UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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SECTION 12 31 00

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11/14, CHG 2: 11/16

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SECTION 12 31 00

MANUFACTURED METAL CASEWORK
11/14, CHG 2: 11/16

****
NOTE: This guide specification covers the requirements for metal casework.

Coordinate the use of this section in conjunction with and coordinated with the referenced sections.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
****

PART 1 GENERAL

1.1 REFERENCES

****
NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also

use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020) Structural Welding Code - Steel
AWS D1.3/D1.3M	(2018) Structural Welding Code - Sheet Steel

ASTM INTERNATIONAL (ASTM)

ASTM A167	(2011) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A325	(2014) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A325M	(2014) Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength (Metric)
ASTM A1008/A1008M	(2020) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
ASTM C1036	(2016) Standard Specification for Flat Glass
ASTM D4689	(2012) Standard Specification for Adhesive, Casein-Type
ASTM D4690	(2012) Standard Specification for Urea Formaldehyde Resin Adhesives
ASTM F594	(2009; R 2020) Standard Specification for Stainless Steel Nuts
ASTM F836M	(2020) Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric)

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.5	(2020) Cylinder and Input Devices for Locks

ANSI/BHMA A156.9	(2015) Cabinet Hardware
ANSI/BHMA A156.11	(2014) Cabinet Locks

INTERNATIONAL CODE COUNCIL (ICC)

ICC IPC	(2018) International Plumbing Code

KITCHEN CABINET MANUFACTURERS ASSOCIATION (KCMA)

KCMA A161.1	(2017) Performance & Construction Standards for Kitchen and Vanity Cabinets

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3	(2005) Standard for High-Pressure Decorative Laminates
NEMA LD 3.1	(1995) Performance, Application, Fabrication, and Installation of High-Pressure Decorative Laminates

SCIENTIFIC EQUIPMENT AND FURNITURE ASSOCIATION (SEFA)

SEFA 7	(2007) Recommended Practice for Laboratory and Hospital Fixtures

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS FF-B-588	(Rev E; Notice 1) Bolt, Toggle: and Expansion Sleeve, Screw
FS FF-S-325	(Basic; Int Amd 3; Notices 3, 4) Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry)
FS TT-C-490	(Rev G; 2019) Cleaning Methods for Ferrous Surfaces and Pretreatments for Organic Coatings
FS TT-E-489	(Rev J; Notice 2) Enamel, Alkyd, Glass, Low VOC Content
FS TT-E-491	(Rev C; Notice 1) Enamel; Gloss, Synthetic (for Metal and Wood Furniture)
FS TT-F-336	(Rev E; Notice 1) Filler, Wood, Paste
FS WW-P-541	(Rev E; Am 1; Notice 1) Plumbing Fixtures

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Pre-Installation Meeting

Within [30] [_____] calendar days after [date of award] [date of receipt by him of notice of award], submit for the approval of the Contracting Officer [six (6)] [_____] copies of outline drawings of all casework to be furnished under this contract, together with weights and overall

dimensions, and required samples. Ensure drawings show the general arrangement and overall dimensions of the casework, details of any casework supports[.][, and provisions for electrical outlets.][, special provisions for external cables and cords.] Submit the following for review and approval:

a. Fabrication Drawings

b. Installation Drawings

Submit installation drawings for metal cabinets. Include in drawings the location of cabinets, details of cabinet relationship and dimensional positions, and locations for roughing in plumbing, including sinks, faucets, strainers and cocks[, special electrical lines or conduits] [cables] [_____].

Submit manufacturer's catalog data and certificates for the following items showing conformance with the referenced standards contained in this section:

a. Cabinets

b. Corrosion-Resistant Steel

[c. Glass

] d. Adhesives

e. Filler Material

f. Fasteners

[g. Steel Sinks

][h. Service Fixtures

] i. Accessories and Hardware

j. Plastic Laminate

k. Countertops

Submit manufacturer's instructions for metal cabinet systems including special provisions required to install equipment components and system packages. Include special notices detailing impedances, hazards and safety precautions.

Submit manufacturer's standard color charts for metal cabinets showing the manufacturer's recommended color and finish selections.

1.3 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that

require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings[; G[, [____]]]

Installation Drawings[; G[, [____]]]

SD-03 Product Data

Cabinets[; G[, [____]]]

Corrosion-Resistant Steel[; G[, [____]]]

[Glass[; G[, [____]]]]

Adhesives[; G[, [____]]]

Filler Material[; G[, [____]]]

Fasteners[; G[, [____]]]

[Steel Sinks[; G[, [____]]]]

[Service Fixtures[; G[, [____]]]]

Accessories and Hardware[; G[, [____]]]

Plastic Laminate[; G[, [____]]]

Countertops[; G[, [____]]]

SD-04 Samples

Accessories and Hardware[; G[, [____]]][; G][; G, [_____]]

Manufacturer's Standard Color Charts[; G[, [____]]]

SD-07 Certificates

Corrosion-Resistant Steel[; G[, [____]]]

Glass[; G[, [____]]]

Adhesives[; G[, [____]]]

Filler Material[; G[, [____]]]

Fasteners[; G[, [____]]]

Steel Sinks[; G[, [____]]]

Service Fixtures[; G[, [____]]]

Accessories and Hardware[; G[, [____]]]

SD-08 Manufacturer's Instructions

Manufacturer's Instructions[; G[, [____]]]

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle metal casework in a manner that prevents damage or disfigurement.

Provide temporary skids under units weighing more than [_____] kilogram pounds.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

2.1.1 Design Requirements

Provide metal casework, factory-fabricated and finished in the manufacturer's standard sizes and finishes of the type, design, and configuration indicated. Construct casework as specified and meet the requirements of KCMA A161.1. Provide wall and base cabinet assemblies consisting of individual units joined into continuous sections. Accomplish fastenings to permit removal and replacement of individual units without affecting the remainder of the installation. Provide counters with watertight sink rim when indicated. Provide removable doors equipped with position stops to avoid accidental complete withdrawals.

Fix or adjust shelves as indicated.

2.2 MATERIALS

Provide corrosion-resistant steel conforming to ASTM A1008/A1008M, and ASTM A167, Type [302] [304] [316] Finish 4.

Provide glass conforming to ASTM C1036, Type I, Class 1, Quality q3, 6 millimeter 1/4 inch thick, for unframed sliding glass doors; other glass is to conform to ASTM C1036, Type II, Class 1, Quality q8, 5 millimeter 7/32 inch thick.

Use thermosetting urea-resin Type II Adhesives for application of plastic laminate conforming to ASTM D4690 as recommended by the manufacturer of the laminate. Use adhesive conforming to ASTM D4689 for wood members.

Provide filler material conforming to FS TT-F-336.

****
NOTE: Review ANSI/NEMA LD 3 and insert style, type, grade, class, and finish as required.
****

Provide plastic laminate conforming to ANSI/NEMA LD 3, Style [_____], Type [_____], Grade [_____], Class [_____], Finish [_____].

Provide accessories and hardware conforming to the following requirements, as applicable:

Extension drawer slides: ANSI/BHMA A156.9, Type B85071

[Semiconcealed hinges: ANSI/BHMA A156.9, Type B81201, 40 millimeter 1-1/2 inches]

[Full surface hinges: ANSI/BHMA A156.9, Type B81131, 40 millimeter 1-1/2 inches]

[Knob pulls: ANSI/BHMA A156.9, 25 millimeter 1-inch diameter, Type B12132]

[Bar type pulls: ANSI/BHMA A156.9, 100 millimeter 4-inch overall length, Type B12012]

Locks, keying, and keys: As directed

Catches: Magnetic, 22 Newton 5-pound pull

Sliding door set:

Impregnated fiberboard track

Nylon glides

Provide Fasteners conforming to the following:

Screws: Complying with ANSI Standards, Group, Type and Class as applicable

Anchoring Devices: FS FF-S-325, Group, Type, and Class as applicable

Toggle bolts: FS FF-B-588, Type I, Class A, Style 2

Nuts: ASTM F594, corrosion-resistant steel

Bolts: ASTM A325, heavy, hexagon head bolts corrosion-resistant steel

Nuts: ASTM F836M, corrosion-resistant steel

Bolts: ASTM A325M, heavy, hexagon head bolts corrosion-resistant steel

****
NOTE: Sink for inset-type installation is as specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE.
****

Corrosion-resistant Steel Sinks:

[18-gauge corrosion-resistant steel, integral with corrosion-resistant steel countertop

][1.3 millimeter 18-gauge corrosion-resistant steel, nonintegral, self-rimming

] Drain holes in center of bowl

Underside coated with 3 millimeter 1/8-inch thick sound deadener

Die-form, seamless, raised edges at front and ends

Cove corners to 13 millimeter 1/2-inch radius

Equip with strainers and tail pieces

Provide Service Fixtures conforming to the following requirements:

a. Provide fixtures in accordance with the water conservation policy as stated in the ICC IPC.

b. Faucets:

(1) Splashback mounted, cast brass, chrome plated, FS WW-P-541

(2) Deck mounted, cast brass, chrome plated, FS WW-P-541

c. Gas, air, and vacuum, distilled water, steam, and de-ionized water cocks: cast brass, chrome plated, ground key type

d. Drains, strainers, and taps: brass, chrome plated, FS WW-P-541

e. Index buttons: plastic, color codes in accordance with SEFA 7

f. Special items: provide nipples and locknuts with each fixture.

****
NOTE: Delete any of the following types that are not applicable:

Type I, zinc phosphate
Type II, iron phosphate
Type III, organic-paint, varnish, lacquer
****

[Metal pretreatment coatings: FS TT-C-490, Type I

][Metal pretreatment coatings: FS TT-C-490, Type II

][Metal pretreatment coatings: FS TT-C-490, Type III

][Enamel: FS TT-E-491, Class 2

]2.3 STEEL CABINET FABRICATION

2.3.1 General

Provide wall and base cabinets fabricated from 0.85 millimeter 22-gauge, cold-rolled furniture steel, except for backs of cabinets and backs of doors provide 0.70 millimeter 24-gauge steel. Construct cabinets with no raw edges or exposed flanges, with welds being flush and ground smooth on all exposed surfaces. Provide concealed fasteners at all exposed exterior surfaces. Provide doors and drawer fronts with panelized double-wall construction, not less than 15 millimeter 1/2-inch thick, with a sound-absorbing material adhered between the walls. Equip doors and drawers with rubber or plastic silencers and bumpers. Provide drawers with removable fronts, mounted on [metal guides] [renewable fiber guides] [plastic guides] and equipped with position stops for complete drawer withdrawal. Provide [fixed] [adjustable] shelving as indicated.

2.3.2 Workmanship

Align end panels, top rails, bottoms and vertical posts at intersections in same plane, without overlap. Grind exposed welds flush and smooth. Welding is to conform to AWS D1.1/D1.1M and AWS D1.3/D1.3M.

Additional casework construction requirements:

a. Welded assembly.

b. Fabricate with enclosed uprights or posts full height or width at front, include sides, backs, bottoms, soffits, ceilings under sloping tops, headers and rail, assembled to form an integral unit.

c. Form sides to make rabbeted stile 19 to 28 mm 3/4 to 1-1/8 inch wide, closed by channel containing shelf adjustment slots.

d. Make bottom of wall units flush, double panel construction.

e. Make top and cross rails of "U" shaped channel.

f. Enclose all backs and bottoms in cabinets, including drawer units.

g. Provide finish panel on exposed cabinet backs.

h. Do not use screws and bolts in construction or assembly of casework, except to secure hardware, applied door stops, accessories, removable panels and where casework is required to fastened end to end or back to back.

i. Fabricate casework, except benches, and desks with finished end panels.

j. Close flush exposed soffits of wall hung shelving, knee spaces in counters, and toe spaces at bases.

k. In base units with sinks provide on piece, lowered backs.

l. In base units with doors provide removable backs.

m. Provide built-in raceways or tubular or channel shaped members of casework for installation of wiring and electric work. Mount junction boxes on rear of cabinets. Electric work is specified in electrical sections of specifications.

n. Provide reinforcing for hardware.

o. Size Dimensions:

(1) Used dimensions shown or specified within tolerances specified.

(2) Tolerance:

(a) Depth: 325 mm 13-inches in lieu of 300 mm 12 -inches, 450 mm 18 inches in lieu of 400 mm 16 -inches, except wall hung units above counter 525 mm 21 inches to 600 mm 24 inches in lieu of 550 mm 22-inches.

(b) Width: Minus 25 mm one inch.

(c) Height: 25 mm 1-inch plus or minus for wall hung cabinets and counter mounted cabinets, excluding sloping tops. 25 mm 1-inch plus for floor standing cabinets,excluding base and sloping tops. Full height cabinets shown back to back same height.

(d) Manufacturer's tolerance for the length, depth or height: Not to exceed 1.58 mm 0.0625-inches

2.3.3 Minimum Thickness of Steel

	U. S. Standard Thickness GAUGE	(MILLIMETER)
Drawer fronts, backs, bodies, closure plates or scribe and filler strips less than 75 mm wide,filler strips less than 75 mm wide, sloping top, shelf reinforcement channel and shelves. Toe space or casework soffits and ceilings and ceilings under sloping tops.	20	0.89

	U. S. Standard Thickness GAUGE	(MILLIMETER)
Base pedestals, casework top sides, back, and bottom panels, closure scribe and filler strips 75 mm or more. Reinforcement for drawers with locks. Table legs, spreaders and stretchers, when fabricated of cold rolled tubing. Metal for desks; except legs and aprons. Door exterior and interior panels, flush or glazed. Cross rails of base units. Front bottom rails, back bottom rails; rails may be 1.49 mm 16 gauge thick. Uprights or posts. Top corner gussets.	18	1.20
Aprons, apron division, reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm 18 gauge thick.reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm 18 gauge thick.	16	1.49
Drawer runners door tracks	14	1.88
Base unit bottom corner gussets and leg sockets	12	2.64
Reinforcement for hinge reinforcement inside doors and cabinets	11	3

	U. S. Standard Thickness GAUGE	(INCH)
Drawer fronts, backs, bodies, closure plates or scribe and filler strips less than 75 mm wide,filler strips less than 75 mm wide, sloping top, shelf reinforcement channel and shelves. Toe space or casework soffits and ceilings and ceilings under sloping tops.	20	0.035
Base pedestals, casework top sides, back, and bottom panels, closure scribe and filler strips 75 mm or more. Reinforcement for drawers with locks. Table legs, spreaders and stretchers, when fabricated of cold rolled tubing. Metal for desks; except legs and aprons. Door exterior and interior panels, flush or glazed. Cross rails of base units. Front bottom rails, back bottom rails; rails may be 1.49 mm 16 gauge thick. Uprights or posts. Top corner gussets.	18	0.047
Aprons, apron division, reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm 18 gauge thick.reinforcing gussets, table legs, desk legs and aprons, spreaders and stretchers when formed without welding. Toe base gussets, drawer slides, and other metal work. Front top rails and back rails except top back rails may be 1.2 mm 18 gauge thick.	16	0.059
Drawer runners door tracks	14	1.88
Base unit bottom corner gussets and leg sockets	12	0.104
Reinforcement for hinge reinforcement inside doors and cabinets	12	3

2.3.4 Cabinets

Provide cabinets with sheet steel fronts, backs, sides, tops, and bottoms.

Form sides with rabbeted stiles 28 millimeter 1-1/8-inches wide, closed by welded channel containing embossed louvers spaced 40 millimeter 1-1/2-incheson center, for adjustable shelves.

Provide cabinets that have a steel channel-shaped top rail, 1.3 millimeter 18-gauge steel cross rails, and Z-shaped rear rail to engage 1.6 millimeter 16-gauge steel hanging bracket.

At base cabinets, provide 40 millimeter 1-1/2-inch long leveling screws for adjusting to floor variations that are accessible through plugged openings in bottom; install 1.9 millimeter 14-gauge gussets to support the screws.

At base cabinets, provide removable backs, knee space panels, or access doors where piping occurs.

2.3.5 Doors

Provide doors that are double-pan construction with 16 millimeter 5/8-inch thick telescoped inner pan into outer pan with exposed vertical edge formed into channel shape having returned lip over inner pan and offset to receive lip.

Coat panels with 3 millimeter 1/8-inch thick asphaltic sound deadener.

Fasten reinforcement for hardware attachment to inner pan and conceal.

Fit hinged doors with pairs of hinges, knob pulls, locks, and bumpers.

Bevel inside edge of cutout in front panel of glass door.

Set glass in continuous rubber gasket between panels.

Equip sliding doors with tracks, guides, bumpers, and bar pulls.

Additional considerations for doors:

a. Hollow metal type, flush and glazed doors not less than 16 mm 5/8 inch thick.

b. Fabricate flush metal doors of two panels formed into pans with corners welded and ground smooth. Provide flush doors with a sound deadening core.

c. Fabricate glazed metal doors with reinforced frame and construct either from one piece of steel, or have separate stiles and rails mitered and welded at corners, and welds ground smooth.

   (1) Secure removable glazing members with screws to back of doors.

   (2) Install glass in rubber or plastic glazing channels.

d. Provide sheet steel hinge reinforcement inside doors.

e. Sliding doors: Provide stops to prevent bypass.

f. Doors removable without use of tools except where equipped with locks.

2.3.6 Drawers

Provide drawer fronts that are double-pan construction with 16 millimeter 5/8-inch thick telescoped inner pan into outer pan with exposed vertical edge formed into channel shape having return lip over inner pan and offset to receive lip. Weld drawer bodies to front through flanges on sides and bottom, and to back through flanges at rear.

Extend flanges outward or downward, top of side, and backrolled.

Cove corners to 15 millimeter 1/2-inch radius.

****
NOTE: Delete locks when not applicable. When width of drawer exceeds 610 millimeter 24 inches, two pulls are required.
****

Provide drawer accessories including slides, bar pulls, lock and stop devices.

Additional considerations for drawers:

a. Drawer fronts flush hollow metal type not less than 16 mm 5/8-inch thick with sound deadening core. Fabricate of two panels formed into pans. Weld and grind smooth corners of drawer fronts.

b. Form bodies from one piece of steel, weld to drawer front.

c. Provide reinforcement for locks and provide rubber bumpers at both sides of drawer head to cushion closing.

d. Equip with roller suspension guides.

2.3.7 Shelves

****
NOTE: Specify stainless steel when sanitation is critical.
****

[Fabricate shelves from sheet steel with front and rear edges flanged down 20 millimeter 3/4-inch and hemmed back at 30 degrees to underside of shelf.
][Fabricate shelves from corrosion-resistant steel sheet with front and rear edges flanged down 20 millimeter 3/4-inch and hemmed back at 30 degrees to underside of shelf.

] Support shelves with 1.6 millimeter 16-gauge shelf clips inserted in slots in front stile and in form channel in back.

Notch flanges at sides to match and engage with embossments on side panels.

Additional considerations for shelves:

a. Capable of supporting an evenly distributed minimum load of 122 kg/m2 (twenty-five pounds per square foot) without visible distortion.

b. Flange shelves down 19 mm 3/4-inch on edges, with front and bearing edges flanged back 13 mm 1/2 inch.

c. For shelves over 1050 mm 42-inches in length and over 300 mm 12 inches in depth install 38 mm by 13 mm by 0.9 mm 1-1/2 x 1/2 x 0.0359 inch thick sheet steel hat channel reinforcement welded to underside midway between front and back and extending full length of shelf.

d. Weld shelves to metal back and ends unless shown adjustable.

e. Provide means of positive locking shelf in position, and to permit adjustment without use of tools.

f. On pharmacy on sloping shelf provide 13 mm 1/2-inch wide clear acrylic plastic raised edge, 3 mm 1/8-inch thick, secured to front edge of shelf.

2.3.8 Dustcover Tops

Provide front face height of 25 millimeter 1-inch.

Slope dustcover tops upward 30 degrees from front to back of cabinet. Equip dustcover tops for attaching from inside of cabinet.

Additional considerations for sloping tops:

a. Provide sloping tops for casework where shown.

b. Where ceilings interfere with installation of sloping tops. Provide filler plates as specified.

c. Omit sloping tops or filler plates whenever ceiling material is turned down and furred-in at face of casework.

d. Provide exposed ends of sloping tops with flush closures.

e. Fasten sloping tops with sheet metal screws inserted from cabinet interior; space fastener as recommended by manufacturer.

2.3.9 Finish

Prime and factory finish steel cabinets with two coats of synthetic enamel, baking quality, conforming to FS TT-E-489, Class B. Provide colors as selected.

2.3.10 Welded Cabinets

Conform to KCMA A161.1, all welded construction.

****
NOTE: Delete when not applicable.
****

[2.3.11 Doors and Drawer Fronts

Doors and Drawer Fronts may be as specified for wood cabinets in lieu of metal pan construction.

]2.3.12 Undercounter Table and Bench Frames

Requirements for undercounter table and bench frames:

a. Using welded construction.

b. Open frame type with aprons and legs when required.

c. Aprons:

(1) Channels shaped welded at corners, with leg sockets and reinforcing triangular corner gussets welded in corners; 05-03M12301-9.

(2) Pierce sockets to receive leg bolts and notch gussets to receive legs.

(3) Upper flange perforated or slotted to receive screws at 200 mm 8-inch centers, and back channels when installed against wall. Sizes lots for 6 mm 1/4-inch anchor bolts.

(4) Pierce aprons to receive drawer formation, rail at top of drawer opening. Install channel shaped apron division welded at ends, 762 mm 30-inches apart to front and back aprons, or at each side of drawer.

(5) Fabricate metal components from sheet steel.

(6) Use 1.5 mm 0.0598-inch thick sheet for gussets and channel aprons.

(7) Use 1.2 mm 0.0478-inch thick sheet for other items.

(8) At knee space, provide exposed metal sides and metal closure plate for soffit. Where shown at knee space, provide exposed metal back secured with continuous angle closures at both side.

d. Legs:

(1) Cold rolled tubing or 1.5 mm 0.0598-inch formed steel.

(2) Leveling-anchoring device at floor.

(3) Stud bolt at top for attachment to leg socket.

e. Leg Braces:

(1) Tables and benches not anchored to walls.

(2) Brace back against front legs near bottom with steel angle channel or tubular braces.

(3) Fasten braces together with steel straps.

f. Leg Shoes:

(1) Fit laboratory casework legs at bottom with either stainless steel, aluminum, or chromium plated brass shoes, not less than 25 mm one inch in height.

(2) Fit other legs with a movable molded vinyl shoe 100 mm 4 inches high and coved at bottom.

2.3.13 Closures and Filler Strips at Pipe Spaces

Requirements for closures and filler strips at pipe spaces:

a. Flat steel strips or plates.

b. Openings less than 200 mm 8-inches wide: 1.2 mm 0.047-inch thick.

c. Openings more than 200 mm 8-inches wide 0.9 mm 0.359-inches wide.

[2.4 MISCELLANEOUS CABINETS

****
NOTE: Delete inapplicable paragraphs, or state appropriate options.
****

[2.4.1 Combination Sink-and-Base Cabinet

A combination sink-and-base cabinet unit may be furnished in lieu of the base cabinet and inset sink indicated provided the combination unit affords facilities and space equal to those indicated and provided the combination unit matches the adjacent units in materials and construction. Provide sink, with matching drainboards, made of [corrosion-resistant steel] [porcelain-enamel steel] and equipped with a chromium-plated [swinging-spout faucet, chromium-plated water-control valves,] [automatic faucet] and chromium-plated cup strainer. Make joints between sink and drainboard and between drainboard and counter top watertight.

][2.4.2 Special Purpose Cabinets

Provide special-purpose cabinets, such as cabinets for eye-level oven units, countertop range units, and built-in refrigerators as indicated[on the drawings,] and of the same materials and construction as adjacent cabinets. Provide space adjacent to sink for a dishwasher, as indicated.

]]2.5 ACCESSORIES AND HARDWARE

Furnish accessories such as utility shelves and racks for extracts, condiments, and towels; bins for sugar and flour; breadboxes; and trays for cutlery and flatware as indicated.

Provide corrosion resistant hardware. Provide exposed hardware with a chromium-plated finish or a corrosion-resistant finish as approved. Paint semi-concealed hinges on cabinets where paint finish is required to match the cabinets. Equip doors with [bullet-type catches] [spring hinges] [magnetic-type catches]. Provide door and drawer pulls as indicated.

2.6 CABINETS

The work includes providing new factory-finished kitchen wall and base cabinets with:

[a. High pressure decorative laminate (HPDL)

][b. Granite countertops

][c. Marble countertops

][d. Synthetic resins countertops

][e. ffrp countertops

][f. Stainless steel countertops

][g. Tile countertops

][h. [_____] custom countertops

] Bathroom vanity cabinets [with HPDL countertops][to receive combination lavatory-countertops as specified in Section 22 00 00 PLUMBING, GENERAL PURPOSE].

Provide cabinets conforming to KCMA A161.1, and bear the "KCMA Certified Cabinet" seal of the Kitchen Cabinet Manufacturers Association. Provide Countertops that conform to NEMA LD 3.1 and requirements specified herein.

2.6.1 Cabinet Locks

Requirements for cabinet locks:

a. Where locks are shown.

b. Locked pair of hinged door over 900 mm 36 inches high:

(1) ANSI/BHMA A156.5, similar to E0261, key one side.

(2) On active leaf use three-point locking device, consisting of two steel rods and lever controlled cam at lock, to operate by lever having lock cylinder housed therein.

(3) On inactive leaf use dummy lever of same design.

(4) Provide keeper holes for locking device rods and cam.

(5) Use two point locking device both doors of cabinet 6D similar to ANSI/BHMA A156.5, E0251, key one side.

c. Door and Drawer: ANSI/BHMA A156.11 cam locks.

(1) Drawer and Hinged Door up to 900 mm 36-inches high: E07261. 05-03M 12301-11

(2) Pin-tumbler, cylinder type lock with not less than four pins. Disc tumbler lock "duo A" with brass working parts and case, as manufactured by Illinois Lock Company are acceptable.

(3) Sliding Door: E07161.

d. Key locks differently for each type casework and master key for each service, such as Nursing Units, Psychiatric, Administrative, Pharmacy.

(1) Key drug locker inner door different from outer door.

(2) Provide two keys per lock.

(3) Provide six master keys per service or Nursing Unit.

e. Marking of Locks and Keys:

(1) 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.

(2) Key change numbers stamped on keys.

(3) Key change numbers to provide sufficient information for manufacturer to replace key.

2.6.2 Cabinet Hardware

Comply with ANSI/BHMA A156.9.

Requirements for cabinet hardware:

a. Door/Drawer Pulls: B02011.

(1) One for drawers up to 575 mm 23-inches wide.

(2) Two for drawers over 575 mm 23-inches wide.

(3) Sliding door flush pull, each door: B02201.

[b. Door in seismic zones: B03352.

(1) Do not provide thumb latch on doors equipped with three point locking device.

(2) Use lever operated two point latching device on paired doors over 900 mm 36-inches high if three point locking or latching device is not used.

] c. Cabinet Door Catch:

(1) Install at bottom of wall cabinets, top of base cabinets and top and bottom of full height cabinet doors over 1200 mm 48-inches.

(2) Omit on doors with locks.

d. Drawer Slides:

(1) Use B05051 for drawers over 150 mm 6-inches deep.

(2) Use B05052 for drawers 75 to 150 mm 3 to 6-inches deep.

(3) Use B05053 for drawers less than 75 mm 3-inches deep.

2.7 FINISH

2.7.1 Cabinet Finish

Provide cabinets with a factory-applied durable finish in accordance with

KCMA A161.1 requirements and of a type standard with the manufacturer.

2.8 COLOR, TEXTURE, AND PATTERN

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NOTE: Coordinate editing of color reference sentence(s) with the Government. Generally, Section 09 06 00 SCHEDULES FOR FINISHES or drawing is used when the project is designed by an Architect or Interior designer. Select color from manufacturers standard colors or identified as a manufacturers color in this specification only when the project is very simple and has minimal finishes.

When the Government directs that color be located in the drawings add a note that states: "Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

Prior to specifying a custom color finish, research to determine if additional cost and lead time is feasible. There is often a minimum order requirement; this requirement will also affect future orders.

When a manufacturer's name, stock number, pattern, and color is used, be certain that the product conforms to this specification, as edited.

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Provide color [in accordance with Section 09 06 00 SCHEDULES FOR FINISHES.] [as indicated on the drawings.] [as selected from manufacturers standard colors.] [[_____.] Color listed is not intended to limit the selection of equal colors from other manufacturers.]

[2.9 DISPENSING TRAYS AND BINS

Requirements for dispensing trays and bins:

a. Design trays and bins to fit cabinets where shown.

b. Fabricate of steel, polypropylene, fiberglass reinforced polyester resin, or other suitable material.

c. Lock securely in place without the use of tools.

d. Fit at angle to provide gravity feed where shown.

e. Dispensing Trays:

(1) Equip trays with two longitudinal dividers adjustable to three position.

(2) Approximate dimensions: 150 mm 6-inches in width 75 mm 3-inches

(in depth, and length to suit cabinets depth furnished.

f. Dispensing Bins:

(1) Open front, except for retaining rim. 05-03M 12301-14

(2) Approximate dimensions: 150 mm 6-inches in width, 125 mm 5-inches in depth, and length to suit cabinets furnished.

][2.10 ELECTRICAL FIXTURES

Requirements for dispensing electrical fixtures:

a. Comply with requirements of DIVISION 26 ELECTRICAL specifications for fixtures, receptacles, wiring and junction boxes required for fixtures and receptacles, included with casework.

b. Suitable for use with electrical system specified and shown.

c. Factory install in casework.

][2.11 SUSPENSION SYSTEM FOR INTERCHANGEABLE CASEWORK

Requirements for dispensing suspension systems for interchangeable casework:

a. Provide a suspension system for independent suspension of interchangeable under-counter cabinets and of countertops. Provide for removal or exchange of under counter cabinets of various heights, widths and types, and for vertical adjustment of counter tops to heights indicated on drawings.

b. Suspension Frames: Fabricate from 32 mm 1-1/4-inch square or 25 mm 1 inch x 38 mm 1-1/2-inch rectangular, 2.6 mm 0.104-inch 12 gauge steel tubing welded to form full rectangle. Provide integral, adjustable leveling device in steel leg with non marring foot cap.

c. Provide mounting channels and support frames which allow for pipe chases and service channels when required.

d. Provide cabinets with a 1.49 mm .059-inch steel shaped form welded across the entire width of back to engage a continuous slot in a wall mounting channel. Provide final positive location and locking of case in position with two fastening devices through case stile at front.

e. Paint all construction materials that are exposed.

][2.12 WHEELED CARRIER

Provide a wheeled carrier to facilitate installation, removal, and transport of interchangeable cases as part of the interchangeable [laboratory]furniture system.

]PART 3 EXECUTION

3.1 INSTALLATION

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NOTE: Installation of sinks is per the requirements

of Section 22 00 00 PLUMBING, GENERAL PURPOSE.
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Install casework as described in manufacturers installation drawings in accordance with design intent.

a. Level base cabinets by adjusting leveling screws.

b. Secure cases permanently to floor and wall construction, where applicable.

c. Secure wall cases in position with screws to blocking, where applicable.

d. Bolt adjoining cases together.

e. Align doors, adjust hardware, and clean surfaces.

3.1.1 Coordination

Before installing casework, verify wall and floor surfaces covered by casework have been finished.

Verify location and size of mechanical and electrical services as required.

Verify reinforcement of walls and partitions for support and anchorage of casework.

3.1.2 Fastenings and Anchorage

Do not anchor to wood ground strips.

Provide hat shape metal spacers where fasteners span gaps or spaces 05-03M 12301-16.

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.

Use 6 mm 1/4-inch diameter hex bolts for securing cabinets together.

Use 6 mm 1/4-inch by minimum 38 mm 1-1/2-inch length lag bolt anchorage to wood blocking for concealed fasteners.

Use not less than No. 12 or 14 wood screws with not less than 38 mm 1-1/2-inch penetration into wood blocking.

Space fastening devices 300 mm 12-inches on center with minimum of three fasteners in 900 or 1200 mm 3 or 4-foot unit width.

Anchor floor mounted cabinets with a minimum of four bolts through corner gussets. Anchor bolts may be combined with or separate from leveling device.

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.

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.

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

3.1.3 Closures and Filler Plates

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, and secured with sheet metal screws to tubular or channel members of units, or bolts where exposed on inside.

Where ceilings interfere with installation of sloping tops, omit sloping tops and provide flat steel filler plates.

a. Secure filler plates to casework top members, unless shown otherwise.

b. Secure filler plates more than 150 mm 6-inches in width top edge to a continuous 25 by 25 mm one by one inch 0.889 mm .035-inches thick steel formed steel angle with screws.

c. Anchor angle to ceiling with toggle bolts, 05-03M 12301-17

Install closure strips at exposed ends of pipe space and offset opening into concealed space. Paint closure strips and fillers with same finishes as cabinets. Caulk and seal laboratory furniture as specified in Section 07 92 00 JOINT SEALANTS

3.1.4 Cabinets

Install in available space; arranged for safe and convenient operation and maintenance. Align cabinets for flush joints except where shown otherwise.

Install cabinets level with bottom of wall cabinets in alignment and tops of base cabinets aligned. Install corner cabinets with hinges on corner side with filler or spacers sufficient to allow opening of drawers.

Plug Buttons:

a. Install plug buttons in predrilled or prepunched perforations not used.

b. Use chromium plate plug buttons or buttons finish to match adjacent surfaces.

Cabinets 6D: Ground to nearest cold water pipe in accordance with NFPA, Underwriters Laboratories, Inc., or other nationally recognized laboratory approved ground specified system.

Cabinets PH77:

a. Install undercounter unit, PH77U, on base to bring cabinet to same height as adjacent cabinets.

b. Install wall hung units, PH77N, as for wall cabinets, bolt together with security type bolts.

c. Install stacked units, PH77D, bolted together and to base with security type bolts.

3.2 CLEANING

Remove crating and packing materials from premises. Wipe down surfaces to remove fingerprints and markings and leave in clean condition.

3.3 FIELD QUALITY CONTROL

3.3.1 Inspection

Examine casework grounds and supports for adequate anchorage, foreign material, moisture, and unevenness that could prevent quality casework installation. Ensure that electrical and plumbing rough-ins for casework are complete. Do not proceed with installation until defects are corrected.

-- End of Section --