

**SECTION 123553 19 –WOOD LABORATORY CASEWORK AND RELATED PRODUCTS
(CONTEMPORARY FULL OVERLAY – STYLE 5)**

PART 1: DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE

A. Section Includes:

1. Using **Kewaunee Scientific Corporation, SIGNATURE SERIES – CONTEMPORARY FULL OVERLAY – STYLE 5 Laboratory Furniture** as a wood casework specification standard, 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, and leveling. 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 Divisions:

1. Divisions 5 & 6 : Behind-the-Wall Blocking and Studs
2. Division 9 : Base Molding
3. Division 11: Chemical Fume Hoods
4. Division 15 : Plumbing
5. Division 16 : Electrical Fittings and 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 A208.1-1999 – Particleboard Plywood
9. ANSI A208.2-1994 – MDF Plywood

1.01 BASIS OF WORK

- A. It is the intent of this specification to use **Kewaunee Scientific Corporation, SIGNATURE SERIES – CONTEMPORARY FULL OVERLAY – STYLE 5 Laboratory Furniture** as the standard of construction for laboratory furniture. The construction standards of this product line shall provide the basis for quality and functional installation.
- B. Supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval from the owner/architect. This approval must be obtained seven (7) days before the quotation deadline. Procedures for obtaining approval for an alternate manufacturer are defined in section 2.00.C in this specification.
- C. General Contractors should secure a list of approved wood laboratory furniture manufacturers from the architect as a protection against non-conformance to these specifications.
- D. Participants in the quotation process have the option of clarifying deviations to the specified design, construction, or materials. Without such clarifications, sealed quotations to the owner or owner representative will be construed as being in total conformance to the requirements of the specification.
- E. The owner / owner representative reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.

1.02 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.

1.03 SUBMITTALS

- A. Manufacturer's Data: Submit manufacturer's data and installation instructions for each type of casework. Provide data indicating compliance with SEFA 8 Standard.
- B. Shop Drawings:
 - Submit shop drawings for furniture assemblies showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fittings.
 - 1. Coordinate shop drawings with other work involved.
 - 2. Provide roughing-in drawings for mechanical and electrical services when required.

PART 2 – PRODUCTS

2.00 MANUFACTURERS

- A. The basis of this specification is wood casework manufactured according to the standards used by **Kewaunee Scientific Corporation**, 2700 Front Street, Statesville, North Carolina. The specified design is **Signature Series – CONTEMPORARY FULL OVERLAY – STYLE 5**. All laboratory equipment covered by the specification shall be the product of one manufacturer and be fabricated at one geographic location to assure shipping continuity and single-source

responsibility. All quotations from a manufacturer other than Kewaunee Scientific Corporation shall contain a review of the following capabilities:

1. List of shop facilities
 2. List of engineering and manufacturing personnel
 3. Proof of financial ability to fulfill the contract
 4. List of a minimum of ten (10) installations over the last five (5) years of comparable scope
 5. Proof of project management and installation capabilities
 6. SEFA member in Good Standing
- B. The selected manufacturer must warrant for a period of one-year, starting on the date of acceptance or occupancy, whichever comes first, that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer's representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.
- C. Samples:
Samples from non-specified manufacturers will be required and reviewed per specification. Samples shall be delivered, at no cost to the architect or owner to a destination set forth by the architect or owner. This must be done seven (7) days before quotation deadline as a condition of approval of each bidder. Samples shall be full size, production type samples. Miniature, or "Show Room" type samples are not acceptable. Furnish the following:
1. One combination drawer and cupboard base unit showing complete construction details, including one shelf.
 2. One acid storage base cabinet typical of specified elevations.
 3. One sample of all top materials shown or called for, of sufficient size to perform finish requirement tests.
 4. Sample of all mechanical service fittings, locks, door pulls, hinges, and interior hardware.
- D. The above samples of the successful manufacturer will be impounded by the architect or owner to insure that material delivered to the jobsite conforms in every respect to the samples submitted.

2.01 MATERIALS

- A. General:
Material shall be selected so that the finished installation shall provide an attractive and harmonious appearance. All exterior casework surfaces exposed to view after installation, and cabinet interior surfaces, shall be **Red Oak**. Solid woods and veneers exposed to view after completion of installation shall be of color and graining in conformance with the normally accepted standards required of the scientific laboratory equipment industry.

or

Material shall be selected so that the finished installation shall provide an attractive and harmonious appearance. All exterior casework surfaces exposed to view after installation, and cabinet interior surfaces, shall be **White Maple**. Solid woods and veneers exposed to view after completion of installation shall be of color and graining in conformance with the normally accepted standards required of the scientific laboratory equipment industry.

*NOTE: Henceforth, all specification language refers to **Red Oak**. If **White Maple** is desired, specification can be read with **White Maple** substituted for **Red Oak**.*

- B. Solid Woods:
All solid woods shall be carefully and thoroughly air-dried, then kiln dried in humidity controlled kilns to a moisture content of 4-1/2%. All kiln dried lumber shall then be tempered to a moisture content of 6% before use. This moisture content shall be maintained throughout production.
- C. Plywoods:
All plywood shall be hardwood plywood. Softwoods such as Fir or Pine are not permitted.
1. Veneer Core or Combination Core Plywood

- a. Plywood shall be minimum 7-ply (3/4") veneer core plywood or 7-ply (3/4") combination core plywood and shall be compliant with ANSI/HPVA HP-1 2004
 - b. Plywood shall be minimum 9-ply (1") veneer core plywood or 9-ply (1") combination core plywood and shall be compliant with ANSI/HPVA HP-1 2004
 - 2. Composition Core Plywood
Composition core plywood shall be 3-ply and shall be compliant with ANSI A208.1-1999, and/or ANSI A208.2-1994.
 - 3. Face Veneers
Plywood face veneers shall be Grade A, plain sliced, slip matched, Red Oak on face, and Grade 1, Red Oak on back.
- D. Banding:
Plywood panels shall be edge banded as specified with 3mm hardwood edgebanding to match the plywood veneer.
- E. Hardboard:
Hardboard shall be a wood fiber/resinous combination formed with heat and pressure into sheets providing a hard, smooth surface.
- F. Glass:
Glass used for framed sliding and swinging doors shall be 1/8" float glass. Glass used for unframed sliding doors, shall be 1/4" float glass.
- G. Hardware and Trim:
- 1. Drawer and Door Pulls:
Drawer and door pulls shall be mounted on 4" centers, offering a comfortable hand grip, and be securely fastened to doors and drawers.
They shall be manufactured from: (pick one)
 - Anodized aluminum in a shallow rounded shape.
 - or
 - Anodized aluminum in flat rectangular shape.
 - or
 - 5/16" diameter steel rod finished with a black epoxy paint.
 - or
 - 5/16" diameter steel rod finished with a white epoxy paint.
 - or
 - 3/8" diameter stainless steel rod with a brushed satin finish.
 - or
 - 5/16" diameter chrome plated brass rod with a brushed satin finish.

Use of plastic pulls (molded or extruded), or a design not compatible for usage by the handicapped shall be unacceptable.
 - 2. Flush Pulls:
Flush pulls for sliding doors shall be satin finish chrome, providing a recessed finger grip. Finger holes or slots machined into doors shall be unacceptable.
 - 3. Hinges:
Hinges shall be the five (5) knuckle, satin finish stainless steel, institutional, offset type for all swinging doors. Hinges shall be 2-3/4" long, and secured to cabinet and doors with flathead screws, so applied to withstand a weight load of 150 lbs. minimum.
 - 4. Locks:
Disk Tumbler:
Locks when shown or called for shall be a 5-disc tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity for 2000 primary key changes. Master key one level with the potential of 10 different, non-interchangeable master key groups.
- or

Pin Tumbler:

Locks when shown or called for shall be a pin tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity of at least 1000 primary key changes, and the capacity to be Masterkeyed, Grand-masterkeyed, Sub-masterkeyed, and Mason Keyed.

5. Roller Catches:
Roller Catches shall have a spring-loaded polyethylene roller and a steel strike plate.
6. Elbow Catches:
Elbow catches and strike plates shall be cast aluminum with bronze finish.
7. Drawer Slides:
Drawer slides shall be zinc plated, cold rolled steel, full extension, linear ball bearing slides rated at 100 pounds minimum. The drawer shall be removable without the use of tools.
8. Leg Shoes:
Leg shoes shall be provided on all table legs. Shoes shall be 2-1/2" high and a pliable, black vinyl material. Use of a leg shoe which does not conceal leveling or anchoring device will not be acceptable.
9. Floor Glides:
Floor glides, where specified for movable open-leg tables, shall be a non-marring material at least 1" dia. to prevent indenting composition flooring and shall have at least a 5/8" height adjustment. Use of metal buttons will not be acceptable.
10. Dowels:
Dowels used to join frames and panels shall be fluted hardwood not less than 8mm in diameter.
11. Shelf Support Clips:
Shelf support clips shall be twin pin type for mounting on interior of cabinet end panels. Clips shall be corrosion resistant and shall retain shelves from accidental removal and tipping. Shelves shall be adjustable on 32mm centers. Surface mounted metal support strips and clips subject to corrosion are not acceptable.
12. Base Molding:
Base molding shall be provided by others.
13. Support Rods, Upright Rod Assemblies and Rod Sockets:
Upright rods, cross rods and ring support rods, where specified, shall be anodized Duraluminum (1/2" or 3/4" dia., as required). Rod sockets shall be chrome plated brass, secured through table tops with lock nut and spring washer. Rod clamps shall be heavy duty, designed to securely hold rod assembly in any position.
14. Label Holders:
Label holders, where shown or called for, shall be self adhesive type aluminum with satin finish and designed for 2-1/2" x 1-1/8" cards, unless otherwise specified.
15. Number Plates:
Number plates, where shown or called for, shall be aluminum brad-attached type with satin finish and indented black lettering.
16. Sink Supports:
Sink Supports, where required, shall be of a cradle type consisting of two 1-1/4" x 1-3/4" horizontal cleats and adjustable leveling bolts or glides. The horizontal cleats shall be supported by two 3/4" x 2-1/2" hardwood plywood cleats attached to the cabinet end panels, or by four 1/4" steel rods attached to the cabinet top frame.

17. Support Struts:

Support struts shall consist of two 16 gauge channel uprights fastened top and bottom by two adjustable "U" shaped spreaders, each 12 gauge, 1-1/2" x length required. Struts shall be furnished to support drain troughs, and to support work top at plumbing space under fume hood superstructures or other heavy loads. They shall be fabricated so as to accept industry standard, pipe and conduit hangers.

2.02 CONSTRUCTION

A. General Requirements:

It is the intent of this specification to provide a high quality wood cabinet specifically designed for the laboratory environment. The cabinet shall be full overlay construction with 3/4" thick door and drawer fronts. The door and drawer fronts shall occupy a plane extending 3/4" past the plane of the front of the cabinet body. Edges of door and drawer fronts shall be square. The doors and drawer fronts shall overlay the face of the cabinet leaving minimal reveals between doors and drawers of approximately 1/8". All cabinet end panels shall be finished for the purpose of future relocation unless cabinet is selected with the "unfinished end" option. The exposed grain for doors and drawer fronts shall run vertical be matched to the door or drawer front above or below it.

B. Base Cabinets:

1. End Panels, Bottoms, and Shelves:

All cabinet end panels shall be 3/4" thick Red Oak veneer core plywood edge banded on exposed edges. End panels shall be multiple doweled, glued, and screwed to top frame members, intermediate rails, and bottoms. Cupboard bottoms shall be 3/4" thick Red Oak veneer core plywood edge banded on exposed edge. All cupboard base cabinet shelves shall be full-width adjustable, 3/4" thick Red Oak veneer core plywood edge banded on exposed edge. Integrally joined parts shall result in a totally enclosed cabinet.

2. Backs:

Cabinet backs shall be 1/4" thick hardboard, dadoed into end panels and securely fastened to cabinet bottom and top back rail. Backs that are attached to end panels with cleats shall be unacceptable.

3. Top Frame: (pick one)

Two-piece Top Frame

The cabinet top frame shall consist of a front rail and a back rail. The front rail shall be 3-1/8" x 1" hardwood with 3mm Red Oak facing. The back rail shall be 2-1/2" x 3/4" hardwood plywood.

or

Full Top Frame:

The cabinet top frame shall consist of a front rail, a back rail and two side rails. The front rail shall be 3-1/8" x 1" hardwood with 3mm Red Oak facing. The back rail shall be 2-1/2" x 3/4" hardwood plywood. The side rails shall be 1-3/4" x 3/4" hardwood and shall be screwed to end panels and front and back rails.

4. Intermediate Rails: (Optional)

Intermediate rails when specified shall be 3-1/4" x 3/4" hardwood plywood edge banded on exposed edge. Rails shall be multiple doweled and screwed to end panels. Intermediate rails shall be mounted at the front between the drawers and between all drawers and doors.

5. Drawers:

Drawers with Hardboard Bottom:

Drawer sides, back, and sub-front shall be 1/2" thick, 9-ply Birch plywood. Drawer heads shall be 3/4" thick, Red Oak, composite core plywood. A dovetail joint shall be used to attach the drawer sub-front and drawer back to the drawer sides. Drawer bottoms shall be 1/4" thick hardboard, set and hot-melt glued into 1/4" grooves, four sides. Each drawer shall have one pull mounted horizontally, drawers over 24" long shall have two pulls. Drawer sub-fronts attached to drawer sides with a lock-tenon joint shall be unacceptable.

or

Drawers with White Hardboard Bottoms:

Drawer sides, back, and sub-front shall be 1/2" thick, 9-ply Birch plywood. Drawer heads shall be 3/4" thick, Red Oak, composite core plywood. A dovetail joint shall be used to attach the drawer sub-front and drawer back to the drawer sides. Drawer bottoms shall be 1/4" thick hardboard with a white melamine finish, set and hot-melt glued into 1/4" grooves, four sides. Each drawer shall have one pull mounted horizontally, drawers over 24" long shall have two pulls. Drawer sub-fronts attached to drawer sides with a lock-tenon joint shall be unacceptable.

6. Doors:

- a. Swinging doors shall be 3/4", Red Oak, composite core plywood edge banded on all four edges, mounted on cabinet with 1 pair of offset hinges and shall be latched with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch mounted on the left-hand door and the lock and a roller catch mounted on the right-hand door. Each door shall have one pull mounted vertically.
- b. Sliding doors shall be 3/4" thick, Red Oak, composite core plywood, edge banded on the vertical edges. Doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the top of the cabinet. Each door shall have one recessed pull.

C. Special Purpose Base Cabinets:

1. Acid Storage Fume Hood Cabinet:

Acid storage fume hood cabinets shall utilize the same materials and construction features as other base cabinets. In addition, they shall have a one piece liner insert made of linear low density polyethylene. The liner insert shall form a one-inch high pan at the bottom to retain spillage. The door shall be lined with a polyethylene sheet. Each cabinet shall be vented with a 1-1/2" vent pipe. It shall provide a positive airflow directly into the fume hood exhaust system.

2. Solvent (Flammable) Storage Cabinet:

Solvent storage cabinets shall be constructed in accordance with OSHA, UL, and NFPA 30 standards. They shall meet the National Fire Protection Association, Flammable and Combustible Liquid Code and shall be UL listed with a UL label affixed to the inside of the cabinet door. Cabinet bottom, top, back, door(s) and sides shall be 1-inch exterior grade veneer core plywood. All joints shall be rabbeted and fastened in two directions with wood screws. Cabinet backs shall be removable for access to utility chase from inside the cabinet, and shall have two threaded, two-inch pipe vent outlets, with flame arrestors and capped for venting as required by local code. Doors shall be hinged with a pair of five-knuckle hinges, latched with a manual three-point latch, and shall overlap by 1" on cabinets with more than one door. The door sill shall be raised at least two inches above the cabinet bottom. Each cabinet shall include two, two-inch deep, removable liquid-tight, powder-coated steel pans to retain spills. One shall be at the bottom of the cabinet, the other mounted on adjustable shelf clips as a shelf. All solvent storage cabinets shall be marked with conspicuous, two-inch high lettering: **FLAMMABLE – KEEP FIRE AWAY.**

3. Vacuum Pump Cabinets:

Vacuum pump cabinets shall utilize the same materials and construction features as other base cabinets except they shall be provided without a bottom to allow vacuum pumps and other equipment to be rolled in and out of the cabinet. The interior of the cabinet shall be lined with a 1 inch thick neoprene foam for sound deadening and easy cleaning. Each cabinet shall be furnished with a 120 VAC, 20 amp, duplex receptacle mounted on the inside cabinet back and a pilot lighted toggle switch mounted in the top front panel. Each cabinet shall be furnished with a 1½" diameter PVC vent pipe in the back for venting or access to the fume hood above. The toe kick shall be attached to the doors and shall allow total access to the front of the cabinet. Internal wiring from the switch and pilot light to the receptacle shall not be

furnished unless otherwise specified.

D. Counter Mounted and Wall Mounted Cabinets:

1. Cabinet:

All cabinet end panels shall be 3/4" thick Red Oak veneer core plywood edge banded on front and bottom edge. Tops and bottoms shall be 1" thick Red Oak veneer core plywood edge banded on exposed edge, multiple doweled into end panels, and secured with glue and countersunk screws. Shelves shall be 1" thick Red Oak veneer core plywood edge banded on exposed edge. Shelves shall be adjustable on 32mm centers utilizing shelf support clips. The backs in open and glazed door cases shall be 1/4" Red Oak composite or veneer core plywood while the back not exposed to view shall be 1/4" hardboard. Case interior shall be flush.

2. Doors:

a. Sliding Doors:

1) Door Construction:

Panel doors shall be 3/4" thick, Red Oak, composite core plywood, edge banded on the vertical edges. Glazed doors shall have 3/4" x 3-3/16" Red Oak framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one recessed pull.

2) Door Mounting:

Sliding doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the cabinet top.

b. Sliding Plate Glass Doors:

Solid glass doors shall be 1/4" thick float glass with polished edges. Doors shall be set in an aluminum bottom frame containing roller bearings and held in position with an aluminum guide at the top of the case.

c. Swinging Doors:

1) Door Construction:

Panel doors shall be 3/4", Red Oak, composite core plywood edge banded on all four edges. Glazed doors shall have 3/4" x 3-3/16" Red Oak framing mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one pull mounted vertically.

2) Door Mounting:

Swinging doors shall be hung on 1 pair of offset hinges, under 48" in height, and 1-1/2 pair on cabinets 48" high.

3) Door Latching:

Doors shall latch with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch mounted to the left-hand door and the lock and a roller catch mounted on the right-hand door.

E. Full Height Storage Cabinets:

1. Cabinet:

All cabinet end panels shall be 3/4" thick Red Oak veneer core plywood, edge banded on front edge. Tops shall be 1" thick Red Oak veneer core plywood, edge banded on exposed edge, multiple doweled into end panels, secured with glue and countersunk screws. Shelves shall be 1" thick Red Oak veneer core plywood, edge banded on exposed edge. To assure a completely rigid case, the center shelf shall be multiple doweled into end panels, secured with glue and countersunk screws. All other shelves shall be adjustable on 32mm centers utilizing shelf support clips.

Cabinet bottoms shall be 3/4" thick Red Oak veneer core plywood, edge banded on exposed edge, multiple doweled and glued securely to end panels. A 3/4" x 4" hardwood veneer core plywood toe space rail on 22" deep cabinets shall be offset 3" from face to form a 4" high totally enclosed toe space. 12" and 16" deep cabinets shall have a 3/4" x 4" hardwood veneer core plywood toe space rail mounted flush with the face of the cabinet. The backs in open and

glazed door cabinets shall be 1/4" Red Oak composite or veneer core plywood while the back not exposed to view shall be 1/4" hardboard. Cabinet interior shall be flush.

2. Doors:

a. Sliding Doors:

1) Door Construction:

Panel doors shall be 3/4" thick, Red Oak, composite core plywood, edge banded on the vertical edges. Glazed doors shall have 3/4" x 3-3/16" Red Oak framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one recessed pull.

2) Door Mounting:

Sliding doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the cabinet top.

b. Swinging Doors:

1) Door Construction:

Panel doors shall be 3/4", Red Oak, composite core plywood edge banded on all four edges. Glazed doors shall have 3/4" x 3-3/16" Red Oak framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one pull mounted vertically.

2) Door Mounting:

Each door shall be hung on 1-1/2 pair of offset hinges.

3) Door Latching:

Doors shall latch with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch and Red Oak astragal mounted to the left-hand door and the lock and a roller catch mounted on the right-hand door.

F. Open-leg Tables:

Legs shall be hardwood core with Red Oak veneer, 2-1/2" square, with all corners radiused 1/32". Legs shall be secured to the apron frame by a heavy duty corner bolt and a 14-gauge metal corner brace. Corner braces shall be locked into apron rails by accurately located grooves and shall be securely fastened with screws. This construction shall guarantee equal tension on all wood and metal parts. All apron rails exposed to view shall be 3/4" thick, solid Red Oak. Leg stretchers, where required, shall be 1-5/16" x 2-1/2", Red Oak, securely joined to the legs without visible fasteners.

G. Kewaunee Matrix Furniture:

1. Adjustable Height Student Table:

Multi-purpose student workstation serving both lecture and laboratory function, able to seat five (5) students all facing the same direction, adjustable in height from 31" to 38", and easily movable and reconfigurable to adapt to changing classroom requirements.

Worksurface shall be 1" Kemresin resin and supported by a heavy gauge steel tubing support structure, securely welded and bolted for stability, and able to support 1200 lbs. The table shall include a 3/4" thick red oak veneer core plywood modesty panel below the worksurface, finished to match other casework on the project. All steel components shall be protected with an chemical resistant, VOC free, powder coat finish.

a. Height Adjustment shall be by the means of: (pick one)

a 120 VAC linear actuator system that includes an electronic control panel securely fastened to workstation that shall control up and down height adjustment as well as providing three (3) height memory settings. System shall be able to support a 1200 lb dynamic load and include a prewired, six (6) foot long power cord.

--- or ---

a telescoping support structure, utilizing drilled and tapped holes with bolts, allowing height adjustment on 1" increments.

- b. The table shall rest on: (pick one)

four (4) removable 12 gauge tubing leg assemblies that include a 1-1/2" diameter non-marring floor glides that is interchangeable with casters.

--- or ---

four (4) removable heavy-duty locking casters capable of supporting a 1200 lb dynamic load. Casters shall be interchangeable with a floor glide assembly.

- c. (Optional — remove if not required)

Table shall be provided with a six (6) outlet, prewired, 20 amp, 120 VAC power outlet strip with six (6) foot 12/3 cord, shipped loose for attachment at time of installation.

2. Fixed Height Pedestal:

Shall integrate with Adjustable Height Student Tables to provide services and additional worksurface area. The shape shall facilitate easy configuration options. Fixed Height Pedestals shall consist of a fixed height base (standing, sitting, or ADA height) a 1" thick Kemresin worksurface, and optional Kemresin drop-in sink, cold water faucet, and GFI electrical outlets. The base shall be constructed of 3/4" Red Oak veneer core plywood, securely glued and screwed, with a removable access panel. Base shall be finished to match casework on the project.

3. Adjustable Height Pedestal:

Shall integrate with Adjustable Height Student Tables to provide additional seating positions or worksurface area. The shape shall facilitate easy configuration options. Adjustable Height Pedestals shall consist of a heavy gauge steel tubular base mounted on 1-1/2" diameter non-marring floor glides, with a 1" thick Kemresin worksurface. The pedestal shall be height adjustable by means of a step-by-step ratcheting system with internal anti-rotation mechanism on 3/4" (20mm) increments and shall support a load of 200 lbs.

4. Instructors Station:

Shall serve as a demonstration table, desk, and specialty storage area for classroom instructors. Casework shall include: cupboard, drawers, and custom storage for overhead projectors. Construction shall conform to paragraphs 2.01 and 2.02 above. Accessories shall include: Kemresin worksurface and drop-in sink with sink outlet (18"x15"x11"), hot and cold water mixing faucet, 90° double outlet gas fitting, two (2) rod sockets with aluminum rod assembly, four (4) GFI protected 120 VAC duplex receptacles, two (2) duplex RJ45 data jacks, and a keyboard tray with mouse platform, monitor arm, and CPU holder.

2.00 FINISH AND PERFORMANCE REQUIREMENTS

All cabinet end panels, whether exposed to view in the final installation or not, shall be stained and finished to match cabinet face to allow the cabinet to be relocated at a later date unless cabinet is selected with the "unfinished end" option.

- A. Environmental Standards:

The finish must be low VOC and reclaimable with enclosed spray and/or roll coat application; thus providing an environmentally responsible product..

- B. Wood Surface Preparation:

Prior to application of wood finish, all cabinet component surfaces shall be sanded smooth to remove loose fibers, scratch marks, and abrasions, with all dust thoroughly removed.

- C. Wood Finish Application:

Cabinet components shall be finished using a state of the art flat-line system. The finish shall be

applied under controlled conditions prior to casework assembly and attachment of hardware. This will provide maximum coverage and protection to the assembled product. The finish shall be fully UV cured to ensure proper performance.

D. Interior Wood Casework Finish:

Interior surfaces shall receive two applications of chemical-resistant, UV cured, epoxy top coat. The first application will be cured, sanded, and cleaned. The final top coat will then be applied and fully cured.

E. Exterior Wood Casework Finish:

Exposed exterior surfaces, and interiors of glazed cabinets and open cabinets shall be stained and additionally sealed with two applications of chemical-resistant epoxy top coat. The fully reclaimable low VOC water-borne stain shall be uniformly applied by a series of automated spray applicators. The stained components shall then travel through a series of heated chambers to incrementally achieve a temperature of 140 degrees F to dry the stain material. The first of two low VOC epoxy top coats shall be applied, cured, sanded, and cleaned. The final top coat will then be applied and UV cured, providing a semi-gloss sheen. The completed product shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS paragraph F and SEFA.

F. Performance Test Results (Chemical Spot Tests):

1. Testing Procedure:

Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-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° ±3° F. For both methods, leave the reagents on the panel for a period of one hour. 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.

2. Test Evaluation:

Evaluation shall be based on the following rating system.

- Level 0 – No detectable change.
- Level 1 – Slight change in color or gloss.
- Level 2 – Slight surface etching or severe staining.
- Level 3 – Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

After testing, panel shall show no more than three (3) Level 3 conditions.

3. Test Reagents

Test No.	Chemical Reagent	Test Method
1.	Acetate, Amyl	Cotton ball & bottle
2.	Acetate, Ethyl	Cotton ball & bottle
3.	Acetic Acid, 98%	Watch glass
4.	Acetone	Cotton ball & bottle
5.	Acid Dichromate, 5%	Watch glass
6.	Alcohol, Butyl	Cotton ball & bottle
7.	Alcohol, Ethyl	Cotton ball & bottle
8.	Alcohol, Methyl	Cotton ball & bottle
9.	Ammonium Hydroxide, 28%	Watch glass

10.	Benzene	Cotton ball & bottle
11.	Carbon Tetrachloride	Cotton ball & bottle
12.	Chloroform	Cotton ball & bottle
13.	Chromic Acid, 60%	Watch glass
14.	Cresol	Cotton ball & bottle
15.	Dichlor Acetic Acid	Cotton ball & bottle
16.	Dimethylformamide	Cotton ball & bottle
17.	Dioxane	Cotton ball & bottle
18.	Ethyl Ether	Cotton ball & bottle
19.	Formaldehyde, 37%	Cotton ball & bottle
20.	Formic Acid, 90%	Watch glass
21.	Furfural	Cotton ball & bottle
22.	Gasoline	Cotton ball & bottle
23.	Hydrochloric Acid, 37%	Watch glass
24.	Hydrofluoric Acid, 48%	Watch glass
25.	Hydrogen Peroxide, 3%	Watch glass
26.	Iodine, Tincture of	Watch glass
27.	Methyl Ethyl Ketone	Cotton ball & bottle
28.	Methylene Chloride	Cotton ball & bottle
29.	Mono Chlorobenzene	Cotton ball & bottle
30.	Naphthalene	Cotton ball & bottle
31.	Nitric Acid, 20%	Watch glass
32.	Nitric Acid, 30%	Watch glass
33.	Nitric Acid, 70%	Watch glass
34.	Phenol, 90%	Cotton ball & bottle
35.	Phosphoric Acid, 85%	Watch glass
36.	Silver Nitrate, Saturated	Watch glass
37.	Sodium Hydroxide, 10%	Watch glass
38.	Sodium Hydroxide, 20%	Watch glass
39.	Sodium Hydroxide, 40%	Watch glass
40.	Sodium Hydroxide, Flake	Watch glass
41.	Sodium Sulfide, Saturated	Watch glass
42.	Sulfuric Acid, 33%	Watch glass
43.	Sulfuric Acid, 77%	Watch glass
44.	Sulfuric Acid, 96%	Watch glass
45.	Sulfuric Acid, 77% and Nitric Acid, 70%, equal parts	Watch glass
46.	Toluene	Cotton ball & bottle
47.	Trichloroethylene	Cotton ball & bottle
48.	Xylene	Cotton ball & bottle
49.	Zinc Chloride, Saturated	Watch glass

* Where concentrations are indicated, percentages are by weight.

G. Performance Test Results (Heat Resistance):

Hot water (190° F - 205° F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

H. Performance Test Results (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.

I. Performance Test Results (Impact Resistance):

A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of a 3/4" 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 eye-ball

examination.

2.01 WORKSURFACES

- A. Materials (Choose one or more and import information from WORKSURFACES spec.):
 - 1. Kemresin Epoxy Resin Tops
 - 2. Plastic Laminate
 - 3. Stainless Steel
 - 4. Hardwood / Natural Finish
 - 5. Hardwood / Penetrating Oil Finish
- B. Performance Requirements (Choose one or more and import information from WORKSURFACES spec.):

2.02 SINKS CUPSINKS, AND DRAINS

- A. Sinks (Choose one or more and import information from SINKS, CUPSINKS, and DRAIN spec.):
 - 1. Molded Epoxy Resin Sinks
 - 2. Stainless Steel Sinks
- B. Cupsinks (Import information from SINKS, CUPSINKS, and DRAIN spec.):
- C. Drain Troughs (Import information from SINKS, CUPSINKS, and DRAIN spec.):

2.03 FITTINGS

- A. Materials (Choose one or more and import information from SERVICE FITTINGS AND ACCESSORIES spec):
 - 1. Chrome-plated red brass or bronze
 - 2. Plastic-coated red brass or bronze
- B. Construction (Choose one or more and import information from SERVICE FITTINGS AND ACCESSORIES spec):
 - 1. Valves:
 - a. Front-loaded valves
 - 1) Water
 - 2) Steam
 - 3) Distilled Water
 - 4) Ground key dry service
 - 5) Needle valve dry service
 - b. Rod-driven remote control valves
 - 1) Water
 - 2) Steam
 - 3) Distilled Water
 - 4) Needle valve dry service
 - 2. Outlets
 - a. Goosenecks
 - b. Aerator outlets
 - c. Tank nipples
 - d. Sink outlets
 - 3. Miscellaneous
 - a. Crumb cup strainers
 - b. Vacuum breakers

C. Performance (Choose one or more and import information from SERVICE FITTINGS AND ACCESSORIES spec):

1. Maximum line pressures
 - a. Laboratory ball valves
 - b. Needle point cocks
 - c. Vacuum valve
 - d. Water (H&C) valve
 - e. Steam valve
2. Sepia bronze finish performance

PART 3 - EXECUTION - LABORATORY CASEWORK AND RELATED PRODUCTS

3.00 SITE EXAMINATION

- A. The owner and/or his representative shall assure all building conditions conducive to the installation of a finished goods product; all critical dimensions and conditions previously checked have been adhered to by other contractors (general, mechanical, electrical, etc.) to assure a quality installation.

3.01 INSTALLATION

- A. Preparation:
Prior to beginning installation of casework, check and verify that no irregularities exist that would affect quality of execution of work specified.
- B. Coordination:
Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.
- C. Performance:
 - 1. Casework:
 - a. Set casework components plumb, square, and straight with no distortion and securely anchor to building structure. Shim as required using concealed shims.
 - b. Screw continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.
 - c. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board.
 - d. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.
 - 2. Worksurfaces:
 - a. Where required due to field conditions, scribe to abutting surfaces.
 - b. Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure the joints in the field, where practical, in the same manner as in the factory.
 - c. Secure worksurfaces to casework and equipment components with materials and procedures recommended by the manufacturer.
- D. Adjust and Clean:
 - 1. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.
 - 2. Adjust doors, drawers and other moving or operating parts to function smoothly.
 - 3. Clean shop finished casework; touch up as required.
 - 4. Clean worksurfaces and leave them free of all grease and streaks.
 - 5. Casework to be left broom clean and orderly.
- E. Protection:
 - 1. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.
 - 2. Advise owner and/or his representative of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.