



CABINET spe

CABINET SPECIFICATIONS

Majestic Millennium Monarch

- Flush or Reveal Overlay Construction
- 3/4" Engineered Core Doors and Drawers
- Door and Drawer Fronts with Premium Grade Veneers (3 mm Banding)
- Door and Drawer Fronts Occupy a Plane
- Extending 3/4" Past the Cabinet Body
- Vertical Grain Match for Doors and Drawers



SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

MajM 07.25.21
Div

PART 1 GENERAL

1.01 SUMMARY

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 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 8W - Laboratory Furniture

1.02 BASIS OF WORK

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) - **Majestic Series** (reveal overlay) Maple Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 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 ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.02 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 Maple veneers and compatible Grade 1 Maple hardwood lumber.
- F. Semi-exposed surfaces shall be plain sliced, HPVA Grade 1 Maple veneers and compatible Grade 2 hardwood lumber.
- 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 Maple.
- I. Hardboard shall be 1/4" 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 2-1/2" 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Maple hardwood construction, 2-1/4" square with 1/4" 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 Maple. 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus or minus 1/16 inch (1.6mm) from corner to corner.
 - b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.

- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8-inch (3 mm) drip groove at underside of exposed edges, set back 1/2 inch (13 mm) from face.
 - c) Finish exposed edges.
 - d. Edge treatment:
 - 1) Standard 1/8 inch (2 mm) chamfered edge.
 - e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
 - f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
 - g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
 - h. Sink cutouts:
 - 1) Routed for drop-in sink.
 - i. Allowable tolerances:
 - 1) Square.
 - a) Plus or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
3. Epoxy Resin Sinks:
- a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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
- Toluene and Other Hydrocarbons
- Carbon - Tetrachloride
- Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
- c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION

SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

MajO 07.25.21
Div

PART 1 GENERAL

1.01 SUMMARY

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 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 8W – Laboratory Furniture

1.02 BASIS OF WORK

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) - **Majestic Series** (reveal overlay) OAK Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 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 ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.02 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 1/4" 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 2-1/2" 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Red Oak hardwood construction, 2-1/4" square with 1/4" 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus or minus 1/16 inch (1.6mm) from corner to corner.

- b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.
- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8-inch (3 mm) drip groove at underside of exposed edges, set back ½ inch (13 mm) from face.
 - c) Finish exposed edges.
- d. Edge treatment:
 - 1) Standard 1/8 inch (2 mm) chamfered edge.
- e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
- f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
- g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
- h. Sink cutouts:
 - 1) Routed for drop-in sink.
- i. Allowable tolerances:
 - 1) Square.
 - a) Plus, or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus, or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
- 3. Epoxy Resin Sinks:
 - a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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
- Toluene and Other Hydrocarbons
- Carbon - Tetrachloride
- Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
 - c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION



CABINET spe

CABINET SPECIFICATIONS

Majestic Millennium Monarch

- Full-Radius Edge Inset/Overlay Construction
- 3/4" Premium Grade Veneered Framed Doors and Drawers Routed with Lip Overlay
- Door & Drawer Fronts Occupy a Plane Extending 3/8" Past the Cabinet Body
- Combination Grain—The Exposed Grain for Doors Run Vertical; Drawers Horizontal



SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

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Div

PART 1 GENERAL

1.01 SUMMARY

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 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

1.02 BASIS OF WORK

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) **Millennium Series** (full radius-lipped edge, inset-overlay) OAK Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 MANUFACTURERS

- A. The basis of this specification is Diversified Casework (www.diversifiedcasework.com) Millennium Series (Lipped Edge). 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 ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.02 MATERIALS

- A. It is the intent of this specification to provide a high-quality wood cabinet specifically designed for the science classroom environment. This style is to be full-radius edge overlay construction with 3/4" thick oak framed drawer and door fronts routed with a lip. The door and drawer fronts occupy a plane existing 3/8" past the plane of the front of the cabinet body. Edges of door and drawer fronts are radiused and overlap front edge by 1/4". The exposed grain for doors shall run vertical, for drawers horizontal.
- 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 1/4" 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 2-1/2" 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Red Oak hardwood construction, 2-1/4" square with 1/4" 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus or minus 1/16 inch (1.6mm) from corner to corner.

- b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.
- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8-inch (3 mm) drip groove at underside of exposed edges, set back ½ inch (13 mm) from face.
 - c) Finish exposed edges.
- d. Edge treatment:
 - 1) Standard 1/8 inch (2 mm) chamfered edge.
- e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
- f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
- g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
- h. Sink cutouts:
 - 1) Routed for drop-in sink.
- i. Allowable tolerances:
 - 1) Square.
 - a) Plus, or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus, or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
- 3. Epoxy Resin Sinks:
 - a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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 Water80 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
- Toluene and Other Hydrocarbons
- Carbon - Tetrachloride
- Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
 - c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION

SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

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PART 1 GENERAL

1.01 SUMMARY

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 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

1.02 BASIS OF WORK

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) Millennium **Series** (full radius-lipped edge, inset-overlay) Maple Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 MANUFACTURERS

- A. The basis of this specification is Diversified Casework (www.diversifiedcasework.com) Millennium Series (Lipped Edge). 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 ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.02 MATERIALS

- A. It is the intent of this specification to provide a high quality wood cabinet specifically designed for the science classroom environment. This style is to be full-radius edge overlay construction with 3/4" thick oak framed drawer and door fronts routed with a lip. The door and drawer fronts occupy a plane existing 3/8" past the plane of the front of the cabinet body. Edges of door and drawer fronts are radiused and overlap front edge by 1/4". The exposed grain for doors shall run vertical, for drawers horizontal.
- 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 Maple veneers and compatible Grade 1 Maple hardwood lumber.
- F. Semi-exposed surfaces shall be plain sliced, HPVA Grade 1 Maple veneers and compatible Grade 2 hardwood lumber.
- 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 Maple.
- I. Hardboard shall be 1/4" 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 2-1/2" 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 applied to door and cabinet to withstand 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Maple hardwood construction, 2-1/4" square with 1/4" 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 Maple. 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus, or minus 1/16-inch (1.6mm) from corner to corner.
 - b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.

- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8 inch (3 mm) drip groove at underside of exposed edges, set back ½ inch (13 mm) from face.
 - c) Finish exposed edges.
 - d. Edge treatment:
 - 1) Standard 1/8 inch (2 mm) chamfered edge.
 - e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
 - f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
 - g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
 - h. Sink cutouts:
 - 1) Routed for drop-in sink.
 - i. Allowable tolerances:
 - 1) Square.
 - a) Plus, or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus, or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
3. Epoxy Resin Sinks:
- a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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
- Toluene and Other Hydrocarbons
- Carbon - Tetrachloride
- Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
- c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION



CABINET spe

CABINET SPECIFICATIONS

Majestic Millennium Monarch

- Flush or Reveal Overlay Construction
- 3/4" Engineered Core Door and Drawer Fronts with Premium Grade Veneers (3mm Banding)
- Door and Drawer Fronts Occupy a Plane that Extends 3/4" Past the Cabinet Body
- Combination Grain—The Exposed Grain For Doors Runs Vertical; Drawers Horizontal
- Aluminum Full Pull Available
- Vertical Grain Match is Available



SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

MonM 07.25.21
Div

PART 1 GENERAL

1.01 SUMMARY

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 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

1.02 BASIS OF WORK+

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) **Monarch Series** (continuous wood pull) Maple Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 MANUFACTURERS

- A. The basis of this specification is Diversified Casework (www.diversifiedcasework.com) Monarch Series (continuous wood pull). 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.

2.02 MATERIALS

- A. It is the intent of this specification to provide a high-quality wood cabinet specifically designed for the science classroom environment. This style is to be continuous wooden pull full overlay construction with 3/4" thick particleboard core door and drawer fronts with Maple veneers, a minimum of 3mm Maple banding and attached continuous wooden pull. The door and drawer fronts occupy a plane extending 3/4" past the plane of the front of the cabinet body. Edges of door and drawer fronts shall have eased edges. The door and drawer fronts shall overlap the front edge of the cabinet by 1/4". The exposed grain for doors shall run vertical. Continuous wood pulls shall be attached at top of doors and drawers on base cabinets and bottom of doors on wall cabinets. Tall full height storage cases shall have 3-point latching handles.
- 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 Maple veneers and compatible Grade 1 Maple hardwood lumber.
- F. Semi-exposed surfaces shall be plain sliced, HPVA Grade 1 Maple veneers and compatible Grade 1 Maple hardwood lumber.
- 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 Maple.
- I. Hardboard shall be 1/4" 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. Hinges shall be BHMA Grade 1 of **stainless steel**, five (5) knuckle institutional, .083" thick, offset type for all swinging doors. Hinges shall be 2-1/2" 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 applied to door and cabinet to withstand weight load of 150 lbs. minimum.
- L. 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.

- M. 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.
- N. 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.
- O. 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.
- P. 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.
- Q. 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.
- R. Base molding and stainless-steel corner clips shall be provided by others.
- S. 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.
- T. Label holders, where shown or called for, shall be stainless steel, brad-attached type with satin finish and designed for 2" x 1" cards.
- U. Number plates, where shown or called for, shall be brass brad-attached type with satin finish and indented black lettering.
- V. 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Maple hardwood construction, 2-1/4" square with 1/4" 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 Maple. 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" horizontally between door and drawer heads and 1/2" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus, or minus 1/16 inch (1.6mm) from corner to corner.
 - b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.

- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8-inch (3 mm) drip groove at underside of exposed edges, set back ½ inch (13 mm) from face.
 - c) Finish exposed edges.
 - d. Edge treatment:
 - 1) Standard 1/8-inch (2 mm) chamfered edge.
 - e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
 - f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
 - g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
 - h. Sink cutouts:
 - 1) Routed for drop-in sink.
 - i. Allowable tolerances:
 - 1) Square.
 - a) Plus, or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus, or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
3. Epoxy Resin Sinks:
- a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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
Toluene and Other Hydrocarbons
Carbon - Tetrachloride
Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
- c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION

SECTION 12 35 53.19 – WOOD LABORATORY CASEWORK

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PART 1 GENERAL

1.01 SUMMARY

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 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

1.02 BASIS OF WORK

- A. This specification uses Diversified Casework (www.diversifiedcasework.com) **Monarch Series** (continuous wood pull) OAK Cabinetry 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.

1.03 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 8W. Documentation shall be provided showing independent testing and compliance with SEFA 8W.
- 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 3/4" veneer core plywood.

- I. Cabinet faces shall be vertically grain matched within door and drawer faces.
- J. Wall cabinets shall be provided with 3/4" X 4" 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.

1.04 SUBMITTALS

- A. Submit compliance statement with bid – see page 14 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

2.01 MANUFACTURERS

- A. The basis of this specification is Diversified Casework (www.diversifiedcasework.com) Monarch Series (continuous wood pull). 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 ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.02 MATERIALS

- A. It is the intent of this specification to provide a high-quality wood cabinet specifically designed for the science classroom environment. This style is to be continuous wooden pull full overlay construction with 3/4" thick particleboard core door and drawer fronts with Red Oak veneers, a minimum of 3mm Red Oak banding and attached continuous wooden pull. The door and drawer fronts occupy a plane extending 3/4" past the plane of the front of the cabinet body. Edges of door and drawer fronts shall have eased edges. The door and drawer fronts shall overlap the front edge of the cabinet by 1/4". The exposed grain for doors shall run vertical. Continuous wood pulls shall be attached at top of doors and drawers on base cabinets and bottom of doors on wall cabinets. Tall full height storage cases shall have 3-point latching handles.
- 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 3/4" 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 1/2" 9-ply veneer core plywood for drawer body; 3/4" 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 1/4" 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. Hinges shall be BHMA Grade 1 of **stainless steel**, five (5) knuckle institutional, .083" thick, offset type for all swinging doors. Hinges shall be 2-1/2" 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.

- L. 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.
- M. 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.
- N. 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.
- O. 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.
- P. 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.
- Q. 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.
- R. Base molding and stainless-steel corner clips shall be provided by others.
- S. 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.
- T. Label holders, where shown or called for, shall be stainless steel, brad-attached type with satin finish and designed for 2" x 1" cards.
- U. Number plates, where shown or called for, shall be brass brad-attached type with satin finish and indented black lettering.
- V. 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.

2.03 CONSTRUCTION

- A. Open-leg Tables: Legs shall be Red Oak hardwood construction, 2-1/4" square with 1/4" 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 3/4" 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 2-1/2" 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 4" 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 3/4" 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 1/2" 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, 1/2" on larger drawers) shall be white 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 1/4" horizontally between door and drawer heads and 1/2" 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 a 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 3/4" 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, 2-1/4" deep x 4" high, shall be totally enclosed by a 3/4" 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 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.

2.04 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 an 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.

2.05 WORKSURFACES

A. SOLID EPOXY RESIN:

- 1. 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.

B. ACCESSORIES:

- 1. Provide solid epoxy resin laboratory shelving, laboratory fume hood base work surfaces, pegboards, and reagent racks where indicated.
- 2. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

C. FABRICATION:

- 1. Fabricate tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 8.
- 2. Epoxy Resin Worksurfaces:
 - a. Thickness:
 - 1) 1 inch (25 mm) unless otherwise indicated.
 - a) Check each sheet at factory for required thickness.
 - b) Maximum variation in thickness: plus or minus 1/16 inch (1.6mm) from corner to corner.

- b. Warpage:
 - 1) Inspect tops for warpage prior to fabrication by placing on true flat surface.
 - a) 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.
- c. Fabrication:
 - 1) Shop fabricates in longest practical lengths.
 - a) Bond joints with highly chemical resistant cement with properties and color similar to base material.
 - b) Provide 1/8-inch (3 mm) drip groove at underside of exposed edges, set back ½ inch (13 mm) from face.
 - c) Finish exposed edges.
- d. Edge treatment:
 - 1) Standard 1/8 inch (2 mm) chamfered edge.
- e. Corner treatment:
 - 1) Exposed corners shall be eased slightly for safety
- f. Back and end splashes:
 - 1) Supplied loose for field installation.
 - 2) Same material and thickness as worksurfaces.
 - 3) 4 inches high unless otherwise indicated.
 - 4) Top-mounted end splash where worksurfaces abut adjacent construction and locations indicated on Drawings.
- g. Joints:
 - 1) Maximum 1/8 inch (2 mm), bonded with epoxy grout.
 - 2) Make joints between two benches level.
 - 3) Locate joints away from sinks and over or near supports.
- h. Sink cutouts:
 - 1) Routed for drop-in sink.
- i. Allowable tolerances:
 - 1) Square.
 - a) Plus or Minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
 - 2) Location of cutouts and drilled openings.
 - a) Plus or Minus 1/8 inch (3 mm) of design dimension.
 - 3) Size of cutouts and drilled openings.
 - a) Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).
- 3. Epoxy Resin Sinks:
 - a. Mold sinks from thermosetting epoxy resin.
 - b. Mold interior corners to radius and slope sink base to drain outlet.
 - 1) Provide 1-1/2 inch (38 mm) outlet with open ended standpipe.
 - a) Standpipe overflow 2 inches (50 mm) shorter than depth of sink.
 - c. Unless otherwise indicated fabricate sinks of drop-in design supported by upper flange from worksurface.
 - 1) Color.
 - a) Match adjacent worksurface.

2.06 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 tin lined interior and 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 Water80 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
Toluene and Other Hydrocarbons
Carbon - Tetrachloride
Mineral Oil

*Percentages are by weight.

PART 3 EXECUTION

3.01 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.

3.02 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.
 - c. 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 ensure 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.

	<u>YES</u>	<u>NO</u>
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 8W	_____	_____
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
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END OF SECTION