SECTION 12 32 00 - WOOD LABORATORY CASEWORK

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood Casework. Furnish all cabinets and casework, including tops, ledges, supporting structures, and miscellaneous items of equipment as listed in these specifications, or equipment schedules including delivery to the building, setting in place, leveling, scribing to walls and floors as required. Furnishing and installing all filler panels, knee space panels and scribes as shown on drawings.

2. Furnishing and delivering all utility service outlet accessory fittings, electrical receptacles and switches, as listed in these specifications, equipment schedules or as shown on drawings as mounted on the laboratory furniture. The above-defined items shall be furnished with supply tank nipples and lock nuts, loose in boxes and properly marked. All plumbing and electrical fittings will be packaged separately and properly marked for delivery to the appropriate contractor.

3. Furnishing and delivering, packed in boxes for installation by the mechanical contractor, all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets with integral tailpieces, which occur above the floor, and where these items are part of the equipment or listed in the specifications, equipment schedules or shown on the drawings. Integral tailpieces when required shall be in accordance with the manufacturer's standards. All tailpieces shall be furnished less the couplings required to connect them to the drain piping system.

4. Furnishing service strip supports and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the details.

5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by others, leaving the premises clean and orderly.

B. Related sections: (Not part of Section 12 34 50):

1. Division 6: Rough carpentry, blocking within walls to adequately support casework.

2. Division 9: Furnishing and installation of base molding.

3. Division 11: Laboratory Fume Hoods.

4. Division 22: Furnishing and installation of piping drain line, traps, final connections and setting of sinks and fixtures.

5. Division 23: Furnishing and installation of exhaust ductwork, transition(s), blowers and equipment, and final connection to fume hood(s).

6. Division 26: Furnishing and installation of electrical wiring, conduit and/or electrical items and final connections.

C. Related Publications:

1. SEFA 3 – Scientific Equipment and Furniture Association.
2. SEFA 8 – Scientific Equipment and Furniture Association.

3. NFPA 30 – National Fire Protection Association.
4. NFPA-45 - National Fire Protection Association.
5. UL - Underwriters Laboratory.
6. ASTM D552 - Bending Test.
7. ANSI/HPVA HP-1 1994 – Hardwood Plywood.
8. ANSI A208.2-1994 – MDF Plywood.

1.2 QUALITY ASSURANCE

A. The wood laboratory furniture contractor shall also provide work tops and fume hoods all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.

B. General Performance: Provide certification that furniture shall meet the performance requirements described in SEFA 8.

C. Finish Performance: Provide independent test lab certification that the furniture finish shall meet the performance requirements described in section 2.03 of these specifications.

1.3 CASEWORK DESIGN

A. Door and Drawer Design:

1. Flush Overlay: Square edged flush overlay design with ⅛" reveals between door to door, door to drawer, drawer to drawer; 1/16" vertical reveal between doors/drawers and cabinet ends.

B. Standard grain pattern:

1. End panels - vertical.
2. Shelving - the grain shall run the width (left to right) of the shelf.
3. Bottoms and tops of all units - the grain shall run the width (left to right) of the unit.
4. Aprons and table frames – horizontal.
5. Knee space panels – vertical.

C. Grain pattern on cabinet fronts:

1. Vertical Matched Grain: Continuous vertical grain match on door and drawer fronts of individual cabinets. (Available for flush overlay construction only.)

D. Cabinet end panels exposed to view after installation must have finished ends. All end panels not exposed to view after installation will be as listed under "concealed" plywood.

E. Cabinets to be rigid, self-supporting design for use in assembly or as a single standalone unit if furnished with exposed finished ends. Suspended units are without sub base.

F. Flush Interiors: Surface mounted bottoms and offsets caused by front face frames, which interfere with ease of cleaning, are not acceptable.

G. Joinery: 32mm doweled joinery system glued, clamped and screwed. Dowels are to be hardwood, laterally fluted with chamfered ends and a minimum diameter of 8mm. Spacing of dowels is to meet AWI (Architectural Woodworking Institute) and WI (Woodwork Institute) standards. **(*Exposed shoulder pocket screw fasteners are not acceptable).***

H. Casework width and depth dimension are to be within plus or minus ½" from what is shown on the drawings. **(*No exceptions).*** Manufacturer's standards are not acceptable unless able to meet these requirements.

1.4 SUBMITTALS

A. Manufacturer's Compliance Statement if included with this specification. **(*Submit At Time Of Bid).***

B. Certified wood projects: The manufacturer's "Chain of Custody" number must be submitted at time of bid. Failure to submit will result in an automatic disqualification and the bid will not be opened.

C. Shop Drawings: Provide large scale plans and elevations of casework, cross sections, rough in and anchor placements, tolerances and clearances. Indicate relationship of units to windows, doors, surrounding walls and other building components.

D. Product Data: Submit manufacturer's catalog for reference. Include cabinet dimensions, configurations, construction details, joint details, attachment details, and rough in details as required.

E. Product Samples to be submitted for approval: (1 each)

1. Worktop: 4" x 4" sample of each material.

2. Finish: 3" x 5" sample of each available standard stain color with finish.

3. Hardware: Pulls, locks and hinges.

4. One complete, with specified hardware, standing height, 24" wide base unit.

5. One complete, with specified hardware, 30" high, 24" wide solid door wall case.

1.5 QUALITY ASSURANCE ***(Submit with bid documents.)***

A. Single source: Casework and fume hoods to be manufactured and furnished by a single laboratory furniture company.

B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled production staff to produce high quality laboratory casework and fume hoods, and shall meet the following minimum requirements:

1. Minimum of 10 years' experience in the manufacturing of wood laboratory casework and fume hoods.

2. 10 installations of equal or larger size.
3. Must be financially stable.
4. Must be a member of AWI and be QCP certified.

C. Installer qualifications: Certified by the manufacturer.

D. Manufacturer to provide on request, load test results certified by an independent testing laboratory for drawers, doors, suspension slides and unit shelving.

1.6 PROJECT CONDITIONS

A. Do not deliver or install wood product until the following conditions are met:

1. Windows and doors are installed and the building is secure and weather tight.
2. Ceiling, overhead ductwork and lighting are installed.
3. All painting is completed and floor tile is installed.

4. Interior building temperature to be between 65°F and 80°F, and ambient relative humidity maintained between 25% and 55% prior to delivery, and during and after installation. Frequent and/or excessive changes in temperature and/or humidity levels during casework installation, or once casework is installed, must be avoided to prevent damage to materials.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery: Schedule delivery so rooms are sufficiently complete that material can be installed immediately following delivery.

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

1. Work surfaces: Protect throughout the construction period.

PART 2: PRODUCTS

2.1 MANUFACTURER

A. Specifications are based on product by Fisher Hamilton L.L.C.

B. VWR

C. Kewaunee

D. Warranty: Provide manufacturer's 1-year warranty against defects in materials and workmanship.

2.2 CASEWORK MATERIALS

A. Definition of cabinet components by surface visibility:

1. Exposed Surfaces:

a. Surfaces visible when drawers and solid doors are closed.
b. Surfaces visible behind clear glass doors.
c. Interior surfaces of open units.
d. Bottoms of cabinets 42" or more above finished floor.
e. Tops of cabinets less than 78" above finished floor, or are visible from an upper floor or staircase after installation.

f. Front edges of cabinet body members visible though a gap greater than ⅛" with doors and drawers closed.

g. Surfaces visible when fixed appliances are installed.
h. All front edges of shelving.

2. Semi-Exposed Surfaces:

a. Surfaces visible when doors or drawers are open.
b. Bottoms of cabinets 30" – 42" above finished floor.

3. Concealed Surfaces:

a. Surfaces not normally visible after installation.
b. Bottoms of cabinets less than 30" above finished floor.
c. Tops of cabinets over 78" above finished floor which are not visible from an upper level.
d. Stretchers, blocking, components concealed by drawers.

4. Hardwood:

a. Hardwood lumber, free of defects. All lumber kilns dried to uniform moisture content of 6%-8%.

1). Exposed material: [**Specifier's Option**]

a). Red Oak (Plain to match exposed veneer cut), FAS.
b). Hard Maple, FAS.

b. Semi-exposed material - Select hardwood.
c. Concealed material - Sound hardwood of species suitable for the intended purpose.

5. Plywood:

a. Core:

1). 7-ply (¾" thick), 9-ply (1" thick) and 13-ply (1½" thick) veneer core plywood with cross and face plies bonded with Type II water resistant glue. (Shelves, wall case tops and bottoms, and tall case tops constructed of veneer core plywood only.)

2). Face veneers:

a). Exposed surfaces: [**Specifier's Option**]

i). Plain sliced red oak veneer, Grade A, selected for golden wheat color, narrow hearts of no more than 5" and no split hearts, on cabinet fronts. Grade A veneer, selected for golden wheat color, on the rest of the cabinet. Book matched, running matched only.

ii). Plain sliced select sap hard maple veneer, (No heartwood), Grade A. Book matched, running matched only.

b) Semi-exposed: Same species as exposed, Grade 1. ***Birch, poplar or other hardwoods or softwoods are not acceptable.***

c). Concealed: Same species and grade as semi-exposed.

6. Glass:

a. Tempered safety glass (3mm on wall/upper cases and 6mm on tall cases) ASTM C 1036, Type 1, Quality Q3; ASTM C 1048, tempered using horizontal tempering and complying with ANSI Z97.1; 4 mm thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.

7. Glue: Laminating; Type II water resistant; assembly; Type III water resistant.

8. Edge banding: 3mm hardwood on all edges of doors and drawers; fronts of shelves, base, wall, upper and tall cases. The bottoms and tops of the wall plus the upper and tall case end panels will to be .5mm.

9. Finish: Factory-finish all exposed and semi-exposed surfaces with the same finish.

a. Finish Performance: Provide finish on all surfaces having chemical resistance of Level 0 (no change) or Level 1(slight change of gloss or slight discoloration) according to SEFA 8.1 and no visible effect when surface is exposed to:

1). Hot water at temperature between 190°F and 205°F trickled down the test surface at 45° angle for 5minutes.

2). Constant moisture in the form of 2” by 3” by 1” cellulose sponge kept continually saturated with water and in contact with test surface for 100 hours.

2.3 CASEWORK FABRICATION

A. Base Units:

1. Cabinet ends: ¾" thick plywood (for both exposed and concealed ends) with 3mm hardwood banding on front edges. Bore interior faces, as appropriate, for security panels, rails, and four rows of shelf support holes: [**Specifier’s Option**]. No levelers required. Wood shimming approved.

2. Toe space rail: 3¾" x ¾" hardwood or 7-ply veneer core plywood, mounted between end panels with glued 8mm dowel joinery and metal fasteners, forming a 4" high x 2½" deep toe space, closed to cupboard bottom.

3. Bottoms: ¾" thick plywood set flush and joined to cabinet end panels with glued 8mm dowels and metal fasteners. Front edge to be banded with 3mm hardwood banding. Suspended unit bottoms to be 1" thick. ***Removable bottoms are not acceptable.***

4. Backs:

   a. Cupboard units: One-piece 3/16" thick hardboard, rabbeted into rear top rail for easy removal from inside of cabinet.

   b. Drawer units: [**Specifier’s Option**]. Open back on units less than 36", full backs in units 36" and over. Removable 3/16" thick hardboard split back panels, rabbeted into top rail.

   c. Sink units: Half height, one-piece 3/16" thick hardboard, rabbeted into rear rail for easy removal from inside of cabinet.

5. Vertical dividers in combination cabinets: 1½" thick veneer core plywood panel (frames not permitted) glued and screwed in place, top and bottom with 3mm hardwood banding on front edge.

6. Security panels: [**Specifier’s Option**]. None required. 3/16" thick hardboard panel rabbeted into front and rear rails (automatically included) and end panels, between drawers and above doors on units with locks. (Select for cabinets with locks keyed differently.)

7. Shelves: [**Specifier’s Option**]. 1” thick, 9-ply veneer core plywood; 3mm hardwood banded on front edge, adjustable on 32mm centers.

   a. Depth: [**Specifier’s Option**]
   b. Half depth shelf, 12" deep.
   c. Full depth shelf, 17¾" deep.
   d. Split depth, two shelves, each 8-7/8" deep.
   e. 20 gauge cold rolled steel covered with electrostatically applied chemical-resistant urethane powder coat finish, front and back edges formed down and back ¾", ends formed down ¾"; shelves over 36" long include welded hat channel bottom reinforcement full width of shelf. Depth of shelf is to be 17¾" deep.

8. Drawer construction:

   a. Box: 4-sided drawer box with back, front and sides of 12mm (½" nominal) 9-ply birch plywood with chemical resistant finish and finished top edges. ***(Three sided drawer box attached to outer drawer front is not acceptable).*** Sides shall be joined by: [**Specifier’s Option**]. Lock joint, glued and pinned.

b. Bottom: Nominal ¼", inset into all four sides of drawer box and sealed with hot melt glue process around entire drawer bottom perimeter. ***(Staples are not acceptable).*** Material to be: [**Specifier's Option**]. White coated MDF board.

c. Divider grooves: [**Specifier's Option**]

- None.
- Included.

9. Door and removable drawer front construction: [**Specifier's Option**]

- 3-ply, ¾" thick particleboard core with 3mm hardwood banding on all four edges. (Flush overlay only).

10. Fillers, knee space panels, scribes, etc.: Shall be of same species and grade as adjacent exposed surfaces, either ¾" thick veneer core plywood or lumber as required, with same stain and finish.

11. Pull boards: 1" thick plywood with balanced laminated faces. Front to be constructed the same as a drawer front with reveals and grain as specified for cabinet face exterior. Suspension to be ¾ extensions, open roller, 75 lb. dynamic load, with hold open feature and epoxy coated.

B. Wall, upper and tall cases:

1. Shall be manufactured with appropriate materials and joinery methods as specified for base units except as noted below.

2. Tops: 1" thick, 9-ply veneer core plywood with 3mm hardwood banding on front edge.

3. Bottoms: ***Exposed pocket shoulder screws are not acceptable.***

a. Wall and upper case: 1" thick, 9-ply veneer core plywood with 3mm hardwood banding on front edge.

b. Tall case: ¾" thick, 7-ply veneer core plywood with 3mm hardwood banding on front edge. Bottom plywood kick rail 3¾" high joined to cabinet sides.

4. Exposed backs: ¼" thick veneered MDF plywood with backs recessed 7/8" and set into top, bottom and ends, sealed with hot melt glue process around entire perimeter. ***(Melamine printed veneers and backs that extend through the bottom panels are not acceptable.)***

5. Semi-exposed backs: ***(Backs that extend through the bottom panels are not acceptable):*** [**Specifier's Option**]

- ¼" thick veneered MDF plywood with backs recessed 7/8" and set into top, bottom and ends, sealed with hot melt glue process around entire perimeter. ***(Melamine printed veneers are not acceptable).***

6. Shelves, (Fixed shelves are 1" thick, 9-ply veneer core) grain to run left to right:

- 1" thick, 9-ply veneer core plywood; 3mm hardwood banded on front edge, adjustable on 32mm centers, must support 100 lbs. at full depth.

7. Door construction:

- 3-ply, ¾" thick plywood core with 3mm hardwood banding on all four edges. (Flush overlay only).

8. Framed glass doors: Solid hardwood, ¾" x 2¾" frame stock machined to accept glass, mitered joints, extruded vinyl retaining molding to allow glass to be replaced without tools. With lipped overlay, meeting edges of pairs of doors to include overlapping astragals: right over left. For sliding doors: nylon roller suspension riding in overhead steel track with bottom retainer strip.

9. Unframed sliding glass doors: Glass as specified with edges ground, set in extruded aluminum shoe with integral pulls, nylon wheel assemblies and top and bottom extruded aluminum track. Provide rubber bumpers at fully opened and closed door position.

C. Hardware:

1. Drawer suspension, except on files: [**Specifier's Option**]

   - Full extension with over travel, ball bearing roller, 150 lb. dynamic load, zinc plated Accuride 4034 series or equal. Drawer bodies less than 4" to be furnished with full extension, 100 lb. dynamic load, zinc plated Accuride 3832 series slides.

2. File drawer suspension: Full extension with over travel, ball bearing roller, 150 lb. dynamic load, zinc plated Accuride 4034 series or equal. File drawers to have built in hanging system.

3. Drawer and hinged door pull: [**Specifier's Option**]

   - 4" Wire: [**Specifier's Option**]
   - Stainless steel.
   - Satin chrome (Plated)

4. All pulls are mounted horizontally on drawers and vertically on doors.

5. Hinges: Notch for proper fit: [**Specifier's Option**]

   - 5 knuckle, institutional style, hospital tipped, provide two hinges for doors up to 48" high; three hinges for doors over 48" high.

   - [Stainless Steel]
   - Satin chrome (Plated). (Wood flush overlay only).

   - Low profile, 3-barrel hinge, semi-concealed, BHMA grade 1, provide 2 hinges for doors up to 36", 3 hinges for doors 36" – 63" and 4 hinges for doors over 63" up to 78-3/4". (Wood and laminate flush and radius overlay only).

2.3.3.6 Unit shelf supports:

   - Metal pin and socket.

2.3.3.7 Door catches: [**Specifier's Option**]

   - Adjustable, spring actuated nylon roller.

   - None required. (Select only if concealed or 3-barrel hinge is specified).

8. Tall cabinet door catches on two door units when locks are required: Heavy-duty spring bolts located at top and bottom of door without the lock. Bolts are attached to one another by means that will conform to ADA requirements.

9. Elbow catches: Spring type with strike.

10. Locks, where indicated on drawings:

    - Manufacturers standard keyable locks.

11. Manufacturers standard label holders (if shown on drawings): 1⅜" x 2⅝", pinned to drawer and door fronts.

12. Number plates (If shown on drawings): Shall be anodized aluminum with black numbers. Start with number 1 in each room where required. To be field installed.

2.4 TABLE FRAME

A. Perimeter table frame rails: ¾" x 4-5/16" hardwood with attached steel corner braces, grooved and screwed into both rails at each corner. (Bottom rail edges to be radiused).

B. Reinforcing cross rails: ¾" veneer core plywood, doweled and glued and pinned into front and back rails, at intervals not more than 33" on center in tables without drawers.

C. Separate cross rails: ¾" x 4-5/16" hardwood with attached steel brackets at both ends.

D. Legs: 2" x 2" hardwood, with ⅜"-16 x 3½" hanger bolt inserted 1¾" into leg and fastened to perimeter rail corner brace.

E. Leg rails (if required): 1¼" x 2½" hardwood mortised into legs and secured with ⅜"-16 x 5" stove bolt.

F. Leg shoes: Black rubber or vinyl with provision for floor clip.

2.5 ACID STORAGE

1. Design: Door overlay design shall be the same as specified for wood laboratory casework.
2. Cabinet: Bottom, top, back, door(s) and sides of cabinet shall be constructed the same as base units.

3. Liner material: [**Specifier's Option**]

    - Chemical resistant ¼" Resisto-Roc lining.

4. Door: Provide with five knuckle hinges.
5. Ventilation: At rear of cabinet.
6. Shelving: Provide with full width and full depth adjustable shelf.
7. Finish: Finish as specified for wood laboratory casework.

2.6 SOLVENT (FLAMMABLE) STORAGE

A. Design and construct in accordance with OSHA regulations, FM, UL and NFPA 30, National Fire Protection Association, Flammable and Combustible Liquids Code. Cabinets shall be Factory Mutual (FM) approved and Underwriters (UL) listed with UL/FM approval label affixed to inside of cabinet door.

B. Design: Door overlay design shall be the same as specified for wood laboratory casework.

C. Cabinet: Bottom, top, back, door(s) and sides of cabinet shall be constructed of 1" veneer core plywood. All joints shall be rabbeted and shall be fastened in two directions with wood screws.

D. Back: Floor mounted and suspended cabinets shall have removable back panels for access to utility chase from inside the cabinet. Floor mounted cabinets with flush top panel shall also

incorporate the top panel as removable.

E. Door: Provide with five knuckle hinges, manual three point latch and door sill raised at least two inches above cabinet bottom to retain spilled liquid within the cabinet. When more than one door is used, there shall be an overlap of not less than ⅝".

F. Ventilation: Cabinet shall include two threaded, 2-inch pipe vent outlets and flame arrestors on the back of the cabinet. Vent as required by local code.

G. Bottom: In addition to cabinet bottom, provide with minimum two inch deep, lipped, removable, liquid tight, powder coated steel bottom pan.

H. Shelving: Provide with full width and full depth ¾" thick adjustable shelf.

I. Identification: All solvent storage cabinets shall be marked with conspicuous, 2” high lettering on 1 door with: FLAMMABLE KEEP FIRE AWAY.

J. Finish: Finish as specified for wood laboratory casework.

PART 3: EXECUTION

3.1 INSTALLATION

A. Casework installation:

1. Set casework components plumb, square, and straight with no distortion and securely anchored to building structure. Shim as required using concealed shims.

2. Fasten continuous cabinets together with joints flush, tight and uniform, with alignment of adjacent units within 1/16" tolerance.

3. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board. The blocking in of the wall by rough carpentry is in Division 6.

4. Abut top edge surfaces in one true plane. Provide flush joints not to exceed ⅛" between top units.

B. Work surface installation:

1. Where required due to field conditions, scribe or caulk to abutting surfaces.

2. Secure joints in the field, where practicable, in the same manner as in factory, with dowels, adhesive or fasteners recommended by manufacturer.

3. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.

C. Sink installation: Sinks shall be set in chemical-resistant sealing compound, secured and supported per manufacturer's recommendations.

D. Accessory installation: Install accessories and fittings in accordance with manufacturer's recommendations. Turn screws to seat flat; do not drive.

3.2 ADJUSTING

A. Repair or remove and replace defective work, as directed by (Architect/Owner) upon completion of installation.

B. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly.

3.3 CLEANING

A. Broom clean finished casework, touch up as required.

B. Clean materials as recommended by manufacturer.

3.4 PROTECTION OF FINISHED WORK

A. Provide necessary protective measures to prevent damage of casework and equipment from exposure to other construction activity.

B. Advise contractor of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.

END OF SECTION 12 32 00