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Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   1. SUMMARY
      1. Section Includes:

This Section is for specifying standard laboratory casework; if custom products are required, consider indicating that in appropriate subparagraphs below.

* + - 1. Wood laboratory casework.
      2. Laboratory casework system.
      3. Tables frames and tops.
      4. Laboratory accessories.
      5. Water, laboratory gas, and electrical service fittings.
    1. Related Requirements:
       1. Add related equipment requirements as required.

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

* 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

"Hardwood Plywood" Paragraph below is based on definition in HPVA HP-1.

* + 1. Hardwood Plywood: A panel product composed of layers, or plies, of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive and faced both front and back with hardwood veneers.
  1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + 1. Preinstallation Conference: Conduct conference at Project site.

Retain "Keying Conference" Paragraph below if locks are required to be keyed as directed.

* 1. COORDINATION

Usually delete first paragraph below and show reinforcements on Drawings. Delete if cabinets are installed directly on masonry or on continuous hanging strips, or if using support framing system.

* + 1. Coordinate installation of laboratory casework with installation of fume hoods and other laboratory equipment.
  1. ACTION SUBMITTALS
     1. Product Data: For each type of product.
     2. Shop Drawings: For laboratory casework. Include plans, elevations, sections, and attachment details.
        1. Indicate types and sizes of cabinets.

Retain applicable subparagraphs below.

* + - 1. Indicate locations of hardware and keying of locks.
      2. Indicate locations and types of service fittings.

Retain first subparagraph below if casework includes a utility space.

* + - 1. Include details of utility spaces showing supports for conduits and piping.

Retain first subparagraph below if casework includes a support framing system.

* + - 1. Include details of exposed conduits, if required, for service fittings.
      2. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
      3. Include coordinated dimensions for laboratory equipment specified in other Sections.
    1. Samples for Initial Selection: For factory-applied finishes and other materials requiring color selection.

Delete "Samples for Initial Selection" Paragraph above if preselecting and specifying or scheduling colors and other characteristics. Retain one of two "Samples for Verification" paragraphs below with or without above.

Usually retain "Samples for Verification" Paragraph above and delete "Samples for Verification" Paragraph below; retain below if full-size Samples are required. Insert or delete Samples below to suit Project. Below may add cost to Project and may be unnecessary if restricting manufacturers to a list of those known to be acceptable.

Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor.

* 1. INFORMATIONAL SUBMITTALS

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + 1. Qualification Data: For manufacturer.
    2. Product Test Reports for Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
    3. Product Test Reports for Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface materials with requirements specified for chemical and physical resistance.
  1. MAINTENANCE MATERIAL SUBMITTALS
     1. Furnish complete touchup kit for each type and color of metal laboratory casework provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.
     2. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

"Cabinet Mounting Clips and Related Hardware" Subparagraph below is an example only; revise to suit Project.

* + - 1. Cabinet Mounting Clips and Related Hardware: Quantity equal to 5 percent of amount installed, but no fewer than 20 of each type.

"Modular Countertop Units" Subparagraph below is an example only; revise to suit Project.

* 1. QUALITY ASSURANCE

Usually retain first "Manufacturer Qualifications" Paragraph below for metal laboratory casework to help ensure that all bidders can comply with requirements.

* + 1. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 M and SEFA 8 W.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.
  2. FIELD CONDITIONS

Revise or delete "Environmental Limitations" Paragraph below if casework contains no wood products.

* + 1. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Section 016000 "Product Requirements."

* 1. MANUFACTURERS
     1. Basis-of-Design Product: Subject to compliance with requirements, provide the Enterprise Modular Component System and the Research Collection as manufactured by Kewaunee Scientific Corporation or comparable product by one of the following:
        1. Saxton Bradley (SBI)
        2. New England Lab
        3. Approved Equal
     2. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.

Retain "Product Designations" Paragraph below if using manufacturer's catalog numbers to designate cabinet types. Revise to suit office practice. Below may not be allowed for public projects.

* + 1. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes and similar door and drawer configurations and complying with Specifications may be considered.
  1. PERFORMANCE REQUIREMENTS

Retain "System Structural Performance" Paragraph below only for casework systems that include support framing. SEFA 8 M, which is referenced in "Casework, General" Article, includes structural performance requirements for base cabinets, shelving, upper cabinets, tall cabinets, and tables.

Loads in five subparagraphs below are examples only. Verify client's needs and manufacturers' capabilities, and revise accordingly.

* + 1. Work Surfaces (Including Tops of Suspended Base Cabinets): 160 lb/ft. (240 kg/m).
    2. Shelves: 40 lb/sq. ft. (200 kg/sq. m).

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for seismic design.

Model building codes and ASCE/SEI 7 establish criteria for buildings subject to earthquake motions. Verify requirements of authorities having jurisdiction.

Design earthquake spectral response acceleration, short period (Sds) is determined by Project's location and site classification. This information is usually provided in structural notes on Drawings.

Component Importance Factor is generally 1.0 unless laboratory casework contains hazardous content, in which case the Component Importance Factor is 1.5, or unless the structure is in Seismic Use Group III and laboratory casework is necessary for continued operation of facility or failure of laboratory casework could impair continued operation of facility, in which case the Component Importance Factor is 1.5.

Retain two load subparagraphs below for cabinets that are not part of a casework system that includes support framing. Options are examples only. Verify client's needs and manufacturers' capabilities, and revise accordingly.

* 1. CASEWORK, GENERAL
     1. Casework Product Standard: Comply with SEFA 8 M, "Laboratory Grade Metal Casework and SEFA 8 W, "Laboratory Grade Wood Casework.

Retain "Flammable Liquid Storage" Paragraph below if using flammable liquid storage cabinets. Retain second option if FM approval is required for insurance purposes.

* + 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  1. METAL CABINET AND TABLE MATERIALS
     1. Metal: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.

Usually delete "Nominal Metal Thickness" Paragraph below if retaining requirement for compliance with SEFA 8 M in "Casework, General" Article.

Grades for MDF changed with the 2002 edition of ANSI A208.2. Grade 130 is approximately equivalent to previous Grade MD.

* + - 1. MDF: ANSI A208.2, Grade 130
  1. WOOD CASEWORK
     1. Design: Full overlay with square edges.
     2. Wood Species: White maple.
     3. Cut: Plain sliced/sawn.
     4. Matching:
        1. None required; select and arrange components for compatible grain and color.
     5. Grain Direction:
        1. Vertical on both doors and drawer fronts, with continuous vertical matching.
        2. Vertical on end panels.
     6. Exposed Materials:
        1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
        2. Plywood: Hardwood plywood, either veneer core or particleboard core, made without urea formaldehyde with face veneer of species indicated. Grade A exposed faces, at least 1/50 inch (0.5 mm) thick, and Grade J crossbands. Provide backs of same species as faces.
        3. Solid Wood: Clear hardwood lumber of species indicated.
     7. Semiexposed Materials:
        1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.
        2. Plywood: Hardwood plywood of same species as exposed plywood. Grade B faces and Grade J crossbands. Provide backs of same species as faces.
        3. Provide solid wood or hardwood plywood for semiexposed surfaces unless otherwise indicated.
     8. Concealed Materials:
        1. Solid Wood: Any species, with no defects affecting strength or utility.
        2. Plywood: Hardwood plywood. Provide backs of same species as faces.
        3. Particleboard.
        4. MDF.
        5. Hardboard.
  2. WOOD CABINET MATERIALS
     1. General:
        1. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
     2. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
     3. MDF: ANSI A208.2, Grade 130.
     4. Particleboard: ANSI A208.1, Grade M-2.
     5. Hardboard: ANSI A135.4, Class 1 Tempered.
     6. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch- (3-mm-) thick, solid wood of same species as face veneer.
        1. Select wood edgebanding for grain and color compatible with face veneers.
  3. TABLETOP AND SINK MATERIALS

Retain options in three effect subparagraphs below to suit Project. For maximum competition, delete options in "No Effect" Subparagraph and retain those in "Slight Effect" and "Moderate Effect" subparagraphs.

Resorcinol adhesive has good chemical resistance, is resistant to boiling water, and has low flame-spread index but cannot generally be used for postformed countertops or with through-color laminates. Urea-formaldehyde adhesive is resistant to oil, grease, and common solvents; is water resistant; and can be used for postformed countertops and with through-color laminates. Contact adhesives vary in water resistance and resistance to severe environments but can be used for postformed countertops and through-color laminates.

* + 1. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
       1. Physical Properties:
          1. Flexural Strength: Not less than 10,000 psi (70 MPa).
          2. Modulus of Elasticity: Not less than 2,000,000 psi (1400 MPa).
          3. Hardness (Rockwell M): Not less than 100.
          4. Water Absorption (24 Hours): Not more than 0.02 percent.
          5. Heat Distortion Point: Not less than 260 deg F (127 deg C).
       2. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
          1. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formaldehyde, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
          2. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
       3. Color: As selected by Owner from manufacturer's full range.

Retain Type 316L in "Stainless-Steel Sheet" Paragraph below if constant wetting by acids is likely. Type 304 cannot be easily distinguished from Type 316L and costs significantly less.

* 1. METAL CABINETS AND TABLES
     1. Fabrication: Assemble and finish units at point of manufacture. Use precision dies for interchangeability of like-size drawers, doors, and similar parts. Perform assembly on precision jigs to provide units that are square. Reinforce units with angles, gussets, and channels. Except where otherwise specified, integrally frame and weld cabinet bodies to form dirt- and vermin-resistant enclosures. Where applicable, reinforce base cabinets for sink support. Maintain uniform clearance around door and drawer fronts of 1/16 to 3/32 inch (1.5 to 2.4 mm).
     2. Flush Doors: Outer and inner pans that nest into box formation, with full-height channel reinforcements at center of door. Fill doors with noncombustible, sound-deadening material.
     3. Hinged Doors: Mortise for hinges and reinforce with angles welded inside inner pans at hinge edge.

"Drawers" Paragraph below describes typical metal drawer construction; revise if other construction is required. Delete option if retaining heavy-duty drawer slides in "Hardware" Article.

* + 1. Drawers: Fronts made from outer and inner pans that nest into box formation, with no raw metal edges at top. Sides, back, and bottom fabricated in one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Provide drawers with rubber bumpers, polymer roller slides, and positive stops to prevent metal-to-metal contact or accidental removal.

Retain first five paragraphs below if wood doors and drawer fronts are required. Verify availability with manufacturers.

Verify, with manufacturers, availability of designs in "Design of Wood Doors and Drawer Fronts" Paragraph below.

below are examples only; revise to suit products available from manufacturers. Plain sliced is typical cut for wood doors and drawer fronts.

First subparagraph below applies to drawer fronts with horizontal grain.

First subparagraph below applies to drawer fronts with horizontal grain.

* + 1. Freestanding Workstation system shall be comprised of Work Surface Support Frames adjustable from 31” to 37” AFF, and a Rear Frame Support Structure, single or double sided, incorporating a vertical post and horizontal support. The vertical supports shall incorporate individual slots for adjustable shelving and accessories. The vertical support shall incorporate a chase for plumbing and wiring of services.
       1. Double-sided Rear Frame Support Structure: Rear frame support structures shall consist of four (4) 2” diameter full height vertical members, connected with a horizontal framing assembly that incorporates upper and lower horizontal cross rails. The upper cross rail shall provide a utility trough the full length of the table. The lower cross rail shall support integral double sided electrical and central plumbing raceway. The raceway may be specified with plumbing, electrical & data as required. Plumbing lines and wiring shall feed through a 6” vertical member centered between the full height vertical members. The 6” vertical member and the lower horizontal member shall have easily removable access panels, with no exposed fasteners. For 42” and 48” tables, the center vertical member can be eliminated if plumbing fittings are not required in the horizontal lower member, allowing for full length shelves. In addition to the horizontal framing structure, the 2” vertical members shall be able to accommodate up to three plumbing services each and a duplex electrical receptacle located below the worksurface. Each vertical member shall include non-marring 3/8” diameter, levelers. The vertical members shall have shelf/accessory slots punched on 1” increments starting at 55” above AFF to top of upright.
    2. Four Leg Adjustable Table: The four leg table shall consist of a worksurface support frame. The frame shall be a welded four sided assembly consisting of 11 gauge steel channel formations, front adjustable height legs, and rear attachment collars. Two additional leg members shall be bolted to the rear attachment collars to provide a four leg self-supporting table frame., adjustable in height from 31” to 37” AFF including 1” work surface. Front and rear leg members shall be 11 gauge steel tubes, 2” outside diameter and 1.75” inner telescoping leg capable of vertical adjustment in 2” increments. Legs shall include non-marring, 3/8” diameter, levelers. d. Load rating shall be 100lbs per linear foot of length to a maximum of 800lbs. With uniformly distributed load, the maximum allowable deflection shall be .125” measured at the front center rail.

Retain subparagraph below if required.

"Utility-Space Framing" Paragraph below is used to support utility services between back-to-back base cabinets and between base cabinets and walls where utilities are not within walls.

Delete subparagraphs below if no utility space is required.

* 1. WOOD CABINET FABRICATION
     1. Construction: Provide wood-faced laboratory casework complying with SEFA 8 W and of the following minimum construction:]
        1. Bottoms of Base Cabinets and Tall Cabinets: 3/4-inch- (19-mm-) thick, veneer-core hardwood plywood.
        2. Ends of Cabinets: 3/4-inch- (19-mm-) thick, hardwood plywood.
        3. Shelves: 1-inch- (25-mm-) thick, veneer-core hardwood plywood.
        4. Drawer Fronts: 3/4-inch- (19-mm-) thick, hardwood plywood or solid hardwood.
        5. Drawer Sides and Backs: 1/2-inch- (12.7-mm-) thick, solid hardwood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
        6. Drawer Bottoms: 1/4-inch- (6.4-mm-) thick, veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers.
        7. Doors 48 Inches (1200 mm) High or Less: 3/4 inch (19 mm) thick, with particleboard or MDF cores, solid-hardwood stiles and rails, and hardwood face veneers and crossbands.
  2. METAL CABINET FINISH
     1. General: Prepare, treat, and finish welded assemblies after assembling. Prepare, treat, and finish components that are to be assembled with mechanical fasteners before assembling. Prepare, treat, and finish concealed surfaces same as exposed surfaces.
     2. Preparation: After assembly, clean surfaces of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
     3. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply laboratory casework manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).
        1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 M. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

Insert other chemical-resistance requirements based on specific chemicals to be used in Project's laboratories if required.

Retain one of three options in "Colors for Metal Laboratory Casework Finish" Subparagraph below. If retaining first, indicate colors in a separate schedule.

* + - 1. Colors for Metal Laboratory Casework Finish: As selected by Owner from manufacturer's full range.
  1. WOOD FINISH

Retain this article for wood cabinets and for metal cabinets with wood doors and drawer fronts.

* + 1. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
    2. Staining: Remove fibers and dust and apply stain to exposed and semiexposed surfaces as necessary to match approved Samples. Apply stain in a manner that produces a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.

Retain one of three options in "Stain Color" Subparagraph below. If retaining first, indicate colors in a separate schedule.

* + - 1. Stain Color: As selected by Owner from manufacturer's full range.
    1. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard three-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
       1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 M. Acceptance level for chemical spot test shall be no more than three Level 3 conditions.

Insert other chemical-resistance requirements based on specific chemicals to be used in Project's laboratories if required. Also insert other test requirements to suit Project.

* 1. HARDWARE

Most laboratory casework manufacturers offer choices for cabinet hardware designs, materials, and finishes, but not all choices are available from all manufacturers. Verify availability with manufacturers.

* + 1. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

Hardware items in "Hinges" Paragraph below are typical; revise to suit Project.

* + 1. Hinges: Stainless steel, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two for doors 48 inches (1200 mm) high or less and three for doors more than 48 inches (1200 mm) high.
    2. Hinged Door and Drawer Pulls: stainless-steel, back-mounted pulls. Provide two pulls for drawers more than 24 inches (600 mm) wide.

If retaining "Design" and "Overall Size" subparagraphs below, verify availability of designs and sizes with manufacturers. Delete if manufacturer's standard pulls are acceptable.

* + - 1. Design: Wire pulls
      2. Overall Size: As selected from manufacturer's full range.

If retaining "Design and Size" Subparagraph below, verify availability of designs and sizes with manufacturers. Delete if manufacturer's standard pulls are acceptable.

Catches can be eliminated if using self-closing hinges. Roller spring catches cost more than magnetic catches but are more effective.

* + 1. Door Catches: Dual, self-aligning, permanent magnet catches. Provide two catches on doors more than 48 inches (1200 mm) high.

Manufacturers' standard products may not comply with requirements in "Drawer Slides" Paragraph below; retaining below may increase cost.

* + 1. Drawer Slides: Side mounted, epoxy-coated steel, self-closing; designed to prevent rebound when drawers are closed; complying with BHMA A156.9, Type B05091.

Grades in first two subparagraphs below correspond to the following initial load test requirements: Grade 1, 50 lb (22.2 kg); Grade 1HD-100, 100 lb (44.5 kg); Grade 1HD-200, 200 lb (90 kg).

Retain first option in "Locks" Paragraph below if more than 225 key changes are required. Most cabinet manufacturers offer disc tumbler locks as standard rather than pin tumbler locks. For laboratories in schools, delete second option, which allows cams attached with screws or nuts rather than permanently attached cams.

* 1. LABORATORY ACCESSORIES

Paragraphs in this article are examples only; revise to suit Project. Indicate sizes, configurations, and locations on Drawings.

* + 1. Pegboards: Stainless steel pegboards with removable pegs and stainless-steel drip troughs with drain outlet.
  1. ELECTRICAL AND COMMUNICATION SERVICE FITTINGS

Delete this article if using surface raceways, specified in Section 260533 "Raceways and Boxes for Electrical Systems," applied to or above countertop backsplashes, instead of service fittings to provide electrical, communication, and data service.

* + 1. Service Fittings, General: Provide units complete with metal housings, receptacles, switches, pilot lights, cover plates, accessories, and gaskets required for mounting on laboratory casework.

If retaining two subparagraphs below, delete "Receptacles," "Switches," "Voice and Data Communication Outlets," and "Cover Plates" paragraphs below.

* + 1. Receptacles: Comply with NEMA WD 1, NEMA WD 6, and UL 498. Duplex type, Configuration 5 20R.

Hospital grade must meet performance requirements applicable to high-abuse areas.

* + - 1. Color of Receptacles: As selected by Owner unless otherwise indicated or required by NFPA 70.

Delete "GFCI Receptacles" Subparagraph below if not required or if receptacles are on ground-fault circuit breakers. If retaining, indicate locations on Drawings or in schedules.

If retaining "TVSS (Transient Voltage Surge Suppressor) Receptacles" Subparagraph below, indicate locations on Drawings or in schedules.

Insert explosion-proof or other special receptacles if required. See Section 262726 "Wiring Devices."

If retaining first subparagraph below, indicate locations on Drawings or in schedules.

Insert explosion-proof or other special switches if required.

Revise "Cover Plates" Paragraph below if other cover plates are required.

* + 1. Cover Plates: Provide satin finish, Type 304, stainless-steel cover plates with formed, beveled edges.
    2. Cover-Plate Identification: Use 1/4-inch- (6-mm-) high letters unless otherwise indicated. For stainless steel or chrome-plated metal, stamp or etch plate and fill in letters with black enamel.
       1. Provide on all cover plates.
          1. Receptacles other than standard 125-V duplex, grounding type.
          2. Receptacles, switches, and other locations indicated.
       2. Provide the following information:
          1. Voltage and phase for receptacles other than standard 125-V duplex, grounding type.
          2. Indicate equipment being controlled by switches and thermal-overload switches.
          3. Number of the breaker in panelboard that controls device.
    3. Line-Type Fittings: Provide with cast-metal boxes with threaded holes for mounting on rigid steel conduit. Provide cover plates same size as boxes.
    4. Recessed-Type Fittings: Provide with galvanized-steel boxes.
    5. Finishes for Service-Fitting Components: Provide housings or boxes for pedestal- and line-type fittings with manufacturer's standard baked-on, chemical-resistant enamel in color as selected by Owner from manufacturer's full range.

1. EXECUTION
   1. EXAMINATION
      1. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
      2. Proceed with installation only after unsatisfactory conditions have been corrected.
   2. INSTALLATION OF CABINETS
      1. Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
      2. Utility-Space Framing: Secure to floor with two fasteners at each frame.
      3. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
      4. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
   3. INSTALLATION OF LABORATORY ACCESSORIES
      1. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.
      2. Securely fasten adjustable shelving supports, stainless-steel shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.
      3. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.
   4. INSTALLATION OF SERVICE FITTINGS
      1. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.
      2. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.
   5. CLEANING AND PROTECTING
      1. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Owner.
      2. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches (1200 mm) o.c.

Copy this article and re-edit for each type of service fitting required. Review manufacturers' catalogs for fitting descriptions to determine types and characteristics required.

Insert number to complete designations below. Use these designations on Drawings to show locations where this service-fitting type is required.

**END OF SECTION**