

Planning, Design and Construction Guidelines UNIVERSITY OF MISSOURI

For University of Missouri Health Care Facilities 2024.10

Division 06 - Woods, Plastics & Composites

See UM Consultant Procedures and Design Guidelines. All design guidelines posted are applicable. Information below supplements and supersedes information provided in Division 06 of those documents.

1. Install ¾” fire-rated plywood on all four walls of Communications rooms and ensure fire rating label of plywood is not obscured. See [UM Consultant Procedures and Design Guidelines](#) for more information.
2. Standard particle board is not allowed in any areas exposed to moisture.
3. Wood blocking shall be 2x fire treated and may be used in the following high load locations:
 - Grab Bars.
 - Sliding Doors.
 - Other locations as approved by the Project Manager.

06 4100 Architectural Wood Laminate Casework

Cabinets:

Refer to Appendix D Interior Finishes Quick Reference Guides for Vertical and Horizontal Surface Materials required for various room types.

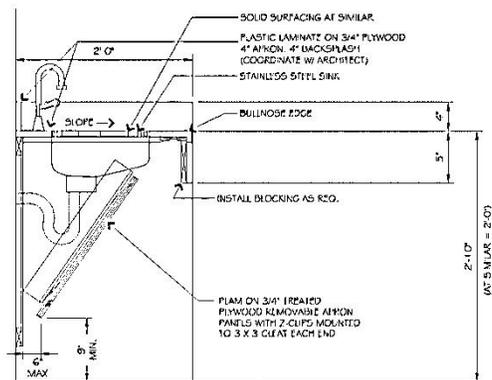
1. Quality Standard: AWI Custom.
2. Wood-look Laminate: Typical Grain Direction to be Vertical.
3. Reveal overlay construction.
4. Adjustable shelving shall be 24” deep for distribution management system in clean utility rooms or PAR storage.
5. Verify with Project Manager where sloped upper cabinet tops should be installed vs. full height PLAM soffits when needed.
 - Provide plastic laminate sloped top on upper cabinets or plastic laminate filler panel between top of upper cabinet and ceiling to minimize collection

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of dust and debris.

6. Infection Control standards do not allow base cabinets under sinks to be used for storage. To insure against this, and to meet ADA requirements, cabinet construction under sinks shall be removable plywood apron panels mounted with Z-clips or screws. In public restrooms, design is to accommodate shallow-bowl sinks and ADA guidelines. In exam rooms and nurses' stations, the design is to accommodate 10" deep-bowl stainless sinks.



7. Cabinet doors are to have PVC edge banding (self-edging not acceptable).
8. Seal all any exposed unfished casework edges including the wood that sits on the floor.
9. Cabinet door hardware for all areas shall be 5-knuckle hinges.

Countertops:

10. All sink counters shall be solid surface material.
11. All work surfaces in Lab areas shall be epoxy resin or equal. Plastic lab grade laminate can be used in certain areas as approved by the Project Manager.

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12. Plastic Laminate Application: For countertops not supported by continuous base cabinets, fabricate using 2 layers of 3/4" plywood (not MDF) covered with HPDL.
13. Vinyl Countertop Edge: PVC tee-molding to match thickness of countertop, color as scheduled.
14. Solid Surface Application: Substrate: 1/2" Plywood covered with 1/2" thick solid surface (typical).
15. Solid Surface Material

- Preferred materials: See Finishes Legend (Appendix D).

Desk Height Built-In Work Surfaces:

1. No built-in base cabinets or pencil drawers.
2. Mobile file cabinets and pencil drawers will be supplied by Owner.
3. Place countertop 1.5" – 2" from back wall to accommodate wire management.
 - Alternate: Grommet placement and installation will be by Owner after construction is complete.
4. Clear space beneath workspace: 30" maximum height (to the top to accommodate standard Owner-furnished file cabinets and meet ADA Guidelines). Verify FFE heights with MUHC Planning, Design & Construction Staff.

Hardware:

1. Cabinet door hinges: 5-knuckle hinges. (Brushed metal finish)
2. Countertop supports to be surface-mounted Rakks #EH1824FM (18x24) or #EH1818FM (18x18) or approved equal.
3. Drawer and Door pulls: U-shaped wire pulls, 4" centers. (Brushed metal finish)
4. Drawer Slides:
 - Regular 100-pound load rated epoxy coated steel, bottom corner mounted

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with smooth and quiet nylon rollers.

- File: Full extension, 150-pound rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions self-closing feature.

Locks:

1. Cabinet Locks – CompX National Stock Locks – Master Keyed to E041A.
2. Ives Elbow Catches IV2-A92. Stamped steel catches are not allowed due to sharp edges.

Fixed Modular Laminate Clad Casework and Components

Definitions:

1. Identification of casework components and related products by surface visibility.
 - Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
 - Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
 - Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
 - Concealed Surfaces: Any surface not visible after installation.

Quality Assurance:

1. A Single Source Manufacturer: All casework, countertops and architectural millwork products must be engineered and built by a single source manufacturer to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers is not permitted.

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Product Handling:

1. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

Job Conditions:

1. Environmental Requirements: Do not install casework until the building is enclosed, wet work is complete, and the HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
 - Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 - After installation, control temperature and humidity to maintain relative as per manufacturers recommendations.
 - See Division 23 for requirements.
2. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete

Products:

1. MATERIALS
 - Core Materials:
 - Particleboard up to 7/8 inch thick: Industrial Grade average 45-pound density particleboard, ANSI A 208.1, M-2 requirements.
 - Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particleboard, ANSI A 208.1, M-2 requirements.
 - Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2- requirements.
 - Decorative Laminates: GREENGAURD Indoor Air Quality Certified
 - High-pressure decorative laminate VGS (.028), NEMA Test LD 3.

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- High-pressure decorative laminate HGS (.048), NEMA Test LD 3.
- High-pressure decorative laminate HGP (.039), NEMA Test LD 3.
- High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2005.
- High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3.
- Thermally fused melamine TFM laminate, NEMA Test LD 3. (TFM allowed on casework interiors only, as specified below. Utilization of TFM on any exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.)
- Edging Materials:
 - 1-mm PVC banding, machine applied.
 - 3-mm PVC banding, machine applied, and machine profiled to 1/8-inch radius.

2. SPECIALTY ITEMS

- Support Members:
 - Countertop support brackets: Epoxy powder coated, 11-gauge steel with integral cleat mount opening and wire management opening. Basis of Design: Rakks #EH1824FM or #EH1818FM
 - Undercounter support frames: Epoxy powder coated.
 - Legs: Epoxy powder coated.

3. CABINET HARDWARE

- Hinges: 5 Knuckle
 - Standard five-knuckle hinge with dull chrome finish. Conforms to ANSI/BHMA 156.9 Grade 1 products.

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- Concealed 120-degree swing, self-closing, clip-on style.
 - i. Doors up to 34 inches in height have 2 hinges per door.
 - ii. Doors 35 inches to 62 inches in height have 3 hinges per door.
 - iii. Doors 63 inches to 80 inches in height have 4 hinges per door.
 - iv. All doors have rubber bumpers.
- 270 degree opening angle.
- Designed for 32-mm boring system.
- Drilled knuckle IDs and machine knuckle edges.
- Non-removable knurled pin.
- Pulls:
 - Pull program offering must include minimum of 20 metal pull design and finish option combinations including:
 - i. Contemporary Pull (Finish option: Brushed Nickel)
 - ii. Heavy Bow Pull (Finish option: Brushed Nickel)
 - iii. Petite Bow Pull (Finish option: Brushed Nickel)
 - iv. Metal Wire Pull (Finish options: Epoxy Powder Coated Gray, Beige, White, Black, Slate, Chrome, and Satin Chrome US26D)
 - All pulls with 96-mm spacing on screws. Pull designs shall comply with the Americans with Disability Act (ADA).

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- Drawer Slides:
 - Regular, knee space and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.
 - File: Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.
- Adjustable Shelf Supports:
 - Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32-mm centers. Each shelf support has 2 integral support pins, 5-mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1-inch-thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.
 - Fixtures and Displays Recessed Heavy Duty 1/2" slotted standards for Slatwall and casework. #SSRBZ8
- Locks:
 - Removable core, disc tumbler, cam style lock with strike. Lock for sliding 3/4-inch-thick doors is a disc-type plunger lock, sliding door type with strike. Lock for sliding glass/acrylic doors is a ratchet type sliding showcase lock.
 - Elbow catch or chain bolt used to secure inactive door on all locked cabinets. Elbow Catch shall be brass or aluminum, machined or cast, and deburred. Stamped steel latches shall not be specified.
- Sliding Door Track: Anodized aluminum double channel.

4. FABRICATION:

- Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- All casework panel components must go through a supplemental sizing process after cutting, producing a panel precisely finished in size and square to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.
- Cabinet Body Construction:
 - Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24-inch-deep cabinets and a minimum of 4 dowels each joint for 12-inch-deep cabinets. (Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.)
 - Tops, bottoms and sides of all cabinets are particleboard core.
 - Cabinet backs: 1/4-inch-thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4-inch x 4-inch particleboard rails will be placed behind the back panel at the top and bottom and doweled to the sides utilizing 10-mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
 - i. Exposed back on fixed or movable cabinets: 3/4-inch-thick particleboard with the exterior surface finished in VGS laminate as selected.
 - Fixed base and tall units have an individual factory-applied base, constructed of 3/4-inch-thick plywood. Base is 102-mm (nominal 4 inch) high unless otherwise indicated on the drawings.
 - Base units, except sink base units: Full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)

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- Side panels and vertical dividers shall receive adjustable shelf hardware at 32-mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
- Exposed and semi exposed edges.
 - i. Edging: 1-mm PVC machine applied.
- Adjustable Shelves in Cabinets
 - i. Core: Particleboard.
 - ii. Core Thickness: 3/4 inch up to 36 inches wide, 1 inch over 36 inches wide.
 - iii. Edge: 1-mm PVC on Front Edge Only.
- Interior finish, units with open Interiors:
 - i. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with high-pressure decorative VGS laminate. Use of TFM on exposed open interiors will not be permitted.
- Interior finish, units with closed Interiors:
 - i. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
- Exposed ends:
 - i. Faced with high-pressure decorative VGS laminate. Use of TFM on exposed ends will not be permitted.
- Wall unit bottom:
 - i. Faced with high-pressure decorative VGS laminate. Use of TFM on wall unit bottoms will not be permitted.
- Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.

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- Drawers:
 - Sides, back and sub front: Minimum 1/2-inch-thick particleboard, laminated with TFM Thermally Fused Melamine, doweled and glued into sides. Top edge banded with 1-mm PVC.
 - Drawer bottom: Minimum 1/2-inch-thick particleboard laminated with TFM Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.
- Door/Drawer Fronts:
 - Core: 3/4-inch-thick particleboard.
 - High-pressure decorative VGS laminate exterior balanced with high-pressure cabinet liner CLS. Use of TFM on exterior or interior surfaces of door/drawer fronts will not be permitted.
 - Edges: 3-mm PVC, machine applied, external edges and outside corners machine profiled to 1/8-inch radius.
 - Provide double doors in openings over 24-inches wide.
- Decorative Laminate Counter Tops:
 - Core:
 - i. 1-1/8-inch-thick ANSI A208.1-1993 M-2 particleboard.
 - Surface: High-pressure decorative HGS/HGP laminate with balanced backer sheeting.
 - Exposed edges of applied backsplash: HGS high-pressure decorative laminate.
 - All countertop joints must be dry fit at the factory to check for consistency in color from one panel to the other and overall finished panel thickness, resulting in a high-quality product easy to install.

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Execution:

1. INSPECTION:

- The casework contractor must examine the job site and the conditions under which the work under this section is to be performed and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

2. PREPARATION:

- Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3. INSTALLATION:

- Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to fit accurately.
- Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
- Repair minor damage per plastic laminate manufacturer's recommendations.

4. CLEANING:

- Remove and dispose of all packing materials and related construction debris.
- Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

5. COLOR SELECTION:

- Laminate Color Selection:
 - To be selected/coordinated/ approved by MUHC.

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- Thermally fused melamine laminate available in White.
- Hardware Color Selection:
 - Pulls: Brushed Chrome Steel Finish
 - Miscellaneous Hardware (support brackets, table frames, etc.):
Select from your choice of epoxy powder coating stock colors
matched to White, Beige, Gray, Black, Slate and Chrome.
- PVC Edge Banding Color Selection:
 - 3-mm PVC: to match or coordinate with the laminate finish.

Countertops:

1. SECTION INCLUDES

- Countertops for architectural cabinetwork.
- Countertops for manufactured casework.
- Wall-hung counters and vanity tops.
- Sinks molded into countertops.

2. REFERENCE STANDARDS

- ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops.
- ANSI A208.1 - American National Standard for Particleboard.
- ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use.
- ANSI Z124.3 - American National Standard for Plastic Lavatories.
- ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

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- ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association.
- NEMA LD 3 - High-Pressure Decorative Laminates.
- PS 1 - Structural Plywood.

3. SUBMITTALS

- Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- Test Reports: Chemical resistance testing, showing compliance with specified requirements.

4. QUALITY ASSURANCE

- Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- Installer Qualifications: Fabricator.

5. DELIVERY, STORAGE, AND HANDLING

- Store products in manufacturer's unopened packaging until ready for installation.
- Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

6. FIELD CONDITIONS

- Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

7. PRODUCTS

• COUNTERTOP ASSEMBLIES

- Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.

- i. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048-inch (HGS, 1.2 mm) nominal thickness.

- Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum, when tested in accordance with ASTM E84.

- ii. Finish: Matte or suede, gloss rating of 5 to 20.

- iii. Manufacturers:

- Formica Corporation: www.formica.com.
- Lamin-Art, Inc: www.laminart.com.
- Panolam Industries International, Inc\Nevamar: www.nevamar.com.
- Panolam Industries International, Inc\Pionite: www.pionitelaminates.com.
- Wilsonart International, Inc: www.wilsonart.com.

- iv. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch (32 mm) thick; covered with matching laminate.

- v. Exposed Edge Treatment: Molded rubber edge with T-spline, sized to completely cover edge of panel.

- vi. Back and End Splashes: Same material, same construction.

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- Plastic Laminate work surfaces: Self-supporting high pressure laminate panel with decorative surface over structural members.
 - i. Panels: Phenolic resin impregnated Kraft paper core with melamine impregnated decorative surface papers; NEMA LD 3 Grade CGS.
 - Panel Thickness: 1 inch (25 mm).
 - Finish: Matte or suede, gloss rating of 5 to 20.
 - Manufacturers:
 - Arborite, division of ITW Canada:
www.arborite.com.
 - Formica Corporation:
www.formica.com.
 - Panolam Industries International, Inc\Pionite:
www.pionitelaminates.com.
 - Wilsonart International, Inc:
www.wilsonart.com.
 - Exposed Edge Treatment: Square natural cut sanded and polished to semi-gloss sheen.
 - Back and End Splashes: Same material, same construction; minimum 4 inches (102 mm) high.
- Chemical Resistant Plastic Laminate worksurfaces in laboratories and pharmaceutical areas shall be: Chemical resistant high pressure decorative laminate sheet bonded to substrate.
 - Laminate Sheet: NEMA LD 3 Grade HGL, 0.039-inch (HGL, 1.0 mm) nominal thickness.
 - i. Finish: Matte or suede, gloss rating of 5 to 20.

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- Manufacturers:
 - i. Formica Corporation: www.formica.com.
 - ii. Panolam Industries International, Inc\Nevamar: www.nevamar.com.
 - iii. Panolam Industries International, Inc\Pionite: www.pionitelaminates.com.
 - iv. Wilsonart International, Inc: www.wilsonart.com.
- Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch (32 mm) thick; covered with matching laminate.
- Back and End Splashes: Same material, same construction; minimum 4 inches (102 mm) high.
- Solid Surfacing worksurfaces in wet areas (i.e. sink tops): Solid surfacing sheet or plastic resin casting over continuous substrate.
 - Flat Sheet Thickness: 1/4 inch (6 mm), minimum.
 - Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 and NEMA LD
 - Acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - i. Sinks and Bowls: Integral castings; minimum 3/4-inch (19 mm) wall thickness; comply with ANSI Z124.3.
 - ii. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - iii. Manufacturers:
 - Dupont: www.corian.com.
 - Formica Corporation: www.formica.com.

- Avonite Surfaces: www.avonitesurfaces.com.
 - Wilsonart International, Inc:
www.wilsonart.com.
- iv. Other Components Thickness: 1/2 inch (12 mm), minimum.
- v. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
8. Accessory Materials
- Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
 - Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf (20 kg/cu m) minimum density; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
 - Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
 - Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
 - Joint Sealant: Mildew-resistant silicone sealant, white.
9. Fabrication
- Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - Join lengths of tops using best method recommended by manufacturer.
 - Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
 - Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

- Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - Height: 4 inches (102 mm), unless otherwise indicated.
- Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

Part 3 Execution

1. Examination

- Do not begin installation until substrates have been properly prepared.
- If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

2. Preparation

- Clean surfaces thoroughly prior to installation.
- Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3. Installation

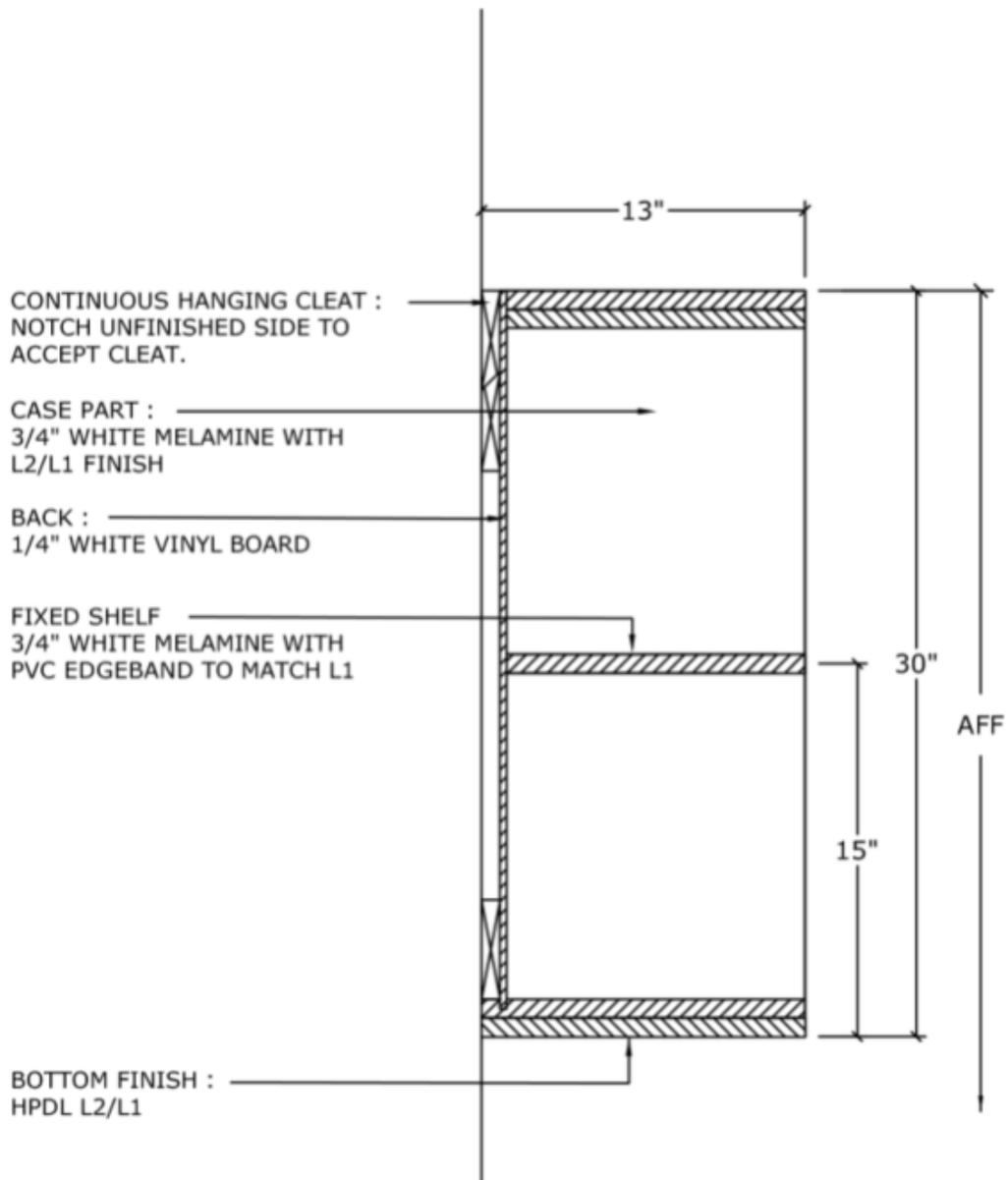
- Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).

- Seal joint between back/end splashes and vertical surfaces.

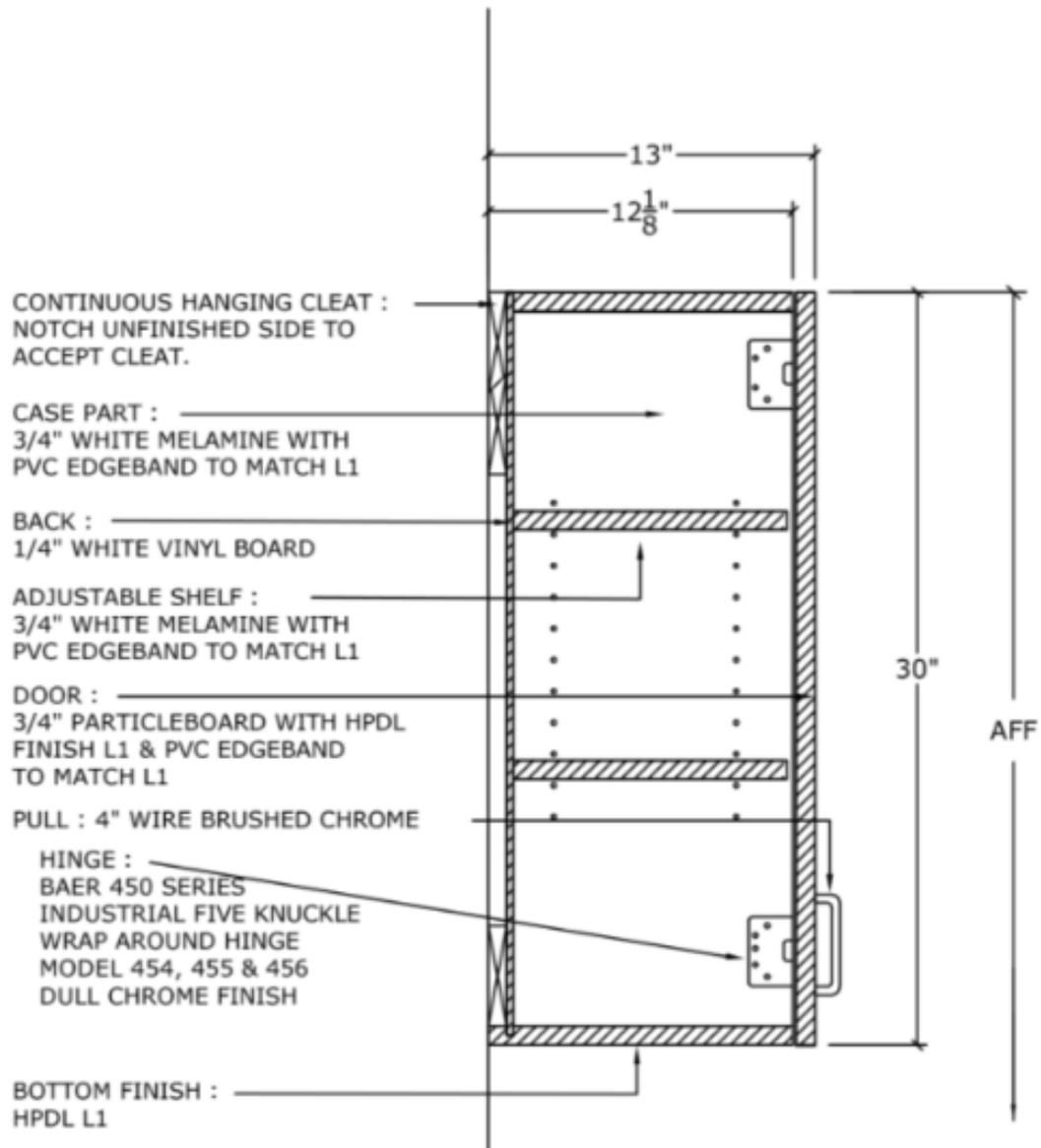
4. Tolerances

- Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.
- Offset From Wall, Countertops: 1/8-inch (3 mm) maximum; 1/16-inch (1.5 mm) minimum.
- Field Joints: 1/8 inch (3 mm) wide, maximum.

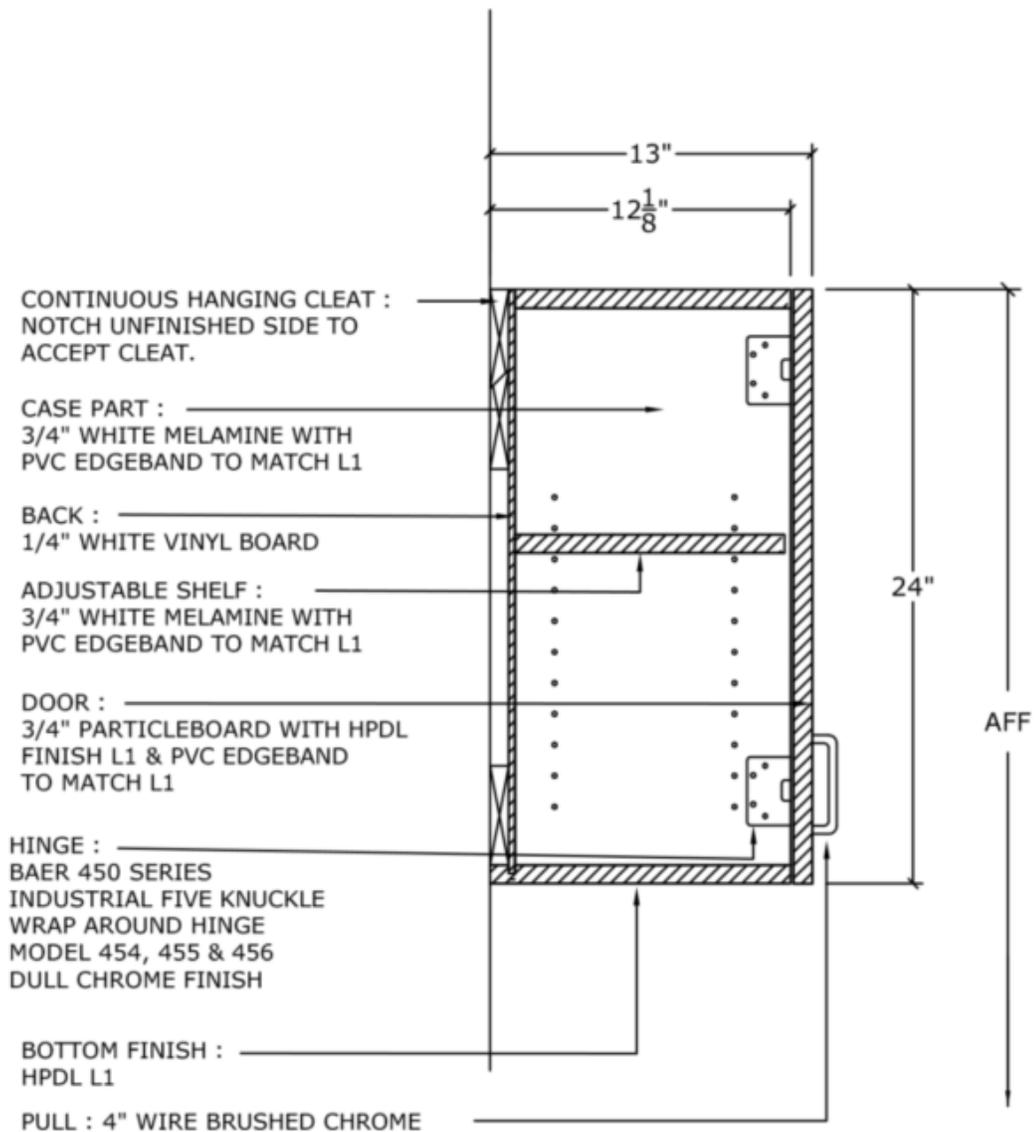
Wall Cabinet 30" High Open



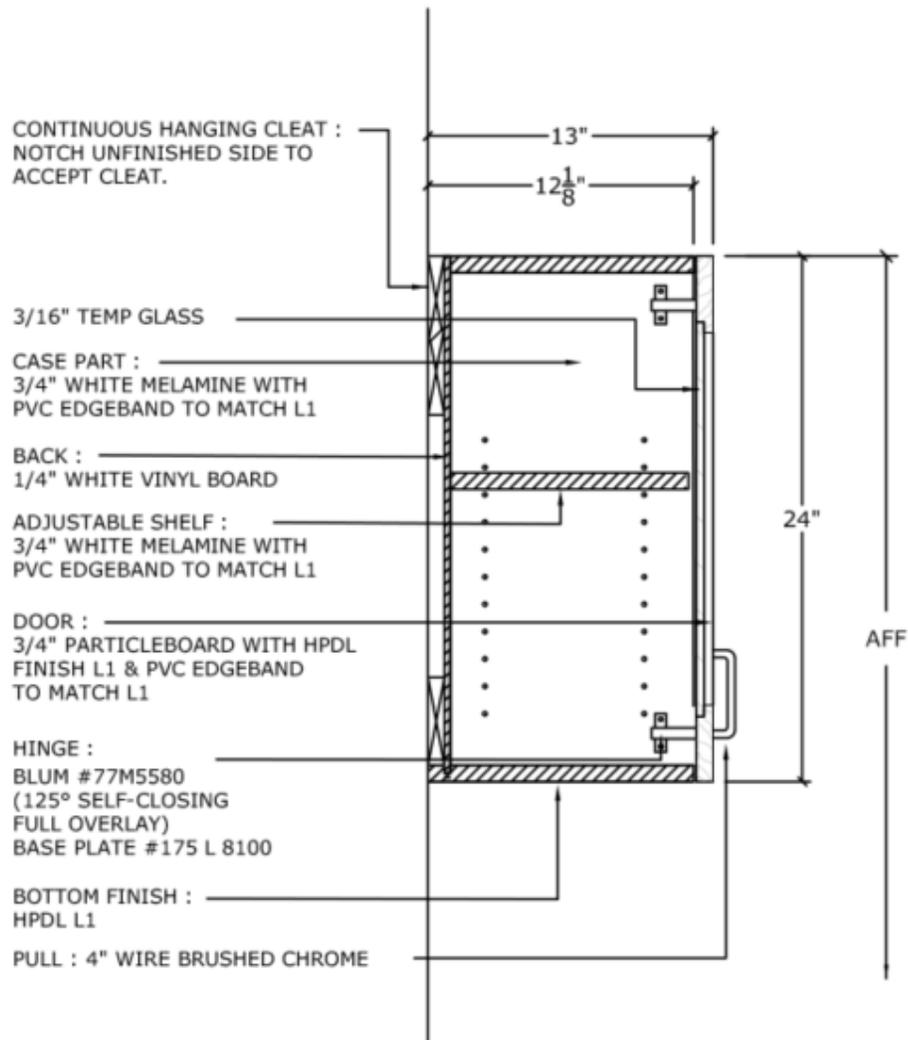
Wall Cabinet 30" High



Wall Cabinet 24" High



Wall Cabinet 24" High x 13 Deep With Glazing



END OF SECTION