SECTION 122113

LOUVER BLINDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Horizontal louver blinds with [aluminum] [wood] [polymer] slats.

1.3 ALLOWANCES

A. Horizontal louver blinds are part of [Window Covering Allowance] <Insert name of allowance>.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For horizontal louver blinds, include fabrication and installation details.
   1. Motorized Operators: Include details of installation in headrails and include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type and color of horizontal louver blind.
   1. Include Samples of accessories involving color selection.

D. Product Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For horizontal louver blinds with polymer slats that have been tested for compliance with NFPA 701, for tests performed by [manufacturer and witnessed by a qualified testing agency] [a qualified testing agency].

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials[, from the same product run,] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Horizontal Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than [two] <Insert number> units.

1.8 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. CACO Inc. Window Fashions.
2. Hunter Douglas Contract.
3. Levolor Contract; a Newell Rubbermaid company.
4. Springs Window Fashions; SWFcontract.

C. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
1. Width: 1 inch .
2. Thickness: Manufacturer's standard.
3. Spacing: [Manufacturer's standard] <Insert dimension>.
4. Finish: [Ionized antistatic, dust-repellent, baked polyester finish] [Reflective finish on outside-facing surface of slat to enhance reflection of solar energy] <Insert finish>.
5. Features:
   a. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.
   b. <Insert feature>.

D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
1. Capacity: [One] [Two] blind(s) per headrail unless otherwise indicated.

2. Ends: [Manufacturer's standard] [Capped or plugged] <Insert description>.
3. Manual Lift Mechanism:
   a. Lift-Cord Lock: [Variable; stops lift cord at user-selected position within blind full operating range] [Top locking; stops lift cord when blind is in fully opened or fully closed positions only; equipped with ring pull not more than 4 inches long].
   b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
4. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
   a. Tilt: Full.
   b. Tilt: [One] [Two]-direction, positive stop or lockout limited at an angle of [20] [60] [80] <Insert number> degrees from horizontal[, both directions].
   c. Operator: [Clear-plastic wand] [Corrosion-resistant steel rod] [Dual cord] <Insert description>.
   d. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
5. Manual Lift-Operator and Tilt-Operator Lengths: [Manufacturer's standard] [Full length of blind when blind is fully closed] [Length required to extend to 48 inches above floor level when blind is fully closed] [As indicated on Drawings] <Insert length>.
6. Manual Lift-Operator and Tilt-Operator Locations: [Manufacturer's standard] [Right side and left side of headrail, respectively,] [Left side and right side of headrail, respectively,] [Right side of headrail] [Left side of headrail] [Left side of headrail and center blind, respectively,] [Right side of headrail and center blind, respectively,] unless otherwise indicated.
7. Integrated Headrail/Valance: [Curved face] <Insert description>.

E. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
   1. Type: [Manufacturer's standard] [Top contoured to match crowned shape of slat] [Bottom contoured to minimize light gaps] <Insert description>.

F. Lift Cords: Manufacturer's standard braided cord.

G. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
   1. Type: [Braided cord] [Reinforced vinyl tape, manufacturer's standard width] [Cloth tape, manufacturer's standard width] <Insert description>.

H. Valance: [Two slats] [PVC strip] [Manufacturer's standard] <Insert description>.

I. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
   1. Type: [Wall] [Overhead] [End] [Wall extension] [Two piece for pocket installation] [As indicated] <Insert description>.
   2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

J. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

K. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.

L. Colors, Textures, Patterns, and Gloss:
   1. Slats: [Match Architect's samples] [Match Architect's samples for custom color and other characteristics] [As selected by Architect from manufacturer's full range] [As indicated on Drawings] <Insert description>.
   2. Components: [Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated] <Insert description>.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, [locations of connections to building electrical system,] and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
1. Locate so exterior slat edges are not closer than [1 inch] [2 inches] <Insert dimension> from interior faces of glass and not closer than [1/2 inch] [1-1/2 inches] <Insert dimension> from interior faces of glazing frames through full operating ranges of blinds.
2. Install mounting and intermediate brackets to prevent deflection of headrails.
3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

B. Electrical Connections: Connect motorized operators to building electrical system.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 122113

SECTION 122413

ROLLER WINDOW SHADES

PART 1 - TIPS:GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Manually operated roller shades with rollers.
   2. Motor-operated roller shades with single rollers.

1.3 ALLOWANCES

A. Roller shades are part of [Window-Covering Allowance] <Insert name of allowance>.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
   1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For each type and color of shadeband material.
   1. Include Samples of accessories involving color selection.

D. Product Schedule: For roller shades. [Use same designations indicated on Drawings.]

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material.

C. Product Test Reports: For each type of shadeband material, for tests performed by [manufacturer and witnessed by a qualified testing agency] [a qualified testing agency].

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than [two] <Insert number> units.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MOTOR-OPERATED, SINGLE-ROLLER SHADES

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
   1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Electric Motor: Manufacturer's standard tubular, enclosed in roller.
      a. Electrical Characteristics: 110-V ac.
      b. Maximum Total Shade Width: As required to operate roller shades indicated.
      c. Maximum Shade Drop: As required to operate roller shades indicated.
      d. Maximum Weight Capacity: As required to operate roller shades indicated.
   3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for mounting. Provide the following for remote-control activation of shades:

a. Keyed Control Station: Keyed, -contact, three-position, switch-operated control station with open, close, and off functions. Provide two keys per station.
b. Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.
c. Color: As selected by Architect from manufacturer's full range.

4. Crank-Operator Override: Crank and gearbox operate shades in event of power outage or motor failure.
5. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
6. Operating Features:
   a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
   b. Capable of interface with [audiovisual] [multiroom] <Insert description> control system.
   c. Capable of accepting input from building automation control system.
   d. Override switch.
7. Accessories:
   a. <Insert accessory>.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
1. Roller Drive-End Location: As indicated on Drawings.
2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers that are operated by one roller drive-end assembly.

F. Shadebands:
1. Shadeband Material: Light-blocking fabric.
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
   a. Type: Enclosed in sealed pocket of shadeband material.
   b. Color and Finish: As selected by Architect from manufacturer's full range.

G. Installation Accessories:
1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
   a. Shape: L-shaped.
   b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than.
2. Endcap Covers: To cover exposed endcaps.
3. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
   a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than height indicated on Drawings.
   b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
4. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.

a. Closure-Panel Width: 2 inches.

5. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.3 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.
1. Source: Roller shade manufacturer.
2. Type: Fiberglass with acrylic backing.
3. Thickness:
4. Weight:
5. Roll Width:
6. Orientation on Shadeband: As indicated on Drawings.
7. Features: Washable Antistatic treatment.
8. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch . Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, [locations of connections to building electrical system,] and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
1. Opaque Shadebands: Located so shadeband is not closer than [2 inches] <Insert dimension> to interior face of glass. Allow clearances for window operation hardware.

B. Electrical Connections: Connect motor-operated roller shades to building electrical system.

C. Roller Shade Locations: [At exterior windows] [As indicated in window-covering schedule] [As indicated on Drawings] <Insert requirements>.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 122413

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SECTION 123553.19

WOOD LABORATORY CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Wood laboratory casework.
2. Utility-space framing at backs of base cabinets.
3. Filler and closure panels.
4. Laboratory casework system that includes support and utility-space framing, filler and closure panels, [wall panels,] [Undercabinet lighting,] and modular countertops.
5. Laboratory countertops.
6. Tables.
7. Shelves.
8. Laboratory sinks[and troughs].
9. Laboratory accessories.
10. Water, laboratory gas, and electrical service fittings.

1.3 DEFINITIONS

A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.
1. Ends of cabinets, including those installed directly against walls or other cabinets, are defined as "exposed."
2. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets are defined as "concealed."

B. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches or more above floor and bottoms of cabinets more than 24 inches but less than 48 inches above floor are defined as semiexposed.

C. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

D. MDF: Medium-density fiberboard.

E. 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.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

B. Keying Conference: Conduct conference at [Project site] <Insert location>. Incorporate keying conference decisions into final keying requirements.

1.5 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.

B. Coordinate installation of laboratory casework with installation of fume hoods and other laboratory equipment.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For laboratory casework. Include plans, elevations, sections, and attachment details.
1. Indicate types and sizes of cabinets.
2. Indicate locations of hardware[and keying of locks].
3. Indicate locations and types of service fittings.
4. Indicate locations of blocking and reinforcements required for installing laboratory casework.
5. Include details of utility spaces showing supports for conduits and piping.
6. Include details of support framing system.
7. Include details of exposed conduits, if required, for service fittings.
8. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
9. Include coordinated dimensions for laboratory equipment specified in other Sections.

C. Keying Schedule: Include schematic keying diagram, and index each key set to unique designations that are coordinated with the Contract Documents.

D. Samples for Initial Selection: For cabinet finishes and other materials requiring color selection.

E. Samples for Verification: For each type of cabinet finish and each type of countertop material, in manufacturer's standard sizes.

F. Samples for Verification: Unless otherwise directed, approved full-size Samples may become part of the completed Work, if in an undisturbed condition at time of Substantial Completion. Notify Architect of their exact locations. If acceptable full-size Samples at Project site are not incorporated into the Work, retain and remove them when directed by Architect.
1. One full-size, finished base cabinet complete with hardware, doors, and drawers.
2. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
3. One Sample each of hinged and sliding doors.
4. 6-inch- square Samples for each type of countertop material.
5. One of each service fitting specified, complete with accessories and specified finish.
6. One of each type of sink and accessory item specified.
7. One of each type of hardware item specified.

G. Delegated-Design Submittal: For laboratory casework indicated to comply with seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. 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[and system structural performance specified in "Performance Requirements" Article].

C. 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.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Cabinet Mounting Clips and Related Hardware: Quantity equal to 5 percent of amount installed, but no fewer than 20 of each type.
2. Modular Countertop Units: Two extra units of each length and material installed.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that [produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 W].

1.10 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.11 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet work are complete and dry, and temporary HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. ALC-Collegedale.
2. CampbellRhea.
3. CiF Laboratory Solutions.
4. Diversified Woodcrafts, Inc.
5. Keur Industries, Inc.
6. Kewaunee Scientific Corporation; Laboratory Products Group.

7. Leonard Peterson & Co., Inc.
8. Mott Manufacturing Ltd.
9. Sheldon Laboratory Systems.
10. South Texas Woodmill, Inc.
11. Terrill Manufacturing Co. Inc.
12. Thermo Fisher Scientific.
13. <Insert manufacturer's name>.

C. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.
1. Obtain [countertops] [sinks] [accessories] [and] [service fittings] from casework manufacturer.

D. 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. See Section 016000 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

A. System Structural Performance: Laboratory casework and support framing system shall withstand the effects of the following gravity loads and stresses without permanent deformation, excessive deflection, or binding of drawers and doors:
1. Support Framing System: [600 lb/ft.] <Insert value>.
2. Suspended Base Cabinets (Internal Load): [160 lb/ft.] <Insert value>.
3. Work Surfaces (Including Tops of Suspended Base Cabinets): [160 lb/ft.] <Insert value>.
4. Wall Cabinets (Upper Cabinets): [160 lb/ft.] <Insert value>.
5. Shelves: [40 lb/sq. ft.] <Insert value>.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design laboratory casework[and support framing system] [, including attachments to other work].

C. Seismic Performance: Laboratory casework[and support framing system] [, including attachments to other work,] shall withstand the effects of earthquake motions determined according to [ASCE/SEI 7] <Insert requirement>.
1. Design earthquake spectral response acceleration, short period (Sds) for Project is <Insert value>.
2. Component Importance Factor: [1.5] [1.0].
3. Base Cabinet Load (Including Countertop and Load on Countertop): [320 lb/ft.] <Insert value>.
4. Wall Cabinet (Upper Cabinet) Load: [160 lb/ft.] <Insert value>.

2.3 CASEWORK, GENERAL

A. Casework Product Standard: Comply with SEFA 8 W, "Laboratory Grade Wood Casework."

B. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements in NFPA 30 by [a testing and inspecting agency acceptable to authorities having jurisdiction] [FM Approvals].

C. 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.

2.4 WOOD CASEWORK

A. Design: [Lipped overlay with radiused edges] [Reveal overlay with square edges] [Reveal overlay with radiused edges].
   1. Provide [1/8-inch] <Insert dimension> reveals between doors and drawers that are adjacent.

B. Wood Species: [Red oak] [White birch] [Red birch] [Alder] [White maple] [Hickory] <Insert species>.

C. Cut: [Plain sliced/sawn] [Quarter sliced/sawn] [Rift cut/sawn] [Rotary cut/plain sawn].

D. Matching:
   1. None required; select and arrange components for compatible grain and color.
   2. Provide veneers for each cabinet from a single flitch, [book and running] [slip and running] [book or slip and running] [book and balance] [slip and balance] [book or slip and balance] matched.
      a. Provide continuous matching of adjacent drawer fronts within each cabinet.
   3. Provide veneers for each elevation from a single flitch, [book and running] [slip and running] [book or slip and running] [book and balance] [slip and balance] [book or slip and balance] matched.
      a. Provide continuous matching of adjacent drawer fronts within each cabinet and end matching between drawer fronts of adjacent cabinets.

E. Grain Direction:
   1. Vertical on both doors and drawer fronts, with continuous vertical matching.
   2. Vertical on doors, horizontal on drawer fronts.
   3. Lengthwise on face frame members.
   4. Vertical on end panels.
   5. Side to side on bottoms and tops of units.
   6. Vertical on knee-space panels.
   7. Horizontal on aprons and table frames.

F. 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 thick, and Grade J crossbands. Provide backs of same species as faces.
   3. Solid Wood: Clear hardwood lumber of species indicated.

G. Semiexposed Materials:
   1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of [any species similar in color and grain to] [same species as] exposed solid wood.
   2. Plywood: Hardwood plywood of [any species similar in color and grain to] [same species as] exposed plywood. [Grade B] [Grade C] 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.
   4. Metal for Steel Drawer Pans: Cold-rolled, carbon-steel sheet complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.

H. 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.

2.5 WOOD CABINET[AND TABLE] MATERIALS

A. General:
1. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.

B. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated[.][, and made without urea formaldehyde][, and that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]

C. MDF: ANSI A208.2, [Grade 130] <Insert grade>[.][; made with binder containing no urea formaldehyde][; that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]

D. Particleboard: ANSI A208.1, Grade M-2[.][; made with binder containing no urea formaldehyde.][; that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]

E. Hardboard: ANSI A135.4, Class 1 Tempered.

F. Edgebanding for Wood-Veneered Construction: [Minimum 1/8-inch- thick, solid wood of same species as face veneer] [Wood veneer of same species as face veneer] [Rigid PVC extrusions, through color with satin finish, 3 mm thick at doors and drawer fronts, 1 mm thick elsewhere].
1. Select wood edgebanding for grain and color compatible with face veneers.
2. Colors: [As indicated by manufacturer's designations] [Match Architect's samples] [As selected by Architect from manufacturer's full range].

2.6 AUXILIARY CABINET MATERIALS

A. Acid Storage-Cabinet Lining: 1/4-inch- thick, [glass-fiber cement board complying with ASTM C 1186] [polyethylene or polypropylene] [polyethylene, polypropylene, epoxy, or phenolic-composite lining material].

B. Glass for Glazed Doors: Clear float glass complying with ASTM C 1036, Type I, Class 1, Quality-Q3; not less than [3.0 mm] [4.0 mm] [5.0 mm] [6.0 mm] thick.

C. Glass for Glazed Doors: Clear tempered glass complying with ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality-Q3; not less than 5.0 mm thick.

D. Glass for Glazed Doors: Clear laminated tempered glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.

E. Frameless Glass Doors: Clear tempered glass complying with ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality-Q3; not less than [5.0 mm] [6.0 mm] thick; with exposed edges seamed before tempering.

2.7 COUNTERTOP [TABLETOP] [SHELF] [TROUGH] [AND] [SINK] MATERIALS

A. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

1. Colors, Patterns, and Finishes: [As indicated by manufacturer's designations] [As selected by Architect from casework manufacturer's full range] [As selected by Architect from plastic-laminate manufacturer's full range] [As selected by Architect from plastic-laminate manufacturer's full range of solid colors].

B. Chemical-Resistant Plastic Laminate:
1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
   a. Formica Corporation; Lab Grade 840 Black.
   b. Panolam Industries International; Pionite Chemguard.
   c. Wilsonart International, Div. of Premark International, Inc.; Chemsurf.
   d. <Insert manufacturer's name; product name or designation>.
2. High-pressure decorative laminate, complying with NEMA LD 3, that has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
   a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), amyl acetate, benzene, butyl alcohol, carbon tetrachloride, chloroform, dimethyl formamide, dioxane, ethyl acetate, ethyl alcohol, ethyl ether, formaldehyde (37 percent), gasoline, gentian violet, hydrogen peroxide (3 percent), methyl alcohol, methyl ethyl ketone, methylene chloride, mono chlorobenzene, naphthalene, toluene, trichloroethylene, xylene, zinc chloride (saturated), [hydrochloric acid (37 percent)] [methyl red] [nitric acid (30 percent)] [phenol (90 percent)] [phosphoric acid (75 percent)] [silver nitrate (saturated)] [sodium hydroxide (20 percent)] [and] [sulfuric acid (77 percent)].
   b. Slight Effect: Cresol, tincture of iodine, sodium sulfide (15 percent), [phenol (90 percent)] [sodium hydroxide (20 percent)] [and] [methyl red].
   c. Moderate Effect: [Hydrochloric acid (37 percent)] [nitric acid (30 percent)] [phosphoric acid (75 percent)] [silver nitrate (saturated)] [and] [sulfuric acid (77 percent)].
3. Color: [Black] [As indicated by manufacturer's designations] [As selected by Architect from chemical-resistant, plastic-laminate manufacturer's full range] <Insert color>.

C. Core Materials for Plastic Laminate:
1. Particleboard: ANSI A208.1, Grade M-2[.][, Exterior glue.][; made with binder containing no urea formaldehyde.][; that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]
2. Exterior Plywood: DOC PS 1, [Exterior A-C] [Exterior B-C] with fully sanded face.

D. Adhesive for Bonding Plastic Laminate: [Resorcinol.] [Urea formaldehyde.] [Contact adhesive.] [Manufacturer's standard waterproof adhesive.] [Manufacturer's standard waterproof, urea-formaldehyde-free adhesive.] [Manufacturer's standard waterproof adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."]

E. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
   a. Durcon, Inc.
   b. Prime Industries, Inc.
   c. Thermo Fisher Scientific.
   d. <Insert manufacturer's name>.

2. Physical Properties:
   a. Flexural Strength: Not less than 10,000 psi.
   b. Modulus of Elasticity: Not less than 2,000,000 psi.
   c. Hardness (Rockwell M): Not less than 100.
   d. Water Absorption (24 Hours): Not more than 0.02 percent.
   e. Heat Distortion Point: Not less than 260 deg F.
3. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
   a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
   b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
4. Color: [Black] [Gray] [Beige] [White] [As selected by Architect from epoxy manufacturer's full range] <Insert color>.

F. Phenolic Composite: Solid, high-pressure decorative laminate, complying with NEMA LD 3, Grade CGS.
1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
   a. Arborite; a division of ITW Canada.
   b. Formica Corporation.
   c. Panolam Industries International.
   d. Thermo Fisher Scientific.
   e. Trespa North America.
   f. <Insert manufacturer's name>.
2. Chemical Resistance: Composite countertop material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
   a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), [benzene,] [carbon tetrachloride,] [dimethyl formamide,] ethyl acetate, ethyl alcohol, formaldehyde (37 percent), furfural, [hydrochloric acid (37 percent),] [hydrofluoric acid (48 percent),] [nitric acid (30 percent),] phosphoric acid (85 percent),[sodium hydroxide (20 percent),] sulfuric acid (33 percent), toluene, [and] [zinc chloride].
3. Color: [Black] [Gray] [Beige] [White] [As selected by Architect from phenolic-composite manufacturer's full range] <Insert color>.

G. Stainless-Steel Sheet: ASTM A 240/A 240M, [Type 304] [Type 316L].

2.8 FABRICATION

A. 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- thick, [veneer-core]hardwood plywood.
2. Tops and Bottoms of Wall Cabinets and Tops of Tall Cabinets: 1-inch- thick, veneer-core hardwood plywood.
3. Ends of Cabinets: 3/4-inch- thick, hardwood plywood.
4. Shelves: 1-inch- thick, veneer-core hardwood plywood.
5. Base Cabinet Top Frames: 3/4-by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.
6. Base Cabinet Stretchers: 3/4-by-4-1/2-inch panel product strips or solid-wood boards at front and back of cabinet, glued and pinned or screwed.[$ds~May be provided as an option to base cabinet top frames.]

7. Base Cabinet Subtops: 3/4-inch- thick panel product glued and pinned or screwed.[$ds~May be provided as an option to base cabinet top frames.]
8. Exposed Backs of Cabinets: 3/4-inch- thick, [particleboard- or MDF-core]hardwood plywood.
9. Unexposed Backs of Cabinets: [1/4-inch- thick hardboard] [1/4-inch- thick, hardwood plywood] [1/2-inch- thick, hardwood plywood] dadoed into sides, bottoms, and tops, unless otherwise indicated.
10. Drawer Fronts: 3/4-inch- thick, [particleboard- or MDF-core]hardwood plywood or solid hardwood.
11. Drawer Sides and Backs: 1/2-inch- thick, solid hardwood or [veneer-core]hardwood plywood, with glued dovetail or multiple-dowel joints.
12. Drawer Bottoms: 1/4-inch- thick, veneer-core hardwood plywood glued and dadoed into front, back, and sides of drawers.[$ds~Use 1/2-inch- thick material for drawers more than 24 inches wide.]
13. Drawer Bodies: Steel drawer pans formed from 0.036-inch- thick metal, metallic phosphate treated, and finished with manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil for topcoat and 2 mils for system.
14. Doors[48 Inches High or Less]: 3/4 inch thick, with particleboard or MDF cores[, solid-hardwood stiles and rails,] and hardwood face veneers and crossbands.
15. Doors More Than 48 Inches High: 1-1/16 inches thick, with honeycomb cores, solid-hardwood stiles and rails, and hardwood face veneers and crossbands.
16. Doors More Than 48 Inches High: 1-1/8 inches thick, with particleboard cores and hardwood face veneers and crossbands.
17. Stiles and Rails of Glazed Doors[48 Inches High or Less]: 3/4-inch- thick, solid hardwood.
18. Stiles and Rails of Glazed Doors[48 Inches High or Less]: 3/4-inch- thick particleboard with hardwood face veneers and crossbands.
19. Stiles and Rails of Glazed Doors More Than 48 Inches High: 1-1/16-inch- thick, solid wood with hardwood face veneers.
20. Stiles and Rails of Glazed Doors More Than 48 Inches High: 1-1/8 inches thick, with particleboard cores and hardwood face veneers and crossbands.

B. Tables: Solid-hardwood legs, not less than 2 inches square with solid-hardwood stretchers as needed to comply with product standard. Bolt stretchers to legs and cross-stretchers, and bolt legs to table aprons.[$ds~Provide leveling device at bottom of each leg.]
   1. Leg Shoes: Black vinyl or rubber, open-bottom, slip-on type.

C. Utility-Space Framing: Steel framing units consisting of two steel slotted channels complying with MFMA-4, not less than 1-5/8 inches square by 0.105-inch nominal thickness, and connected at top and bottom by U-shaped brackets made from 1-1/4-by-1/4-inch steel flat bars. Framing units may be made by welding specified channel material into rectangular frames instead of using U-shaped brackets.

D. Removable Backs: Provide backs that can be removed from within cabinets at utility spaces.

E. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.
   1. Provide knee-space panels (modesty panels) at spaces between base cabinets, where [cabinets are not installed against a wall or where space is not otherwise closed] [indicated].
   2. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.

3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.

2.9 LABORATORY CASEWORK SYSTEM

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Kewaunee Scientific Corporation.
2. Thermo Fisher Scientific.
3. <Insert manufacturer's name>.

C. Provide casework manufacturer's standard integrated system that includes support framing, suspended modular wood cabinets, filler and closure panels, [wall panels,] [undercabinet task-lighting fixtures,] countertops, and fittings needed to assemble system. System includes hardware and fasteners for securing support framing to permanent construction.
1. Cabinets can be removed and reinstalled without use of special tools for relocation within system.
2. Base cabinets can be removed without providing temporary support for, or removing, countertops.
3. Sinks are supported independent of base cabinets.
4. Support framing has provision for fastening pipe supports at utility space in not more than 1-inch increments.
5. System includes filler and closure panels to close spaces between support framing, cabinets, shelves, countertops, floors, and walls unless otherwise indicated. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.

D. Support Framing: Casework manufacturer's standard system consisting of vertical supports and connecting braces and rails as follows:
1. Cabinets, shelves, and countertops are supported from vertical supports[except where floor-supported base cabinets are indicated]. Vertical positioning of supported cabinets, shelves, and countertops can be varied in 1-inch increments through full height of supports.
2. Vertical supports rest on adjustable leveling bases and are secured to floor with metal clips fastened to floor.
3. Vertical supports are installed with braces and rails, connecting them to each other and to permanent building walls to create a stable, rigid structure with framed utility spaces where indicated.
4. Vertical supports are braced at floor with cantilevered horizontal leg members where indicated.

E. Undercabinet Task-Light Fixtures: Single-tube fluorescent fixtures with switch and heavy-duty cord and plug.
1. Finish: Baked enamel.
2. Diffusers: Virgin acrylic with high resistance to yellowing and other changes due to aging, heat, and UV radiation.
3. Ballast Sound Rating: A.

F. Countertops: Provide in modular lengths indicated, without seams.

2.10 WOOD FINISH

A. 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.

B. 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.
   1. Stain Color: [As indicated by manufacturer's designations] [Match Architect's samples] [As selected by Architect from manufacturer's full range].

C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard [two] [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 W. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2.11 HARDWARE

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

B. Butt Hinges: [Stainless][Epoxy-coated]-steel, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two for doors 48 inches high or less and three for doors more than 48 inches high.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, Type B01602, [100] [135] [170] degrees of opening[, self-closing]. Provide two for doors 48 inches high or less and three for doors more than 48 inches high.

D. Hinged Door and Drawer Pulls: [Solid-aluminum, stainless-steel, or chrome-plated-brass] [Epoxy-coated-steel,] back-mounted pulls. Provide two pulls for drawers more than 24 inches wide.
   1. Design: [Wire pulls] [Rectangular loop pulls] [Rectangular loop pulls with rounded corners] [As selected from manufacturer's full range] [As indicated] <Insert description>.
   2. Overall Size: [1 by 4-1/2 inches] [1-1/4 by 4-1/2 inches] [1-3/8 by 5-1/2 inches] [As selected from manufacturer's full range] [As indicated] <Insert dimensions>.

E. Sliding Door Pulls: [Stainless-steel or chrome-plated] [Epoxy-coated-steel] recessed flush pulls.
   1. Design and Size: [Round, 3/4-inch diameter by 1/8 inch deep] [Round, 3/4-inch diameter by 3/16 inch deep] [Oval, 1 by 3 inches, 3/8 inch deep] [As selected from manufacturer's full range] [As indicated] <Insert description>.

F. Pulls: Recessed [aluminum] [polypropylene] pulls. Provide two pulls for drawers more than 24 inches wide.

G. Pulls: Full-width, recessed solid-hardwood channels; matching exposed wood of cabinets.

H. Door Catches: [Nylon-roller spring] [Dual, self-aligning, permanent magnet] catches. Provide two catches on doors more than 48 inches high.

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

1. Provide [Grade 1] [Grade 1HD-100]; for drawers not more than 6 inches high and 24 inches wide.
2. Provide [Grade 1HD-100] [Grade 1HD-200]; for drawers more than 6 inches high or 24 inches wide.
3. Standard Duty (Grade 1): [Full] [Partial]-extension type, with polymer rollers.
4. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): [Full] [Full-overtravel]-extension, ball-bearing type.

J. Drawer Slides: Hardwood runners under centers of drawers with polymer guides fastened to backs of drawers.

K. Label Holders: Stainless steel, aluminum, or chrome plated; sized to receive standard label cards approximately 1 by 2 inches, attached with screws or rivets. Provide [where indicated] [on all drawers].

L. Locks: Cam type[with five-pin tumbler], brass with chrome-plated finish; complying with BHMA A156.11, Type E07281[or Type E07261].
1. Provide a minimum of [two] <Insert number> keys per lock and [two] <Insert number> master keys.
2. Provide [where indicated] [on all drawers and doors].
3. Keying: Key [locks alike within each room, key each room separately] [each lock separately] [locks as directed].
4. Master Key System: Key all locks to be operable by master key.

M. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.

N. Adjustable Shelf Supports: Powder-coated steel shelf rests complying with BHMA A156.9, Type B04013.

O. Adjustable Shelf Supports: Mortise-type, powder-coated steel standards and shelf rests complying with BHMA A156.9, Type B04071 and Type B04091.

P. Adjustable Wall Shelf Supports: Surface-type steel standards and steel shelf brackets, with epoxy powder-coated finish, complying with BHMA A156.9, Type B04102 and Type B04112.

2.12 COUNTERTOPS[, TABLETOPS] [, SHELVES] [, TROUGHS,] AND SINKS

A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch, with continuous drip groove on underside 1/2 inch from edge.

B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2, unless otherwise indicated.
2. Overflows: [For each sink except cup sinks,] [Where indicated,] provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches less than sink depth. Provide in same material as strainer.

C. Plastic-Laminate [Countertops] [Tabletops] [and] [Shelves]:
1. Countertops: [Plastic] [Chemical-resistant plastic] laminate shop bonded to top surface and exposed edges of [3/4-inch-] [1-inch-] [1-3/16-inch-] thick core with plastic-laminate backing bonded to bottom surface. Sand surfaces to which plastic laminate is to be bonded.
   a. Backsplash Core Thickness: [3/4 inch] [1 inch].
   b. Countertop Core: [Particleboard] [or] [exterior plywood].
   c. Countertop Core for Counters Containing Sinks: [Exterior-glue particleboard] [or] [exterior plywood].

d. Countertop Configuration: Flat, with square edges, flat backsplashes, and flat end splashes. Finish faces and exposed edges of splashes with same plastic laminate as top.
e. Countertop Configuration: Postformed, with[raised,] rolled edge and integral coved backsplash with rolled top edge. Construct top and backsplash from one piece of plastic laminate. Where indicated, provide separate end splashes of same material as top and fitted to top.
f. Plastic-Laminate Grade: [HGS] [HGL] [HGF] [HGP].

2. Tabletops: [Plastic] [Chemical-resistant plastic] laminate shop bonded to top surface and exposed edges of [3/4-inch-] [1-inch-] [1-3/16-inch-] thick core with plastic-laminate backing bonded to bottom surface. Sand surfaces to which plastic laminate is to be bonded.
a. Tabletop Core: [Particleboard] [or] [exterior plywood].
b. Plastic-Laminate Grade: [HGS] [HGL] [HGF] [HGP].

3. Plastic-Laminate Shelves: [Plastic] [Chemical-resistant plastic] laminate shop bonded to both faces and all edges of [3/4-inch-] [1-inch-] thick core. Sand surfaces to which plastic laminate is to be bonded.
a. Shelf Core: [Particleboard] [or] [exterior plywood].
b. Plastic-Laminate Grade: [HGS] [HGL] [HGF] [HGP].

D. Epoxy [Countertops] [Tabletops] [and] [Sinks]:
1. Countertop Fabrication: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
a. Countertop Configuration: Flat, [5/8 inch] [3/4 inch] [1 inch] thick, with [beveled] [or] [rounded] edge and corners, and with drip groove and [integral coved] [or] [applied] backsplash.
b. Countertop Configuration: Raised (marine) edge, [5/8-inch] [3/4-inch] [1-inch] minimum thickness, with integral or applied raised edge having [beveled] [or] [rounded] edge and corners, and with [integral coved] [or] [applied] backsplash.
c. Countertop Configuration: As indicated.
d. Countertop Construction: [Uniform throughout full thickness] [Epoxy composition not less than 1/4 inch thick, laminated to backing].
e. Product Option: Phenolic-composite countertops may be substituted for epoxy countertops at Contractor's option.

2. Tabletop Fabrication:
a. Tabletop Configuration: Flat, [5/8 inch] [3/4 inch] [1 inch] thick, with [beveled] [or] [rounded] edge and corners, and with drip groove at perimeter.
b. Tabletop Configuration: Raised (marine) edge, [5/8-inch] [3/4-inch] [1-inch] minimum thickness, with integral or applied raised edge having [beveled] [or] [rounded] edge and corners.
c. Tabletop Construction: [Uniform throughout full thickness] [Epoxy composition not less than 1/4 inch thick, laminated to backing].
d. Product Option: Phenolic-composite tabletops may be substituted for epoxy tabletops at Contractor's option.

3. Sink Fabrication: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.
a. Provide with polypropylene strainers and tailpieces.
b. Provide sinks for drop-in installation with 1/4-inch- thick lip around perimeter of sink.
c. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.
d. Provide manufacturer's recommended adjustable support system for table- and cabinet-type installations.

E. Phenolic-Composite [Countertops] [Tabletops] [and] [Shelves]:
   1. Countertop Fabrication: Fabricate with cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
      a. Countertop Configuration: Flat, [1/2 inch] [5/8 inch] [3/4 inch] [1 inch] thick, with [beveled] [or] [rounded] edge and corners, and with drip groove and integral coved backsplash.
      b. Countertop Configuration: Raised (marine) edge, [1/2-inch] [5/8-inch] [3/4-inch] [1-inch] minimum thickness, with [beveled] [or] [rounded] edge and corners, and with integral coved backsplash.
      c. Countertop Configuration: As indicated.
   2. Tabletop Fabrication:
      a. Tabletop Configuration: Flat, [1/2 inch] [5/8 inch] [3/4 inch] [1 inch] thick, with [beveled] [or] [rounded] edge and corners, and with drip groove at perimeter.
      b. Tabletop Configuration: Raised (marine) edge, [5/8-inch] [3/4-inch] [1-inch] minimum thickness, with integral or applied raised edge having [beveled] [or] [rounded] edge and corners.
   3. Shelf Configuration: Flat, [5/8 inch] [3/4 inch] thick, with [beveled] [or] [rounded] edge and corners.

F. Stainless-Steel Countertops: Made from stainless-steel sheet, not less than 0.062-inch nominal thickness, with No. 4 satin finish.
   1. Extend top down 1 inch at edges with a 1/2-inch return flange under frame. Apply heavy coating of heat-resistant, sound-deadening mastic to undersurface.
   2. Form backsplash coved to and integral with top surface.
   3. Provide raised (marine) edge [around perimeter of countertops containing sinks] [and] [where indicated].
   4. Pitch countertops containing sinks two ways to sink[, where indicated,] without channeling or grooving.
   5. Factory punch holes for service fittings.
   6. Reinforce underside of countertop with channels, or use thicker metal sheet where necessary to ensure rigidity without deflection.
   7. Weld shop-made joints.
   8. Where field-made joints are required, provide hairline butt joints mechanically bolted through continuous channels welded to underside at edges of joined ends. Keep field jointing to a minimum.
   9. Where stainless-steel sinks or cup sinks occur in stainless-steel countertops, factory weld into one integral unit.
   10. After fabricating and welding, grind surfaces smooth, and polish as needed to produce uniform, directionally textured finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

G. Stainless-Steel Shelves: Made from stainless-steel sheet, not less than 0.050-inchnominal thickness, with No. 4 satin finish. Weld shop-made joints. Fold [down] [up] front edge 3/4 inch; fold up back edge 3 inches. Provide integral stiffening brackets, formed by folding up ends 3/4 inch and welding to upturned [back edge] [front and back edges]. After fabricating, grind welds smooth, and polish as needed to produce uniform, directionally textured finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

H. Stainless-Steel Sinks: Made from stainless-steel sheet, not less than 0.050-inchnominal thickness. Fabricate with corners rounded and coved to at least 5/8-inchradius. Slope sink bottoms to outlet. Provide double-wall construction for sink partitions, with top edge rounded to at least 1/2-inch diameter. Provide continuous butt-welded joints. After fabricating and welding, grind surfaces smooth, and polish as needed to produce uniform finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.
1. Factory punch holes for fittings.
2. Provide with stainless-steel strainers and tailpieces.
3. Provide with integral rims except where located in stainless-steel countertops.
4. Apply 1/8-inch- thick coating of heat-resistant, sound-deadening mastic to under sink surfaces.

I. Cup Sinks: [Epoxy] [Polypropylene] [Stainless steel], [3-by-6-inch oval] [3-by-9-inch oval] [5-inch diameter].
1. Provide with [polypropylene] [stainless-steel] strainers and integral tailpieces.

J. Cup Sinks: Material and size as indicated.
1. Provide [epoxy] [and] [polypropylene] cup sinks with polypropylene strainers and integral tailpieces.
2. Provide stainless-steel cup sinks with stainless-steel strainers and integral tailpieces.

K. Troughs: [Epoxy] [Stainless steel] [Epoxy or stainless steel, as indicated]. Pitch to drains not less than 1/8 inch/foot. Except where troughs empty into sinks, provide NPS 1-1/2 outlets with strainers and tailpieces.
1. Epoxy Troughs: Molded in one piece with smooth surfaces and coved corners; [1/2-inch] [5/8-inch] [3/4-inch] minimum thickness. Provide polypropylene strainers and tailpieces.
2. Stainless-Steel Troughs: Made from stainless-steel sheet, not less than [0.050-inch] [0.062-inch] nominal thickness. Fabricate with corners rounded and coved to at least 5/8-inch radius. Provide continuous butt-welded joints. After fabricating and welding, grind surfaces smooth, and polish as needed to produce uniform finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean. Provide stainless-steel strainers and tailpieces.

2.13 LABORATORY ACCESSORIES

A. Reagent Shelves: Provide as indicated, fabricated from same material as adjacent countertop unless otherwise indicated.

B. Burette Rods: Aluminum or stainless-steel rods, 1/2 inch in diameter and 18 inches long, threaded on one end to fit tapered plug adapter for flush socket receptacle. Provide with tapered plug adapter and receptacle.

C. Upright Rod Assembly and Metal Crossbar: Aluminum or stainless steel. Two vertical rods and one horizontal crossbar, 3/4 inch in diameter and 36 inches long unless otherwise indicated; two flush socket receptacles and two crossbar clamps. Ends of vertical rods are tapered to fit receptacles; all other rod ends are rounded.

D. Greenlaw Arm Assembly: Aluminum or stainless-steel vertical rod, tapered on one end to fit flush socket receptacle. Adjustable crossbar of hardwood with black, acid-resistant finish, secured to upright with adjustable clamp. Provide with receptacle.

E. Lattice Assembly: Aluminum or stainless-steel, vertical and horizontal rod lattice assembly with 3/4-inch- diameter rods at approximately 12 inches o.c. with two flush socket receptacles for mounting.
1. Size: [36 inches] [48 inches] wide by [24 inches] [36 inches] high.

F. Pegboards: Polypropylene, epoxy, or phenolic-composite pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.

G. Pegboards: Stainless-steel pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.

2.14 WATER AND LABORATORY GAS SERVICE FITTINGS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
1. Broen Inc.; Distributed by Laboratory Enterprises, a Watts Water Technologies company.
2. Chicago Faucets; a Geberit company.
3. WaterSaver Faucet Company.
4. <Insert manufacturer's name>.

B. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures - Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.

C. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.

D. Finish: [Chromium plated] [Chromium plated unless otherwise indicated] [Acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes].
1. Provide chemical-resistant powder coating in laboratory casework manufacturer's standard metallic brown, aluminum, white, or other color as approved by Architect.

E. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
3. Self-Closing Valves: Provide self-closing valves where indicated.

F. Ball Valves: Chrome-plated ball and PTFE seals. Handle requires no more than 5 lbf to operate. Provide units designed for working pressure up to 75 psig, with serrated outlets.
1. Where ball valves are indicated for fuel-gas use, provide locking safety handles that must be [pushed in] [or] [pulled up] before being turned on[unless otherwise indicated].

G. Ground-Key Cocks: Tapered core and handle of one-piece forged brass, ground and lapped, and held in place under constant spring pressure. Provide units designed for working pressure up to 40 psig, with serrated outlets.

H. Steam Valves: Stainless-steel seat and PTFE seat disc. Provide units designed for steam working pressure up to 20 psig, with serrated outlets.

I. Needle Valves: Provide units with renewable, self-centering, floating cones and renewable seats of stainless steel or Monel metal, with removable serrated outlets.
1. Provide units designed for working pressure up to [60 psig] [100 psig] [125 psig].

J. Hand of Fittings: Furnish right-hand fittings unless fitting designation is followed by "L."

K. Remote-Control Valves: Provide needle valves, straight-through or angle type as indicated for fume hoods and where indicated.

L. Handles: Provide [three- or four-arm, forged-brass] [or] [three- or four-wing, molded-plastic or powder-coated-metal] handles for valves unless otherwise indicated.
1. Provide lever-type handles for ground-key cocks. Lever handle aligns with outlet when valve is closed and is perpendicular to outlet when valve is fully open.
2. Provide lever-type handles for ball valves unless otherwise indicated. Lever handle aligns with outlet when valve is closed and is perpendicular to outlet when valve is fully open.
3. Provide heat-resistant plastic handles for steam valves.
4. Provide knurled, molded-plastic handles for needle valves.

M. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant. Comply with SEFA 7 for colors and embossed identification.

2.15 ELECTRICAL[AND COMMUNICATION] SERVICE FITTINGS

A. Service Fittings, General: Provide units complete with metal housings, receptacles, switches, pilot lights,[voice and data communication outlets,] cover plates, accessories, and gaskets required for mounting on laboratory casework.
1. Receptacles, switches, pilot lights, cover plates, and accessories are specified in Section 262726 "Wiring Devices."
2. Voice and data communication outlets are specified in Section 271500 "Communication Horizontal Cabling."

B. Receptacles: Comply with NEMA WD 1, NEMA WD 6, and UL 498. Duplex type, Configuration 5 20R.
1. Receptacle Grade: [Hospital] [General] grade unless otherwise indicated.
2. Color of Receptacles: [Brown] [Ivory] [As selected by Architect] <Insert color> unless otherwise indicated or required by NFPA 70.
3. GFCI Receptacles: Straight blade, [feed-through] [or] [non-feed-through] type. Comply with UL 943, Class A, [Hospital] [General] grade, and include indicator light that is illuminated when device is tripped.
4. TVSS (Transient Voltage Surge Suppressor) Receptacles: Comply with UL 1449, with integral TVSS in line to ground, line to neutral, and neutral to ground.
    a. TVSS Components: Multiple metal-oxide varistors; with a nominal clamp-level rating of 400 V and a minimum single transient pulse energy dissipation of 240 J, according to IEEE C62.41.2 and IEEE C62.45.
    b. Active TVSS Indication: Visual and audible, with light visible in face of device to indicate device is "active" or "no longer in service."
    c. Receptacle Type: [Hospital] [General] grade[, with isolated-ground terminal].
    d. Identification: Distinctive marking on face of device to denote TVSS-type unit.
    e. Color of TVSS Receptacles: Blue.

C. Switches: Comply with NEMA WD 1 and UL 20. Provide single-pole, double-pole, or three-way switches as required; rated 120 to 277-V ac; and in amperage capacities to suit units served.
1. Color of Switches: [Brown] [Ivory] [As selected by Architect] <Insert color> unless otherwise indicated or required by NFPA 70.
2. Provide pilot light adjacent to switch or neon-lighted handle, illuminated when switch is on, where noted as "PL" next to switch identification.
3. Provide key-operated switch where noted as "KEY" next to switch identification.
4. Provide thermal-overload switches, single or double pole, as required, with maximum overcurrent trip setting to suit particular motor controlled.

D. Voice and Data Communication Outlets: Two RJ-45 jacks for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1; complying with [Category 5e] <Insert category>. Comply with UL 1863.

E. Cover Plates: Provide satin finish, [chrome-plated] [Type 304, stainless-steel] cover plates with formed, beveled edges.

F. Cover-Plate Identification: Use 1/4-inch- 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.] [at the following locations:]
      a. Receptacles other than standard 125-V duplex, grounding type.
      b. Switches and thermal-overload switches.
      c. Pilot lights when located remotely from associated equipment or switch, where function is not obvious.
      d. Receptacles, switches, and other locations indicated.
   2. Provide the following information:
      a. Voltage and phase for receptacles other than standard 125-V duplex, grounding type.
      b. Indicate equipment being controlled by switches and thermal-overload switches.
      c. Indicate equipment being controlled for pilot lights when located remotely from associated equipment or switch, where function is not obvious.
      d. Number of the breaker in panelboard that controls device.

G. Pedestal-Type Fittings: Cast-aluminum housings with sloped single face or two faces, as indicated, with neoprene gasket under base and with concealed mounting holes in base for attaching to laboratory casework. Provide holes tapped for conduits.

H. Line-Type Fittings: Provide with cast-metal boxes with threaded holes for mounting on rigid steel conduit. Provide cover plates same size as boxes.

I. Recessed-Type Fittings: Provide with galvanized-steel boxes.

J. 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 Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

A. 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:
   1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
   2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
   3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
   4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
   5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.

C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
   1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than two fasteners per side.

D. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches o.c.

E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

F. 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.

3.3 INSTALLATION OF COUNTERTOPS

A. Comply with installation requirements in SEFA 2.3. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where indicated on Shop Drawings.

B. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
   1. Use concealed clamping devices for field-made joints in plastic-laminate countertops. Locate clamping devices within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.

C. Fastening:
   1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
   2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
   3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.

D. Provide required holes and cutouts for service fittings.

E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.

F. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

A. Comply with installation requirements in SEFA 2.3.

B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.

C. Semiflush Installation of Stainless-Steel Sinks: Before setting, apply sink and countertop manufacturers' recommended sealant under rim lip and along top. Remove excess sealant while still wet and finish joint for neat appearance.

D. Drop-in Installation of Epoxy Sinks: Rout groove in countertop to receive sink rim if not shop prepared. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess adhesive and sealant while still wet and finish joint for neat appearance.

E. Drop-in Installation of [Epoxy] [and] [Polypropylene] Cup Sinks: Rout groove in countertop to receive sink rim if not shop prepared. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess adhesive and sealant while still wet and finish joint for neat appearance.

F. Surface Installation of [Epoxy] [and] [Polypropylene] Cup Sinks: Set sink in sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF LABORATORY ACCESSORIES

A. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.

B. Securely fasten adjustable shelving supports, stainless-steel shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.

C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

D. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.

3.6 INSTALLATION OF SERVICE FITTINGS

A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.

B. 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.

3.7 CLEANING AND PROTECTING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches o.c.

3.8 SERVICE-FITTING SCHEDULE

A. Water Service Fitting, Type WF-[#]:
   1. Fitting Type: [Swing-spout mixing faucet] [Rigid, gooseneck mixing faucet] [Rigid, gooseneck, single-service faucet] [Remote-control, rigid, gooseneck, single-service faucet] [Single-service hose bibb].
   2. Outlet: [Aerator] [Vacuum breaker and removable serrated outlet].
   3. Mounting: [Wall] [Deck] [Line] mounted.
   4. Additional Requirements: [Self-closing valves] [For reagent-grade water] <Insert requirement>.

B. Laboratory Steam Service Fitting, Type SF-[#]:
   1. Fitting Type: [Turret] [Line mounted] [Flange type] [Remote-control turret] [Remote-control flange type].
   2. Outlets: [One] [Two, at 90 degrees] [Two, at 180 degrees] [Three] [Four].
   3. Outlet Type: [Straight] [Angled].

C. Laboratory Gas Service Fitting, Type GF-[#]:
   1. Service: [Air] [Gas (fuel gas)] [Vacuum] <Insert service>.
   2. Fitting Type: [Turret] [Line mounted] [Flange type] [Remote-control turret] [Remote-control flange type].
   3. Outlets: [One] [Two, at 90 degrees] [Two, at 180 degrees] [Three] [Four].
   4. Outlet Type: [Straight] [Angled].
   5. Valve Type: [Ground-key cock] [Ball valve] [Needle valve].

D. Electrical Service Fitting, Type EF-[#]:
   1. Fitting Type: [Pedestal, single faced] [Pedestal, double faced] [Recessed] [Line mounted].
   2. Device: [One duplex receptacle] [Two duplex receptacles] [Four duplex receptacles] [One switched receptacle] [One duplex receptacle, switch, and pilot light].
   3. Additional Requirements: [GFCI] [TVSS] receptacles.

E. Communication Service Fitting, Type CF-[#]:
   1. Fitting Type: [Pedestal, single faced] [Pedestal, double faced] [Recessed] [Line mounted].
   2. Device: [One duplex communication receptacle] [Two duplex receptacles].

F. Electrical and Communication Service Fitting, Type ECF-[#]:
   1. Fitting Type: [Pedestal, single faced] [Pedestal, double faced] [Recessed] [Line mounted].
   2. Device: [One duplex receptacle and one duplex communication receptacle] [Two duplex receptacles and two duplex communication receptacles] [One switched receptacle and one duplex communication receptacle].
   3. Additional Requirements: [GFCI] [TVSS] receptacles.

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SECTION 123623.13

PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes plastic-laminate countertops.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
   1. Show locations and sizes of cutouts and holes for [plumbing fixtures] [faucets] [soap dispensers] [electrical switches and outlets] [and other items] installed in plastic-laminate countertops.
   2. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Verification:
   1. Plastic laminates, [8 by 10 inches] [12 by 12 inches], for each[type,] color, pattern, and surface finish[, with one sample applied to core material] [and specified edge material applied to one edge].
   2. Wood-grain plastic laminates, [12 by 24 inches] [24 by 24 inches], for each[type,] pattern and surface finish[, with one sample applied to core material] [and specified edge material applied to one edge].

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For [Installer] [fabricator].

B. Product Certificates: For [each type of product.] [the following:]
   1. Composite wood and agrifiber products.
   2. High-pressure decorative laminate.
   3. Chemical-resistant, high-pressure decorative laminate.
   4. Adhesives.

C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.[Shop is a certified participant in AWI's Quality Certification Program.][Shop is a licensee of WI's Certified Compliance Program.]

B. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver countertops until painting and similar operations that could damage countertops have been completed in installation areas. If countertops must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between [25 and 55] [43 and 70] [17 and 50] <Insert humidity range> percent during the remainder of the construction period.

C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE COUNTERTOPS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
   1. Provide [labels] [and] [certificates] from AWI certification program indicating that countertops[, including installation,] comply with requirements of grades specified.
   2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

B. Grade: Premium.

C. High-Pressure Decorative Laminate: NEMA LD 3, [Grade HGS] [Grade HGL] [Grade HGF] [Grade HGP].
   1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
      a. Abet Laminati, Inc.
      b. Formica Corporation.
      c. Lamin-Art, Inc.
      d. Panolam Industries International, Inc.
      e. Wilsonart International Holdings, Inc.

D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. As indicated by manufacturer's designations.
   2. Match Architect's sample.
   3. As selected by Architect from manufacturer's full range in the following categories:
      a. Solid colors, [gloss] [matte] finish.
      b. Solid colors with core same color as surface, [gloss] [matte] finish.
      c. Wood grains, [gloss] [matte] finish.
      d. Patterns, [gloss] [matte] finish.
   4. Grain Direction: Parallel to cabinet fronts.

E. Edge Treatment: Same as laminate cladding on horizontal surfaces.

F. Core Material: Medium-density fiberboard made with exterior glue.

G. Core Material at Sinks: medium-density fiberboard made with exterior glue.

H. Core Thickness: 3/4 inch.
   1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.

I. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
   1. Wood Moisture Content: [5 to 10] [8 to 13] [4 to 9] percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

2.3 ACCESSORIES

A. Grommets for Cable Passage through Countertops: [1-1/4-inch] [2-inch] <Insert dimension> OD, [brown] [black] <Insert color>, molded-plastic grommets and matching plastic caps with slot for wire passage.
   1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
      a. Doug Mockett & Company, Inc.; .

2.4 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Plastic Laminate: [Unpigmented contact cement] [Contact cement] [PVA] [Urea formaldehyde] [Resorcinol].
   1. Adhesive for Bonding Edges: Hot-melt adhesive[or adhesive specified above for faces].

2.5 FABRICATION

A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:
   1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
   2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   1. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
   1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
   2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
   1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   2. Secure backsplashes [to tops with concealed metal brackets at 16 inches o.c.] [and] [to walls with adhesive].

3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 123623.13

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SECTION 123661.16

SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.
5. Solid surface material sinks.

1.3 ACTION SUBMITTALS

A. Product Data: For countertop materials[and sinks].

B. Samples for Initial Selection: For each type of material exposed to view.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of countertops.

C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
1. Build mockup of typical countertop as shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements[after base cabinets are installed but] before countertop fabrication is complete.

1.8 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
   1. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
   2. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
      a. Avonite Surfaces.
      b. E. I. du Pont de Nemours and Company.
      c. Formica Corporation.
      d. LG Chemical, Ltd.
      e. Meganite Inc.
      f. Samsung Chemical USA, Inc.
      g. Swan Corporation (The).
      h. Transolid Div of Trumbull Industries.
      i. Wilsonart International Holdings, Inc.
   3. Type: Provide Standard typeunless Special Purpose type is indicated.
   4. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
   5. Colors and Patterns: As selected by Architect from manufacturer's full range.

B. Solid Wood Edges and Trim: Clear lumber, free of defects, selected for compatible grain and color, and kiln dried to 7 percent moisture content.

C. Particleboard: ANSI A208.1, Grade M-2 Grade M-2-Exterior Glue.

D. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
   1. Grade: Custom.

B. Configuration:
   1. Front: Straight, slightly eased at top.
   2. Backsplash: Straight, slightly eased at corner.
   3. End Splash: Matching backsplash.

C. Countertops: 3/4-inch- thick, solid surface material.

D. Backsplashes: 3/4-inch- thick, solid surface material.

E. Fabricate tops with shop-applied edges[and backsplashes] unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
   1. Fabricate with loose backsplashes for field assembly.
   2. Install integral sink bowls in countertops in the shop.

F. Joints: Fabricate countertops without joints.

G. Joints: Fabricate countertops in sections for joining in field.

1. Joint Locations: Not within 18 inches of a sink or cooktop and not where a countertop section less than 36 inches long would result, unless unavoidable.

H. Cutouts and Holes:
1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
   a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
   b. Provide vertical edges, rounded to 3/8-inch radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch into fixture opening.
   c. Provide 3/4-inch full bullnose edges projecting 3/8 inch into fixture opening.
2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.
4. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Fasten subtops to cabinets by screwing through subtops into corner blocks of base cabinets. Shim as needed to align subtops in a level plane.

D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

G. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
   1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

I. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

SECTION 124813

ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Roll-up rail mats.
2. Recessed frames.

1.3 COORDINATION

A. Coordinate size and location of recesses in concrete to receive floor mats and frames.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for floor mats and frames.

B. Shop Drawings:
1. Items penetrating floor mats and frames, including door control devices.
2. Divisions between mat sections.
3. Perimeter floor moldings.
4. Custom Graphics: Scale drawing indicating colors.

C. Samples: For the following products, in manufacturer's standard sizes:
1. Tread Rail: Sample of each type and color.
2. Frame Members: Sample of each type and color.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For floor mats and frames to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS AND FRAMES, GENERAL

A. Structural Performance: Provide roll-up rail mats and frames capable of withstanding the following loads and stresses within limits and under conditions indicated:
1. Uniform floor load of [300 lbf/sq. ft.] <Insert value>.
2. Wheel load of [350 lb] <Insert value> per wheel.

B. Regulatory Requirements: Comply with applicable provisions in [the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities] [and] [ICC A117.1] <Insert regulation>.

2.2 ROLL-UP RAIL MATS

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [the product indicated on Drawings] <Insert manufacturer's name; product name or designation> or a comparable product by one of the following:
1. Arden Architectural Specialties, Inc.
2. Balco, Inc.
3. Crowder, K. N. Manufacturing, Inc.
4. C/S Group.
5. J. L. Industries, Inc.
6. Mats Inc.

C. Roll-up, Aluminum-Rail Hinged Mats: Extruded-aluminum tread rails [1-1/2 inches] [2 inches] <Insert dimension> wide by 3/8 inch thick, sitting on continuous vinyl cushions.
1. Tread Inserts: 1/4-inch- high, 28-oz./sq. yd. weight, level-cut, nylon-pile, fusion-bonded carpet.
2. Colors, Textures, and Patterns of Inserts: [As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from full range of industry colors].
3. Rail Color: [Mill finish] [Clear] [Light bronze] [Medium bronze] [Dark bronze] [Black] [Match Architect's sample] [As selected by Architect from full range of industry colors and color densities].
4. Hinges: Aluminum.
5. Mat Size: [As indicated] <Insert size>.

2.3 FRAMES

A. Recessed Frames: Manufacturer's standard extrusion.
1. Extruded Aluminum: ASTM B 221, Alloy 6061-T6 or Alloy 6063-T5, T6, or T52.
a. Color: [Mill finish] [Clear] [Light bronze] [Medium bronze] [Dark bronze] [Black] [Match Architect's sample] [As selected by Architect from full range of industry colors and color densities].

2.4 FABRICATION

A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.

B. Surface-Mounted Frames: As indicated for permanent surface-mounted installation, complete with corner connectors, splice plates or connecting pins, and postinstalled expansion anchors.

C. Recessed Frames: As indicated, for permanent recessed installation, complete with corner pins or reinforcement and anchorage devices.
1. Fabricate edge-frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

D. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

2.5 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, [AA-M12C22A41, Class I, 0.018 mm] [AA-M12C22A31, Class II, 0.010 mm] or thicker.

B. Color Anodic Finish: AAMA 611, [AA-M12C22A42/A44, Class I, 0.018 mm] [AA-M12C22A32/A34, Class II, 0.010 mm] or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and floor conditions for compliance with requirements for location, sizes, [**minimum recess depth,**]and other conditions affecting installation of floor mats and frames.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install recessed mat frames to comply with manufacturer's written instructions. Set mat tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.
   1. For installation in terrazzo flooring areas, provide allowance for grinding and polishing of terrazzo without grinding surface of recessed frames. Coordinate with other trades as required.
   2. Install necessary shims, spacers, and anchorages for proper location, and secure attachment of frames.
   3. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.

3.3 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 124813

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