

SECTION 12345 - WOOD LABORATORY CASEWORK AND EQUIPMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of contract, including General and Supplementary Conditions and Division-1 specification sections, apply to work of this section.

1.02 QUALIFICATIONS

- A. All laboratory equipment covered by this specification and accompanying drawings shall be manufactured or furnished by one manufacturer and supplied under his direction to eliminate any divided responsibility.
- B. Owner/Architect reserves the right to reject any or all bids and award contract to other than lowest bidder if, in his opinion, such action would insure better performance and a higher level of function, quality, and value.

1.03 QUALITY ASSURANCE

- A. **Basis of Design and Quality: It should be noted that model/unit numbers shown on the drawings are for "design intent" only as they apply to size, door/drawer configuration, utility, etc. The specifications and detailed drawings clearly define the requirements of this project and must be strictly adhered to. The product requirements of this project are not necessarily the standard of any one manufacturer. The listing of manufacturers in this specification does not imply approval of their product. It is the responsibility of the bidder to bring to the attention of the architect any deviation from this specification. All deviations must be submitted to the architect, in writing, a minimum of ten days prior to bid date for review and/or approval. An addendum will be issued listing all approved deviations. Any deviations from this specification that have not been approved by the architect will not be accepted.**
- C. Manufacturers (**Inclusion in this list does not imply approval of manufacturers products**):
 - A. Sheldon Laboratory Systems
 - B
 - C

1.04 WORK BY LABORATORY EQUIPMENT CONTRACTOR

- A. Furnishing, delivering to the building, uncrating, setting in place, leveling, and anchoring all casework and equipment listed in the specification or equipment schedule and/or shown on the drawings.
- B. Furnishing plumbing fixtures and fittings only as defined in the specifications, complete with tank nipples and lock nuts for mounting fixtures and fittings on tops or curbs. Installation will be by other respective trades as a part of their final connections.
- C. Furnishing electrical service fixtures directly attached to the casework or equipment as called for in the specifications, equipment list and/or shown on the drawings. Fixtures supplied only, not attached or assembled. Installation will be by other respective trades as a part of their final connections.
- D. Furnishing and installing sink bowls and cup sinks, complete with required overflows, plugs and strainers as called for in the specifications, equipment list and/or shown on the drawings.
- E. Furnishing and installing filler panels and scribes as required for finished installation.

- F. Removal of all debris, dirt, and rubbish accumulated as a result of installation of this equipment, leaving premises broom clean and orderly.

1.05 WORK BY OTHERS

- A. Furnishing, installing, and connecting of all service lines, drain lines, piping, and conduit within equipment and fume hoods, in service turrets or tunnels, through, under, or along the backs of working surfaces, and in reagent racks above counter tops as required by specifications and/or drawings.
- B. Furnishing, installing, and connecting all ductwork from fume hoods to blowers and from blowers to final point of discharge to atmosphere. Blower furnished by mechanical contractor.
- C. Furnishing, installing, and connecting of all vents, re-vents, steam fittings and special plumbing fixtures or piping to meet local codes, even though not specifically called for in the specifications and/or shown on the drawings.
- D. Furnishing and installation of all rigid or flexible conduit, wire, pulling of wire, fittings, special electrical equipment and accessories including boxes, receptacles; flush plates sent loose. Included are those in box curbs or tops that are not installed at Equipment Contractor's plant due to inconvenience of shipping. All wiring and connecting of switch to fume hood lights and blower motors.
- E. Providing all framing and reinforcements of walls, floors, and ceilings necessary to adequately support the equipment, and all bucks and plaster grounds required for proper installation of equipment.
- F. Furnishing any miscellaneous materials generally classified as maintenance or supply items.
- G. Providing protection and security by General Contractor during and after laboratory equipment installation.
- H. Hoisting or elevator service by General Contractor at no charge to Equipment Contractor.

1.06 SUBMITTALS

Submit the following in accordance with General Conditions of contract specifications.

- A. Product data for each type of casework, hardware and accessories specified.
- B. Shop drawings for countertops showing sizes, shapes, edge and backsplash profiles, cutouts for plumbing fixtures and methods of joining.
- C. Shop drawings for casework showing location and size of each type of casework, accessories, materials, finishes, hardware types and locations, filler panels and anchorage details. Include fully dimensioned plans, elevations and sectional details of all equipment included in this specification. Shop drawings shall show the construction and interface of all equipment included in this specification.
- D. Samples for initial selection purposes of manufacturers color charts showing the full range of colors, textures and patterns for each type of material included in this specification.
- E. Samples for verification purposes must be based on the following specifications and not a "manufacturers standard" product. Manufacturer will be allowed to submit only one set of samples for approval. Samples not meeting the following specification will be grounds for rejection of bid. Upon request of the architect, samples must be submitted within thirty days and may be held until project completion. Samples that may be required are as follows:
 - 1. Full size Axis3 InfinityLab Table per specifications

2. Combination hot water, cold water and gas vandal resistant, solid cast service fixture.
3. Combination cold water and gas vandal resistant, solid cast service fixture.
4. Full size base cabinet with door and drawer-24"l.X22"w.X36"h.
5. Full size upper cabinet with solid hinged door-24"l.X12"d.X30"h.

F. Product certificates:

1. Certificate must be signed by the manufacturer certifying that materials and equipment furnished comply with specified requirements
2. Certification Statement for SEFA 8-1999 Recommended Practices must be signed by manufacturer.

1.07 MAINTENANCE AND OPERATING INSTRUCTIONS

This contractor shall include in its bid, the cost of providing a technically qualified representative for a period of one (1) day to thoroughly instruct the Owner's personnel in correct procedures of operating and maintaining this contract.

1.08 GUARANTEE

This contractor shall guarantee all materials and workmanship of equipment provided on this contract for a period of one (1) year from the date of final acceptance. Any defective materials or faulty workmanship occurring within that time shall be replaced or corrected without charge.

PART 2 PRODUCTS

2.01 MATERIALS (WOOD CASEWORK)

A. General

1. All casework shall be of modern design and shall be constructed in accordance with the best woodworking practices of the cabinet making industry. First class quality casework shall be established by use of machinery, tools, fixtures, and skilled workmanship.
2. Units shall be assembled using thru-bolt construction at all major points of strain, properly glued and further reinforced with screws or steel power lock pins making each unit rigid and self-supporting for use interchangeable in an assembly or single unit use.

B. Definitions

1. The following definitions apply to wood laboratory casework units. Casework unit size and type are indicated on the drawings and/or equipment list.
 - a. Exposed portions of casework include surfaces visible when doors and drawers are closed. Bottoms of cases more than 4'-0" above floor shall be considered as exposed. Visible members in open cases or behind glass doors also shall be considered as exposed portions.
 - b. Unexposed portions of casework shall include surfaces behind closed doors, sleepers, web frames, dust panels, and other surfaces not usually visible after completed installation.

C. Materials

1. Materials used for construction of cabinets, cases and tables as specified herein shall meet or exceed the minimum standards as specified.
 - a. Exposed Woods

1. Solid Wood: Plain sawn Red Oak lumber, clean and free from defects. All lumber thoroughly and properly air dried to a uniform moisture content of 4%-6% by weight, tempered to 7%-8% during fabrication.
 2. Plywood: Red Oak plywood shall be thickness as specified herein, faced with surface veneer secured with highly water-resistant glue. **Oak veneer shall be "Premium Grade" Rift Cut sorted for uniform color. Rotary cut and Plain sliced veneers will be rejected.**
- b. Unexposed Woods
1. Solid Lumber: Dry, sound, selected to eliminate appearance defects. Any species of hardwood similar in color and grain to exposed portions.
 2. Plywood: **Red Oak "Grade 1" Rift Cut veneer core sorted for uniform color. Rotary cut and Plain sliced veneers will be rejected.**
 3. Hardboard (Tempered): Shall be 1/4" thick. All hardboard shall be composed of wood fibers and resinous binder compressed under heat and pressure.
- * The use of woods allowing knots, repaired knots, worm holes, etc. will not be accepted in any portion of the construction of cabinetry.

D. Construction

1. Cabinets, cases, tables, and other units shall be of the size and configuration indicated on the drawings and/or equipment list.
2. All units shall be flush front construction. Drawer fronts and hinged doors shall have square edges, partial flush overlap design and shall overlap openings on all edges.
3. Cabinet End Panels: End panels shall be 3/4" thick, 7-ply solid core, veneer core plywood.
4. Vertical partition: Partitions shall be 3/4" thick, 7-ply solid core, veneer core plywood.
 - a. Exposed edges of end panels, partitions and shelves shall be edged with solid oak.
5. Top Frame - Base Cabinet: 2" X 1-1/4" solid oak rails, front and back, grooved to receive 1/4" diameter thru-bolt and cross rails. Cross rails are 2" X 1" solid hardwood fully housed into front and back rails with mortised and tenoned joints to form a full four-sided top frame. **Cabinets with top frame only are not acceptable and will be rejected. All cabinets must have top and bottom full frames.**
6. Bottom Frame - Base Cabinet: 2" X 1-1/4" solid oak rails, front and back, grooved to receive 1/4" diameter thru-bolt. **Cabinets with top frame only are not acceptable and will be rejected. All cabinets must have top and bottom full frames.**
 - a. Base cabinet bottoms: Bottoms 1/2" thick solid core, veneer core plywood. Bottoms fully housed into front and back rails with mortised and tenoned joints to form a totally solid and rigid assembly.
7. Bottom Frame - Sink Cabinet: 2" X 1-1/4" solid oak rails, front and back, grooved to receive 1/4" diameter thru-bolt and cross rails. Cross rails are 2" X 1" solid hardwood fully housed into front and back rails with mortised and tenoned joints to form a full four-sided bottom frame. **Cabinets with top frame only are not acceptable and will be rejected. All cabinets must have top and bottom full frames.**
 - a. Sink cabinet bottoms: Bottoms are 1/4" thick tempered hardboard attached to

bottom frame. Cabinet bottoms are removable and replaceable.

8. Top and Bottom Frame - Upper and Tall Cabinets: 2" X 1-14" solid oak rails, front and back. Rails are grooved to receive 1/4" diameter thru-bolt. **Cabinets with top frame only are not acceptable and will be rejected. All cabinets must have top and bottom full frames.**
 - a. Upper and tall cabinet tops and bottoms: Tops and bottoms are 1/2" thick solid core, veneer core plywood. Cabinet tops and bottoms are fully housed into front and back rails with mortised and tenoned joints to form a totally solid rigid assembly.
9. Intermediate Rail: Intermediate front rails are 3/4" X 3" solid oak. Rails are located between drawers/drawers and drawers/doors. Rail is grooved to receive security panel.
10. Security Panel: Security panel is 1/4" thick hardboard. Panel is provided between drawers/drawers and drawers/doors when base cabinet is to have locks that are keyed differently.
11. Drawers
 - a. Front: Drawer fronts shall be 3/4" thick solid particle board core, oak veneer, **vertical match-grain** with square edge to provide a partial flush overlap. Edges are banded with 3mm solid oak.
 - b. Body: Back, sides, and front shall be 1/2" thick solid hardwood joined by tongue and grooved joint and interfibrous friction fasteners. Drawer bottom is 1/4" thick hardboard, set in groove all around, pinned and glued.
 - c. Finish: All drawer bodies shall receive a clear coat finish.
 - d. Drawer Slide System: Drawer runners shall be powder coated, cold roll steel, featuring a captive roller system with in and out stop and out position keeper. Drawer runners shall be side and bottom mount with 100 lb. load rating per SEFA 8-1999.
12. Doors - Base and Wall Cabinets
 - a. Doors shall be 3/4" thick solid particle board core with oak veneer, **vertical match-grain**. Both surfaces faced with oak veneer. Edges are banded with 3mm solid oak to provide a flush overlap.
13. Doors - Tall Cabinets, Solid
 - a. Doors shall be 3/4" thick solid particle board core with oak veneer, **vertical match-grain**. Both surfaces faced with oak veneer. Edges are banded with 3mm solid oak to provide a flush overlap.
14. Doors - Framed Glass
 - a. Doors constructed of veneer core plywood machined to receive glass panels. Glass is set into machined opening and held in place by plastic retainer. (Hinged and sliding)
15. Cabinet Backs
 - a. Exposed - 1/4" thick oak plywood
 - b. Unexposed - 1/4" thick hardboard (Removable at sink cabinets)
16. Cabinet Shelves

- a. Shelves over 30" shall be 1" thick, 9-ply solid core, hardwood veneer core plywood, and shelves under 30" shall be 3/4" 7-ply hardwood veneer core plywood. Front edge banded with solid oak. Shelves are adjustable on 1-1/4" centers, supported by four (4) nickel-plated steel pin and socket type shelf clips.
- E. Laboratory Grade Wood Finish
1. ***Exterior and interior*** of all cabinets shall be finished with one (1) of manufacturers standard finishes. A minimum of four (4) finish selections shall be provided.
 2. All parts shall be carefully sanded and buffed in preparation for the finishing processes. The first coat shall be a stain and sealer coat of synthetic resin. The product is then cured at elevated temperatures. After the first sealer coat, the product shall be sanded, wiped clean and then two (2) more coats of an acid resisting synthetic resin shall be applied and cured at elevated temperatures.
 3. Cabinet Finish Chemical Test and Evaluation
 - a. All manufacturers proposing to submit a bid must provide certification that the finish will meet the following requirements.
 - b. Chemical Resistance
 1. Chemical Reagents - withstand one (1) hour contact with ten (10) drops (1/2 ml.) covered by watch glass, convex side down in center of pool to prevent evaporation.
 - Hydrochloric Acid, all concentrations
 - Nitric Acid, 30%
 - Sulfuric Acid, 50%
 - Acetic Acid, all concentrations
 - Phosphoric Acid, 75%
 - Ammonium Hydroxide, all concentrations
 - Sodium Hydroxide, all concentrations
 - Potassium Hydroxide, all concentrations
 - Zinc Chloride, saturated

RESULT - No visible effect other than slight discoloration, change of gloss or temporary softening of film.
 2. Solvents - withstand contact with ten (10) drops (1/2 ml.) placed on surface until evaporated.

Benzene	Methyl Alcohol
Toluene	Ethyl Alcohol
Chloroform	Ethyl Ether
Carbon Tetrachloride	Acetone
Naphtha	

RESULT - No visible effect other than slight discoloration, change of gloss, or temporary softening of film.
 3. Heat Resistance - Hot water (190-205 degrees) trickled down surface (tilted 45 degrees) for five minutes. No visible effect.
 4. Moisture Resistance - Cellulose sponge (2" X 3" X 1") soaked with water and placed on finish for 100 hours and kept constantly wet. No effect.
 5. Fade Resistance - 100 hours exposure to Sylvania 275 R.S. sun lamp placed 10" above surface. Slight discoloration.

2.02 CASEWORK HARDWARE AND ACCESSORIES

- A. Hinges: Institutional type, five-knuckle, with pins of not less than .177" in diameter and leaves of not less than .095" thick. Hinges shall be wrought steel with black powder coating. Two (2) hinges shall be provided on doors under 36" in height and three (3) hinges for doors 36" and over.
 - 1. Physical properties: Hinge must be capable of supporting 150 lbs. placed 12" from hinge center with door open 90 degrees.
- B. Pulls: **Solid metal**, wire type, 4" long mounted with two (2) screws fastened from back. Pulls shall be black powder coated to match hinges. Provide two (2) pulls for drawers over 24" wide.
- C. Door Catches: Provide two (2), top and bottom. Dual aligning magnetic catch.
- D. Elbow Catches: Brass with latch held by coiled compressing spring. Catch plates of 16 gauge plated steel.
- E. Leg Shoes: Molded vinyl or rubber, black, coved bottom type to match radius of base molding.
- F. Glass: Tempered glass
- G. Locks: Provided only when specifically shown on drawings, equipment list, or indicated by catalog number. Five disc tumblers - die cast zinc alloy plated cylinder. Positive tumbler operation for unlocking is accomplished by the action of a heavy brass key. All locks provided with two (2) keys and subject to master keying.
- H. Sliding Doors - (Frame-less Glass) - tempered glass with seamed edges. Operate on metal track applied at top and bottom front horizontal rails of cabinet. Doors easily removable for cleaning. Locks, when indicated, showcase type.
- I. Sliding Doors - (Framed Glass/ Wood Tall Cases) - operate in overhead metal track with ball bearing rollers and nylon wheels. Metal tracks applied to bottom. Locks, where shown on drawings or indicated by catalog number, plunger bolt type.

2.03 TOPS, SINKS, AND ACCESSORIES

- A. General
 - 1. Comply with physical and chemical resistance requirements for materials for tops and sinks as specified herein.
 - 2. Tops: Provide smooth, clean, exposed tops and edges, in uniform plane free of defects. Splash and curbs shall be 4" high x 1" thick, unless otherwise noted on the drawings, and shall be located at the backs of all counter tops.
 - a. Top sizes: Furnish tops in maximum practicable lengths, in configuration indicated on the drawings.
- B. Countertops
 - 1. Shelresin (epoxy resin) - especially blended to produce a high chemical resistant material. Tops shall be one inch black (1") thick. Physical and mechanical properties:

Tensile strength, psi	10,700 PSI
Compressive strength, psi	30,600 PSI
Flexural strength, psi	12,800 PSI
Hardness, Rockwell "M"	105
Density, gr/cc	2.03 G/CC
- C. Sinks, Troughs, and Service Turrets

1. Shelresin (epoxy resin) – black one-piece construction. Inside corners and bottoms coved for easy cleaning. All sinks to be drop-in type, flush mounted.

D. Plumbing Fittings

1. Vandalguard water fixtures - (Specifically designed to prevent student damage and provide extra protection from student vandalism.) Water fitting shall have the main body cast in one-piece of 5A-ASTM-30 brass. Tubing shall not be a part of its structure.

Body shall be carefully machined using standard valve seat, composition washer, operating screw threads and stem for cold and/or hot water.

Operating handle shall be delrin plastic fitted with cold and/or hot water index.

Outlet is a removable, anti-splash soft flow aerator.

Fixture shall be fitted with a rectangular semi-resilient neoprene gasket and tank nipples that extend through the work surface and are held in place with washers and lock nuts.

2. All working parts are removable and interchangeable with fitting of same type. Fixtures furnished with hose connection and/or vacuum breakers when indicated.

Water valve stems are held in place by large packing nut with brass and fiber washer and preformed long life packing. Valve stem assembly removable without disturbing installation of fixture. Double acme thread on valve stem and fixture body. Seat is interchangeable bronze. Surface highly polished.

3. Ground key cocks for gas. Ground key cocks shall have a forged brass valve body, with a straight (10) serration hose end integral with the valve body. Valve plug shall be forged brass with an oversize operating handle held in place with a non-removable solid stainless steel pin, and shall have a color coded screw-on type index disc which permits full visibility of the color from the side. Ground key cocks shall be individually ground, lapped and sealed and shall be individually tested at 100 PSI under water. The maximum working pressure for ground key cocks shall be 40 PSI.

****Ball cock valve shall be used for all ADA gas fixtures.**

****Wrist blade handles shall be used for all ADA water fixtures.**

4. FINISH - ALL FITTINGS TWILIGHT IN COLOR SHALL HAVE POWDER COAT APPLIED TO SANDBLASTED SURFACE TO CREATE CHEMICAL AND REAGENT RESISTANT FINISH.

E. Drain Fittings

1. Sink Fittings - All sinks provided with stopper and threaded sink outlets.

F. Electrical Fixtures

1. Electrical Fixtures - part of, or installed in the equipment, approved by National Board of Underwriters and must conform to City and State Building Ordinances.
2. Knock-out Boxes - when indicated, installed in laboratory equipment.
3. Receptacles - grounded type, 20-amp heavy duty industrial grade.

2.04 Technical Product

General

The following specifications are provided to accurately describe the technical products shown on the drawings. Because of the specific educational function of these items, any deviations from this section will not be considered.

PART 3 EXECUTION

3.01 COORDINATION

The casework contractor shall coordinate all deliveries and installation of this equipment with the General Contractor and associated trades.

- A. Lab casework shall not be delivered to the jobsite until the following conditions have occurred.
 - 1. Overhead ceiling work - ductwork, lighting, acoustical ceiling, etc. is complete.
 - 2. Windows and exterior doors are installed. Building is secure and weather-tight.
 - 3. Air circulation control system is functioning and maintaining relatively constant temperature and humidity conditions closely approximating those to be maintained by the Owner.
- B. It is recommended that all painting be completed in the areas in which casework is to be installed prior to such installation.

3.02 CABINET INSTALLATION

- A. The casework shall be delivered to the building in pre-finished modular units. It shall be set in place, leveled, secured to walls or floors as necessary, trimmed or scribed to make a neat installation. Installation shall be under the direction of a factory approved superintendent.
- B. Provide filler panels where required to close spaces between casework and walls.
- C. The casework contractor shall deliver to the appropriate contractor all sinks, troughs, service fixtures, etc., as supplied in this section, for installation and connection by the appropriate trades.

3.03 CLEANING AND PROTECTION

- A. Remove all debris, dirt, rubbish and excess material accumulated as a result of the installation of this equipment and leave casework clean and orderly.
- B. Advise contractor of procedures for protection of installed material from damage from work of other trades.