

**SECTION 12 34 00
MANUFACTURED PLASTIC CASEWORK**

SPEC WRITER NOTES:

1. Delete between // // if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
2. Verify details are shown on the construction documents.
3. Review VA Design Guides for appropriate use of and installation requirements for casework types.

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section specifies interchangeable modular plastic casework system.
- B. System includes support components, storage units, accessories, electrical wiring chases, for wall hung, and island arrangements.

1.2 RELATED WORK:

- A. //Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS: Sustainable Design Requirements. //
- B. //Section 06 20 00, FINISH CARPENTRY: Custom Wood Casework. //
- C. Section 07 92 00, JOINT SEALANTS: Sealants.
- D. Section 09 06 00, SCHEDULE OF FINISHES: Color of Casework Finish.
- E. Section 09 22 16, NON-STRUCTURAL METAL FRAMING: Backing Plates for Wall Mounted Casework.
- F. Section 09 65 13, RESILIENT BASE AND ACCESSORIES: Resilient Base.
- G. //Section 12 31 00, MANUFACTURED METAL CASEWORK: Standard Manufactured Metal Casework. //
- H. //Section 12 32 00, MANUFACTURED WOOD CASEWORK: Standard Manufactured Wood Casework. //
- I. Section 12 36 00, COUNTERTOPS: Countertop Construction and Materials and Items Installed in Countertops:.
- J. Division 22, PLUMBING: Plumbing Requirements Related to Casework.
- K. Division 26, ELECTRICAL: Electrical Lighting and Power Requirements Related to Casework.

1.3 QUALITY ASSURANCE:

- A. Approval by Contracting Officer Representative (COR) is required of manufacturer and installer based upon certification of qualifications specified.
- B. Manufacturer's Qualifications:
 - 1. Manufacturer is regularly engaged in design and manufacture of modular plastic casework, casework components and accessories of scope and type similar to indicated requirements for a period of not less than five (5) years.
 - 2. Manufacturer has successfully completed at least three (3) projects of scope and type similar to indicated requirements.
 - 3. Submit manufacturer's qualifications and list of projects, including owner contact information.
- C. Installer Qualifications:
 - 1. Installer has completed at least three (3) projects in last five (5) years in which these products were installed.
 - 2. Submit installer qualifications.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. // Sustainable design submittals, as described below:
 - 1. // Volatile organic compounds per volume as described in PART 2 - PRODUCTS. //
 - 2. // For composite wood products, documentation indicating product contains no added urea formaldehyde. // //
- C. Product data:
 - 1. Manufacturer's literature and other data showing compliance with the specification for materials.
- D. Certification:
 - 1. Manufacturer's qualifications specified.
 - 2. Installer's qualifications specified.
- E. Shop drawings:
 - 1. Drawings complete, accurate and to scale.
 - 2. Show:
 - a. Location of each component.
 - b. Dimensions and clearance as required.
 - c. Identify each component with both drawing identification and manufacturer's product number.

- d. Details including cuts, holes, scribes, attachments and specialized construction requirements.
- 3. Installation procedures: Show dimensions, methods of assembly, anchorage, installation and conditions relating to adjoining work.
- 4. Placement Listing: Itemized listing by room number of components provided.
- 5. Complete listing of each component used.
- 6. Include the weight of each component.

SPEC WRITER NOTES:

Evaluate the need to have samples submitted.
Coordinate samples required with products specified in PART 2.

F. Samples:

- 1. //Support rail, 1219 mm (48 inches) long.//
- 2. //Wall strip two pieces each, 1219 mm (48 inches) long.//
- 3. //Storage unit, drawers with countertop each type.//
- 4. //Storage unit, tambour door.//
- 5. //Process table.//
- 6. //Shelf unit, open.//
- 7. //Shelf unit, closed.//
- 8. //Mobile storage cart.//
- 9. //Typical service module.//
- 10. //Plastic laminate.//

G. Operational and Maintenance Manual.

H. Manufacturer's warranty.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle to prevent damage and deterioration until final acceptance of project.
- B. Deliver and store materials in manufacturer's original, labeled containers after building is enclosed and wet work is complete and dry.
- C. Store materials in a secure, locked area.
- D. Repair or replace damaged items due to storage or handling.

1.6 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".

B. Manufacturer Warranty: Manufacturer shall warranty their plastic casework for a minimum of five (5) // // years from date of installation and final acceptance by the Government. Submit manufacturer warranty. Submit manufacturer warranty.

1.7 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation.

SPEC WRITER NOTE: Update applicable specifications to current issue at time of project specification preparation.

B. American Hardwood Association:

A135.4-12.....Basic Hardwood

C. American National Standards Institute (ANSI):

A208.1-09.....Particleboard

D. ASTM International (ASTM):

A36/A36M-19.....Carbon Structural Steel

A240/A240M-20.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

A283/A283M-18.....Low and Intermediate Tensile Strength Carbon Steel Plates

A423/A423M-09 (R2014)....Seamless and Electric-Welded Low-Alloy Steel Tubes

A568/A568M-19a.....Steel, Sheet, Carbon, Structural and High-Strength, Low-Alloy Hot-Rolled and Cold-Rolled, General Requirements

A1008/A1008M-20.....Steel Sheet, Carbon Cold-Rolled, Commercial Quality

B221-14.....Aluminum and Aluminum-Alloy Extruded Bars, Rods Wire, Profiles and Tubes

B221M-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods Wire, Profiles and Tubes (Metric)

B456-17.....Electrodeposited Coatings of Copper Plus, Nickel Plus Chromium and Nickel Plus Chromium

- D1201-13.....Polyester Thermosetting Molding Compound
- D4673-16).....Acrylonitrile-Butadiene-Styrene (ABS)
Molding and Extrusion Materials
- E84-20.....Surface Burning Characteristics of
Plastics and Alloys Building Materials
- E. Code of Federal Regulation (CFR):
 - 40 CFR 59-2016.....Determination of Volatile Matter Content,
Water Content, Density Volume Solids, and
Weight Solids of Surface Coating
- F. National Association of Architectural Metal Manufacturers
(NAAMM):
 - AMP 500 Series-06.....Metal Finishes Manual
- G. National Electrical Manufacturers Association (NEMA):
 - LD 3-05.....High Pressure Decorative Laminates
- H. American Welding Society (AWS):
 - D1.1/D1.1M-20.....Structural Welding Code Steel
 - D9.1/D9.1M-18).....Sheet Metal Welding Code
- I. National Fire Protection Association (NFPA):
 - 70-20.....National Electric Code (NEC)
- J. U.S. Department of Commerce, Product Standard (PS):
 - PS1-95.....Construction and Industrial Plywood
- K. Scientific Equipment and Furniture Association (SEFA):
 - 2.3-10.....Installation of Scientific Laboratory
Furniture and Equipment
- L. Underwriters Laboratories (UL):
 - Annual Fire Resistance Directories
 - 437-13.....Key Locks

PART 2 - PRODUCT

SPEC WRITER NOTE: Make design and material requirements agree with applicable requirements specified in the referenced Applicable Publications. Update and specify only that which applies to the project.

2.1 DESIGN REQUIREMENTS:

- A. Provide components which are alike by one (1) manufacturer with specified flexibility and interchangeability requirements.

- B. Components interchangeable to form flexible system which will accommodate change:
1. Dimensions of products are nominal and shown on construction documents and schedules.
 2. Hanging components modular on same increments.
 3. Selectively removable and replaceable without disturbing adjacent components.
- C. Combustibility: Maximum flame spread rating of 25 and smoke development of 450 when tested in accordance with ASTM E84.
- D. Basic Support Components:
1. Service Modules:
 - a. Steel support frames designed to support storage assemblies and work surfaces, enclosed plumbing and electrical lines and hold fixtures.
 - b. Used to form work area configurations that are easily rearranged.
 - c. Modules maybe installed as wall-attached structures or in freestanding configurations.
 - d. Adjacent modules capable of being joined together.
 - e. Equip module with adjustable floor guides to compensate for uneven floors.
 - f. Modules equipped with stability accessories such as floor anchors and wall attachments brackets as required. Show details on shop drawings.
 - g. Provide access panels for easy access to interior of pipe chase areas. Access panels supported individually and not tied into each other.
 - h. Modules contain method to secure piping for fixtures, electrical outlets and sinks. Detail on shop drawing.
 - i. Enclose modules to floor with a removable panel.
 - j. Modules have end panels where noted. End panels capable of supporting storage assemblies.
 - k. Modules shipped completely finished preassembled, ready for installation.
 2. Vertical Wall Strips:
 - a. Fabricated of steel or aluminum.
 - b. Wall-mounted designed to suspend selected components that require vertical height adjustments.

- c. Vertical adjustment 25 mm (1 inch) maximum.
 - d. Only one (1) wall strip is required between side by side suspended components.
 - e. Attach wall strips to walls or service modules by mechanical fasteners. Wall strips may be an integral part of service modules.
3. Horizontal Support Rail:
- a. Fabricated of steel or aluminum.
 - b. Designed to suspend selected components in one place, allowing them to be removed and replaced in same or different location.
 - c. Rail designed to be supported from vertical rails or service modules.
 - d. Rail configuration able to receive each hanging component.
 - e. Rail able to be cut to any length using simple hand tool or applied to form continuous runs.
 - f. System designed to eliminate area of potential dust accumulation or bacteriological growth.
 - g. Attach rail to walls or service modules with mechanical fasteners to provide a permanent installation.
4. Panel Support System:
- a. Steel hanger supports with slots of 25 mm (1 inch) intervals for suspension of casework or countertops.
 - b. Adjustable level or slides to provide uniform height on adjacent units.
 - c. Allow removal, replacement or relocation without removing adjacent panels.
 - d. Capable of installation on top of finished floor without use of fasteners to floors.
 - e. Have electrical channels as specified in electrical components with two (2) duplex outlets per panel side.
 - f. Heights from 865 mm (34 inches) to 2032 mm (80 inches) standard with manufacturer.
 - g. Widths from 305 mm (12 inches) to 1220 mm (48 inches) standard with manufacturer.
 - h. Connectors to withstand weight of loaded components and stress of movement under loaded conditions, including a

variety of panel configurations and panels of differing heights.

E. Process Tables:

1. Free-standing work surface same construction as countertops for work surface.
2. Have capability to suspend and easily change under table mounted storage units.
3. Locate support legs at work surface edges to maximize knee and storage unit space.
4. Equip legs with adjustable leveling feet.
5. Provide leveling adjustment capability so units can be brought into a level position to compensate for in-site floor conditions and excessive weight loads on surfaces.

F. Modular Storage Units:

1. Fabricate with no exterior cracks, crevices, joints corners or angles that may facilitate bacterial accumulation.
2. Design to accept drawers, shelves, tambour doors and other accessories as indicated in construction documents. Drawer and shelf guides integrally molded into unit. Provide for shelf adjustments or drawer adjustments.
3. Provide unit with a top or with the ability to accept a lid.
4. Capable of being assembled by simple hand action without tools, except for those components fastening to work surfaces.
5. Designed to be suspended from support rail or from countertops.
6. Units, when broken apart for periodic washing and sanitizing operations have inherent capability for easy draining.
7. Drawers available in sizes indicated in construction documents and meet following requirements:
 - a. Drawer body molded one (1) piece unit. Drawer front may be added to a molded one (1)-piece tray.
 - b. Drawers capable of being suspended from horizontal support elements of storage unit without use of tool or additional pieces.
 - c. Drawers capable of stacking.
 - d. Drawers capability to accept snap-on labels.
 - e. Drawers capability to accept dust cover.

- f. Provide quantity of sub-containers and dividers for drawers, as shown on construction documents with label flags for compartments.
 - g. Drawer depth to be full depth of the base cabinet.
- G. Shelves:
- 1. Continuous molded lip around perimeter designed to retain liquid spillage and retain container dividers.
 - 2. Self-stacking for storage.
 - 3. Capability to easily accept snap-on labels.
 - 4. Provide container dividers, as indicated in construction documents.
- H. Shelf Units - Open and Closed Type:
- 1. Rounded exposed surfaces free from sharp edges.
 - 2. Attach and interchangeable on wall strips and service module.
 - 3. Doors designed to allow maximum use of interior cubic space.
 - 4. Provide for shelf adjustment on 25 mm (1 inch).
 - 5. Readily installed, removed and relocated without disturbing adjacent units.
- I. Miscellaneous Components:
- 1. Mobile Storage Carts:
 - a. Capable of supporting six (6) full-loaded storage units.
 - b. Equipped with minimum 127 mm (5 inch) diameter hard-rubber tire casters, with grease fittings for lubrication. Equip two (2) casters with brakes.
 - c. Exposed and non-exposed surfaces capable of easily being cleaned and sanitized.
 - 2. Sink Modules:
 - a. Meet requirements of work services.
 - b. Design to hang on support rail and service modules.
 - c. Provide solid front and sides to conceal plumbing hardware.
 - d. Provide backsplash.
 - 3. Included in casework features that are part of the manufacturer's standards commercial product.
 - 4. Keyboard Tray:
 - a. Minimum of 558 mm (22 inches) wide by 254 mm (10 inches) deep.
 - b. Designed to attach to underside of counter and roll out on supports.

c. Fabricated as plastic laminate face unit with vinyl edge strip.

5. Transportation:

a. Single unit capable of lifting large storage modules on and off storage rails providing a stable platform for transporting large storage modules to other locations without tipping over.

b. Equipped with hard rubber tires wheels not less than 127 mm (5 inches) in diameter with grease fitting for lubrication to accommodate washing and cleaning.

c. Design to be moved to insure safety to operator.

J. Assembly and Disassembly:

1. Mechanical interlock system that does not require tools.

Positive locking system that prevents potential of accidental dislodged.

2. Use of standard hand tools where fasteners used, no special designed tools permitted.

3. Components of such size and weight that can easily be lifted or moved by one (1) person or with transportation designed for such purpose.

K. Live Load Capacity:

1. Loads in addition to weight of components supported.

2. Panel types; minimum of 130 kg (300 pounds) maximum of 500 kg (1100 pounds.) per panel per sides.

3. Open panel types: Minimum of 86 kg (190 pounds), maximum of 181 kg (400 pounds).

4. Roller Rails: 136 kg (300 pounds.) per linear foot.

5. Vertical wall strips: Minimum 272 Kg (600 pound.).

6. Service modules: frames: 998 kg (2200 pounds.).

7. Under counter storage units: 91 kg (200 pounds.).

8. Overhead Storage Units:

a. 762 mm (30 inches) wide by 381 mm (15 inch) deep by 533 mm (21 inches) high, maximum of 32 kg (70 pounds.).

b. 1200 mm (48 inches) wide by 381 mm (15 inches) deep by 533 mm (21 inches) high maximum of 64 kg (140 pounds.).

c. Manufactures standard modular sizes acceptable.

9. Special Storage Units:

- a. 558 mm (22 inches) wide by 610 mm (24 inches) deep by 635 mm (25 inches) high maximum of 91 kg (200 pounds.).
 - b. 558 mm (22 inches) wide by 762 mm (30 inches) deep by 635 mm (25 inches) high: maximum of 91 kg (200 pounds.).
 - c. Pullout shelves or fixed shelves. Maximum of 23 kg (50 pounds.) each.
 - d. Manufacturers standard modular sizes acceptable
10. Drawers: 181 kg (400 pounds.) for drawers 101 mm (4 inches) deep.

L. Finish:

- 1. Selected from manufactures standard colors, specification Section 09 06 00, SCHEDULE FOR FINISHES.
- 2. More than one (1) color may be selected for units.
- 3. Steel components finished with chemical resistant paint.

2.2 GLASS:

- A. ASTM C1048 Kind FT Type I, Class 1, Quality q3.
 - B. For Doors: 6 mm (1/4 inch) thick; except where laminated glass is shown on construction documents.
 - C. For Shelves: // 6 mm (1/4 inch) // // 9 mm (3/8 inch) // thick.
 - D. Laminated Glass: Fabricate of two (2) sheets of 3 mm (1/8 inch) thick clear ASTM C1172 Kind LT glass, laminated together with a 1.5 mm (0.060 inch) thick vinyl interlayer, to a total overall thickness of 8 mm (5/16 inch).
- E. Locks:
- 1. Manufacturer's standard design.
 - 2. Drawers capable of locking into cabinets or lockable lids.
 - 3. Cabinets capable of locking.
- F. Cabinet Locks:
- 1. Provide where locks are indicated on construction documents.
 - 2. Locked pair of hinged doors over 915 mm (36 inches) high:
 - a. ANSI/BHMA A156.5, key one side.
 - b. On active leaf use three (3) point locking device, consisting of two (2) steel rods and lever controlled cam at lock, to operate by lever having lock cylinder housed therein.
 - c. On inactive leaf provide dummy lever of same design.
 - d. Provide keeper holes for locking device rods and cam.

3. Door and Drawer: ANSI/BHMA A156.11 cam locks. Provide one type for each condition as follows:
 - a. Drawer and Hinged Door up to 915 mm (36 inches) high: E07261.
 - b. Drawer and Hinged Door: Pin-tumbler, cylinder type lock with not less than four (4) pins or a UL 437 rated wafer lock with brass working parts and case.
 - c. Sliding Door: E07161.
4. Key locks differently for each type casework and master key for each service, such as Nursing Units, // Psychiatric, // // Administrative, // // Pharmacy //.
 - a. Key drug locker inner door different from outer door.
 - b. Furnish two (2) keys per lock.
 - c. Furnish six (6) master keys per service or Nursing Unit.
5. Marking of Locks and Keys:
 - a. Name of manufacturer, or trademark which can readily be identified legibly marked on each lock and key change number marked on exposed face of lock.
 - b. Key change numbers stamped on keys.
 - c. Key change numbers to provide sufficient information for manufacturer to replace key.

G. Hinged Doors:

1. Provide doors 915 mm (36 inches) and more in height with three (3) hinges and doors less than 915 mm (36 inches) in height is to have two (2) hinges. Each door is to close against two (2) rubber bumpers.
2. // Hinges: Fabricate hinges with minimum 1.8 mm (0.072 inch) thick chromium plated steel leaves, and with minimum 3.5 mm (0.139 inch) diameter stainless steel pin. Hinges to be five (5) knuckle design with 63 mm (2-1/2 inch) high leaves and hospital type tips. //
3. // Concealed Hinges: BHMA A156.9, Type B01602, // 100 // // 135 // // 170 // degrees of opening //, self-closing //. //
4. Fasteners: Provide full thread wood screws to fasten hinge leaves to door and cabinet frame. Finish screws to match finish of hinges.

H. Door Catches:

1. Friction or Magnetic type fabricated with metal housing.

2. Provide one (1) catch for cabinet doors 1220 mm (48 inches) high and under, and two (2) for doors over 1220 mm (48 inches) high.

SPEC WRITER NOTE: Verify locks are shown on details for cabinets.

I. Drawer and Door Pulls:

1. Doors and drawers to have flush pulls, fabricated of either chromium-plated brass, chromium plated steel, stainless steel, or anodized aluminum. Drawer and door pulls to be of a design that can be operated with a force of 22.2 N (5 pounds) or less, with one (1) hand and not require tight grasping, pinching or twisting of the wrist.

J. Drawer Slides:

1. Full extension steel slides with nylon ball-bearing rollers.
2. Slides to have positive stop.
3. Equip drawers with rubber bumpers.

K. Sliding Doors:

1. Each door to be supported by two ball bearing bronze or nylon rollers, or sheaves riding on a stainless steel track at top or bottom, and to be restrained by a nylon or stainless steel guide at the opposite end.
2. Plastic guides are not acceptable.
3. Each door to have rubber silencers set near top and bottom of each jamb.

L. Shelf Standards (Except For Fixed Shelves):

1. Bright zinc-plated steel for recessed mounting with screws, 16 mm (5/8 inch) wide by 5 mm (3/16 inch) high providing 13 mm (1/2 inch) adjustment, complete with shelf supports.

M. Gate Bolt:

1. Surface mounted barrel type with strike.

N. Hinged Gates:

1. Gates to have two (2) double-acting // hinges // // pivots //, size as required for gate size and weight.

O. // Casters:

1. Locking type rated for 79 kg (175 pounds.) each. //

P. // Floor Glides:

1. Non-skid material minimum 25 mm (1 inch) diameter with minimum 16 mm (5/8 inch) height adjustment. //

2.3 MATERIALS:

- A. Carbon Structural Steel: ASTM A36/A36M.
- B. Stainless Steel: ASTM A240/A240M Type 302B with number 4 finish minimum.
- C. Steel plates: ASTM A283/A283M.
- D. Sheet Steel: ASTM A1008/A1008M or ASTM A568/A568M.
- E. Steel Tubes: ASTM A423/A423M.
- F. Aluminum: ASTM B221M (B221).
- G. ABS compounds: ASTM D4673.
- H. Plastic Laminate: NEMA LD-3.
- I. Hardboard: AHA A135.4, Class 1, tempered.
- J. Particleboard: ANSI A208.1; no added urea formaldehyde.
- K. Plywood, Softwood: Prod. Std. PS1, five (5) ply construction from 13 mm to 28 mm (1/2 inch to 1-1/8 inch) thickness, and seven (7) ply for 31 mm (1-1/4 inch) thickness.
- L. // Adhesive: Provide adhesive with VOC content of // 250 // //
// g/L or less when calculated according to 40 CFR 59,
(EPA Method 24). //

2.4 FABRICATION:

- A. Manufacturer's standard design of modular casework system meeting design requirements.
 - 1. Casework requirements specified are intended to establish minimum requirements.
 - 2. Dimensions of components shown on construction documents are nominal to represent module requirements.
 - 3. Provide components compatible with each other as to color, finish and hardware.
- B. Components of acrylonitrile butadiene styrene (ABS) compounds, ASTM D4673, with integral color throughout and molded to manufacturer's standard system design.
- C. Components stain and rust-resistant capable of withstanding washing temperatures up to 85 degrees C (185 degrees F) without distortion or physical imperfections.
- D. Storage modules, plastic laminate exposed surfaces including interiors conforming to and fabricated in accordance with LD3, over plywood conforming to PS1 or not less than 641 Kg/cubic meter (45 pounds. per cubic foot) particleboard conforming to ANSI A208.1.

- E. Storage modules of molded plastic:
 - 1. Fire-retardant thermoplastic or sheet-molding compound ASTM D1201, injection-molding, compression-molding or vacuum-forming technique.
 - 2. Constructed to achieve structural strength, durability and resistance to acids, stains, corrosion and heat.
 - 3. Color integral throughout plastic.
- F. Fabricate frames and rails of steel or aluminum as standard with modular casework manufacturer's system.
- G. Finish metals in accordance with NAAMM AMP 500-505 and plated steel in accordance with ASTM B456 as standard with modular casework manufacturer's system.
- H. Fabricate steel components of ASTM A36/A36M, ASTM A283/A283M, ASTM A1008/A1008M or ASTM A568/A568M as standard with casework system manufacturer.
- I. Weld in accordance with AWS D1.1/D1.1M or AWS D9.1/D9.1M. Finish welds smooth and free of sharp edges where exposed.
- J. Plated Metal: Finish in accordance with ASTM B456 for steel products and NAAMM AMP 500-505.
- K. Painted Steel: Finish in accordance with NAAMM AMP 500-505
- L. Anodized Aluminum: Finish as standard with modular cabinet manufacturers system.

2.5 PRODUCTS OF OTHER COMPONENTS DIRECTLY RELATED TO CASEWORK:

- A. Refer to Section 07 92 00, JOINT SEALANTS for work related to sealants used in conjunction with joints of countertops, casework systems, and adjacent materials.
- B. Refer to Section 09 65 13, RESILIENT BASE AND ACCESSORIES for work related to rubber base adhered to casework systems.
- C. Refer to Section 09 22 16, NON-STRUCTURAL METAL FRAMING for backing plates used in conjunction with wall assemblies for the attachment of casework systems.
- D. Refer to Section 12 36 11, COUNTERTOPS for work related to plastic laminate, acid-resistant plastic laminate, metal, molded resin, wood, and methyl methacrylic polymer countertops and/or shelving used in conjunction with casework systems. When countertop materials are provided by the casework manufacturer, include the following features:

1. Capable of being suspended from vertical support rails or horizontal wall strips or service modules.
 2. Provided with rounded corners and impact resistant material on exposed edges.
 3. Capable of being easily relocated and installed without tools.
 4. Capable of being suspended and easily changed under counter mounted storage units.
 5. Provide leveling adjustment capability so units can be brought into a level position.
 6. Secured using fasteners. Show detail on shop drawings.
- E. Refer to Section 12 36 11, COUNTERTOPS for work related to and integral with countertop systems such as pegboards, funnel and graduate racks.
- F. Refer to Division 22, PLUMBING for the following work related to casework systems:
1. Sinks, faucets and other plumbing service fixtures, venting, and piping systems.
 2. Compressed air, gas, vacuum and piping systems.
- G. Refer to Division 26, ELECTRICAL for the following work related to casework systems:
1. Connections and wiring devices.
 2. Connections and lighting fixtures except when factory installed by the manufacturer.

PART 3 - EXECUTION

3.1 COORDINATION:

- A. Begin only after work of other trades is complete, i.e. wall and floor finish completed, ceilings installed, light fixtures and diffusers installed and connected, and area is free of trash and debris.
- B. Verify location and size of mechanical and electrical services as required and perform cutting of components of work installed by other trades.
- C. Verify reinforcement of walls and partitions for support and anchorage of casework.
- D. Coordinate with other Divisions and Sections of the specification for work related to installation of casework systems to avoid interference and completion of service connections.

3.2 INSTALLATION:

- A. Install casework in accordance with manufacturer's written instructions // and per SEFA 2.3 recommendations //.
 - 1. Install in available space; arranged for safe and convenient operation and maintenance.
 - 2. Align cabinets for flush joints except where shown otherwise on construction documents.
 - 3. Install with bottom of wall cabinets in alignment and tops of base cabinets aligned level, plumb, true, and straight to a tolerance of 3.2 mm in 2438 mm (1/8 inch in 96 inches).
 - 4. Install corner cabinets with hinges on corner side with filler or spacers sufficient to allow opening of drawers.
- B. Support Rails:
 - 1. Install true to horizontal at heights shown on construction documents; maximum tolerance for uneven floors is plus or minus 13 mm (1/2 inch).
 - 2. Shim as necessary to accommodate variations in wall surface not exceeding 5 mm (3/16 inch) at fastener.
- C. Wall Strips:
 - 1. Install true to vertical and spaced as shown and spaced as shown on construction documents.
 - 2. Align slots to assure that hanging units will be level.
- D. Plug Buttons:
 - 1. Install plug buttons in predrilled or prepunched perforations not used.
 - 2. Use chromium plate plug buttons or buttons finish to match adjacent surfaces.
- E. Seal junctures of casework systems with mildew-resistant silicone sealants as specified in Section 07 92 00, JOINT SEALANTS.

3.3 CLOSURES AND FILLER PLATES:

- A. Close openings larger than 6 mm (1/4 inch) wide between cabinets and adjacent walls with flat, steel closure strips, scribed to required contours, or machined formed steel fillers with returns, secure with sheet metal screws to tubular or channel members of units, or bolts where exposed on inside.
- B. Where ceilings interfere with installation of sloping tops, omit sloping tops and provide flat steel filler plates.

- C. Secure filler plates to casework top members, unless shown otherwise on construction documents.
- D. Secure filler plates more than 152 mm (6 inches) in width top edge to a continuous 25 x 25 mm (1 x 1 inch) 0.889 mm (1/16 inch) thick steel formed steel angle with screws.
- E. Anchor angle to ceiling with toggle bolts.
- F. Install closure strips at exposed ends of pipe space and offset opening into concealed space.
- G. Finish closure strips and fillers with same finishes as cabinets.

3.4 FASTENINGS AND ANCHORAGE:

- A. Do not anchor to wood ground strips.
- B. Provide hat shape metal spacers where fasteners span gaps or spaces.
- C. Use 6 mm (1/4 inch) diameter toggle or expansion bolts, or other appropriate size and type fastening device for securing casework to walls or floor. Use expansion bolts shields having holding power beyond tensile and shear strength of bolt and breaking strength of bolt head.
- D. Use 6 mm (1/4 inch) diameter hex bolts for securing cabinets together.
- E. Use 6 mm (1/4 inch) by minimum 38 mm (1-1/2 inch) length lag bolt anchorage to wood blocking for concealed fasteners.
- F. Use not less than No. 12 or 14 wood screws with not less than 38 mm (1 1/2 inch) penetration into wood blocking.
- G. Space fastening devices 305 mm (12 inches) on center with minimum of three (3) fasteners in 915 or 1220 mm (3 or 4 foot) unit width.
- H. Anchor floor mounted cabinets with a minimum of four (4) bolts through corner gussets. Anchor bolts may be combined with or separate from leveling device.
- I. Secure cabinets in alignment with hex bolts or other internal fastener devices removable from interior of cabinets without special tools. Do not use fastener devices which require removal of tops for access.
- J. Where units abut end to end, anchor together at top and bottom of sides at front and back. Where units are back to back, anchor backs together at corners with hex bolts placed inconspicuously inside casework.

- K. Where type, size, or spacing of fastenings is not shown or specified on construction documents, show proposed fastenings and method of installation on shop drawings.

3.5 ADJUSTMENTS:

- A. Adjust equipment to insure proper alignment and operation.
- B. Replace or repair damaged or improperly operating materials, components or equipment.

3.6 CLEANING:

- A. Immediately following installation, clean each item, removing finger marks, soil and foreign matter resulting from work of this section.
- B. Remove from job site trash, debris and packing materials resulting from work of this section.
- C. Leave installed areas clean of dust and debris resulting from work of this section.

3.7 INSTRUCTIONS:

- A. Provide operational and cleaning manuals and verbal instructions in accordance with Article INSTRUCTIONS, SECTION 01 00 00, GENERAL REQUIREMENTS.
- B. Provide in service training both prior to and after facility opening. Coordinate in service activities with COR.
- C. Commencing at least seven (7) days prior to opening of facility, provide one (1) four (4) hour day of on-site orientation and technical instruction on use and cleaning procedures application of products and systems specified herein.

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