

SECTION 123110 - METAL LABORATORY CASEWORK

1.1 SUMMARY

A. M.S.U. ISSUES

1. Laboratory furniture shall be premium grade, conventional wall mounted units and floor mounted base units. All cabinetry shall be welded-steel flush or flush-overlap construction, with all parts die-formed to insure uniformity and interchangeability. If matching existing casework or other concerns make wood or plastic-laminate casework more appropriate, they may be used with the approval of M.S.U. The manufacturer must have an assured delivery program for the specified type of furniture and related equipment and accessories.
2. Assemble and install furniture and tops in accordance to the manufacturer's directions. When assembled each cabinet shall be a complete and secure unit that will fit into an assembly of cabinets, and will permit a reorganization of components in the future. The countertops, utility chases, reagent shelves, and splashes shall form a complete working surface with all joints sealed and all components securely attached for a smooth, level and tight fit.
3. Verify locations of all cutouts prior to installation; coordinate work with electrical and plumbing trades. All electrical and plumbing services and fixtures shall be installed in conformance with the manufacturer's instructions, appropriate State codes, standard trade practices, and the direction of the M.S.U. Project Representative for a complete job.
4. In order for cabinets other than those listed in this standard to be approved, sufficient time must be provided for appropriate M.S.U. staff to review cabinet specifications and view a local site where the proposed cabinets have previously been installed.

B. This Section includes the following:

1. Metal laboratory casework.
2. Laboratory countertops.
3. Laboratory sinks.

C. Related Sections include the following:

1. Division 11 Section LABORATORY FUME HOODS for fume hoods, including base cabinets and countertops under fume hoods.
2. Divisions 22 and 26 Sections for installing service fittings specified in this Section.
3. Division 12 Section WOOD LABORATORY CASEWORK
4. Division 12 Section PLASTIC LAMINATE LABORATORY CASEWORK

1.2 PERFORMANCE REQUIREMENTS

1.3 SUBMITTALS

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

- B. Shop Drawings: For metal laboratory casework. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Indicate locations of blocking and reinforcements required for installing laboratory casework.
 - 2. Indicate locations and types of service fittings, together with associated service supply connection required.
 - 3. Include details of utility spaces showing supports for conduits and piping.
- C. Samples for Verification: On request, for each type of finish, including countertop material, in manufacturer's standard sizes.
- D. Qualification Data: For testing agency.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain laboratory casework, including countertops, sinks, service fittings, and accessories, through one source from a single manufacturer.
- B. Product Standard: Comply with SEFA 8, "Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices."
- C. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements of NFPA 30 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Cabinets that are not listed and labeled but are constructed according to NFPA 30, Paragraph 4-3.3(b) may be used if acceptable to authorities having jurisdiction.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install metal laboratory casework 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.

1.7 COORDINATION

- A. Coordinate installation of metal laboratory casework with installation of fume hoods and other laboratory equipment.

1.8 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of metal laboratory casework provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Metal Laboratory Casework:
 - a. BMC Industrial Educational Services, Inc.
 - b. Jamestown Metal Products, Inc.
 - c. Keur Industries, Inc.
 - d. Kewaunee Scientific Corporation; Laboratory Division.
 - e. Lab Fabricators Co.
 - f. Mott Manufacturing.
 - g. Or as approved.
 - 2. Epoxy Countertops, Sinks, and Troughs:
 - a. Durcon Company, Inc. (The).
 - b. Epoxyn Products.
 - c. Laboratory Tops, Inc.
 - d. Prime Industries, Inc.
 - e. Or as approved

2.2 CABINET MATERIALS

- A. Metal: Cold-rolled commercial steel sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.
- B. Minimum Metal Thickness:
 - 1. Sides, Ends, Fixed Backs, Bottoms, Tops, Soffits, and Items Not Otherwise Indicated: 0.0428 inch. Except for flammable liquid-storage cabinets, bottoms may be 0.0329 inch if reinforced.

2. Back Panels, Doors, Drawer Fronts and Bodies, and Shelves: 0.0329 inch except 0.0428 inch for back panels and doors of flammable liquid-storage cabinets and for unreinforced shelves more than 36 inches long.
 3. Intermediate Horizontal Rails, Table Aprons and Cross Rails, Center Posts, and Top Gussets: 0.0528 inch.
 4. Drawer Runners, Sink Supports, and Hinge Reinforcements: 0.0677 inch.
 5. Leveling and Corner Gussets: 0.0966 inch.
- C. Acid Storage-Cabinet Lining: 1/4-inch- thick, polyethylene, polypropylene, epoxy, or phenolic-composite lining material.
- D. Glass for Glazed Doors: Clear laminated glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Class I, Quality q³; with 2 lites not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer, unless otherwise approved.

2.3 CABINET FABRICATION

- A. General: Assemble and finish units at point of manufacture. Use precision dies for interchangeability of like-size drawers, doors, and similar parts. Perform assembly on precision jigs to provide units that are square. Reinforce units with angles, gussets, and channels. Integrally frame and weld to form a dirt and vermin-resistant enclosure. Where applicable, reinforce base cabinets for sink support. Maintain uniform clearance around door and drawer fronts of 1/16 to 3/32 inch.
- B. Flush Doors: Outer and inner pans that nest into box formation, with full-height channel reinforcements at center of door. Fill doors with noncombustible, sound-deadening material.
- C. Glazed Doors: Hollow-metal stiles and rails of similar construction as flush doors, with glass held in resilient channels or gasket material.
- D. Hinged Doors: Mortise for hinges and reinforce with angles welded inside inner pans at hinge edge.
- E. Drawers: Fronts made from outer and inner pans that nest into box formation, with no raw metal edges at top. Sides, back, and bottom fabricated in one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Weld drawer front to sides and bottom to form a single, integral unit. Provide drawers with rubber bumpers, ball-bearing slides, and positive stops to prevent metal-to-metal contact or accidental removal.
- F. Adjustable Shelves: Front, back, and ends formed down, with edges returned horizontally at front and back to form reinforcing channels.
- G. Toe Space: Fully enclosed, 4 inches high by 3 inches deep, with no open gaps or pockets.
- H. Table Legs: Welded tubing, not less than 2 inches square with stretchers where needed to comply with product standard. Weld or bolt leg stretchers to legs and cross-stretchers and bolt legs to table aprons. Provide leveling device welded to bottom of each leg.
1. Leg Shoes: Black vinyl or rubber or Satin-finished stainless steel, open-bottom, slip-on type.

- I. Utilities: Provide space, cutouts, and holes for pipes, conduits, and fittings in cabinet bodies to accommodate utility services and their support-strut assemblies.
- J. Filler Strips and Utility-Space Closure Panels: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets and with hemmed or flanged edges.

2.4 METAL CABINET FINISH

- A. Preparation: After assembly, clean surfaces of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- B. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply laboratory casework manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
 - 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2.5 CABINET HARDWARE

- A. General: Provide laboratory casework manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type. All cabinet hardware and methods of installation shall meet the latest ICC/ANSI A117.1 standards to provide barrier free access for mobility and physically impaired users.
- B. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors 48 inches or less in height and 3 for doors more than 48 inches in height.
- C. Pulls: Stainless steel, fastened from back with two screws. For sliding doors, provide stainless-steel recessed flush pulls. Provide 2 pulls for drawers more than 24 inches in width.
- D. Door Catches: Nylon-roller spring catch with stainless steel strike, and rubber stops. Provide 2 catches on doors more than 48 inches in height.
- E. Drawer Slides: Full suspension steel channels and runners, with minimum four ½ inch diameter nylon rollers; automatic positive cushioned stops; easy drawer removal, rebounding prevention springs; drawer front rubber bumpers.
- F. Locks: Manufacturer's standard lockset with Best core, or Best lockset.
- G. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.

2.6 COUNTERTOPS AND SINKS

- A. Epoxy Countertops and Sinks: Factory molded of 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.
 2. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
 3. Color: Black.
 4. Countertop Fabrication: Fabricate with factory cutouts for sinks and with butt joints assembled with epoxy adhesive and prefitted, concealed metal splines.
 - a. Countertop Configuration: Flat, 1 inch thick, with rounded edge and corners.
 5. Sink Fabrication: Molded in 1 piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of metal laboratory casework.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

- A. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Base Cabinets: Adjust top rails and subtops within 1/16 inch of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than 2 fasteners per side.
- C. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches o.c. Align similar adjoining doors to a tolerance of 1/16 inch.
- D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- E. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

- A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection.
- B. Fastening:
 - 1. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
 - 2. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
- C. Provide required holes and cutouts for service fittings.
- D. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
- E. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in Divisions 22 and 26 Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring.

3.5 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches o.c.

END OF SECTION 123110