

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Architectural woodwork including, but not limited to:
1. Clear finish, full overlay, laboratory and other wood casework and millwork including, but not limited to base cabinets, fume hood base cabinets, wall cabinets, tall storage cabinets, countertop support, wall shelves and reagent shelves.
 2. Countertops of epoxy resin, stainless steel, butcher block, solid polymer, and plastic laminate with clear finish wood edges.
 3. Casework and woodwork hardware.
 4. Clear finish wood wall and ceiling panels, moldings, and base.
 5. Clear finish wood handrails for ornamental stairs.
 6. Window sills with clear finish wood veneer or plastic laminate tops, and solid wood edges.
 7. Shop applied woodwork finishes.
 8. Pantry sinks, faucets, and appliances.
 9. Engineered stone countertops for toilet rooms and Café.
 10. Whiteboards and tackboards in custom wood frames.
 11. Movable and adjustable height laboratory tables.
 12. Painted metal laboratory service enclosures and shelf supports.
 13. Laboratory service fixtures and fittings.
 14. Laboratory sinks of epoxy resin and stainless steel.
 15. Radiator grilles, laptop safes, safety cabinets, stainless steel wire shelving, test lead holders, geology and paleontology specimen cabinets, exhaust snorkel, water polishers and other purchased items related to architectural woodwork assemblies.
 16. Shelf standards and brackets.
 17. Other woodwork items not shown or specified in other Sections.
 18. Fillers, scribes, trim, blocking, nailers, furring, grounds, rough hardware, and accessories necessary to install architectural woodwork.
- B. Related Sections:

1. Blocking: Section 092116.
2. Resilient base & accessories: Section 096500.
3. Field painting: Section 099100.
4. Plumbing work: Division 22.
5. HVAC work: Division 23.
6. Electrical work: Division 26.

1.02 REFERENCES

- A. The following standards are cited in this Section. They govern the work of this Section only to the extent specified in each citation.
- B. Architectural Woodwork Institute (AWI): "Quality Standards" of AWI shall apply and by reference are hereby made part of this Section. References to Premium in the Specification shall be as defined in the latest edition of the AWI Quality Standards. Any item not given a specific quality grade shall be premium.
- C. U.S. Department of Commerce Commercial Standards (CS): CS236-66 Mat-Formed Wood Particleboard.
- D. U.S. Product Standards (PS):
 1. PS 1, Construction and Industrial Plywood.
 2. PS 20, American Softwood Lumber Standard.
 3. PS 51, Hardwood and Decorative Plywood.
 4. PS 58, Basic Hardwood.
- E. American National Standards Institute (ANSI):
 1. A156.9-82 Cabinet Hardware.
 2. A156.11 Cabinet Locks.
 3. A208.1-79 Mat-Formed Particleboard.
- F. Federal Specifications (FS):
 1. FF-N-105B (3) Nails, Brads, Staples, and Spikes: Wire, Cut, and Wrought.
 2. FF-S-325 Shield, Expansion, and Nail, Drive Screw (Devices, Anchoring, Masonry).
- G. National Electrical Manufacturers Association (NEMA): LD3-1980 High Pressure Decorative Laminates.
- H. Scientific Equipment & Furniture Association (SEFA)

1. SEFA 2.3 Scientific Laboratory Furniture And Equipment
2. SEFA 3 Work surfaces
3. SEFA 7 Laboratory And Hospital Fixtures

1.03 PERFORMANCE REQUIREMENTS

- A. Counters, low case tops, and stools shall support a 200-pound concentrated load at mid-span without noticeable springiness or finish/trim separation or overstress of anchorage or supports.
- B. Work shall accommodate changes in temperature and humidity without separation of joints, warping, binding of moving parts, or overstress.

1.04 SUBMITTALS

- A. Comply with Section 013300 requirements.
- B. Shop Drawings: Shall be prepared by the manufacturer of the architectural woodwork, and shall:
 1. Show dimensioned plans, elevations, profiles, and full or large-scale details. Identify details and key them to elevations.
 2. Show relation to adjoining construction, including (but not limited to) provisions for fitting and trimming work to accommodate allowable tolerances in adjoining construction. Identify structural support furnished and installed under this and other Sections.
 3. Show construction of all parts of the work: materials, thicknesses, and finishes; joining methods; details of field connections and anchorage; and provisions for moisture and thermal movement.
 4. Show other information necessary to establish conformance to specified requirements and to fabricate, install, and coordinate work with affected trades.
- C. Product Data: Manufacturers printed descriptive data and catalog cuts for cabinet hardware, service fixtures and other manufactured items.
- D. Samples:
 1. Transparent-finished Wood Veneer: See PART 1: QUALITY ASSURANCE.
 2. Transparent-finished Lumber Samples: Duplicate pairs of transparent-finished lumber of each species and cut. Each pair shall show the extremes of the range of variable appearance characteristics of lumber proposed for production work.
 3. High-Pressure Decorative Laminate Samples: Two 2 x 3-inch (min.) size samples for each NEMA grade/color/pattern/finish combination.

4. Wood paneling samples: Two 24" x 24" size samples of each wood species, indicating edge treatment and finish.
 5. Window sill samples: One 12" x 12" size sample of laminate top with solid wood edge, and one 12" x 12" size sample of wood veneer top and solid wood edge.
 6. Solid/perforated ceiling samples: One 18" x 18" size sample showing typical construction of assembly showing both solid and perforated wood, transition between the two, provisions for support, and finishing.
 7. Finished custom shelf bracket.
- E. Certificates:
1. Fire Retardant-Treated Wood: Treater's certificate and Contractor's affidavit for treated wood products per Section 063000 requirements.
 2. Fabric: Manufacturer's certificate to show compliance with regulatory requirements for flame propagation.

1.05 QUALITY ASSURANCE

- A. Woodworker Qualifications: Work shall be done by a pre-qualified architectural woodworker regularly engaged in fabricating, shop-finishing, and installing custom woodwork of the kind and quality required for the Project. The Architect reserves the right to approve the manufacturer selected to produce laboratory casework.
- B. Transparent-Finished Wood Veneer for Exposed Surfaces:
1. Display: Collect and display a variety of flitches of specified species and cut, from which the Architect can select natural wood veneers for transparent-finished work. Display rough cuts of flitches in proper sequence to illustrate proposed veneer and panel face assembly. Make finished samples from Architect-selected veneers.
 2. Samples: After flitch selection, submit duplicate pairs of transparent-finished veneered panels. Each panel shall be 24 x 24 inches or larger, as required to show veneer face panel assembly. Each pair of panels shall show extremes of the range of variable appearance characteristics proposed for production work.
- C. Chemical and Physical Resistance of Metal Finish: Submit an independent testing laboratory report certifying that the finish of metal laboratory casework and accessories is capable of withstanding the following:
1. Cured films shall be unaffected by 2 ft-lbs impact or 1/2" (12.7mm) mandrel bend when supported on 18 gauge (1.21mm) steel panel and shall have a pencil hardness of 8H to 9H. The finished product shall have a smooth, hard and flexible finish that has superior resistance to abrasion, corrosion and chemical activity. The polymerized film shall resist the action of the following reagents without any effect other than loss of luster or slight discoloration when subjected to a one c.c. puddle test for one hour:
 - a. Acetic Acid: 1% to glacial

- b. Sulfuric Acid: 25%
- c. Sulfuric Acid: 50%
- d. Sulfuric Acid: 85%
- e. Hydrochloric Acid: 10%
- f. Hydrochloric Acid: 37%
- g. Nitric Acid: 10%
- h. Nitric Acid: 25%
- i. Nitric Acid: 60%
- j. Phosphoric Acid: 85%
- k. Perchloric Acid: 60%
- l. Formaldehyde: 37%
- m. Phenol: 85%
- n. Ammonium Hydroxide Concentrate
- o. Carbon Tetrachloride
- p. Chloroform
- q. Acetone
- r. Xylol
- s. Furfural
- t. Sodium Hypochlorite

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 016000 requirements.
- B. Do not deliver products until storage and installation areas are dry enough to eliminate damage caused by excessive moisture and changes in moisture content.
- C. Deliver products in closed vans. Bundle loose materials to prevent loss and damage.
- D. Store products in a clean, protected space in the Project, under specified environmental conditions.

1.07 PROJECT CONDITIONS

- A. Environmental Conditions: HVAC system shall be operating and ambient occupancy conditions attained.
- B. Adjoining Work: Constructed to specified tolerances and where applicable, to guaranteed dimensions.
- C. Field Measurements: Fabricate work to field measurements. If field measurements cannot be made without delaying the Work, the Contractor shall provide guaranteed dimensions and coordinate work of affected trades/Sections to assure proper execution of adjoining work. The casework manufacturer is responsible for details and dimensions that result from field conditions and shall indicate on shop drawings all required field measurements.

1.08 SEQUENCING/SCHEDULING

- A. The Woodwork Contractor shall coordinate delivery and installation of products furnished and/or installed under the work of this and other Sections/trades so that:
 - 1. Locations of anchor plates, openings, and recesses for architectural woodwork are provided in time to be incorporated in drywall construction.

2. Access shall be provided for installation and testing of electrical work built into or concealed by architectural woodwork.

1.09 MOCK-UP

- A. For laboratory casework mockup refer to front end document requirements.

PART 2 - PRODUCTS

2.01 ARCHITECTURAL WOODWORK MANUFACTURERS

- A. Work of this Section shall be provided by one of the following companies, or approved equal:
 1. OC River Laboratory Furniture, 300 S. Krueger Street, Suring, WI 54174 (416-998-1455).
 2. CIF Lab Solutions, 56 Edilcan Drive, Concord, Ontario CA L4K 3S6 (905-738-5821).
 3. Mott Manufacturing, 452 Hardy Road, Brantford, Ontario CA N3T 5L8 (304-497-2115) represented locally by Scientifix 37-24 24th Street, Long Island City, NY 11101 (718-669-7050).

2.02 LUMBER MATERIALS

- A. Hardwood Lumber: PS 58; clear and free from defects; graded in accordance with AWI requirements; maximum moisture content of 6 percent; of the following species and grade for transparent finish:
 1. Exposed exterior parts: Steamed European Beech, quarter-sawn, AWI Lumber Grade I, to match Architect's control sample.
 2. Semi-exposed parts: Steamed European Beech, AWI Lumber Grade II.

2.03 SHEET MATERIALS

- A. Hardwood Plywood: PS 51; graded in accordance with AWI requirements; core material of veneers or particleboard; thickness as indicated on drawings; of the following species, grade and face veneer cuts for transparent finish:
 1. Exposed exterior parts: Select, quarter-sliced Steamed European Beech, AWI face grade AA, with all fronts for the same cabinet cut from a single sheet, and with all cabinets in an assembly or space appearance matched for consistency of color, grain and other characteristics. Grain shall run vertically through all cabinet doors and drawer fronts.
 2. Semi-exposed parts: Plain sliced Steamed European Beech of face grade A.
- B. Core Material Products:
 1. Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 85 percent.

2. Hardboard: AHA A135.4.
 3. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
 4. Particleboard: ANSI A208.1, Grade M-2.
 5. Softwood Plywood: DOC PS 1.
 6. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
- C. High Pressure Plastic Laminate: FS L-P-508H, NEMA LD 3, .050 inch thick, matte finish, manufactured by Formica, or approved equal. Colors will be selected by the Architect.
- D. Backing Sheets: .020 inch thick high pressure paper base laminate without decorative finish.

2.04 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWWA C20 (lumber) and AWWA C27 (plywood). Use Exterior Type or Interior Type A. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Kiln dry material after treatment.
- B. Fire-Retardant Particleboard: Panels made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture with flame-spread index of 25 or less and smoke developed index of 25 or less per ASTM E 84.
- C. Fire-Retardant Fiberboard: ANSI A208.2 medium-density fiberboard panels made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture with flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

2.05 ACCESSORIES

- A. Glue: Water-resistant type as recommended to suit application.
- B. Nails: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, and Screws: Of size and type to suit application; chrome plated brass or stainless steel finish in exposed locations; carbon steel in concealed locations.

2.06 GENERAL FABRICATION REQUIREMENTS

- A. Fabricate all items in accordance with AWI Quality Standards for Premium Grade, transparent finish, as amended in this Section.
1. Transparent-Finished Wood: Select wood for uniform appearance in each assembly and among all assemblies in the same space. Distribute to best

advantage the characteristics and defects allowed by specified AWI Quality Grade.

2. Matched Lumber and Veneer: Where required appearance match (after finishing) cannot be obtained with the same species, obtain the Architect's approval to change lumber species or to substitute veneered solid core assembly for lumber.
 3. Scribing Trim: Where not otherwise shown or specified, match species, cut, and finish of work scribing trim is used with.
 4. Panel Products: 3-ply construction with 3/4" thick core where not otherwise specified, with face veneers specified for each category of work. Use FX MDF core for all wall paneling, and for any cabinets to be installed in corridors or lobbies. Use MDF core where core edges are to be sanded and finished; use MDF or particleboard core elsewhere.
- B. Fit plywood and particleboard shelf, drawer front, fin and door edges with 3/16-inch matching hardwood edge-bands, unless otherwise noted. Use full-length pieces only.
- C. Use concealed fasteners wherever possible. Obtain prior approval for any exposed fasteners.
- D. Provide access to electrical junction boxes and plumbing valves. Coordinate with other trades and indicate locations and means of access on shop drawings.
- E. Provide concealed continuous stiffeners to the underside of any countertop spanning 4'-0" or more.
- F. No particleboard or plywood shall be in contact with flooring. Cabinet bases shall be 4-inch (min.) high solid American Cherry lumber.
- G. Cabinet Hardware:
1. Factory-install cabinet hardware. Remove it as required for shipping. Package field-installed hardware with the assembly to which it is fitted.
- H. Built-ins:
1. Cut/drill openings for fixtures, specialties, accessories, and other built-ins per template/instructions furnished by the manufacturer.
 2. Cut/drill openings necessary to accommodate conduit, cable, wiring, and wiring devices. Provide wire access grommets for wire holes in exposed surfaces.
- I. Assembly:
1. Trial-assemble all work. Permanently assemble work in the largest units that meet shipping and Project conditions.
 2. Field Joints in Counters: Make counters in one-piece for-length where possible. Where field joints are unavoidable, prepare work for assembly with Flush Joint Fasteners.

- J. Provide removable countersunk screws and receiver ring at removable rear panels at knee openings.

2.07 SHOP APPLIED WOODWORK SEALING AND FINISHING

- A. Transparent finish for exposed and semi-exposed surfaces: AWI Finish System TR-5, catalyzed vinyl, dull rubbed effect.
- B. Sealing: Seal unfinished wood surfaces to prevent moisture gain. Seal immediately all bare wood that is exposed by field fabrication and fitting.

2.08 CASEWORK HARDWARE

- A. Casework hardware includes, but is not limited to, the following:
 - 1. Wire pulls: Lamp by Sugatsune EC-100/S stainless steel with satin finish. Pulls shall be inset 1 inch from door or drawer edges. Mount door pulls vertically and drawer pulls horizontally.
 - 2. Edge Pulls: Lamp by Sugatsune SN-120S, satin stainless steel. Mount pulls horizontally to align with face of horizontal and vertical edge of door.
 - 3. Hinges: Grass Nexis, concealed self-closing hinges. For doors up to 24 inches wide, weighing up to 20 lbs., provide 2 hinges; for doors up to 24 inches wide, weighing 20-40 lbs., provide 3 hinges.
 - 4. Drawer and shelf slides:
 - a. Box and file drawers over 4 inches deep: Accuride 7435, full extension (plus one inch) steel ball bearing, 100 lbs./pair capacity, with rail mounting system and closed position hold-in detent, bright zinc.
 - b. Lateral files: Accuride 4034, full extension (plus one inch) steel ball bearing, 150 lbs./pair capacity, with rail mounting system and closed position hold-in detent, bright zinc.
 - c. Computer keyboard tray: Accuride 2008, $\frac{3}{4}$ length of slide travel, 45 lbs./pair capacity, bright zinc.
 - d. Pullout shelves: Accuride 322 full extension steel ball bearing, 100 lbs./pair capacity, bright zinc.
 - 5. Locks:
 - a. Casework Locks: Use at locations noted on drawings. Lamp Sugatsune #6810 Million Lock. Master and Grand Master keyed. Stainless steel finish.
 - b. Locker Locks: Re-settable combination lock with three dials, key override function and code scrambling. Mastercombi Built-In Combination Locker Lock. Combi-Lock 1153, vertical orientation, Hafele 231.16.312. Provide two Combi-code Codefinders, Hafele

231.16.999. With Hafele 231.14.300 handle and Hafele 231.16.706 strike plate.

6. Shelf standards: Knappe & Vogt #85, double-slotted type where shelf sections meet, matching #83 single-slotted type at ends of shelf sections, 16-gage, anachrome finish.
7. Shelf brackets: 16-gauge steel with three blade hooks as detailed. Shelves shall be screwed to brackets. Brackets paint color to be selected, semi-gloss enamel.
8. Furniture levelers: Zinc-plated steel leg levelers and mounting brackets for bottoms of base cabinets.
9. Cable sets: Two-part with spring closure in top, light gray, 80 mm. Hafele 429.99.548.
10. Coat hooks:
 - a. Lockers: Rockwood 796 Small Double Coat Hooks, stainless steel finish. Two per locker.
 - b. Office: Rockwood 806 Medium Coat Hook, stainless steel finish. Two per office.
11. Tension catches: Lamp by Sugatsune BCT-60W nickel finish.
12. Grilles for fin tube unit enclosure tops, AV cabinet doors and countertop, and BV base cabinet doors: Aluminum bar grille linear diffuser with mounting frame and integral access doors; CT-540 x Type 3 concealed fastening mounting frames, 4" wide, by Titus Products.
13. Laptop safes: Smartdesk flipIT (800-770-7042).
14. Metal shelf supports: Hafele 282.04.739 (nickel-plated), ¼" diameter, spoon shaped pins.
15. Locking casters: Dual-wheel 3" (75mm) swivel lock/wheel brake with double-row ball bearing swivels. Hard gray rubber tires. 200 lb. capacity. Mounting type to suit application. Medium Duty Dual-Wheel Casters by the Jilson Group Caster Products Division.
16. Sliding whiteboard hardware: Bartels Terra H ST.1061.TH barn door system with rail, valance, and wheels. 300 lb. capacity. Stainless steel.
17. Nova Downview Flat Panel Display Kits (for Computer Room AC007): Model FPA-0-1818-AK with tempered glass viewport (18" x 18" x ¼"), ABS visor (12" x 21-1/2" x 6-1/4"), injection molded plastic trim ring (18" x 18" x 1-1/4"), adjustable tension-mounted steel flat panel arm, and ABS keyboard dual-mount drawer with hangers. Nova Downview Flat Panel Display Kits are available through KE Hardware (410-771-5556).

18. CPU Holder: Adjustable (inside dimensions) from 5" to 9-1/2" one way, 14" to 24" the other. Metallic Silver finish.. Model CPU1A Universal CPU Holder by Doug Mockett & Company, Inc. (800-523-1269).

B. Display Cabinet Hardware:

1. Glass Doors: Blumcraft #1301 Series glass doors with top and bottom clear satin anodized aluminum channels (1-1/4" x 1-1/4"); pivot hinges surface mounted to wood case above and below doors; 1/2" clear tempered glass with polished eased edges; #7150 lever type cam lock in lower channel; and roller catch.
2. Glass Shelves: 3/4" tempered glass with polished eased edges.
3. Glass Scrim: 1/2" laminated with polyurethane inner layer.

2.09 WORK SURFACES

- A. Laboratory bench tops: Molded chemical and abrasion resistant epoxy resin, one inch thick. Counter tops shall be provided with drip grooves on the underside of exposed edges. Exposed edges shall have a 1/8" radius on front top edge and at vertical corners. Curbs shall be 4" high, unless otherwise noted on drawings, and shall be 3/4" thick bonded to the surface of the top to form a square joint. Furnish with cutouts for sinks, piping, etc., manufactured by Epoxyn Products, 500 East 16th Street, Mountain Home, AR 72653 (870-425-0820). Color: Epoxyn #02 White.
- B. Plastic laminate with solid wood edges: Countertops, backsplashes and curbs shall have a plastic laminate finish equal to AWI "Premium" grade standards. Wood core to receive plastic laminate finish shall be 1-1/4" thick. Provide 1/2" (12.7mm) hardwood edge banding on exposed edges. Edges shall be European Steamed Beech. Plastic laminate for exposed horizontal surfaces shall be 0.050" thick, general purpose (high pressure). Plastic laminate for concealed panel backing shall be 0.020" thick, backer type (high pressure) and color shall be selected by Architect. Material shall be manufactured by Formica, or approved equal.
- C. Stainless steel: Counter tops, curbs and integral sinks noted on drawings as "Stainless Steel" shall be constructed of 16-gauge stainless steel. Exposed surfaces shall have #4 finish. Stainless steel counter tops shall be constructed with raised front rim, marine edge construction. Top surface, rear curb and rear or top edge shall be one piece without seams or joints. The top of the 6" (152mm) high curb shall be chamfered 45 degrees. The joint where the rear curb meets the counter top shall be integral and slightly radiused. Carbon steel or stainless steel shall be welded to the underside in at least three locations along the length to prevent twisting, oil canning, or buckling of surface. The underside shall receive a coat of sound deadening material. Stainless steel counter tops shall be 1" thick. Tops shall be as long as practical to permit access to building and room. Field joints shall be provided to join oversized tops with welded channels and angles with bolting arrangements for pulling tops together to produce a hair-line waterproof seam, maximum 1/64". Where sinks are shown on drawings, they shall be integral and of the size specified. Tops shall be adequately reinforced to accept sinks. Seams and joints shall be welded, ground smooth and polished.
- D. Butcher block countertops, backs guards and shelves: Edge-grained strips of maple with clear surfaces and ends. Seasoned, kiln-dried maple strips are bonded together with resin and electronically cured, planed, sanded and varnished (baked between

coats) for a highly water and abrasion resistant clear finish and satin-smooth resilient work surface. Maple countertops are 1-3/4" thick, shelves and back guards are 1-1/4" thick.

2.10 LABORATORY SINKS

- A. Epoxy Resin: Epoxy resin sinks shall be a solid molded mass consisting of a modified resin, coloring and proper fillers producing a smooth finish the same color as the surrounding counter top, highly resistant to laboratory chemicals, abrasion and water absorption. The side of the sink shall be tapered and the inside corners radiused. Epoxy resin sinks shall have integral side mounted overflows. The bottom of the sink shall pitch to the drain. Epoxy sinks mounted in epoxy resin tops, shall be supported on steel channels attached to the ends of sink cabinets and adjustable by screw type rods to insure tight fit to the underside of the table with a water-proof compound. Sinks shall be manufactured by: Durcon Corporation (Plymouth, MI), Epoxyn Products (Mountain Home, AR) or Laboratory Tops Inc (Taylor, Tx). Color: White. Sink Types SK-1 through SK-6 are epoxy resin.
- B. Stainless Steel: Stainless steel sinks shall be constructed of 16 gauge #4 finish on exposed surfaces. Sinks shall have interior coved corners with bottoms pitched toward drain. Stainless steel sinks shall have integral side mounted overflows. Standard stock sized sinks shall be deep drawn from a single sheet. Other sinks shall be fabricated having continuous heliarc welded joints ground and polished smooth. The type of stainless steel used to fabricate integral sink to be the same as that used in adjacent counter top (either type 302/304 or 316). Sinks placed in stainless steel counter tops shall be welded in and seams shall be ground smooth and polished to match the counter top finish. Those mounted in plastic laminate or wood tops shall use self rimming design. Those mounted in epoxy resin tops shall be installed in the same manner as epoxy resin sinks.
- C. Sink Outlets, Tailpieces and Overflows. Sinks shall be equipped with an integral overflow that is connected directly to the tailpiece. Overflow shall consist of an outlet located 2" (50.8mm) below counter top and 1/2" (12.7mm) diameter tygon tubing to connect overflow to tailpiece which shall be modified to accept tubing.

2.11 WALL AND CEILING PANELING AND TRIM

- A. AWI Premium Grade x Transparent Finish. Provide concealed mounting hardware, fasteners, accessories and auxiliary materials necessary to complete the installation.
- B. Wall and Ceiling Paneling and Trim: Quarter-sliced, Steamed European Beech veneer faces with matching quarter sawn lumber edges with particleboard or MDF cores in sizes, and configurations indicated on drawings. AA grade veneers, or better. Grain shall run in a consistent direction through all panels.
- C. Perforated Wood Wall and Ceiling Panels: Same as above, perforated. Perforation pattern to be selected by Architect.
 - 1. Acoustic Insulation: Permacote Linacoustic R-300 rigid fiber glass plenum liner board by Johns Manville, 1" and 2" thicknesses, as indicated on drawings.
- D. Fabric Wrapped Panels (Multipurpose and Lecture Rooms):
 - 1. Acoustic Insulation: Permacote Linacoustic R-300 rigid fiber glass plenum liner board by Johns Manville, 1" and 2" thicknesses, as indicated on drawings.

2. Fabric: Carte Blanche Collection, Freehand series, Pallas Textiles Panel Fabrics (800-472-5527), or approved equal (Fabric 1 on color schedule).
- E. Fabric Wrapped Panels (Adler Center Lobby): Custom-wrapped, tackable surface, ½" thick Class A fire-resistant wall panels (55% recycled content), Homosote N.C.F.R. (800-257-9491) with Carte Blanche Collection, Oasis series, Pallas Textile Panel Fabrics (800-472-5527), or approved equal (Fabric 2 on color schedule).

2.12 WINDOW SILLS

- A. Where "Wood Sills" are indicated on drawings: Quarter-sliced Steamed European Beech veneer tops, and solid quarter-sawn Steamed European Beech edges, clear finished.
- B. Where "PLAM Sills" are indicated on drawings: High Pressure Plastic Laminate with edges of clear-finished quarter-sawn Steamed European Beech lumber.

2.13 STORAGE CABINETS AND LOCKERS

- A. Steamed European Beech lumber and matching veneer construction, premium grade. Mount with concealed fasteners. AWI Premium Grade x Transparent Finish.
- B. Wood lockers with hinges, shelf, coat hooks, stainless steel number disk, and re-settable combination lock.
- C. Wood, whiteboard, and glass storage cabinets with hinges, edge pulls, cabinet locks, adjustable shelves on recessed pins, and clear tempered glass.

2.14 DISPLAY BOARDS

- A. European Steamed Beech lumber and matching veneer construction, premium grade. AWI Premium Grade x Transparent Finish.
- B. Wood-framed tackboards and picture rails: As detailed, in lumber frames, scribed for tight fit to partitions.
- C. Whiteboards in wood frames: As detailed, with enameled steel whiteboards in lumber frames, with concealed fastening to partitions.

2.15 LABORATORY SERVICE FITTINGS

- A. Laboratory service fittings shall be products of Water Saver Faucet Co., unless otherwise noted. Fittings include the following:
 1. Gas (G), Air (A), Vacuum (V): L4200-132AWSA (180-degree straight) deck mounted at island benches; L4200-131WSA single deck mounted at wall benches and ADA locations as noted; L4870FT-325 (wall mounted with floating escutcheon) at typical wall benches.
 2. Water fitting at lab bench sinks (HW CW): L2212VB-127VB with swing gooseneck and vacuum breaker, blade handle, removable aerator. Also provide this fixture at stainless steel wall mounted sinks in rooms G115, G118, and G414B.

3. Eyewash fitting at noted lab bench sinks (EW): EW1022.
4. Pure water fitting at lab bench sinks (PW): L7611 WSA (non self-closing).
5. Faucet with foot-peddle control for HW and CW (Room G313 island benches): L081WSA and L3001.
6. Emergency shower stations (all with thermostatic mixing valve option): SSBF2150 (typical), SSBF2173 (at Rooms G106 and G414 only), and SS909 (at Room G107 only).
7. Glasswash stainless steel sink panel mounted pre-rinse HW-CW mixing fitting: PR1711WSA-110WSA with flexible stainless steel hose (rubber interior), spring, wall bracket and in-line vacuum breaker.
8. Glasswash stainless steel sink panel mounted pure water fitting (RO): L2784WSA with self-closing handle.
9. Panel Mounted CO2 Fitting with Low Pressure (0-30 psi) Regulator Gauge: L3170-364-758FT.
10. Single-gang, single-face and double-face electrical pedestal box with mounting shank: E300SA-WS (DH1A), and E500SA-WS (DH1B).
11. Multiplex Series (Electric and Data) Service Fittings: Wiremold LeGrand MP4 ((DH2) and MP8 (DH4).

2.16 MOVABLE AND ADJUSTABLE HEIGHT TABLES

- A. Movable tables with 1-1/2" apron front, 4" sides and back; 1" x 1" tubular stainless steel telescoping legs fitted with a 1-1/2" diameter adjustable non-marring floor glides with 1" adjustment capability. Moveable tables shall have the ability to be adjusted in height from 30" to 38" in 1" increments inclusive of 1" thick counter top. Movable tables shall be installed at height indicated on Drawings. Fixed section of leg shall be set at height appropriate for a 31" high table top and adjustable portion of leg shall be stainless steel, drilled at 1" increments, and concealed within each metal table leg. Movable tables 7ft - 8ft long shall be reinforced with a deep welded steel channel frame of a gauge appropriate for the load bearing requirements and concealed by wood elements. Load capacity of tables shall be 1,000 lb. uniformly loaded and support a 250 lb. concentrated load at midspan with deflection not to exceed 1/8". Provide a countersunk metal slide plate with grooves at underside of each leg and provide chain for each pin support. Wood portions of tables are European Steamed Beech lumber. Tops are epoxy resin.

2.17 REAGENT SHELF SUPPORT FRAMES

- A. Adjustable shelves mounted above peninsula or island benches shall be mounted to a welded double-sided, steel frame assembly. Assembly shall be fabricated of 14 ga. fully welded steel tube with slots laser cut into uprights and be coated with an acid, alkali and solvent resistant epoxy powder coat. Slotted studs and standards shall have a fully compatible slot pattern. Adjustable shelves shall be furnished with integral mounting brackets or clips. Color: silver metallic to match Architect's sample.

2.18 DRYING RACKS

- A. Drying racks shall be fabricated of stainless steel. Pegboards shall be furnished with removable rounded-tip white polypropylene pegs, stainless steel drip trough, 1/4" diameter drip trough outlet and flexible tubing between drip trough outlet and sink (cut as required). Pegboard size and configuration shall be as indicated on the Drawings.

2.19 CARBOY/POLISHER SUPPORTS

- A. Carboy/Polisher supports: Custom, removable 3/4" dia. stainless steel rod and perforated stainless steel plate assemblies for mounting to reagent supports. Perforation pattern: 3/8" dia. holes on 3/4" straight centers, with 3/4" border. Provide mounting hardware consisting of spreader screws for tightening rods within pipe sleeves pins, as detailed.

2.20 NURSING POWER COLUMN/ HEADWALL

- A. Furnish and install 9" square, floor to ceiling, factory pre wired and pre-piped power columns at locations indicated on drawings. See drawings for required services (electrical, plumbing, and audiovisual). Laminate color to be selected by Architect. "Regal Series" PC09FL-GEN by Amico Corporation (877-462-6426).
- B. Accessories include: channel or rail adaptor, 12" arm extension, 5" shelf with slide in VESA75/100 plate, and nurse call.
- C. Height of columns: 9'-6" (field verify).

2.21 STAINLESS STEEL SINKS, FAUCETS AND APPLIANCES

- A. Stainless Steel Sinks: Elkay Gourmet and Lustertone 18-gauge Type 304 stainless steel sinks, of the following types and sizes:
 1. SK-7: Elkay Gourmet Single Bowl LR2521 (25" x 21" x 8") with Type 3 hole configuration.
 2. SK-8: Elkay Gourmet Single Bowl LRAD2522 (25" x 21" x 6") barrier free, with Type 3 hole configuration.
 3. SK-9: Elkay Gourmet Undermount Single Bowl ELU1418 ((14" x 18" x 8").
 4. SK-10: Elkay Lustertone Undermount Single Bowl ELUHAD1418 (14" x 18" x 5") barrier free.
- B. Pantry Faucets: Chicago Faucets Model 527 with handle style 210, and GN-RGD2 swing spout.
- C. Undercounter Refrigerator: 5.7 cu. ft. capacity, 34"H x 23-1/2" W x 24-1/8" D, Model GMR06AAZWW by General Electric.

2.22 ENGINEERED STONE COUNTERTOPS FOR TOILET ROOMS AND CAFÉ

- A. Homogenous quartz surface material, 1-1/8" (3 cm) thickness with eased square edge, 1/8" seam width (max.), for undermount sink installation, applied end and backsplashes, Zodiaq by DuPont, or approved equal.

- B. Provide joint adhesive, sink mounting hardware and other accessory products as required.
- C. Factory fabricate and shop assemble engineered stone products. Install in accordance with manufacturer's recommendations.
- D. Colors and finishes shall be selected by Architect.

2.23 SOLID POLYMER COUNTERTOPS WITH INTEGRAL LAVATORIES AND BACKSPLASHES

- A. Cast, filled, acrylic (not coated, laminated, or of composite construction, meeting ANSI Z124 1980, Type Six, and FS WW-P-541E/GEN. 5000 psi (min.) tensile strength when tested in accordance with ASTM D638. 7000 psi (min.) flexural strength when tested in accordance with ASTM D790. 25 (max.) flame spread, and 30 (max.) smoke developed when tested in accordance with ASTM E84. Corian Surfaces, by E.I. duPont de Nemours & co., Inc., or approved equal. ¾" (min.) thickness, 4" high backsplashes. Colors to be selected by Architect.
- B. Use manufacturer's standard joint adhesive, panel adhesives, and sealant.
- C. Factory fabricate components to greatest practical sized and shapes indicated, in accordance with approved shop drawings. Provide factory cutouts for plumbing fittings and bath accessories. Rout and finish component edges with clean, sharp returns. Rout cutouts, radii and contours to template. Smooth edges. Repair or reject defective and inaccurate work.

2.24 METAL FREESTANDING SAFETY CABINETS

- A. Flammable Storage Cabinets: 18 gauge steel sides, top, bottom and doors are double-wall construction, fire-baffle capped vents with 2" threaded fittings, yellow with red warning lettering, with grounding attachment, 3-point lock, 2" raised leakproof door sill, adjustable shelves with 4 brackets each, capable of supporting 350 lbs. Model 1947 by Eagle Manufacturing Company (304-737-3171).
- B. Acid/Corrosive Safety Cabinets: Constructed of non-metallic polyethylene for resistance to acid vapors and spills. Flat blue finish, 44 gallon capacity. Model CRA-P44 by Eagle Manufacturing Company (304-737-3171).
- C. Paint and Ink Storage Cabinets: FM approved, with 18 gauge steel sides, top, bottom and doors of double-wall construction, fire-baffle capped vents with 2" threaded fittings, yellow with red warning lettering, with grounding attachment, 3-point lock, 2" raised leakproof door sill, adjustable shelves with 4 brackets each, capable of supporting 350 lbs., Model PI-47 by Eagle Manufacturing Company (304-737-3171).

2.25 STAINLESS STEEL WIRE SHELVING

- A. Type 304 stainless steel wire shelves and posts, in the configurations indicated on the drawings. Super Erecta Shelf Wire Shelving by InterMetro Industries Corporation (570-825-2741).
- B. Wall shelving at Geology Labs: Double Shelf Post Type; 3-tiers 1WS24S with 33PDFS posts and SBES end brackets.

C. Freestanding shelving identified by type in Casework Schedule on Drawings of the following types and sizes:

1. WS2436: Metro Model 2436NS (24" x 36").
2. WS2442: Metro Model 2442NS (24" x 42").
3. WS2448: Metro Model 2448NS (24" x 48").
4. WS2454: Metro Model 2454NS (24" x 54").

All of the above are with four (4) Metro Model 86 PS stationary posts (86-1/2" high).

2.26 TEST LEAD HOLDERS

A. Wire racks for Physical Sciences laboratories: Model 2708 and 1508 Test Lead Holders, by Pomona Access (800-444-6785).

2.27 GEOLOGY AND PALEONTOLOGY SPECIMEN CABINETS AND TRAYS

A. Heavy-duty all steel cabinets specially designed for heavy specimens, with double wall construction, lift-off doors with slip-type hinges, handles with key lock, reinforced door, elastomeric door seals, and steel trays. Each cabinet shall be provided with 16 shelves. Model 301 cabinets by Lane Science Equipment Corporation (212-563-0663).

2.28 VENTILATED FUME HOOD BASE CABINETS (BV)

A. Cabinet doors shall be full overlay, clear finish Select, quarter-sliced Steamed European Beech, AWI face grade AA, with all fronts for the same cabinet cut from a single sheet, and with all cabinets in an assembly or space appearance matched for consistency of color, grain and other characteristics. Grain shall run vertically through all cabinet doors and drawer fronts. Construction shall match the other custom wood laboratory casework.

B. Cabinet bodies, interior and shelf shall be lined with white flame and chemical resistant polypropylene to withstand severe chemical exposure. Removable back shall be gasket-sealed and two gasket-tight 2-inch light gray polypropylene vent pipes shall extend from cabinet to fume hood and 1/2-inch above hood work surface. Provide aluminum bar grille vents in doors. Shelf in BV cabinets shall be adjustable, and full width of cabinet. Provide in bottom of cabinet a 1/4-inch thick, heat welded, liquid tight, one-inch deep, removable polypropylene pan. Catches, glides and shelf clips shall be stainless steel.

2.29 FLAMMABLE STORAGE FUME HOOD BASE CABINETS (BO)

A. Cabinet doors shall be full overlay, clear finish Select, quarter-sliced Steamed European Beech, AWI face grade AA, with all fronts for the same cabinet cut from a single sheet, and with all cabinets in an assembly or space appearance matched for consistency of color, grain and other characteristics. Grain shall run vertically through all cabinet doors and drawer fronts. Construction shall match the other custom wood laboratory casework.

B. Cabinet bodies, interior and shelf shall be lined with white flame and chemical resistant polypropylene to withstand severe chemical exposure. Cabinets shall be

constructed to comply with NFPA 30 4-3.2.2 and OSHA 1910.106 (d) 93) (ii) (b) requirements. These requirements include, but are not necessarily limited to the following:

1. The bottom, sides and top of cabinets shall be constructed of exterior grade plywood at least 1-inch in thickness, which shall not break down or delaminate under fire conditions. All joints shall be rabbeted and shall be fastened in two directions with wood screws. When more than one door is used, there shall be a rabbeted overlap of not less than 1-inch.
 2. Cabinet doors shall be equipped with a means of self-closing and latching, and hinges shall be constructed and mounted in such a manner as to not lose their holding capacity when subjected to fire exposure.
 3. A raised sill or pan capable of containing a two-inch depth of liquid shall be provided at the bottom of the cabinet to retain spilled liquid within the cabinet.
- C. Cabinets are not ventilated. All OSHA cabinets shall be labeled in painted (color to be selected) 1-1/2" high Helvetica Medium lettering: FLAMMABLE--KEEP FIRE AWAY.

2.30 EXHAUST SNORKEL

- A. Alsident System 75AL Extraction Arm for ceiling mounting, including 280 mm PETG dome hood with white fittings, ceiling column, and all necessary mounting hardware, fasteners and accessories for a complete installation.

2.31 WATER POLISHERS

- A. Millipore Milli-Q Reference System with Q-POD (Quality-Point-of-Delivery) units. System produces Type 1 ultrapure water with a resistivity of 18.2 megohms-cm @ 25° C., and a flow rate of 2l/minute, utilizing a three step purification process (pretreatment, polishing and final filtration) suitable for all general laboratory applications.
- B. Millipore Milli-Q Direct with Q-POD and 30L pure water storage tank (at Shared Prep Room G318 only). Both polisher and water storage tank are wall-mounted (not placed on shelves due to their large sizes). Provide wall mounting bracket (by Millipore) for water polisher and mounting hardware for storage tank. Coordinate wall support locations for these items with general contractor.

2.32 METAL LABORATORY CASEWORK FOR ANIMAL RESEARCH LAB

- A. Sheet steel used in the construction of metal laboratory casework shall be cold rolled, prime furniture steel, stretcher leveled, three pass cold rolled, patent beveled, resquared, and free of scales, buckles, or other defects; ASTM A 366, Class I (matte) finish. Gauges shall be U.S. standard, selected to develop structurally the required strength and rigidity for each component part, in the following minimums:
1. 20-gauge: Back panels, inner door panels, drawer outer pan, inner pan and body, and shelves. Add reinforcement or use 18-gauge material for shelves over 36" long.

2. 18-gauge: Sides, ends fixed backs, bottoms, tops, soffits, and outer door pans. Provide 18-gauge for other items where gauge is not specifically noted.
3. 16-gauge: Intermediate horizontal rails, table frame aprons and cross rails, center posts, top gussets.
4. 14-gauge: Sink supports, door and case hinge reinforcements.
5. 11-gauge: Leveling and corner gussets.

Note: Sink base cabinets shall be galvanized prior to painting.

- B. Fabrication: Complete all assembly and finish work at point of manufacture. Perform unit assembly on precision jigs to provide units that are square, fully reinforced with angles, gussets, and channels, integrally framed and welded to form a dirt and vermin retardant enclosure. Maintain uniform clearance around door and drawer fronts, not exceeding 3/32-inch. Casework shall be fabricated as sectional units, ready for placement in the laboratory as a complete integral rigid unit permitting relocation at any subsequent time. Component parts of the unit shall be manufactured ensuring uniformity, interchangeability and accurate alignment.
- C. Flush Doors: 3/4" thick, double wall, outer pan and inner pan formed and telescoped into box formation, with channel reinforcements full height and center of each pan. Pre-paint door interiors and fill doors solid with fire-resistant, sound-deadening material.
- D. Glazed Doors: Hollow metal stiles and rails of similar construction as flush doors, with glass held in resilient channels or gasket material. Outer heads shall be of one-piece construction. Inner framing members shall be removable for glass replacement.
- E. Hinged Doors: Mortise at flanges for hinges and reinforce with minimum 14-gauge angle, welded inside inner pan at hinge edge. Provide nylon roller catches, rubber bumpers, runners and positive stops to prevent metal-to-metal contact or accidental removal.
- F. Adjustable Shelves: Sides and ends formed down, and returned to front and back. Reinforce with welded hat channels for full width of shelves.
- G. Knee Space Units: Fabricate units plain or with drawers as indicated. Provide rails above and below the drawers, and stiles between the drawers. Fabricate the panels of these units of 18-gauge material, with channel shaped flanges on the top and bottom at the front, back and sides. Provide enclosure panels at the rear of the knee spaces below these units for enclosing pipe spaces; design to be removable to provide access to pipe spaces, but with fixed head and base components.
 1. Provide full 24-inch deep recess at all openings.
 2. Provide panel support where indicated on drawings, with adjustable leveling device.

3. Provide units with front apron, in indicated depth, incorporating a pencil drawer or keyboard drawer, as shown.
 4. Provide self-supporting countertop at equipment spaces (no apron).
- H. Filler Strips: Provide where required for closing space between cabinets, walls and ceilings, or same material and finish as cabinets; hem exposed edges. Field-fabricated fillers are not acceptable. Fillers between casework elements are not acceptable.
- I. Utility Space: Provide space, cut-outs, and holes for pipes, conduits and fittings in cabinet bodies to accommodate services and their support assemblies.
- J. Toe Spaces: Approximately 4" high by 3" deep, closed metal with no open pockets.

2.33 CYLINDER RACKS

- A. Furnish and install wall mounted cylinder racks, constructed as indicated on the Drawings. The specific series and gauge required for each component shall be as indicated on the Drawings along with associated accessories. Channels and parts shall be furnished to laboratory furniture manufacturer in a plain state in order to allow them to weld and paint the finished assemblies with their standard acid resistant epoxy powder coat finish. Color to be selected by Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Comply with Section 016000 requirements.

3.02 PREPARATION

- A. Protecting Building Surfaces: Install work without damaging building surfaces and with all evidence of drilling, cutting, and anchorage concealed by installed work.

3.03 INSTALLATION

- A. Comply with AWI requirements for Installation of Architectural Woodwork (Interior), as amended by the following.
- B. Install work plumb, level and true to line and plane as measured from established lines and levels. Provide blocking, grounds, shims, supports, and rough hardware necessary for installation. Anchor work securely in place.
- C. Cutting, Fitting, and Placement: Do all cutting, drilling, and fitting required for installation of the work.
- D. Scribing Trim:

1. Cut and fit scribing trim closely and accurately to building surfaces. Use one-piece-for-length scribing trim wherever possible.
 2. Make joints tight; back end joints with splicers/splines.
 3. Secure scribes with concealed fasteners.
- E. Anchors and Fasteners:
1. Face Nailing: Confine face nailing to inconspicuous locations. Set nails. Fill holes in exposed and semi-exposed surfaces to conceal nail locations.
 2. Anchorage to Drywall Construction: Anchor work to framing/anchor plates with toggle bolts or tapping sheet metal screws; space screws to limit loads to 50 pounds withdrawal or 80 pounds shear per anchor. Where fastening to unreinforced gypsum board is necessary, limit loads to 20 pounds withdrawal or 40 pounds shear per anchor.
 3. Anchorage to Concrete: Anchor work with bolts and expansion shields.

3.04 ADJUSTING, CLEANING, AND PROTECTION

- A. Correct nonconforming, poorly fitting, and damaged work. Remove and replace work that cannot be satisfactorily corrected at the Project.
- B. Cover casework for protection during remainder of construction period. Remove covering at completion of construction, inspect, and make any required final repairs.

END OF SECTION