SECTION 12 31 00

MANUFACTURED METAL CASEWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Manufactured metal casework.
2. [Plastic laminate countertop and splashes.]
3. [Special laboratory countertop and splashes.]
4. Manufactured metal casework hardware.
5. [Service fittings and outlets.]

B. Related Sections:
1. Section 07 92 00 - Joint Sealants.

1.02 REFERENCE STANDARDS

A. American National Standards Institute:
1. ANSI Z97.1 - Performance Specifications and Methods of Test for Glazing Materials Used in Buildings).

B. ASTM International:
1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. [ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.]
3. [ASTM C1036 - Standard Specification for Flat Glass.]
4. [ASTM C1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.]

C. [National Electrical Manufacturers Association:]
1. NEMA LD 3 - High-Pressure Decorative Laminates.

D. Scientific Equipment and Furniture Association:
1. SEFA 8 – Laboratory Furniture

E. [South Coast Air Quality Management District:]
1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

F. [Woodwork Institute:]
1. AWS - Architectural Woodwork Standards.

1.03 DESIGN REQUIREMENTS

A. Manufactured metal casework shall be comprised of independent completely welded units without applied panels at ends, backs or bottoms, so that cases can be used interchangeably or as a single, stand-alone unit

B. Dimensions shown are nominal; variations will be permitted provided unit function remains unaltered.

C. Appearance Requirements:
   1. Flush Overlay Construction: Surfaces of doors and drawers shall overlay the cabinet ends, top or bottom rails. Horizontal and vertical case shell members (panels, top rails and bottoms) shall be concealed behind drawer and door fronts. Reveals shall be a uniform 1/8 inch horizontally between drawer and door fronts and 5/16 inch vertically between adjacent drawer and door fronts.
   2. Slimline Styling: Front width of end panels 3/4 inch and front height of top and bottom members 1 inch.

D. Interior of Case Units: Easily cleanable, flush interior. Base cabinets, 30 -48 inches wide, with double swinging doors shall provide full access to complete interior without center vertical post.

E. Drawers: Sized on a modular basis for interchange to meet varying storage needs, and designed to be easily removable in field without the use of special tools.

F. Case openings: Rabbeted joints all four sides of case opening for hinged doors and two sides for sliding doors in order to provide structural integrity.

G. Framed Glazed Doors: Identical in construction, hardware and installation to solid panel doors. Design frame glazed doors to be removable for glass replacement.

1.04 PERFORMANCE REQUIREMENTS

A. Structural performance requirements: Manufactured metal casework components shall withstand the following minimum loads without damage to the component or to the manufactured metal casework operation:
   1. Steel base unit load capacity: 500 pounds per lineal foot.
   2. Suspended units: 300 pounds.
   3. Drawers in a cabinet: 150 pounds.
   4. Utility tables (4 legged): 300 pounds. (with levelers)
   5. Hanging wall cases: 300 pounds.
   6. Load capacity for shelves of base units, wall cases and tall cases: 40 pounds. per square foot, maximum load – 200 pounds up to 48 inches wide.

B. Metal Finish Performance Requirements;
   1. Abrasion resistance: Maximum weight loss of 5.5 mg. per 100 cycle when tested on a Taber Abrasion Tester #E40101 with 1000 gm wheel pressure and Calibrase #CS10 wheel.
   2. Hardness: Surface hardness equivalent to 4H or 5H pencil.
   3. Humidity resistance: Withstand 1000 hour exposure in saturated humidity at 100 degrees Fahrenheit.
   4. Moisture Resistance:
      a. No visible effect to surface finish after boiling water trickled over test panel inclined at 45 degrees for five minutes.
      b. No visible effect to surface finish following 100 hour continuous application of a water soaked cellulose sponge, maintained in a wet condition throughout the test period.
   5. Adhesion: Score finish surface of test panel with razor blade into 100 squares, 1/16 inch by 1/16 inch, cutting completely through the finish but with minimum penetration of the substrate, and brush away particles with soft brush. Minimum 90 squares shall maintain their finish.
   6. Salt spray: Withstand minimum 200 hour salt spray test.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate size of access and route to place of installation.
   2. Coordinate details of manufactured metal casework with other work supporting, adjoining, or fastening to manufactured metal casework.
   3. Coordinate manufactured metal casework with partition construction including backing for the placement and installation of items fastening to partitions.
   4. Coordinate manufactured metal casework installation with size, location and installation of service utilities
   5. Coordinated manufactured metal casework work with installation of associated and adjacent components, [_____,] [plumbing rough-in,][and][electrical rough-in],

B. [Preinstallation Meeting:]

C. Sequencing:
   1. Sequence manufactured metal casework work to ensure utility connections are achieved in orderly and expeditious manner.
   2. [Resilient flooring is to be installed underneath built-in manufactured metal casework prior to installation of manufactured metal casework.]

D. Scheduling:
   1. Provide information as required for proper placement of backing.
   2. Schedule delivery of manufactured metal casework and equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.

1.06 [SUSTAINABLE CHARACTERISTICS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:
   1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:

SPEC NOTE ***List materials specified in this section required to have recycled content.***

      a. [_____.]
   2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]

SPEC NOTE ***List materials specified in this section required to be regional materials.***

      a. [_____.]

1.07 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide component dimensions, configurations, construction details, joint details, and attachments, utility and service requirements and locations.

C. Certifications: Submit the following certifications indicating that:
   1. Manufacturer meets qualifications specified in this Section
   2. Installer meets qualifications specified in this Section.

D. Shop Drawings:
   1. Indicate manufactured metal casework locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions, tolerances, and clearances

required. Indicate countertop and splash fabrication and attachment.
2. Indicate relation of units to surrounding walls, windows, doors and other building components.
3. Provide 1/4-inch equals 1'-0" rough-in plan drawings for coordination with trades.

E. Samples:
1. Submit two samples, minimum size 6 by 6 inch of each color of color of finish for manufactured metal casework, work surfaces and for other pre-finished equipment and accessories.
2. Manufactured Metal Casework Unit: Only as requested.

F. Test Reports: Submit to certify manufactured metal casework satisfies structural and finish requirements.

G. Manufacturer's Installation Instructions: Indicate installation requirements.

1.08 [SUSTAINABLE DESIGN SUBMITTALS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
1. Materials Resources Certificates:
a. Certify source and origin for [salvaged] [and] [reused] products.
b. Certify recycled material content for recycled content products.
c. Certify source for regional materials and distance from Project site.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
1. Provide cost data for the following products:
a. [Salvage products.]
b. [Reused products.]
c. Products with recycled material content.
d. Regional products.

1.09 QUALITY ASSURANCE

A. All manufactured metal casework construction and performance characteristics shall be in full compliance with SEFA 8 Metal standards. At University’s request, independent, third part testing must be submitted validating compliance and adheres to the architectural specifications.

B. Manufacturer’s Qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality manufactured metal casework and equipment, and shall meet the following minimum requirements
1. Five years or more experience in manufacture of manufactured metal casework and equipment of type specified.
2. Ten installations of equal or larger size and requirements.

C. Installer's Qualifications: Installer of manufactured metal casework shall be factory trained and licensed or otherwise certified by manufactured metal casework manufacturer and shall have been regularly providing installations of the types required for no less than five years and proving a background of not less than three years of installations of comparable size to that herein specified.

1.10 DELIVERY, STORAGE, AND PROTECTION

A. Deliver manufactured metal casework to job site only after proper facilities are available for handling, storing, and protecting items; receiving areas are broom-cleaned, exterior openings are closed; wet work and mechanical and electrical rough-ins are completed.

B. Accept manufactured metal casework on site. Inspect on arrival for damage.

C. Provide temporary protective covers for items during delivery, installation, and until final acceptance of Project.

1.11 SITE CONDITIONS

A. Environmental Requirements: Provide proper heat and humidity in area of storage and installation to maintain equilibrium moisture content in wood until job is completed: Maximum relative humidity 50 percent to 65 percent at 70 degrees Fahrenheit.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Manufactured Metal Casework:
   1. Thermo Fisher Scientific Inc.'s "Hamilton Acclaim Metal Casework"; or equal

2.02 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, CS or FS Type B, with G90/Z275 coating; stretcher leveled.

B. Sheet Steel: Mild, cold rolled and leveled unfinished steel.

C. Stainless Steel Sheet: ASTM A666 Type 304.

D. Glass:
   1. Float: ASTM C1036, Type 1, Quality Q3 (glazing select); [____] inch thick minimum; exposed edges ground, cut or drilled to receive hardware; clear.
   2. Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering and complying with ANSI Z97.1; 4 mm thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.

E. Base Material for Plastic Laminate:
   1. [Panel Core (Particleboard):]
      a. Description: A medium density mat-formed flat panel consisting of particles of wood bonded together with a urea-formaldehyde free synthetic resin or other suitable binder, compressed to proper density and cured under heat and pressure. Particleboard shall meet the requirements of ANSI A208.2, Class MD.
      b. Product: SierraPine Limited's "Medite II"; Temple-Inland Inc.'s "TemStock-Free"; or equal.
   2. [Panel Core (Particleboard):]
      a. Description: A mat-formed flat panel consisting of particles of wood bonded together with a synthetic resin or other suitable binder, compressed to proper density and cured under heat and pressure. Particle board to urea-formaldehyde free and made of recycled content. Particleboard shall meet the requirements of ANSI A208.1, Table 1 Grade 1-M-3.

b. Product: Panel Source International's "PureKor Particleboard Plus"; or equal.

3. [Plywood Core (Where Noted): Closed grained hardwood plywood with WI "Sound" (2) Grade face veneer, and crossband under the face veneer shall be WI "Industrial" (3) grade or better.
4. Lumber (Solid Stock): Gum, Birch, or Sugar Pine.

F. [High Pressure Decorative Laminate:]
1. Description:
   a. High pressure decorative laminate in wood grain or solid colors with textured surfaces.
   b. Plastic Thickness and Grade: Meet requirements of NEMA LD3.
      1) Typical Horizontal Surfaces: HGS, 0.048-inch nominal thickness.
      2) Typical Vertical Surfaces: VGS, 0.028-inch nominal thickness.
      3) Typical Postforming Surfaces: HGP, 0.042-inch, PF 42.
      4) Door and Drawer Edges: VGP, 0.028-inch nominal thickness.
      5) Cabinet Liners: CLS, 0.020-inch nominal thickness.
      6) Balancing Sheets: BKL, 0.020-inch nominal thickness.
2. Manufacturers: Formica Corp.; Wilsonart International Inc.; Nevamar Decorative Surfaces; Abet Inc.'s; or equal.

G. [Acid-Resistant Plastic Laminate:]
1. Description:
   a. Solid colors, finely textured finish of matte finish, high resistance to chemical attack from organic solvents, alkalis, and acids.
   b. Meet typical standards of NEMA LD3.
2. Product: Wilson International Inc.'s "Chemsurf Chemical-Resistant Laminate, Type 390, #60 Matte Finish"; or equal.

H. [Adhesive for High Pressure Decorative Laminate: Adhesive must meet the following requirements.]
1. [Meet or exceed VOC limits for adhesives and sealants. Adhesives must meet or exceed the VOC limits of SCAQMD #1168 by, and all sealants used as filler must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.]
2. [Interior] Aerosol Adhesives: Maximum volatile organic compound content in accordance with GS-36.]
3. [Meet all applicable air quality requirements.]
4. Recommended by high pressure decorative laminate manufacturer.

SPEC NOTE Include complete description and product.

I. [Special Laboratory Countertop and Splashes: Modified epoxy resin, acid resistant.]

SPEC NOTE Include complete description and product for each item required.

J. [Service Fittings and Fixtures:]
1. Cup Sinks: Stainless steel with waste fittings, [____] inch diameter, [____] inch deep.
2. Natural Gas Outlet: Model: [_____] manufactured by [_____].
3. Air Outlet: Model: [_____] manufactured by [_____].
4. Vacuum Outlet: Model: [_____] manufactured by [_____].
5. Water Outlet: Model: [_____] manufactured by [_____].
6. Escutcheons: Stainless steel.

K. [Electrical Outlet Covers: Stainless steel.]

L. Sound Deadening Material: Inorganic, for sandwich panel fabrication.

M. Sealant: Sanitary type, specified in Section 07 92 00 - Joint Sealants.

2.03 HARDWARE

A. Hardware: Manufacturer's standard unless otherwise indicated.

B. Shelf Standards and Rests: Stainless Steel.

C. Shelf Brackets: Stainless Steel.

D. Drawer and Door Pulls: Stainless Steel wire pulls, 4 inches wide.

E. Sliding Door Pulls: Recessed steel circular design.

F. Cabinet Locks: Lock with 4 pin cylinder and 2 keys per lock.

G. Catches: Magnetic.

H. Hinges: Offset pin.

I. Sliding Door Track Assemblies: Nylon track with solid bearing followers.

2.04 CASEWORK FABRICATION

A. Preparation:
1. Verify dimensions of receiving spaces at job site.
2. Verify details and dimensions of equipment and fixtures integral in manufactured metal casework for proper fit and accurate alignment.

B. General:
1. Fabricate manufactured metal casework in accordance with manufactured metal casework manufacturer’s printed specifications unless specifically noted otherwise.
2. Metal Gauges: Manufacturer’s standard or heavier where required to meet structural capacities.
3. Fabricate matching filler panels and trim where required for scribing.
4. Make provisions for concealed anchorage of tops and splashes.
5. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
6. Fabricate components of die formed sheet steel, and stainless steel. Form each unit rigid, not dependent on building structure for rigidity.
7. Form edges and seams to be smooth. Form material for counter tops from continuous sheets.
8. Turn down edges of shelves 1-1/2 inch on each side and return 5/8-inch front and back.
9. Electric spot weld manufactured metal casework; grind joints smooth and flush.
10. [Set glass in doors with gasket and removable stops to minimize rattles or vibration.]
11. Cut and drill counter tops, backs, and other components for service outlets and fixtures.
12. Install fixtures and fittings built into or part of manufactured metal casework. Provide access panels for maintenance of utility service and mechanical and electrical components.

C. Base Units, Wall, Upper and Tall Cases:
1. Base Units: End panels and back reinforced with internal reinforcing front and rear posts. Base units shall be 22 inches overall in depth.
2. Wall and Tall Cases: Formed end panels with front and rear reinforcing post channels; back shall be formed steel panel, recessed 3/4 inch for mounting purposes

3. Posts: Front post fully closed with full height reinforcing upright. Shelf adjustment holes in front and rear posts shall be perfectly aligned for level setting, incrementally adjustable to 1/2 inch on-center full height of unit.
4. Secure intersection of case members with spot and arc welds. Provide gusset reinforcement at front corners.
5. Base unit backs: Provide drawer units without backs and cupboard units with removable backs for access to services behind units.
6. Bottoms: Base units and 25-inch, 31-inch, 37-inch and 49-inch-high wall and upper cases shall have one piece bottom with front edge formed into front rail, rabbeted as required for swinging doors and drawers and flush design for sliding doors.
7. Top rail for base units: Interlock with end panels, flush with front of unit.
8. Horizontal Intermediate Rails: Recessed behind doors and drawer fronts.
9. Base for Base Units: Four inches high by 3 inches deep with formed steel base and 11-gauge die formed steel gussets at corners. Provide 3/8-inch diameter leveling screw with integral bottom flange of minimum 0.56 square inch area at each corner, accessible through openings in toe space.
10. Tops of wall and upper cases: One piece, with front edge formed into front rail.

D. Steel Drawer Fronts: 3/4-inch thick, double wall steel construction, prepainted prior to assembly and sound deadened:
1. Drawer Bodies: Bottom and sides formed from one-piece, cold rolled steel with bottom and sides coved and formed top edges. Front and back panels spot welded to center section
2. Drawer Suspension: Heavy duty coved raceways for both case and drawer with nylon tired, ball bearing rollers; self-centering and self-closing when open to within 3 inches of the closed position.
3. Provide drawer with rubber bumpers. Friction centering devices are not acceptable.
4. Provide security panels for drawers with keyed different locks.
5. File drawers: Provide with 150-pound full extension slides for full access and operation.

E. Doors:
1. Steel Solid Panel Doors: 3/4-inch thick, double wall, telescoping box steel construction with interior prepainted and sound deadened.
   a. Reinforce interior of front panel with welded steel hat channels.
   b. Hinges with screws to internal 14 gauge reinforcing in case and door. Hinges shall be removable, welding of hinges not acceptable.
   c. Doors shall close against rubber bumpers.
2. Sliding Doors - Solid or Framed Glazed: Design for easy removal after removal of bottom guide. Doors shall be hung with nylon-tired sleeve bearing rollers in formed steel top hung track and shall close against rubber bumpers.
3. Unframed sliding glass doors: Glass with edges ground set in extruded aluminum shoe with integral pulls, wheel assemblies and top and bottom extruded aluminum track. Provide rubber bumpers at fully opened and closed-door position.

F. Shelves:
1. Form front and back edges down and back 3/4 inch. Form ends down 3/4 inch.
2. Reinforce shelves over 36 inches long with welded hat channel reinforcement the full width of shelf.

2.05 TABLE FRAMES

A. Table frames: 4-1/2 inch high "C" channel front and back aprons, end rails and cross rails.

B. Legs: Two inch by two-inch steel tube legs with welded leg bracket. Attach legs with two bolts to front and back aprons and weld to end rails. Each leg shall have a recessed leveling screw and a black, coved vinyl or rubber leg shoe, 2 inches in height

C. Table Drawers: Provide front and back rails; drawer unit, hardware and suspension same as specified for base unit drawers.

2.06 COUNTERTOPS

A. [High Pressure Decorative Laminate Countertops and Splashes:]
1. Fabricate countertops as detailed on the Drawings and in accordance with AWS Custom grade or better specifications unless otherwise noted.
2. [Use plywood as base material for high pressure decorative laminate at countertops with sinks. Extend plywood at least 2 feet each way from sinks.]
3. Countertops to be 3/4 inch thick unless otherwise indicated.
4. Compensate high pressure decorative laminate on one face of base material with laminate balancing sheet on opposite face.
5. Back splashes to be finished 3/4 inch thick unless otherwise indicated and to be secured to countertops with concealed metal fastenings and with contact surfaces set in waterproof adhesive.
6. Provide cut outs as required for mechanical, electrical, data, communications, telephone, equipment, and other similar items.
7. [Cover exposed edges of countertops and back splashes with high pressure decorative laminate.]
8. [Cover back splashes with high pressure decorative laminate.]
9. Provide cut outs as required for mechanical, electrical, data, communications, telephone, equipment and other similar items.

SPEC NOTE Include any special countertop requiements.

B. Special Laboratory Countertop and Splashes:

2.07 FINISHES

A. Metal (Except Stainless Steel):
1. Preparation: Spray clean metal with a heated cleaner/phosphate solution, pre-treat with iron phosphate spray, water rinse, and neutral final seal. Immediately dry in heated ovens, gradually cooled, prior to application of finish.
2. Application: Electrostatically apply urethane powder coat of selected color and bake in controlled high temperature oven to assure a smooth, hard satin finish. Surfaces shall have a chemical resistant, high grade laboratory furniture quality finish of the following thickness: Liquid, dipped, solvent-based finishes are not and will not be acceptable.
a. Exterior and interior exposed surfaces: 1.5 mil average and 1.2 mil minimum.
b. Backs of cabinets and other surfaces not exposed to view: 1.2 mil average.
3. Color: As indicated on Drawings.

B. [Stainless Steel: No. 4 finish.]

C. [Plastic Laminate: Smooth finish, color as indicated on Drawings.]

D. Exposed Hardware: Corrosion-resistant satin chrome finish unless indicated otherwise.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of support framing and anchors.

3.02 INSTALLATION

A. Install manufactured metal casework, components and accessories in accordance with manufacture metal casework manufacturer's instructions.

B. Use anchoring devices to suit conditions and substrate materials encountered.

C. Set manufactured metal casework components plumb, square, and straight with no distortion and securely anchored to building structure. Level as required using cabinet levelers.

D. Bolt continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16-inch tolerance.

E. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board.

F. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8 inch between top units

G. Insulate to prevent electrolysis between dissimilar metals.

H. Scribe to abutting surfaces and align adjoining components. Apply matching filler pieces where manufactured metal casework abuts dissimilar construction.

I. Countertops:
   1. Where required due to field conditions, scribe to abutting surfaces.
   2. Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure joints in field, where practicable, in the same manner as in factory, with dowels, splines, adhesive or fasteners recommended by manufacture metal casework manufacturer.
   3. Secure work surfaces to manufactured metal casework and equipment components with material and procedures recommended by the manufacturer.

J. [Sink Installation: Sinks which were not factory installed shall be set in chemical resistant sealing compound and secured and supported per manufacturer's recommendations.]

K. Accessory installation: Install accessories and fittings in accordance with manufacturer's recommendations. Turn screws to seat flat; do not drive.

L. Close ends of units, splash aprons, shelves and bases with sealant.

M. Field touch-up blemishes to original finish.

3.03 ADJUSTING

A. Adjust manufacture metal casework doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. See Section 01 74 00 - Cleaning.

B. Clean manufacture metal casework, counters, shelves, legs, hardware, fittings, and fixtures.

C. Remove damaged, soiled, or otherwise disfigured portions of manufactured metal casework and replace with new prior to final acceptance.

D. Wash finished manufacture metal casework in strict accordance with product manufacturer's directions and ensure that washed surfaces do not differ from clean unwashed surfaces. Any difference will be considered unsatisfactory manufactured metal casework.

3.05 PROTECTION OF INSTALLED WORK

A. Protect installed Work under provisions of Section 01 76 00 - Protecting Installed Work.

B. Protect manufacture metal casework and fixtures from damage until University's final acceptance.

C. Do not permit finished manufactured metal casework to be exposed to continued construction activity.

D. Provide all necessary protective measures to prevent exposure of manufactured metal casework and equipment from exposure to other construction activity.

END OF SECTION