

SECTION 12 35 53.19
WOOD LABORATORY CASEWORK

ClaO 8/16

PART 1 GENERAL

1.01 SUMMARY

- A. The following specifications for Wood Laboratory Casework and related equipment outline the minimum requirements expected by the Owner and Architect on this project.
- B. Section Includes:
 - 1. Furnishing, delivering to the building, uncrating, setting in place, leveling, and anchoring all casework, countertops, equipment, and technical products listed in the specifications, equipment schedule or shown on the drawings.
 - 2. Furnishing and installing filler panels and scribes as required for finished installation.
 - 3. Furnishing laboratory service fixtures and fittings, as described in the specifications, equipment list or shown on the drawings, that are directly attached to the casework or equipment, complete with tank nipples and lock nuts for mounting on tops or curbs. Installation and final connections will be by other respective trades as part of their work.
 - 4. Furnishing laboratory sinks and cup sinks, complete with threaded sink outlets, and required overflows, plugs, and strainers as described in the specifications, equipment list or shown on the drawings. Installation and final connections will be by other respective trades as part of their work.
 - 5. Furnishing electrical service fixtures, as described in the specifications, equipment list or shown on the drawings, that are directly attached to the casework or equipment. Installation and final connections will be by other trades as part of their work.
 - 6. Removal of all debris, dirt, and rubbish accumulated as a result of installation of this equipment, to an onsite container provided by others.

1.02 RELATED DIVISIONS AND SECTIONS

- A. Section 06 10 00 – Rough Carpentry: Grounds/blocking provided within metal stud walls to adequately support wall mounted casework provided and installed in this section.
- B. Section 09 65 00 – Resilient Flooring: Base molding for laboratory casework provided and installed in this section.
- C. Section 11 53 00 – Laboratory Equipment: Specialized equipment described in this section and furnished in lab areas is provided and installed in this section of work.
 - 1. Laboratory Fume Hoods provided and installed in section 12 35 53.19.

- D. Division 22 00 00 – Plumbing: Material and final connections for rough-ins, drain lines, vents, traps, tailpieces, service piping, shut-off valves, adapters, supports, in-line vacuum breakers, thermostatic mixing valves, etc. are provided and installed in this division for laboratory sinks, faucets, service fixtures, emergency showers, and fume hoods that are part of laboratory casework.
 - 1. Laboratory fume hood superstructures are provided with internal service piping pre-piped by Hood manufacturer.
- E. Division 23 00 00 – HVAC: Material and final connections for exhaust and supply fans, stacks, ductwork, elbows, supports, dampers, controls, duct collar adapters, etc. are provided in this division for laboratory casework fume hoods.
- F. Division 26 00 00 – Electrical: Material and final connections for electrical rough-ins, junction boxes, conduit, wiring, etc. are provided in this division for laboratory casework electrical service fixtures.
 - 1. Laboratory fume hood superstructures are provided with internal electrical conduit and wiring by Hood manufacturer that terminates on top of hood at junction box.
- G. Division 27 00 00 – Communications: Voice, audio-video cabling, data and data outlets are provided in this division.

1.03 REFERENCES

- A. ADAAG: 2004 Americans with Disabilities Act Accessibility Guidelines; Revised 2010 ADA Standards for Accessible Design.
- B. ANSI/ISEA Z358.1-2014: Emergency Eyewash and Shower Equipment.
- C. NFPA 30: Flammable and Combustible Liquids Code.
- D. NFPA 45: Standard for Fire Protection for Laboratories Using Chemicals.
- E. SEFA: Scientific Equipment and Furniture Association Recommended Practices. Desk Reference, 5th Edition, 2014. www.sefalabs.com
 - 1. SEFA 1-2010: Recommended Practices for Fume Hoods.
 - 2. SEFA 2-2010: Recommended Practices for Installation.
 - 3. SEFA 3-2010: Recommended Practices for Work Surfaces.
 - 4. SEFA 7-2010: Recommended Practices for Laboratory Service Fixtures.
 - 5. SEFA 8-W-2014: Recommended Practices for Wood Laboratory Grade Casework.
- F. California Air Resources Board; CARB Phase 2 Compliant.
- G. ANSI/HPVA HP-1 2009: Hardwood Veneer Core Plywood.
- H. ANSI A208.1-2009: Particleboard; Composite Panel.

- I. ANSI A208.2-2009: Medium Density Fiberboard (MDF); Composite Panel.
- J. UL-1805: Laboratory Fume Hoods.
- K. ANSI/ASHRAE 110: Method of Testing Performance of Laboratory Fume Hoods as Manufactured.

1.04 SUBMITTALS

- A. Refer to Section 01 33 00 for Submittal Procedures.
- B. Shop Drawings: Submit shop drawings showing plans, service rough-Ins, elevations, sections, end views, service chases, countertop details, location and type of sinks and service fixtures, installation details, and location of grounds/blocking within walls for adequate wall cabinet reinforcement.
- C. Manufacturer's Data:
 - 1. Provide data indicating compliance with SEFA 8-W-2014, Laboratory Furniture Certificate of Performance Test from SEFA approved, Independent Test Facility.
 - 2. Provide Test Report from SEFA approved, Independent Test Facility, certifying that wood casework finish complies with SEFA 8-W-2014, Chemical Resistance Testing requirements.
- D. Selection Samples: Submit one (1) set of manufacturer's standard color chips for wood casework.

1.05 QUALITY ASSURANCE

- A. All laboratory casework, including cabinetry, work surfaces, sinks, and accessories, service fixtures and fittings, fume hoods, and technical products should be provided by the Wood Laboratory Casework Manufacturer.
- B. Provide certification that laboratory casework shall meet the performance requirements described in SEFA 8-W-2014.
- C. Provide certifications required in the specifications with submittal package.

1.06 PROJECT SITE CONDITIONS

- A. Building should be enclosed and weather-tight. HVAC system should be operating and maintaining a temperature range of 65-80 deg F with relative humidity range of 30%-50% to maintain acceptable wood casework moisture content, and to prevent problems such as drawers swelling and doors warping.
- B. Additional Conditions:
 - 1. Required grounds/blocking in walls for reinforcement of wall-mounted cabinets must be in place.
 - 2. If floor tile is required under casework, it must be in place.

3. Overhead ductwork, ceiling grid, tile, and light fixtures must be in place.
4. Wet operations should be complete.
5. Painting should be complete.
6. Service lines for water, gas, etc. must be flushed clean of dirt and chips, capped and tested for leaks prior to the Plumber's final connections.
7. Electrical service and lighting should be available in each room where casework will be installed.

1.07 DELIVERY, STORAGE, HANDLING

- A. Delivery: Products shall be delivered to the project site in undamaged condition, unloaded by casework installer, distributed to required rooms, unpackaged, and made ready for installation.
- B. Storage: If rooms are not ready for installation, store product indoors, in ventilated areas with constant temperature range of 65-80 deg F, and range of relative humidity as noted in 1.06 A. Do not remove wrapping or packaging material.
- C. Handling: Use proper moving equipment to unload and distribute equipment and utilize personnel that are experienced in moving furniture and equipment.
- D. Waste Disposal: Casework installers shall remove refuse resulting from their casework installation and place in trash container and leave installation site clean and free of debris. Trash container shall be provided by the General Contractor.

1.08 WARRANTY

- A. Casework Manufacturer Warranty: Provide written warranty with close-out documents stating that this contractor shall guarantee that all Wood Casework provided on this contract to be free from defects in material and workmanship for a period of one (1) year from the date of substantial acceptance.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The products of Sheldon Laboratory Systems, Crystal Springs, MS are specified herein as the standard of quality required on this project. Tel: 601-892-2731.
- B. The following Manufacturers are approved to Bid this project based on providing Wood Laboratory Casework and Technical Products as specified, unless they submit a list of Product Deviations to the architect at least ten (10) days prior to Bid Date, and receive written approval by addendum to Bid on their deviations.
 1. Sheldon Laboratory Systems
 2. Kewaunee Scientific Corporation
 3. Diversified Casework

- C. Qualifications of other Manufacturers seeking prior approval to bid this project.
1. Submit request to Architect at least ten (10) days prior to project bid date to allow adequate time for review.
 2. Provide name, location, and description of Wood Laboratory Casework Manufacturer, including source and data of laboratory grade service fixtures, work surfaces and sinks, fume hoods, and technical products.
 3. Provide list of five (5) installations of comparable size and scope completed within the past five (5) years, along with a contact name and phone number for each project.
 4. Provide a list of product deviations to the Architect describing any differences between proposed products and specified products.
 5. Provide products AS SPECIFIED, unless Deviations are approved in writing.
 6. Failure to submit product deviation list will result in Architect's assumption that proposed products DO NOT DEVIATE from specified products.
 7. Provide certification that manufacturer's product complies with standards and test performance of SEFA 8-W-2014.

2.02 MATERIALS

A. General

1. All casework shall be of modern design and shall be constructed in accordance with the recommended practices of the Scientific Equipment and Furniture Association. First class quality casework shall be established by use of modern machinery, tools, fixtures, and skilled workmanship.
2. The following definitions apply to wood laboratory casework units. Size and type of units is indicated on the drawings or equipment list.
 - a. EXPOSED SURFACES of casework include exterior surfaces visible after installation when all doors and drawer fronts are closed. Visible surfaces in open cases or behind clear glass doors shall be considered as exposed portions. Back of drawer fronts and panel doors shall be considered as exposed surfaces. Bottoms of wall hung cabinets shall be considered as exposed.
 - b. SEMI-EXPOSED SURFACES of casework shall include interior surfaces exposed to view only when opaque doors are open.
 - c. UNEXPOSED SURFACES not visible after installation include back rails, top side rails, stretchers, web frames, blocking, components concealed by drawers. Also included is the underside of knee spaces and drawer aprons, as well as tops of 82" high tall cabinets and wall hung cabinets.

B. Casework Materials

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

- a. All exterior surfaces exposed to view after installation, and all cabinet interior surfaces shall be Red Oak with the exception of back panels behind opaque doors which shall be Hardboard, and drawer boxes which shall be Birch.
- b. All wood or plastic laminate panels made of plywood, particleboard or medium density fiberboard shall be CARB Phase 2 Compliant.
- c. Exposed solid wood: Plain sawn Red Oak lumber, Grade FAS or better, clear and free of defects. Lumber shall be air dried, then kiln dried, and tempered to moisture content of 6%-9% before use.
- d. Unexposed solid wood: Other hardwoods may be used that are Grade FAS or better, clear and free of defects, and properly dried, same as exposed solid wood.
- e. Plywood: Hardwood Veneer Core Plywood shall be minimum 3-ply (1/4"), 5-ply (1/2"), 7-ply (3/4"), or 9-ply (1"), with select Red Oak, grade A-1, plain sliced, book matched veneer face and back, and shall be ANSI/HPVA HP-1 2009 compliant. Use of other unexposed hardwood veneer is acceptable. Combination core with composite cross bands is acceptable in lieu of veneer core.
- f. Plywood: Composite Core Plywood for cabinet drawer fronts and panel doors shall be 3-ply, 3/4" thick with select Red Oak, Grade A-1, plain sliced, book matched veneer face and back, and shall be compliant with ANSI A208.1-2009 and/or ANSI A208.2-2009.
- g. Banding: Plywood panels shall be edge banded where specified herein with 3mm solid Oak edge band.
- h. Hardboard: Tempered hardboard shall be 1/4" thick. All hardboard shall be composed of wood fibers and resinous binder compressed under heat and pressure.
- i. Glass: Wall Cabinet framed swinging and framed sliding doors shall have 1/8" float glass. Wall Cabinet and Tall Cabinet frameless sliding doors shall have 1/4" float glass with polished edges. Tall Cabinet framed swinging doors shall have 1/4" float glass.
- j. Tempered Glass: Tempered safety glass will be provided ONLY WHEN SPECIFICALLY CALLED FOR on the drawings or equipment list.

2.03 FABRICATION

A. General

1. The Wood Cabinetry selected for this project shall be as follows.
 - a. Cabinet Front Style: CLASSIC SERIES – Red Oak.
 - b. Cabinet drawer fronts and panel doors feature a square edge with slight radius, partial overlay style with vertical match grain fronts and Oak edge band.
 - c. Drawer fronts and panel doors on each cabinet are cut from one (1) Oak composite core plywood panel as a MATCHING FRONT SET.

2. Cabinets, tables, and other units shall be of the size and configuration indicated on the drawings and/or equipment list. Wood cabinetry is bored, doweled, grooved, and rabbeted construction.
3. Base Cabinet Construction:
 - a. Cabinet End Panels shall be 3/4", Oak veneer core plywood. End panels shall be doweled and glued to top frame members, intermediate rails, and bottoms.
 - b. Vertical Partitions are 3/4", Oak veneer core plywood.
 - c. Exposed or semi-exposed edges of end panels, partitions, bottom panels, and shelves shall be edged with 3mm solid Oak edge banding.
 - d. Two-Piece Top Frame consists of nominal 1" X 3" solid Oak front rail, with back edge grooved to receive cross rails, and similar 1" X 3" solid Oak back rail, both set flush with cabinet ends, doweled and glued into place.
 - e. Top Frame Cross Rails are nominal 1" X 2-1/4" solid hardwood fully housed into front and back rails with tongue and groove joints to form a full four-sided top frame. CROSS RAILS ARE ONLY PROVIDED IF SPECIFICALLY CALLED FOR.
 - f. Intermediate Rails are provided on all base cabinets between drawer/drawer configurations and drawer/door configurations. Rails are 1" X 3" solid Oak with back grooved to receive lock security panels (when panels are required). Rails shall be set flush with cabinet ends, doweled and glued into place.
 - g. Bottom Panel shall be 3/4", Oak veneer core plywood. Panel shall be set flush with cabinet ends, doweled and glued into place.
 - h. Back Panel shall be 1/4" thick Oak plywood when cabinet interior is exposed and 1/4" hardboard when cabinet interior is semi-exposed. Backs are recessed into grooved end panels and secured on all four (4) sides.
 - i. Recessed Front Toe Rail shall be 4"x 3/4" Oak veneer core plywood.
 - j. Cabinet Shelves shall be 1", Oak veneer core plywood. Shelves are adjustable on 32mm centers, supported by four (4) nickel-plated steel pin and socket type shelf clips.
 - k. Security Panels are 1/4" thick hardboard. Panel is provided between drawer/drawer and drawer/door base cabinets only when called for, OR WHEN LOCKS ARE SPECIFIED TO BE KEYED DIFFERENT.
4. Wall Cabinet Construction:
 - a. Cabinet End Panels shall be 3/4", Maple veneer core plywood. End panels shall be doweled and glued to top and bottom panels.
 - b. Vertical Partitions shall be 3/4", Maple veneer core plywood.
 - c. Exposed or semi-exposed edges of end panels, top and bottom panels, partitions, and shelves shall be edged with 3mm solid Oak edge banding.

- d. Top and Bottom Panels shall be 1", Oak veneer core plywood. Panels shall be set flush with cabinet ends, doweled and glued into place.
 - e. Back Panel shall be 1/4" Oak plywood when cabinet interior is exposed and 1/4" hardboard when interior is semi-exposed. Back panels shall be rabbeted into ends and secured on all (4) sides.
 - f. Cabinet Shelves shall be 1", Oak veneer core plywood. Shelves are adjustable on 32mm centers and supported by four (4) nickel-plated steel pin and socket type shelf clips.
 - g. Top and Bottom Back Rail shall be 4" x 1/2" hardwood plywood pinned to rear of top and bottom panel.
 - h. Each wall cabinet will be provided with two (2) heavy-duty, angled steel, mounting brackets screwed to the interior of the rear upper end panels, and shall be used for mounting cabinet through back panel and top back rail into wall structure. See 3.02, C.1.c. for installation method.
5. Tall Cabinet Construction:
- a. Cabinet End Panels shall be 3/4", Oak veneer core plywood. End panels shall be doweled and glued to top and bottom panels.
 - b. Vertical Partitions shall be 3/4", Oak veneer core plywood.
 - c. Exposed edges of end panels, top and bottom panels, partitions, and shelves shall be edged with 3mm solid Oak edge banding.
 - d. Cabinet Top Panel shall be 1", Oak veneer core plywood. Panel shall be set flush with cabinet ends, doweled and glued into place.
 - e. Cabinet Bottom Panel shall be 3/4", Oak veneer core plywood. Panel shall be set flush with cabinet ends, doweled and glued into place.
 - f. Top Back Rail and Center Back Rail shall be 3" x 1" solid hardwood doweled and glued into end panels.
 - g. Bottom Back Rail shall be 4" x 3/4" hardwood veneer core plywood doweled and glued into end panels.
 - h. Recessed Bottom Front Toe Rail shall be 4" x 3/4" Oak veneer core plywood doweled and glued into end panels.
 - i. Back Panel shall be 1/4" Oak plywood when cabinet interior is exposed and 1/4" hardboard when interior is semi-exposed. Back panels are recessed into grooved end panels and secured on four (4) sides.
 - j. Shelves shall be 1", Oak veneer core plywood with one (1) center fixed shelf and four (4) adjustable shelves that are adjustable on 32mm centers, supported by four (4) nickel-plated steel pin and socket type shelf clips.
 - k. Each tall cabinet shall be provided with two (2) heavy-duty, angled steel, mounting brackets screwed to the interior of the rear upper end panels, and shall be used for mounting cabinet through back panel and top back rail into wall structure. See 3.02, C.1.c for installation method.
6. Drawers and Doors:
- a. Drawer Fronts:

- 1) CLASSIC SERIES - Square Edge Partial Overlay Style.
 - 2) 3/4", Oak composite core plywood and 3mm solid Oak edge band with a slight radius.
 - 3) Drawer fronts and panel doors on each cabinet have vertical match grain cut from one (1) plywood panel as a Matching Front Set.
- b. Drawer Box Body:
- 1) Front, sides, and back are 1/2" thick 9-ply Birch plywood.
 - 2) Concealed chuck and bore joinery with sides glued and pinned to front and back.
 - 3) 1/4" thick hardboard bottom with white melamine surface.
 - 4) Bottom set in grooves on four (4) sides, hot-melt glued on underside.
 - 5) Drawer box has clear chemical resistant finish.
 - 6) Top edge of box provided with FINISHED TOP CAP to conceal edge of veneer core.
- c. Panel Doors – Base Cabinets:
- 1) CLASSIC SERIES: Square Edge Partial Overlay Style.
 - 2) 3/4", Oak composite core plywood and 3mm solid Oak edge band with a slight radius.
 - 3) Panel doors and drawer fronts on each cabinet have vertical match grain cut from one (1) plywood panel as a Matching Front Set.
- d. Panel Doors – Wall and Tall Cabinets:
- 1) CLASSIC SERIES: Square Edge Partial Overlay Style.
 - 2) 3/4", Oak composite core plywood and 3mm solid Oak edge band with a slight radius.
 - 3) Panel doors on each cabinet have vertical match grain cut from one (1) plywood panel as a Matching Front Set.
- e. Framed Glass Doors – Wall and Tall Cabinets:
- 1) CLASSIC SERIES: Square Edge Partial Overlay Style.
 - 2) 3/4" x 3" solid Oak top, bottom, and side rails, doweled and glued together, sanded for smooth fit, and edge detailed with a slight radius.
 - 3) Tall Cabinet doors shall have a 3/4" x 6" wide solid Oak center rail.

7. Utility Tables:
 - a. Tables shall be fully framed with 3/4" x 4" radius edged solid Oak apron rails with diagonal heavy-duty steel corner braces locked into grooves and screwed with four (4) screws to inner face of rails. Intermediate rails shall be solid hardwood.
 - b. Table legs shall be properly fitted into position and securely fastened to diagonal corner braces with nut, washer and 3-1/2" x 5/16" carriage bolt, completely running through the leg providing a positive system, whereby bolt can be tightened without depending upon screw holding power of the table legs. Legs shall be 2-1/4" square laminated solid Oak, thoroughly glued, and radius edged. Legs shall be equipped with rubber leg shoes, and adjustable nylon glides.
 - c. Available options, WHEN CALLED FOR, include drawers or book compartments, pedestal legs, leg stretchers, and casters.

2.04 LABORATORY GRADE WOOD FINISH

- A. Prior to application of wood finish, component parts shall be carefully sanded and buffed in preparation for the finishing process.
 1. Exposed wood surfaces shall receive a stain and sealer coat of synthetic resin. The product is then cured at elevated temperatures. After the sealer coat, the product shall be sanded, wiped clean, and then a double pass coat of chemical resistant synthetic resin shall be applied and cured at elevated temperatures.
 2. Semi-exposed surfaces receive sealer coat and a double pass coat of chemically resistant synthetic resin.
 3. Unexposed cabinet end panels receive a sealer coat.
- B. Cabinet Wood Surface Finish Tests and Evaluation:
 1. The final finished wood product shall meet the performance test requirements and evaluations described under Paragraph 8.0 Cabinet Surface Finish Tests found in Section 8-W-2014 of the SEFA Recommended Practices for Laboratory Grade Wood Casework.
 2. Paragraph 8.1 Chemical Spot Test and 8.1.1 thru 8.1.3. This Test Procedure describes the testing of a RED OAK wood veneer panel without stain, using forty-nine (49) chemical reagents with each given a final rating system of Level 0, Level 1, Level 2, or Level 3. After testing, panel shall have no more than four (4) Level 3 conditions.
 3. Paragraph 8.2 Hot Water Test and 8.2.1 thru 8.2.3. This Test Procedure describes the testing of a RED OAK wood veneer panel without stain, using hot water with no visible effect.
 4. The above Test Procedures shall be performed for Wood Casework Manufacturer by an Independent third party, SEFA approved, testing facility.

2.05 CASEWORK HARDWARE AND ACCESSORIES

- A. Hinges: Institutional type, ground tip, five-knuckle, with pins of not less than .177" in diameter and leaves of not less than .095" thick. Hinges shall be 2-3/4" long wrought steel with chemical resistant epoxy powder coating. Two (2) hinges shall be provided on doors under 36" in height and three (3) hinges for doors 36" and over. Standard color of epoxy powder coat is Black. Chrome color of powder coat is available option.
- B. Pulls: Solid metal, wire type, 4" long mounted with two (2) screws fastened from back. Pulls shall have chemical resistant epoxy powder coating to match hinges. Provide two (2) pulls for drawers over 24" wide. Standard color of epoxy powder coat is Black. Chrome color of powder coat is an available option.
- C. Drawer Slides: For standard drawers shall be BHMA A156.9-2010 Grade-1, easily removable, 3/4 extension, epoxy powder coated, cold rolled steel, nylon rollers, side/bottom mount, positive stop. File drawers shall have full extension, zinc plated anochrome finish, ball bearing, side mount slides with lever release.
- D. Door Catches: Provide two (2), top and bottom, dual, self-aligning magnetic catches on base and wall cabinet doors, and two (2) heavy-duty magnetic catches on tall cabinet doors.
- E. Elbow Catches: Brass with latch held by coiled compressing spring. Catch plates of 16-gauge plated steel. Provide on base and wall cabinets with double doors where locks are specified.
- F. Spring Actuated Latch: Latch has 4-5/8" bevel slide bolt with 2-1/4 lbs./in. actuating spring. Provide on tall cabinets with double doors where locks are specified.
- G. Leg Shoes: Molded vinyl or rubber, black, coved bottom type.
- H. Glass: Type I, Class I, float glass.
- I. Tote Trays: High impact molded plastic tray with high gloss.
- J. Locks: PROVIDED ONLY IF SPECIFICALLY SHOWN ON DRAWINGS, OR INDICATED ON THE EQUIPMENT LIST, or where included in a product catalog number.
 - 1. Locks are laboratory grade, cylinder cam locks, with 5-disc tumbler mechanism, and a dull chrome-plated face. Tumblers and keys are brass, while plug and cylinder are die cast zinc alloy. Locks are equipped with RemovaCore™ keying control. With the use of a control key, the key core of the lock assembly can be removed and a new key core inserted, changing the entire locking system.
 - a. Keying Option - 1: All locks are keyed alike. Each lock is keyed the same as all other locks, and a single key can operate every lock.

- b. Keying Option - 2: Locks are keyed alike per room, but each room different and master keyed. Each lock in a room can be opened with one (1) key, but each room would have a different key, and all rooms can be opened with a single master key. Provide minimum of two (2) master keys per project.
- 2. When locks are shown on drawings or equipment list, and DESIGNATED AS BEING KEYED DIFFERENT, the following will be provided. Locks are keyed different and master keyed. Each lock is keyed different from all other locks. All locks in this group can be opened with one (1) master key. With keyed different locks, security panels are provided between drawers and between drawers and cupboards.
- K. Sliding Doors (Frameless Glass - Wall Cabinets and Tall Cabinets): 1/4" thick float glass with polished edges. Doors operate on metal track applied at top and bottom front horizontal rails of cabinet. Doors easily removable for cleaning. Locks, when indicated, shall be showcase type.
- L. Swinging Doors (Framed Glass - Wall and Tall Cabinets): 1/8" thick float glass on wall cabinets and 1/4" thick float glass on tall cabinets. Locks, when indicated, shall be cam type.
- M. Sliding Doors (Framed Glass - Wall Cabinets): 1/8" thick float glass. Doors operate in overhead plastic track. Plastic track is applied to bottom and sized to allow cleaning space at each end. Locks, when indicated, shall be plunger bolt type.

2.06 WORK SURFACES, SINKS, AND ACCESSORIES

- A. General:
 - 1. Comply with physical and chemical resistance requirements for materials for tops, sinks, and accessories as specified herein and in accordance with SEFA 3-2010 Laboratory Work Surfaces.
 - 2. Provide tops with smooth, clean, exposed surfaces and edges, in uniform plane, free of defects. Provide 4" high x 1" thick back splash and end splash where tops abut walls, or where shown on drawings.
 - a. Top sizes: Furnish tops in longest practical lengths, in configuration indicated on the drawings.
- B. Work Surfaces:
 - 1. Epoxy Resin Tops (Shelresin): Shall consist of sheets cast from modified 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.
 - a. Wall counters shall be monolithic throughout without surface coating application, and shall be flat and 1" thick with 1/8"

chamfered exposed edges. Provide drip grooves under all exposed edges. Exposed corners shall be eased slightly for safety. Bond joints of tops and splashes with highly chemical resistant cement with properties and color similar to base material. Standard color is Black.

b. Minimum Physical Properties and Test Results:

TEST	ASTM	IMPERIAL
Rockwell Hardness	D785-08	109 (M scale)
Density	D792-00	133 (lb/ft ³)
Compressive Strength	D695-02	33.5 (kpsi)
Flexural Strength	D790-07	14.9 (kpsi)
Fire Resistance	D635-06	Self-Extinguishing
Water Absorption	D570-98	0.008 (% after 24 hrs)
Linear Thermal Expansion	D696-03	1.37x10 ⁻⁵ (in/in degree F)
Flame Spread Index	E84-06	0.29 (in)
Smoke Developed Index	E84-06	8.71 (in)

c. Chemical Resistance Tests and Evaluation: Epoxy Resin Tops shall meet the performance test requirements and evaluations described under Paragraph 2.1.1 Chemical/Stain Resistance Test found in Section 3-2010 of the SEFA Recommended Practices for Laboratory Work Surfaces. Epoxy Resin Top material shall be tested using forty-nine (49) Reagents and shall result in no more than four (4) Level-3 conditions.

2. Phenolic Resin Tops: Shall be a compression molded composite of a homogeneous core of organic fiber reinforced phenolic, and may contain one or more integrally cured surfaces that are non-porous. Tops shall be 1" thick. Standard color is Black.
3. Fiberglass Reinforced Structural Polyester Resin Top with Integral sink and service turrets: Shall have acid resistant, durable gel coat surface, and semi-gloss sheen, to resist moderate chemicals, solvents, biological stains, heat and moisture. The Polyester resin shall be fire retardant, treated with Hydrated Alumina, and shall meet the requirements for NON-BURNING when submitted to the ASTM D-635 test.
4. Plastic Laminate Tops: Shall be thermosetting, high-pressure, plastic laminate sheet 1/16" thick, cemented to underlayment with a highly water resistant resin adhesive. Underlayment shall have smooth surface, free of wood grain or other defects that would "telegraph" through to the top surface. Top shall be edge banded with same material as top, set under edge of top and cemented with a highly water resistant resin adhesive. Top thickness to be 1-1/4" unless noted otherwise.

C. Sinks and Troughs:

1. Epoxy Resin Sinks (Shelresin): Shall be one-piece, molded construction. Sinks to be “drop-in” style with inside corners and bottoms coved for easy cleaning. Standard color of sink is Black.
2. Epoxy Resin Troughs (Shelresin): Trough for TELL Student Tables shall be one-piece, molded construction with integral raised service turrets. Trough to have inside corners and bottoms coved for easy cleaning, and shall have molded raised ribs to facilitate glassware drying. Standard color of trough is Black.
3. Stainless Steel Sinks: Shall be 18 gauge, type 304, unless otherwise called for. All exposed surfaces shall be finished in a No. 4 finish. Bottoms shall be pitched to drain.

D. Sink Outlets:

1. Epoxy Resin Sinks and Troughs and Fiberglass Sinks shall be provided with 1-1/2” dia. X 3” threaded polypropylene sink outlet with locknut, removable disc strainer, and sink stopper.
2. Stainless Steel Sinks shall be provided with 1-1/2” dia. crumb cup strainer with gasket and locknut.

2.07 LABORATORY SERVICE FIXTURES, FITTINGS, AND ACCESSORIES

A. Water Faucets and Valves:

1. Provide units that comply with SEFA 7 – 2010, Laboratory Service Fittings Recommended Practices, and also complying with ANSI/ASME 112.18.1-2005 and certified by CSA International under CAN/CSA B.125.1-05.
2. Provide units fabricated from cast or forged red brass unless otherwise indicated.
3. Provide fittings complete with threaded mounting shanks, locknuts, and washers. Include necessary flanges, escutcheons, extension rods, etc.
4. Provide units complying with ADA accessible requirements where indicated on the drawings or equipment list. Provide one (1) faucet with 4” wrist blade handles at ADA sinks.
5. All water faucets shall be provided with aerators unless specifically noted to have serrated hose ends.
6. If serrated hose ends are designated on any water faucets, provide the unit with a vacuum breaker.
7. Water faucets shall have self-contained renewable compression valve units with stainless steel valve seats. Compression unit valve stem shall be sealed with molded TFE stem packing to prevent leakage. Provide color coded index discs.

B. Gas Fixtures:

1. Provide gas fittings in multiple service faucets, deck mounted turrets, or panel mounted flanges with forged brass lever handle, non-removable serrated hose end, color coded index discs, ball valve and INTERNAL CHECK VALVE (except vacuum service).
2. Provide ball valve with chrome plated ball and PTFE seals. Valve handle shall require no more than 5 lbs. of force to operate. Valve shall be factory tested at 125 PSI. Maximum working pressure is 75 PSI.

C. Vandal Resistant Multiple Service Combination Faucets shall be provided with the following construction features.

1. Goosenecks and faucet risers shall be constructed of minimum 1/2" IPS heavy wall pipe that is sufficient to resist bending and breakage.
2. Aerators or serrated hose ends shall be of vandal-resistant design.
3. Index discs shall be tamperproof and cemented in place.
4. Fittings for laboratory gases shall be provided with ball valve and INTERNAL CHECK VALVE (except vacuum) to prevent back flow into gas system.
5. Where serrated hose ends are designated, integral vacuum breakers shall be provided, and shall have vandal-resistant brass bonnet and cover screws to prevent removal only by maintenance personnel.
6. Combination water/gas faucets shall have inlet shanks machined from solid brass bar stock and heavy wall steel pipe.

D. Quality Assurance:

1. All water faucets and service fixtures shall be fully assembled and factory tested prior to shipment.

E. Faucet and Fixture Finish:

1. All water faucets and service fixtures shall have BLACK powder coat epoxy finish.

F. Vandal-Resistant Multiple Service Combination Faucets:

1. Sheldon Unicast Faucet No. 80020:
 - a. Combination cold water-gas fixture
 - b. Black powder coat epoxy finish
 - c. Color coded nylon handles for cold water
 - d. Vandal-resistant features
 - e. Wrist blade handles at ADA sinks
 - f. Internal check valve in gas fixtures

2. Sheldon Unimix Faucet No. 80030:
 - a. Combination hot water-cold water-gas fixture
 - b. Black powder coat epoxy finish
 - c. Color coded nylon handles for hot and cold water
 - d. Vandal-resistant features
 - e. Wrist blade handles at ADA sinks
 - f. Internal check valve in gas fixtures

- G. Approved Equal:
 1. WaterSaver Faucet Co. No. VR5300WSA:
 - a. Combination cold water-gas fixture
 - b. Black powder coat epoxy finish
 - c. Color coded nylon handles for cold water
 - d. Vandal-resistant features
 - e. Wrist blade handles at ADA sinks
 - f. Internal check valve in gas fixtures

 2. WaterSaver Faucet Co. No. VR5800WSA:
 - a. Combination hot water-cold water-gas fixture
 - b. Black powder coat epoxy finish
 - c. Color coded nylon handles for hot and cold water
 - d. Vandal-resistant features
 - e. Wrist blade handles at ADA sinks
 - f. Internal check valve in gas fixtures

- H. Electrical Fixtures:
 1. Electrical Fixtures that are a part of, or installed in the lab casework shall be approved by the National Board of Underwriters and must conform to city and state building codes.
 2. Knock-out boxes when indicated, shall be installed in the lab casework.
 3. Receptacles shall be grounded type, 20-amp heavy-duty industrial grade.

2.08 TECHNICAL PRODUCTS LIST

- A. The following list describes Technical Products shown on the Plans and/or Equipment List.

PART 3 EXECUTION

3.01 EXAMINATION

- A. The casework contractor shall verify that building conditions have been completed as described in 1.06 A and B which outline building readiness required before casework installation begins.

3.02 INSTALLATION

- A. Installer Qualifications: The Installer shall have a minimum of five (5) years of experience installing laboratory casework using professional and accepted trade practices and be familiar with SEFA's Recommended Practices as described in SEFA 2-2010.
- B. Coordination: Coordinate the work of this section with regard to installing casework. Cooperate with other trades regarding mechanical and electrical connections to casework that are provided in their work, including final connections to sinks, plumbing fixtures, electrical fixtures, fume hoods, etc.
- C. Performance:
 - 1. Casework:
 - a. Set base cabinets in place, level, secure to walls or floors as necessary. Install fillers, trim and scribe to walls. Shim as required using concealed shims.
 - b. Screw continuous cabinets together with joints flush, tight and uniform.
 - c. Secure tall cabinets and wall cabinets to the walls. Secure these cabinets to solid supporting material, utilizing grounds/blocking that is provided in walls in another section of work. Use steel mounting brackets for attachment to walls that are provided in wall and tall cabinets by the manufacturer.
 - 2. Work Surfaces:
 - a. Work surfaces shall be installed with nominal 1" overhang on the front and end, unless otherwise indicated on the shop drawings.
 - b. Level and shim as necessary. Shims shall generally not exceed 1/8".
 - c. Install work surfaces to achieve a uniform alignment of the front edge of the top.
 - d. Only factory-prepared field joints, located per the shop drawings, shall be permitted.
 - e. Secure work surfaces to the understructure with adhesive or mechanical fasteners per the manufacturer's recommendations.
 - f. Provide flush joints not to exceed 1/8" between work surface sections.
 - g. Grout butt joints with material and method per the manufacturer's recommendation.
 - h. Backsplashes and end returns shall be secured in place with joints sealed per manufacturer's recommendation.

3.03 ADJUST AND CLEAN-UP

- A. Adjust doors and drawers to operate smoothly.
- B. Clean casework and touch-up as required.

[PROJECT NUMBER]
[DATE]

[PROJECT NAME]
[PROJECT LOCATION]

- C. Clean work surfaces.
- D. Remove all debris, dirt, rubbish, and excess material as a result of the installation of this equipment and leave the site clean and orderly.

3.04 PROTECTION

- A. Protect countertops with Kraft paper or cardboard after installation to help prevent damage from other trades.
- B. The General Contractor is responsible for protection of casework, work surfaces, and fixtures from damage by work of other trades.

END OF SECTION