May 4, 2018
DSA File No.: 34-H7
DSA Application No.: 02-115633

ADDENDUM NO. 3

Sacramento City Unified School District
West Campus High School
Science & Technology Building, Inc 2.

May 4, 2018

By _____
Patrick M. Derickson
CA License C17107
Stafford King Wiese Architects

A. Work described in this addendum is to be of the same quality as specified in the original documents.

B. SUBSTITUTION REQUESTS

1. 08 62 50 Tubular Skylights
    a. Velux America, Inc, see attachments.
2. 11 53 13 Laboratory Fume Hood
    a. ICI Jamestown Demonstration Fume Hood, see attachments.
    b. Airmaster Systems Fume Hood, see attachments.
3. 12 35 53 Lab Casework
    a. Diversified Casework, see attachments.

C. PROJECT MANUAL

4. 00 01 10 TABLE OF CONTENTS
    a. Replace entire section, see attached.
5. 09 30 00 TILING
    a. Revise section 2.03.A as follows:

        A. Mortar
            1. Latex-Portland Cement Mortar: Comply with ANSI A118.4 as required for installation method designated.
            2. ***Portland Cement Mortar: Comply with ANSI A108.02 as required for installation method designated.***

    b. Revise section 3.03.A as follows:

1. Floors Thin-Set: TCNA F113A-17
2. Walls Thin-Set: TCNA W247-17
3. ***Floors Thick-Set: TCNA F112A-17***

6. 10 21 13 COMPOSITE TOILET PARTITIONS

    a. Replace entire section, see attached.

7. 11 53 13 LABORATORY FUME HOODS

    a. Replace entire section, see attached.

D. DRAWINGS

1. C2.5.1 PAVING PLAN

    a. Revised, see AD-11attached, clarification for paving locations and added callout for condenser unit pad.

2. A2.2.4 REFLECTED CEILING PLAN

    a. Replace with attached sheet, ceiling access panel locations revised.

3. A2.6.1 INTERIOR ELEVATIONS

    a. Revised, see AD-12 attached, revised Classroom elevation 100-4 with access panel added.

4. A2.9.2 CASEWORK DETAILS

    a. Revised, see AD-13 attached, added access panel to demonstration desk.

5. M2.5.2 HVAC DETAILS

    a. Detail 3 revised, see attached sheet AD-14.

6. E2.3.1 POWER FLOOR PLAN

    a. See attached sheet AD-15, two outlet locations revised.

7. P2.0.3 PLUMBING SCHEDULE

    a. See attached sheet AD-16, overlapping text revised

E. ATTACHMENTS

Substitution Requests:

Tubular Daylighting Devices – Velux
Laboratory Fume Hoods – ICI

Laboratory Fume Hoods – Airmaster Systems
Lab Casework – Diversified Casework

Project Manual:

00 01 10 – Table of Contents
10 21 13 – Composite Toilet Partitions
11 53 13 – Laboratory Fume Hoods

8.5 x 11 Drawings:

AD-11
AD-12
AD-14
AD-15
AD-16

11 x 17 Drawings:

AD-13

30x42 Drawings:

A2.2.4 Reflected Ceiling Plan

END OF ADDENDUM 3

VOLUME 1

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section specifies solid plastic, floor-anchored, overhead braced, toilet partitions complete, including attachment and operating hardware. Section also specifies urinal screens.

B. Related requirements specified elsewhere:
1. Documents affecting work of this Section include, but are not limited to, Conditions of the Contract and Sections in Division 01 of these Specifications.
2. Sealants for sealing around fixtures - Section 07 90 10, Joint Sealing.
3. Mounting of toilet accessories - Section 10 28 13, Toilet Accessories.

1.02 SUBMITTALS

A. Literature
1. Manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
2. Manufacturer's current recommendations for methods of installation including instructions for installation of anchorage devices built into the Work.

B. Shop drawings for fabrication and erection of toilet partition assemblies not fully described by product literature. Indicate field measurements on final shop drawings.

C. Samples: Submit for each color and finish on same substrate as will be installed.

D. Contract closeout: Manufacturer's guarantee.

1.03 QUALITY ASSURANCE:

A. Manufacturer shall certify that flame spread of panel material meets minimum requirements for Class III and maximum smoke density 450 when tested in accordance with ASTM E 84.

1.04 DELIVERY STORAGE AND HANDLING

A. All panels, doors and pilasters to arrive at job site with special plastic protective covering.

1.05 WARRANTY

A. Guarantee that composite materials will not break or corrode for 25 years.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Product: Bobrick; Sierra Series 1092.67P compartments as represented by R. E. Edwards, (925) 829-2942 or, subject to requirements, Manufacturers offering products that may be incorporated into the work include, but are not limited to thefollowing:
a. Privacy Plus™ Toilet Company by Gerali Custom Design, Inc.
b. WilsonArt®Gibraltar® Material.
c. WilsonArt® EarthStone™ Material
d. Or equal

B. Toilet partition constructed Solid Color Reinforced Composite Material composed of dyes,organic fibrous material, and polycarbonate/phenolic resins. Material shall have a non-ghosting,graffiti-resistant surface integrally bonded to core by thermal and mechanical pressure.. Edge material shall be the same color as the surface. Enameled Steel, Laminate Plastic- faced ,High Density Polyethylene (HDPE) or High Density Polypropylene is not acceptable.

C. Toilet-Enclosure Style: Overhead braced.

D. Urinal-Screen Style: Wall-hung.

2.02 MANUFACTURED UNITS

A. Provide materials selected for surface flatness and smoothness. No exposed surfaces which show pitting, seam marks, roller marks, stains, discolorations, or other imperfections.

B. Panels, doors, pilasters and screens: Solid color, reinforced composite with homogenous color throughout. 3/4-inch thickness. Bottom of panels and doors mounted 14-inches above floor.
1. Doors: Swing doors into compartments, unless otherwise shown. 54-inches high.
   a. 24-inches wide, unless otherwise indicated on the Drawings or specified.
   b. 36-inches wide, minimum, at stalls designated as "Accessible".
2. Urinal screens: Wall Hung, 24-inches wide; 42-inch high.
3. Compartment panels: 54-inches high.
4. Pilasters: 82-inches high.

C. Hardware: Institutional grade.

1. Pilaster shoes and Sleeves (Caps): Manufacturer's standard 4” tall one-piece design; stainless steel.

2. Panel and screen brackets: 18 ga. stainless steel one-piece, full-height U-channels and angle brackets;

3. Hinges
   a. Cam shall be adjustable in the field tp permit door to be fully closed or partially open when compartment is unoccupied.

4. Hinges shall be attached to door and stile by theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts.

3. Fasteners secured directly into the core are not acceptable.

4. Door shall be furnished with two 11-gauge stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond stile.

5. Door stops and hinges shall be secured with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.

6. Threaded brass inserts shall withstand a direct pull force exceeding 1,500 lbs. per inset.

L. Brackets (Fittings):

1. Mounting Brackets shall be 18-gauge stainless steel and extend full height of panel.

2. U-channels shall be utilized for secure panels to stiles

3. Angle brackets shall be furnished to secure stiles to walls and panels to walls.

4. Fasteners at locations connecting panels-to-stiles shall be through bolted with stainless steel, pin-in-head Torx sex bolt fasteners. Through-bolted fasteners shall withstand direct pull force exceeding 1,500 lbs. per fastener.

5. Wall mounted urinal brackets shall be 11 gauge double thickness.

2.03 ACCESSORIES

A. Hardware:

1. All hardware to be 18-8, type-304 stainless steel with satin finish.

2. Hardware of chrome-plated "Zamak", aluminum, or extruded plastic is unacceptable.

B. Latch:

1. Sliding door latch shall be 14-gauge and shall slide on nylon track.

2. Sliding door latch shall require less than 5 lb force to operate. Twisting latch operation will note acceptable.

3. Latch track shall be attached to door by machine screws into factory installed threaded brass inserts.

4. Threaded brass inserts shall be factory installed for door hinge and latch connections and shall withstand a direct pull exceeding 1,500 lbs. per insert.

5. Through-bolted, stainless steel, pin-in-head Torx sex bolt fasteners shall be used at latch keeper-to-stile connections and shall withstand direct put pull force exceeding 1,500 lbs. per fastener.

6. All doors shall be equipped with self-closing hinge.

7. Fasteners secured directly into the core are not acceptable.

C. Clothes Hook

1. Clothes Hook shall be constructed of stainless steel and shall project no more than 1-1/8" from face of door.

2. Clothes hook shall be secured by to door by through-bolted, theft-resistant, pin-in-head Torx stainless steel screws. Through-bolted fasteners shall withstand a direct pull force exceeding 1,500 lbs. per fastener

D. Leveling Device shall be 7-gauge, 3/16" hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

E. Stile Shoe shall be one-piece, 4" high, type-304, 22-gauge stainless steel with satin-finish. Top shall have 90° return to stile. Shoe will be composed of one-piece of stainless steel and capable ofbeing fastened (by clip) to stiles starting at wall line.

F. Headrail (Overhead-Braced): shall be satin-finish, extruded anodized aluminum (.125" thick)

with anti-grip profile.

2.04 FABRICATION

A. Overhead Braced/Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

B. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at tops and bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.

C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, in-swinging doors for standard toilet compartments and 36-inch- wide, out-swinging doors with a minimum 32-inch- wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Before beginning the work specified in this section, carefully inspect the substrate to which the work specified in this section will be applied. Execution of the work specified in this section shall constitute a certification by the Contractor that the substrate is in proper condition to receive subsequent work.

3.02 INSTALLATION

A. Comply with manufacturer's recommended procedures and installation sequence. Install rigid, straight, plumb, and level. No evidence of drilling, cutting, or patching shall be visible in the finished work.

B. Panel and screen attachment
1. Provide maximum clearance of 1/2-inch between pilasters and panels, and maximum 1-inch between panels/screens and walls.
2. Secure panels and screens to walls with minimum two stirrup brackets attached near top and bottom of panel/screen. Locate wall brackets so that holes for wall anchorages occur tile joints (where occus).
3. Secure panels to pilasters with minimum of two stirrup brackets located to align with stirrup brackets at wall.

C. Door Attachment
1. Install top and bottom hinges to each door at manufacturer's standard location; conceal working parts within doors; 3/16-inch maximum clearance between doors and pilasters.
2. Set hinges to hold in-swinging doors ajar 30 degrees; out-swinging doors to stand closed.

D. Latches: Provide one latch per door at midpoint of latching jamb.

E. Hooks and bumper: Center on back of door, 3-inches from top.

F. Pulls: Install 2-inches below latch.

G. Floor Anchorage: Minimum 2-inch penetration into structural floor, unless otherwise recommended by partition manufacturer.

H. Wall Anchorage: Secure divider panels and screens to built-in anchorage devices using concealed fasteners. Level, plumb, and tighten installation with devices furnished. Hang doors and adjust so that bottoms of doors are level with bottoms of pilasters when doors are in closed position.

I. Overhead Bracing: Secure to each pilaster with minimum of two fasteners.

J. Accessories: Mount accessories to partition units in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust and lubricate hardware for proper operation.
   1. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched.
   2. Set hinges on out-swinging doors (and entrance swing doors) to return to fully closed position.

B. Alignment
   1. Align pilaster and panel tops. Doors aligned with pilasters when doors are closed.
   2. Overhead bracing parallel to and in alignment with both doors and pilasters/panels.

3.04 CLEANING

A. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Bench-top laboratory fume hoods.
2. Piping and wiring within fume hoods for service fittings, light fixtures, fan switches, and other electrical devices included with fume hoods.

B. Related Divisions:

1. Division 22 Plumbing
2. Division 23 HVAC
3. Division 26 Electrical Fittings and Connections

1.3 COORDINATION

A. Coordinate installation of fume hoods with laboratory casework, fume hood exhaust ducts, electrical work, and other laboratory equipment.

1.4 QUALITY ASSURANCE

A. Obtain fume hoods from a single source.

B. Product Standards: Comply with SEFA 1.2, “Laboratory Fume Hoods - Recommended Practices.”

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For laboratory fume hoods.

1. Include plans, elevations, sections, and attachment details.
2. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports.
3. Indicate locations and types of service fittings together with associated service supply connection required.
4. Indicate duct connections, electrical connections, and locations of access panels.
5. Include roughing-in information for mechanical, plumbing, and electrical connections.

C. Samples: For finishes.

1.6 INFORMATIONAL SUBMITTALS

A. 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.

B. Source quality-control reports.

C. Manufacturer Seismic Qualification Certification: Submit certification that laboratory fume hoods, shall withstand seismic forces defined according to ASCE/SEI 7.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install fume hoods until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Locate concealed framing, blocking, and reinforcements that support fume hoods by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Bench-Top, Ducted, Restricted-Bypass Fume Hoods, Fume Hood Face Velocity Controller, and Steel Exterior:

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

a. Air Master Systems Corporation.
b. Labconco Corporation.
c. Kewaunee Scientific Corporation
d. Thermo Fisher Scientific, Inc.
e. Or equal.

B. Product: Kewaunee Scientific Corporation, Supreme Air Fume Hood or equal. Other manufacturers' fume hoods of similar sizes, types, and configurations, and complying with the Specifications, may be considered. See Section 01 60 00 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110 as modified below:

1. As-Manufactured (AM) Rating: AM 0.02 (0.02 ppm).
2. As-Installed (AI) Rating: AI 0.05 (0.05 ppm).
3. Average Face Velocity: 100 fpmplus or minus 10 percent with sashes fully open.
4. Face-Velocity Variation: Not more than 10 percent of average face velocity across the face opening with sashes fully open.
5. Sash Position: Fully open.
6. Release Rate: 6.0 L/min.

B. Static-Pressure Loss: Not more than 1/2-inch wgat 100-fpmface velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

2.3 FUME HOODS

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

B. Restricted-Bypass Fume Hoods: Provide restricted-bypass fume hoods. Partial compensating bypass above the sash opens after sash is closed to less than 20 percent open. Design partial bypass to maintain exhaust capacity of at least 25 cfm per sq. ft. of work surface regardless of sash position.

C. Sash:

1. Vertical Rising. 1/4” Tempered Glass.
2. Sash Height: Between 27” and 30”.

D. Liner: Type 304 Stainless steel model H08

E. Accessible (CBC Title 24 Access-Compliant) Fume Hood

F. Fume Hood Size: 4’-0” length

G. Surface: Epoxy Resin Surface.
1. Hood work surface shall be 1-1/4” thick molded epoxy resin made in the form of a watertight pan, not less than 3/8” deep to contain spillage with a 6” wide safety ledge across the front edge. Top shall be manufactured at the same manufacturing location as the fume hood to assure proper cutout alignment and coordinated shipping. A cup drain flush with the recessed worksurface shall be provided. The worksurface and cup drain shall be available in either black or gray.

H. Steel cabinets and pilaster. Model G08M372215

2.4 MATERIALS

A. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, stretcher-leveled standard of flatness.

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

1. Physical Properties:

a. Flexural Strength: Not less than 10,000 psi.
b. Modulus of Elasticity: Not less than 2,000,000 psi.

c. Hardness (Rockwell M): Not less than 100.
d. Water Absorption (24 Hours): Not more than 0.02 percent.
e. Heat Distortion Point: Not less than 260 deg F.
f. Flame-Spread Index: 25 or less according to ASTM E 84.

2. Chemical Resistance: As follows 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), dimethylformamide, 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).

C. Glass: Clear, laminated tempered glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.

1. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
2. Permanently mark safety glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

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

2.5 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 door opening.

B. Stainless-Steel Exterior: Fabricate from stainless-steel sheet, 0.050 inch 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.

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: Stainless steel, not less than 0.050 inch thick with epoxy coating.

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. 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. Stainless-Steel Lining Assembly: Welded unit consisting of end panels, back panel, top, and work top; reinforced to form a rigid assembly to which exterior is attached.

H. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom. 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.

I. 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, unless otherwise indicated.

J. Bypass Grilles: Provide grilles at bypass openings of fume hoods.

K. Sashes: Provide operable sashes of type indicated.

1. Fabricate from 0.050-inch-thick 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. Glaze with laminated safety glass.
3. 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.

L. 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 coated with polytetrafluoroethylene or polyvinylidene fluoride.

M. Light Fixtures: Provide vapor-proof, two-tube, rapid-start, fluorescent light fixtures, of longest practicable length; complete with tubes at each fume hood. Shield tubes from hood interior with 1/4-inch-thick laminated glass or 3-mm-thick tempered glass, sealed into hood with chemical-resistant rubber gaskets. Provide units with fluorescent tubes easily replaceable from outside of fume hood.

1. Provide fluorescent tubes with color temperature of 3500 K and minimum color-rendering index of 85.

N. Filler Strips: Provide as needed to close spaces between fume hoods and adjacent building construction. Fabricate from same material and with same finish as fume hoods.

O. Ceiling Extensions: Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling.

P. Finished Back Panels: Where rear surfaces of fume hoods are exposed to view, provide finished back panels matching rest of fume hood enclosure.

Q. Comply with requirements in other Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring. Install according to Shop Drawings. Securely anchor fittings, piping, and conduit to fume hoods unless otherwise indicated.

2.6 CHEMICAL-RESISTANT FINISH

A. General: Prepare, treat, and finish welded assemblies after welding. Prepare, treat, and finish components that are to be assembled with mechanical fasteners before assembling. Prepare, treat, and finish concealed surfaces same as exposed surfaces.

B. 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.

2.7 ACCESSORIES

A. Airflow Indicator and Alarm: Provide each fume hood with manufacturer's standard airflow indicator with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

B. Airflow Indicator: Provide each fume hood with airflow indicator of one of the following type(s):

1. Indicator Type: Direct-reading aneroid (Magnehelic-type) gage that measures exhaust duct static pressure of fume hood as an indication of airflow.
2. Indicator Type: Thermal anemometer that measures fume hood face velocity and indicates whether it is below normal, normal, or above normal.
3. Indicator Type: Thermal anemometer that measures fume hood face velocity and displays data as digital readout.

C. Airflow Alarm: Provide fume hoods with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

1. Provide with thermal-anemometer or aneroid (Magnehelic-type) gage airflow sensor.
2. Provide with reset and test switches.
3. Provide with switch that silences audible alarm and automatically resets when airflow returns to within preset range.

D. Sash Alarm: Provide fume hoods with audible and visual alarm that activates when sash is opened beyond preset position.

1. Provide with silence and test switches.

E. Sash Stops: Provide fume hoods with sash stops to limit hood opening to 50 percent of sash height. Sash stops can be manually released to open sash fully for cleaning fume hood and for placing large apparatus within fume hood.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fume hoods according to manufacturer's written instructions.

B. 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.

C. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

3.3 FIELD QUALITY CONTROL

A. Field test installed fume hoods according to ASHRAE 110 as modified in "Performance Requirements" Article 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.
2. After making corrections, retest fume hoods that failed to perform as specified.

3.4 ADJUSTING AND CLEANING

A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.

B. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by the Project Manager.

END OF SECTION

DESIGN CONSULTANT USE ONLY:
___ Check Not Attached - Not Accepted
___ Accepted
_X_ Accepted as Noted
___ Not Accepted
___ Received Past Time Period Allowed by Public Contract Code #3400.

Per Addendum #2, the skylight has dimming controls in Prep Room 104 & 107, make sure to include dimming controls in substitution.

By RG - SKW Architects Date 05.04.2018
Remarks

VELUX®
Substitution Request Form

Project: SCUSD West Campus HS
Science & Technology Building

Section Number: 08625 – Tubular Daylighting Devices
From: Candice Clark, LEED GA, CSI

To: Chris Garcia
Date: 4/24/2018

Re: VELUX TCC &TCM Substitution request. Room 104& 107, and Restrooms and Locker Rooms

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Manufacturer: VELUX America, Inc., 450 Old Brickyard Rd, Greenwood, SC 29648-5001
Phone: 1 - 800 – 888 – 3589 Website: www.VELUXusa.com

VELUX is a global company founded on a vision of daylight, fresh air, and quality of life – and these benefits are enjoyed in millions of homes and commercial buildings around the world. VELUX is one of the strongest brands in the global building materials sector and VELUX products are sold in most parts of the world. The Group has more than 10,000 employees.

Today, more than seventy-seven years after the first VELUX roof window was installed in a Danish school, our vision has evolved to include more daylighting products like the VELUX SUN TUNNEL Skylight. VELUX has been manufacturing skylights and roof windows since 1941 and tubular daylighting devices since November 14, 1995.

Project Summary:

The SCUSD STEM Project utilizes TDD's as they are meant to be used. There is a blend of product configurations to meet the unique needs of the space. Below is an outline of what is specified and the direct translation from Solatube to Velux as equal parts and performance.

- ROOM 104 and 107:

  Total 2) 21-22" dia. system, with a curb cap for a curb, tubing, and termination in a gyp ceiling with a Fresnel diffuser.

  Velux Model: TCC-22-TTC equal to the Solatube Model: 330DS-C* not listed in specification, but intended, per details.

- Restrooms and Locker Rooms:

  Total 6) 14" dia. system, with a pan flashing for install as an over under on a metal roof, tubing, and termination in a gyp ceiling with a Fresnel diffuser

  Velux Model: TMC-14-THC equal to the Solatube Model: 290DS * per spec and details

Deviations from Specified item:

Substitution Request Form

1. The VELUX Commercial SUN TUNNEL Skylight offers no undesirable product deviations from the category of skylights specified. The VELUX curb mount flashing is available for 14" and 22" diameter tunnel sizes. The only consideration is the outside dimensions of the TCC 022 flashing are 31" x 31", compared to 27" x 27" for the Solatube flashing.
2. Options for aesthetics: For rooms 104 & 107, (gypsum ceiling) there is an option in the Velux line to meet the spec of the 2x2 diffuser and transition box (Velux code TTC). Or we can offer a easier installed diffuser for gypsum that is circular with trim (22" dia) and will not have a transition box (Velux Code THC).

VELUX offers similar features and benefits that compare well to the proprietary information listed in the specifications. In addition, VELUX design layout, daylight analysis, and rendering are available by request. In order to complete this request, drawings and/or building description documents need to be sent to the VELUX SUN TUNNEL Product Manager, Bruce Mosher. His email address is Bruce.Mosher@VELUX.com. Yet from my experience at a 40 degree latitude, I have only ever noticed a 1-2 foot candle difference between the products. This is minimal in the scope projects design.

The following products are recommended because of their superior light capturing ability, high performance ratings, and excellent distribution of daylight.

VELUX TCC 022 – Curb mount flashing with pivoting tunnel system, condensation management, transparent acrylic or polycarbonate tall dome, light capturing VELUX SunCurve, engineered light transferring tunnel sections made from ultra high quality 99.9% reflective silver layer for the transfer of the whitest and brightest light. This super reflective layer uses a protection layer that ensures a +98% total reflectance for the next 20 years and comes with a 20 year tunnel reflectivity warranty. The light is diffused throughout the occupied space by means of the diffuser options described below.

VELUX TMC 014 – Recommended for all sloped roof exposures up to 60 degrees. The dome and tunnel opening face upward to minimize the light gathering variations caused by changing roof orientations. The daylight system consist of a one piece pan flashing with pivoting tunnel system, condensation management system, transparent acrylic or polycarbonate dome, engineered light transferring tunnel sections made from ultra-high quality 99.9% reflective silver layer to ensure the transfer of the whitest and brightest light. This super reflective layer uses a protection layer that ensures a +98% total reflectance for the next 20 years and comes with a 20 year tunnel reflectivity warranty. The light is diffused throughout the occupied space by means of the diffuser options described below.

Many other accessories are available for both sizes to increase the performance and simplify the installation:

Tunnel Options

1. VELUX ZTR –24" long reflective tunnel extensions configured to meet the needs of the project. Tunnel components come with the Flexi-Loc™ tunnel connection system to ensure ease of installation, maximum light output, and provide labor savings for the project.
2. Diffusion enhancing accessories

Diffuser Options

1. Style matching Rooms 104/107 "TTC" 22" round to 24" square diffuser assembly for suspended (tile) ceiling applications with a choice of frosted, prismatic, or a Fresnel diffuser. Available in reflective white acrylic or in a plenum rated material. This is Solatube's only style for this size. Velux has the option for a round with trim (THC) or square (TTC) design solution, since the ceiling is gypsum. The Diffuser material Fresnel, which is equal to Solatube's branded Fresnel Diffuser – Optiview.
2. Style matching spec in Restrooms and Locker rooms, and option for Rooms 104/107: "THC" round thermally efficient double diffuser system for hard ceiling applications, available with a frosted, prismatic, or Fresnel outer diffuser layer. The Diffuser material is Fresnel, which is equal to Solatube's branded Fresnel Diffuser – Optiview.
3.

Energy Efficiency Options (omitted, not in Spec, or Details)

A. Reason for the substitution

To provide an equivalent product at a lower installed cost and one with a tunnel warranty superior to the one specified. VELUX is the world leader in daylighting solutions.

The VELUX SunCurve (for the TCC 022 & TMC 14) The tunnel used by VELUX is not negatively affected by UV radiation and comes with a 20 year warranty to support this claim. VELUX tunnel reflectivity values and color performance testing is based on applied application specific tunnel performance measurements. VELUX offers a pivoting tunnel system, elbows, and Flexi Loc connector systems that increase the ease of installation and increase the amount of light captured and transferred to maximize light output performance.

VELUX has a full line of accessories to support virtually any application, and certainly for those in the current project.

B. Does substitution affect indicated dimensions or details?

Only minor changes in rough opening sizes will be experienced based on the flashing option chosen. The VELUX TCC 022 curb mount flashing is 31" x 31", the outside curb dimensions with flashing and roofing material should be 30 1/2" x 30 1/2

The nominal tunnel diameter for the VELUX product is 22" and the nominal tunnel diameter for the Solatube product is 21"

The 21" Solatube curb mount flashing is 27" x 27"

C. Compare significant qualities of proposed substitution with work or product originally specified or indicated.

VELUX offers an equivalent product with highly transmissive domes on the 22" size to capture the light, a highly reflective tunnel with an exceptional warranty to transfer the light, and choice of diffuser assemblies and diffuser options to fit any project. The VELUX Flexi-Loc™ tunnel connection system can save 50% of the time required to assemble the tunnel sections when compared to conventional mechanical screw type fastening system. This will help keep the project under budget.

D. State effect substitution will have on work schedule.

The standard components should not change work schedules. VELUX products ship within two days.

E. Statement from proposed manufacturer indicating products, materials, or assemblies in substitution do not contain asbestos, or polychlorinated biphenyl (PCB) in any form.

VELUX products and/or packaging's do not contain asbestos or polychlorinated biphenyl (PCB) in any form.

F. Manufacturer's Warranties of proposed and specified items

VELUX warranty:

Ten (10) years from the date of purchase, VELUX warrants product will be free from defects in material and workmanship. The reflectivity of the tunnel has a 20 year warranty that the reflection enhanced material will be free from defects in material and workmanship and correspond to the agreed materials properties.

VELUX warranty link –
http://dd1.domwebx.com/inet/literature.nsf/vcurrlitbyalias/NEWProductWarrantyA21/$file/X20194-0311-Product%20Warranty.pdf

Solatube warranty link –
http://www.solatube.com/residential/customer-service/registration.php

G. Performance test results

1. Air infiltration when tested in accordance with ASTM E 283: 0.3 cfm per square foot maximum for any diffuser assembly.

2. Water test when tested in accordance with ASTM E 331, no uncontrolled water leakage at 15 psf pressure differential and 5 gal/min water.

3. Per WDMA Hallmark Certificates of Conformance and License (CCL), uniform load testing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 (uniform load test for 2012 and 2015 IBC code requirements performance grade:
   - for the TCC 014: TDDCC/TDDOC-PG145, Design Pressure (DP): +300/-145 psf
   - for the TCC 022: TDDCC/TDDOC-PG130, Design Pressure (DP): +300/-130 psf

4. Wind-borne debris resistance: Missile level C, Wind Zone 3 requirements, and +50/-50 psf cycle pressure minimum, when the polycarbonate dome is ordered.

5. Class B burning brand test passed when evaluated in accordance with ASTM E 108 Standard Test Methods for Fire Tests of Roof Coverings. Acrylic dome and optional dome edge protection (ZZZ 192) was used in the tests and is needed to meet the fire rating.

6. Acrylic dome has CC2 ratings based on a linear burning rate of 33 mm/min., and self-ignition temperature greater than 842°F (against a 650°F requirement).

7. Polycarbonate dome has CC1 ratings because it does not ignite during the rate of burn testing, and self-ignition temperatures greater than 900°F .

8. NFRC Thermal Testing, Note: considerations should be made to add energy efficient accessories Velux- ZTC . Solatube should be instructed to add the TIP for an apples to apples component review. The specification and component details did not call for thermal enhancements.

   a. TCC-22-TTC/THC – rigid

CPD #	Manufacturer Product Code	U-factor	SHGC	VT
VEL-N-26-00003-00001	With Diffuser: TOC 022 000* (*denotes 0| 2| or 3) + ZTC 022 0401US	0.40	0.27	0.42
VEL-N-26-00004-00001	With Diffuser: TOC 022 000* (*denotes 0| 2| or 3)	1.52	0.33	0.55
VEL-N-26-00005-00001	With Diffuser: TTC 022 000* (*denotes 0| 2| or 3) + ZTC 022 0401US	0.40	0.26	0.41
VEL-N-26-00006-00001	With Diffuser: TTC 022 000* (*denotes 0| 2| or 3)	1.46	0.33	0.53

   b. TMC-14- TTC/THC - rigid

CPD #	Manufacturer Product Code	U-factor	SHGC	VT
VEL-N-27-00002-00001	With Diffuser: TTC 014 000* (*denotes 0| 2| or 3) + ZTC 014 0401US	0.51	0.34	0.36
VEL-N-27-00003-00001	With Diffuser: TTC 014 000* (*denotes 0| 2| or 3)	2.00	0.61	0.52
VEL-N-27-00004-00001	With Diffuser: TOC 014 000* (*denotes 0| 2| or 3) + ZTC 014 0401US	0.50	0.33	0.33
VEL-N-27-00005-00001	With Diffuser: TOC 014 000* (*denotes 0| 2| or 3)	1.68	0.47	0.45

New

VELUX®
Skylights

Introducing

Commercial SUN TUNNEL™ skylights

Capturing daylight for the workplace

Why VELUX

VELUX is the world leader in skylights and roof windows and is one of the strongest brands in the global building materials sector. VELUX products are available nationwide. Our newest generation of SUN TUNNELS™ provide increased daylight, more light control, special functions and are easier to install.

Where to install VELUX commercial SUN TUNNELS™

VELUX Commercial SUN TUNNEL™ skylights are designed for flat or low slope commercial roofing applications that are above spaces that will benefit from daylight, thereby reducing energy loads and improving occupant's performance and comfort.

Ideal applications for commercial SUN TUNNEL™ skylights includes schools, retail spaces, and warehouses that require a cost effective daylight solution. The round, highly reflective light shaft requires less assembly time compared to previous commercial SUN TUNNEL skylights.

VELUX SUN TUNNEL skylights provide a cost effective method for transferring daylight through the roof. Cost savings can be achieved with open ceiling applications.

Take it from the top... VELUX SunCurve

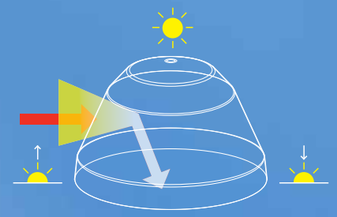
22″
559 mm

This highly transmissive light capturing VELUX SunCurve comes standard on every 22″ commercial SUN TUNNEL™ skylight.

- Designed to capture sunrays that would normally pass through the dome, and instead directs them down the tunnel.

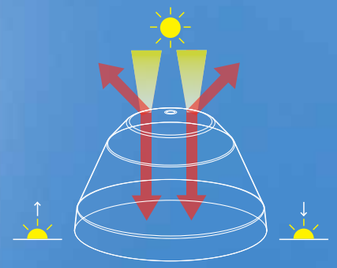
22″ kit includes outer dome and VELUX SunCurve

What makes the VELUX SunCurve better?



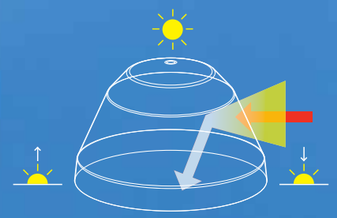
Morning light

Captures low-angle sunlight and curves it down the tunnel.



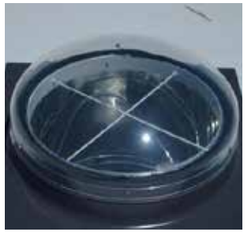
Mid-Day light

Manage the intense, direct mid-day sun so that the space below is bright and confortable without glare.



Afternoon light

Captures low-angle sunlight and curves it down the tunnel.



Maximum security kit *(ZTQ)*
Crossing steel bars and security screws for both the dome and curb flashing.
Available for 14" and 22"

Diffusion enhancer *(ZTZ 209)*
Increase the diffusion capabilities of your VELUX SUN TUNNEL.

Turret Extender *(ZTA)*
Flashing extender to raise the edge of the dome for increased protection and better performance in flat roof applications.

Exterior fire band *(ZZZ 192)*
Fire band provides dome edge protection needed for installation on roof assemblies with fire classifications of A, B or C.

Insulating pane - thermal break *(ZTC)*
Insulating pane and thermal break that is designed to go in line with the buildings insulation in commercial applications.

Daylight controller *(ZTP)*
Allows the user to control the amount of daylight that enters a room and is perfect for rooms that require room darkening. Requires a 24 DC power supply (VELUX KES 160).

24" rigid tunnel sections *(ZTR)*
Tunnel sections manufactured with the Flexi Loc™ tunnel connector system that reduces tunnel installation time in half and delivers the highest quality daylight into the spaces below.

Universal 45° elbows *(ZTE 0000)*
A durable and easy to operate elbow that can be used at the top, bottom, or middle of your installation.

Rotating coupler *(ZTZ 211)*
Multiple elbows can be joined together with rotating couplers to form a 90 degree bend or any configuration needed to maneuver around in tight spaces.

From point A to point B

Flexi Loc™ quick assembly system

A tunnel connection system that reduces tunnel installation time in half. With our unique Flexi Loc™ system, screws are a thing of the past. Use this unique clip system to piece your elbows, tunnel sections and other rigid tunnel components together quicker.

Highly reflective silver tunnel

All VELUX SUN TUNNEL skylights feature a highly reflective silver layer that is electrostatically applied.

- Creates an ultra smooth highly, reflective surface
- Greater than 98% total reflectivity (99.9% on silver layer)

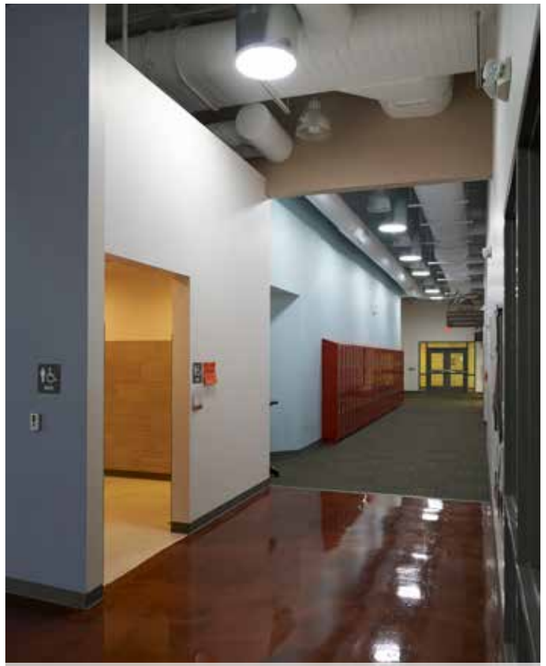
20-year rigid tunnel reflective warranty

Diffuser options

Choose from a variety of ceiling options to meet all of your application needs.
Available in 14" and 22"

Hard ceiling

Suspended ceiling



Open ceiling

Diffuser materials

Frosted diffuser
Frosted diffusers offer a combination of performance and aesthetics.

Prismatic diffuser
The industry standard prismatic diffusers provide good light distribution with the look and feel to match existing architectural design.

Fresnel diffuser
Fresnel diffusers utilize a concentric honeycomb pattern of parabolic prisms provide superior light diffusion.

Flashing types

Choose the right flashing type for your installation from the choices below:

Flat roof application: Self flashed mount model TGC

- Lower profile dome
- Low profile pan flashing
- Flexi Loc™ tunnel system
- Upper collar 16"
- Roof pitch 0° - 60°

Flat roof application: Curb mount flashing model TCC

- Lower Profile dome
- Low profile curb mount flashing
- Flexi Loc™ tunnel system
- Upper collar 16"
- Roof pitch 0° - 60°

Pitched roof application: Model TMC

- Lower profile dome
- 20° Pitched pan flashing
- Flexi Loc™ tunnel system
- Upper collar 16"
- Roof pitch 0° - 60°

VELUX SUN TUNNEL™ skylights are designed to fit all your installation needs.

Flat roof application: Self flashed mount model TGC

- High profile SunCurve
- Low profile pan flashing
- Flexi Loc™ tunnel system
- Upper collar 16"
- Roof pitch 0° - 60°

Flat roof application: Curb mount flashing model TCC

- High profile SunCurve
- Low profile curb mount flashing
- Flexi Loc™ tunnel system
- Upper collar 16"
- Roof pitch 0° - 60°

Two ways to order

Option 1: Time-saving and easy-to-order configurable kits

- Designed to accomodate most applications
- Please call 1-888-878-3589 for customized configurations

Step 1: Choose your size and flashing type

14″ 356 mm

Self (TGC)

Curb (TCC)

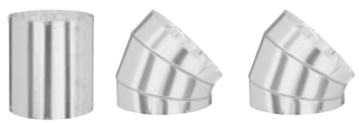
22″ 559 mm

Self (TGC)

Curb (TCC)

Pitched (TMC)

Step 2: Tunnel options



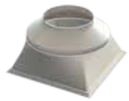
Tunnel kit (TTK) – Tunnel and (2) 45° elbows

or

Tunnel extensions (ZTR)

Step 3: Choose your diffuser type and diffuser material

Hard ceiling (THC)



Suspended ceiling (TTC)

Open ceiling (TOC)

Frosted

Prismatic

Fresnel

Please see price list for other accessories to help customize your commercial SUN TUNNEL skylight needs.

New

Option 2: Bulk purchasing program for SUN TUNNEL™ skylights is available

- Please call 1-888-878-3589 for pricing and product availability
- Purchase VELUX SUN TUNNEL components in bulk quantities for additional savings

VELUX America Inc.
450 Old Brickyard Road
PO Box 5001
Greenwood, SC 29648-5001
Tel 1-888-878-3589
Fax 1-864-943-2631
veluxusa.com

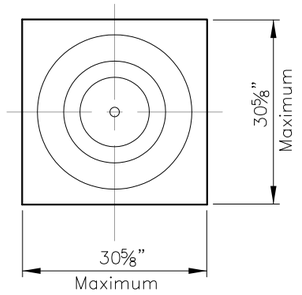
www.facebook.com/veluxamerica
www.twitter.com/veluxamerica
www.youtube.com/veluxusa

Bringing light to life™

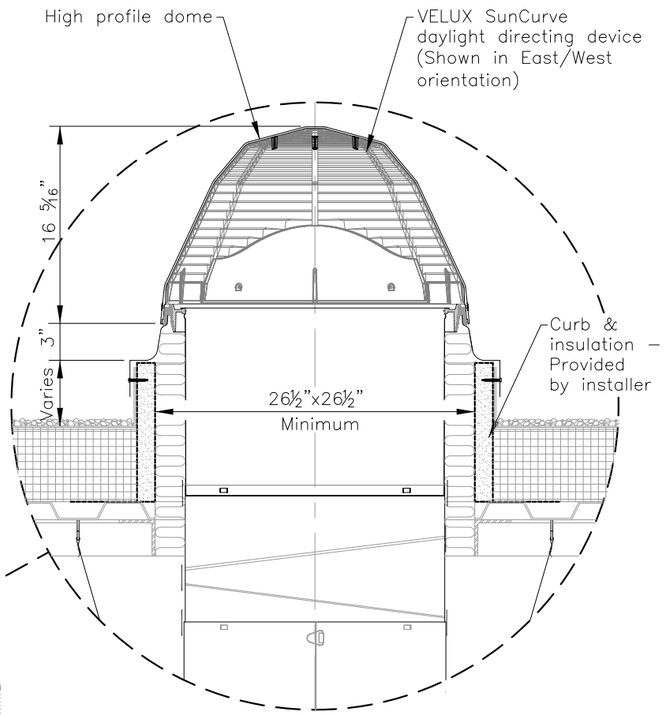
VELUX®

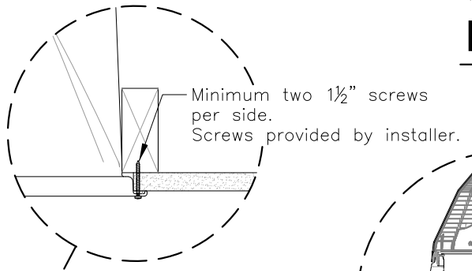
General Notes

1. This drawing emphasizes the TCC curb flashed VELUX SUN TUNNEL Skylight. It illustrates a general arrangement layout (plus recommendations) for a VELUX TCC installation in a 0–60 degree roof pitch application utilizing a finished (gypsum board) ceiling installation.
2. The architectural/structural design and specifications for the inclusion of a tubular daylighting device, such as the VELUX TCC, in any roofing/ceiling application is determined and provided by others. The design criteria includes, but is not limited to design loads, structural configurations, structural framing member sizes and material, architectural finishes and integration with the roofing/ceiling systems of the building. VELUX assumes no responsibility or liability in the design, construction and performance of a building structure by others.
3. Secure eye screws/bolts to the roofing structure and attach suspension wire to connect to clips at end of tunnel section.
4. Secure suspension wires to the ceiling adaptor assembly & eyebolts.
5. Dimensions shown are nominal, unless indicated otherwise.
6. Product specific dimensions are referenced in the TCC Product Data Sheet documentation.



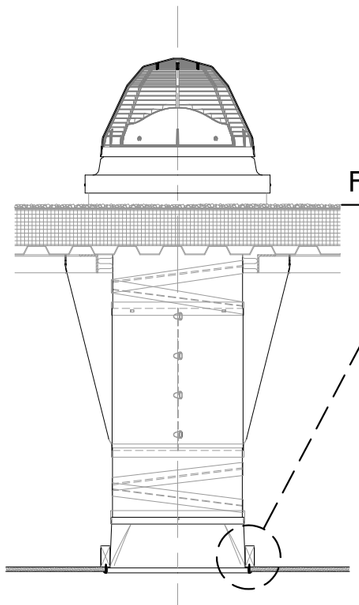
Plan



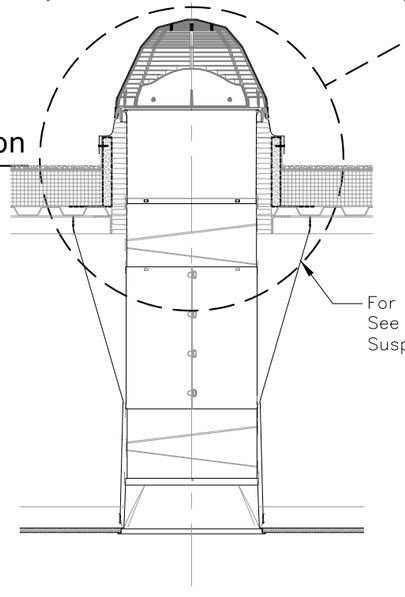


Finished Ceiling Installation

4:1



Elevation



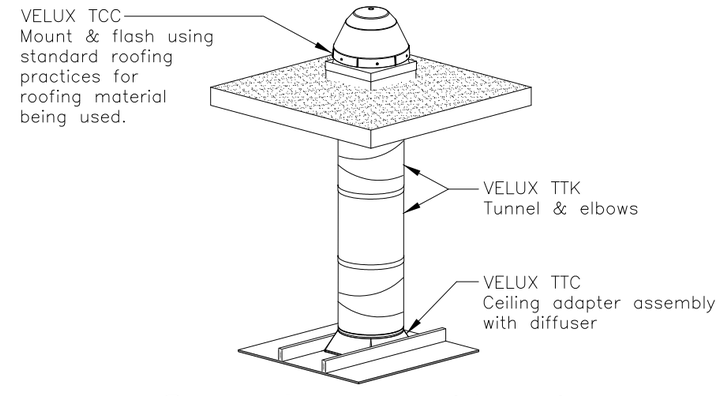
Cross Section

2:1

For suspension wire installation, See General Notes and SUN TUNNEL Suspension Wire Installation Instructions (ZTZ 203)

TCC 022 Components	Quantity
TCC 022 3000 • Acrylic Dome • VELUX SunCurve daylight directing device • Counter flashing assembly • Top collar (16"/.41m) • Hardware bag • Option • TCC 022 5000 – Impact Polycarbonate dome	____
TTK 022 • 24"/.61m Rigid tunnel • (2) 16"/.41m Rigid elbows • Tape for tunnel joints • Hardware bag	____

TTC 022 0002
• Ceiling adapter assembly with prismatic diffuser
• Tape for tunnel joints
• Gasket material for diffuser
• Hardware bag
• Suspension wire
• Options
  • TTC 022 0001 – Frosted diffuser
  • TTC 022 0003 – Fresnel diffuser
	____



General Arrangement Layout

VELUX
Sky–Product Management

VELUX
1418 Evans Pond Road
Greenwood, SC 29649
1–800–88–VELUX
www.VELUXUSA.com

	Name	Date
Drawn by	JDH	Feb 2014
Checked by	JL,CJ	Feb 2014

Drawing No.

Commercial SUN TUNNEL Skylight
TCC 022 w/ TTK 022, TTC 022
(TCC 022 3002TT/TCC 022 5002TT)

TCC 022–04A–0214

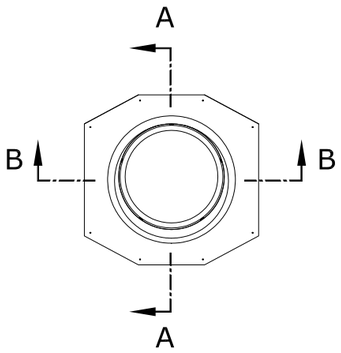
General Notes

1. This drawing emphasizes the TMC pitched flashing VELUX SUN TUNNEL Skylight. It illustrates a general arrangement layout (plus recommendations) for a VELUX TMC installation in a 14–45 degree roof pitch application utilizing either a suspended acoustical tile or grid ceiling installation.

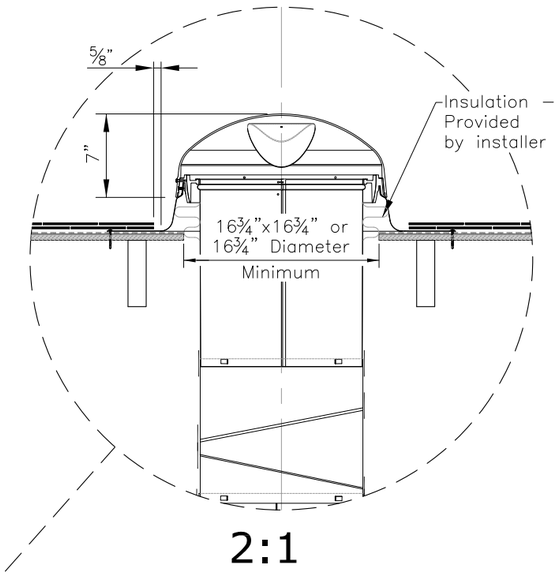
2. The architectural/structural design and specifications for the inclusion of a tubular daylighting device, such as the VELUX TMC, in any roofing/ceiling application is determined and provided by others. The design criteria includes, but is not limited to design loads, structural configurations, structural framing member sizes and material , architectural finishes and integration with the roofing/ceiling systems of the building. VELUX assumes no responsibility or liability in the design, construction and performance of a building structure by others.

3. Dimensions shown are nominal, unless indicated otherwise.

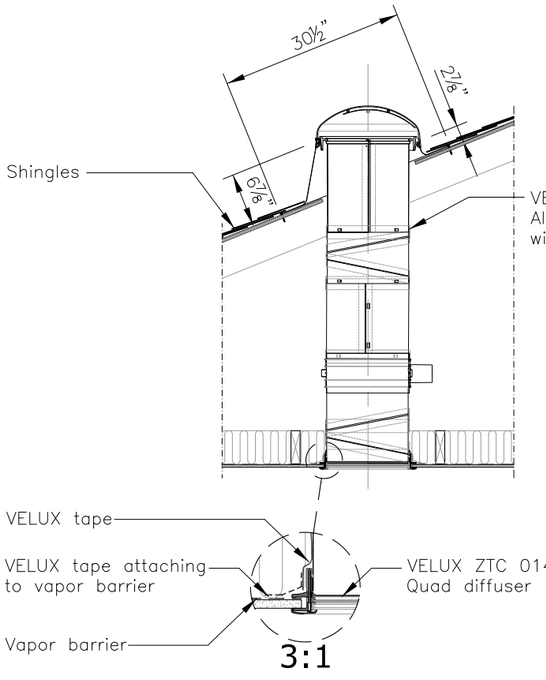
4. Product specific dimensions are referenced in the TMC Product Data Sheet documentation.



Plan

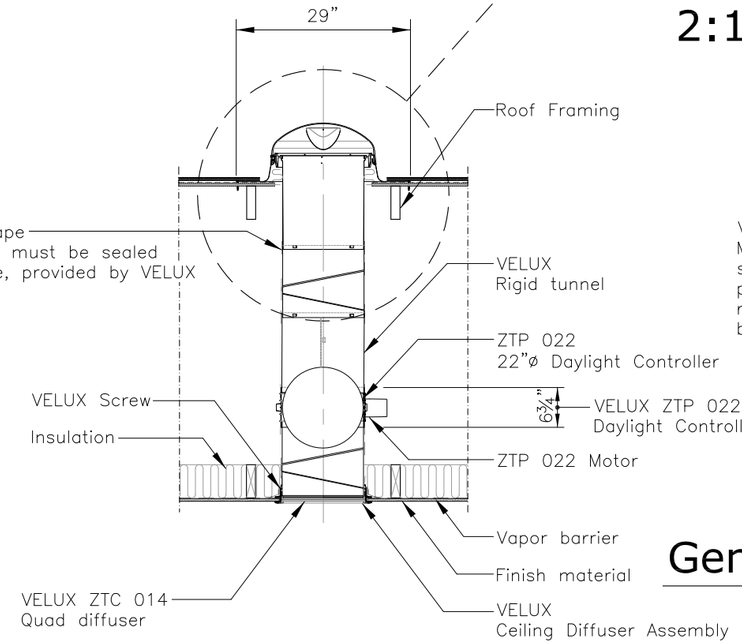


2:1

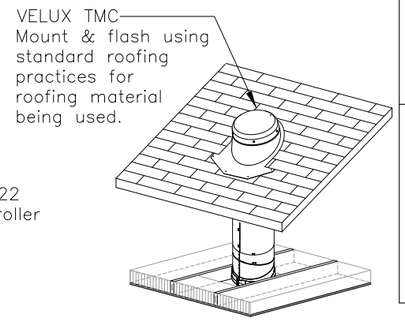


3:1

Section A-A



Section B-B



General Arrangement Layout

14°-45°

TMC 014 Components	Quantity
TMC 014 0000 • Acrylic Dome • Counter flashing assembly • Top collar (16"/.41m) • Hardware bag • Option • TMC 014 1000 – Impact Polycarbonate dome	____
TTK 014 • 24"/.61m Rigid tunnel • (2) 12"/.30m Rigid elbows • Tape for tunnel joints • Hardware bag	____

THC 014 0002
• Ceiling ring assembly with prismatic diffuser
• Tape for tunnel joints
• Gasket material for diffuser
• Hardware bag
• Options
  • THC 014 0001 – Frosted diffuser
  • THC 014 0003 – Fresnel diffuser
	____

ZTP 014 • Daylight Controller KES 160 Control System also required for control & power to ZTP 014	____
ZTC 014 0041US • Residential energy kit (Thermal plate & diffusing disc)	____
Option: ZTR 014 • ZTR 014 0002 24"/0.61m Rigid tunnel • ZTR 014 0004 48"/1.22m Rigid tunnel • ZTR 014 0006 72"/1.83m Rigid tunnel	____ ____ ____

VELUX
Sky–Product Management

VELUX
1418 Evans Pond Road
Greenwood, SC 29649
1–800–88–VELUX
www.VELUXUSA.com

	Name	Date
Drawn by	JDH	July 2014
Checked by	JL,CJ	July 2014
Drawing No.		

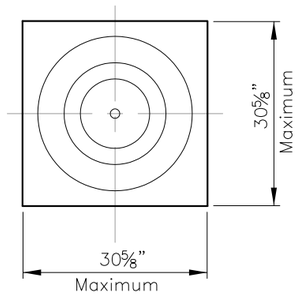
Commercial SUN TUNNEL Skylight
TMC 014 w/ TTK 014, THC 014, ZTP 014, ZTC 014
(TMC 014 0002TH/TMC 014 1002TH)

TMC 014–03–0714

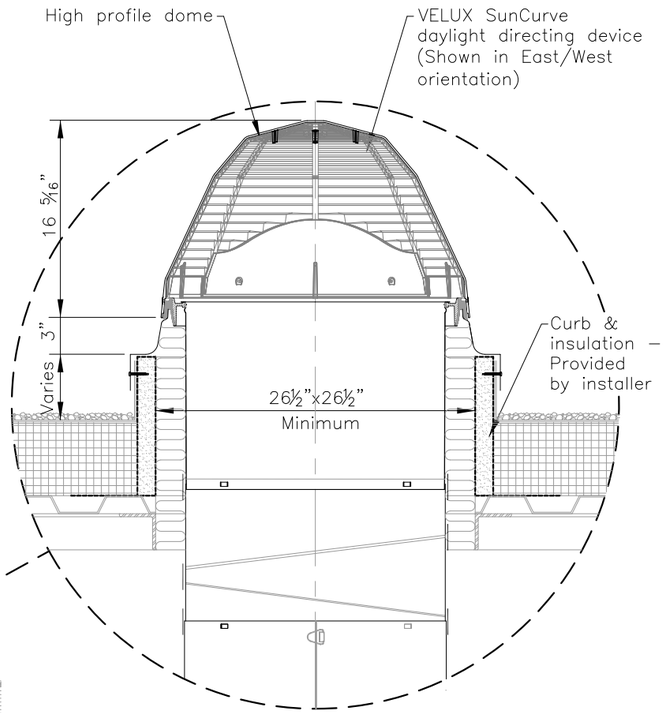
This drawing is an instrument of service and is provided for informational use only.

General Notes

1. This drawing emphasizes the TCC curb flashed VELUX SUN TUNNEL Skylight. It illustrates a general arrangement layout (plus recommendations) for a VELUX TCC installation in a 0–60 degree roof pitch application utilizing a finished (gypsum board) ceiling installation.
2. The architectural/structural design and specifications for the inclusion of a tubular daylighting device, such as the VELUX TCC, in any roofing/ceiling application is determined and provided by others. The design criteria includes, but is not limited to design loads, structural configurations, structural framing member sizes and material, architectural finishes and integration with the roofing/ceiling systems of the building. VELUX assumes no responsibility or liability in the design, construction and performance of a building structure by others.
3. Dimensions shown are nominal, unless indicated otherwise.
4. Product specific dimensions are referenced in the TCC Product Data Sheet documentation.



Plan



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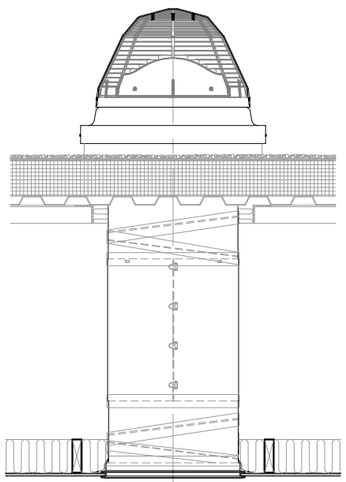
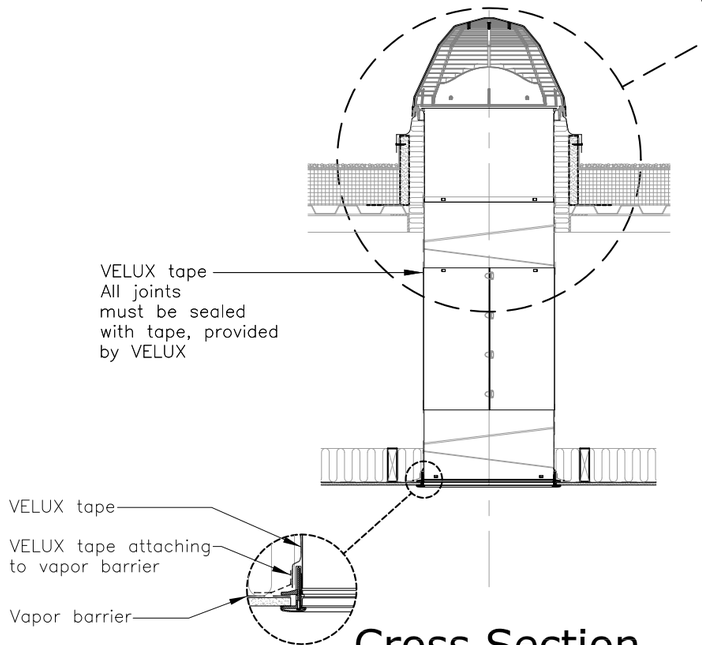


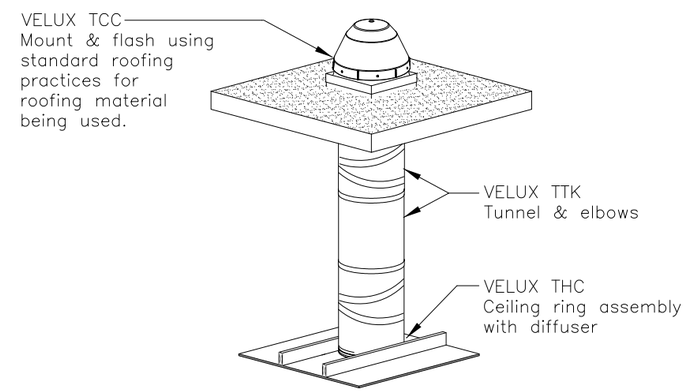
Elevation



Cross Section

TCC 022 Components	Quantity
TCC 022 3000 • Acrylic Dome • VELUX SunCurve daylight directing device • Counter flashing assembly • Top collar (16"/.41m) • Hardware bag • Option • TCC 022 5000 – Impact Polycarbonate dome	____
TTK 022 • 24"/.61m Rigid tunnel • (2) 16"/.41m Rigid elbows • Tape for tunnel joints • Hardware bag	____

THC 022 0002
• Ceiling ring assembly with prismatic diffuser
• Tape for tunnel joints
• Gasket material for diffuser
• Hardware bag
• Options
  • THC 022 0001 – Frosted diffuser
  • THC 022 0003 – Fresnel diffuser
	____



General Arrangement Layout

VELUX
Sky–Product Management
VELUX
1418 Evans Pond Road
Greenwood, SC 29649
1–800–88–VELUX
www.VELUXUSA.com

	Name	Date
Drawn by	JDH	Feb 2014
Checked by	JL,CJ	Feb 2014
Drawing No.		

Commercial SUN TUNNEL Skylight
TCC 022 w/ TTK 022, THC 022
(TCC 022 3002TH/TCC 022 5002TH)

TCC 022–07–0214

SUBSTITUTION REQUEST FORM **Section 01 62 01**

To: STAFFORD, KING AND WIESE

Project: West Campus High School
Science & Technology Building, Inc. 2

Date Received: 4/20/18

Specification Section Number and paragraph: GLASS WALLED FUME HOODS 115313

Drawing and details affected: 2 ON A6.1

Proposed Substitution:
Manufacturer INSTITUTIONAL CASEWORK (JAMESTOWN ICI) EXPLORER SERIES
Product (model, pattern, etc.):

WHY IS SUBSTITUTION BEING SUBMITTED ? (Select **all that apply** of the following):
[X] Pre-Bid Substitution (Prior Approval) Bid Date:
[ ] Post-Bid Substitution
[ ] Specified product is not available. Explain.
[ ] Cost savings to Owner. Indicate comparative cost analysis.
[X] Other. Explain. Fume hoods and casework would be provided by the same manufacturer.

EFFECTS OF PROPOSED SUBSTITUTION Answer the following questions and attach explanations.

Does substitution affect dimensions indicated on Drawings?
(NO) (YES, explain)

Does substitution affect Work of other Sections?
(NO) (YES, explain)

Does substitution require modifications to design, changes to Drawings, or revisions to specifications to be incorporated into the Project?
(NO) (YES, explain)

Attach list of at least 3 projects where proposed substitution has been used within past 12 months include name, address, and telephone number of Owner and Architect.

CONTRACTOR'S / BIDDER'S REPRESENTATION
Undersigned accepts responsibility for coordination of proposed substitution and accepts all additional costs resulting from the incorporation of proposed substitution into the Project per Section 01 62 00.

SUBMITTED BY:

PAULA MARTIN
DOW DIVERSIFIED, INC.

Subcontractor's signature and date:

Contractor's signature and date:

For Architect's use:
Accepted [ ] Not Accepted [X]
No Action Required [ ]
Submission: Incomplete [ ]
Too Late [ ]
Reviewed by/date:
Comments: The manufacturer is accepted, but the model is not. The base cabinet and fume hood need to be ADA accessible.


FLAMMABLE
3
KEEP FIRE AWAY
CORROSIVE
8

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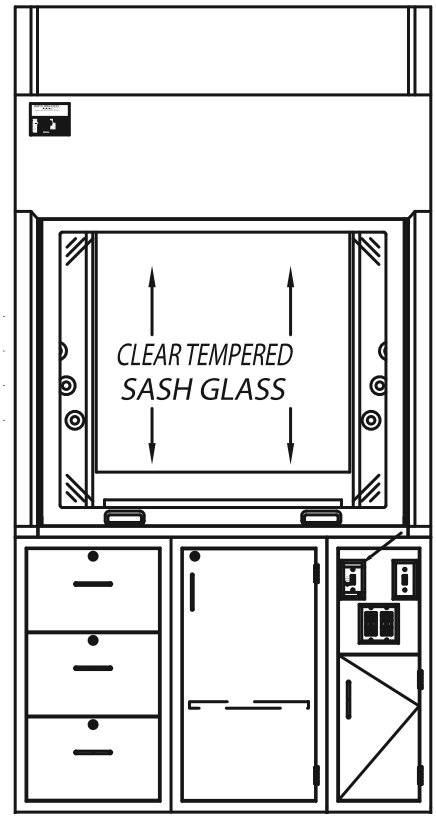
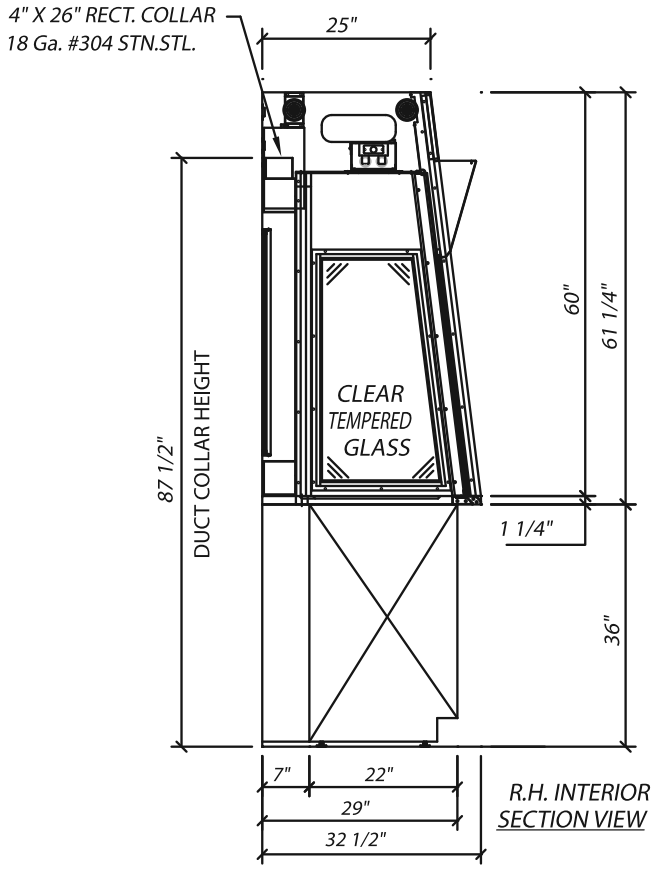
F-EXP Explorer Bench Hood – Framed Sash

The EXPLORER series of science fume hoods are designed to support a variety of research in University and K-12 environments. A basic module can be a stand alone unit with a poly-resin rear panel, or combined back-to-back with a glass back panel to create a see through condition. Glass side panels allow instructors to easily monitor activities within the fume hood. Electrical fixtures and Plumbing valves must be contained within the cabinet below.

- Unparalleled user safety
- Full hood access for easy set ups
- Years of maintenance free service
- Unmatched ease of use
- Unique design qualities for unlimited customization possibilities
- Field conversion between Constant Air Volume (CAV) and Variable Air Volume (VAV)
- Hoods available in “Knock Down” (KD) mode for transport and assembly in restricted areas



Note: Casework sold separately.



F-EXP Explorer Bench Hood – Features

- Unsurpassed containment (designed and tested to exceed ASHRAE 110-1995)
- Unique chain driven sash mechanism that comes with a lifetime warranty
- Galvanized Steel Pan Superstructure
- Transparent Viewpass bypass system
- Stainless steel air foil
- Aerodynamically designed Airplane wing style sash handle enhances the perimeter containment
- Vertical sashes provide the greatest hood interior access
- Full view sash with 33 3/4" opening
- Quality engineering ensures years of reliable service

F-K12 Series – Educational Hoods – Ordering Information

F-EXP Explorer Bench Hood Air Flow Data

Catalog Number	Duct Rectangular	33.75" Vertical Open @ 100 FPM	18" Vertical Open @ 100 FPM
F-EXP-48SIN	4" x 26"	1008 CFM @ .44 "SP	538 CFM @ .13 "SP
F-EXP-60SIN	4" x 30"	1289 CFM @ .48 "SP	688 CFM @ .14 "SP
F-EXP-72SIN	4" x 30"	1570 CFM @ .72 "SP	838 CFM @ .20 "SP

F-EXP Explorer Bench Hood Product Numbers

F-EXP-48SIN	48" Bench	Framed	
F-EXP-48DBL	48" Bench	Framed	Double sided
F-EXP-60SIN	60" Bench	Framed	
F-EXP-60DBL	60" Bench	Framed	Double sided
F-EXP-72SIN	72" Bench	Framed	
F-EXP-72DBL	48" Bench	Framed	Double sided

F-EXP Explorer Bench Hood Liner Options

White Polyglass is standard. Please see the Hood Liners section for available options.

F-EXP Explorer Bench Hood Electrical Options

Fascia is pre-punched with two electrical cutouts per side. The right fascia is pre-punched for a velocity alarm. Please see the Electrical Fixtures section for available options.

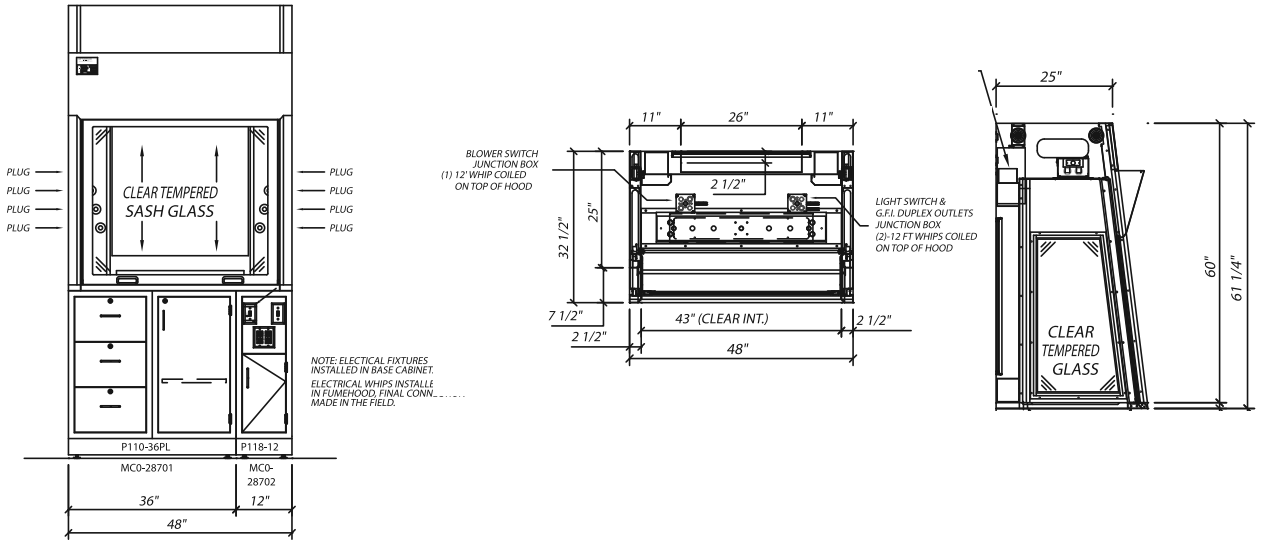
F-EXP Explorer Bench Hood Plumbing Fixtures

Fascia is pre-punched with five 3/4" dia. holes to accept rod driven remote fixtures (ten holes total). Please see the Plumbing Fixtures section for available options.

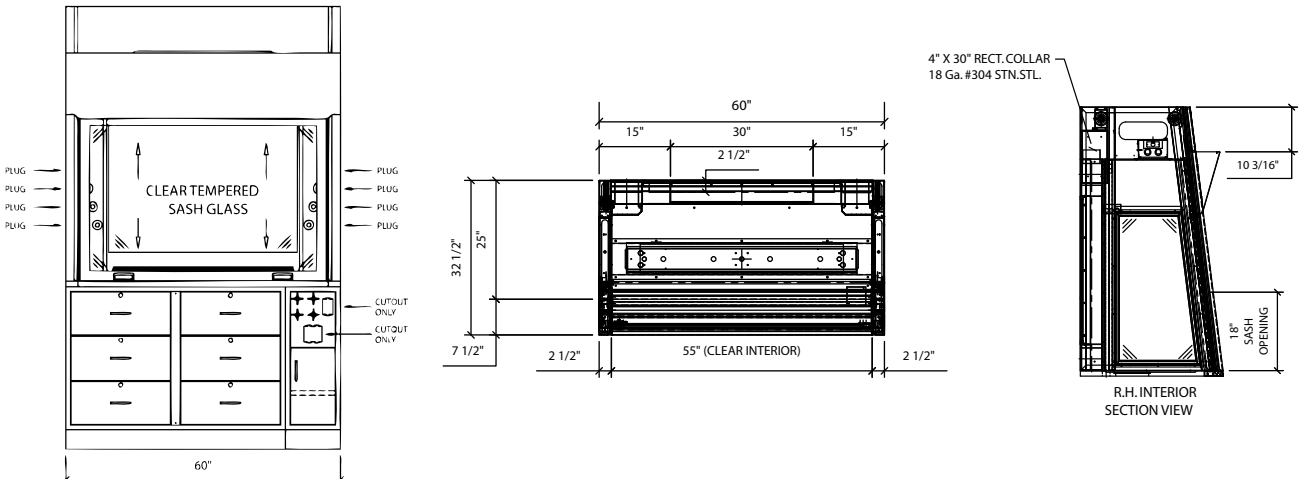
F-EXP Explorer Bench Hood Accessories

Please see the Fume Hood Accessories section for available options.

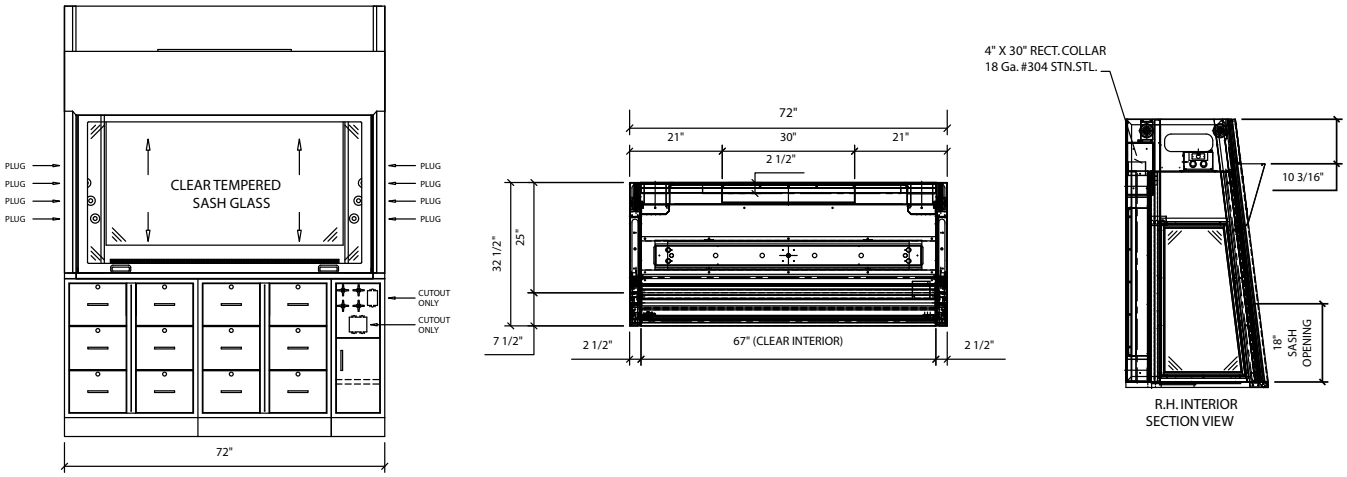
F-EXP-48SIN – 48" Explorer Bench Hood



F-EXP-60SIN – 60" Explorer Bench Hood

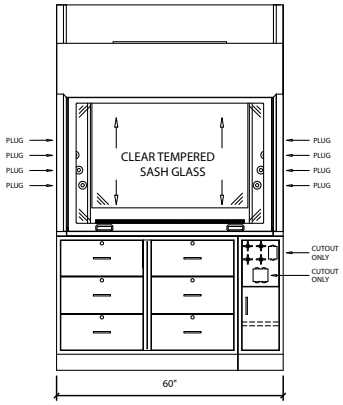


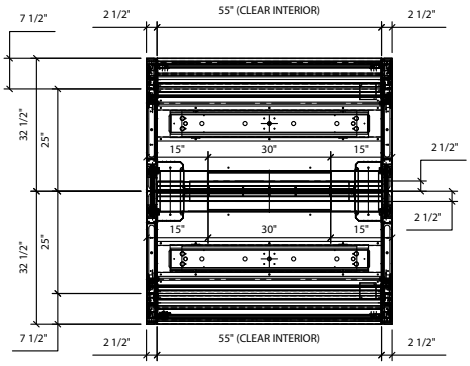
F-EXP-72SIN – 72" Explorer Bench Hood

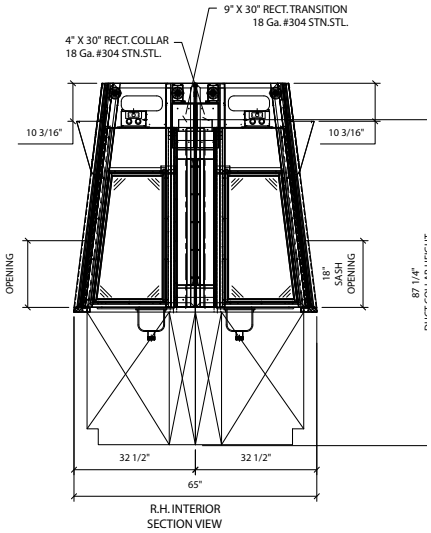


F-K12 Series – Educational Hoods – Product Dimensions

F-EXP-60DBL – 60" Explorer Double-Sided Bench Hood







SUBSTITUTION REQUEST FORM

TO: Roebbelen Contracting

CHECK APPROPRIATE LINE:

__x__ Substitution Request Prior to Bid (During Bid Period)
__x__ Product or System Substitution
_____ Design Change Substitution

_____ Substitution Request After Award of the Contract
_____ Product or System Substitution
_____ Design Change Substitution

The Contractor Awarded the Contract for this Project shall assign sequential Substitution Request # below.
Leave blank if submitted during the Bid Period.

SUBSTITUTION REQUEST #_____

WE HEREBY SUBMIT FOR YOUR CONSIDERATION THE FOLLOWING PRODUCT OR METHOD AS SUBSTITUTION FOR THE SPECIFIED OR DRAWING ITEM FOR THIS PROJECT:

PROJECT: West Campus High School

SPECIFIED ITEM: Kewaunee Scientific

115313	1	1.2.A	Fume Hood
Specification Section #	Page #	Paragraph #	Description

OR
DRAWING ITEM: _____

_____	_____	_____
Drawing #	Detail Cut #	Description

PROPOSED CREDIT IF ANY: Competitive Bidding

PROPOSED SUBSTITUTION:
_____ proposes to use Airmaster Systems for the fume hoods.

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents to which the proposed substitution will require for its proper installation.

The undersigned claimant certifies: (Modifications by the claimant to the following list is cause for automatic rejection without further review)

1. The proposed substitution does not affect dimensions shown on drawings or code requirements indicated.
2. The undersigned claimant shall compensate the Architect at a rate of an hour, two hour minimum for each review for investigation and comments whether or not the request is approved for changes required to the building design, including engineering design, detailing, and construction costs caused by the requested substitution. The Architect is herein defined as any of those firms or individuals listed by reference on the Drawings, including all Consultants identified herein.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. Attach information for a minimum of three projects where the substitution has been used locally within a 200 mile distance of this project, including names, addresses and telephone numbers of Owners who have accepted this product into their projects.
6. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality of proposed substitution and cost differential.
7. The undersigned claimant shall pay for any subsequent changes in incorporating the proposed substitution that were not apparent at the time of approval into the Work, including compensation to the Architect as described in item 2 above.

The undersigned Claimant(s) declares under penalty of perjury per the California Government Code Section 12650, et seq., that the claim of function, appearance and quality are equivalent or superior to the specified or drawing item, and further know and understand that submission for certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.

SUBMITTED BY CLAIMANT:

Signature _____
Firm Pacific Cabinets, Inc.

Address PO Box 81
Ferdinand, ID 83526
Date 4/26/18
Telephone 916-936-6092

ADDITIONAL CLAIMANT SIGNATURE REQUIRED:

The Contractor or Construction Manager if submitted after the Award:

Signature _____
Firm _____

DESIGN CONSULTANT USE ONLY:

___ Check Not Attached - Not Accepted
___ Accepted
_X_ Accepted as Noted
___ Not Accepted
___ Received Past Time Period Allowed by Public Contract Code #3400.

NOTE: Accepted as substituted fume hood meets the minimum criteria of the specification. However, this hood has a higher CFM requirement. A redesign of the ductwork and associated exhaust fans will be required to accommodate substituted hood. The cost for engineering and redesign and DSA approval will be the responsibility of the contractor.

By RG - SKW Architects Date 05.04.2018
Remarks _____

END OF SECTION

AIR MASTER SYSTEMS

Fume Hood Catalog

MADE IN THE USA

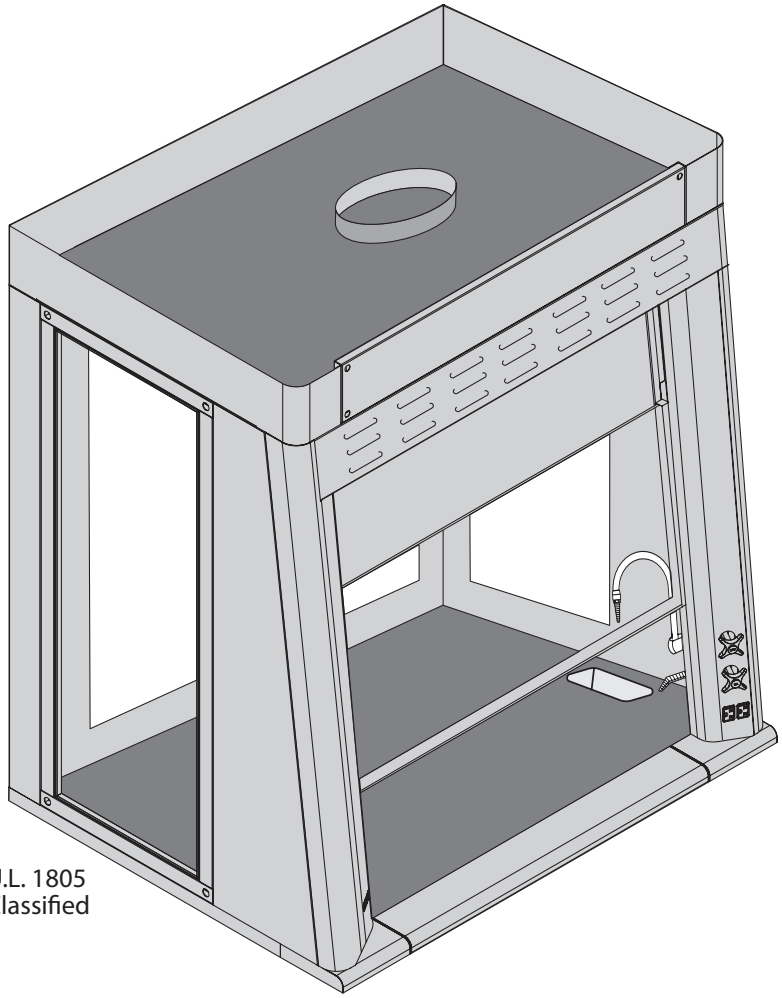
LISTED

SEFA

www.AirMasterSystems.com

6480 Norton Center Dr • Muskegon MI • 49441 • 231-798-1111 office • 231-798-4000 fax

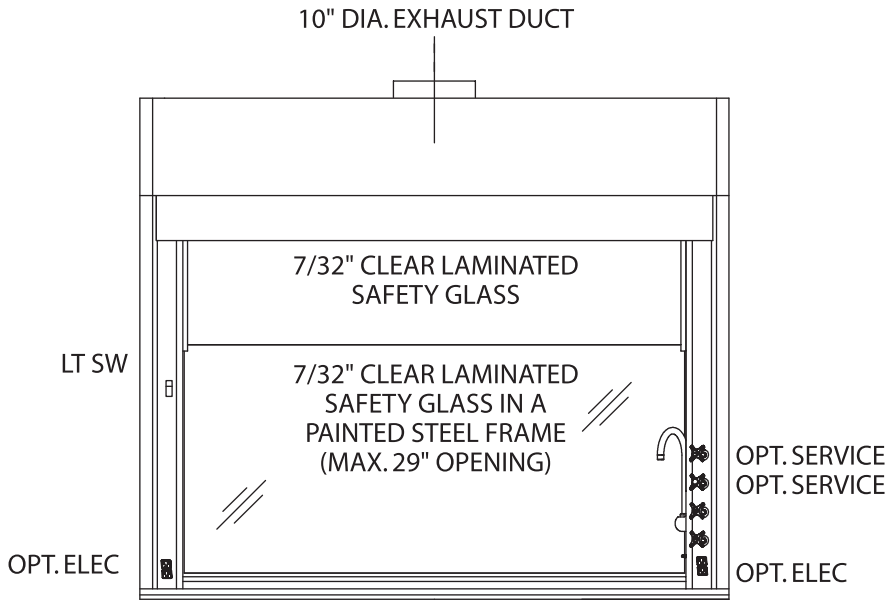
The Eliminator SWS SERIES: Solution Work Station



U.L. 1805
Classified

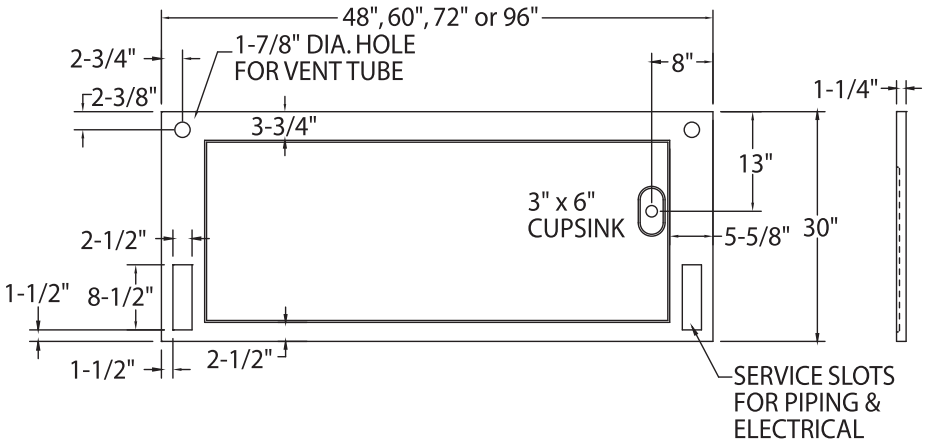
Viewing Everything

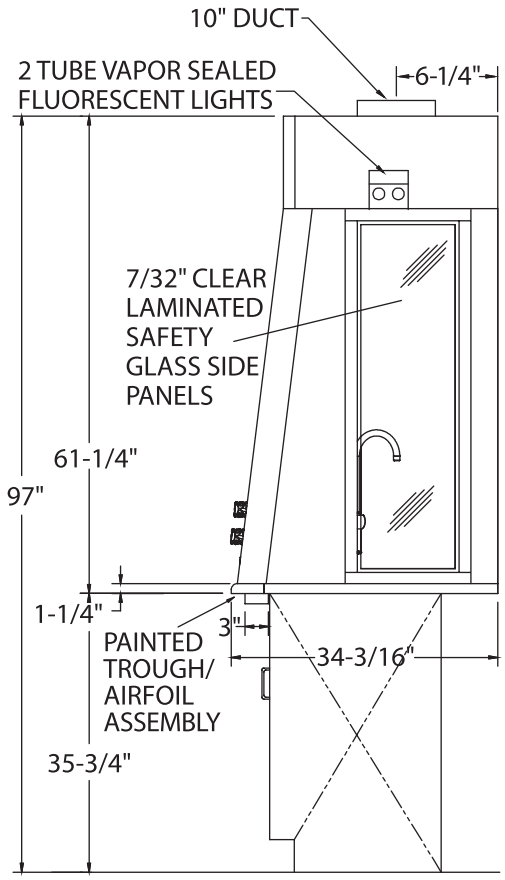
The Solution Work Station was designed to allow 360 degree viewing for undergraduate teaching labs. With the absence of counterweights and baffles, the SWS maximizes ambient light throughout the hood. In addition, this hood has the flexibility necessary to allow back-to-back or side-by-side configurations.



standard features

- Powder coat finish
- Full frame construction
- Constant force sash counterbalance
- T-8 fluorescent light with bulbs
- Flush-mount airfoil
- Full-length finger lift
- Louvered front for by-pass
- 10" round S/S duct collar





Part Number	Superstructure			Worktop			Hood Opening		CFM @ 100LFM	SP at Hood**	10" Duct Size	Shipping Weight
	W	H	D	W	H	D	W	H				
SWS-480	48"	60"	34-3/16"	48"	1-1/4"	30"	37-1/2"	29"	770	.25"	10"	424
DWS-480	48"	60"	68-3/8"	48"	1-1/4"	60"	37-1/2"	29"	770	.25"	2 - 10"	848
SWS-600	60"	60"	34-3/16"	60"	1-1/4"	30"	49-1/2"	29"	1000	.33"	10"	496
DWS-600	60"	60"	68-3/8"	60"	1-1/4"	60"	49-1/2"	29"	1000	.33"	2 - 10"	992
SWS-720	72"	60"	34-3/16"	72"	1-1/4"	30"	61-1/2"	29"	1250	.5"	10"	578
DWS-720	72"	60"	68-3/8"	72"	1-1/4"	60"	61-1/2"	29"	1250	.5"	2 - 10"	1156

SWS = Single Sided Work Station
DWS = Double Sided Work Station
(order two single sided hoods and face them back to back)

*HVAC will have to "wye" double sided hood duct.
For VAV Hoods, add -VAV to the part number.

accessories

ITEM	AMS PT#	PAGE #
Plumbing Accessories		34
Base Cabinets		36
Electrical		35

MADE IN THE USA

Air Monitor Alarms

AFA 500 Mk3 Fume Hood Airflow Monitor Specifications

Alarm range	30-400 fpm (.15 -2.0 m/s)
Accuracy	Face velocity accuracy +/- 10%
Airflow sensor	On-board or remote sensor
Calibration	Single or 2-point (Installer selectable)
Low Air Alarm delay	Fixed 5 secs
Relay output	1 --(Low Air alarm)
Analog output	Not available
Relay input	2 – Night setback and sash high
Comm. Port	RS232 – Can be connected via serial interface to LAN network (Full hood performance software reporting available)
Sash high indication	Yes – using a Micro switch or Proximity switch input With repeat alarm feature factory set to 5 min. (Can be adjusted via laptop up to 30 mins)
Night setback	Yes – using a relay input
External alarm indication	Not available
Power Requirement	Input—120VAC, 60Hz Output—15VDC, 500ma
Display—visual	LEDs: red, alarm; green, normal
Alarm indication	Red LED and audible alarm
Horn silence	Yes – temporary
Mounting	Semi Flush
Operating temperature	55-86 F (13-30 C)
Storage temperature	-40-150 F (-40-65 C)
Instrument dimensions	Instrument Case: 5.2" H x 3.19" W x 1.97" D (132mm H x 81mm W x 50mm D)
Agency listings	UL and CE

AFA 1000/1 Mk3 Fume Hood Airflow Monitor Specifications

Display range	0-999 fpm (0-5.0 m/s)
Alarm range	0-999 fpm (0-5.0 m/s)
Field set-up	2-point velocity calibration (with on-screen instructions)
Accuracy	Sensor / Display resolution 1 fpm Face velocity accuracy +/-10%
Alarm delays	User configurable – 0 to 60secs
Relay output	4 (1 on board – 3 on optional plug in relay interface unit)
Analog output	0-10V output, directly proportional to velocity (Optional)
Relay input	3
Comm. Port	RS232 – Can be connected via Serial interface to LAN network (Full software available)
Sash high indication	Yes, with separate plug-in connection
Night setback	Yes
External alarm indication	Yes
Power Requirement	Input–120VAC, 60Hz Output–15VDC, 500ma
Units	English and Metric (user selectable)
Display–visual	Analog bar graph or Fault Timeline LEDs: red, alarm; yellow, caution; green, normal Digital display of velocity reading (can be turned off)
Alarm indication	Red LED and audible alarm (to a certain sound spec)
Horn silence	Yes (temporary / permanent/automatic depending on type of alarm or external input)
Mounting	Semi Flush
Operating temperature	55-86 F (13-30 C)
Storage temperature	-40-150 F (-40-65 C)
Instrument dimensions	Instrument Case: 5.2" H x 3.19" W x 1.14" D (132mm H x 81mm W x 29mm D)
Agency listings	UL and CE

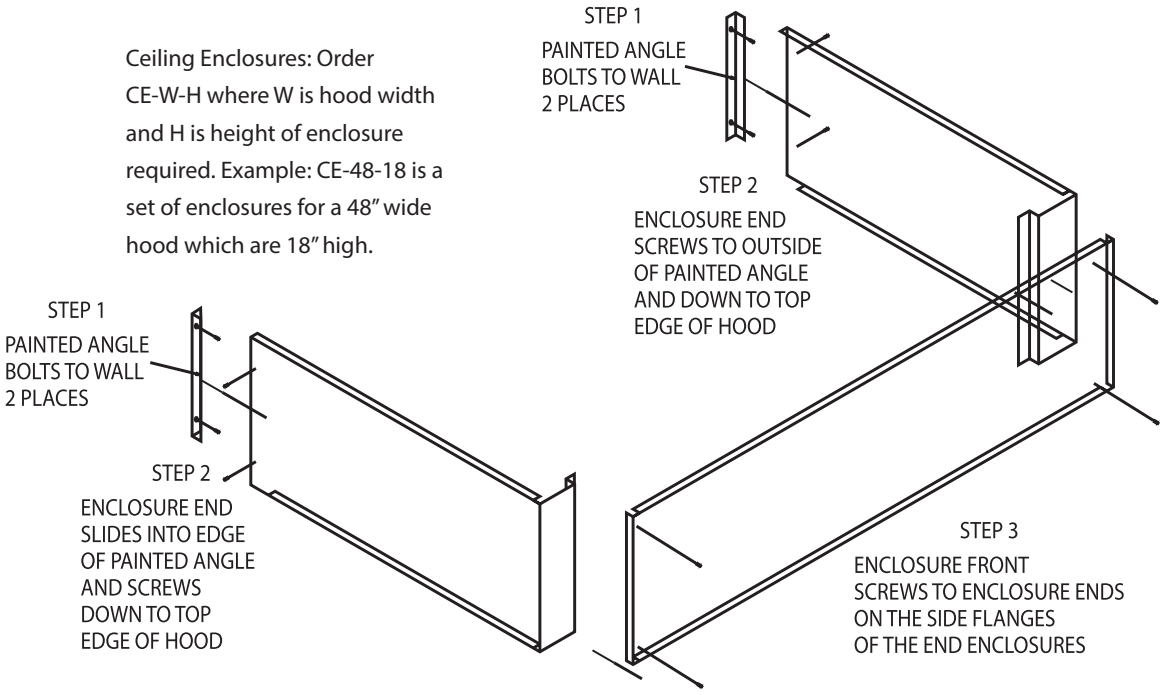
MADE IN ★★★ THE USA

Ceiling Enclosures and Finished Backs

Air Master Systems Corporation offers ceiling enclosures and finished backs to provide a professional, finished design in any setting. Ceiling enclosures and finished backs are fabricated of cold rolled steel and finished to match the fume hood superstructure.

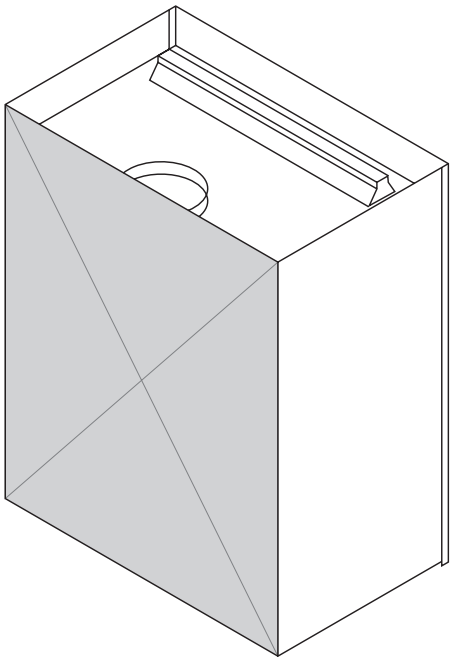
The ceiling enclosures are available in two types: for standard fume hoods and also for those fume hoods utilizing the optional Air Chamber. Both enclosures conceal and protect the hood ductwork, electrical conduit and other supply lines.

Ceiling Enclosures: Order CE-W-H where W is hood width and H is height of enclosure required. Example: CE-48-18 is a set of enclosures for a 48" wide hood which are 18" high.



Finished backs are used to close off the back of the fume hood, giving it a finished look when located in the center of a room.

Finished Backs:
Order FINBACK-W where W equals hood width.

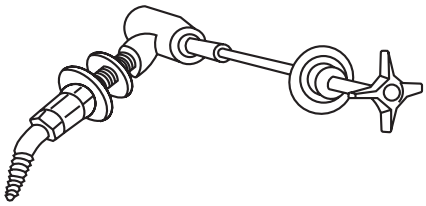


Plumbing Accessories

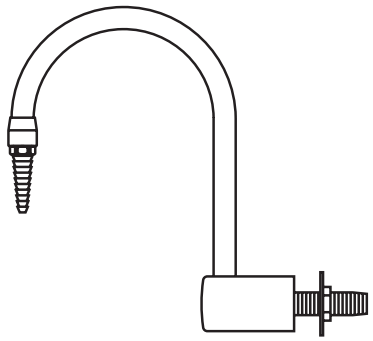
Description	Part #
Gas	FXTGAS
Air	FXTAIR
Vacuum	FXTVAC
Nitrogen	FXTNIT
Cold water	FXTCW

Others available upon request

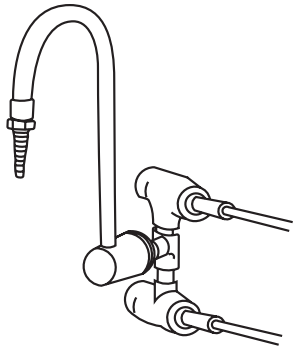
All Air Master Systems Corporation remote-operated fixtures come standard with four-prong handles, baked color-coded epoxy upper assemblies and control rods cut to length. Chrome and other styles are available upon request. Preplumbed services are 1/2" OD copper tubing for water, air, gas and vacuum. All type "L" copper connections & elbows are made with Vega Pro-Press fittings.



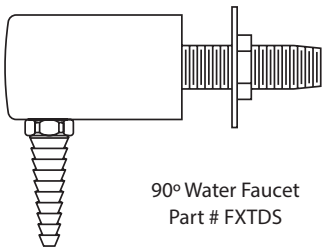
Remote Control Fixtures



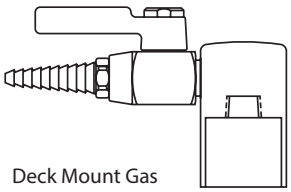
Gooseneck Faucet
Part # FXTGN
Specify Hot or Cold



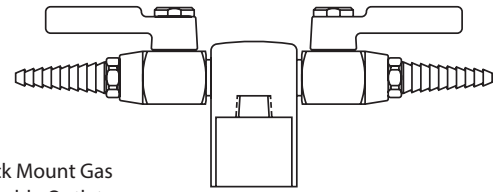
Hot and Cold Water Mixing
Part # FXTCWM



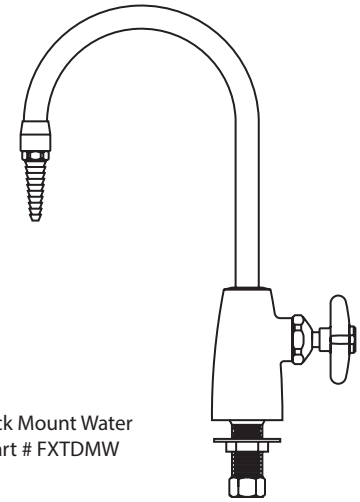
90º Water Faucet
Part # FXTDS



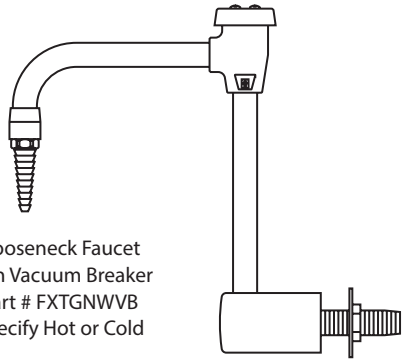
Deck Mount Gas
Single Outlet
Part# FXTDMG1



Deck Mount Gas
Double Outlet
Part # FXTDMG2



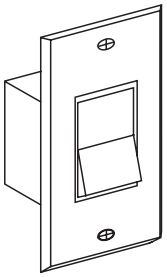
Deck Mount Water
Part # FXTDMW



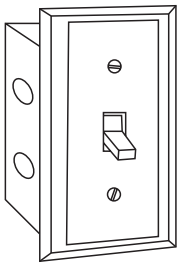
Gooseneck Faucet
with Vacuum Breaker
Part # FXTGNWVB
Specify Hot or Cold

MADE IN THE USA

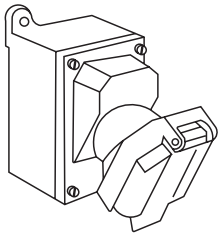
Electrical Accessories and Specifications



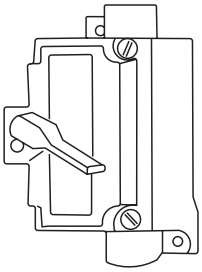
Single Pole
15 Amp Light Switch
Standard Black Color
and Cover Plate
Part# LTSW



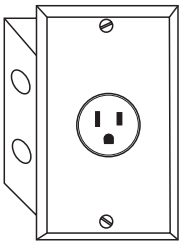
Red Illuminated
Toggle Switch
with Black Cover Plate
Part# BLSW



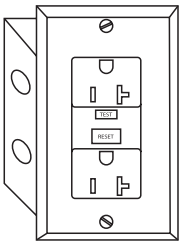
Explosion Proof Outlet
Class 1, Group 1
Part# XPO



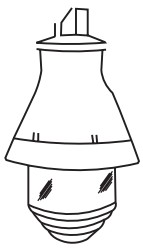
Explosion Proof Switch
Class 1, Group 1
Part# XSW



208 Volt, 20 Amp
Single Pole Receptacle
230, 277 or other
available upon request
Part# 208



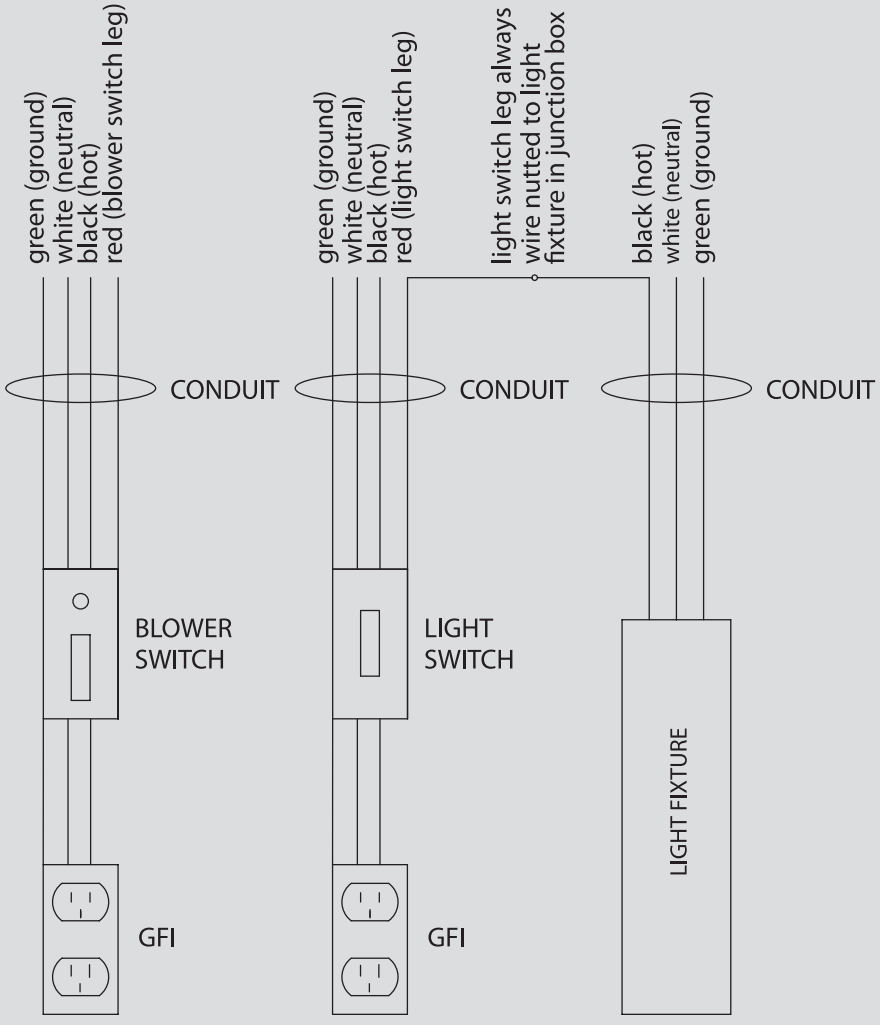
120 volt 20 Amp Ground Fault
Interrupter (GFI)
Duplex Outlet
Standard Black color with cover
Part# GFI



Explosion Proof Light
Class 1, Group 1
Available in
incandescent or fluorescent
Part# XPL

Pre-Wire service is completed in accordance with NEC and UL-1805 standards.

Note: If the fume hood is not pre-wired, wiring in the field must be accomplished using UL listed electrical fixtures while observing NEC standards and local electrical codes.

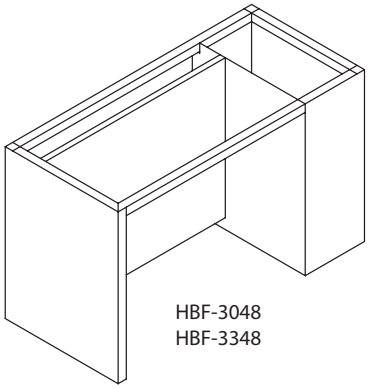


Base Cabinets

Although AMS is your fume hood expert, we do offer a selection of inset metal wall and base cabinets in 29", 33" and 35" heights. When a large quantity of standard laboratory cabinets is required, please contact us for an approved distributor.

AMS fume hood base cabinets conform to the method of testing and performance requirements set forth in the Scientific Equipment Furniture Association (SEFA). All ADA and hood base cabinets can be manufactured in stainless steel.

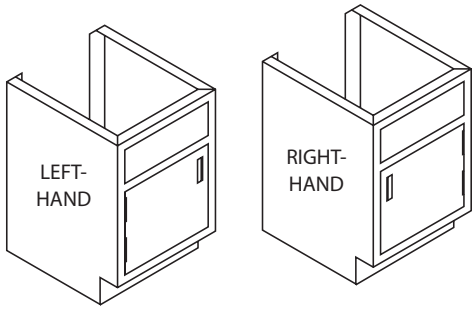
ADA Base Frames



HBF-3048
HBF-3348

Must be specified left- or right-hand; right-hand shown

ADA Hood Bases



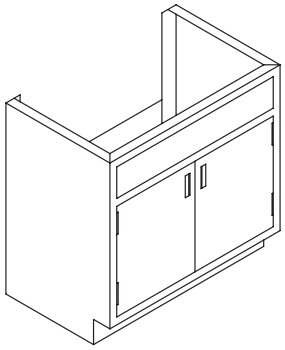
B2912-10P
B2918-10P
B2924-10P

B3312-10P
B3318-10P
B3324-10P

Must be specified left- or right-hand

NOTE: ADA cabinet configurations come in both 30″ and 33″ high.

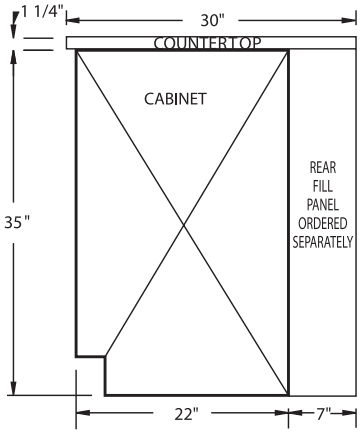
Hood Bases



B3512-10P*
B3518-10P*
B3524-20P*
B3530-20P
B3536-20P
B3548-20P

EXAMPLE: HB-3630 = 36″h x 30″w

NOTE: These cabinets also come in 33″ high and 29″ high



END VIEW OF HOOD CABINET
ALL HOOD BASES HAVE ADJUSTABLE FEET

*Single door; specify left- or right-hand

NOTE: Other metal base cabinets available upon request.

Flammable and Acid Storage Cabinets; Vacuum Pump Cabinet

The Flammable Liquid Storage Cabinet is a "cabinet-within-a-cabinet" design with fully welded 18ga interior and exterior units. Both cabinets are completely powder coated inside and out, offering greater protection against corrosion then the standard double panel construction. This design creates a 1.5" airspace on all four sides as well as top and bottom for heat resistance up to 2400 degrees F.

The interior of the cabinet contains one fully adjustable shelf and a 2" deep removable drip pan to capture any spills or leaks inside the cabinet. Exterior depth of the cabinet is 18" and interior depth is 14". A 2" x 2" 12ga support angle is shipped with each cabinet for countertop installation.

Doors have a continuous hinge and lever type handles with a hidden 3-point lock mechanism. If a self-closing feature is required, a hydraulic closure will be attached to the doors and a custom closing system attached to the interior cabinet. The back of the cabinet has two venting holes that are plugged with 2" barrel bungs.

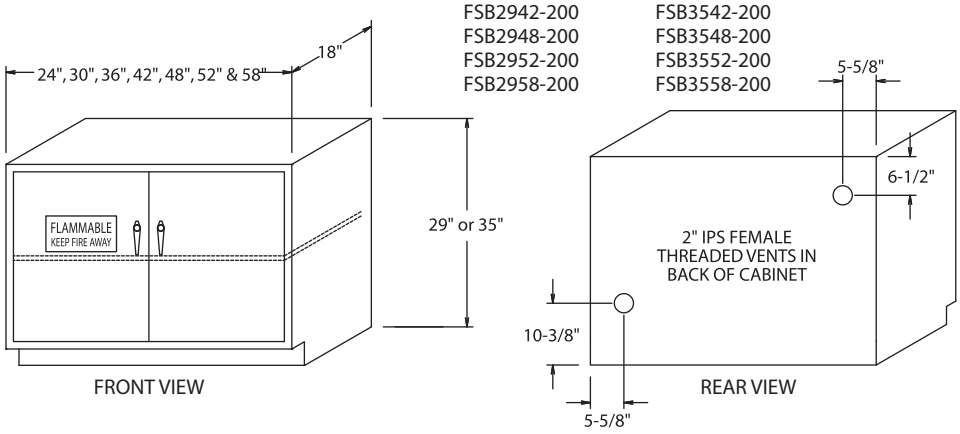
AMS Flammable Liquid Storage Cabinets are constructed in accordance with OSHA and NFPA 30, and are UL listed.

Flammable Storage Cabinet

FSB2924-100
FSB2930-200
FSB2936-200
FSB2942-200
FSB2948-200
FSB2952-200
FSB2958-200

FSB3524-100
FSB3530-200
FSB3536-200
FSB3542-200
FSB3548-200
FSB3552-200
FSB3558-200

} 1 Door Units



Flammable storage cabinets can be painted any standard color or safety yellow.
For synchronized self-closing doors, add -SCC to the part number.
For 22" deep,replace -200 with -220. For mobile cabinet, contact your AMS representative.

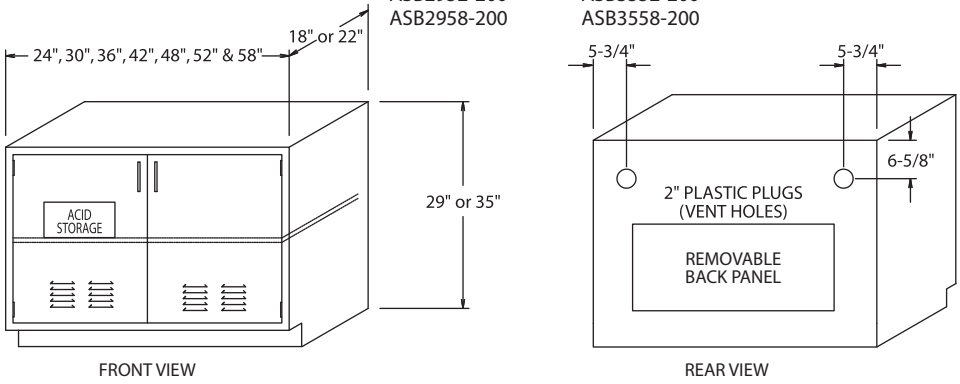
Acid Storage Cabinet

ASB2918-100
ASB2924-100
ASB2930-200
ASB2936-200
ASB2942-200
ASB2948-200
ASB2952-200
ASB2958-200

ASB3518-100
ASB3524-100
ASB3530-200
ASB3536-200
ASB3542-200
ASB3548-200
ASB3552-200
ASB3558-200

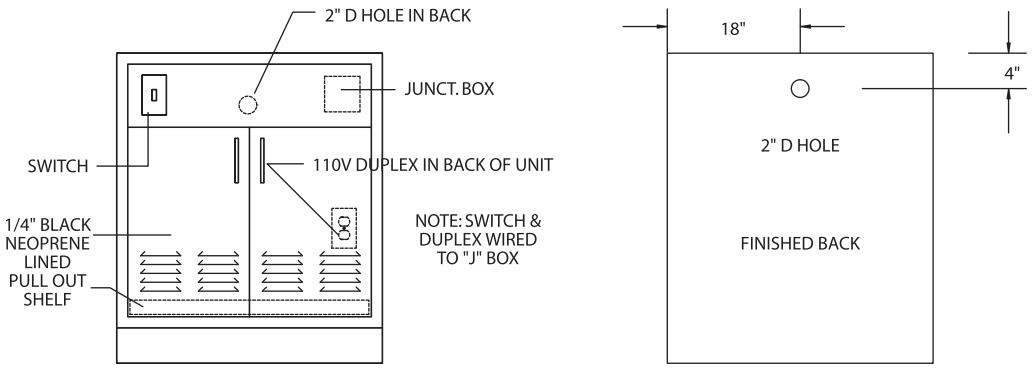
} 1 Door Units

Add Suffix "VK" if Vent Kit is Required



Acid cabinet can be painted any standard color or safety blue.

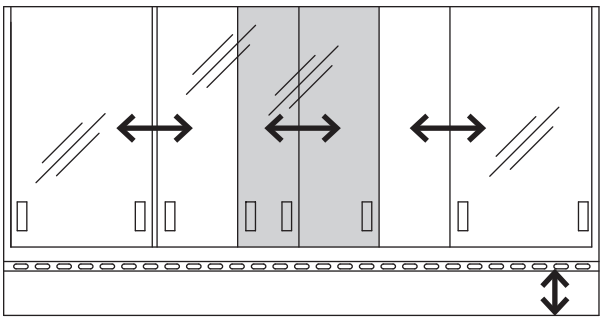
Vacuum Pump Cabinet



Additional insulation materials for noise reduction available upon request.

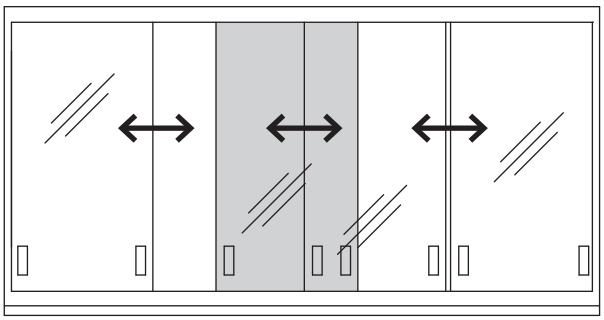
Sash Options

To order these optional sashes, please refer to the Ordering Guide on the back cover of this catalog. The large, underlined number in each of the part numbers below is the Sash Style number to use when ordering.



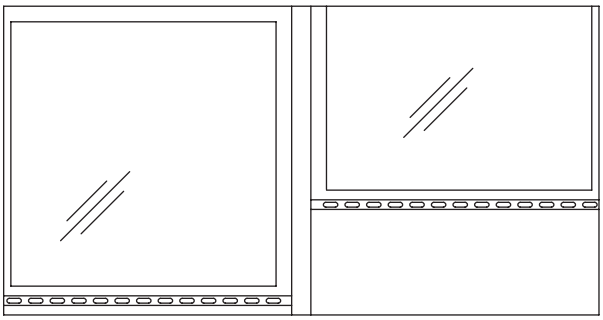
Combo Horizontal/Vertical Sash

EH-1<u>2</u>1-72



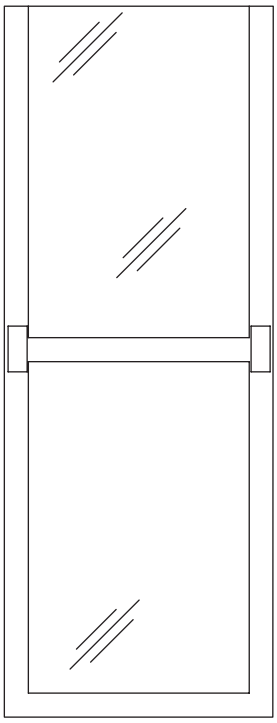
Horizontal Sash Only

EH-1<u>3</u>1-72



Interlocking Sash

EH-1<u>4</u>1-72



Hanging Horizontal Doors

EH-4<u>5</u>1-72

Additional Sash Options

- SASH ALARM: a red light alarm activated when sash is opened above a pre-set height
- SASH STOP: a device to limit sash opening, with manual override
- AUTO SASH RETURN: returns sash to 18" working height when opened beyond set height
- SASH INTERLOCK: allows only one sash to be opened at any time on a double-sided hood
- DOUBLE HUNG SASH: for larger openings with ceiling height limitations
- SASH LOCK: a keyed lock that keeps the sash closed if needed in a classroom setting
- PUSHBUTTON SASH*: opens and closes sash with the push of a button
- AUTO-SENSING SASH*: automatically closes sash when operator walks away

**These two types of sashes have a wide range of capabilities. Please call an Air Master Systems representative or the factory to determine which application is right for your needs.*

Epoxy Resin and Stainless Steel Surfaces

Work Surfaces

Another key component of effective and efficient fume hood utilization is the type of work surface to use. Inappropriate work surfaces can interfere with lab processes and be a potential danger to lab personnel. Air Master Systems Corporation provides durable, high-performance epoxy resin and stainless steel surfaces that feature top quality materials and workmanship.

Epoxy Resin

Epoxy resin fume hood surfaces provide a durable, chemical resistant worksurface for the harshest laboratory environment. The worksurface is surrounded by a 3/8" (10mm) integrally-molded containment rim designed to ease clean-ups and prevent hood and casework damage from large chemical spills.

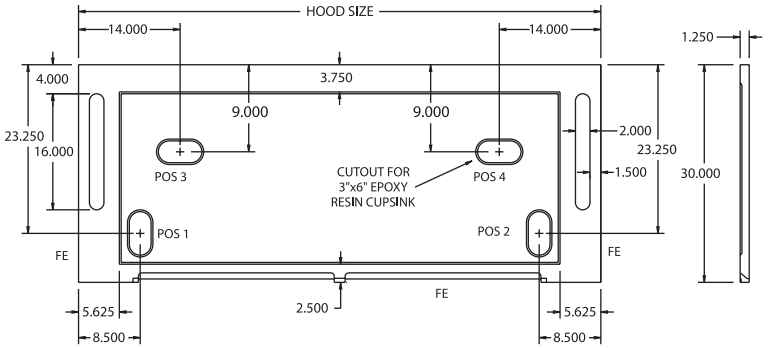
Oval 3" x 6" (7.65 x 15.3cm) cup sinks are standard; locations must be specified when ordering. Other sinks sizes are available upon request.

Stainless Steel

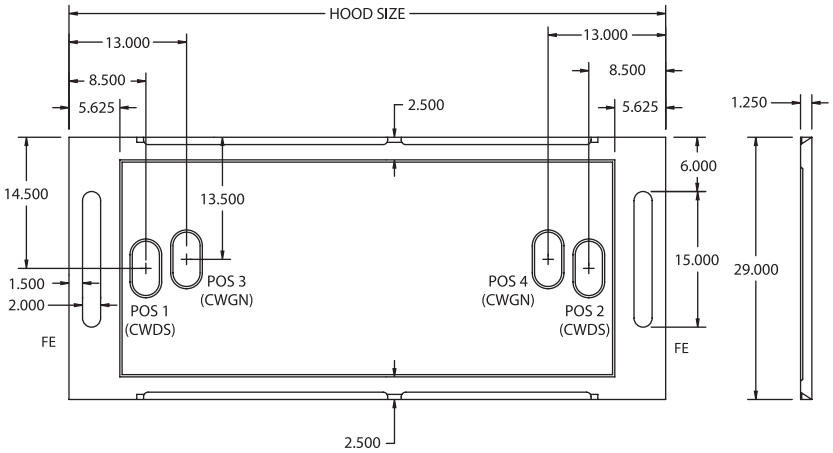
Stainless steel work surfaces are fabricated of 304 stainless steel*, are 1-1/4" (3.2 cm) thick and dished 3/8" with a #4 smooth satin finish. Square 3" x 6" (7.65 x 15.3 cm) welded cup sinks are standard; locations must be specified when ordering.

**In perchloric acid applications, 316 stainless steel is used for lab safety.*

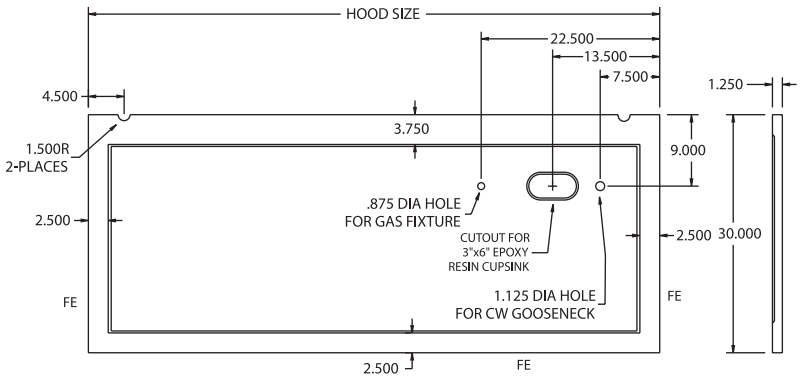
100 and 500 Series Epoxy Work Surfaces



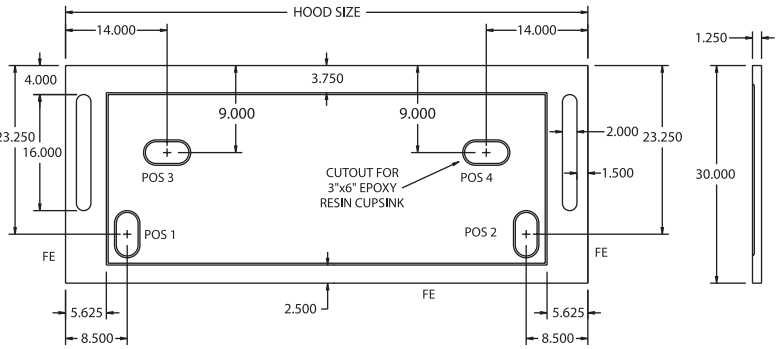
200 Series Epoxy Work Surfaces



300 Series Epoxy Work Surfaces



800 Series Epoxy Work Surfaces



Fume Hood General Design Requirements

1.01 FUME HOOD GENERAL DESIGN REQUIREMENTS

A. Fume hoods shall function as ventilated, enclosed workspaces, designed to capture, confine and exhaust fumes, vapors and particulate matter produced or generated within the enclosure.

B. Design fume hoods for consistent and safe air flow through the hood face. Negative variations of face velocity shall not exceed 20% of the average face velocity at any designated measuring point as defined in this section.

C. Average illumination of work area: Minimum 80 foot-candles. Work area shall be defined as the area inside the superstructure from side to side and from face of baffle to the inside face of the sash, and from the working surface to a height of 28 inches.

D. Fume hood shall be designed to minimize static pressure loss with adequate slot area and stainless steal exhaust collar configuration. Maximum average static pressure loss readings taken three diameters above the hood outlet from four points, 90 degrees apart, shall not exceed the following maximums.

Face Velocity	Measured S. P. L. (W.G)
100 F.P.M.	.30 inches
125 F.P.M.	.45 inches
150 F.P.M.	.60 inches

1.02 SUBMITTALS

A. Shop Drawings: Indicate equipment locations, large-scale plans, elevations, and cross sections, rough in and anchor placement dimensions and tolerances and all required clearances.

B. Product Data: Submit manufacturer's data for each component and item of laboratory equipment specified. Include component dimensions, configurations, construction details, joint details, and attachments, utility and service requirements and locations.

C. Samples: Submit 3" x 6" inch samples of finish for fume hood, work surfaces and for other pre finished equipment and accessories for selection by Architect.

D. Test Reports: Submit test reports verifying conformance to test performances specified. Submit independent tests as specified.

1.03 QUALITY ASSURANCE

A. Single source responsibility: Fume hood casework, work surfaces, and other laboratory equipment and accessories shall be manufactured or furnished by a single laboratory furniture company.

B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled worker to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:
1. Ten years or more experience in manufacturing of laboratory casework and equipment of type specified.
2. Ten installations of equal or larger size and requirements.

C. Installer's qualifications: Factory certified by the manufacturer.

D. Product shall be manufactured and assembled in the United States of America.

1.04 DELIVERY, STORAGE AND HANDLING

A. Schedule delivery of equipment so that spaces are sufficiently complete that equipment can be installed immediately following delivery.

B. Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating.

C. Protect all work surfaces throughout construction period with 1/4" corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering No Standing."

1.05 PROJECT CONDITIONS

A. Do not deliver or install equipment until the following conditions have been met:
1. Windows and doors are installed and the building is secure and weather tight.
2. Plumbing, overhead ductwork and lighting are installed.
3. All painting is completed and floor tile located below casework is installed.

Fume Hood General Design Requirements (continued)

2.01 FUME HOOD MATERIALS

A. Steel: High quality, cold rolled, mild steel meeting requirements of ASTM A366; gauges U.S. Standard.

B. Stainless Steel: Type 304 or 316; gauges U.S. Standard.

C. Ceiling closure panels: Minimum 18 gauge; finish to match hood exterior.

D. Bypass grilles: Low resistant type, 18 gauge steel, upward directional louvers.

E. Safety glass: 7/32" thick laminated safety glass.

F. Sash cables: 7 x 7 steel, coated, 1/8" diameter coated to 5/32". (Military spec. quality.)

G. Sash guides: A full length extruded corrosion resistant polyvinyl chloride or powder coated steel with PVC guides to protect against metal to metal contact.

H. Pulley assembly for sash cable: 2" diameter, steel construction, ball bearing type, with cable retaining device.

I. Sash pull: Full width 16 gauge steel to match hood color.

J. Interior access panels: To be made of the same material as the fume hood liner with an easily removable PVC gasket.

K. Fastenings:
1. Exterior structural members attachments: Sheet metal screws, zinc plated.
2. Interior fastening devices concealed. Exposed screws not acceptable.
3. Exterior panel member fastening devices to be corrosion resistant non-metallic material. Exposed screws not acceptable.

2.02 FUME HOOD CONSTRUCTION

A. Superstructure: Rigid, self-supporting assembly of double wall construction, maximum 5-1/4" thick.
1. Wall consists of a sheet steel outer shell and a corrosion resistant inner liner, and houses remote operating service fixture mechanisms and electrical services.
2. Access to fixture valves concealed in wall provided by exterior removable access panels, gasketed access panels on the inside liner walls, or through removable front posts.
3. Hoods must be of full frame construction. Hoods that use metal brackets and spacers to hold interior and exterior panel in place are unacceptable.

B. Exhaust outlet: 10" round, 20 gauge stainless steel exhaust collars.

C. Access opening perimeter: Top and sides of face opening to be radiuses or angled.
1. Bottom horizontal: foil shall be a flush-mount type and provide a 1" bypass to insure a clean sweep and to minimize eddies along the work surface when sash is in the closed position. For ADA fume hoods, a secondary containment trough with flush mount airfoil to be provided.
2. Bottom sash rail: 1-1/2" frame section, 16-gauge steel or PVC. Provide pull, full width of bottom rail.
3. Set safety glass into rails in deep form, extruded polyvinyl chloride or neoprene glazing channels if a steel sash frame is being used.
4. Counter balance system: Single weight, pulley, cable, counter balance system which prevents sash tilting by means of a shaft driven" system and permits one finger operation at any point along full width pull. Sash not using this type of counter balance systems are unacceptable. Maximum 9 pounds pull required to raise or lower sash throughout its full length of travel. Design system to hold sash at any position without creep and to prevent sash drop in the event of cable failure.
5. Open and close sash against rubber bumper stops.

D. Fume hood liner: 3/16" Polyresin: Reinforced polyester panel smooth finish and white color in final appearance. Flexural strength: 14,000 psi. Flame spread: 15 or less per U.L. 723 and ASTM E84-80.

E. Baffles: Fabricate fixed baffles providing controlled air vectors into and through the fume hood of the same material as the liner. Hoods with adjustable baffles are unacceptable. All baffle support brackets to be non-metallic.

F. Service fixtures and fittings: Color-coded hose nozzle outlets and valves mounted inside the fume hood and controlled from the exterior with color-coded index handles (when specified).
1. Valves: Rod-driven needlepoint type with self-centering cone tip and seat of hardened stainless steel.
2. Provide pre-piping for all service fixtures from valve to common point for final connection by respective trades. 1/2" OD copper tubing for water, air, gas and vacuum. All type "L" copper connections & elbows are made with Vega Pro-Press fittings.

Fume Hood General Design Requirements (continued)

3. Fixtures exposed to hood interior: Brass with chemically resistant powder coating.
4. Remote control handles: Prong type, easy to grasp.
5. Services: To be determined by Architect/Planner.

G. Hood light fixtures: Two lamp, rapid start, T-8 UL listed fluorescent light fixture with sound rated ballast installed on top panel.
   1. Interior of fixture: White, high reflecting plastic enamel.
   2. Size of fixture: Largest possible up to 48" for hoods with superstructures up to six feet. Provide two 24" fixtures for hoods with eight foot superstructures.
   3. Include lamps with fixtures.
   4. Illumination: Per performance values, part 1 of this section.
   5. Provide switch with black acid resistant thermoplastic (when specified).
   6. 3-way switch on each side of double sided hoods (when specified).

H. Electrical services: Provide on each front post of hoods. Three wire grounding type receptacles rated at 120v GFI, 20 amperes where specified. Flush Plates: Black acid resistant thermoplastic.

I. Work surfaces: 1-1/4" thick dished a nominal 1/4" to contain spills.
   1. Molded resin work surfaces for hoods with white Resisto Roc or Poly-resin liners. Front raised edge no more than 1/2" wide.

J. Safety Monitor/Alarm System: Provide safety Monitor/Alarm system that monitors face velocity and provides audible and visual alarm if face velocity drops below safe levels. The technology used in the TEL 500 will be based on thermally compensated thermistor based in the alarm module. As the internal fume hood pressure changes as the sash opening is closed and opened, the flow passing over the thermistor is calibrated to a face velocity that is displayed on the front of the monitor.
   1. Safety monitor: UL listed, tamper proof, with all alarm circuits, electric components, external tubing, and manifolds furnished complete and factory installed. Monitor shall have light emitting diode display that provides clear indication of airflow conditions.
   2. Calibration is the responsibility of the owner and is required once the hood is stationed and the hood exhausts and room supply systems are balanced. A secondary calibration has been factory set into the alarm's memory only to determine that the alarm is functional and ready for shipment. The primary calibration must be completed in the field.
   3. Airflow sensor: Thermally compensated glass beaded thermistor, factory connected to a sidewall port on the interior of the fume hood.
   4. Alarm Signal: Audible signal and visual, red light emitting diode:
      a. Silence pushbutton, which disables the audible alarm, shall be accessible on the front of the safety monitor.
      b. Provide alternate mode in which visible alarm is silenced indefinitely but visual alarm remains activated until the alarm condition is corrected.
      c. When alarm condition is corrected and face velocity and volume return to specified levels, the Safety Monitor will automatically reset and begin routine monitoring.
      d. Provide test circuit to verify proper Safety Monitor operation.
      e. Electrical rating: Maximum 12 VDC, and maximum current rating of 20 OMA.
      f. Provide a option for a sash alarm / sensor if required.

2.03 CEILING ENCLOSURE: Provide ceiling enclosure from top of hood to accommodate a ceiling height (verify). Fabricate enclosure from 18 gauge steel to match the hood material and finish.

A. Preparation: Spray clean metal with a heated cleaner/ phosphate solution.

B. Application: Electro statically apply powder coat of selected color and baked in controlled high temperature oven to assure a smooth, hard satin finish. Surfaces shall have a chemical resistant, high grade laboratory furniture quality finish of the following thickness:
   1. Exterior and interior surfaces exposed to view: 1.5 mil average and 1.2 mil minimum.

2.04 SOURCE QUALITY CONTROL

A. Demonstrate fume hood performance by means of documentation of a third party testing company to the ASHRAE 110-1995 methods of testing.

Fume Hood Technology — Glossary of Terms

Airfoil: Shaped or streamlined member at hood entrance designed to enhance movement of air into the hood.

Air Volume: Rate of airflow, normally expressed in cubic feet per minute (CFM).

ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers, a professional organization that sets industry standards for fume hood testing procedures.

Auxiliary Air: Supply or makeup air delivered external to the chamber of a fume hood to reduce air consumption.

Baffle: Panels located across back of hood interior, which control pattern of air moving through the hood.

Blower: Air moving device (or fan) consisting of motor, impeller, and scroll.

Bypass: Compensating opening that helps maintain constant volume exhaust from fume hood, regardless of sash position.

Canopy Hood: Ceiling or wall suspended ventilating device for noncritical use with heat, water vapor, odors, etc.

CFM: Cubic Feet Per Minute, a unit of measurement of air volume.

Combination Sash: Horizontal panels in a vertically rising frame; see *sash.*

Constant Volume: Type of fume hood exhaust system that exhausts the same volume of air, regardless of sash position.

Containment: Extent to which fumes are confined within the hood compartment.

Damper: Device installed in duct to control air volume.

Demonstration Hood: Fume hood with glass panels on two or three sides to improve visibility for demonstrating experiments in a classroom setting.

Exhaust Volume/Parameters: Quantity of air exhausted by the fume hood; quantity of air required to maintain desired face velocity, expressed in cubic feet per minute (CFM).

Face Velocity: Speed of air moving into the fume hood through the face opening (through the sash), measured in feet per minute (FPM).

FPM: Feet per minute; measurement of air velocity.

Liner: Fume hood interior sides, back, and top, including baffle.

Lintel: Portion of fume hood front located above access opening

Louvers: Slit-like openings in the lintel that allow bypass air to enter the hood when the sash is closed.

NFPA: National Fire Protection Association.

Negative Pressure: Pressures lower than one atmosphere.

Positive Pressure: Pressures higher than one atmosphere.

Restricted Bypass Fume Hood: Fume hood operating type, designed with limited bypass area; commonly used in conjunction with Variable Air Volume (VAV) exhaust systems and restricted sash opening designs.

Sash: Sliding glass panel set in the fume hood face that provides access to the hood interior.

Service Fitting/Plumbing: Water faucets and gas valves mounted on or fastened to the fume hood.

Static Pressure: Air pressure, or resistance, in fume hood or duct, expressed in inches of water.

U.L. 1805: Underwriters Laboratories certification that verifies conformance to electrical, mechanical, and airflow standards.

Variable Air Volume (VAV): Type of fume hood exhaust system that typically maintains constant fume hood face velocity by adjusting blower motor speed or a balance damper in response to changes in sash position.

Velocity: Speed of air, measured in feet per minute (FPM).

Velocity Pressure: Force per square inch applied by moving air.

Volume: Quantity of air, usually measured in cubic feet per minute (CFM).

Work Surface: Top material; area in fume hood where apparatus rests and where work takes place.

SUBSTITUTION REQUEST FORM

TO: Roebbelen Contracting

CHECK APPROPRIATE LINE:

__x__ Substitution Request Prior to Bid (During Bid Period)
__x__ Product or System Substitution
_____ Design Change Substitution

_____ Substitution Request After Award of the Contract
_____ Product or System Substitution
_____ Design Change Substitution

The Contractor Awarded the Contract for this Project shall assign sequential Substitution Request # below.
Leave blank if submitted during the Bid Period.

SUBSTITUTION REQUEST #_____

WE HEREBY SUBMIT FOR YOUR CONSIDERATION THE FOLLOWING PRODUCT OR METHOD AS SUBSTITUTION FOR THE SPECIFIED OR DRAWING ITEM FOR THIS PROJECT:

PROJECT: West Campus HS

SPECIFIED ITEM: Wood Lab Casework

123553	1	2.1.A	Wood Lab Casework
Specification Section #	Page #	Paragraph #	Description

OR
DRAWING ITEM: _____

Drawing #	Detail Cut #	Description

PROPOSED CREDIT IF ANY: Competitive Bid

PROPOSED SUBSTITUTION:
proposes to use Diversified Woodcraft for the wood laboratory casework.
Fisher Hamilton is out of business. This leave you with only one approved mfgr.

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents to which the proposed substitution will require for its proper installation.

The undersigned claimant certifies: (Modifications by the claimant to the following list is cause for automatic rejection without further review)

1. The proposed substitution does not affect dimensions shown on drawings or code requirements indicated.
2. The undersigned claimant shall compensate the Architect at a rate of an hour, two hour minimum for each review for investigation and comments whether or not the request is approved for changes required to the building design, including engineering design, detailing, and construction costs caused by the requested substitution. The Architect is herein defined as any of those firms or individuals listed by reference on the Drawings, including all Consultants identified herein.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. Attach information for a minimum of three projects where the substitution has been used locally within a 200 mile distance of this project, including names, addresses and telephone numbers of Owners who have accepted this product into their projects.
6. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality of proposed substitution and cost differential.
7. The undersigned claimant shall pay for any subsequent changes in incorporating the proposed substitution that were not apparent at the time of approval into the Work, including compensation to the Architect as described in item 2 above.

The undersigned Claimant(s) declares under penalty of perjury per the California Government Code Section 12650, et seq., that the claim of function, appearance and quality are equivalent or superior to the specified or drawing item, and further know and understand that submission for certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.

SUBMITTED BY CLAIMANT:

Signature 
Firm Pacific Cabinets, Inc.

Address PO Box 81
Ferdninand, ID 83526
Date 4/26/18
Telephone 916-936-6092

ADDITIONAL CLAIMANT SIGNATURE REQUIRED:

The Contractor or Construction Manager if submitted after the Award:

Signature
Firm

DESIGN CONSULTANT USE ONLY:

___ Check Not Attached - Not Accepted
_X_ Accepted
___ Accepted as Noted
___ Not Accepted
___ Received Past Time Period Allowed by Public Contract Code #3400.

By RG - SKW Architects Date 05.04.2018
Remarks

END OF SECTION

design
renovation
new build

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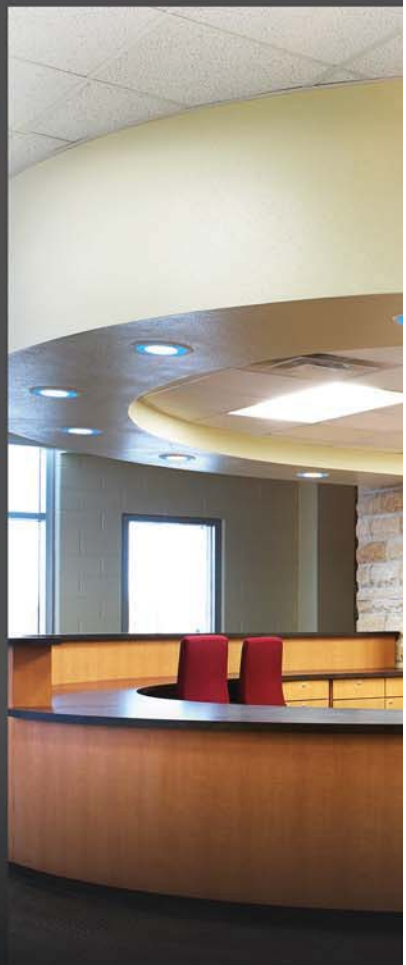

Your Strategic Partner

For over 40 years, we have created high-quality laboratory grade furniture for the lab & science market.

Our Difference

- 95.5% On-Time and Complete (Based on Last 10 Years)
- Limited Lifetime Warranty with a .001% Annual Warranty Claims
- .001% Annual Freight Damage

Our Capabilities

- Custom Stains
- Custom Veneers
- Custom Hardware
- FSC Materials
- MAS Certified
- SEFA Tested
- Design and Budget Support
- Experienced National Dealer Network

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DiversifiedCasework.com

For More Information: Info@DiversifiedCasework.com

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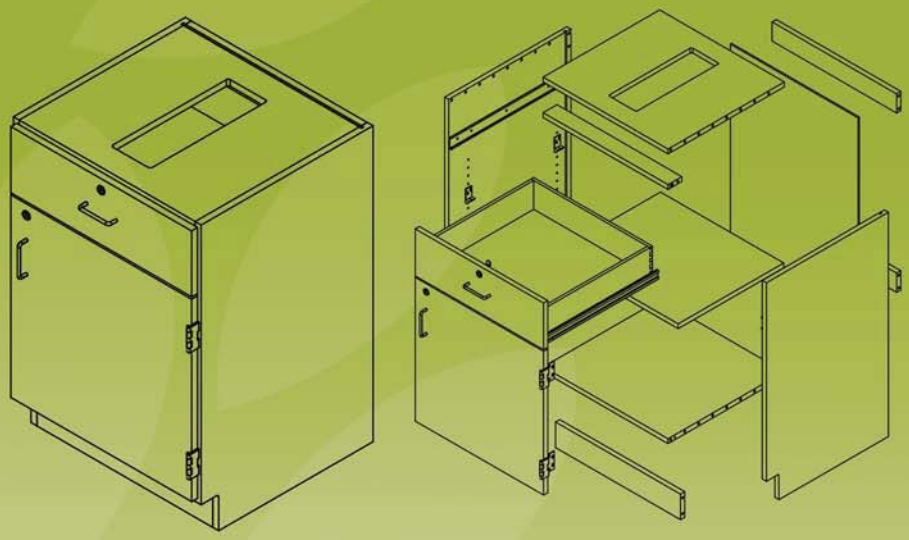
CASEWORK

Casework Specifications

- DESIGN
- ESTIMATING
- SUBMITTALS DRAWING
- PRODUCTION
- FINISHING
- ASSEMBLY
- SHIPPING
- INSTALLATION

Our Specifications



- Custom Stains
- Veneer Core Plywood Cabinet Panels
- FSC CoC Materials Available
- Complete Range of Face Veneers
- Exposed Surface Grade Veneers (Both Cabinet Sides)
- SEFA 8W Compliant Finish
- 63 mm Dowel Spacing
- Five Knuckle & Concealed Hinge
- Complete line of drawer glides
- Full Height Drawer Bodies
- Multiple Dovetail Drawer Joinery on All Four Corners
- Full Sub-top for Strength and Stability with Hand Holds for Easy Installation
- Dowel and Pocket-hole Screw Joinery for Additional Strength
- Standard Vertical Grain Match (Door/Drawer Fronts)
- Available with All Finished Ends
- Limited Lifetime Warranty Available
- North American, Sustainable Grown Materials
- No-Added-Urea-Formaldehyde Materials Available
- Carb Phase 2 Formaldehyde Emissions Compliant Standard
- No VOC Emissions Flat-line Finish
- MAS Certified
- SEFA 8W Tested and Compliant

quality beautiful environment

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quality durable

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CABINET ACCESSORY OPTIONS

STANDARD HARDWARE (Custom Options Available)

#100400

96 MM STAINLESS STEEL SATIN FINISH

#100401BK

96 MM BLACK EPOXY COATED

#100401

96 MM SATIN CHROME FINISH

#101105

4" ALUMINUM BAR PULL BRUSHED FINISH

FULL ALUMINUM PULL

#611163

5 DISC CAM LOCK

#239878

PAD LOCK HASP CAM NICKEL MATTE FINISH

#100613BK

5 KNUCKLE BLACK EPOXY

#100613

5 KNUCKLE ZINC PLATED

#100980

5 KNUCKLE STAINLESS STEEL (SEFA)

#249765

170 DEGREE CONCEALED HINGE

#250847

75 LB DYNAMIC 3/4" DRAWER SLIDES

#100132

100 LB DYNAMIC 3/4" DRAWER SLIDES

#100776

100 LB ZINC FULL EXTENSION SLIDES

#100190

150 LB ZINC FULL EXTENSION SLIDES

#100662

NUMBER PLATE

#219279BK

BLACK LABEL HOLDER

#219279

STAINLESS STEEL LABEL HOLDER

#100027

TWIN PIN SHELF CLIP

#100025

ROLLER CATCHES

#222546

MAGNETIC CATCH

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DIVERSIFIED CASEWORK

[SEFA RESULTS]

WHAT IS SEFA?

The Scientific Equipment and Furniture Association (SEFA) is a voluntary international trade association representing members of the laboratory furniture, casework, fume hood and related equipment industry. The Association was founded to promote this rapidly expanding industry and to improve the quality, safety and timely completion of laboratory facilities in accordance with customer requirements.

SEFA members work together to establish, monitor and modify, as needed, industry-wide recommended practices in the areas of fume hoods, laboratory work surfaces, equipment and furniture installations.

SEFA RECOMMENDED PRACTICES

SEFA and its committees are active in the development and promotion of recommended practices having domestic and international applications. Recommended practices are developed by the association taking into account the work of other national standard-writing organizations. Liaison is also maintained with government agencies in the development of their specifications. SEFA's recommended practices are developed in and for the public interest. These practices are designed to promote better understanding between designers, architects, manufacturers, purchasers, and end users to assist the purchaser in selecting and specifying the proper product to meet the user's particular needs.

SEFA 8 CERTIFICATE OF PERFORMANCE INDEPENDENT TEST LAB

Diversified Woodcrafts, Inc. contracted with Intertek, 4700 Broadmoor SE, Suite 200, Kentwood, MI 49512 to test our laboratory casework as it conforms to the SEFA 8 standards. The finish tests were also performed by Interlak. Here is a summary of the report.

LABORATORY FURNITURE - SEFA 8

This recommended practice is intended to provide manufacturers, specifiers, and users tools for evaluating the safety, durability, and structural integrity of laboratory casework and complimentary items.

DESCRIPTION OF TEST CABINETS

- Base Cabinet: CW108-4822
- Wall Cabinet: CWDO3-4812
- Table: P7601K36S

Test	Result	Test	Result
4.2	Pass	6.3	Pass
4.3	Pass	6.4	Pass
4.4	Pass	6.5	Pass
4.5	Pass	7.1	Pass
5.1	Pass	8.1	Pass
5.2	Pass	8.2	Pass
5.3	Pass	8.3	Pass
6.1	Pass	9.2	Pass
6.2	Pass		

CABINET LOAD TEST

4.2.1 Purpose of Test

The cabinet load test challenges the structural integrity and the load-bearing capability of the cabinet construction. The test demonstrates the ability of the cabinet to support heavy loads.

4.2.2 Test Procedure

The cabinet top was loaded using 2,000 pounds of solid steel bars stacked five high, in eight equally spaced rows. After 10 minutes, the bars were removed from the cabinet.

4.2.3 Acceptance Level

There are no signs of permanent damage.

CABINET CONCENTRATED LOAD TEST

4.3.1 Purpose of Test

The purpose of the test is to challenge the functional characteristics of the cabinet when subjected to a concentrated load on the center of the cabinet top.

4.3.2 Test Procedure

Four, 50 pound solid steel bars were placed on top of the cabinet, along the cabinet center line. With the weight in place, the drawers and doors were operated and inspected.

4.3.3 Acceptance Level

Doors and drawers operated normally. There is no permanent distortion to the front rail, cabinet joinery, doors, or drawers.

CABINET TORSION

4.4.1 Purpose of Test

The test evaluates the structural integrity of the cabinet construction when subjected to torsional load.

4.4.2 Test Procedure

The cabinet was supported on three, 3-1/4" x 3-1/2" x 4"H hardwood blocks, located under the two rear corners and one front corner. The cabinet was secured, diagonally from the unsupported corner with seven, 50 pound, solid steel bars to prevent overturning. Four, 50 pound, solid steel bares were placed on the unsupported corner of the cabinet and left in position for 15 minutes. The weights were then removed and the cabinet was placed on the floor in its normal, upright, position. The cabinet joinery was inspected and the cabinet was leveled and measured, diagonally, between the corners of the face and the back of the cabinet.

4.4.3 Acceptance Level

When returned to normal position, the operation of the cabinet was normal and there was no evidence of permanent damage. The difference between the diagonal measurements does not exceed 1/8" front or back.

CABINET SUBMERSION TEST

4.5.1 Purpose of Test

The test demonstrated the ability of a cabinet to resist standing water.

4.5.2 Test Procedure

The thickness of the material along the perimeter of the bottom of the cabinet was measured on 6" increments. The thickness was recorded and the arithmetic mean was calculated. The cabinet was then placed in a pan of water so that the bottom 2" of the cabinet was submerged. The cabinet remained in the water for 4 hours and then it was removed and immediately re-measured at the same locations that were measured initially. The thickness at each location was recorded and the arithmetic mean was calculated. After the cabinet had dried, it was inspected for damage.

4.5.3 Acceptance Level

The cabinet shows no signs of permanent deformation or deterioration and the average increase in thickness is less than four percent (3.5%).

DOOR HINGE TEST

5.1.1 Purpose of Test

The test demonstrates the durability of the door and its hardware to an applied load of 200 pounds.

5.1.2 Test Procedure

The shelf was removed and weight was placed on top of the cabinet to prevent it from overturning. A cabinet door was opened 90˚ and a sling with four 50 pound weights was hung over the top of the door, at a point out from the hinge center line. The door was then slowly moved through the full cycle of the hinge (up to a 160˚ arc). The weight was then removed, the door was swung through its full intended range of motion, and closed.

5.1.3 Acceptance Level

There was no significant permanent distortion and the door operated normally after the weight was removed.

DOOR IMPACT TEST

5.2.1 Purpose of Test

The test demonstrates the resistance to a 240 inch-pound impact to the door face.

5.2.2 Test Procedure

Eight, 50 pound solid steel bars were placed on top of the cabinet to prevent overturning. A 20 pound sand bag was then suspended from a pendulum support and dropped providing an impact of 240 inch-pound at the center of a closed door.

5.2.3 Acceptance Level

Door and catch operated normally and show no signs of permanent damage.

DOOR CYCLE TEST

5.3.1 Purpose of Test

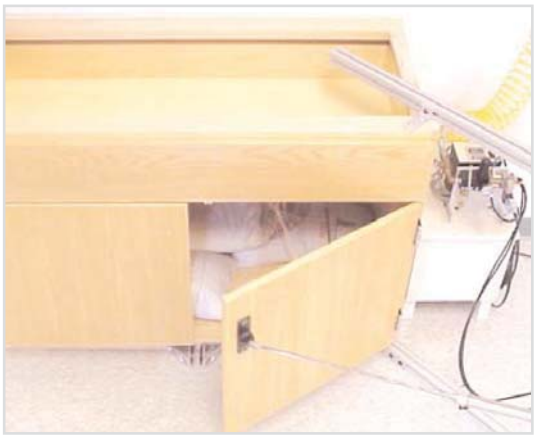
The test demonstrates the ability of the door hinge hardware to withstand 100,000 cycles as a reliable measure of longevity.

5.3.2 Test Procedure

A cycling mechanism, that swings a door through an arc of 90˚, was operated for 100,000 cycles.

5.3.3 Acceptance Level

The door operated for the full 100,000 cycles without deterioration that significantly affected the function of the door. After completion of the test, the door operates freely and without binding.



DRAWER STATIC LOAD TEST

6.1.1 Purpose of Test

The test demonstrates the ability to support a point load given to the front of the drawer and will challenge the attachment of the drawer head to the drawer.

6.1.2 Test Procedure

Eight, 50 pound solid steel bars were placed on to of the cabinet to prevent overturning. A drawer was opened to 13" of travel and 150 pounds was hung from the drawer head, at the center line of the drawer, for 5 minutes. The weight was then removed and the drawer was operated through the full cycle.

6.1.3 Acceptance Level

There was no interference with the normal operation of the drawer.

DRAWER & DOOR PULL TEST

6.2.1 Purpose of Test

The test evaluates the strength of the pull and the pull hardware.

6.2.2 Test Procedure

The pulls were installed in accordance with Diversified Woodcrafts practice using specified attaching hardware and method. A drawer and a door were blocked closed and a cable, pulley, and weight assembly was used to apply a force of 50 pounds perpendicular to each pull. Similar set-up was then used to hang a 50 pound weight from each pull.

6.2.3 Acceptance Level

Pulls resisted the force and supported the weight and there is no evidence of permanent distortion..

DRAWER IMPACT TEST

6.3.1 Purpose of Test

The test demonstrates the resistance to impact of the drawer bottom and the slide mechanism.

6.3.2 Test Procedure

A drawer was opened to 13" of travel and then a 10 pound sand bag was dropped, from a height of 24", into the bottom of the drawer, at the center line of the width of the drawer and 6" back from the inside face of the drawer.

6.3.3 Acceptance Level

The drawer was operated through a full cycle and it operated normally. There was no visible deformation of the drawer.

DRAWER INTERNAL ROLLING IMPACT

6.4.1 Purpose of Test

The test evaluates the strength of the drawer head, bottom, and back as a result of opening and closing the drawer with a rolling load.

6.4.2 Test Procedure

The drawer was positioned on a table at a 45˚ angle and a 2" diameter by 12" long steel rod, that weighs approximately 10 pounds, was positioned 13" from the target impact area such that the rod rolled freely to impact the back of the drawer. The back was subjected to three impacts and then the drawer was reversed and the front was subject to three additional impacts.

6.4.3 Acceptance Level

There are no visible signs of permanent damage. All joinery is intact and the drawer operated normally when returned to the unit.

DRAWER CYCLE TEST

6.5.1 Purpose of Test

The test is intended to replicate years of operation of a drawer under full load.

6.5.2 Test Procedure

A static load of 100 pounds (using ten 10 pound sand bags) was uniformly distributed in a drawer and the force required to activate the drawer was measured. The drawer was then opened from a closed position to a position within 1/4" of full extension and then closed. The procedure was repeated 50,000 times at a rate that did not exceed 10 cycles per minute.

6.5.3 Acceptance Level

After the 50,000 cycles were completed, the drawer operated freely with no evidence of dragging, rubbing, or binding. The force required to open and close the loaded drawer increased by 7.1% which is less than the allowable maximum (20%). The force required to open and close the loaded drawer was less than 8 pounds.

SHELVING

7.1.1 Purpose of Test

The test demonstrates the ability of a shelf and mounting hardware to support normal laboratory loads.

7.1.2 Test Procedure

The shelf was mounted in the manner in which it was designed and a dial indicator was positioned under the center of the shelf and adjusted to zero. Thirteen 10 pound sand bags were uniformly distributed on the shelf to obtain a loading of 40 pounds per square foot of shelf area and the deflection was recorded. The weight was then removed from the shelf.

7.1.3 Acceptance Level

The deflection of the shelf under load - 0.245” which is less than the allowable maximum of 0.25." There was no significant permanent distortion of the shelf.

WALL CABINET LOADING TEST

8.1.1 Purpose of Test

The test demonstrates the strength of the back of the wall cabinet as well as the joinery of the cabinet and function of the doors when the unit is subjected to loads normally expected for laboratory furniture.

8.1.2 Test Procedure

130 pounds of sand bags, 40 pounds per square foot, were used to load the cabinet bottom, the cabinet top and shelves. With the weight in place the doors were operated through their full travel to verify normal operation. The weight was then removed and the doors were again operated through their full travel to verify normal operation.

8.1.3 Acceptance Level

Doors opened and closed normally with and without the weight in place. There is no significant permanent deflection or damage to cabinet, cabinet back, cabinet top, cabinet bottom or shelf.

TABLE TEST

9.1.1 Purpose of Test

This test will demonstrate the structural integrity of the table construction when subjected to a racking load. Most racking failures occur upon dragging an unloaded table across a floor. The ability of a table to resist a racking load will indicate less damage to the structure. The following tests were based on and adapted from ANSI/ BIFMA X5.5-1989 American National Standard for Office Furnishings "Desk Products-Tests." Adjustments have been made to better accommodate the specific applications of tables used in laboratories.

9.1.2 Test Procedure

The table shall have a common two-by-four wood rail clamped on the center line of the top parallel to the ends of the table. The table shall then be positioned at 45°, with one pair of legs on the floor and the other raised and supported (see Figure 14). The table shall then have 250 pounds (113.398 Kg) of weight (five 50-pound (22.679 Kg) bars) placed on its top and held in place by the two-by-four wood rail. The unit shall remain in this position for seventy-two hours. The unit shall be lowered without shock to the leveled surface and the general operation of the drawers shall be evaluated.

9.1.3 Acceptance Level

When returned to normal position, the operation of the table was normal, and there was no permanent damage.

DIVERSIFIED CASEWORK

[SEFA RESULTS]

CHEMICAL RESISTANCE TESTING
(RATING SCALE)

LEVEL 0 = NO DETECTABLE CHANGE
LEVEL 1 = SLIGHT CHANGE IN COLOR OR GLOSS
LEVEL 2 = SLIGHT SURFACE ETCHING OR SEVERE STAINING
LEVEL 3 = PITTING, CRATERING, SWELLING, EROSION OF COATING, OBVIOUS & SIGNIFICANT SRETIORATION

CHEMICAL	RATING	COMMENTS
Amyl Acetate	0	
Ethyl Acetate	0	
Acetic Acid 98%	0	
Acetone	0	
Acid Dichromate 5%	0	
Butyl Alcohol	0	
Ethyl Alcohol	0	
Methyl Alcohol	0	
Ammonium Hydroxide 28%	2	Severe staining (dark became black)
Benzene	0	
Carbon Tetrachloride	0	
Chloroform	0	
Chromic Acid 60%	0	
Cresol	0	
Dichloro Acetic Acid	1	Slight change in gloss
Dimethylformanide	0	
Dioxane	0	
Ethyl Ether	0	
Formaldehyde 37%	0	
Formic Acid 90%	0	
Furfural	0	
Gasoline	0	
Hydrochloric Acid 37%	0	
Hydrofluoric Acid 48%	2	Severe staining (surface became white)
Hydrogen Peroxide 3%	0	
Tincture of Iodine	2	Severe staining (surface became yellow)
Methyl Ethyl Ketone	0	
Methylene Chloride	0	
Mono Chlorobenzene	0	
VM&P	0	
Nitric Acid 20%	0	
Nitric Acid 30%	0	
Nitric Acid 70%	2	Severe staining (surface became brown)
Phenol 90%	0	
Phosphoric Acid 85%	0	
Silver Nitrate (Saturated)	0	
Sodium Hydroxide 10%	2	Severe staining (dark grain became black)
Sodium Hydroxide 20%	2	Severe staining (dark grain became black)
Sodium Hydroxide 40%	2	Severe staining (dark grain became black)
Sodium Hydroxide Flake	0	
Sodium Sulfide (Saturated)	0	
Sulfuric Acid 25%	0	
Sulfuric Acid 85%	2	Severe staining (dark grain became brown)
Sulfuric Acid 96%	2	Severe staining (dark grain became black)
Sulfuric Acid 85% & Nitric Acid 70% (Equal Parts)	1	Slight change in color (yellow stain)
Toluene	0	
Trichloroethylene	0	
Xylene	0	
Zinc Chloride Saturated	0	
TOTAL OF ALL RATINGS	**20**	

FINISH TEST

10.1.1 Purpose of Test

The purpose of the chemical spot test is to evaluate the resistance the finish has to chemical spills.

10.1.2 Test Procedure

The received sample measuring 14" x 24" was tested for chemical resistance as described herein. The panel was placed on a flat surface, cleaned with soap and water, then blotted dry. The panel was conditioned for 48 hours at 73+3˚F and 50+ 5% relative humidity. The panel was then tested for chemical resistance using forty-nine different chemical reagents by one of the following methods.

Method A - Volatile chemicals were tested by placing a cotton ball saturated with reagent in the mouth of a 1-oz. bottle an inverting the bottle on the surface of the panel.

Method B - Non-volatile chemicals were tested by placing five drops of the reagent on the surface of the panel and covering with a 24mm watch glass, convex side down. For both methods, the reagents were left on the panel for a period of one hour, then washed off with water, cleaned with detergent and naptha, and rinsed with deionized water. The panel was then dried with a towel and evaluated after 24-hours at 73± 3˚F and 50 ± 5% relative humidity.

10.1.3 Acceptance Level

Chemical test exceeded the requirements of no more than four of 49 chemicals tested failed with a fail rate of three.

HOT WATER TEST

10.2.1 Purpose of Test

The purpose of this test is to insure the coating is resistant to hot water.

10.2.2 Test Procedure

Hot water (190˚F. to 205˚F) was allowed to trickle with a steady stream and at a rate of not less than 6 ounces/minute on the finished surface, which was set at an angle of 45˚, for a period of five minutes.

10.3.3 Acceptance Level

After cooling and wiping dry, the finish showed no visible effect from the hot water.

IMPACT TEST

10.3.1 Purpose of Test

The purpose of this test is to evaluate the ductility of the coating.

10.3.2 Test Procedure

A one-pound ball approximately 2" in diameter was dropped from a distance of 12" onto the flat horizontal surface, which was coated to DWI standard manufacturing method.

10.3.3 Acceptance Level

There is no visual evidence to the naked eye of cracks or checks in the finish due to impact.

SECTION 12 35 53.19 – Wood Laboratory Casework

PART 1: DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE

A. Section Includes:

1. All cabinets and casework, including tops, ledges, supporting structures, and miscellaneous items of equipment as listed in these specifications, or equipment schedules including delivery to the building, setting in place, leveling, scribing to walls and floors as required. Furnish and install all filler panels, knee space panels and scribes as shown on drawings. Installation shall be completed by a factory certified installer.

2. Furnish and deliver all utility service outlet accessory fittings, electrical receptacles and switches, as listed in these specifications, equipment schedules or as shown on drawings as mounted on the laboratory furniture. Items shall be furnished with supply tank nipples and lock nuts, loose in boxes and properly marked. All plumbing and electrical fittings will be packaged separately and properly marked for delivery to the appropriate contractor.

3. Furnish and deliver, packed in boxes for installation by the mechanical contractor, all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor and where these items are part of the equipment or listed in the specifications, equipment schedules or shown on the drawings. Integral tailpieces when required shall be in accordance with the manufacturer's standards. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.

4. Furnish service strip supports and set in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the details.

5. Remove of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory casework to an onsite container provided by others, leaving the premises clean and orderly.

B. Related Divisions:

1. Divisions 05 00 00 & 06 00 00 : Behind-the-Wall Blocking and Studs
2. Division 09 00 00 : Base Molding
3. Division 11 53 13 : Chemical Fume Hoods
4. Division 22 00 00 : Plumbing
5. Division 26 00 00 : Electrical Fittings and Connections

C. Related Publications:

1. Architectural Woodwork Institute Quality Standards, 8th Edition
2. NFPA 30 – National Fire Protection Association
3. NFPA-45 - National Fire Protection Association
4. UL - Underwriters Laboratory
5. ASTM D552 - Bending Test
6. SEFA 8 W – Laboratory Furniture

1.01 BASIS OF WORK

A. This specification uses Diversified Casework (www.diversifiedcasework.com) - Majestic Series (reveal overlay) as the standard of construction for wood laboratory casework. The construction standards of this product line shall provide the basis for quality and functional installation. Pricing from other manufacturers must be submitted as an alternate in order to assure quality standards are maintained.

B. Supply all equipment in accordance with this specification. **No alternates, deviations or exceptions to the specified construction or materials are allowed.**
C. As a means of maintaining the desired level of quality, any and all other manufacturers shall be submitted as an alternate to the specified product provided by Diversified Casework.

D. The owner / owner representative reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.

1.02 QUALITY ASSURANCE – the following items are required components of this specification and cannot be modified.

A. The wood laboratory furniture contractor shall also provide work tops and fume hoods to assure proper staging, shipment and single source responsibility.

B. Each cabinet shall be foam and shrink wrapped to ensure cabinet surfaces are protected until the time of installation. Blanket-wrap is not allowed because they do not stay with the cabinets after delivery and because they are not assured of being grease and dirt-free.

C. SEFA Compliance and Assurance: Wood cabinets shall be capable of passing all tests contained in SEFA-8-W. Documentation shall be provided showing independent testing and compliance with SEFA-8-W.

D. MAS and/or Green Guard Certification: Manufacturer shall provide current documentation proving compliance and certification with either MAS or Green Guard small-scale chamber emissions test. Wood products shall be MAS Certified Green® and/or GreenGuard® Certified.

E. Casework shall be installed by a factory certified installer or Lifetime Warranty shall be negated to a 2 year warranty.

F. Cabinets shall be manufactured with dowel construction placed on a maximum 63mm on-center.

G. Cabinets shall use a minimum of 2 mechanical fasteners along with dowel construction in securing the toe-space panel.

H. Cabinets shall use a full sub-top construction composed of a minimum of ¾” veneer core plywood.

I. Cabinet faces shall be vertically grain matched within door and drawer faces.

J. Wall cabinets shall be provided with ¾” X 3” screw strips at both the top and bottom behind the cabinet back and doweled into both cabinet sides. Screws shall be applied via pocket hole fastener systems.

1.03 SUBMITTALS

A. Submit compliance statement with bid – see page 12 of this specification.

B. Casework samples will be required and reviewed per specification. Samples shall be delivered, at no cost to the architect or owner, to a destination set forth by the architect or owner. This must be done seven (7) days before quotation deadline as a condition of approval of each bidder. Samples shall be full size, production type samples as will be delivered for the project. Furnish the following:

1. One combination drawer and cupboard base unit, including one shelf.

2. One sample of all top materials shown or called for.

3. Sample of all mechanical service fittings, locks, door pulls, hinges, and interior hardware.

C. Submit shop drawings for furniture assemblies showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fittings.

1. Coordinate shop drawings with other work involved.

2. Provide roughing-in drawings for mechanical and electrical services when required.

PART 2 – PRODUCTS

2.00 MANUFACTURERS

A. The basis of this specification is Diversified Casework (www.diversifiedcasework.com) - Majestic Series. No exceptions, deviations or alternates to the specified construction or materials are allowed.

B. **Lifetime warranty**: The selected manufacturer must warrant for the life of the product in the application and location installed, starting at the date of acceptance or occupancy, whichever comes first, that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer's representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.

C. All manufacturers must submit samples in accordance with this specification.

D. The architect will impound the above samples of the successful manufacturer or owner to insure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.01 MATERIALS

A. It is the intent of this specification to provide a high quality wood cabinet specifically designed for the lab environment.

B. Hardwood shall be kiln-dried, clear and free of defects and shall meet surface requirements as specified below.

C. Plywood shall be of balanced construction and ¾" 7-ply veneer core hardwood plywood for shelves, cabinet ends, tops and bottoms of base and tall cabinets; 1" 9-ply veneer core hardwood plywood for shelves over 36", bottoms of wall and upper cabinets, and tops of wall, upper and tall cabinets; nominal ½" 9-ply veneer core plywood for drawer body; ¾" 3-ply particleboard core plywood for cabinet doors and drawer heads. Plywood shall meet the standards of ANSI/HPVA HP-1-2009.

D. Casework parts shall be as defined in AWI Quality Standards, 8th Edition, 400-G-3.

E. Exposed surfaces shall be of plain-sliced, HPVA Grade A Northern Red Oak veneers and compatible clear, defect-free Red Oak hardwood lumber. Veneers shall be selected for golden wheat color and narrow hearts of no more than 5". No split hearts are allowed. Appalachian and Southern red oak veneers are not allowed.

F. Semi-exposed surfaces shall be plain sliced, HPVA Grade 1 Northern Red Oak veneers and compatible clear, defect-free Red Oak hardwood lumber. Appalachian and Southern red oak veneers are not allowed.

G. Concealed surfaces shall be no less than HPVA Grade D face or Grade 3 back veneers and compatible mill option, hardwood lumber, suitable for the application..

H. Edging for cabinet parts shall be 3 mm hardwood edging of compatible hardwood Red Oak.

I. Hardboard shall be ¼” thick 55 lb. density hardwood chip fiberboard formed with heat and pressure into sheets providing a hard, smooth surface.

J. Glass used for framed sliding and swinging doors shall be 3/16" tempered glass. Glass used for unframed sliding doors, shall be 1/4" tempered glass.

K. Drawer and door pulls shall be satin finish, zinc coated wire type, 96 mm centers, offering a comfortable hand grip, and be securely fastened to doors and drawers. Two pulls shall be required on all drawers over 24" long.

L. Hinges shall be BHMA Grade 1 of **stainless steel**, five (5) knuckle institutional, .083" thick, offset type for all swinging doors. Hinges shall be 2- ½” long, one (1) pair for doors under 4 ft. in height and 1-1/2 pair on doors over 4 ft. in height. Hinges are mounted with flathead screws, so applied to door and cabinet to withstand a weight load of 150 lbs. minimum.

M. Locks when shown or called for shall be a National Lock, 5-disc tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin). Locks shall have capacity for 200 primary key changes. Master key one level with the potential of 200 different, non-interchangeable master key groups.

N. Roller catches shall be used on swinging doors. Catches shall have two spring-loaded polyethylene rollers and metal catch to secure doors. Double doors without locks shall have a catch on each door. Full height cases shall have 3-point latching devices. Magnetic catches are not allowed.

O. Leg shoes shall be provided on all table legs, unless otherwise specified, to conceal leveling device. Shoes shall be 2-1/2" high and made of pliable, black rubber material. Use of a leg shoe, which does not conceal leveling device, will not be acceptable.

P. Floor glides, where specified for movable open-leg tables, shall be a non-skid material at least 1" diameter to prevent indenting composition flooring and shall have at least a 5/8" height adjustment. Use of metal buttons will not be acceptable.

Q. Dowels used to join frames and panels shall be fluted hardwood not less than 8 mm in diameter. Dowels shall be spaced at a maximum of 64mm on center.

R. Shelf support clips shall be “seismic” twin pin type for mounting on interior of cabinet work. Clips shall be corrosion resistant and shall retain shelves from accidental removal. Shelves in all cabinets are adjustable on 32mm centers. Single pin support clips and surface mounted metal support strips and clips are not acceptable.

S. Base molding and stainless steel corner clips shall be provided by others.

T. Upright rods, cross rods and ring support rods, where specified, shall be aluminum (1/2" or 3/4" dia., as required). Rod sockets shall be aluminum, secured through table tops with lock nut and washer. Rod clamps shall be heavy duty, designed to securely hold rod assembly in any position. Use of wood rod assemblies will not be accepted.

U. Label holders, where shown or called for, shall be stainless steel, brad-attached type with satin finish and designed for 2" x 1" cards.

V. Number plates, where shown or called for, shall be brass brad-attached type with satin finish and indented black lettering.

W. Sink supports, where required, shall be of a cradle type consisting of two 1-1/2” x 3/4” horizontal cleats and adjustable leveling bolts or glides. The horizontal cleats shall be supported by two 1/8” x 1-1/2” angle irons attached to the cabinet end panels.

2.02 CONSTRUCTION

A. Open-leg Tables: Legs shall be Red Oak hardwood construction, 2-1/4" square with ¼" radius on all corners. Legs shall be secured to the apron frame by a heavy-duty corner bolt and a 13-gauge steel corner brace. Corner braces shall be locked into apron rails by accurately located grooves and shall be securely fastened with screws. All apron rails shall be 13/16" thick solid Red Oak. Top shall be attached using zinc coated screws through pocket holes in the apron. Leg stretchers, where required, shall be 7/8" x 2-1/2", secured with a 4" long through-bolt.

B. Base Cabinets shall consist of the following minimum construction:

1. Joinery must meet AWI Premium Grade requirements and these specifications.
2. End panels shall be multiple doweled and glued to top frame members, intermediate rails and bottoms. Dowel spacing shall be a maximum of 64mm on center.
3. Cabinet bottoms shall be multiple doweled and glued to end panels. Dowel spacing shall be a maximum of 64mm on center.
4. Toe space shall be 4" high and fully enclosed. Toe space shall be attached with a minimum of 4 dowels and shall also be mechanically fastened to each end panel with screw fasteners.
5. Edging shall be provided on the front edges of ends, tops, bottoms and shelves, and on all four edges of door and drawer fronts.
6. Cabinet top shall be composed of a single full sub-top composed of a ¾" veneer core plywood that has been doweled and glued to all end panels. A cutout in the top shall be provided in order to provide for ease of installation and leveling of tops.
7. Intermediate rails ($^3/_4$" x 2-½" hardwood per parts definition) shall be multiple doweled and glued to end panels at the front of the cabinet between drawers and between drawers and doors.
8. Screw strips ($^3/_4$" by 3" veneer core hardwood plywood) shall be located at the top and bottom behind the cabinet back and multiple doweled to the cabinet ends.
9. Hardboard cabinet backs shall be fully captured and dadoed into end panels and bottoms, with full perimeter gluing around the rear of the back. Where a removable back is indicated, it shall be an additional piece applied to cover an opening that is added to the fully captured back. (Backs are to meet the visual requirement of cabinet parts.)
10. Shelves shall be ¾" thick in cabinets up to 36" wide, 1" thick in all cabinets over 36" wide. (Front edges of shelves are to meet the visual requirement of cabinet parts.)
11. Drawer box shall be four-sided (sub-front, sides and back), each panel made of nominal ½" thick, 9-ply Baltic Birch plywood and joined to adjacent panels by full glue and multiple dovetail joinery all four corners.
12. Drawer bottom ($^1/_4$" on drawers under 42" wide, ½" on larger drawers) shall be melamine faced hardboard (appearance to meet visual appearance of drawer box), dadoed into all four drawer box sides with full perimeter gluing on the underside.
13. Door and drawer heads shall be 3/4" thick plywood with edging as specified to resist warping. Reveals shall be 1/8" vertically and ¼" horizontally between door and drawer heads and 7/16" on end panels. Face veneers shall be vertically grain matched.
14. Drawer slides shall be easily removable with a 100 lb. dynamic load rating and nylon roller bearings, powder coated surfaces, self-closing and with hold-open feature. Slides shall be attached to the drawer box both from below and the side. File drawers shall be full extension, 150 lb. dynamic load rating mounted to the drawer sides.

C. Full Height Sliding Door Cases:

1. Shall be designed and constructed for full enclosure to assure dust proofing of the interior.
2. Tops shall be 1" thick plywood, multiple doweled into end panels, secured with glue.
3. A double extruded aluminum track shall be attached to the case top for suspension system when sliding doors are called for. Doors shall be suspended from an adjustable hanger and glide on nylon roller wheels. An aluminum U-channel is located on the case bottom to guide the bottom of the doors.
4. Solid panel doors shall be 3/4" thick plywood with edging as specified.
5. Glazed doors shall have 2-3/4" x 7/8" thick framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer.
6. Doors shall be removable without use of tools, and so designed to prevent by-passing.
7. Shelves shall be ¾" thick in cabinets up to 36" wide, 1" thick in all cabinets over 36" wide.

8. To assure a rigid case, the center shelf is structurally joined to the end panels and glued.
9. Case bottoms shall be 3/4" thick plywood, multiple doweled and glued securely to end panels.
10. A 3” full width strip shall be doweled and mechanically fastened into the side panels of the cabinet at both top and bottom of the back and used for attaching the cabinet to wall.
11. Toe space, 2-¼” deep x 4” high, shall be totally enclosed by a ¾” x 4" plywood rail**.**
12. Backs in open and glazed door cases shall be 1/4" plywood; backs not exposed to view shall be 1/4" high-density fiberboard.
13. Case interior shall be flush.

D. Full Height Swinging Door Cases: General construction features shall be the same as for sliding door cases except for the following:
1. Doors shall overlap opening on all four sides.
2. A 3” full width strip shall be doweled and mechanically fastened into the side panels of the cabinet at both top and bottom of the back and used for attaching the cabinet to wall.
3. Hardwood door rails shall be mitered at corners.
4. Astragal applied to left hand door shall provide further dust proofing.

E. Wall-Hung Sliding Door Cases: General construction features shall be the same as for full height type cases with the following exception:
1. A 3” full width strip shall be doweled and mechanically fastened into the side panels of the cabinet at both top and bottom of the back and used for attaching the cabinet to wall.
2. Case bottoms shall be 1” thick plywood, multiple doweled and glued securely to end panels.

F. Wall Hung Swinging Door Cases: Construction and materials shall be the same as for sliding door cases with the following exceptions:
1. Panel or glass framed doors shall be hung on 1 pair of offset, institutional type hinges under 48" in height. Doors on cases 48" high shall have 1-1/2 pair of offset, institutional type hinges.
2. All doors shall overlap opening four sides.
3. A 3” full width strip shall be doweled and mechanically fastened into the side panels of the cabinet at both top and bottom of the back and used for attaching the cabinet to wall..
4. Glass doors shall use mitered corners for the hardwood stiles and rails.
5. Astragal applied to left hand door shall provide further dust proofing.

2.03 FINISH AND PERFORMANCE REQUIREMENTS

A. Wood Surface Preparation: Prior to application of the wood finish, case and cabinet surfaces shall be smoothly sanded to remove loose fibers, scratch marks and abrasions, with all dust thoroughly removed by compressed air. Finish shall be applied to cabinet parts prior to assembly in order to assure uniform coverage.

B. Wood Stain Color: Selected from Manufacturer’s standard selection

C. Wood Finish Application: Finishes shall be applied and cured under controlled atmospheric conditions, aided by infrared radiant heaters. Finish must be VOC-free. Finish shall be applied via a flat line, roller applied system prior to cabinet assembly in order to assure uniform coverage.

D. Interior Wood Casework Finish: Interior surfaces shall receive a triple application of an acid, alkali, solvent, water and abrasion resistant finish meeting AWI requirements.

E. Exterior Wood Casework Finish: Exposed exterior surfaces, including interiors of glazed cases and open shelving, shall be provided with a acid, alkali, solvent, water and abrasion resistant finish meeting both AWI section 1500 and SEFA 8 requirements. Finish shall be applied to cabinet parts prior to assembly in order to assure uniform coverage.

2.04 WORKSURFACES

SOLID EPOXY RESIN:

Sheets cast from modified 1” epoxy resin and non-asbestos inert fillers; compounded mixture cured and thermoset specifically from formulation to provide exceptional physical and chemical resistance required in medium to heavy duty laboratory environments. Color shall be black.

ACCESSORIES

Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, reagent racks where indicated.

Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

FABRICATION

Fabricated tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.

Epoxy Resin Worksurfaces:

1. Thickness:
a. 1 inch (25 mm) unless otherwise indicated.
b. Check each sheet at factory for required thickness.
c. Maximum variation in thickness: plus or minus 1/16 inch (1.6 mm) from corner to corner.
2. Warpage:
a. Inspect tops for warpage prior to fabrication by placing on true flat surface.
b. Maximum allowable warpage: 1/16 inch (1.5 mm) in 36 inch (900 mm) span or 3/16 inch (4.5 mm) in 96 inch (2400 mm) span.
3. Fabrication:
a. Shop fabricate in longest practical lengths.
b. Bond joints with highly chemical resistant cement with properties and color similar to base material.
c. Provide 1/8 inch (3 mm) drip groove at underside of exposed edges, set back 1/2 inch (13 mm) from face.
d. Finish exposed edges.
4. Edge treatment: Standard 1/8 inch (2 mm) chamfered edge.
5. Corner treatment: exposed corners shall be eased slightly for safety.
6. Back and end splashes:
a. Supplied loose for field installation.
b. Same material and thickness as worksurfaces.
c. 4 inches high unless otherwise indicated.
d. Top-mounted end splash where worksurfaces abut adjacent construction at and locations indicated on Drawings.
7. Joints:Maximum 1/8 inch (2 mm), bonded with epoxy grout.
8. Make joints between two benches level.
9. Locate joints away from sinks and over or near supports.
10. Sink cutouts: Routed for drop-in sink.
11. Allowable tolerances:
a. Square: Plus or minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.

b. Location of cutouts and drilled openings: Plus or minus 1/8 inch (3 mm) of design dimension.
c. Size of cutouts and drilled openings: Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).

Epoxy Resin Sinks:

1. Mold sinks from thermosetting epoxy resin.
2. Mold interior corners to radius. Slope sink base to drain outlet.
3. Provide 1-1/2 inch (38 mm) outlet with open ended standpipe; standpipe overflow 2 inches (50 mm) shorter than depth of sink.
4. Unless otherwise indicated, fabricate sinks of drop-in design supported by upper flange from worksurface.
5. Color: To match adjacent worksurface.

2.05 SERVICE FITTINGS AND ACCESSORIES

A. MATERIALS:

1. Laboratory Service Fittings:
   Service fittings shall be laboratory grade, and water faucets and valve bodies shall be cast red brass alloy or bronze forgings, with a minimum content of 85%. All fittings shall be chromium plated unless specified otherwise.

2. Plastic Coated Finish (Sepia Bronze):
   When specified, laboratory service fittings shall have an acid resistant plastic coating applied over a fine sand-blasted surface. Surfaces shall be sprayed and baked three times with a minimum thickness of .0005 to .0010 mils. (See Performance Ratings).

3. Service Indexes:
   Fittings shall be identified with service indexes in the following color coding:

   Hot Water..... Red
   Cold Water..... Dark Green
   Gas ..... Dark Blue
   Air..... Orange
   Vacuum..... Yellow
   Distilled Water.. White
   Steam ..... Black
   Nitrogen ..... Brown
   Oxygen ..... Light Green
   Hydrogen ..... Pink
   Special Gases.. Light Blue

B. CONSTRUCTION:

1. Water Fittings:
   Water fittings shall be provided with a renewable unit containing all operating parts which are subject to wear. The renewable unit shall contain an integral volume control device and all faucets shall be capable of being readily converted from compression to self-closing, without disturbing the faucet body proper. Four (4) arm forged brass handles shall contain plastic screw-on type colored service index buttons.

2. Steam Fittings:
   Steam fittings shall have a black, heat resistant composition handle, and shall be the heavy pattern design with stainless steel removable seat and flat Teflon seat disc. They shall have Teflon impregnated packing, and shall be so constructed that they can be repacked under pressure.

3. Distilled Water Fittings:
   Distilled water fittings shall be chromium plated cast bronze with the interior tin lined, and shall be the self-closing type, or shall be made of aluminum and not be the self-closing type. Handles shall be furnished with tamper-proof and vandal resistant service indexes.

4. Laboratory Ball Valves:
   Laboratory ball valves shall have a forged brass valve body with a non-removable serrated hose end and a forged brass lever-type handle with a full view color-coded index button. Valves shall have a floating chrome plated brass ball and molded TFE seals. Valves shall be certified by CSA International for use with natural gas under ANSI Z21.15./CGA9.1

5. Needle Valve Hose Cocks:
   Needle type valves shall have a stainless steel replaceable floating cone, precision finished and self-centering. Cone locates against a stainless steel seat, easily removable and replaced with a socket wrench. Valve shall have "TEFLON" impregnated packing and designed so unit can be repacked while under pressure.

6. Gooseneck Type Outlets:
   Gooseneck outlets shall have a separate brazed coupling to provide a full thread attachment of anti-splash, serrated tip or filter pump fittings.

7. Remote Control Valves:
   All valves for remote control use shall be as previously specified, but shall be complete with aluminum extension rods, escutcheon plates, brass forged handles and screw-on type colored service index button.

8. Tank Nipples:
   Tank nipples shall be provided with locking nut and washer for all fixtures where fittings are anchored to equipment.

9. Sink Outlets:
   Unless otherwise specified, sink outlets for other than stainless steel sinks shall be sin, with integral cross bars, tapered for overflow and be complete with gasket and lock nut with 1-1/2" I.P.S. male straight thread outlet. Overflows shall not be furnished for sink outlets unless specifically called for.

10. Crumb Cup Strainers:
    Crumb cup strainers shall be stainless steel or chromium plated brass, as specified, and shall be furnished for stainless steel sinks, and be complete with gasket, lock nut and 4" long unthreaded tailpiece outlet in 1-1/2" size.

11. Vacuum Breakers:
    Vacuum breakers where required shall be "Nidel" or "Watts" unless otherwise specified or identified to be an integral part of the water fixture assembly.

12. Aerator Outlets:
    Aerator type outlets shall be furnished for all gooseneck water faucets not furnished with serrated hose connectors.

13. Waste Lines:
    Waste lines shall be furnished by other trades.

14. Traps:
    Traps shall be furnished by other trades.

15. Electrical Fittings:
    Electrical fittings shall contain 20 Amp., 125 Volt AC, 3-wire polarized grounded receptacles, unless otherwise specified. Pedestal and line-type boxes shall be of aluminum, metallic finish

with stainless steel flush plates. Receptacle boxes shall be of plated steel. All electrical or conduit fittings called for or to be furnished under these specifications shall meet the requirements of the National Electrical Code.

C. PERFORMANCE:

1. Maximum Line Pressures:
   Laboratory Ball Valves (Gas and Air).....75 PSI
   Needle Point Cocks (Gas and Air).....65 PSI
   Vacuum .....28.5" Mercury
   Hot and Cold Water.....80 PSI
   Steam .....30 PSI

2. Sepia Bronze Finish Performance:
   Finish shall show no rupture, other than a slight discoloration or possible softening when subjected to the following fumes for approximately six (6) days: Plastic coated fittings shall be suspended in a container, 6 cu. ft. capacity 12" above open beakers, each containing 199 cc. of 70% Nitric Acid, 94% Sulphuric Acid, 37-38% Hydrochloric Acid, respectively. Finish shall also withstand direct contact of reagents dropped from a burette at a rate of 60 drops/min. for a period of 10 minutes. Chemicals are shown below:

   Concentrated Hydrochloric Acid 37-38%*
   Concentrated Nitric Acid 70%*
   Concentrated Sulphuric Acid 94%
   Glacial Acetic Acid 99.5%*
   Ethyl and Other Alcohols
   Toulene and Other Hydrocarbons
   Carbon - Tetrachloride
   Mineral Oil

   *Percentages are by weight.

PART 3 - EXECUTION - LABORATORY CASEWORK AND RELATED PRODUCTS

3.00 SITE EXAMINATION

A. The owner and/or his representative shall assure all building conditions conducive to the installation of a finished goods product; all critical dimensions and conditions previously checked have been adhered to by other contractors (general, mechanical, electrical, etc.) to assure a quality installation.

B. Site conditions shall be in compliance with AWS Edition 1, Section 2.

3.01 INSTALLATION

A. Installer: Installer shall be certified by the factory as having the necessary skills and equipment to install the casework so as not to void the warranty.

B. Installation shall be to the standards set forth in SEFA 2 -2010 Installation

C. Preparation: Prior to beginning installation of casework, check and verify that no irregularities exist that would affect quality of execution of work specified.

D. Coordination: Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.

E. Performance:

1. Casework:

a. Set casework components plumb, square, and straight with no distortion and securely anchor to building structure. Shim as required using concealed shims.

b. Screw continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.

c. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board.

d. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.

2. Work surfaces:

a. Where required due to field conditions, scribe to abutting surfaces.

b. Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure the joints in the field, where practical, in the same manner as in the factory.

a. Secure work surfaces to casework and equipment components with materials and procedures recommended by the manufacturer.

3. Adjust and Clean:

a. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.

b. Adjust doors, drawers and other moving or operating parts to function smoothly.

c. Clean shop finished casework; touch up as required.

d. Clean work surfaces and leave them free of all grease and streaks.

e. Casework to be left broom clean and orderly.

F. Protection:

1. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.

2. Advise owner and/or his representative of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.

COMPLIANCE STATEMENT – SECTION 12 35 53.19

Project: _____

Bidding Company: _____

INSTRUCTIONS:

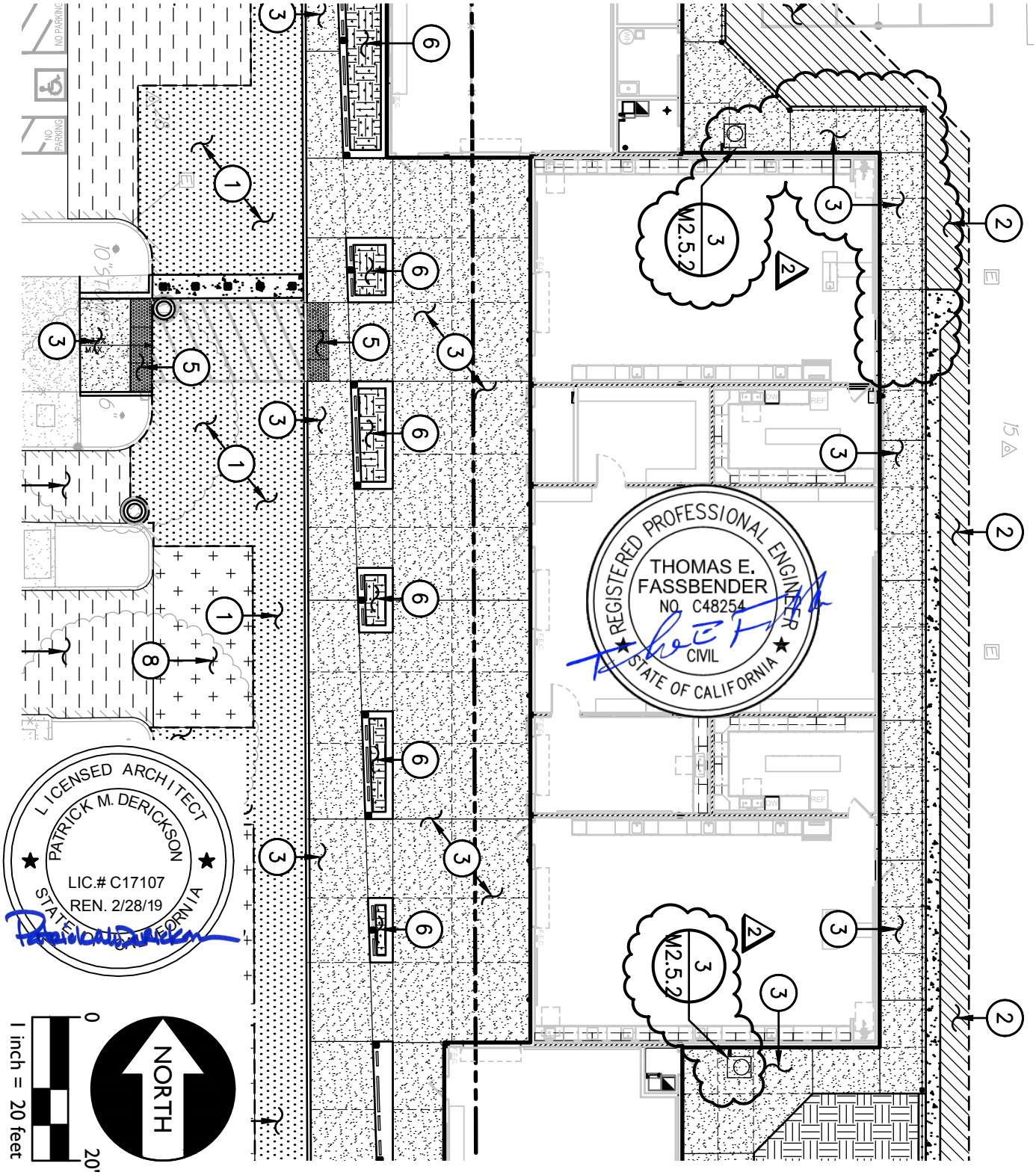
This Compliance Statement is to insure all bids are comparable products and meet specifications. Initial each item in appropriate column and sign at bottom. Submit completed statement with bid. Non-compliance and lack of completed Compliance Statement are cause for dismissal of bid.

	YES	NO
1 Lifetime warranty	____	____
2 Mechanical fastening at front toe base	____	____
3 AWI Premium hardwood dowel cabinet joinery - 64mm on center	____	____
4 MAS® or GreenGuard® Certified	____	____
5 HPVA Grade A-1 plain-sliced veneers , vertically matched	____	____
6 Independently tested to SEFA-8-W	____	____
7 Stainless steel five-knuckle institutional hinges	____	____
8 Screws strips at top and bottom on wall cabinets	____	____
9 Chemical-resistant finish meets AWI standards and is applied to parts prior to assembly via a flat line, roller applied system	____	____
10 Chemical-resistant finish meets SEFA standards and is VOC-free	____	____
11 Cabinets will be foam- and shrink-wrapped, not blanket wrapped	____	____

Our bid is for cabinets built per this compliance statement and the specifications as written.

Officer of the Bidding Company:

Signature Printed Title Date



STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME (REF. SHEET #)
C2.5.1 PAVING PLAN

DATE
05/04/18

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

PROJECT NO.
4800.00

DRAWING NO.
AD - 11

DRAWN BY
SMN

CHECKED BY
AT

REF.
ADDENDUM #3

GENERAL NOTES

A. SEE MECHANICAL DRAWINGS FOR ALL HVAC SUPPLY / RETURN EXHAUST FAN LOCATIONS.

B. SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURES AND LOCATIONS.

C. CEILING HEIGHTS MARKED WITH ELEVATION, IF IT IS A CONSTANT ELEVATION. CEILINGS WITHOUT ELEVATION TAGS ARE SLOPED TO MATCH ROOF SLOPE, SEE SECTIONS.

D. ALL DOOR HEADERS ARE 7'-2" AFF UNLESS NOTED OTHERWISE.

E. SEE WINDOW TYPE AND SCHEDULE FOR WINDOW HEAD ELEVATIONS.

F. SUSPENDED ACT CEILINGS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH **ASTM C635, ASTM C636/3 AND THE CISCA FOR SEISMIC ZONES 3-4** AS MODIFIED BY THE **2013** CALIFORNIA BUILDING CODE, CCR, TITLE 24.

G. ALTERNATE MEANS OF COMPLIANCE: INSTALLATION OF SEISMIC SUSPENSION SYSTEM WITH 7/8 INCH PERMIETER ANGLE AND BEAM END RETAINING CLIPS (BERC 2 CLIP) IN LIEU OF CODE REQUIRED 2" PERMIETER ANGLE FOR SUSPENDED ACOUSTICAL CEILINGS BERC 2 CLIPS WITH SCREW INSTALLED LOOSE IN SLOT TO ALLOW MOVEMENT OF SYSTEM AT FREE END. INSTALL #7 x 7/16 INCH SCREW ATTACHMENT AT FIXED END OF MAIN AND CROSS TEE RUNNERS TO PERMIETER TRIM.

H. A HEAVY DUTY T-BAR GRID SYSTEM SHALL BE USED.

I. SUSPENDED CEILINGS SHALL BE SUBJECT TO SPECIAL INSPECTION.

J. CEILING AREAS SHALL PROVIDE SPACE AROUND ALL SPRINKLER HEADS OR OTHER PENETRATIONS IN ORDER TO PROVIDE AT LEAST 1 INCH MOVEMENT IN ALL HORIZONTAL DIRECTIONS.

K. EACH VERTICAL HANGER SHALL BE MIN 12 GA. AND BE ATTACHED TO THE CEILING SUSPENSION MEMBER AND THE SUPPORT ABOVE WITH A MIN OF THREE TIGHT TWISTS IN 1-1/2 INCHES.

L. EACH VERTICAL HANGER SHALL BE CAPABLE OF CARRYING A LOAD OF NOT LESS THAN 200 POUNDS.

M. SUSPENSION WIRES MORE THAN 1 IN 6 OUT-OF-PLUMB SHALL HAVE A COUNTER SLOPING WIRE PROVIDED.

N. PERIMETER HANGERS AT THE ENDS OF EACH CROSS RUNNER AND MAIN RUNNER SHALL BE SUPPORTED INDEPENDENTLY A MAX. OF 8 INCHES OR 1/4 THE LENGTH OF THE END RUNNER WHICHEVER IS LESS FROM EACH WALL OR CEILING DISCONTINUITY.

O. HORIZONTAL RESTRAINT POINTS SHALL NOT BE PLACED MORE THAN 8 FEET BY 12 FEET ON CENTER. HORIZONTAL RESTRAINT WIRES SHALL BE MIN 12 GA. AND SECURED TO MAIN RUNNERS WITH FOUR TIGHT TWISTS IN 1-1/2 INCHES.
   1. AT HORIZONTAL RESTRAINT POINTS, PROVIDE BRACING ASSEMBLIES CONSISTING OF A COMPRESSION STRUT AND FOUR (4) HORIZONTAL RESTRAINT BRACING WIRES ORIENTED 90 DEGREES FROM EACH OTHER.
   2. THE SLOPE OF THE HORIZONTAL RESTRAINT WIRES SHALL NOT EXCEED 45 DEGREES FROM THE PLANE OF THE CEILING AND SHALL BE TAUT, SPLICES IN BRACING WIRES SHALL NOT BE PERMITTED.

P. ALL RECESSED OR DROP IN LIGHT FIXTURES AND DIFFUSER GRILLES SHALL BE SUPPORTED DIRECTLY FROM THE FIXTURE HOUSING TO THE STRUCTURE ABOVE WITH A MINIMUM OF TWO 12 GA. WIRES LOCATED AT DIAGONALLY OPPOSITE CORNERS. LEVELING AND POSITIONING OF THE FIXTURES MAY BE PROVIDED BY THE CEILING GRID. FIXTURE SUPPORT WIRES MAY BE SLIGHTLY LOOSE TO ALLOW THE FIXTURE TO SEAT IN THE CEILING GRID.

Q. ALL LIGHTING FIXTURES SHALL BE POSITVELY ATTACHED TO THE SUSPENDED CEILING SYSTEM. THE ATTACHING DEVICE SHALL HAVE A CAPACITY OF 100 PERCENT OF THE LIGHTING FIXTURE WEIGHT ACTING IN ANY DIRECTION.

R. LIGHTING FIXTURES WEIGHING 56 POUNDS OR MORE SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE BY APPROVED HANGERS. IN SUCH CASE THE CEILING SLACK WIRES MAY BE DELETED.

S. FIXTURES SHALL BE INSTALLED SO THAT MAIN RUNNERS OR CROSS RUNNERS WILL BE ECCENTRICALLY LOADED.

T. SURFACE MOUNTED FIXTURES SHALL BE ATTACHED TO THE MAIN RUNNER WITH AT LEAST TWO POSITIVE CLAMPING DEVICES MADE FROM MATERIAL A MIN OF 14 GA.. ROTATIONAL SPRING CATCHES ARE NOT ALLOWED. A 12 GA. SUSPENSION WIRE SHALL BE ATTACHED TO EACH CLAMPING DEVICE AND THE STRUCTURE ABOVE.

U. MECHANICAL TERMINALS AND SERVICES WEIGHING NO MORE THAN 56 POUNDS SHALL BE POSITIVELY ATTACHED TO THE MAIN RUNNERS OR TO THE CROSS RUNNERS WITH THE SAME CARRYING CAPACITY AS THE MAIN RUNNERS AND SHALL HAVE TWO 12 GA. HANGERS FROM THE TERMINAL OR SERVICE TO THE STRUCTURE ABOVE. THESE WIRES MAY BE SLACK.

V. MECHANICAL TERMINALS OR SERVICES WEIGHING 56 POUNDS OR MORE SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE BY APPROVED HANGERS.

W. CONDUITS AND CABLES SHALL BE SUPPORTED INDEPENDENTLY OF THE SUSPENDED CEILING SYSTEM.

X. MAIN RUNNERS AND CROSS RUNNERS ON TWO ADJACENT WALLS SHALL BE ATTACHED TO PERIMETER GRID BY APPROVED CLIPS AND SCREWS. PROVIDE A MIN. 3/4 INCH SPACE AT MAIN RUNNERS AND CROSS RUNNERS AT OPPOSITE WALLS.

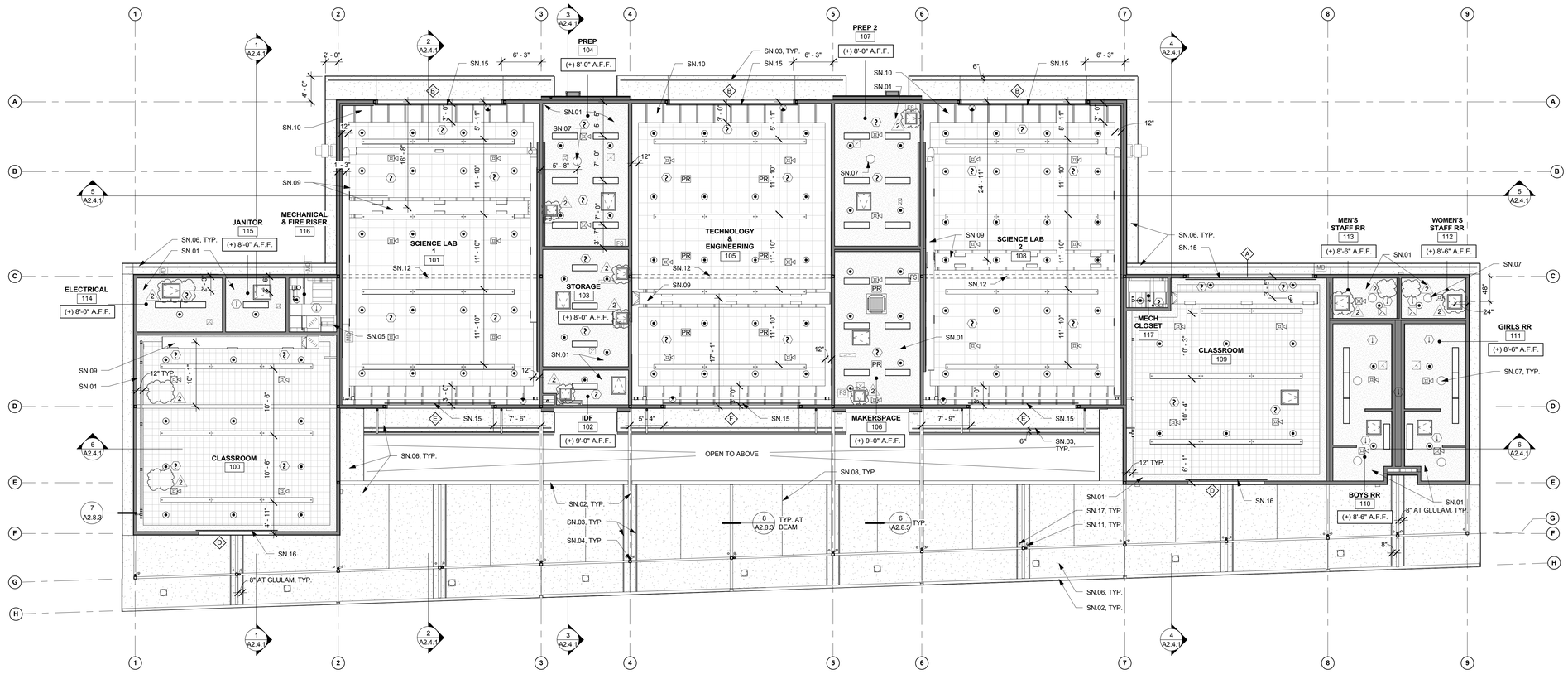
Y. USE UNPUNCHED STUDS AT SOLID BRACING LOCATIONS AND COMPRESSION STRUTS.

LEGEND

- WOOD FRAMED GYPSUM BOARD CEILING
- 12"x12" ACOUSTIC GLUE-UP TILE
- 24"x24" SUSPENDED ACOUSTIC TILE CEILING SYSTEM
- PORTLAND CEMENT PLASTER AT CEILING/SOFFIT
- TUBE SKYLIGHT DIFFUSER, PER DETAIL 14 / A2.8.1
- PR — POWER REEL DROP FROM CEILING, REFER TO ELECTRICAL DRAWINGS
- LIGHT FIXTURES, REFER TO ELECTRICAL DRAWINGS
- CEILING ACCESS PANEL, PER DETAIL 8 / A2.9.3
- SPRINKLER HEAD, REFER TO FIRE PROTECTION
- FIRE ALARM DEVICES, REFER TO ELECTRICAL
- ILLUMINATED EXIT SIGN

SHEET NOTES

SN.01	1/2" GYPSUM BOARD CEILING, SEE DETAIL 7 / A2.9.3
SN.02	EXPOSED STRUCTURE PER STRUCTURAL. PAINT/STAIN PER ARCHITECTS DIRECTION.
SN.03	PLASTER SOFFIT VENT SCREED. ALL AROUND AT HIGH ROOF, 6" INSET FROM FASCIA. 8" INSET FROM GLULAM BEAMS AT CANOPY
SN.04	STRUCTURAL COLUMN PER STRUCTURAL DRAWINGS.
SN.05	FIRE SPRINKLER RISER PER FIRE PROTECTION DRAWINGS.
SN.06	EXTERIOR PLASTER SOFFIT, PER DETAIL 7 / A2.8.3
SN.07	SOLAR TUBULAR SKYLIGHT, PER DETAIL 14 / A2.8.1
SN.08	PLASTER CONTROL JOINTS
SN.09	EXPOSED DUCTWORK, PER MECHANICAL DRAWINGS.
SN.10	PAINT HIGH CEILING ABOVE SUSPENDED CEILING PER ARCHITECTS DIRECTION.
SN.11	DOWNSPOUTS, PER 8 / A2.8.1 & 12 / A2.8.3
SN.12	GLU-LAM BEAM ABOVE
SN.13	GUTTER & DOWNSPOUT, PAINTED
SN.14	VALLEY GUTTER WITH RWL/OFL ABOVE
SN.15	MOTORIZED ROLLER SHADE, SEE WINDOW DETAILS & SCHEDULES
SN.16	MANUAL ROLLER SHADE, SEE WINDOW DETAILS & SCHEDULES
SN.17	OVERFLOW OUTLET, PER 8 / A2.8.1



1 **REFLECTED CEILING PLAN**
SCALE: 1/8" = 1'-0"

STAFFORD KING WIESE ARCHITECTS

PATRICK M. DERICKSON — LICENSED ARCHITECT — STATE OF CALIFORNIA
LIC.# C17107
REN. 2/28/19

801 T STREET
SACRAMENTO CALIFORNIA 95811
(916) 930-5900 FAX (916) 930-5800
EMAIL: mail@skwaia.com

CONSULTANT STAMP

Sacramento City Unified School District

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

AGENCY APPROVAL

FILE NO. **34 - H7**
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
02 - 115633
AC____ FLS____ SS____
DATE ____
INCREMENT 2

REVISIONS

NO.	DATE	DESCRIPTION
2	05/04/2018	ADDENDUM #3

KEY PLAN

SHEET NAME
REFLECTED CEILING PLAN

SUBMITTAL
CONSTRUCTION DOCUMENTS

PROJECT NO. **4800.00**
DRAWN BY **RG** | CHECKED BY **CG**
ISSUE DATE **04/03/2018**

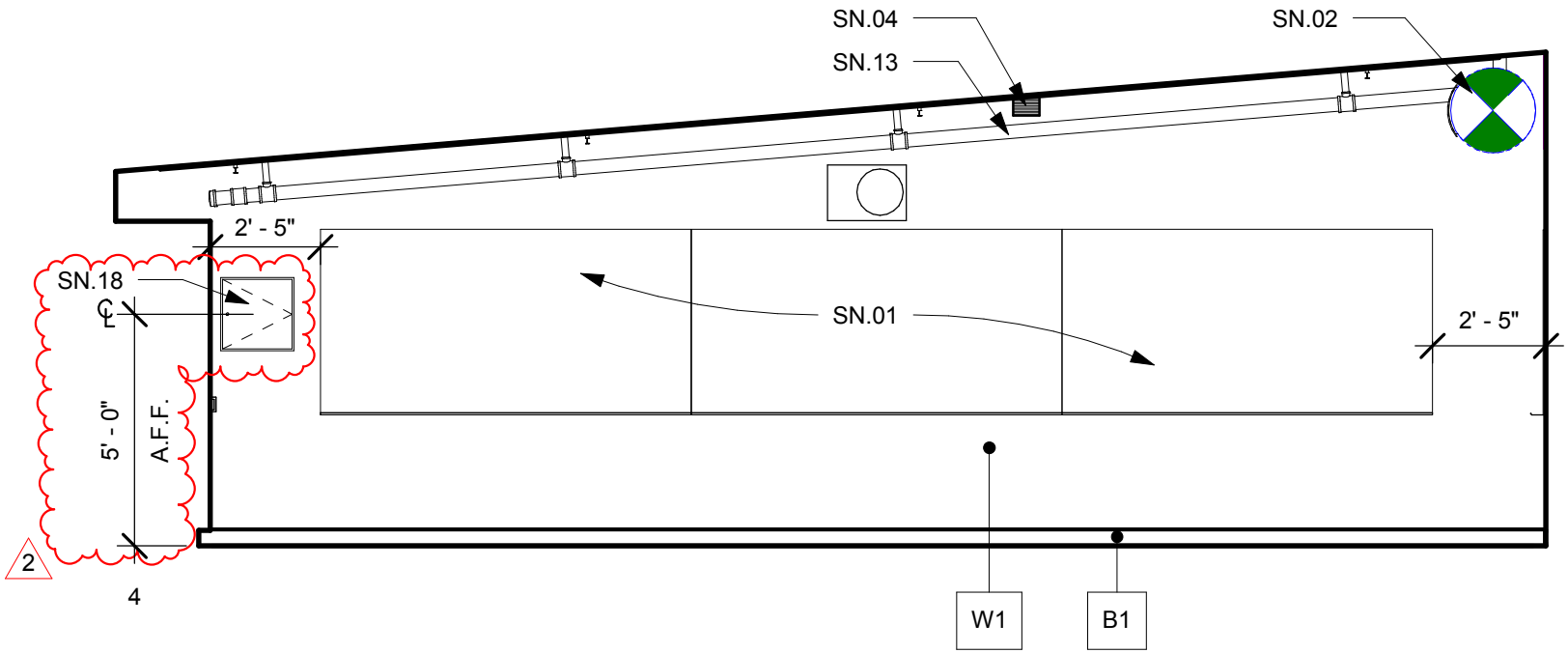
A2.2.4

EDIT DATE: 5/4/2018 12:47:37 PM
FILE PATH: C:\Users\rogan_greenhill\Documents\4800_West Campus_ARCH_CENTRAL_rogan_greenhill.rvt

SHEET NOTES

SN.18 18"x18" ACCESS PANEL, PAINT PER ARCHITECTS DIRECTION. 2

LICENSED ARCHITECT
PATRICK M. DERICKSON
LIC.# C17107
REN. 2/28/19
STATE OF CALIFORNIA



100 CLASSROOM 1

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

STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME (REF. SHEET #)
A2.6.1 INTERIOR ELEVATIONS

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

DATE
05/03/18

PROJECT NO.
4800.00

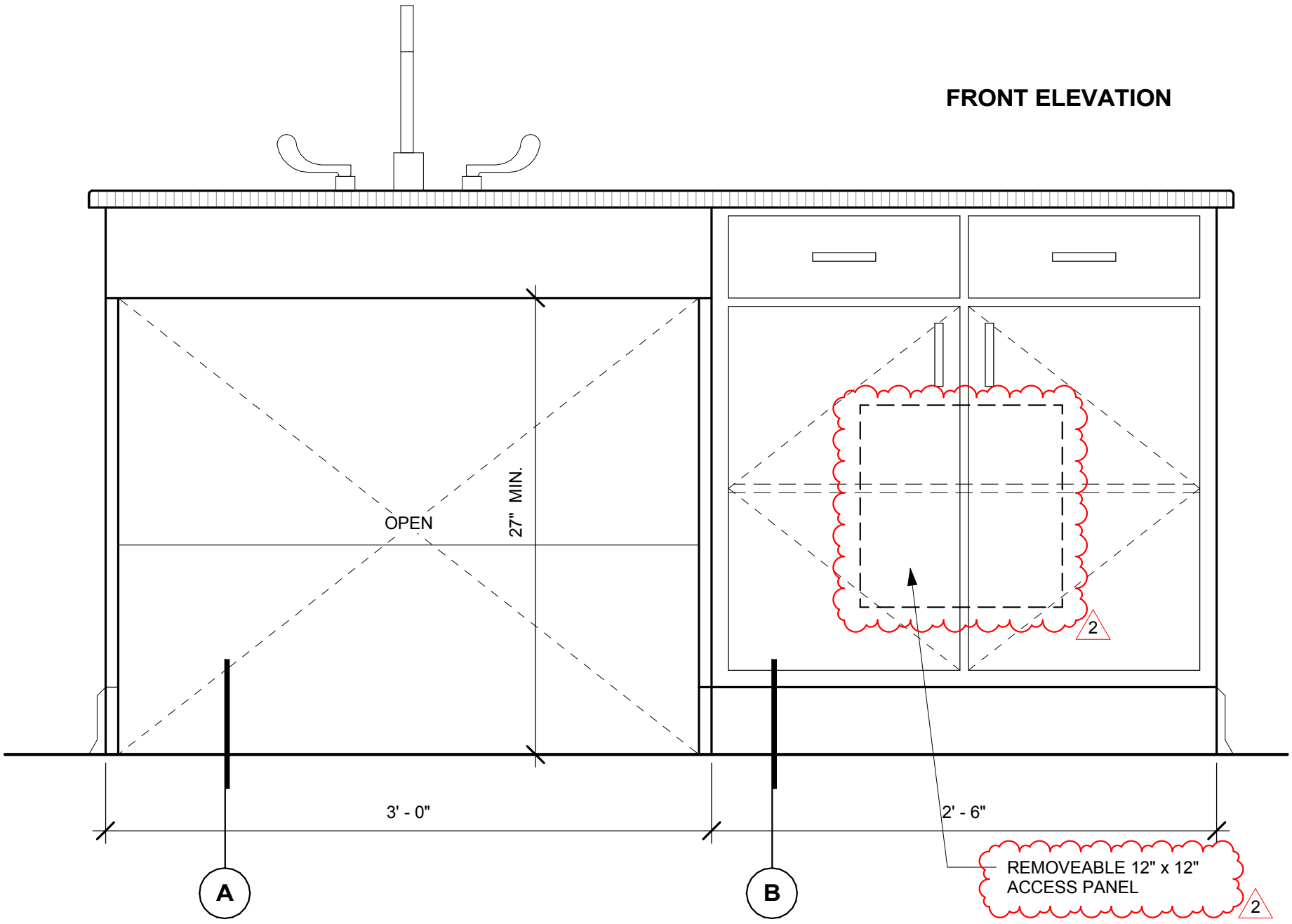
DRAWING NO.
AD - 12

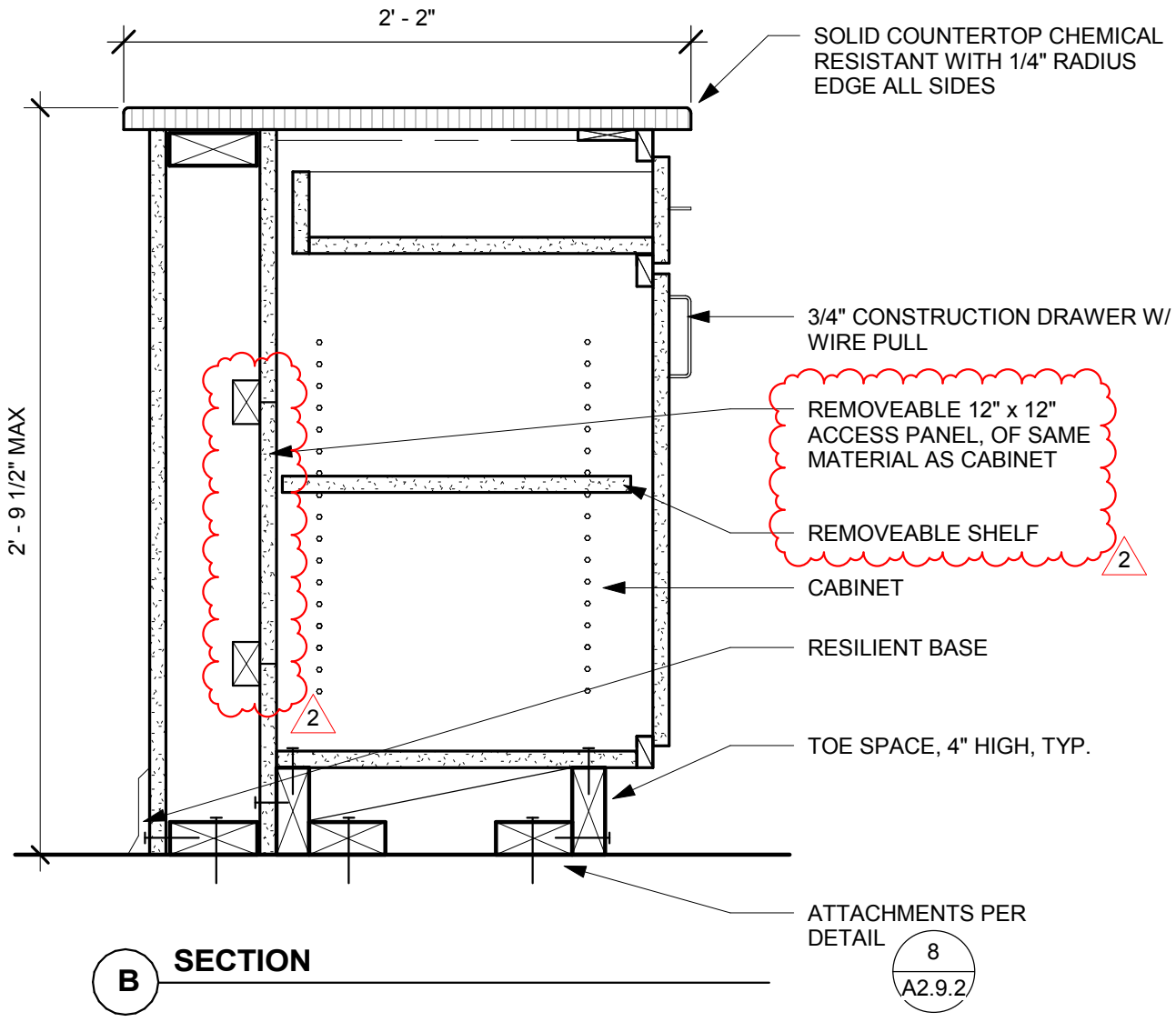
DRAWN BY
RG

CHECKED BY
CG

REF.
ADDENDUM #3

FRONT ELEVATION





B **SECTION**

LICENSED ARCHITECT
PATRICK M. DERICKSON
LIC.# C17107
REN. 2/28/19
STATE OF CALIFORNIA

14 DEMONSTRATION DESK - LABORATORY CASEWORK

1 1/2" = 1'-0"

STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME (REF. SHEET #)
A2.9.2 CASEWORK DETAILS

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

DATE **05/04/18**

PROJECT NO. **4800.00**

DRAWN BY **RG**

CHECKED BY **CG**

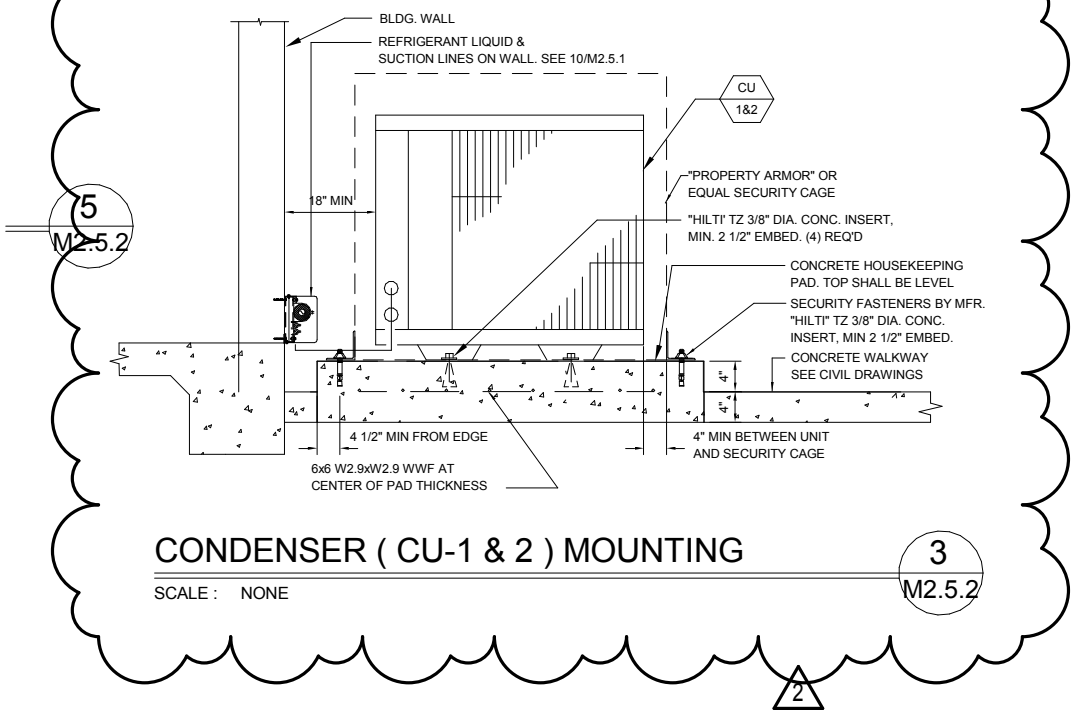
DRAWING NO. **AD - 13**

REF. **ADDENDUM #3**

VENT & COMBUSTION AIR PIPING

SCALE : NONE

2 M2.5.2



5 M2.5.2

CONDENSER (CU-1 & 2) MOUNTING

SCALE : NONE

3 M2.5.2

2

LICENSED ARCHITECT
PATRICK M. DERICKSON
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REN. 2/28/19
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
LOWELL E. SHIELDS
M 21583
EXPIRES 6/30/17
MECHANICAL
STATE OF CALIFORNIA

DATE SIGNED: _____

STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME (REF. SHEET #)
M2.5.2 - HVAC DETAILS

DATE
05/04/18

SCUSD WEST CAMPUS HS - ONE STORY STEM CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

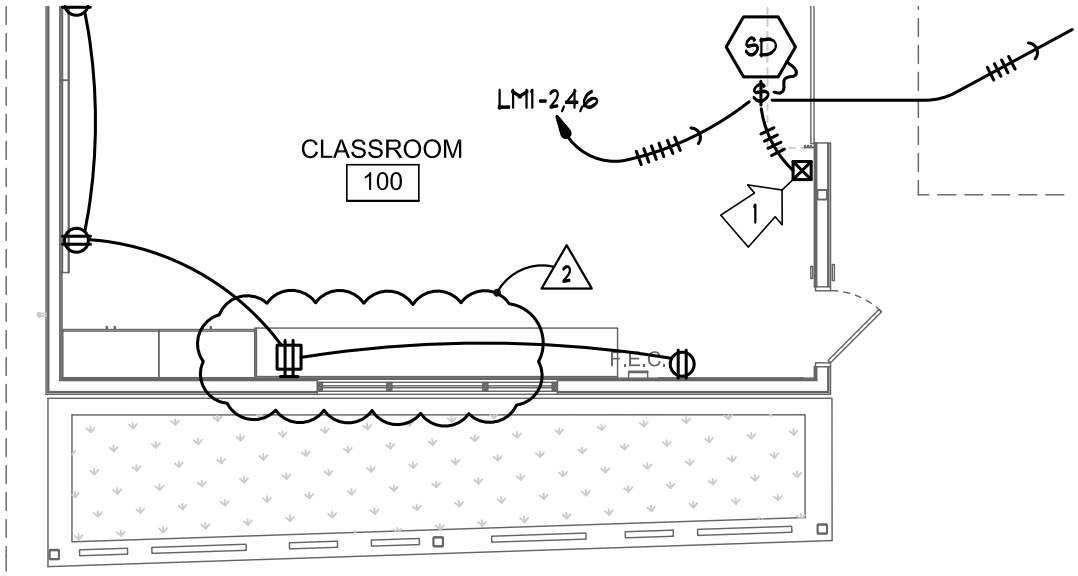
PROJECT NO.
4800.00

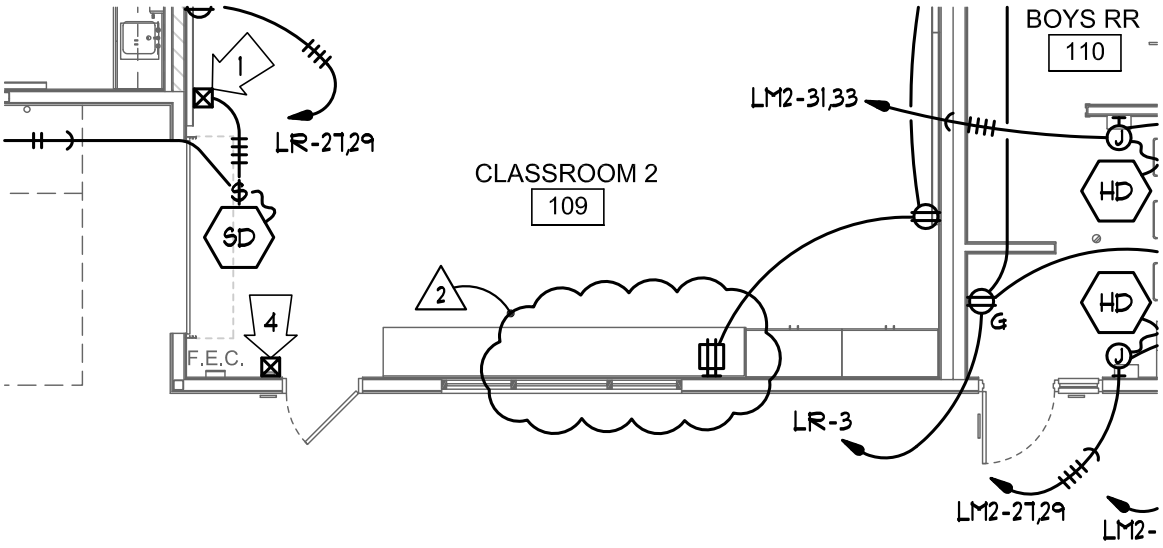
DRAWING NO.
AD - 14

DRAWN BY
MAB

CHECKED BY
TD

REF.
ADDENDUM #3





STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME (REF. SHEET #)
E2.3.1 POWER FLOOR PLAN

DATE
05/04/18

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

PROJECT NO.
4800.00

DRAWN BY
SKF

CHECKED BY
DY

DRAWING NO.
AD - 15

REF.
ADDENDUM #3

TMV-1	THERMOSTATIC MIXING VALVE EMERGENCY SHOWER/EYEWASH	"GUARDIAN" G3800LF ESH–EW TMV 3.0 TO 44GPM CAPACITY WITH DIAL THERMOMETER & FAIL SAFE PROTECTION. SET HIGH TEMP LIMIT TO 90°F.
RIM	REFRIGERATOR ICE MAKER	"GUY GRAY" MODEL SSIB2AB LEAD FREE ICE MAKER HOOK–UP, WITH 1/2" FIP INLET AND 1/4" COMPRESSION OUTLET
TMV-2	THERMOSTATIC MIXING VALVE	"POWERS" LFMM434HL LEAD FREE BRASS CONSTRUCTION HI/LO THERMOSTATIC MIXING VALVE 5PSI LOSS AT 56GPM. SET OUTLET TEMPERATURE AT 120°F.

2

JRES ABOVE SUBJECT TO APPROVAL BY SCHOOL DISTRICT AND ARCHITECT.

LICENSED ARCHITECT
PATRICK M. DERICKSON
LIC.# C17107
REN. 2/28/19
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
THOMAS A. DUVAL
M 22836
EXPIRES 9/30/18
MECHANICAL
STATE OF CALIFORNIA

DATE SIGNED: 2018–05–04

STAFFORD KING WIESE ARCHITECTS

REF. SHEET NAME: P0.0.3 - PLUMBING FIXTURE SCHEDULE

PLUMBING SCHEDULE CLARIFICATION

SCUSD WEST CAMPUS HS SCIENCE & TECHNOLOGY CLASSROOM BUILDING

5022 58TH STREET
SACRAMENTO, CA 95820

DATE: 05/04/18

PROJECT NO.: 4800.00

DRAWING NO.: AD - 16

DRAWN BY: JV

CHECKED BY: TD

REF.: ADDENDUM #3

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