

M-line Wood Casework Specifications

PART 1 - GENERAL

Summary: The following specification is written to provide the level of design expectation of the owner and architect in regards to the quality/functionality of the product and installation for the wood casework.

1.1 SECTION INCLUDES

- A. Furniture: Provide and install all wood casework, furniture and benches; which may include, but is not limited to: wood casework, countertops, reagent shelves, tables, standards, filler panels, scribes, knee space panels, accessories, utility space framing, utility space closure panels between base cabinets and at exposed ends of utility spaces, laboratory sink cutouts and sinks, cup sinks, cup drains, strainers, overflows, sink outlets, miscellaneous wall shelving, overhead service carrier or tiles and miscellaneous items of equipment as listed in the specifications or as shown on drawings. Work includes all laboratory furniture depicted on drawings or listed in these specifications unless otherwise noted as "Not in Contract" (NIC) within the drawings, equipment schedule or said specifications.
- B. Plumbing Fixtures: Furnish, deliver and install the fixtures at service outlets that are either listed in these specifications, depicted in drawings or identified in the equipment schedule as being affixed to laboratory casework. Installation is to be "hand tight" only, final connection is by others.
- C. Electrical Service Fixtures: Furnish, deliver and install the electrical service fixtures that are either listed in these specifications, depicted in drawings or identified in the equipment schedule as being affixed to laboratory casework. Installation is to be "hand tight" only, final connection is by others.
- D. Sink Bowls and Cup-sinks Integral with Countertops: Furnish, deliver and install all sinks bowls, cup-sinks and tail pieces (if shown or specified) at locations that are listed in these specifications, depicted in drawings, or identified in the equipment schedule. Sinks and cup-sinks are to be installed within the countertop with final connection to the drain piping system by others

1.2 RELATED SECTIONS

- A. Division __ LEED Requirements
- B. Division 06 Section: "Rough Carpentry" for blocking within walls to adequately support casework
- C. Division 06 Section: "Finish Carpentry"/Millwork.
- D. Division 11 Section 53 00, "Laboratory Equipment"
- E. Division 12 Section 36 00, "Countertops"
- F. Division 22 Section 40 00, "Plumbing Fixtures"
- G. Related Work to be Performed by Others:
 - a. Final connection to service lines of all plumbing and electrical fixtures attached to laboratory casework or furniture

1.3 REFERENCES

- A. ANSI/Hardwood Plywood Veneer Association Manual
- B. ANSI-A135: for all hardboard.
- C. ANSI-A161.2-1998: performance for fabricated high-pressure decorative laminate countertops.



- D. ANSI-A208.1-2009: for Mat-Formed Wood Particleboard Grade M-3
- E. ANSI-A112.18.1m-1989: for fixtures and water service.
- F. ANSI Z359.1-1998: for safety eyewashes and equipment.
- G. ASSE Standard 1001: for vacuum breakers
- H. ASTM B88 and ANSI/NSF 61: for plumbing.
- I. AWI Standards 8th Edition – 2003 Sections 400A-T-12, 400B-T10 and 1600-T-11: for woodwork standards.
- J. BHMA A156.9: for Grade-1 hinge requirements.
- K. CAN/CSA b.125.M89 Canadian Standards: for fixtures and water service.
- L. National Electrical Code, Article 352-B: for surface nonmetallic raceway.
- M. NEMA 3 LD – 2005: for performance requirements of high pressure laminates.
- N. SEFA 8 Recommended practices for cabinet construction.
- O. UL-5A: for raceway listed for electrical wiring.
- P. UL 94 V-0: for raceway systems

1.4 DEFINITIONS

- A. “Barrel Hinge” is a hinge composed of two plates attached that are attached to abutting surface.
- B. “Concealed hinge” is any hinge that has no components visible from the outside of the cabinet.
- C. “Concealed Portions of Casework” surfaces that are not visible after installation; Bottoms of cabinets are less than 30 inches above finished floor; Tops of cabinets are 72 inches or more above finished floor (and are not visible from an upper level); Stretchers, blocking and/or components that are concealed by drawers; Corners created by tall, wall, or base cabinets and which are non-accessible. NOTE: For the purpose of maintaining modular casework all cabinet ends will be considered exposed.
- D. “Eased” is a process of providing a slight radius on door and drawer fronts of a cabinet.
- E. “Exposed surfaces” are surfaces that are visible when: Drawer fronts and doors are closed; Cabinets and shelving are open or behind clear glass doors; Bottoms of cabinets are seen 48 inches or more above the finished floor; Tops of cabinets are seen below 72 inches above finished floor, or are visible from an upper floor or raised area after installation (Please see Modular Casework note under C. above)
- F. “False Fronts” are nonfunctional fronts attached to particular units that mimic drawer box fronts to create an uninterrupted visual image of an elevation.
- G. “FSC” is the term used for Forest Stewardship Council, required to achieve the LEED credit for certified wood.
- H. “Reveal Overlay” is casework design that requires the reveal of 1/8” between all individual door and drawer components within a cabinet. There is a 3/8” reveal at the edge of door and drawer components to the edge of the cabinet to maintain a 3/4” reveal on adjacent cabinets.
STANDARD
- I. “Full Flush Overlay” is casework design that requires the AWI reveal of 1/8” between all individual door and drawer components within a cabinet. There is a 1/16” reveal at the edge of door and drawer components to the edge of the cabinet to maintain a 1/8 reveal on adjacent cabinets. OPTIONAL
- J. “Laboratory Casework Contractor/Manufacturer” is defined as the manufacturer and/or manufacturer’s representative that is to provide and install the laboratory casework, equipment, and accessories listed under the specifications, laboratory equipment schedule and/or illustrated on drawings.
- K. “NAUF” is the term used for “no added urea formaldehyde”. This is required when no part of the wood product or any product on the entire can contain added urea formaldehyde in the production of the products. This is critical to LEED point criteria and if specified must be followed explicitly or complete building failure will occur.



- L. "Reveal" is the measurement between individual door and drawer components on the face of a cabinet.
- M. "Semi-exposed" surfaces that are visible when: Opaque doors are open or drawers are extended; Bottoms of cabinets more than 30 inches and less than 42 inches above finished floor.
- N. "Service Fixtures" are laboratory gas, air, and vacuum cocks; hot, cold and reagent water faucets; remote control valves, electrical receptacles (with necessary flush mounting hardware), fluorescent and/or incandescent light fixtures, light switches and/or motor switches for fume hoods and other items which serve as an operational part of the equipment.
- O. "Service Lines" are the necessary piping and drain lines for laboratory gas, air and vacuum as well as hot, cold and reagent grade water that conveys the respective services from building roughing through floors or walls through equipment to the previously defined service fixtures. Also includes conduits, junction boxes, conduit fittings, wire disconnect switches and fuse or circuit breakers necessary to conduct electrical services from building roughing in floors or walls through equipment to service fixtures.

1.5 SYSTEM DESCRIPTION

- A. Cabinet and Casework Area Design: LEED REQUIREMENTS- Cabinet and all components included in this section are subject to specific LEED and or owner/architect/consultant requirements for environmental and or health goals. The owner requires that all manufacturers follow the criteria required for LEED without deviation or clarification. Please refer to Division ___ for LEED requirements that may include any or all of the following:
 - a. Credit MR 4.1 Recycled Content
 - b. Credit MR 7. FSC Certification of all wood products.
 - c. Credit IEQ 4.4. Urea Formaldehyde shall not be added to any product or raw material.
 - d. Credit IEQ 4.1. The use of sealants and adhesives within the finished product.
- B. Reveal overlay with 1/8" reveal between intra-cabinet doors and drawers and 3/8" reveal at cabinet edge for offset of the hinge around the door. All door and drawer fronts will be adjusted to maintain these tolerances. STANDARD
- C. "Full Flush Overlay" is casework design that requires the AWI reveal of 1/8" between all individual door and drawer components within a cabinet. There is a 1/16" reveal at the edge of door and drawer components to the edge of the cabinet to maintain a 1/8 reveal on adjacent cabinets. OPTIONAL
- D. Doors and drawer fronts are to be slightly eased at all edges.
- E. No exposed fasteners are allowed without prior approval of the architect or lab planner.
- F. Cabinet elevations will be built in symmetrical sizes as required to fill the area.
- G. Maximum filler size is 4" and must be balanced and on each end of wall to wall elevations.
- H. Rolled 3mm hardwood Edge banding is required.

1.6 SUBMITTALS

- A. Shop Drawings:
 - a. Comply with Division 1
 - b. Submit 3 sets of laser quality, 11x17 shop drawings consisting of:
 - i. Finish, hardware, construction options selection sheet



- ii. Small scale floor plan showing casework in relation to the building.
 - iii. Large scale elevations and plan views.
 - iv. Cross-sections; service runs; locations of blocking within walls (blocking is done by others); rough-in requirements and, sink centerlines.
 - c. Drawings should include data and details for construction of the laboratory casework as well as information regarding the name, quantity, type and construction of materials (such as hardware, gauges, etc.), that will be used to complete the project.
 - d. The manufacturer or purchaser of any equipment prior to approval by the owner's representative will be undertaken at the manufacturer's risk.
 - e. Field Measurements: In instances in which casework is indicated to fit to other construction, dimensions are to be verified by field measurements before fabrication and reflected on shop drawings.
- B. Samples:
 - a. Sample cabinets upon request: 1 base and/or 1 wall cabinet as selected by owner/architect
 - b. Stain and Finish Samples
 - i. A minimum of five (5) standard manufacturer's samples, constructed of the same material from which the casework will be constructed, stained and clearly identified, should be submitted to the architect for color selection.
 - ii. Stain and finish samples will be retained by the owner's representative.

1.7 QUALITY ASSURANCE

- A. Design Data/Test Reports: Manufacturer shall submit test data and design criteria which are in compliance with the project specifications. Testing of safety devices and performance criteria shall be performed by a 3rd party validator.
- B. Certificates: All certifications required in the specifications should be submitted with the original submittal package under separate cover. Certificates must be provided with the signature of a qualified individual of the supplier.
- C. Qualification of Bidder/Manufacturer: The following list of information should be provided to the Architect at least ten (10) days prior to the bid opening:
 - a. List of manufacturing facilities
 - b. A list of five (5) installations of comparable stature completed within the past 3 years
- D. Regulatory Requirements
 - a. Reference Standard: The ensuing specifications are based on the design of CiF Lab Solutions M-Line Series wood casework.
 - b. Source Limitations: All casework, including countertops, sinks, service fittings and accessories, should be obtained from a single source to ensure consistency in project delivery.
- E. Mock-Ups
 - a. Area mockups shall be as indicated on the shop drawings. Mockup areas must be priced for disassembly and reassembly and used within the project.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Packaging, Shipping, Handling and Unloading Packaging: Products should have packaging adequate enough to protect finished surfaces from soiling or damage during shipping, delivery and installation.



- B. Delivery: Casework delivery should only take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.
- C. Handling: Care, such as the use of proper moving equipment, experienced movers, etc., should be used at all times to avoid damaging the casework. Until installation takes place, any wrapping, insulation or other method of protection applied to products from the factory should be left in place to avoid accidental damage.
- D. Acceptance at Site: Casework will not be delivered or installed until the conditions specified under Part 3, Installation section of this document have been met.
- E. Storage: Casework should be stored in the area of installation. If, prior to installation, it is necessary for casework to be temporarily stored in an area other than the installation area, the environmental conditions shall meet the environmental requirements specified under the Project Site Conditions article of this section.
- F. Waste Management and Disposal: The supplier of the laboratory casework is responsible for removing any waste or refuse resulting from the installation of, or work pertaining to laboratory casework; thereby leaving the project site clean and free of debris. Trash container/s to be provided by others.

1.9 PROJECT SITE CONDITIONS

- A. Building must be enclosed (windows and doors sealed and weather-tight);
- B. An operational HVAC system that maintains temperature and humidity at occupancy levels must
- C. be in place; Relative humidity must be regulated and stable between 25% and 55% per AWI standards before products are brought on site, throughout project completion and with the site moving forward while the building is in use by the owner.
- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as “wet work.”
- F. Required backing and reinforcements must be installed accurately and the project must be read for casework installation.

1.10 WARRANTY

- A. Furnish a written warranty that Work performed under this Section shall remain free from defects as to materials and workmanship for a period of three (3) years from date of acceptance. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner. Defects include, but are not limited to:
 - a. Ruptured, cracked, or peeling veneer
 - b. Discoloration or lack of finish integrity
 - c. De-lamination of components or edge banding
 - d. Slippage, shift, or failure of attachment to wall, floor, or ceiling
 - e. Warping or unloaded deflection of components
 - f. Failure of hardware



- B. The warranty specifically does not cover any product or hardware, which has been incorrectly installed, including poor climate conditions, exposed to excessive loads or abuse.
- C. All non-casework items supplied, but not manufactured at CiF Lab Solutions shall be covered under the original manufacturer's warranty.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: CiF Lab Solutions 53 Courtland Avenue, Vaughan, ON, Canada L4K3T2
- B. Substitution Limitations:
 - a. Substitutions will be considered only when other manufacturers submit substitution requests in accordance with procurement substitution and/or substitution procedures, or provide a comparable product with the following support information detailed below:
 - b. Written documentation stating specification compliance regarding construction, materials, and standard of quality and manufacturing techniques.
 - c. Note all deviations to the drawings and/or specifications in writing.
 - d. Provide the Architect with a full-scale base cabinet not less than ten days prior to bid date. The sample shall represent typical construction and materials for the product the casework manufacturer proposes, meeting the quality standards set forth by this specification. The sample may be impounded by the owner and retained until completion of the casework installation.
 - e. The owner, or its designated representative, reserves the right to reject any proposal that in his opinion fails to meet the criteria established by this specification. Such a decision shall be final.
- C. Approved Equals
 - a. _____
 - b. _____

2.2 MATERIALS

- 1. Wood Casework:
 - A. Solid Lumber Used:
 - a. All hardwoods shall be carefully and thoroughly air-dried, and then kiln dried to a moisture content of 6-9 percent before use.
 - B. Exposed Veneer
 - a. The veneer shall be specifically hand selected by area (within reasonable visual range) prior to fabrication of the cabinet faces and exposed components for uniformity of color and grain. The resulting selection shall provide a pleasing uniform color with natural characteristics selected to not interfere with the overall aesthetic appearance of the casework.
 - b. Veneer used for door and drawer fronts shall be constructed of Grade A, Red Oak (Plain Sliced) / White Maple (Rotary Cut) book matched of at least 1/45 inch thick veneer modified for appearance as indicated below. Manufacturer shall strictly follow the verbiage in ANSI Standard HP-1-2004 paragraph 3.3.3. OPTIONAL



- c. All Doors and Drawer fronts will have a matching vertical grain orientation by cabinet. OPTIONAL
 - d. All Doors will have a vertical grain orientation and drawer fronts will have a horizontal grain orientation. OPTIONAL
- C. Other materials for construction for Casework Body, Interior shelving and Doors/Drawer Heads:
- a. Cabinet ends, bottoms, shelves and backs shall be fabricated of premium ¾" MDF board. Components of particleboard, lumber or other materials will not be acceptable.
 - b. Doors and drawer fronts shall be fabricated of premium ¾" MDF board. STANDARD
 - c. Doors and drawer fronts shall be ¾" Grade AA (with modifications to grade), Red Oak (Plain Sliced or Rift Cut or Quartered) / White Maple (Plain Sliced or Quartered) / White Oak (Plain Sliced or Rift Cut or Quartered) / Grade A Birch (Plain Sliced or Quartered) / European Steamed Beach (Plain Sliced or Quartered) book matched of at least 1/45 inch thick veneer modified for appearance as indicated below. Note that the Maple and the Birch options would be slip matched vs. book matched. Manufacturer shall follow the verbiage in ANSI Standard HP-1-2004 paragraph 3.3.3. - OPTIONAL
 - d. Backs of all open or glazed wall and tall cabinets shall be ½" MDF board. Backs of all semi-exposed wall and tall cabinets will be ½" thermally fused melamine.
 - e. Cabinet liners, vinyl covered boards, foils or other similar materials are not acceptable on any components.
 - f. Glass shall be tempered, 6mm thick for unframed doors and 5mm thick for framed doors.
 - g. Glass shall be laminated safety, 6mm thick for unframed doors and 5mm thick for framed doors. - OPTIONAL
- D. Hardware
- a. Pulls shall be nominal 4" wire type. Finish shall be brushed chrome (STANDARD) (stainless steel is OPTIONAL). Drawers over 24" wide to receive two pulls. Mount drawer pulls horizontally. Mount door pulls vertically (horizontally...OPTIONAL).
 - b. Hinges shall be institutional type 2 3/4", 5-knuckle steel hinge, wrap around design (STANDARD). Finish to be brushed chrome [stainless steel is OPTIONAL]. Two hinges on doors up to 36" in height, three hinges on doors over 36" in height, four hinges on doors over 60" in height
 - c. Hinges shall be an institutional grade, three knuckle steel hinge, with a 270° opening, zinc finished and complete with cover cap. OPTIONAL...NOTE: must specify for Full flush Overlay or Reveal overlay cabinet style.
 - d. Hinges shall be full overlay, concealed, 170° opening incorporating a self-closing feature. Mounting plate shall provide three-way adjustment in door alignment. OPTIONAL
 - e. Door catches: Adjustable type, spring activated nylon roller catches.



- f. Note: Door catches not required with the 3 Knuckle self-closing hinges or concealed self-closing hinges
- g. Elbow catches shall be spring actuated and come complete with strike plate. Provided where locks occur in hinged double door units.
- h. Drawer slides shall be full extension, ball bearing type equal to Accuride model #3832, full extension series. File drawer slides shall be equal to the Accuride model #4034, 150lb, full extension – STANDARD.
- i. Drawer slides shall be 100 lb rated, epoxy coated, self-closing slides with captive roller and positive in-stop. File drawer slides shall be full extension. OPTIONAL
- j. Locks: 5 disc tumbler cam locks with offset cam and removable core. Exposed face chrome plated. Keying: [Select - keyed alike or in groups per room with master key or keyed differently with security panels.] STANDARD
- k. Locks: 5 pin tumbler cam locks with offset cam and non-removable core. Exposed face chrome plated. Keying: (Select – keyed alike or in groups per room with master key or keyed differently with security panels.) OPTIONAL
- l. Framed Glass Hinged Doors: Locks shall be as specified in x. and xi. above. Tempered Glass STANDARD and Laminated Safety Glass OPTIONAL.
- m. Sliding Framed Glass Doors: Locks shall be plunger type sliding showcase locks. Tempered Glass STANDARD and Laminated Safety Glass OPTIONAL.
- n. Sliding Unframed Glass Doors: Locks shall be ratchet type sliding showcase locks. Tempered Glass STANDARD and Laminated Safety Glass OPTIONAL.
- o. Tracks for solid sliding doors to be K&V #1093AL for upper track and K&V #469 lower track with #429 STL steel sheaves.
- p. Adjustable seismic shelf supports shall be double pin, plastic locking type, able to accommodate both $\frac{3}{4}$ " and 1" thick shelves. STANADARD
- q. Adjustable steel shelf supports shall be bright zinc plated angle type, $\frac{1}{2}$ " wide. Pin shall be $\frac{1}{4}$ " x $\frac{3}{8}$ " long pin. OPTIONAL
- r. Levelers shall be Hafele #637.30.941 with protective cap #637.02.090. (NOTE: This option requires holes in the bottom of the cabinet for access to adjust height and include a black rubber plug insert) - OPTIONAL
- s. Label holders shall be formed steel 3 $\frac{1}{2}$ " x 1 $\frac{3}{4}$ ", overall size with satin chrome finish. - OPTIONAL
- t. Number plates: Aluminum with anodized finish, black numerals. Number plates will be shipped loose for on-site installation. - OPTIONAL



E. Countertops

- a. Epoxy Resin Countertops: Countertops are to be flat, black, 1" thick with beveled, rounded top, front edge and all corners, with 1" thick, 4" high applied backsplash/curbs (unless otherwise noted), constructed of the same material and located at the rear of tops and on end returns. Ends of countertop to be square. Backsplash/curbs shall be bonded to top surface to form a square joint. Joints are to be sealed water-tight with corrosion resistant caulk. Front overhangs should be equal to 1" at cabinet fronts and side overhangs at exposed units shall be $\frac{3}{4}$ ", with a drip groove on the underside $\frac{1}{2}$ " from the edge. Tops should be manufactured of one piece and cut to the maximum lengths possible. Fabricate with factory cutouts for sinks and with butt joints assembled with silicone.
- b. Phenolic Resin Countertops: Countertops are to be 1" inch thick with $\frac{3}{4}$ " thick, 4" high curbs (unless otherwise noted), constructed of the same material and located at the rear of tops and on end returns. Overhangs should be equal to 1" at cabinet fronts and exposed ends with a drip groove on the underside $\frac{1}{2}$ " from the edge. Tops should be manufactured of one piece and cut to the maximum lengths possible. Installation should take place without any field cutting or drilling. Holes and cutouts should be provided as necessary for equipment, service fittings and fixtures. Size of openings should be verified prior to making openings.
- c. Plastic Laminate Countertops and Curbs: Particleboard core material for plastic laminate surfaced countertops is to be 1 inch thick industrial grade, 45 pound density particleboard for dry areas and 1" thick hardwood plywood for wet areas. Fabrication shall be with horizontal grade laminate surface with a backer sheet. Edges shall be edged with 3mm PVC edge banding.

F. Sinks

- a. Molded Epoxy Resin Drop-In Sinks: Sinks shall be of epoxy resin modified and compounded with selected materials and designed to provide the same performance requirements as specified for the epoxy resin countertops. Sinks shall be non-glaring black color.
- b. Stainless Steel Sinks: As an option to epoxy resin sinks, provide stainless steel sinks constructed of 16 gauge type 304 stainless steel of equivalent or comparable sizes. Exposed surfaces shall have #4 finish. To be used with plastic laminate tops.
- c. Sink Sizes: Sizes and model numbers shall be as designated on the drawings.

2.3 FABRICATION

A. Base Units

- a. Cabinet ends shall be $\frac{3}{4}$ " MDF board.
- b. Cabinet ends shall be $\frac{3}{4}$ " MDF board, with a waterproof plywood base tongue and grooved to the bottom edge for protection against dampness. - OPTIONAL
- c. Front top rail: $\frac{3}{4}$ " x 3 $\frac{3}{4}$ " MDF board, fastened to cabinet ends with fluted dowels.
- d. Rear top and bottom support rails: $\frac{3}{4}$ " x 3 $\frac{3}{4}$ " MDF board, fastened to cabinet with fluted dowels.
- e. Intermediate rails (when specified) shall match front rail materials and construction. - OPTIONAL



- f. Toe space rail: $\frac{3}{4}$ " x 4" MDF board fastened to cabinet ends with fluted dowels to form a 4" high x 2" deep toe space.
 - g. Cabinet bottoms: $\frac{3}{4}$ " MDF board set flush and fastened to cabinet ends with fluted dowels.
 - h. Cabinet backs: Cabinet backs in exposed cabinets shall be fabricated of $\frac{1}{2}$ " MDF board. Cabinet backs in semi-exposed cabinets shall be fabricated of one-piece $\frac{1}{4}$ " white tempered hardboard. Backs are not provided on drawer units.
 - i. Vertical dividers: Full height dividers and half height dividers shall be 1 $\frac{1}{2}$ " MDF board secured to bottom, front top rail and rear top rail with dowels and screws.
 - j. Adjustable shelves shall be set on steel pin type shelf supports at 1 $\frac{1}{4}$ " spacing. Shelves shall be $\frac{3}{4}$ " depth in standard cupboards and full depth in open units. Adjustable shelves on base cabinets 36" and smaller shall be $\frac{3}{4}$ " thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick.
 - k. Adjustable shelves shall be set on double pin, plastic locking shelf supports at 1 $\frac{1}{4}$ " spacing. Shelves shall be full depth in standard cupboards and in open units. Adjustable shelves on base cabinets 36" and smaller shall be $\frac{3}{4}$ " thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick. – OPTIONAL
 - l. Drawer Construction: Drawer box back, front and sides to be of $\frac{1}{2}$ " Baltic Birch, 9 ply hardwood plywood and shall be finished with the same laboratory grade finish as applied to the cabinet. Use dovetail joinery on all four joints. Drawer bottom shall be $\frac{1}{4}$ " white thermo-fused melamine faced MDF and shall be grooved into all four sides of the drawer box and glued into position. Drawer body will be affixed to drawer front by screws. - STANDARD
 - m. Drawer Construction: Drawer box back, front and sides to be of $\frac{1}{2}$ " Baltic Birch, 9 ply hardwood plywood and shall be finished with the same laboratory grade finish as applied to the cabinet. Use dovetail joinery on all four joints. Drawer bottom shall be $\frac{1}{2}$ " Baltic Birch, 9 ply hardwood plywood and shall be grooved into all four sides of the drawer box and glued into position. Drawer bottoms shall be finished using the same laboratory grade finish as applied to the cabinet. Drawer body will be affixed to drawer front by screws. - OPTIONAL
 - n. Doors and drawer fronts shall be $\frac{3}{4}$ " MDF board. Construction shall be full overlay.
 - o. Doors and drawer fronts shall be $\frac{3}{4}$ " 3 ply particle core plywood and edge banded. Construction shall be Full Flush overlay. Grain direction on doors and drawer fronts shall be vertically matched. – OPTIONAL, MDF or Combination core substrates are OPTIONAL
- B. Wall and Tall Cases
- a. Case ends: $\frac{3}{4}$ " MDF board.
 - b. Case ends: $\frac{3}{4}$ " MDF board. Floor case ends shall have a $\frac{3}{4}$ " x 3" waterproof plywood base tongue and grooved to the bottom edge for protection against dampness. - OPTIONAL
 - c. Tops of wall and tall cases: 1" MDF board fastened to ends with fluted dowels
 - d. Bottoms of wall cases: 1" MDF board fastened to cabinet ends with fluted dowels.
 - e. Bottoms of tall cases: $\frac{3}{4}$ " MDF board fastened to cabinet with fluted dowels.
 - f. Exposed backs on wall and tall cabinets shall be $\frac{1}{2}$ " MDF board; semi-exposed backs shall be $\frac{1}{2}$ " melamine. Backs shall be stapled and glued into rebates on back edge of ends.
 - g. Fixed center shelves on tall cases shall be 1" thick and shall be fastened to ends with
 - h. fluted dowels.
 - i. Adjustable shelves shall be set on steel pin type shelf supports at 1 $\frac{1}{4}$ " spacing. Shelves shall be $\frac{3}{4}$ " depth in standard cupboards and full depth in open units. Adjustable shelves



on base cabinets 36" and smaller shall be $\frac{3}{4}$ " thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick.

- j. Adjustable shelves shall be set on double pin, plastic locking shelf supports at $1\frac{1}{4}$ " spacing. Shelves shall be full depth in standard cupboards and in open units. Adjustable shelves on base cabinets 36" and smaller shall be $\frac{3}{4}$ " thick. Adjustable shelves on cabinets over 36" wide shall be 1" thick. – OPTIONAL

C. Doors

Solid Doors

- a. Solid doors shall be $\frac{3}{4}$ " MDF board. Construction shall be Reveal overlay (STANDARD) or Full flush overlay (OPTIONAL).
- b. Solid doors shall be $\frac{3}{4}$ " plain sliced, red oak particle (plain sliced white maple) particle core plywood, with matching $\frac{1}{8}$ " hardwood banding. Doors shall be finished with a laboratory grade catalyzed vinyl finish. - OPTIONAL in either Reveal overlay or Full flush overlay style.
- c. Provide two hinges on all doors up to 36" in height and a minimum of three hinges on doors exceeding this height.

Framed Glazed Doors

- a. Hinged doors shall be full overlay construction, $\frac{3}{4}$ " MDF board moulded and shaped to accept 5mm thick glass on wall and floor cases. Glass to be retained with an extruded vinyl moulding, designed so that glass can be replaced without tools.
- b. Hinged doors for full overlay construction shall be fabricated of $\frac{3}{4}$ " x $2\frac{1}{2}$ " solid hardwood, using stile and rail construction. Doors shall be finished with a laboratory grade catalyzed vinyl finish. - OPTIONAL
- c. Sliding doors shall be as hinged solid door except doors shall slide in a top channel and with a nylon wheel operating on an inset plastic track.
- d. Provide two hinges on all doors up to 36" in height and a minimum of three hinges on doors exceeding this height.
- e. Glass shall be held in place with a removable brown plastic panel retainer to facilitate change of damaged glass.

Unframed Sliding Glass Doors

- a. 6mm tempered glass with all edges ground. Top and bottom of the glass doors shall be set in extruded aluminum shoe with nylon wheel assemblies.
- b. Provide silencer guides fitting on top of glass panel for smooth and noiseless operation.
- c. Pulls shall be ground into sliding glass door.

D. Tables

- a. Standing height table aprons shall be not less than $\frac{3}{4}$ " x $4\frac{5}{8}$ " solid hardwood, machined to receive metal corner blocks and bolted to $2\frac{1}{4}$ " x $2\frac{1}{4}$ " solid hardwood legs. Drawers shall be constructed and finished as cabinet drawers.
- b. Sitting height table aprons shall be not less than $\frac{3}{4}$ " x $3\frac{3}{4}$ " solid hardwood, machined to receive metal corner blocks and bolted to $2\frac{1}{4}$ " x $2\frac{1}{4}$ " solid hardwood legs. Drawers shall be constructed and finished as cabinet drawers.
- c. ADA height table aprons shall be not less than $\frac{3}{4}$ " x $3\frac{3}{4}$ " solid hardwood, machined to receive metal corner blocks and bolted to $2\frac{1}{4}$ " x $2\frac{1}{4}$ " solid hardwood legs. Drawers shall be constructed and finished as cabinet drawers.
- d. All tables shall come equipped with leveling devices and black PVC shoes.
- e. Leg stretchers, when specified, shall be 1-1/4" x 1-3/4" hardwood

2.4 FINISHES

A. Casework Finish

- a. Casework shall be finished on all interior and exterior surfaces in a flat line; oven cured process, spraying a catalyzed vinyl coating especially formulated for laboratory casework and be acid/solvent resistant (System 7 Catalyzed Vinyl).
- b. Casework finish shall meet AWI Quality Standards Eighth Edition for Specialty Finishes – Premium Catalyzed Vinyl and SEFA 8-1999 CHEMICAL RESISTANCE SPECIFICATIONS. Manufacturers are to provide documentation to the architect of their finishes' compliance to the above.
- c. Apply a coat of sealer and two finish coats to surfaces. Thoroughly sand surfaces between coats. Maximum film build is 6 wet mils and (2.9-3.3) mils dry.
- d. Solids content to be minimum 35% by weight.
- e. Prior to finishing sand surfaces smooth, ensuring that they are free of dirt, defects, chatter and machine marks.
- f. Apply sealer and finish coats to all exposed and semi-exposed casework surfaces.
- g. Finish coat shall leave a smooth, clear, satin finish with consistent coloration.
- h. Finishes must pass the following tests or they will be rejected.
 1. 20 cycle Cold Check Test.
 2. Print Test ASTM D2091
 3. Moisture Resistance Test
 4. Impact Resistance Test
 5. Hot Water Test
 6. Chemical Resistance Test – ASTM D1308

PART 3 – EXECUTION

3.1 INSTALLERS

- A. Installer Qualifications: For installation and maintenance of units, an authorized representative of the casework manufacturer required for this project.

3.2 EXAMINATION

- A. Site Verification of Conditions: Casework will not be delivered or installed until the following conditions have been met:
- B. Building must be enclosed (windows and doors sealed and weather-tight);
- C. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place; Relative humidity must be regulated and stable between 25% and 55% per AWI standards before products are brought on site, throughout project completion and with the site moving forward while the building is in use by the owner.
- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as “wet work.”
- F. Required backing and reinforcements must be installed accurately and the project must be read for casework installation.

NOTE: In the event that any of the specified requirements for installation are not present at the time of requested delivery, the general contractor or owner must provide the casework manufacturer with a letter of deviation that releases the manufacturer from any responsibility or liability from any damage to the products resulting from the unfavorable building conditions.

3.3 INSTALLATION

A. Casework Installation:

- a. Casework should be set with components plumb, straight and square, securely anchored to building structure with not distortion. Concealed shims should be used as required.
- b. Cabinets in continuous runs should be bolted together with joints flush, uniform and tight with and alignment of adjacent units not to exceed 1/16 of an inch.
- c. Wall casework should be secured to solid material, not lath, plastic or gypsum board.
- d. Top edge surfaces should be abutted in one true place. Joints are to be flush and should not exceed 1/8 of an inch between tops units.
- e. Casework and hardware shall be adjusted and aligned to allow for accurate connection of contact points and efficient operation of doors and drawers without any warping or binding.

B. Countertop Installation:

- a. Countertops are to have been fabricated in lengths according to drawings, with ends abutting tightly and sealed with corrosion resistant sealant.
- b. Tops will be anchored to base casework in a single true plane with ends abutting at hairline joints with no raised edges at joints.
- c. Joints shall be factory prepared having no need for in-field processing of top and edge surfaces.
- d. Joints should be dressed smoothly, surface scratches removed and entire surface cleaned thoroughly.

C. Cleaning

- a. Ensure all products are unsoiled and match factory finish. Remove or repair damaged or defective units.
- b. Clean all finished surfaces, including drawers and cabinet shelves, and touch up as necessary.
- c. Countertops should be cleaned and free of grease or streaks.

D. Protection:

- a. Counter tops and ledges should be protected with 1/4 inch ribbed cardboard or plastic covering of 6mm thickness.

END OF SECTION