SECTION 12360 – WOOD LABORATORY CASEWORK

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These specifications differentiate between Laboratory Casework and Architectural Woodwork / Custom Casework because of the specialized nature and use of the product. Architectural Woodwork / Custom Casework (in rooms other than labs) shall be specified separately in Division 6 Wood and Plastics.
These Standards are to be use for UMB laboratory renovations. For renovations in the School of Pharmacy Addition or School of Medicine Health Science Facility 3 building involving modular lab casework, seek additional direction from the UMB Project Manager for the as-built specifications.

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 furnishing and installation of all wood laboratory cabinetwork and related items, as indicated on the Drawings and/or specified herein, and includes, but is not limited to, the following:
   1. Island and peninsula bench and wall bench cabinets, wall mounted cabinets and floor mounted tall cabinets, and other cabinetwork items, all complete with internal shelving.
   2. Wood returns, closures, filler panels, aprons, service drop enclosures, miscellaneous trims and other items indicated.
   3. Adjustable shelving.
   4. Wall-mounted metal standards and brackets for adjustable shelving at walls.
   5. Plastic laminate clad countertops and backsplashes at desk spaces.
   6. Epoxy resin countertops and backsplashes.
   7. Epoxy tub sinks and cup sinks.
   8. Epoxy pegboards and drying racks with stainless steel trough.
   9. Marker boards and tack boards.
   10. Flammable storage cabinets.
   11. Stainless steel cabinet and drawer pulls and hardware.
   12. Utility-space framing below peninsula and island counters.
   13. Laboratory casework accessories as specified herein.

B. Related Requirements:
   1. Division 5 & 6: For behind the wall blocking and studs.
   2. Division 11: “Laboratory Fume hoods” for fume hoods in laboratories.
   3. Division 12: "Simulated Stone Countertops”" for lab bench counters.

4. See Division 22 for all required plumbing hardware including stainless steel sinks, faucets, strainers, tail pieces, eye washes, laboratory gas, and natural gas service fittings.
5. See Division's 26 & 27 for all required electrical and/or data service fittings.

1.3 DEFINITIONS

A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.
   1. Ends of cabinets, including those installed directly against walls or other cabinets, are defined as "exposed."

B. Semi-exposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interior faces, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches or more above floor and bottoms of cabinets more than 24 inches but less than 48 inches above floor are defined as semi-exposed.

C. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

D. MDF: Medium-density fiberboard.

E. Hardwood Plywood: A panel product composed of layers, or plies, of hardwood veneer, or MDF core, joined with urea-formaldehyde free adhesive and faced both front and back with hardwood veneers.

1.4 LEED REQUIREMENTS FOR WOOD LABORATORY CASEWORK

A. All wood casework cabinetry and shelving shall be FSC-Certified as having been manufactured from wood harvested in accordance with the "FSC Principles and Criteria" for well managed forests developed by the Forest Stewardship Council (FSC) of Bonn, Germany. Acceptable certification organizations include Scientific Certification Systems (Oakland, CA) and the Rainforest Alliance Smart Wood (New York, NY).

B. The location where the casework cabinetry and custom steel framing were manufactured and the origin (location) of the raw materials from which these products were manufactured shall be documented in accordance with the Green Building Submittal Requirements of this section.

C. Interior adhesives and sealants shall meet the requirements of Division 7 Joint Sealants.

D. Wood products shall utilize an environmentally friendly, laboratory grade finish. Finish process, stains and finishes, shall be executed with then use of compression spray equipment capable of providing high-transfer efficiency and low waste generation.

E. LEED Submittals:
   1. Credit EQ 4.1: Manufacturers' product data for construction adhesives, including printed statement of VOC content.

2. Credit EQ 4.2: Manufacturers' product data for paints, including printed statement of VOC content and chemical compounds.
3. Credit EQ 4.4:
   a. Composite wood manufacturer's product data for each composite wood product used indicating that the bonding agent contains no urea formaldehyde.
   b. Adhesive manufacturer's product data for each adhesive used indicating that the adhesive contains no urea formaldehyde.
4. Credit MR 5.1: Use a minimum of 20% of materials and products (cost) that are manufactured regionally, within a 500-mile radius.
5. Credit MR 7: Manufacturers' Certificates of chain-of-custody signed by manufacturers certifying that products specified to be made from certified wood were made from wood obtained from forests certified by an FSC–accredited certification body to comply with FSC 1.2, "Principles and Criteria". Include evidence that the mill is certified for chain-of custody by an FSC-accredited certification body.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product. Submit manufacturer's catalog for reference. Include cabinet dimensions, configurations, construction details, joint details, attachment details, and rough in details as required.

B. Shop Drawings: For laboratory casework. Include plans, elevations, sections, and attachment details.
   1. Indicate types and sizes of cabinets.
   2. Indicate locations of hardware and keying of locks.
   3. Indicate locations and types of service fittings.
   4. Indicate locations of blocking and reinforcements required for installing laboratory casework.
   5. Include details of utility spaces showing supports for conduits and piping.
   6. Include details of support framing system.
   7. Include details of exposed conduits, if required, for service fittings.
   8. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
   9. Include coordinated dimensions for laboratory equipment specified in other Sections.
   10. Provide data indicating compliance with SEFA 8 Standard.

C. Keying Schedule: Include schematic keying diagram and index each key set to unique designations that are coordinated with the Contract Documents.

D. Samples for Verification:
   1. One Cabinet Sample combination drawer and base unit showing complete construction details, including one shelf. Photos of approved cabinet stored at UMB site, or photos of an approved and installed sample cabinet on UMB campus will suffice for this requirement.
   2. Worktop: four (4) inch x four (4) inch sample of each material.

3. Finish: three (3) inch x five (5) inch sample of specified custom stain color with finish.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer as follows:
   1. List of shop facilities.
   2. List of engineering and manufacturing personnel.
   3. Proof of project management and installation capabilities.
   4. Certification of SEFA membership in Good Standing.
   5. Proof that manufacturer is a member of AWI and is QCP certified.

B. Qualification Data: For Installer as follows:
   1. Proof that installer is certified by the AWI.

C. Sample warranty form.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 W.

B. Shop is a certified participant in AWI's Quality Certification Program.

C. Installer qualifications: Certified by the AWI.

D. Sole Source Requirements: Provide wood laboratory casework, work tops, shelving and accessories from a single source or supplier.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Schedule delivery so rooms are sufficiently complete that material can be installed immediately following delivery, and for the installation of wood products the following conditions must be met:
   1. Building or area is fully enclosed.
   2. Areas shall be broom cleaned and at least a prime coat of paint applied.
   3. Ceiling grid work should be complete (finished ceilings and final finish coating complete) with light fixtures connected and permanent power provided for adequate lighting.
   4. Floor covering shall be installed.
   5. Floors must be leveled to 1/8" per 10'-0" non-accumulative and within commercial tolerances.

B. Casework: Protect finished surfaces from soiling or damage during handling and installation.

1.9 CERTIFIED WOOD PRODUCTS

A. Wood products used in the fabrication of all wood components shall comply with the Forest Stewardship Council (FSC) "Percentage Based Claims Policy Green Rating System" and shall bear the Forest Conservation Program Label. Wood/fiber products shall come from FSC "certified" sustained managed forestry sources, complying with FSC 1.2, Principals and Criteria. Manufacturer shall submit documentation that the source of at least 70% of the wood/fiber material used in its products are certified for sustainability contents, do not contain urea formaldehyde and a "chain-of- custody" certificate, with their shop drawing submittal. Certificate shall provide a system for tracking certified wood from the forest, through each stage of production and distribution, to the point of sale. Certificates shall be by U.S. Based certifiers, Scientific Certification Systems, Emeryville, California or SmartWood Program, Richmond, Virginia.

B. Wood products shall utilize an environmentally friendly, laboratory grade finish. Finish process, stains and finishes, shall be executed with the use of compression spray equipment capable of providing high-transfer efficiency and low waste generation.

C. Adhesive manufacturer's product data sheets are to be provided indicating that the adhesive does not contain urea formaldehyde.

1.10 WARRANTY/GUARANTEE

A. Furnish a written warranty that Work performed under this Section shall remain free from defects as to materials and workmanship for a period of five (5) years from date of acceptance. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner. Defects include, but are not limited to:
   1. Ruptured, cracked, or stained coating
   2. Discoloration or lack of finish integrity
   3. Cracking or peeling of finish
   4. De-lamination of components or edge banding
   5. Slippage, shift, or failure of attachment to wall, floor, or ceiling
   6. Weld or structural failure (visible weld marks)
   7. Warping or unloaded deflection of components F
   8. Failure of hardware

A. Provide manufacturer's written warranty and assure that forms have been completed in the Owner's name and registered with the manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Laboratory Casework: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
   1. OC River Laboratory Furniture. (Suring WI.)
   2. Kewanee Scientific Corporation; Laboratory Products Group. (Statesville, NC.)
   3. Mott Manufacturing Ltd. (Maxwelton, WV.)
   4. New England Lab (Woburn, MA)

5. Product Designations: Drawings may indicate sizes and configuration of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturer's lab casework is to have the same door and drawer configurations and face panel heights as listed casework of similar size for the intended locations.

2.2 CASEWORK, GENERAL

A. Casework Product Standards:
   1. Comply with SEFA 8 W, "Laboratory Grade Wood Casework."
   2. Comply with the "Architectural Woodwork Standards" for grades of architectural wood cabinets indicated for construction, finishes, installation, and other requirements.
   3. Provide certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

B. Grade: AWI Premium and provide stricter requirements as specified.

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 in NFPA 30 by a testing and inspecting agency acceptable to authorities having jurisdiction.

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

E. Low-Emitting Materials: Fabricate casework, including countertops, with adhesives and composite wood products containing no urea formaldehyde.

2.3 WOOD CABINET MATERIALS

A. General:
   1. Maximum Moisture Content for Lumber: 7% for hardwood and 12% for softwood.

B. Hardwood Plywood: HPVA HP-1, hardwood veneer or MDF core, and made without urea formaldehyde in one of the following configurations:
   1. Veneer core inner plies with bonded MDF cross bands; Pure Bond Classic Core plywood by Columbia Forest Products or approved equivalent.
   2. Solid MDF core.

C. MDF: ANSI A208.2, Grade 130; made with binder containing no urea formaldehyde

D. Hardboard: ANSI A135.4, Class 1 Tempered.

E. Edge banding for Wood-Veneered Construction:

For lab renovations in areas where the existing casework has edge banding of 1/8 inch rolled wood, and when approved by the University, 1/8" solid hardwood edge banding may be specified. Choose 1a or 1b for Thickness.

1. Thickness:
   a. Minimum 3/16-inch thick, solid stick solid hardwood of same species and cut as face veneer. Roll or tape type edge banding material shall not be permitted.
   b. Minimum 1/8-inch-thick, solid wood of same species and cut as face veneer.
2. Select wood edge banding for grain and color compatible with face veneers.
3. Colors: Match face veneers.

2.4 WOOD CASEWORK

A. Design: Reveal overlay with square edges.
   1. Provide 1/8-inch reveals between doors and drawers that are adjacent.

B. Wood Species: Red oak.

C. Cut: <**Plain-sliced**><**Quarter sliced/sawn**>.

D. Matching:
   1. Provide veneers for each cabinet from a single flitch, book and balance matched.
      a. Provide continuous matching of adjacent drawer fronts within each cabinet.

E. Grain Direction:
   1. Vertical on both doors and drawer fronts, with continuous vertical matching.
   2. Vertical on end panels.
   3. Vertical on knee-space panels.

F. Exposed Materials:
   1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings and no sharp contrasts at veneer joints.
   2. Plywood: Hardwood plywood, made without urea formaldehyde with face veneer of species indicated. Grade A exposed faces, at least 1/45 inch thick, and MDF cross bands. Provide backs of same species as faces.
   3. Solid Wood: Clear hardwood lumber of species indicated.

G. Semi exposed Materials:
   1. Solid Wood: AWS Grade I, FAS Sound hardwood lumber, Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.
   2. Plywood: Hardwood plywood. Grade A plywood with exposed or semi-exposed faces shall be same species and cut as faces.
   3. Provide solid wood or hardwood plywood for semi exposed surfaces unless otherwise indicated.

H. Concealed Materials:
   1. Solid Wood: Any species, with no defects affecting strength or utility.
   2. Plywood: Hardwood plywood. Provide backs of same species as faces.
   3. MDF.

I. AUXILIARY CABINET MATERIALS

J. Acid Storage-Cabinet Lining: 1/4-inch-thick, glass-fiber cement board complying with ASTM C 1186 or 1. fiberglass reinforced polyester.

2.5 SHELF MATERIALS

A. Chemical-Resistant Plastic Laminate:

Verify with UMB Project Manager if chemical-resistance is necessary, based on the User input. Standard plastic laminate may be acceptable. Specify the color from three different manufacturers.

1. Products: Subject to compliance with requirements, provide one (1) of the following:
   a. Formica Corporation; Lab Grade 840.
   b. Panolam Industries International; Pionite Chemguard.
   c. Wilsonart International, Div. of Premark International, Inc.; Chemsurf.
2. Color:
   a. Formica: <**Insert color here**>
   b. Pionite: **<Insert color here>**
   c. Wilsonart: <**Insert color here**>

B. Core Materials for Plastic Laminate: Hardwood plywood or MDF.

C. Adhesive for Bonding Plastic Laminate: Manufacturer's standard waterproof, urea-formaldehyde-free adhesive.

2.6 COUNTERTOP AND SINK MATERIALS

Verify with UMB Project Manager if epoxy resin or solid surface countertops are required. Provide separate spec. section if solid surface. UMB standard for labs is drop in stainless steel sinks, unless otherwise desired by the User.

A. Epoxy Resin: Factory-molded, modified epoxy-resin formulation with smooth, non specular finish.
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
   a. Kemresin by Kewanee Scientific.
   b. Durcon, Inc.
   c. Prime Industries, Inc.
   d. Thermo Fisher Scientific.
2. 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%.
   e. Heat Distortion Point: Not less than 260ºF.

3. 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%), acetone, ammonium hydroxide (28%), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70%), phenol, sulfuric acid (60%), and toluene.
   b. Slight Effect: Chromic acid (60%) and sodium hydroxide (50%).
4. Color: <**Black**> <**Gray**><**Insert color here**>
5. Sink size: < **Insert size here**>.

2.7 FABRICATION

A. Construction: Provide wood-faced laboratory casework complying with SEFA 8 W, AWI Architectural Woodwork Standards and of the following minimum construction:
   1. Tops of Wall Cabinets and Tall Cabinets: 3/4-inch-thick, veneer faced plywood with exposed edges faced with 3/16" solid hardwood.
   2. Ends of Cabinets: 3/4-inch-thick, veneer core plywood, edge banded with 3/16-inch solid hardwood.
   3. Shelves: 1 inch-thick, hardwood plywood, recessed 1inch from back face of door. Shelves shall be edged at front and rear faces.
   4. Base Cabinet Top Frames (full top frame): 3/4 inch by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed. Front frame member is solid lumber with 3mm edge-banding to match cabinet face, sides and back frame members are solid hardwood. Side members are tenoned and glued into front & back components.
   5. Fixed Backs of Movable Cabinets (at movable cabinets): 3/4-inch-thick, veneer faced plywood where exposed, doweled and rabbeted into end panels. The back panel shall be inset no further than 1/32 inch from back edge of cabinet sides.
   6. Unexposed Backs of Fixed Cabinets (at peninsula, island or against wall): 1/2-inch-thick, veneer core plywood dadoed into sides, and securely attached at bottom and top back rails. Backs that are attached to end panels with cleats shall be unacceptable.
   7. Drawer Fronts: 3/4-inchthick, veneer cored plywood, edge banded with 3/16-inch solid hardwood. Drawer fronts shall be fastened to the drawer bodies with four pan head machine screws.
   8. Drawer Sides and Backs: 1/2-inch-thick, solid hardwood or hardwood plywood, with glued dovetail or multiple-dowel joints.
   9. Drawer Bottoms: 1/4-inch-thick, hardwood plywood glued and dadoed into front, back, and sides of drawers.
   10. Doors 48 Inches High or Less: 3/4 inch thick, with MDF and hardwood face veneer and cross-bands, edge banded with 3/16-inch solid hardwood.
   11. Doors More Than 48 Inches High: 1-1/8 inches thick, with MDF cores and hardwood face veneer and cross-bands, edge banded with 3/16-inch solid hardwood.
   12. Stiles and Rails of Glazed Doors: ¾ inch thick solid hardwood stile and rails joined using mortised and tendon joints. Plastic bowtie type fasteners are not acceptable.

B. Utility-Space Framing: Steel framing units consisting of two steel slotted channels complying with MFMA-4, not less than 1-5/8 inches square by 0.105-inch nominal thickness and connected at top and bottom by U-shaped brackets made from 1-1/4 inch by-1/4-inch steel flat bars. Framing units may be made by welding specified channel material into rectangular frames instead of using U-shaped brackets.

C. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.
   1. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, below countertops.
      a. Panels shall consist of one removable panel and a 5-inch-high static panel for mounting rubber base molding.
      b. Removable and static panel sections shall be secured to an adequate structural assembly with stainless steel grommeted screws and shall be finished to match adjacent cabinetry in material and finish.
      c. Panels are to be secured to framing with a minimum of four (4) grommeted screws.
      d. The maximum length of a removable panel shall be 48 inches.
   2. Provide cabinet side extensions or side closure panels for base cabinets at knee-spaces between two cabinets to extend the depth to 25 inches for refrigerator storage.
   3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed. Closure panels to be removable with stainless steel grommeted screws.
   4. Vertical Stanchions: Provide where indicated from top of peninsula above finished ceiling. Fabricate from same material and with same finish as exposed cabinet surfaces unless otherwise indicated.
   5. Extend stanchion to two (2) inches minimum above ceiling.
   6. Wood stanchions to be factory fabricated, with 1 ½" x ¾" solid wood corners with veneered hardwood panels dadoed into corner wood.
   7. Provide access panels as indicated on drawings for access to back of plumbing fixtures.
      a. Access panel to be of exact matching veneer as wall panel.
      b. Edge four (4) sides of access panel with 1/8" solid stock wood of matching wood species.
   8. Where wood stanchion is indicated to terminate below finished ceiling, provide top closure wood cap of 3/4-inch thick, veneer faced plywood with exposed edges faced with 3/16-inch solid hardwood.
   9. Toe space filler: At gap created between the cabinet or ledge static panel and the floor due to leveling conditions, mechanically fasten (flat head screw) a 4-inch 18 gage galvanized steel plate to the cabinet behind the rubber base molding to support its application.

2.8 WOOD FINISH

A. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform

smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.

B. Staining: Remove fibers and dust and apply stain to exposed and semi exposed surfaces as necessary to match approved Samples. Apply stain in a manner that produces a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.
   1. Stain Color: As indicated by manufacturer's designations.

C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
   1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 W. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2.9 HARDWARE

A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type and ANSI/BHMA A156.9, American National Standards for Cabinet Hardware.

B. Butt Hinges: Stainless-steel overlay five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two (2) for doors 48 inches high or less and three (3) for doors more than 48 inches high.
   1. Basis of Design: No 376, 376SS by Rockford Process Control, Inc. or approved equal.
   2. Finish: Stainless steel.

C. Hinged Door and Drawer Pulls: Stainless-steel back-mounted pulls. Provide two pulls for drawers more than 24 inches wide.
   1. Design: 3/8” dia. four (4) inch Tubular Stainless Steel wire pulls w/ brushed satin finish.
   2. All pulls are mounted horizontally on drawers.
   3. All pulls are mounted vertically on doors. Mount pull at height below bottom of glass door panels, or at horizontal rail in tall glass cabinet, to prevent pull from impacting glass on adjacent door.

D. Door Catches: Nylon-roller spring catches. Provide two (2) catches on doors more than 48 inches high.

E. Drawer Slides: Side mounted, zinc-plated steel; designed to prevent rebound when drawers are closed.
   1. At drawers under both 6 inches high and under 24” wide: Grade 1HD-100 full extension 100 lb. dynamic load, FR 5000 by Fulterer or approved equal by Accuride or Precision Slide.
   2. At drawers 6 inches high and higher, or 24” wide and wider: Grade 1HD-200 full extension 200 lb. dynamic load, FR5210 by Fulterer, no substitutes.

F. Aluminum Slides for Sliding Glass Doors: BHMA A156.9, B07063.

G. Leg shoes shall be provided on all table legs. Shoes shall be 2-1/2" high and a pliable, black vinyl material.

H. Floor Glides (for movable open-leg tables as shown on drawings) shall be a non-marring material at least 1" dia. To prevent indenting composition flooring and shall have at leat a 5/8" height adjustment. Use of metal buttons will not be acceptable.

I. Label Holders: Stainless steel; sized to receive standard label cards approximately 1 inch by 2 inches, attached with screws or rivets. Provide only where indicated on drawings.

J. Drawer Locks: Disc tumbler cylinder cam locksets with heavy duty removable core. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity to be Different, Masterkeyed, and Grand-masterkeyed. Manufacturer: CompX National. Provide only where indicated on drawings.

K. Door and Drawer Silencers: BHMA A156.16, L03001.

L. Shelf Adjustment: Adjustable shelf support clips inside cabinets and at regent shelving: Twin pin, heavy duty, clear molded plastic. Shelf lock shall be for ¾ inch or 1 inch shelves, as required.
   1. Model: 282.47.402, by Hafele 1-800-423-3531.
   2. Approved equal by Fastenal.

M. Wall-mounted Shelf Standards and Brackets (for adjustable shelving where indicated on drawings):

Specified below is a typical heavy-duty shelf and standard assembly for a UMB lab, based on standard spacing at 16" o.c. Other types of shelf and standards may be required, verify with UMB Project Manager.

   1. Extra-heavy duty.
   2. Size: 1 ¼" wide x ½" deep x selected length.
   3. Finish: Electro zinc-plated cold rolled steel.
   4. Vertical Shelf Standards: BHMA A156.9
      a. 16-guage steel for 8 inch – 12-inch brackets.
      b. 14-guage steel for 14 inch and deeper brackets.
   5. Shelf brackets: BHMA A156.9,
   6. Model: 85 Heavy Duty Commercial Grade Double Slotted Standard with 185 Heavy Duty Commercial Grade Brackets, right, center and left configuration as required by Knape and Vogt www.kv.com.
   7. For shelves that are 16 inch or deeper, provide 82 Heavy Duty Commercial Grade Double Slotted Standard with 182 Heavy Duty Commercial Grade Brackets.
   8. Requests for Substitutions will be considered in accordance with Division One requirements.

2.10 COUNTERTOPS AND SINKS

A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of one (1) inch, with continuous drip groove on underside 1/2 inch from edge.

B. Epoxy Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
   1. Sink Hardware: See Plumbing Specifications for all required sink hardware.

C. Epoxy Countertops and Sinks:
   1. Epoxy Countertop Fabrication: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
      a. Countertop Configuration: Flat, one (1) inch thick, with 1/8 inch machined top edge with blended radius corners, and with drip groove and applied backsplash.
      b. Countertop Construction: Uniform throughout full thickness.
   2. Epoxy Sink Fabrication: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet: ½-inch minimum thickness.
      a. Size: EDIT FOR PROJECT

D. Cup Sinks: Epoxy, 3inch by-6inch oval.

E. Stainless Steel Countertop Sinks: See Division 22 Plumbing Specifications for requirements.

F. Vertical chases for mechanical/electrical services from bench top to a minimum of 6 inches above ceiling or flush with top shelf as indicated on the drawings.
   1. Chemical-resistant plastic laminate or wood veneer (as indicated on drawings) shop bonded to all exposed faces of 3/4 inch thick core.
   2. Entire vertical chase box structure to be factory fabricated with minimum seams, conceal nails and fasteners.
   3. Provide a removable front panel to facilitate installation around vertical piping, fasten with stainless steel flat-head screws with grommets.
   4. Provide 8 inch wide by 12-inch-high removable panel next to A/G/V services as show on drawings, edge removable panel with 3/16” solid stock wood of same species and cut panel to provide continuous wood grain. Fasten with stainless steel flat-head screws with grommets.
      a. Core: Exterior plywood.
      b. Plastic-Laminate Grade: HGP.

G. Reagent Shelves (shelves above peninsula or islands as indicated on drawings):
   1. Plastic-Laminate Shelves: Chemical-resistant plastic laminate shop bonded to all faces of 1-inch-thick core, with 1/2-inch-thick solid red oak band at outside edge of shelf. Sand surfaces to which plastic laminate is to be bonded.
      a. Shelf Core: Exterior plywood.

b. Plastic-Laminate Grade: HGP.
c. Red oak band to provide a 1/4-inch-high lip when indicated on the drawings.

H. Wall-mounted Shelves (shelves at adjustable wall-mounted shelving on shelf standards):
1. Plastic-Laminate Shelves: Chemical-resistant plastic laminate shop bonded to both faces and all edges of 3/4-inch-thick core, with 1/2-inch-thick solid red oak band at outside edges of shelf. Sand surfaces to which plastic laminate is to be bonded.
a. Shelf Core: Exterior plywood.
b. Plastic-Laminate Grade: HGP.
c. Red oak band to be flush with top of plastic laminate surface, or as indicated on drawings.

2.11 LABORATORY ACCESSORIES

A. Pegboards: Epoxy resin pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.
1. Color: Match epoxy resin countertops.

PART 3 - EXECUTION

3.1 SITE ENVIRONMENT

A. UMB Building Environments: UMB building environments are maintained as follows:
1. Heating Mode: In heating mode the HVAC building systems maintain 72ºF without humidity control during the heating season (November to March). Humidity levels can be as low as 10% in this mode.
2. Cooling Mode: In cooling mode the HVAC building systems maintain 75ºF and 50% RH during the cooling season (March to November).
3. Renovation Projects: Where supply air is cutoff from the building project site the temperature and humidity control will not be maintained by the building systems.

B. Humidity and Temperature Requirements – Casework Installation: Unless otherwise indicated by the casework supplier the humidity and temperature requirements for casework installation shall be as follows:
1. Humidity Levels: Humidity levels should be maintained at a stable level without continual variations. Stabilized humidity level should not exceed 55%. A more desirable humidity level is 30% to 40%.
2. Temperature Levels: Temperature level should be maintained between 55ºF and 75ºF to allow the use of epoxy cements and adhesive materials. At no time should the space temperature exceed 90ºF.

C. Manufacturer and CM Responsibility: Responsibility shall be as follows:
1. Manufacturer: The casework manufacturer shall be responsible for verifying the humidity and temperature levels indicated above and coordinating with the Contractor to ensure the proper installation environment will be provided by the Contractor.

2. Contractor: The Contractor shall be responsible for providing the required temporary HVAC equipment and/or piping and power connections to maintain the desired installation environment.

3.2 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of laboratory casework.

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

3.3 INSTALLATION OF CABINETS

A. Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.

C. Base Cabinets: 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.
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 two (2) fasteners per side.

D. Wall Cabinets: 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.

E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

F. 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.

3.4 INSTALLATION OF COUNTERTOPS

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

B. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Prepare edges in shop for field-made joints.

C. Fastening:
   1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
   2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
   3. 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.

D. Provide required holes and cutouts for service fittings.

E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.

F. 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.

G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.5 INSTALLATION OF LABORATORY ACCESSORIES

A. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.

B. Securely fasten adjustable shelving supports to partition framing, wood blocking, or reinforcements in partitions.
   1. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

C. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in vertical chases.

3.6 INSTALLATION OF SERVICE FITTINGS

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

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

3.7 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 a minimum of 48 inches o.c.

END OF SECTION 123600