

E

Equipment and Services

The types of equipment included in this Element consist of the following: commercial, institutional, and vehicular. The types of furnishings found here include window treatments, seating, furniture, *etc.*

There is specific information with regards to equipment and services that will need to be discussed with the Caltech representatives for each individual project and implemented to meet the requirements of Caltech. Any questions or conflicts in the documents should be addressed with the Caltech Project Manager for clarification.

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E10 EQUIPMENT

Doors need to be self closing with three point latch.

E1030 Loading Dock

1. Gates: Loading Docks shall be provided with a pair of swinging gates with drop rod anchors. Refer to images on page 246 for reference.

E1040 Institutional Equipment

1. Equipment Selections: Consult Caltech Project Manager regarding information specific to institutional equipment.

E1040.10 Educational and Scientific Equipment

1. Audio/Visual Equipment Accessories: Provide overhead projector mounts in conference rooms.

2 Gas Cabinets: Design Professional to meet with Caltech Safety Office (Environment, Health & Safety Services) to properly locate cabinets.

- a. Follow NFPA requirements for toxic gases.
- b. Conform to FM Global recommendations.

3. Flammable Safety Cabinets: Design Professional to meet with Caltech Safety Office (Environment, Health & Safety Services) to properly locate cabinets.

- a. For Corrosive cabinets: Label: "CORROSIVES" in conspicuous silk screened lettering. Stick on decals are not acceptable.
- b. For Flammable cabinets: Label: "FLAMMABLE KEEP FIRE AWAY" in conspicuous silk screened lettering. Stick on decals are not acceptable.
- c. It is Caltech's preference for Corrosive cabinets to have louvers in doors.
- d. Doors need to be self closing with three point latch.

E1040.20 Laboratory Fume Hoods:

1. General:

a. Summary

1) Section Includes:

- a) Bench-top laboratory fume hoods.
- b) Floor-mounted laboratory fume hoods.
- c) Fume hood base cabinets.
- d) Work tops within fume hoods.
- e) Water, laboratory, gas, and electrical service fittings in fume hoods.

b. Performance requirements

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

- a) Sash operating position while work is being performed in the chemical fume hood is a maximum of 18" opening for vertical rising sashes. Sash setup position is defined as an opening greater than the operating

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position of 18” for loading materials with which to perform work. Work should not be performed in the setup position.

b) Average Face Velocity: 100 fpm plus or minus 10 percent with sashes fully open.

c) Face-Velocity Variation: Factory tested not to exceed 20 percent of average face velocity.

d) Working Sash Position: Fully open at 18” for vertical rising sashes.

1) Test hoods with horizontal sashes with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.

2) Test hoods with combination sashes fully raised to 18”, with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.

e) As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm).

f) As-Installed (AI) Rating: AI 0.05 (0.05 ppm).

2) Static-Pressure Loss: Not more than 0.5 inch wg at 100-fpm face velocity when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

3) Structural Performance: Provide fume hood components capable of withstanding the following loads without permanent deformation, excessive deflection, or binding of cabinet drawers and doors:

a) Chemical Fume Hoods:

1) Work Tops: 75 lb/ft.

2) Base Cabinets of Chemical Fume Hoods: 75 lb/ft.

b) Radioisotope Fume Hood Work Tops: 200 lb/ft.

c) Base Cabinets of Radioisotope Fume Hoods: 75 lb/ft. within cabinets, 50 lb/ft. work top, 200 lb/ft. on work top, plus weight of hood.

4) Seismic Performance: Fume hoods, including attachments to other work, shall withstand the effects of earthquake motions determined according to SEI/ASCE 7 and CBC requirements. Seismic anchorage must comply with seismic calculations provided by licensed structural engineer for seismic zone 4.

5) Product Standards: Comply with SEFA 1, “Laboratory Fume Hoods – Recommended

Practices.” Provide fume hoods UL listed and labeled for compliance with UL 1805.

6) Safety Glass: products complying with testing requirements in 16 CFR 1201 for Category II materials.

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

7) Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended loca-

tion and application.

8) Hoods shall be equipped with a quantitative airflow monitor that continuously indicates whether air is flowing into the exhaust system during operation. The quantitative airflow monitor shall measure either the exact rate of inward airflow or the relative amount of inward airflow. Examples of acceptable devices that measure the relative amount of inward airflow include: diaphragm pressure gauges (i.e. Magnehelic gauge). The requirement for a quantitative airflow monitor may also be met by an airflow alarm system if the system provides an audible or visual alarm when the airflow decreases to less than 80 fpm.

9) Acoustic performance:

Submit Chemical fume hood's acoustical performance data measured by a certified acoustical test lab. Clearly indicate the sound power level for each octave band under normal operating condition at full sash opening. Chemical fume hoods without certified acoustical test data shall not be considered.

10) In accordance with UL 1805, fume hoods shall be supplied factory pre-piped and pre-wired to POC for mechanical and electrical trades. Hoods shall be pre-piped and pre-wired to top, or as shown.

2. Products:

a. Manufacturers

1) Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a) Fisher Hamilton L.L.C.
- b) Kewaunee Scientific Corporation; Laboratory Products Group.
- c) LabConco Corporation.
- d) Jamestown Metal products (JMP)
- e) Hanson lab furniture Inc.
- f) Substitutions as allowed by CIT Project Manager.

b. Fume hood ventilation

1) Constant-Volume Fume Hoods:

- a) The type of bypass, (i.e. open bypass Vs. restricted bypass) shall be determined during design and programming phase after detailed analysis by the mechanical engineer.
- b) Chemical fume hood shall readily be capable of operating at 60 fpm velocity without any modifications, in order to accommodate expected lower future face velocity requirements.
- c) Exhaust air static pressure at the hood shall be no less than the manufacturer's minimum requirement.
- d) Provide packless or chemical rated sound attenuator as needed to attenuate excessive transmitted sound from the roof exhaust fan.

2) Variable-Air-Volume Fume hoods:

- a) Variable-Air-Volume Fume hood Control: Provide variable air volume fume hoods as indicated on lab or architectural plans. Coordinate

with Work provided in Section 23 09 00 “Instrumentation and Controls for HVAC.” Controls NIC for Fume Hood Manufacturer.

b) Chemical Fume hood operating in Variable air volume (VAV) mode shall feature automatic sash closer and occupant proximity sensor to automatically close the sash when there are no occupants near the fume hood for a period of 10 minutes (Adjustable) or longer.

c) Automatic sash closer shall utilize optical sensor to prevent sash closure when there is an obstacle at the fume hood opening.

d) Chemical fume hood shall readily be capable of operating at 60 fpm velocity without any modifications, in order to accommodate expected lower future face velocity requirements.

e) Exhaust air static pressure at the hood shall be no less than the manufacturer’s minimum requirement.

f) Provide packless or chemical rated sound attenuator as needed to attenuate excessive transmitted sound from the roof exhaust fan.

3) Base Cabinets and base cabinet ventilation:

a) Base cabinets serving Acid and Base storage shall be internally vented to the back of the exhaust baffle plenum .

b) Vacuum pumps Base cabinets shall be internally vented to the back of the exhaust baffle plenum via a 1” O.D. polypropylene pipe. Provide a pilot lit toggle switch outside the base cabinet to energize and de-energize the vacuum pump.

c) Provide a cooling fan inside the vacuum pump base cabinet to maintain the temperature below 95°F. operation of the cooling fan shall be interlocked to the vacuum pump. Hot air shall be rejected to the room from the rear side of the base cabinet through the cooling fan opening. Provide provisions for make- up air, as required.

d) Provide internal acoustical lining to attenuate vacuum pump noise and a thermostatically operated internal cooling fan to exhaust the heat being rejected by the vacuum pump.

e) Provide a pull-out roller tray at the bottom of vacuum pump base cabinet to accommodate maintenance.

d) solvent storage base cabinet shall be directly connected to the main exhaust duct above the fume hood collar via a manufacturer furnished 2” diameter stainless steel flexible duct and saddle connection.

e) Provide base cabinets in finish matching fume hood exterior finish.

f) Base cabinets doors shall be self-closing and self-latching.

3. Execution

a. EXAMINATION AND INSTALLATION

1) Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fume hoods.

2) Proceed with installation only after unsatisfactory conditions have been cor-

rected.

3) Install fume hoods according to Shop Drawings and manufacturer's written instructions. Install 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.

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

5) Comply with requirements in other Divisions and Sections for installing water and laboratory gas service fittings and electrical devices.

a) 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.

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

a) Test one installed fume hood, selected by Architect, for each type of hood installed, according to ASHRAE 110 as modified in "Performance Requirements" Article. If tested hood fails to meet performance requirements, field test additional hoods as directed by Architect.

7) Field test installed fume hoods according to ASHRAE 110 as modified in "Performance Requirements" Article to verify compliance with performance requirements.

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

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

8) Fume Hood Schedule:

a) Bench Top Fume Hood Type:

1) Ventilation Type: Constant Volume or Variable Air Volume, depending on HVAC design.

2) ASHRAE 110 As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm). c. 3) ASHRAE 110 As-Installed (AI) Rating: AI 0.05 (0.05 ppm).

4) Sash Configuration:

a) Operation: Combination sash consisting of two horizontal-sliding, bypassing sashes retained in a vertical-sliding, single-hung, top-hung frame.

b) Max. Opening Height for setup : 27 to 30 inches.

c) Max opening height for working: 8 inches

d) Work Top: Epoxy.

- e) Cup Sinks: Polypropylene, 3-by-6-inch oval.
- f) Service Fittings: Provide the following with quick connect compression connections at valve body where indicated or required in accordance with UL 1805:

- i) Water: One or more remote-control, rigid, gooseneck, single-service faucet(s), and removable serrated outlet.
- ii) Laboratory Gas for Air, Gas (Fuel Gas), Vacuum, or as shown. One or two flange-type fitting(s) with angled outlet and remote-control- needle valve.
- iii) Electrical: One duplex receptacle at both end(s) of hood, mounted on exterior front face of end pilaster.
- iv) Provide GFCI receptacles.

E1060 Residential Equipment

1. Equipment Selections: Consult Caltech Project Manager regarding information information specific to residential equipment and appliances.

E1090 Other Equipment

E1090.10 Solid Waste Handling Equipment

1. Recycling Equipment:

- a. Each office shall have a minimum of one recycling container - Rubbermaid, Model 2956-06 (Blue color).
- b. Each laboratory and classroom shall have a minimum of one recycling container – Rubbermaid, Model 3540-06 (Blue color).
- c. Main floor shall have three recycling containers and be consistent with the campus standards. Coordinate with Director of Sustainability for guidance.

2. Fall Protection Equipment:

- a. Roofs without parapets and guardrails shall be provided with a Horizontal Life Line System. This system will provide continuous protection for multiple users working at any height.



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E20 FURNISHINGS

All supply cabinets and bookcases are to be anchored to the wall and shelves shall have earthquake restraints to prevent items from falling.

Provide locks on cabinet drawers and doors where requested.

E2010 Fixed Furnishings

E2010.20 Window Treatments

1. Roller Shades: For exterior fenestration, provide roller shades; manual or electric to be determined based on Project requirements.

2. Horizontal Louver Blinds: For interior sidelights and borrowed lights, provide horizontal louver blinds, if needed

E2010.30 Casework

1. General:

- a. Do not deliver or install casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- b. Do not use adhesives that contain urea formaldehyde.
- c. Comply with South Coast Air Quality Management District rules for VOC limits for installation adhesives and glues.
- d. All supply cabinets and bookcases are to be anchored to the wall and shelves shall have earthquake restraints to prevent items from falling.
- e. Provide a minimum of 30" deep knee space for under counter refrigerators and freezers. Coordinate mechanical and plumbing work to not conflict with the placement of the undercounter equipment.
- f. Drawer Slides: Side-mounted, full extension, zinc coated.
 - 1) Accuride 3832 regular or easy close
 - Up to 100 lbs
 - Up to 36" wide
 - 2) Accuride 4034 regular or easy close
 - Up to 150 lbs
 - Up to 42" wide

2. Custom Casework: Plastic-laminate cabinets.

- a. Provide Woodwork Institute (WI) certified compliance labels and certificates indicating that woodwork, including installation, comply with requirements of WI Premium Grade.
- b. Provide interior architectural woodwork produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, *FSC Principles and Criteria for Forest Stewardship*.
- c. Provide locks on cabinet drawers and doors where requested.
- d. Provide exterior-grade plywood, minimum 3/4 inch thick, core material at sinks and shelves. Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.
- e. Transparent and Paint Finishes: WI Finish System 4, conversion varnish.

3. Wood Laboratory Casework: Refer to Caltech Master Specification, Section 12 35 53 *Wood Laboratory Casework and Furniture* in **Appendix V**.

4. Stainless Steel Laboratory Casework: Stainless steel laboratory casework; utility-space framing at backs of base cabinets and between backs of base cabinets; filler and closure panels; laboratory countertops; tables; shelves; laboratory sinks; laboratory accessories; water, laboratory gas, and electrical service fittings; laboratory area requirements, such as marker boards, flooring, and base material requirements.

a. Design Requirements: Provide the following:

- 1) For laboratory casework indicated to comply with seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. Laboratory casework, including attachments to other work, shall withstand the effects of earthquake motions determined according to CBC.
- 2) Pull-out “breadboard” equipment shelf made of stainless steel. Design shelf slides and hardware to support 100 pound load.
- 3) Under-counter task lighting at wet benches and desk areas.
- 4) Stainless steel hinges, door and drawer pulls.
- 5) Drawer suspension: Side-mounted, full extension, zinc coated.
 - a) Accuride 3832 regular or easy close
Up to 100 lbs
Up to 36” wide
 - b) Accuride 4034 regular or easy close
Up to 150 lbs
Up to 42” wide

b. Quality Assurance:

- 1) A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8.
- 2) Casework Product Standard: Comply with SEFA 8, *Laboratory Furniture – Casework, Shelving and Tables – Recommended Practices*.
- 3) Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide painted steel units that are UL listed and labeled as complying with requirements in NFPA 30 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- 4) 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.

c. Stainless Steel Lined Acid Storage Cabinets: Provide lined acid storage cabinets with chemically-resistant 3/16 inch thick molded polyethylene lining with coved corners and 1 inch lip at front of cabinet opening. Cabinets to include removable back panel and two vent cutouts in the cabinet back. Doors to be lined with 1/8 inch thick polyethylene. Shelving is half depth with polyethylene spill tray.

d. Stainless Steel Work Surfaces and Sinks:

Provide seamless, die-formed 3/16 inch high integral marine edges at sink tops.

Provide products by Fisher Hamilton L.L.C. or Kewaunee Scientific Corporation; Laboratory Products Group.

Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish.

- 1) Stainless steel tops with scullery sinks are made from 14 gage Type 304 stainless steel with #4 finishes. Tops with welded field joints are made from 14 gage Type 304 stainless steel with No. 4 finish. All other tops are made from 16 gage Type 304 stainless steel with No. 4 finishes.
- 2) Form tops with 1 inch lip and 1/2 inch return flange, and provide 16 gage stainless steel reinforcing channels applied to underside as required for rigidity and sound dampening. Form edges, flanges, and curbs integrally with top, from one sheet of metal.
- 3) Sink Tops: Provide seamless, die-formed 3/16 inch high integral marine edges at sink tops. Unless otherwise noted, provide plain edges at all other tops. Coat underside of all with sound dampening material.
- 4) All sink bowls are made from 16 gage Type 304 stainless steel. Electrically weld stainless steel bowls to opening in top. Grind welds flush and polish to a satin finish to produce an integral unit with invisible joint line. Underside of sink bowls require sound dampening material.
- 5) Joints: Electrically weld all shop joints; grind smooth and polish. Design field joints to be mechanically bolted and supported full length, resulting in a hairline seam with flat, level surfaces each side of joint.
- 6) Sound Dampening Material: Material shall be waterborne and non-flammable in its liquid state. Material to contain clay, to act as a flame retardant. Material shall contain no volatile organic compounds (VOC). Film thickness of spray-applied product shall be approximately 20 mil.

e. Stainless Steel Cabinets and Tables: Provide products by Fisher Hamilton L.L.C. or Kewaunee Scientific Corporation; Laboratory Products Group.

- 1) Structural Performance Requirements: Casework components shall withstand the following minimum loads without damage to the component or to the casework operation:
 - a) Steel Base Unit Load Capacity: 500 lbs. per linear foot.
 - b) Suspended Units: 300 lbs.
 - c) Drawers in a Cabinet: 150 lbs.
 - d) Utility Tables (4 legged): 300 lbs.
 - e) Hanging Wall Cases: 300 lbs.
 - f) Load Capacity for Shelves, Base Units, Walls, and Tall Cases: 40 lbs per square foot.
- 2) Table Frames: 4-1/2 inch high "C" channel front and back aprons, end rails, and cross rails.
- 3) Legs: 2 inch by 2 inch steel tube legs with welded leg bracket. Attach legs with two bolts to front and back aprons and weld to end rails. Legs shall have a recessed leveling screw.
- 4) Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
- 5) 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.

f. Hardware:

All hardware to be stainless steel.

- 1) General: All hardware to be stainless steel.
- 2) Hinges: Stainless steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two for doors 48 inches high or less and three for doors more than 48 inches high.
- 3) Drawer Pulls: Stainless steel wire pulls. Provide two pulls for drawers more than 24 inches wide.
- 4) Drawer Slides: Side-mounted, full extension, zinc coated.
 - a) Accuride 3832 regular or easy close
 - Up to 100 lbs
 - Up to 36" wide
 - b) Accuride 4034 regular or easy close
 - Up to 150 lbs
 - Up to 42" wide
- 5) Locks for Cabinets: Cam type with 5-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281 or E07261.
 - a) Provide lockable drawers at desks.
 - b) Master Key System: Key all locks to be operable by master key.
- 6) Adjustable Wall Shelf Supports: Surface-type steel standards and steel shelf brackets, complying with BHMA A156.9, Types B04102 and B04112.
- 7) Plastic Grommets: Provide grommets at desk areas, matching countertop finishes.

g. Pegboards: Stainless steel pegboards with removable polypropylene pegs and stainless steel drip troughs with drain outlet.

h. Water and Laboratory Gas Service Fittings:

- 1) Manufacturers: WaterSaver Faucet Co.
- 2) Service Fittings: Provide units that comply with SEFA 7, Laboratory and Hospital Fixtures – Recommended Practices. Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items. Provide units that comply with *Vandal-Resistant Faucets and Fixtures* recommendations in SEFA 7.
- 3) Materials: Fabricated from cast or forged red brass unless otherwise indicated.
 - a) Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- 4) Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
 - a) Aerators: Provide aerators on water fittings that do not have serrated outlets.
 - b) Self-Closing Valves: Provide self-closing valves where indicated.

Service Fittings: Provide units that comply with SEFA 7, Laboratory and Hospital Fixtures – Recommended Practices.

Provide color-coded plastic discs with embossed identification,

Coordinate requirements with Caltech Project Manager for kitchenette design.

Provide solid-surface material countertops in kitchenettes. Plastic laminate countertops are not permitted.

5) Needle Valves: Provide units with renewable, self-centering, floating cones, and renewable seats of stainless steel or Monel metal, with removable serrated outlets.

6) Service Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service fitting handle to be tamper-resistant. Comply with SEFA 7 for colors and embossed identification.

i. Installation:

1) Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:

- a) Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
- b) Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
- c) Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
- d) Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
- e) Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

2) Countertops: Comply with installation requirements in SEFA 2.3. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.

5. Racks: Provide double depth cylinder racks as shown on page 253.

- a. Provide 1/4" clear polycarbonate sheets with chamfered edge at all exposed sides underneath cylinder tanks.

6. Kitchenettes: Coordinate requirements with Caltech Project Manager for kitchenette design.

7. Countertops:

- a. Provide solid-surface material countertops in kitchenettes. Plastic laminate countertops are not permitted.
- b. Fabricate tops in one piece, as much as possible. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing. Drill holes in countertops for fittings and accessories.

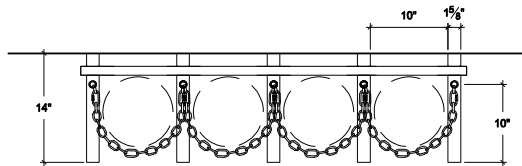
E2050 Movable Furnishings

1. Laboratory Furniture: Refer to Caltech Master Specification, Section 12 35 53 *Wood Laboratory Casework and Furniture* in **Appendix VI**.

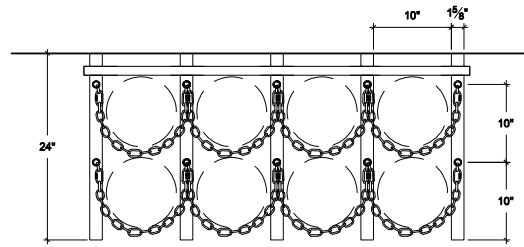
2. Metal Base Levelers: Use LL-158-3/8" Thread 3" or 4" Long support base w/ slotted leveler & hex nut set which includes 1 brace and 1 leveler. Part # LL-158-3 or LL 158-4. Refer to Outwater Plastics Industries, INC. & Architectural Products for more info.

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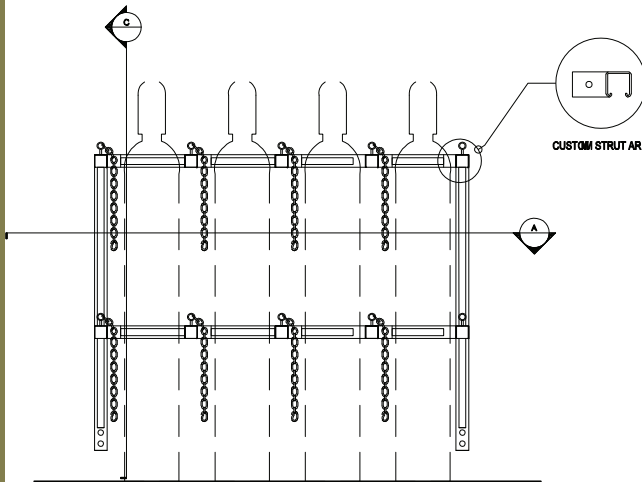
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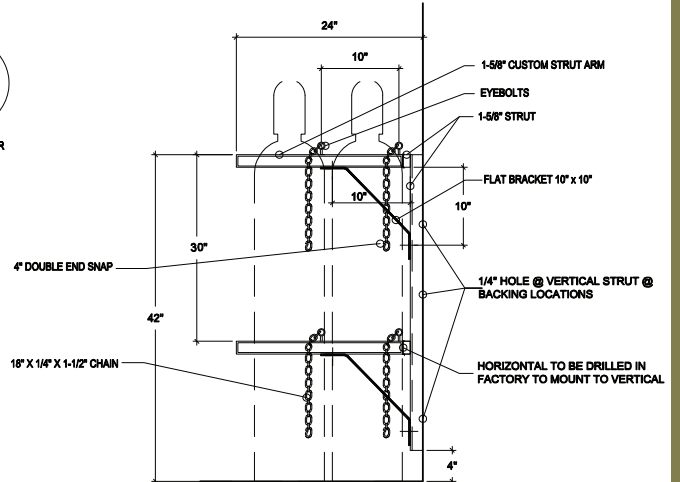
A.PLAN



A.PLAN



B.ELEVATION



C.SECTION

CR	Cylinder Rack Detail
	Scale
	3/4" = 1'

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