

SECTION 12345 – WOOD LABORATORY CASEWORK AND FURNISHINGS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of contract, including General and Supplementary Conditions and Division-1 Specification apply.

1.02 QUALIFICATIONS

- A. All laboratory equipment covered by this specification and the relevant project drawings shall be furnished by a single source to facilitate coordination between the various manufacturers and eliminate divided responsibility.
- B. Equipment Contractor shall submit a list demonstrating the completion of at least ten (10) projects of equal or greater size than this project and that have been in service for five (5) years or longer.
- C. Those seeking to bid, other than the supplier of the specified products must apply for approval at least seven (7) days prior to bid opening. Full-sized samples of wall, base, and tall cabinets along with relevant specifications must be submitted to the architect.

1.03 QUALITY ASSURANCE

- A. Basis of Design and Quality –
Labscape™, manufacturers of industrial and educational casework as distributed by:

Longo Associates, Inc.
100 Hilltop Road
Ramsey, NJ 07446-1119
Telephone: (201) 825-1500
Fax: (201) 825-4784

- B. B. Provide certification that furniture meets the performance requirements described in SEFA 8.

1.04 WORK BY EQUIPMENT CONTRACTOR

- A. Furnishing, delivering to the jobsite, uncrating, setting in place, leveling and securing 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 by specifications or noted on project drawings and/or as included in manufacturer's standard model number. Assembling and securing fixtures to casework and equipment shall be by the Plumbing Contractor as part of their final connections.
- C. Furnishing electrical service fixtures as defined by specification or noted on project drawings and/or included in manufacturer's standard model number. Assembling or securing fixtures to casework and equipment shall be by the Electrical Contractor as 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. Furnishing and installing locks at doors and drawers when specifically noted in the specifications or project drawings. (If locks are not noted or called for, they will be excluded from Equipment Contractor's scope of work.)
- G. Removal of all debris, dirt, and rubbish accumulated as a result of installation of this equipment, leaving premises broom clean and orderly. Debris and rubbish to be deposited in dumpsters provided by General Contractor.

1.05 WORK BY OTHERS

- A. Plumbing Work
Service rough-ins, shut-off valves, internal piping, support brackets, or final connection to plumbing fixtures (Service fixtures, when provided, are installed by the Plumbing Contractor.)
- B. Electrical Work
Service rough-ins, junction boxes, internal conduit and wiring, support brackets, or final connection to electrical fixtures. (Electrical receptacles, when provided, are installed by Electrical Contractor.)
- C. Sink Drains
Waste rough-ins, hubs, vents, adapters, internal piping, support brackets, traps, tailpieces, or final connection to sink outlet.
- D. Fume Hood Duct Work, Fans, and Blowers
Exhaust and supply duct, fans, exhaust stacks, mounting brackets, adapters, safety disconnects, magnetic starters, conduit and wiring to fans or final connection to equipment.
- E. Offsite Storage
Should site conditions not be ready for storage of product, and said product has been delivered as requested by Contractor, then offsite storage shall be provided at no cost to this Sub-Contractor. The General Contractor will reimburse this Sub-Contractor any cost related to moving product from Offsite Storage to Site.
- F. Appliances, Data Outlets, Wall-Mounted Chalkboard and Tack Boards
Chalkboards and tack boards are provided when they are an integral part of the Labscape product.
- G. Locks
Except where specifically called for.
- H. Demolition Work
- I. Caulking Between Tops, Walls, Battens, and Equipment
All caulking to be by General Contractor.
- J. Framing or Reinforcements
Any framing or reinforcement of walls, floors, and ceilings required to support the equipment provided under this section, including but not limited to threaded rods, uni-strut, and plaster grounds shall be provided and installed by the respective trade. Equipment supplier shall provide detailed drawings showing types and locations of required blocking and securement apparatus.
- K. Performance Bond
Not supplied unless specifically required by law or contract documents.

- L. Furnishing, installing, and connecting of all vents, revents, 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.
- M. 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 which are not installed at Equipment Contractor's plant due to inconvenience of shipping. Wiring and connection of switch to fume hood lights and blower motors.
- N. Furnishing any miscellaneous materials generally classified as maintenance or supply items.
- O. Providing protection and security by General Contractor during and after laboratory equipment installation.
- P. Hoisting or elevator service
General Contractor to provide these services at equipment locations above ground floor.

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. Provide data indicating compliance with SEFA 8 standards.
- 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, and filler panels. 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 manufacturer's 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 (1) set of samples for approval. Samples not meeting the following specification will be grounds for rejection of bid. Upon request of the Architect/Owner, samples must be submitted within thirty (30) days and may be held until project completion. Samples that may be required are as follows:
 - 1. One (1) combination drawer and cupboard base cabinet showing construction details.
 - 2. Sample of countertop material.
 - 3. Specifications and product literature indicating deviations from the project specifications.

1.08 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.

1.09 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 – MATERIALS

- 2.01 **HARDWOOD PLYWOOD** (for this specification, all language refers to Northern Red Oak. White Maple or Birch may be substituted in lieu of Northern Red Oak.)
- A. Plywood used for exterior surfaces and exposed to view after installation or for interior surfaces of open face cabinets or cabinets having glazed doors shall have A-1 plain sliced face grade veneers and shall be of thickness described under Part 3 – Construction of this specification.
 - B. Plywood used for exterior surfaces unexposed to view after installation or interiors of cabinets with doors or drawers shall be hardwood Grade D veneer face, Grade 3 back.
- 2.02 **LUMBER**
- A. All lumber used for exposed cabinet members shall be selected northern grown hardwood, matching that of the hardwood plywood selected, free from cracks, checks and knots.
 - B. All lumber used for interior construction shall be hardwood as selected by the manufacturer and free from structural defects.
 - C. All solid lumber shall be thoroughly air-dried, then kiln dried to a moisture content of 6 – 7% and finally environmentally tempered before fabrication.
- 2.03 **HARDBOARD**
- A. Hardboard shall be $\frac{1}{4}$ " thick, composed of wood fibers and resinous binder compressed under heat and pressure to form a hard, smooth surface.
- 2.04 **HIGH DENSITY FIBERBOARD**
- A. High Density Fiberboard shall be $\frac{3}{4}$ " thick, composed of wood fibers and resinous binder formed with heat and pressure to form a hard, smooth surface.
- 2.05 **EDGING**
- A. All exposed cabinet doors, drawer and drawer fronts and shelf edges shall be edged with 3 mm solid oak banding applied with hot melt adhesive under extreme heat and pressure.
 - B. Unexposed shelf edging shall be edged with 3MM solid oak banding applied with hot melt adhesive under extreme heat and pressure.
- 2.06 **GLASS**
- A. Framed sliding and swinging doors shall be $\frac{3}{16}$ " thick tempered glass.
 - B. Unframed sliding glass doors shall be $\frac{1}{4}$ " thick tempered glass.
 - C. Fume hood glass shall be $\frac{7}{32}$ " thick laminated safety float glass.
- 2.07 **DOWELS**

A. Dowels used to assemble rails and panels shall be 8MM diameter fluted hardwood.

2.08 HARDWARE

A. Hinges

1. Hinges shall be 5 knuckle hospital tip institutional grade quality, .083" thick, offset type for swinging doors. Hinges shall be 2½" long with a non-removable pin and be satin finish stainless steel.
 - a. Doors under 48" in height shall receive two (2) hinges.
 - b. Doors exceeding 48" in height shall receive three (3) hinges.
 - c. Hinges are mounted using four (4) flat head screws to the cabinet end and five (5) flat head screws to the door resulting in a minimum weight load capacity of 200 pounds.

B. Door and Drawer Pulls

1. Pulls shall be zinc coated steel bow or wire type, nominally 4" O.C.
 - a. Pulls shall be surface mounted and attached using two (2) machine screws.
 1. All doors shall receive one (1) pull per door.
 2. Drawer fronts up to 24" wide shall receive one (1) pull.
 3. Drawer fronts exceeding 24" wide shall receive two (2) pulls.
2. Flush pulls for sliding doors shall be recessed providing a finger grip and be satin finish chrome plated steel.

C. Locks

1. Locks, when specified and called for on the drawings, shall be 5-disc tumbler with an interchangeable cylinder. Finish shall be satin nickel.
 - a. Locks shall have the capacity for 200 primary key changes.
 - b. Cam shall fit securely into mortised slot located in cabinet bottom, side or intermediate rail.

D. Catches

1. Base and wall cabinets shall have roller catches consisting of two (2) spring-loaded polyethylene rollers and metal catch.
 - a. Double door cabinets without locks shall have a catch on each door.
2. Tall cabinets shall employ a 3-point latch mechanism.

E. Drawer Slides

1. Standard drawers shall be equipped with a ¾ extension slide assembly consisting of a 2-part slide mechanism of epoxy coated steel and captive nylon rollers. Minimum dynamic load rating shall be 100 pounds.
 - a. Drawer slide member shall have two (2) legs formed at 90° wrapping side and bottom of drawer.
 - b. Cabinet slide member shall be U-shaped formed to capture nylon roller and be mounted with screws to the side of the cabinet.
2. Full extension slide, when specified, shall be a 3-part slide mechanism consisting of zinc plated cold rolled steel and captive steel ball bearings. Minimum dynamic load rating of 100 pounds.
 - a. Drawer slide members are side mounted with screws.

- F. Shelf Supports
 - 1. Shelf supports shall be heavy-duty nylon or injection molded plastic with a double stem engagement system inserted into pre-drilled holes in the cabinet ends or partition. Pre-drilled holes shall be located 32MM (1¼") on center.
 - 2. Shelf supports shall have molded locking tabs, that will accept ¾" and 1" shelving, to prevent accidental tipping.
- G. Wardrobe Hangar Rod
 - 1. 1¼" diameter chrome plate steel rod supported by end mounted captive sockets.
- H. Tote Trays
 - 1. Impact resistant polystyrene of tan color.
- I. Leg Boot / Floor Glides
 - 1. All table legs shall receive 2½" black rubber leg boots to conceal leveling device.
 - 2. Leg leveling device shall be of non-skid, non-marring material 1" in diameter with a minimum of 5/8" height adjustment.
- J. Base Molding
 - 1. Base molding shall be provided and installed by others.
- K. Upright Rod Assemblies
 - 1. Upright rods and cross rods, when specified, shall be ¾" diameter aluminum.
 - 2. Rod sockets shall be aluminum and secured through the work surface with a lock nut and washer.
- L. Label Holders / Number Plates
 - 1. When specified, shall be zinc plated satin finish steel designed to accept 2" x 1" labels. Secured with matching brads.
 - 2. When specified, shall be satin finish aluminum with black lettering. Secured with matching brads.
- M. Sliding Glass Doors
 - 1. Framed Doors
 - a. Double extruded aluminum track with hanging nylon rollers secured to the cabinet top and door top. An aluminum U-channel is secured to the bottom of the cabinet for guidance.
 - 2. Unframed Glass Doors
 - a. Double extruded aluminum track with roller bearings secured to the bottom of the cabinet. An aluminum U-channel is secured to the top of the cabinet for guidance.

PART 3 – CONSTRUCTION

3.01 TABLES

- A. Open Leg Tables
 - 1. Legs shall be solid Red Oak 2¼" square with ¼" radius on each long corner.

2. Aprons shall be 4" x $\frac{13}{16}$ " solid Red Oak.
3. Legs shall be secured to the apron frame by a heavy-duty corner bolt and a 13 gauge steel corner brace.
 - a. Corner braces shall be locked in to apron rails by located dadoes in apron and securely fastened with screws.
4. Work surface shall be attached to the apron rails using zinc coated screws through pocket holes drilled on the inside face of the apron.
5. Leg stretchers, where required, shall be $\frac{7}{8}$ " x 2 $\frac{1}{2}$ " solid Red Oak secured through the legs with a 4" through bolt.

3.02 BASE CABINETS

A. Cabinet End Panels

1. Shall be $\frac{3}{4}$ " thick 7-ply veneer core plywood with $\frac{1}{4}$ " solid Red Oak edge banding on the front edge.
2. Shall have two (2) rows of 5MM holes vertically row bored, 32MM on center, on each end panel to accept drawer slides and shelf supports.
3. Shall be notched 4" high x 2 $\frac{1}{4}$ " deep on the front bottom edge to receive a 4" x $\frac{3}{4}$ " piece of hardwood plywood forming a totally enclosed toe space.
4. Shall receive a $\frac{1}{4}$ " x $\frac{1}{4}$ " vertical dado $\frac{3}{4}$ of an inch in from the rear edge to accept a $\frac{1}{4}$ " thick back.

B. Cabinet Bottom

1. Shall be $\frac{3}{4}$ " thick 7-ply veneer core plywood with $\frac{1}{4}$ " solid Red Oak edge banding, multiple doweled. Dowels are to be glued securely to end panels and clamped under pressure to ensure joint integrity and unit squareness.

C. Horizontal Top Frame

1. At the front of the cabinet, rail shall be 2 $\frac{1}{2}$ " x 1" solid oak.
2. At the rear of the cabinet, rail shall be 2 $\frac{1}{2}$ " x 1" solid hardwood.
3. At the sides of the cabinet, rails shall be 1 $\frac{1}{2}$ " x $\frac{3}{4}$ " hardwood.
4. All rails shall be multiple doweled. Dowels are to be glued securely to end panels and clamped under pressure to ensure joint integrity and unit squareness, resulting in a fully framed cabinet.

D. Horizontal Intermediate Rails

1. Shall be 2 $\frac{1}{2}$ " x $\frac{3}{4}$ " solid oak, multiple doweled and glued securely to end panels.
2. Shall be located at the front of the cabinet between stacked drawers and between doors and drawers.

E. Backs

1. Shall be $\frac{1}{4}$ " high density fiber board at unexposed interiors.
2. Shall be $\frac{1}{4}$ " 5-ply hardwood plywood at exposed interiors.
3. In all base cabinets, the back will fit snugly into a $\frac{1}{4}$ " deep dado in the end panels and bottom, and be secured by hot melt adhesive.

F. Hang Rails

1. Shall be 3" x $\frac{3}{4}$ " 7-ply hardwood plywood, multiple doweled and glued securely to the cabinet ends at the top and bottom of the cabinet.

G. Drawers

1. Drawer sides, back and sub-front shall be $\frac{7}{16}$ " thick 9-ply Birch plywood.
2. Drawer bottom shall be $\frac{1}{4}$ " thick hardboard with a thermally fused laminated interior surface.
3. Sides, back and sub-front shall be assembled using multiple dovetail joints and glue at all four corners.
4. Drawer bottoms shall be set and glued into $\frac{1}{4}$ " dadoes on all four sides.

H. Shelves

1. Shelves 30" wide or less shall be $\frac{3}{4}$ " thick 7-ply veneer core plywood with $\frac{1}{4}$ " solid oak edge banding on the front edge.
2. Shelves over 30" shall be 1" thick 9-ply veneer core plywood with $\frac{1}{4}$ " solid oak edge banding on the front edge.

I. Doors and Drawer Fronts

1. Shall be $\frac{3}{4}$ " thick solid core material with oak veneer both sides.
 - a. All four (4) edges to be banded with 3 mm solid oak.
 - b. Drawer fronts and swinging doors shall overlap the cabinet opening on all four (4) sides by $\frac{1}{4}$ ".
2. An astragal shall be applied to the inside face of the left door and shall extend beyond the rear of the right door, thus securing the left door when locks are required as the right door shall receive the lock.
3. Glass-framed doors shall be $\frac{7}{8}$ " thick x $2\frac{3}{4}$ " wide solid oak framing.
 - a. The rear inside edge of the opening shall be rabbeted to accept $\frac{3}{16}$ " thick tempered glass. Glass shall be held in place with plastic retainer.

3.03 WALL CABINETS

A. Cabinet End Panels

1. Shall be $\frac{3}{4}$ " thick 7-ply veneer core plywood with $\frac{1}{4}$ " solid Red Oak edge banding on the front and bottom edge.
2. Shall have two (2) rows of 5MM holes vertically row bored, 32MM on center, on each end panel to accept shelf supports.
3. Shall receive a $\frac{1}{4}$ " x $\frac{1}{4}$ " vertical dado $\frac{3}{4}$ of an inch from the rear edge to accept a $\frac{1}{4}$ " thick back.

B. Cabinet Top and Bottom Panels

1. Shall be 1" thick 9-ply veneer core plywood with $\frac{1}{4}$ " solid Red Oak edge banding, multiple doweled. Dowels are to be glued securely to end panels and clamped under pressure to ensure joint integrity and unit squareness.
2. Shall receive a $\frac{1}{4}$ " x $\frac{1}{4}$ " dado the length of the member $\frac{3}{4}$ of an inch in from the rear edge to accept a $\frac{1}{4}$ " thick back resulting in a fully captured back panel.

C. Backs

1. Shall be $\frac{1}{4}$ " thick high density fiberboard at unexposed interiors.
2. Shall be $\frac{1}{4}$ " thick 5-ply hardwood plywood at exposed interiors.
3. In all wall cabinets, the back will fit snugly into a $\frac{1}{4}$ " deep dado located in the cabinet end panels and top and bottom panels, resulting in a fully captured back. Back shall be secured by hot melt adhesive.

D. Hang Rails

1. Shall be 3" x 3/4" 7-ply hardwood plywood, multiple doweled and glued securely to the end panels at the top and bottom of the cabinet.

E. Shelves

1. Shelves 30" wide or less shall be 3/4" thick 7-ply veneer core plywood with 1/4" solid oak edge banding on the front edge.
2. Shelves over 30" shall be 1" thick 9-ply veneer core plywood with 1/4" solid oak edge banding on the front edge.

F. Doors

1. Shall be 3/4" thick solid core material with oak veneer both sides.
 - a. All four (4) edges to be banded with 1/4" solid oak.
 - b. Swinging doors shall overlap the cabinet opening on all four (4) sides by 1/4".
2. An astragal shall be applied to the inside face of the left door and shall extend beyond the rear of the right door, thus securing the left door when locks are required as the right door shall receive the lock.
3. Glass-framed doors shall be 7/8" thick x 2 3/4" wide solid oak framing.
 - a. The rear inside edge of the opening shall be rabbeted to accept 3/16" thick tempered glass. Glass shall be held in place with plastic retainer.

3.04 FULL HEIGHT CABINETS

A. Cabinet End Panels

1. Shall be 3/4" thick 7-ply veneer core plywood with 1/4" solid Red Oak edge banding on the front edge.
2. Shall have two (2) rows of 5MM holes vertically row bored, 32MM on center, on each end panel to accept drawer slides and shelf supports.
3. Shall be notched 4" high x 2 1/4" deep on the front bottom edge to receive a 4" x 3/4" piece of hardwood plywood forming a totally enclosed toe space.
4. Shall receive a 1/4" x 1/4" vertical dado 3/4 of an inch in from the rear edge to accept a 1/4" thick back.

B. Cabinet Bottom

1. Shall be 3/4" thick 7-ply veneer core plywood with 1/4" solid Red Oak edge banding, multiple doweled. Dowels are to be glued securely to end panels and clamped under pressure to ensure joint integrity and unit squareness.

C. Cabinet Top and Bottom Panels

1. Shall be 1" thick 9-ply veneer core plywood with 1/4" solid Red Oak edge banding, multiple doweled. Dowels are to be glued securely to end panels and clamped under pressure to ensure joint integrity and unit squareness.
2. Shall receive a 1/4" x 1/4" dado the length of the member 3/4 of an inch in from the rear edge to accept a 1/4" thick back resulting in a fully captured back panel.

D. Hang Rails

1. Shall be 3" x 3/4" 7-ply hardwood plywood, multiple doweled and glued securely to the cabinet ends at the top, center and bottom of the cabinet.

E. Shelves

1. Shelves 30" wide or less shall be $\frac{3}{4}$ " thick 7-ply veneer core plywood with $\frac{1}{4}$ " solid oak edge banding on the front edge.
2. Shelves over 30" shall be 1" thick 9-ply veneer core plywood with $\frac{1}{4}$ " solid oak edge banding on the front edge.

F. Backs

1. Shall be $\frac{1}{4}$ " thick high density fiberboard at unexposed interiors.
2. Shall be $\frac{1}{4}$ " thick 5-ply hardwood plywood at exposed interiors.
3. In all tall cabinets, the back will fit snugly into a $\frac{1}{4}$ " deep dado located in the cabinet end panels and top and bottom panels, resulting in a fully captured back. Back shall be secured by hot melt adhesive.

G. Doors and Drawer Fronts

1. Shall be $\frac{3}{4}$ " thick solid core material with oak veneer both sides.
 - a. All four (4) edges to be banded with $\frac{1}{4}$ " solid oak.
 - b. Drawer fronts and swinging doors shall overlap the cabinet opening on all four (4) sides by $\frac{1}{4}$ ".
2. An astragal shall be applied to the inside face of the left door and shall extend beyond the rear of the right door, thus securing the left door when locks are required as the right door shall receive the lock.
3. Glass-framed doors shall be $\frac{7}{8}$ " thick x 2 $\frac{3}{4}$ " wide solid oak framing.
 - a. The rear inside edge of the opening shall be rabbeted to accept $\frac{3}{16}$ " thick tempered glass. Glass shall be held in place with plastic retainer.

PART 4 – CABINET FINISH REQUIREMENTS

4.01 WOOD SURFACE PREPARATION

- A. Smoothly sand all wood surfaces to remove any and all scratches and abrasions. Dust shall be removed by compressed air.

4.02 EXPOSED EXTERIOR AND INTERIOR FINISH

- A. All exposed exterior surfaces and semi-exposed interior surfaces shall receive one (1) coat of non-fiber lifting stain to achieve the selected color.
- B. One (1) coat of penetrating sealer shall be applied, thoroughly dried, sanded and all dust removed. A second coat of sealer shall then be applied and thoroughly dried.
- C. Two (2) successive coats of a water base synthetic polymer finish shall then be applied and thoroughly dried, resulting in a highly acid, alkali, solvent, water and abrasion resistant semi-gloss finish.
- D. Curing of finishes shall be made under controlled environmental conditions and aided by infrared radiant heat.

4.03 UNEXPOSED INTERIOR FINISH

- A. Two (2) successive coats of water base synthetic polymer finish shall be applied and thoroughly dried.

4.04 PERFORMANCE TEST RATING AND RESULTS

A. Terms referred to in PERFORMANCE TEST RESULTS are as follows:

”A” (**Excellent**) – Indicates excellent to superior integrity of finish film. Includes no effect to slight allowable change in gloss (dulling or increase in gloss) and slight discoloration.

”B” (**Good**) – Indicates good to very good integrity of finish film. Allows change of gloss or discoloration. Any effect can be removed from the tested area by abrading with 325-mesh silica powder and water, indicating that the discoloration is only superficial and that the finish film is good below the surface.

B. Chemical Spot Tests

Chemical spot tests shall be made by applying 5 drops of each reagent to the surface to be tested. Each reagent (except those marked **) shall be covered with a 24MM watch glass, convex side down to confine the reagent. Spot tests of volatile solvents marked ** shall be tested as follows: A ball of cotton shall be saturated with solvent and placed on the surface to be tested. The cotton ball shall then be covered by an inverted 1-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° F ± 3° F. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels. Per the SEFA standards, no more than four (4) of the 49 chemicals/concentrations tested shall fail.

<u>Reagent</u>	<u>Ratings</u>
Acetate Amyl **	Pass
Acetate Ethyl **	Pass
Acetic Acid 98%	Pass
Acetone **	Pass
Acid Dichromate 5%	Pass
Alcohol Butyl **	Pass
Alcohol Ethyl **	Pass
Alcohol Methyl **	Pass
Ammonium Hydroxide 28%	Pass
Benzene **	Pass
Carbon tetrachloride **	Pass
Chloroform **	Pass
Chromic Acid 60%	Pass
Cresol	Pass
Dichloro Acetic Acid	Fail
Dimethylformamide	Pass
Dioxane	Pass
Ethyl Ether **	Pass
Formaldehyde 37% **	Pass
Formic Acid 90%	Pass
Furfural	Pass
Gasoline **	Pass
Hydrochloric Acid 37%	Pass
Hydrofluoric Acid 48%	Pass
Hydrogen Peroxide 3%	Pass
Iodine **	Pass
Methyl Ethyl Ketone **	Pass
Methylene Chloride	Pass
Mono Chlorobenzene **	Pass

Reagent	Ratings
Naphthalene **	Pass
Nitric Acid 20%	Pass
Nitric Acid 30%	Pass
Nitric Acid 70%	Pass
Phenol 90%	Fail
Phosphoric Acid 85%	Pass
Silver Nitrate	Pass
Sodium Hydroxide 10%	Pass
Sodium Hydroxide 20%	Pass
Sodium Hydroxide 40%	Pass
Sodium Hydroxide Flake	Pass
Sodium Sulfide, Saturated	Pass
Sulfuric Acid 33%	Pass
Sulfuric Acid 77%	Pass
Sulfuric Acid 96%	Fail
Sulfuric Acid 77 % and Nitric Acid 70%	Pass
Toluene **	Pass
Trichloroethylene **	Pass
Xylene **	Pass
Zinc Chloride Saturated	Pass

* Where concentrations are indicated, percentages are by weight.

** Indicates these solvents tested with cotton and jar method.

C. Heat Resistance

Hot water (190° F – 205° F) shall be allowed to trickle on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five (5) minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

D. Moisture Resistance

A cellulose sponge (2" x 3" x 1") shall be soaked with water and placed on the finished surface for a period of 100 hours. The sponge shall be maintained in a wet condition throughout the entire test period. At the end of the test period, the surface shall be dried and no visible effect shall be shown on the finish.

E. Impact Resistance

A one (1) pound ball (approximately 2" in diameter) shall be dropped from a distance of one (1) foot onto the finished surface of a ¾" thick plywood panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close examination.

PART 5 – TOPS, SINKS AND ACCESSORIES

5.01 EPOXY RESIN TOPS

- A. Tops shall be 1" thick and black in color. Backsplash and end splashes shall be 4" high, unless otherwise noted on drawings, and shall be applied to the top of the work surface at all adjoining walls. Means of attachment shall be a two (2) part epoxy adhesive applied at all joints.

B. Physical and mechanical properties shall meet the following criteria:

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

5.02 SINKS, TROUGHS, AND SERVICE TURRETS

- A. Epoxy resin black one-piece construction. Inside corners and bottoms covered for easy cleaning. All sinks to be drop-in type, flush mounted.
- B. Provide appropriate sink outlet with stopper at all sinks. Tailpiece and trap by others.

5.03 PLUMBING FITTINGS

- A. All service fittings to meet SAMA standards with all working parts removable and interchangeable with fittings of same type and number. Buttons clearly marked in accordance with SAMA standard color code.
 - 1. Plumbing fittings and turret type mountings – cast from red brass (85-5-5-5) an alloy of 85% copper, 5% tin, 5% lead, and 5% zinc.
- B. Water fittings – all working parts removable and interchangeable with fittings of same type and number. Fixtures furnished with hose connection and/or vacuum breakers when indicated.
 - 1. Valve stems – 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.
 - 2. Seat – interchangeable bronze. Surface highly polished.
 - 3. Goosenecks – $1\frac{1}{16}$ " O.D. brass, threaded to accommodate $\frac{3}{8}$ " I.P.S. accessories.
 - 4. Water handles – four-arm type, forged from high grade brass with recessed snap-in index buttons.
- C. Ground key cocks for gas – ground key cocks shall have a forged brass valve body, with a straight ten (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.
- D. Fitting Finish – Chrome polished heavy duty triple stage high bright nickel and chrome over copper plate. Plating to meet Federal Specifications WWP-541-B-Type A.

5.04 ELECTRICAL FITTINGS

- A. Electrical Fixtures – part of, or installed in the equipment, approved by the National Board of Under Writers and must conform to City and State Building Ordinances.
 - 1. Knock-Out Boxes – when indicated, provided but not installed.
 - 2. Receptacles – grounded type, 20 amp heavy duty industrial grade. All receptacles, switches, indicator lights, and light fixtures to be of quality equal to Hubbell, Arrow, Bryant or Killark specifications.

PART 6 EXECUTION

6.01 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 and overhead work be completed in the areas in which casework is to be installed prior to such installation.

6.02 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.

6.03 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. All debris to be deposited in dumpsters provided by General Contractor
- B. Advise contractor of procedures for protection of installed material from damage from work of other trades.

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