBINATION DEVICES OR PRE-PIPED FIT OUT KITS.

10 VERTICAL FAN COIL UNIT PIPING DETAIL - TWO PIPE
SCALE: NOT TO SCALE



11 MANUAL AIR VENT DETAIL
SCALE: NOT TO SCALE

CORNELL UNIVERSITY

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ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/2025	ADDENDUM 01

KEY PLAN:

PROJECT NORTH
TRUE NORTH

PROJECT:

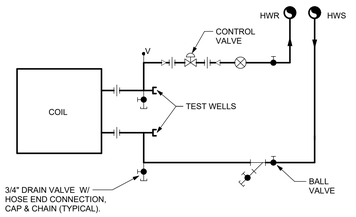
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:

DETAILS - HVAC

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: As indicated

M-400R



DETAIL NOTES:

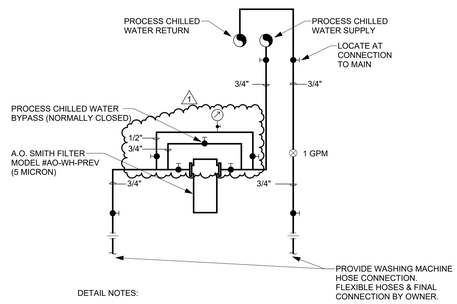
A. ARRANGE PIPING FOR REMOVAL OF COIL WITHOUT DISTURBING PIPING AHEAD OF UNIONS.

B. PROVIDE DUCT ACCESS DOOR UPSTREAM OF COIL.

C. PIPE COIL FOR COUNTERFLOW ARRANGEMENT IF COIL IS MORE THEN ONE ROW. HOT WATER SUPPLY CONNECTION SHALL BE ON THE DISCHARGE AIR SIDE OF THE COIL.

D. THE FOLLOWING ARE NOT ALLOWED: DIELECTRIC UNIONS, AUTOMATIC FLOW CONTROL VALVES, COMBINATION DEVICES OR PRE PIPED COIL FIT OUT KITS.

1 TERMINAL REHEAT COIL PIPING DETAIL - HOT WATER
SCALE: NOT TO SCALE

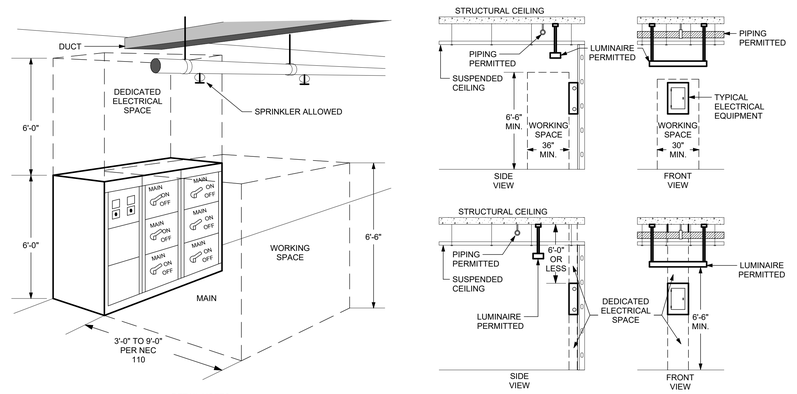


DETAIL NOTES:

A. LOCATE ALL VALVES AND SPECIALITIES AT AN ACCESSIBLE HEIGHT.

B. THE FOLLOWING ARE NOT ALLOWED: DIELECTRIC UNIONS, AUTOMATIC FLOW CONTROL VALVES, COMBINATION DEVICES OR PRE-PIPED COIL FIT OUT KITS.

2 PROCESS CHILLED WATER MANIFOLD DETAIL
SCALE: NOT TO SCALE



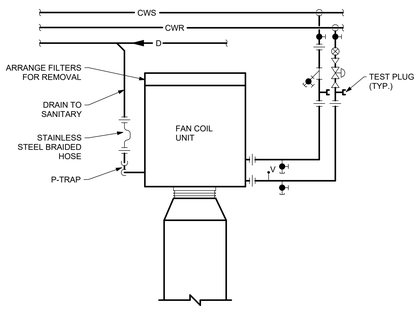
DETAIL NOTES:

A. ELECTRICAL EQUIPMENT INCLUDES PANELS, TRANSFORMERS, DISCONNECTS, STARTERS, MOTOR CONTROL CENTERS, SWITCHGEAR, ADJUSTABLE SPEED DRIVES, AND FUSED SWITCHES (THIS ALSO APPLIES TO ELECTRICAL GEAR MOUNTED DIRECTLY ON MECHANICAL EQUIPMENT).

B. DEDICATED ELECTRICAL SPACE IS DEFINED BY NEC 110.

C. NO PIPING OR DUCTWORK MAY BE INSTALLED IN DEDICATED ELECTRICAL SPACE OR WORKING SPACE.

3 PIPING OVER ELECTRICAL EQUIPMENT DETAIL
SCALE: NOT TO SCALE



DETAIL NOTES:

A. HANG UNIT FROM STRUCTURE AS HIGH AS POSSIBLE WITH STEEL ROD AND VIBRATION ISOLATORS.

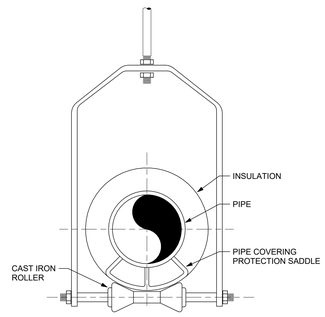
B. UNIT SHALL BE ACCESSIBLE FROM BELOW. MECHANICAL AND ELECTRICAL WORK SHALL NOT BE LOCATED BELOW UNIT. ARRANGEMENT SHALL PERMIT REMOVAL OF FAN COIL UNIT FOR MAJOR SERVICING.

C. CONTROL PANEL SHALL BE ACCESSIBLE FOR SERVICING.

D. DRAIN PIPING BY PLUMBING CONTRACTOR.

E. THE FOLLOWING ARE NOT ALLOWED: DIELECTRIC UNIONS, AUTOMATIC CONTROL VALVES, COMBINATION DEVICES OR PRE-PIPED COIL FIT OUT KITS.

4 CEILING MOUNTED FAN COIL UNIT DETAIL - TWO PIPE
SCALE: NOT TO SCALE



DETAIL NOTES:

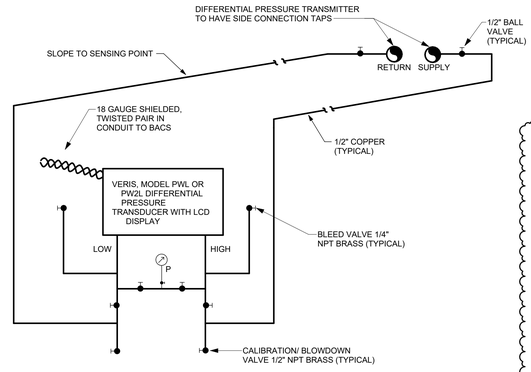
A. GRINNELL FIGURE 181 PIPE ROLL.

B. GRINNELL FIGURE 160 (SERIES) PROTECTION SADDLE.

C. MIN. THREADED ROD SERIES: 2" THRU 3 1/2" - 1/2" DIA., 4"&5" - 5/8" DIA., 6" & 8" - 3/4" DIA., 10" & 12" - 7/8" DIA., 14" - 1" DIA.

D. UPPER ATTACHMENTS VARY, EG. HORIZONTAL TRAVELERS, BEAM CLAMPS "C"-C;AMPS, WELD LEGS, CONSTANT SUPPORT HANGER ETC. (REFER TO DRAWING NOTES)

5 ADJUSTABLE STEEL YOKE PIPIE ROLLER
SCALE: NOT TO SCALE



DETAIL NOTES:

A. INSTALL SENSING POINTS IN CENTERLINE OF PIPIE IN A HORIZONTAL RUN.

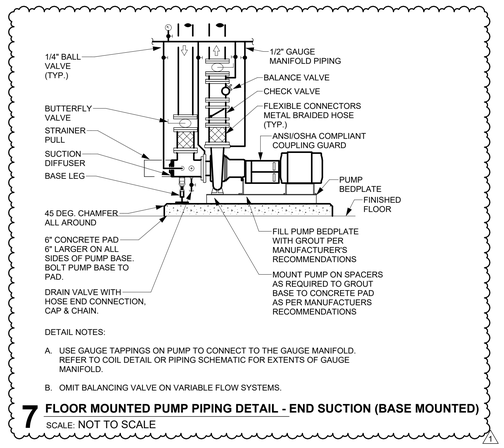
B. SENSING LINES SHALL BE SLOPED DOWN ALL THE WAY TO THE TRANSMITTER.

C. ONE VALVE TO PRESSURE GAUGE SHALL BE CLOSED.

D. DETAIL APPLIES TO CHILLED WATER, HOT WATER HEATING, AND GLYCOL HEATING SYSTEMS.

E. IF A 3-VALVE MANIFOLD IS USED WITH THE TRANSMITTER, THE VALVING SHOWN ON DETAIL SHALL ALSO BE PROVIDED.

6 DIFFERENTIAL PRESSURE TRANSMITTER DETAIL
SCALE: NOT TO SCALE

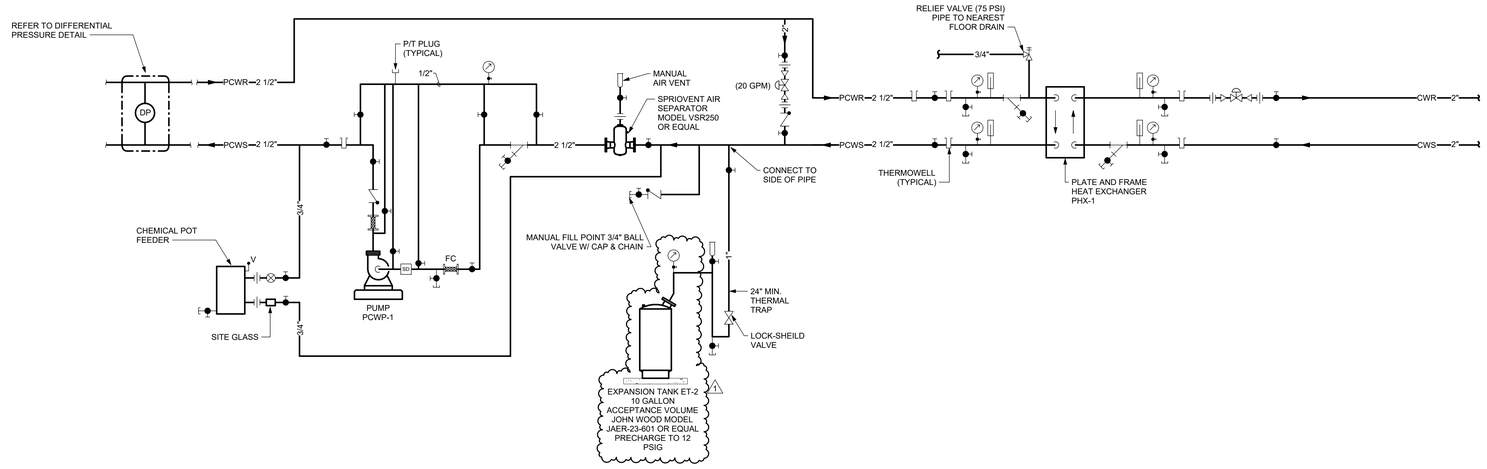


DETAIL NOTES:

A. USE GAUGE TAPPINGS ON PUMP TO CONNECT TO THE GAUGE MANIFOLD. REFER TO COIL DETAIL OR PIPING SCHEMATIC FOR EXTENTS OF GAUGE MANIFOLD.

B. OMIT BALANCING VALVE ON VARIABLE FLOW SYSTEMS.

7 FLOOR MOUNTED PUMP PIPING DETAIL - END SUCTION (BASE MOUNTED)
SCALE: NOT TO SCALE



8 PROCESS CHILLED WATER SYSTEM PIPING SCHEMATIC
SCALE: NTS

CORNELL UNIVERSITY

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ISSUE/REVISION:

NO.	DATE	COMMENTS
1	12/08/2025	ADDENDUM 01

KEY PLAN:

PROJECT NORTH
TRUE NORTH

PROJECT:
TANG HALL LABORATORY FIT-OUT

DRAWING TITLE:
DETAILS AND PIPING SCHEMATIC - HVAC

PROJECT NO: 250800	DATE: 11/07/2025
PHASE: BID SET	SCALE: NOT TO SCALE

M-401R

CORNELL UNIVERSITY

TANG HALL LABORATORY FIT-OUT **December 8, 2025**

RFI Form

RFI/ Response Index	Page/ Dwg./Spec./Rep. Number	Section/ Paragraph/Topic	RFI	Design Team Response
1	A-900, A-910, & A-920	Whiteboards	Please provide further information / detail for the whiteboards if they are contractor furnished, contractor installed.	Whiteboards will be Owner furnished, Contractor installed. See Addendum No. 1 revised drawings A-900R, A-910R, & A-920R .
2		Cornerguards	Please provide specification for cornerguards.	Refer to specification section 092500, 2.03, B1.
3		BIM Coordination	Can you give us the company that did the BIM coordination while building Tang Hall? This would make BIM on this project allot easier.	BIM coordination was done by Kris Kimmel.
4	Spec. 017700, 1.3C	Duct Cleaning	Spec 017700, 1.3C calls for duct cleaning. The M drawings do not define what needs to be cleaned. Please review and quantify the extent of the duct cleaning.	See Addendum No. 1, Item 1. Duct cleaning was removed from specification.
5	Dwg. P-100	Fluorine Gas Cabinet	It appears that the 2% Fluorine Gas Cabinet is pre-purchased (Ref: drawing P-100, note 2)? Please confirm. If contractor purchased, please provide a spec.	See Addendum No. 1, Item 20. Note #1 and #2 on P-100 for Basis of Design. Contractor to purchase and install gas cabinet.
6	P-100R	Sierra N2 Flowmeter	The Sierra N2 flowmeter Rep needs the below info to price the meters: (a) Pressure-inlet and outlet. (b) Flow ranges. (c) Accuracy. (d) Body, elastomers, seal types. (e) Voltage requirements.	See Addendum No. 1, Item 20 for information requested.
7	Spec 115313 & 123553	Fume Hood and Lab Casework	In sections 115313 fume hoods & 123553 the specs note to match the recently completed Tang Hall project (Thurston Hall). However, the issued specs don't match what we previously provided in Tang. Should we bid per these specs or based on what we previously provided	See Addendum No. 1, Items 4 and 5. Fume hood model will be revised to Mott Safeguard and wood lab casework finish will be revised to Mott's standards to match exising Tang Hall standard.
8		Door Hardware	On the door schedule, door opening B97.1 shows hardware set 4. I do not see a Hardware Set 4 in the specifications. Please verify what hardware set to use.	See Addendum No. 1, Items 2 and 3, and revised section 087100, attached.
9	Spec 115313	Proposed Lab Casework Substitution	I am submitting an RFI for a substitution request for the Laboratory Casework for CU - Tang Hall Basement Lab Fit Out. I have to submit it this way because of having attachments to include. CiF Educator Series: •SEFA Member Certificate •Capabilities Brochure •Data Sheet •SEFA 8 Wood Casework Certificate	The bid module has a place/field where substitution information (including pricing info) can be uploaded and reviewed during the descope.
10	Spec 123553	Proposed Fume Hood Substitution	I am submitting an RFI for a substitution request for the Fume Hood for CU - Tang Hall Basement Lab Fit Out. I have to submit it this way because of having attachments to include. Hamilton Concept Fume Hood: •Product Sheet •ASHRAE Testing •Independent Test	Proposed fume hood substitution is not acceptable.