PART 1 – GENERAL

1.0 SUMMARY

A. Section Includes:
   1. Steel casework
   2. Table frames
   3. Work surfaces
   4. Sinks and outlets
   5. Service fittings
   6. Accessory equipment

B. Related Sections:
   1. Division 1 Section "LEED Requirements" for additional LEED requirements
   2. Division 6 Section "[Rough Carpentry] [Miscellaneous Carpentry]" for wood blocking for anchoring laboratory casework.
   3. Division 9 Section "Gypsum Plaster" for reinforcements in metal-framed plaster partitions for anchoring laboratory casework.
   4. Division 9 Section "Gypsum Board Assemblies" for reinforcements in metal-framed gypsum board partitions for anchoring laboratory casework.
   5. Division 9 Section "Resilient Wall Base and Accessories" for resilient base applied to metal laboratory casework
   6. Division 11 Section "Laboratory Fume Hoods" for fume hoods, including base cabinets and countertops under fume hoods
   7. Division 12 Section [Wood] [Plastic Laminate] [Phenolic Resin] [Epoxy Resin] Laboratory Casework
   8. Division 15 and 16 Sections for installing service fittings specified in this Section
   9. Division 15 and 16 Sections for connecting service utilities at indicated point. Piping and wiring for service fittings within laboratory casework up to point of connection are specified in this Section.

1.1 ALTERNATE PROPOSALS

Proposals are invited from alternate manufacturers only if they comply with the minimum design requirements and the minimum performance requirements. A notarized letter stating full compliance must be included in alternate proposals signed by an officer of the manufacturer to ensure compliance.

1.2 RELATED WORK BY OTHER SPECFICATION SECTIONS

A. Furnishing, installation and connection of “Service Lines” within and/or attached to equipment, slotted studs, partitions, service tunnels or service turrets, through, under or along backs of working surfaces as required for “Service Fixtures.”
B. Receiving, installing and connecting “Service Fixtures” furnished by laboratory casework manufacturer including the pulling of wire and connecting of electrical fixtures in service lines.
C. Receiving, handling, installing and connecting separate laboratory sinks, cup sinks or drains, overflows, sink outlets and tail-pieces furnished by the laboratory casework manufacturer.
D. Furnishing, installing and connecting vents and drain lines.
E. Furnishing, installing, setting and connecting special electrical and plumbing fixtures and piping to meet local codes, even though not specifically called for in

specifications and shown on drawings.

F. Furnishing, installing and connecting of ducts from fume hoods to blowers and from blowers to atmosphere.
G. Furnishing, handling and installing fans with motors (blowers).
H. Furnishing, and installation of framing or reinforcements for wall, floors and ceilings to adequately support laboratory equipment and brick, plaster, metal or wood grounds required for proper anchoring of the equipment.
I. Furnishing fluorescent tubes (for task lights), light bulbs, and/or any miscellaneous materials generally classified as maintenance or supply items.
J. Furnishing and installation of pipe hangers.
K. Furnishing in-wall exhaust duct and connection to vented cabinets.

1.3 CASEWORK DESIGN REQUIREMENTS

A. Flush Overlay Construction: Surfaces of doors and drawers shall overlay the cabinet ends, top or bottom rails. Horizontal and vertical case shell members (panels, top rails and bottoms) shall be concealed behind drawer and door fronts. Maintain the following reveals:
Steel fronts - 1/8” (3 mm) horizontally and vertically between door and drawer fronts, 5/32” (4 mm) vertical side reveals at end of cabinet. Flush overlay steel fronts with concealed hinges 1/16” (1.6 mm).
Wood fronts - 1/8” (3 mm) horizontally and vertically between door and drawer fronts, 1/16” (1.5 mm) vertical side reveals at end of cabinet
    1. Steel front option: 20 gauge interior and 18 gauge exterior panels; interior filled with sound deadening material; 14 gauge steel reinforcement added at hinge locations; 20 gauge vertical reinforcement channel, one each door.
    2. Wood front option: ¾” thick veneer clad particle board core with 3mm thick veneer edge banding. (Specifier's option) Red Oak, White Maple or Bamboo veneers.

OR

B. Flush Front Construction: Surface of doors, drawers and panel faces shall align with cabinet fronts without overlap of case ends. Vertical case shell members shall meet in the same plane without overlap, crack or crevices. Maintain the following reveals:
Steel fronts - 1/8” (3 mm) horizontally and vertically between door and drawer fronts, 3/32” (.094 mm) vertical side reveals at end of cabinet
    1. Steel front option: 20 gauge interior and 18 gauge exterior panels; interior filled with sound deadening material; 14 gauge steel reinforcement added at hinge locations; 20 gauge vertical reinforcement channel, one each door.
C. Field convertible design allows for conversion of cabinet door and drawer front styles, drawer body suspension and cabinet horizontal and vertical rails with the use of simple hands tools.
D. Slimline styling: Front width of end panels 3/4" and front height of top members 1".
E. Self-supporting units: Completely welded shell assembly without applied panels at ends, backs or bottoms, so that cases can be used interchangeably or as a single, stand-alone unit.
F. Interior of case units: Easily cleanable, flush interior. Base cabinets, 30"- 48” wide, with double swinging doors shall provide full access to complete interior without center vertical post.
G. Drawers: Sized on a modular basis for interchange to meet varying storage needs,

and designed to be easily removable in field with the use of simple hand tools.

H. Framed glazed doors: Identical in construction, hardware and installation to solid panel doors. Design framed glazed doors to be removable for glass replacement.

1.4 QUALIFICATIONS

The following performance details are project requirements and must be met by all Bidders whether named herein, or approved by Addendum, regardless of Manufacturer's "Standards". Deviations will not be allowed.

A. Structural Cabinet Body: Cabinet body shall be minimum 18 gage cold-rolled steel welded construction. Cabinet bottoms shall be turned down and welded to the cabinet sides and shall incorporate an 11 gage steel gusset with 3/8" threaded levelers. The toespace shall be fully enclosed. Top rail shall be welded to cabinet ends. Back panels shall be lift-out gravity fit (mechanical fasteners are not permitted). Single platform shall accept both inset and flush overly designs.

B. Interior Structure: Cabinet front vertical and rear structural supports shall be predrilled and prepunched to accept all hinge, drawer suspension and shelving options. All components shall be self-locating. All components are height adjustable on one-inch increments. All combinations base cabinets over 30" wide shall be furnished with a vertical divider to reduce horizontal members shelf deflection. Front vertical rail shall be installed without tools or mechanical fasteners.

C. Cabinet Loading: Base cabinets shall support 500 lbs. per linear foot up to 2000 lbs. Wall cases shall support 600 lbs. Shelves shall support 40 lbs. per square foot up to 200 lbs. Mobile tables shall support 300 lbs., free-standing tables shall support 600 lbs. and fixed tables shall support 2000 lbs.

D. Cabinet Components: Cabinet construction shall have common cabinet components that can be field converted with simple hand tools. Horizontal and vertical front rails are self- locating and attach with mechanical fasteners (welding is not permitted). Internal components (drawers, door and drawer fronts, drawer suspensions, hinges shelves) can be converted in the field allowing the customer to change the function or appearance without removing the casework with simple hand tools.

E. Drawer Suspensions: All drawer suspensions must be full extension with positive instop and outstop. All suspensions install without tools and can be located anywhere within the vertical plain of the vertical structural support. Drawer suspension must include manual, self-closing and soft-closing options as a standard cataloged product. Dynamic (operational) load rating shall be minimum 100 lbs. (45 kg). Minimum 150 lbs. (68 kg) static load rating.

F. Industry Compliance: All products must have passed third-party independent testing agencies requirements for compliance for the SEFA 8 Metal standards. Flammable storage must pass both UL 1275 and FM 6050 requirements.

Architect/Owners opinion and decision shall be final in evaluation of manufacturer's product for approval to bid or award of contract.

1.5 CASEWORK PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal laboratory casework and support framing capable of withstanding the effects of the following gravity loads and stresses per support framing module without permanent deformation, excessive deflection, or binding of drawers and doors:
B. Structural requirements: Casework components shall withstand the following minimum loads without damage to the component or to the casework operation:
    1. Steel base unit load capacity: 500 lbs. per lineal foot.
    2. Suspended units: 300 lbs.
    3. Drawers in a cabinet body: 150 lbs.
    4. Utility tables (4 legged): 600 lbs. (with levelers) 300 lbs. (with casters)
    5. Hanging wall cases: 300 lbs.
    6. Load capacity for shelves of base units, wall cases and tall cases: 40 lbs. per square foot, maximum load – 200 lbs. up to 48” wide.
    7. Mobile cabinets: 300 lbs
C. Metal Finish Performance Requirements:
    1. Abrasion resistance: Maximum weight loss of 5.5 mg. per 100 cycle when tested on a Taber Abrasion Tester #E40101 with 1000 gm wheel pressure and Calibrase #CS10 wheel.
    2. Humidity resistance: Withstand 1000 hour exposure in saturated humidity at 100 degrees F.
    3. No visible effect to surface finish following 100 hour continuous application of a water soaked cellulose sponge, maintained in a wet condition throughout the test period.
    4. Salt spray: Withstand minimum 200 hour salt spray test.

1.6 CHEMICAL RESISTANCE PERFORMANCE REQUIREMENTS

A. Metal finish:
    1. Preparation: Spray clean metal with a heated cleaner/phosphate solution, pre-treat with iron phosphate spray, water rinse, and neutral final seal. Immediately dry in heated ovens, gradually cooled, prior to application of finish.
    2. Application: Electrostatically apply urethane powder coat of selected color and bake in controlled high temperature oven to assure a smooth, hard satin finish. Surfaces shall have a chemical resistant, high grade laboratory furniture quality finish of the following thickness: Liquid, dipped, solvent based finishes are not and will not be acceptable.
        a. Exterior and interior exposed surfaces: 1.5 mil average and 1.2 mil min.
        b. Backs of cabinets and other surfaces not exposed to view: 1.2 mil average.
B. Cabinet Surface Finish Tests:
    All casework construction and performance characteristics shall be in full compliance with current SEFA 8 Metal standards. At the owner’s request, independent, third party performance testing must be submitted validating compliance and adheres to the finish specifications.
    1. Chemical Spot Test
        a. Purpose of Test
            i. The purpose of the chemical spot test is to evaluate the

resistance a finish has to chemical spills.

ii. **Note:** Many organic solvents are suspected carcinogens, toxic and/or flammable. Great care should be exercised to protect personnel and the environment from exposure to harmful levels of these materials.

b. Test Procedure

i. Obtain one sample panel measuring 14" x 24" (355.6mm x 609.6mm). The received sample to be tested for chemical resistance as described herein.

ii. Place panel on a flat surface, clean with soap and water and blot dry. Condition the panel for 48-hours at 73±3°F / 23±2°C and 50±5% relative humidity. Test the panel for chemical resistance using forty-nine different chemical reagents by one of the following methods:

iii. Method A – Test volatile chemicals by placing a cotton ball saturated with reagent in the mouth of a one-ounce (29.574cc) bottle and inverting the bottle on the surface of the panel.

iv. Method B – Test volatile chemicals by placing five drops of the reagent on the surface of the panel and covering with a 24mm watch glass, convex side down.

v. For both of the above methods, leave the reagents on the panel for a period of one hour. Wash off the panel with water, clean with detergent and naphtha, and rinse with deionized water. Dry with a towel and evaluate after 24-hours at 73±3°F / 23°±2°C and 50±5% relative humidity using the following rating system:

- Level 0: No detectable change.
- Level 1: Slight change in color or gloss.
- Level 2: Slight surface etching or severe staining.
- Level 3: Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

Test #	Chemical Reagent	Test Method
1.	Acetate, Amyl	A
2.	Acetate, Ethyl	A
3.	Acetic Acid, 98%	B
4.	Acetone	A
5.	Acid Dichromate, 5%	B
6.	Alcohol, Butyl	A
7.	Alcohol, Ethyl	A
8.	Alcohol, Methyl	A
9.	Ammonium Hydroxide, 28%	B
10.	Benzene	A
11.	Carbon Tetrachloride	A
12.	Chloroform	A
13.	Chromic Acid, 60%	B
14.	Cresol	A
15.	Dichlor Acetic Acid	A
16.	Dimethylformanide	A
17.	Dioxane	A
18.	Ethyl Ether	A
19.	Formaldehyde, 37%	A
20.	Formic Acid, 90%	B
21.	Furfural	A
22.	Gasoline	A
23.	Hydrochloric Acid, 37%	B
24.	Hydrochloric Acid, 48%	B
25.	Hydrogen Peroxide, 3%	B
26.	Iodine, Tincture of	B
27.	Methyl Ethyl Ketone	A
28.	Methylene Chloride	A
29.	Mono Chlorobenzene	A
30.	Naphthalene	A
31.	Nitric Acid, 20%	B
32.	Nitric Acid, 30%	B
33.	Nitric Acid, 70%	B
34.	Phenol, 90%	A
35.	Phosphoric Acid, 85%	B
36.	Silver Nitrate, Saturated	B
37.	Sodium Hydroxide, 10%	B
38.	Sodium Hydroxide, 20%	B
39.	Sodium Hydroxide, 40%	B
40.	Sodium Hydroxide, Flake	B
41.	Sodium Hydroxide, Saturated	B
42.	Sulfuric Acid, 33%	B
43.	Sulfuric Acid, 77%	B
44.	Sulfuric Acid, 96%	B
45.	Sulfuric Acid, 77% and Nitric Acid, 70% equal parts	B
46.	Toluene	A
47.	Trichloroethylene	A
48.	Xylene	A
49.	Zinc Chloride, Saturated	B

c. Acceptance Level
Results will vary from manufacturer to manufacturer. Laboratory grade finishes should result in no more than four Level 3 conditions. Suitability for a given application is dependent upon the chemicals used in a given laboratory.

2. Hot Water Test
   a. Purpose of Test
   The purpose of this test is to insure the coating is resistant to hot water.
   b. Test Procedure
   Hot water, 190°F to 205°F (88°C to 96°C), shall be allowed to trickle (with a steady stream and at a rate of not less than 6 ounces (177.44cc) per minute on the surface, which shall be set at an angle of 45-degrees, for a period of five minutes.
   c. Acceptance Level
   After cooling and wiping dry, the finish shall show no visible effect from the hot water.
3. Impact Test
   a. Purpose of Test
   The purpose of this test is to evaluate the ductility of the coating.
   b. Test Procedure
   A one-pound ball approximately 2" (50.8mm) in diameter shall be dropped from a distance of 12" (304.8mm) onto a flat horizontal surface, coated to manufacturer's standard manufacturing method.
   c. Acceptance Level
   There shall be no visible evidence to the naked eye of cracks or checks in the finish due to impact.
4. Paint Adhesion on Steel Test
   a. 4.1 Purpose of Test
   The paint adhesion test is used to determine the bond of the coating to steel. This does not apply to non-steel products.
   b. 4.2 Test Procedure
   This test is based on ASTM D2197-86 "Standard Method of Test for Adhesion of Organic Coating." Two sets of eleven parallel lines 1/16" (1.587mm) apart shall be cut with a razor blade to intersect at right angles thus forming a grid of 100 squares. The cuts shall be made just deep enough to go through the coating, but not into the substrate. They shall then be brushed lightly with a soft brush for one minute. Examine under 100-foot candles of illumination.
   c. Acceptance Level
   Ninety or more of the squares shall show finish intact.
5. Paint Hardness on Steel Test
   a. Purpose of Test
   The paint hardness test is used to determine the resistance of the coatings to scratches.
   b. Test Procedure
      - Pencils, regardless of their brand, are valued in this way: 8-H is the hardest, and next 11 order of diminishing hardness are 7-H, 6-H, 5-H, 4-H, 3-H, 2-H, H, F, HB, B (soft), 2-B, 3-B, 4-B,

5-B (which are softest).

- The pencils shall be sharpened on emery paper to a wide sharp edge. Pencils of increasing hardness shall be pushed across the paint film in a chisel-like manner until one is found that will cut or scratch the film. The pencil used before that one, that is the hardest pencil that will not rupture the film, is then used to express or designate the hardness.

c. Acceptance Level
The paint shall have a hardness of 4-H minimum with no visible puncture of the finish surface.

C. Wood Finishes

1. Chemical Resistant Wood Finish: The finishing process described in this section shall result in a highly chemical resistant finish that is equally suitable for an AWI premium finish application. A minimum of three pass exposed and two pass semi exposed is required along with appropriate steps for minimizing barber pole effect and glue line exposure to assure a high quality veneer appearance. Prior to application of the wood finish, case and cabinet surfaces shall be smoothly sanded to remove loose fibers, scratch marks and abrasions in the sequences described below. All dust is to be thoroughly removed from the panel prior to finish application. The finishing technology utilized shall be either 100% solids UV, water borne compression spray UV or water borne traditional compression spray.

2. Finishing Processes Allowed

A. 100 Percent Solids Ultraviolet Cured: The finish utilized shall be a 100% solids mixture formulated for application with automated roll coat technology cured with ultraviolet light.

B. Ultraviolet Cured Water Borne Compression Spray: The finish utilized shall be water borne mixture formulated for use in a modern sealed compression spray UV tunnel cured with ultraviolet light. The topcoat must be increased to the quantity required to meet the chemical resistance in this specification.

C. Traditional Water Borne Compression Spray: The finish material shall be water borne compression spray. Water borne topcoats must be increased to the quantity required to meet the chemical resistance required in this specification.

3. Wood Finish Application Finishing applications require the use of a series of steps that must be followed for compliance to this specification. This section applies to UV cured roll coat applications. Compression spray applications shall assure equivalent performance. Sanding steps must be followed to comply with the appearance standards required by this specification. A minimum tone shall be applied to all products. Tones offered shall be “masking “in nature and offered in 2-4 percent range in brown or red range at a minimum.

a. 400 grit cross-belt sanding (not required for plain sliced red oak). Each exposed veneer panel shall be thoroughly sanded with modern wood processing equipment with 400 grit paper at a 30 degree angle to assure minimum barber pole and component glue line exposure.

b. 180 grit wide belt sanding. After cross belt sanding, each part that is to receive either stain or finish shall be thoroughly sanded with modern wood processing equipment with 180 grit paper in the direction of the grain. This process opens the grain for proper application and stain consistency.

c. 220 grit wide belt sanding. After 180 grit sanding, each part that is to receive either stain or finish shall be thoroughly sanded with modern wood processing equipment with 220 grit paper in the direction of the grain.

d. Staining: Staining (if required). If a stain color is selected, all exposed and semi-exposed surfaces shall be thoroughly stained in a manner which allows for a consistent application of the stain over all surfaces. The application shall ensure all areas are consistent and any visible splotchy areas are not allowed. The stain must be selected to meet the requirements of Green Seal GS-11 and all LEED requirements of the project, if so specified.

e. Fill Coat: A pressed in coat of filler material must be applied to all species. Any open grain species such as red oak, white oak, ash, beech will be filled at each pass assuring that all grain is “filled” leaving no the open pores. The fill coat will be set to approximately .2 millimeters in thickness or as required to fill the grain of the species selected.

f. Pre-top coat Cure: The fill coat will be gelled to a minimum of 50% cure prior to the application of the top coat.

g. 1st Top Coat: After passing the fill process, the product will enter a dual stage top coat process. A first stage roller shall apply coating material in mass proportion to assure all parts of the panel are properly coated.

h. 2nd Top Coat: A tandem top coat station shall then both re-apply and smooth the finish over the panel. The process shall assure a smooth and consistent application finish material evenly over the entire product.

i. Cure: The product will then be 100% cured with a dual ultraviolet light system or heated oven for traditional spray systems.

j. 320 Grit Scuff Sanding. Each panel will then be sanded with 320 grit paper ready for re-application of the top coat.

k. 3rd Pass Top Coat: Each part will again pass a single stage top coat process. The process shall assure a smooth and consistent application of finish material evenly over the entire product.

l. Cure: The product will then be 100% cured with a dual ultraviolet light system or heated oven for traditional spray systems.

m. The top coat process must be repeated as many times as are required to meet the chemical resistance requirements of this specification.

1. The final process will allow for a finish material thickness minimum of 2.0 mils for UV coatings and 3.0 mils for compression spray systems. Finishes shall be applied under atmospheric conditions that do not adversely affect both the chemical resistance and aesthetic characteristics of the finish. Once applied, all finishes shall be tested with the series of chemicals as listed in the SEFA guidelines.

2. The finish must then be tested against the SEFA guidelines. Certified 3rd party reports must be presented upon request.

1.7 REFERENCE STANDARDS

A. Scientific Equipment & Furniture Association (SEFA)
    1. SEFA 1 Laboratory Fume Hoods
    2. SEFA 2 Installation
    3. SEFA 3 Work Surfaces
    4. SEFA 7 Laboratory and Hospital Fixtures
    5. SEFA 8 Laboratory Furniture-Casework-Shelving and Tables (Metal, Phenolic resin, Plastic laminate, Polypropylene, Wood)
    6. SEFA 9 Ductless Enclosures
    7. SEFA 10 Adaptable Furniture Systems
    8. SEFA 11 Liquid Chemical Storage
B. Builders Hardware Manufacturers Association (BHMA)
C. National Electrical Manufacturers Association (NEMA)
D. National Fire Protection Association (NFPA) 30 Flammable Liquid Storage
E. National Fire Protection Association (NFPA) 70 Electrical Components, Devices and Accessories.
F. National Particleboard Association (NPA) 8-Voluntary Standard for Formaldehyde Emission from Particleboard

1.8 SUBMITTALS

A. Refer to submittal section of the General and Supplementary Specifications in Division 1 for requirements and procedures. Fabrication or purchase of any items prior to approval will be at the manufacturer's risk.
B. Product Data: For each type of product indicated.
C. Shop Drawings: For metal laboratory casework. Include plans, elevations, sections, details, and attachments to other work.
    1. Indicate locations of blocking and reinforcements required for installing laboratory casework. Indicate locations and types of service fittings, together with associated service supply connection required. Include details of utility spaces showing supports for conduits and piping. Include details of support framing system. Include details of exposed conduits, if required, for service fittings.
    2. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment. Include coordinated dimensions for laboratory equipment specified in other sections.
D. Samples for Initial Selection: For factory-applied finishes, [plastic-laminate countertops] [epoxy sinks] [epoxy countertops and troughs] [and] [phenolic-

composite countertops].

E. Samples for Verification: For each type of finish, including countertop material, in manufacturer's standard sizes.
F. Samples for Verification: Unless otherwise directed, approved sample units will be retained by the Owner's Representative.
    1. 6-inch- (150-mm-) square Samples for each type of countertop material.
    2. One full-size, finished base cabinet complete with hardware, doors, and drawers, but without countertop.
    3. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
    4. One Sample each of hinged and sliding doors.
    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. Adhesives and sealants
G. LEED Submittals:
    1. Credit EQ 4.4:
        i. Particleboard manufacturer's product data indicating that the bonding agent contains no urea formaldehyde.
        ii. Adhesive manufacturer's product data for adhesive used indicating that the adhesive contains no urea formaldehyde.
        iii. Recycled content – pre and post consumer content
        iv. Paints, stains and finishes maximum VOC (volatile organic compounds) limits as defined under GS 11
H. Qualification Data: For testing agency.
I. Product Test Reports: Based on evaluation of comprehensive SEFA tests performed by a qualified testing agency, indicating total compliance of laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.

1.9 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified for testing indicated, as documented according to ASTM E 548.
B. Source Limitations: Obtain laboratory casework, including countertops, sinks, service fittings, and accessories, through one source from a single manufacturer.
    1. Obtain through same source from same manufacturer as fume hoods specified in Division 11 Section "Laboratory Fume Hoods."
C. Installer Qualifications: A factory trained authorized representative of the casework manufacturer for installation and maintenance of units required for this Project.
D. Product Standard: Comply with SEFA 8 Metals, "Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices."
E. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements of NFPA 30 by UL and FM and inspecting agency acceptable to authorities having jurisdiction.
    1. Cabinets that are not listed and labeled but are constructed according to NFPA 30, Paragraph 4-3.3(b) may be used if acceptable to authorities having jurisdiction.
        i. Electrical Components, Devices, and Accessories: Listed and labeled as

defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

F. Manufacturer's qualification: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment and shall meet the following requirements:
   1. Five years or more experience in manufacture of laboratory casework and equipment of the type specified.
   2. Ten installations of equal or larger size and requirements.
G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.10 DELIVERY, STORAGE, AND HANDLING

A. Schedule delivery of casework and equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.
B. Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating.
C. Protect all work surfaces throughout construction period with 1/4" corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering "No Standing."

1.11 PROJECT CONDITIONS

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

1.12 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of metal laboratory casework.
B. Coordinate installation of metal laboratory casework with installation of fume hoods and other laboratory equipment.

1.13 EXTRA MATERIALS

A. Furnish complete touchup kit for each type and color of metal laboratory casework provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.
B. Furnish extra materials described in Part 3 that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.14 EXCEPTIONS TO DRAWINGS AND SPECIFICATION

A. All exceptions shall be subject to written approval prior to receipt of bid. If no written communication is received prior to receipt of bid and approval indicated in an addendum, it is assumed that bidder will be in total compliance with specifications and will be held responsible for default or delay, regardless of any statement to the contrary in their written proposal.
B. Requests for a substitution must be made directly to the Owner's Representative's office for consideration no later than fifteen (15) working days prior to bid receipt date.

C. Requests for a substitution following the bid opening will be rejected.
D. Substitutions approved prior to bid date will be handled as an addendum and be sent to all bidders.

1.15 WARRANTY

A. Furnish a written warranty that Work performed under this Section to be and remain free from defects as to materials and workmanship for a period of one (1) year from date of acceptance. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner. Defects include, but are not limited to:
    1. Ruptured, cracked, or stained coating
    2. Discoloration or lack of finish integrity
    3. Cracking or peeling of finish
    4. De-lamination of components or edge banding
    5. Slippage, shift, or failure of attachment to wall, floor, or ceiling
    6. Weld or structural failure (visible weld marks)
    7. Warping or unloaded deflection of components
    8. Failure of hardware

PART 2 – PRODUCTS

2.0 SUMMARY

A. Design, materials, construction and finish of casework specified in the minimum acceptable standard of the for a universal steel laboratory casework line. The basis of this product specification is Hamilton Scientific LLC, 1716 Lawrence Drive, STE 1, DePere WI 54115

   General: Assemble and finish units at point of manufacture. Use precision dies for interchangeability of like-size drawers, doors, and similar parts. Perform assembly on precision jigs to provide units that are square. Reinforce units with angles, gussets, and channels. Integrally frame and weld to form a dirt and vermin-resistant enclosure. Where applicable, reinforce base cabinets for sink support. Maintain 1/8” (3 mm) horizontally and vertically between door and drawer fronts. Vertical side reveals between the door/drawer and end of cabinet: Flush overlay steel fronts 5/32” (4 mm); Inset steel fronts 3/32” (2.4 mm); flush overlay wood fronts and flush overly radiused steel fronts with concealed hinges 1/16” (1.6 mm)
B. Steel Doors: Outer and inner pans that nest into box formation, with full-height channel reinforcements within the door. Fill doors with sound-deadening material.
C. Wood Doors: ¾” thick veneer clad particle board core with 3mm thick veneer edge banding. (Specifier’s option):
    1. Red Oak, plain sliced, book matched
    2. Red Oak, rift-cut, slip matched
    3. Bamboo caramelized, edge cut
    4. Bamboo, natural, edge cut
    5. Bamboo, caramelized, flat cut
    6. Bamboo, natural, flat cut
    7. Maple, rotary cut
    8. Maple, plain sliced, booked matched

9. Maple, quarter sawn, slip matched

D. Wood Flush Overly with 1/8” reveal between intra-doors and 1/16” reveal at cabinet edge. Requires the hinge to be notched into door. Drawer heads must be manufactured with integral drawer adjusters for the correct alignment of the 1/8” reveal across the face of the cabinet.
E. Wood veneer grain on the door and drawer fronts are to be matched vertically per door/drawer set by the cabinet block.
F. Wood doors and drawer fronts are to be slightly eased at all edges.
G. Glazed Steel Doors: Hollow-metal stiles and rails of similar construction as flush doors, with glass held in resilient channels of gasket material.
H. Hinged Steel Doors: Reinforce with angles welded inside inner pans at hinge edge.
I. Steel Drawers: Fronts made from outer and inner pans that nest into box formation, with no raw metal edges at top. Sides, back, and bottom fabricated in one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Fasten drawer front to sides and bottom to form a single, integral unit. Provide drawers with ball-bearing slides and positive stops to prevent metal-to-metal contact or accidental removal.
J. Adjustable Shelves: 1” front, back, and ends formed down, with edges returned horizontally at front and back to form reinforcing channels.
    1. Adjustable base unit shelves shall be quantity 2 split shelves each 8.75” (223 mm) or 17.56” (375 mm) deep, unless otherwise noted on the drawings.
    2. Adjustable shelves shall be mounted to surface type steel standards (wall condition) or slotted studs (above peninsula benches). Adjustable shelves shall be supported by steel shelf brackets. Brackets shall be cold rolled steel with epoxy powder coated finish, complying with BHMA A156.9, Types B04102 and B04112. Shelves shall be fastened to brackets with two stainless steel screws per bracket.
    3. Adjustable shelves mounted on slotted studs shall be supplied with a continuous 2” (50.8mm) high band to create a 1” (25.4mm) high curb at rear of shelf. The curb along the back shall be of similar material as the shelf.
K. Toe Space: Fully enclosed (per NIH vermin control requirements), 4 inches (100 mm) high by 2.125” inches (55 mm) deep, with no open gaps
L. Table Legs: Welded tubing, 2 .125 inches (75 mm) nominal, square with stretchers where needed to comply with product standard. Weld or bolt leg stretchers to legs and cross-stretchers and bolt legs to table aprons. Provide leveling device welded to bottom of each leg.
M. Leg Shoes: [Black vinyl or rubber] [Satin-finished stainless steel], open-bottom, slip-on type.
N. Utilities: Provide space, cutouts, and holes for pipes, conduits, and fittings in cabinet bodies to accommodate utility services and their support-strut assemblies.
O. Utility-Space Framing: Laboratory casework manufacturer's standard steel framing units consisting of 2 steel slotted channels complying with MFMA-2, not less than 1-5/8 inches (41 mm) square by 0.0966 inch (2.5 mm) thick, and connected together at top and bottom by U-shaped brackets made from 1-1/4-by-1/4-inch (32-by-6-mm) steel flat bars. Framing units may be made by welding specified channel material into rectangular frames instead of using U-shaped brackets.
P. Filler Strips [and Utility-Space Closure Panels]: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets and with hemmed or flanged

edges.

2.1 CASEWORK SYSTEM

A. General: Provide casework manufacturer's standard integrated system that includes support framing, suspended modular cabinets, filler and closure panels, [wall panels,] [under cabinet task-lighting fixtures,] countertops, and fittings needed to assemble system. System includes hardware and fasteners for securing support framing to permanent construction.
   1. Cabinets shall be fabricated as sectional units and be capable of being removed and reinstalled without use of special tools for relocation within system. Component parts of the unit shall be manufactured ensuring uniformity, interchangeability and accurate alignment. All base cabinets shall have integral enclosed bases.
   2. Base cabinets allow for field conversion of cabinet door and drawer front styles, drawer body suspension systems and cabinet horizontal and vertical support rails with the use of simple hands tools.
   3. Suspended cabinets can be removed without removing or providing temporary support for countertops.
   4. Sinks (drop in) shall be supported independent of base cabinets.
   5. Support framing has provision for fastening pipe supports at utility space in not more than 1-inch (25-mm) increments.
   6. System includes filler and closure panels to close spaces between support framing, cabinets, shelves, countertops, floors, and walls, unless otherwise indicated. Fabricate panels from same material and with same finish as cabinets and with hemmed or flanged edges.
   7. System includes wall-mounted casework that matches all other laboratory casework in design and material.

B. 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 (25-mm) increments through full height of supports.
   2. Vertical supports rest on adjustable leveling bases and are secured to floor with optional 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.

C. Under cabinet Task-Light Fixtures: As specified under Electrical Service Fittings in this Specification Section.

2.2 ACID STORAGE CABINET

A. Description: Construct as specified for metal casework, including hardware and locks.
B. Provide ¼” (6.35mm) thick glass-fiber cement board or molded one-piece white polypropylene lining on interior surfaces.
C. Provide 1-1/2 inch (38MM) diameter indicators for field cut-outs for vent hose

connecting at the rear of base cabinet cement/rock lined only). When cabinet is used without a fume hood, vent hose is to extend to the appropriate laboratory exhaust system.

D. Removable access back panel.
E. Manual closing doors are available for Flush Overlay and Flush Front cabinets. Self-closing doors are only available on cabinets with a flush panel above a door models.
F. Provide one adjustable lined shelf, of similar material and thickness as interior liner. Shelf to be capable of supporting 40 lbs. per square foot up to 200 lbs.
G. One (1) 1 inch (25.4mm) deep liquid tight drip pan to cover the entire floor area of the cement board lined cabinet compartment. Pan to be fabricated of ¼" (6.35mm) thick white polypropylene with seams welded.
H. Door catch shall be a non-metallic plunger and roller style
I. Apply signage, contrasting color, to cabinet doors indicating "CORROSIVE CHEMICALS."

2.3 FLAMMABLE LIQUIDS STORAGE CABINET

A. Conform to OSHA Regulations and the requirements of NFPA 30, National Fire Protection Association, Flammable and Combustible Liquids Code. Cabinets shall be Factory Mutual (FM) 6050 approved and/or Underwriters Laboratories (UL) 1275 listed. Cabinets shall limit the internal temperature at the center, one inch (25mm) from the top to not more than 325 degrees Fahrenheit (162.8 degrees Celsius) when subjected to a ten-minute fire test that simulates the fire exposure of the standard time-temperature curve specified in NFPA 251.
B. If cabinet is required to be vented by local authorities, provide 1-1/2" (38.1mm) diameter vented outlet with fire arrestor.
C. Cabinet shall not be ventilated unless required by local authorities. Opening provided by the manufacturer shall be sealed with bungs.
D. Casing: Bottom, top, back, door and sides of cabinet shall be constructed of metal and finished in the same manner as the metal casework herein before specified, provided that the bottom, top, door and sides of the cabinet shall be at least 18 gage sheet steel and shall be double-walled, with 1-1/2 inch (38mm) air space. Joints shall be riveted, welded or made tight by equally effective means.
E. Ground (to structure) and bond cabinet.
F. Flame arrestor on cabinet vent outlet.
G. Adjustable, full width, metal shelf supported with "locking" clips to avoid inadvertent tipping.
H. Apply signage, contrasting color, in a conspicuous size to cabinet doors indicating "FLAMMABLE KEEP FIRE AWAY."
I. Door: Shall be self closing with a continuous piano hinge and three point locking mechanism. Door sill spacing shall be raised at least 2 inches (50mm) above the bottom of the cabinet to retain spilled liquid within the cabinet. Specifiers Option: Self- Closing or Manual doors
J. Finish: Finish as specified for metal laboratory casework except interior and shelf finish shall be three-mils thick.

2.4 VACUUM PUMP CABINET

Flush Overly Construction: Surface of doors and drawers shall overlay the cabinet ends, top or bottom rails. Horizontal and vertical case shell members (panels, top rails and bottoms) shall be concealed behind door and drawer fronts.

Surfaces of doors, drawers and panel faces shall align with cabinet fronts without overlap of case ends, top or bottom rails. Horizontal and vertical case shell members (panels, top rails and bottoms) shall meet in the same plane without overlap, cracks or crevices.

OR

Flush Front Construction: Surface of doors, drawers and panel faces shall align with cabinet fronts without overlap of case ends. Vertical case shell members shall meet in the same plane without overlap, crack or crevices.

Slimline styling: Front width of end panels 3/4". (Top rail is 1” – there is no bottom rail.)

Self-supporting units: Completely welded shell assembly without applied panels at ends, backs or top panel, so that cases can be used interchangeably or as a single, stand-alone unit.

Interior of case units: Acoustically treated sides, back and top panel and interior door with sound deadening materials. Base cabinets, 30" and wider, with double swinging doors shall provide full access to complete interior without center vertical post.

A. Vacuum pump storage to provide a means to store and vent vacuum pumps and their emissions and heat loads.
B. Vacuum pump cabinet shall have hinged doors with integral toe space without a cabinet bottom. Optional door louvers will be incorporated when the exhaust fan is specified.
C. Vacuum pump cabinet shall have removable back panel(s) for utility access and visual inspection. Back panel shall incorporate an integral 2 “vent hole for a standard vent assembly.
D. Vacuum pump cabinet shall incorporate acoustical insulation on the interior door panels, sides, back and underside of the top panel. Insulation shall be open cell foam of clonal design.
E. Storage unit shall incorporate an integral electrical switch (120V, 20 amps) with pilot light to indicate the operational mode of the vacuum pump unit. Switch shall be supplied with an optional 20’ long, ½” trade size flexible metal conduit.
F. Optional variac voltage transformer shall be factory installed in the flush front panel to provide a variable voltage source for instrumentation. Variac shall include a metal enclosure, cover plate, toggle switch, duplex electrical receptacle, fuse holder and pilot light. Electrical input 120VAC, 50/60 Hz – output 140VAC, 10 amps. Variac will be supplied with a 20’ long, ½” trade size flexible metal conduit.
G. Storage unit shall have an electrical duplex outlet, located in the rear of the cabinet, for the vacuum pump plug end. Outlet to be accessible from the inside of the cabinet. Outlet shall be hard wired to the electrical switch.
H. Mobile platform shall be capable of supporting 300 lbs. Front two casters shall be locking/swivel models. Lipped construction shall safely contain any accidental spills. Platform shall support a removable polypropylene tray for ease of cleanabilty.
I. An optional 235 cfm exhaust fan will be supplied for greater heat loads. The exhaust fan assembly will be attached to the back of the cabinet for maximum pump storage and airflow. The fan assembly shall incorporate a 4” diameter duct collar to connect

to the building HVAC.

J. Vacuum Pump Cabinet – Nominal Dimensions:
Width: 24”, 30”, 36”, 48”
Depth: 25” with electrical junction box; 29-5/8” with exhaust fan housing
Height: 34.75”

K. Mobile Pump Platform – Nominal Dimensions:
Width: 21”, 27”, 33”, 45”
Depth: 17.863”
Height: 5.750”

2.4 CABINET HARDWARE

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

B. Hinges: Stainless steel, #4 finish, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with rounded tips. Provide 2 for doors 48 inches (1200 mm) and less in height and 3 for doors more than 48 inches (1200 mm) in height, four for doors 84” or more in height.
(Specifier’s option)
1. Inset steel, stainless steel, 5-knuckle
2. Flush overlay wood, stainless steel, 5- knuckle or zinc coated concealed
3. Flush overly steel, stainless steel, 5- knuckle
4. Radius flush overlay steel, zinc coated concealed

C. Drawer and Door Pulls: Pulls fastened from back with two screws. For sliding doors, provide stainless steel or chrome-plated recessed flush pulls. Provide two (2) pulls for drawers more than 24 inches (600 mm) in width.
(Specifier’s option)
1. Rectangular brushed aluminum
2. Aluminum wire
3. Stainless steel wire
4. Satin chrome wire
5. Small sweep matte stainless steel
6. Semi-recessed polypropylene – chameleon
7. Semi-recessed polypropylene – black
8. Semi-recessed polypropylene – gray
9. Semi-recessed polypropylene – white
10. Flush stainless steel

D. Door Catches: Nylon-roller spring loaded, self-aligning, catch with a steel strike plate. Double doors without locks shall have a catch on each door. Tall cases shall have latching devices located on the structurally fixed center shelf. The left hand door shall have a positive catch and the right hand door shall have a roller type catch where locks are used. Where locks are used, catches and strike plates shall be used on left hand doors of double door cases and shall be steel, cadmium plated. Provide 2 catches on doors more than 48 inches (1200 mm) in height.

E. Drawer Slides: Full-extension, heavy-duty, zinc plated drawer slides; designed to prevent rebound when drawers are closed; SEFA 8 Metal complaint and rated for 100 lbs and 150 lbs. full extension slides; 150 lbs slides standard on all file drawers. Drawer slides shall have an integral stop mechanism to avoid inadvertent removal. Self-closing and soft-closing slides are BIFMA rated.

(Specifier's option)
1. 100 lbs. full extension, SEFA 8 Metal (Standard Default)
   Pull board (Only Option)
2. 100 lbs. full extension, self closing, BIFMA X5.2 Clause III, X5.3 Clause II
3. 100 lbs. full extension, soft closing, BIFMA X5.2 Clause III, X5.3 Clause II
4. 150 lbs. full extension, SEFA 8 Metal

F. Label Holders: Stainless steel, aluminum, or chrome plated; sized to receive standard label cards approximately 1 by 2 inches (25 by 50 mm), attached with screws or rivets. Provide where indicated on drawings.
G. Locks: Cam or half-mortise type with 5-disc or 5-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281, E07111, or E07021. Locks shall be mounted in special housing so designed as to prevent removal when in locked position. The locks and lock housings shall be fully concealed within the drawer heads and doors. The lock tongues shall engage the rails or stiles when in locked position. Sliding door locks shall be push-type operating in sleeves and engaging both doors when in locked position and provided with positive door holding device. Install theft panels above each drawer or cupboard segment in order to isolate locked section. Locks shall be separately keyed (including cabinets with multiple locks and cabinets in the same room).
   1. Provide minimum of [two] paracentric keys per lock and [two] master keys.
   2. Provide [where indicated] [on all drawers and doors].
   3. The exposed face shall be [chromium plated] [stainless steel] with satin finish.
H. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.
I. Leg Shoes: Leg shoes shall be provided on all table legs, unless otherwise specified, to conceal leveling device. Leg shoes shall be pliable 2.5" (35mm) high coved to the floor at the bottom.
J. Shelf Adjustment: Adjustable shelf support clips are designed for adjusting shelves on 1.26" (35 mm) centers and shall be painted steel complying with BHMA A156.9, Type B04013. In addition to shelf clips required for initial assembly, six (6) dozen additional clips to be provided to the owner.
K. Pull-Out Boards: Pull-out boards shall be fabricated of the same material and finish as the cabinet body. The pull out board shall be located in the top rail of the cabinet, supported by drawer slides rated for 100 lb. (45.36mm), full-extension, and load with a stop mechanism to avoid inadvertent removal. They are not required in apron units. Each pull out board shall have front fascia, the same width as the drawer heads that fills void between the counter top and drawer or door below. The top of the fascia shall be flush to the top surface of the pull out board
L. Standards: Surface mounted adjustable shelves, shall be mounted to twin-tracked standards. Standards shall be coated with an epoxy powder coating complying with BHMA A156.9 Types B04102 with a nominal cross section of 1-1/2" x ½" (38.1mm x 12.7mm). Acceptable manufacturers shall be Reeve, Fixture Hardware Manufacturing Corporation, and Knape and Vogt. Standards and slotted studs shall have a fully compatible slot pattern. Fasten standards to concrete masonry walls or properly blocked steel studded walls with appropriate flat head screws. Adjustable shelves, wall cabinets and pegboards will be furnished with integral mounting brackets or clips.
M. Slotted Studs: Adjustable shelves, wall cabinets and peg boards mounted above peninsula or island benches shall be mounted to a welded double-sided, twin tracked

stud assembly. Assembly shall be fabricated of 14 gauge, fully welded steel tube with slots laser cut into uprights and be coated with an epoxy powder coat. Acceptable manufacturers shall be Reeve, Fixture Hardware Manufacturing Corporation, and Knape and Vogt. Slotted studs and standards shall have a fully compatible slot pattern. Adjustable shelves, wall cabinets and pegboards shall be furnished with integral mounting brackets or clips.

N. File Drawers. File drawers shall be furnished integral design that allows Pendaflex inserts to hold files in a front-to-back configuration.
O. Adjustable Leveling Devices: Each base cabinet shall have leveling devices, 3/8”-16, 2.5” long similar to model # 2500T32 as manufactured by McMaster-Carr Supply Company, New Brunswick, NJ.
P. Casters shall be equal to Sheppard PRS30406BC, 3” soft rubber wheeled casters. Front casters are rigid and locking, rear casters are swivel.
Q. Reagent Shelves: Provide as indicated, fabricated from same material as adjacent countertop, unless otherwise indicated.

2.5 UMBILICALS

A. Vertical service columns shall extend from the [floor] [countertop] to a minimum of 6” (150mm) above the hung finished ceiling and secured at bottom and top to insure structural stability.
B. Umbilical shall be fabricated and finished the same as the laboratory casework. Color to be selected by Architect.
C. Umbilicals shall have a removable access panel, screwed in place, on unobstructed side. One unobstructed side (opposite side with conduit cut-outs).

2.6 ADD-A-DRAWER BASE MOBILE CABINETS

A. Add-A-Drawer Mobile Base Cabinets: Cabinets with casters or otherwise noted must incorporate “Add-A-Drawer” design to allow casework to be used in both standing and sitting height configuration and shall be constructed as follows:
B. Mobile base cabinet shall be nominally 24.36” (619 mm) high. Top of the base cabinet shall be same material and finish as exposed faces of cabinet
C. A 7.5” (191 mm) high, fully enclosed drawer box made same width as cabinet below, shall sit on top of each base cabinet to create a standing height cabinet. Top of the apron shall be same material and finish as exposed face of cabinet.
D. Apron shall be aligned with two (2) zinc plated bolts that engage cabinet’s back rail through pre-drilled holes with full diameter metal inserts. Front rail is aligned by a full width slip joint.
E. Drawer units must be equipped with an anti-tip/anti-trick mechanism that shall include an interlock in the lower cabinet so that only one drawer in a vertical stack can be opened at one time. Base cabinets shall have an 18 gage metal plates across the underside of the finished bottom and held in place by a welded pocket to act as a counter weight.
F. Optional pull board shall be fabricated of the same material and finish as the cabinet body. The pull out board shall be located below the top rail of the cabinet, supported by drawer slides rated for 100 lb. (45.36mm), full-extension, and load with a stop mechanism to avoid inadvertent removal. They are not required in apron units. Each pull out board shall have front fascia, the same width as the drawer heads. Front pullboard head shall be flush with the writing work surface.

2.7 WALL MOUNTED CASEWORK

A. Where noted as such, provide wall-mounted casework that matches all other laboratory casework in design and material. The assembly's construction however, must be modified to withstand the rigors of being mounted directly to the wall and suspended above the floor, without sagging or effecting the door or drawer operation. The assembly must be capable of supporting an equipment load of at least 300 lbs. above and beyond the weight of the assembly.

PART 3 – EXECUTION

3.0 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of metal laboratory casework.
    1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.1.1 INSTALLATION OF CABINETS

A. Install level, plumb, and true by means of the micro-adjustment device located in each bottom corner of the base cabinets. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit with no visible gaps, with fasteners concealed where practical.
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: Adjust top rails and sub-tops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches (600 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).
    1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches (600 mm) o.c. and at sides of cabinets with not less than 2 fasteners per side.
D. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches (600 mm) o.c. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
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.
G. The assemblies listed below are to be fastened together with devices of adequate strength to support cabinet of shelf fully loaded. Fully loaded at (40) LBS. per square, up to 200 lbs., foot per shelf for enclosed wall cabinets or open adjustable shelves not inclusive of cabinet, shelf and bracket weight. Securely fasten wall-mounted items to solid supporting material only. Installation to meet seismic requirements:
    1. Wall cabinet to wall
    2. Adjustable shelf to wall

3. Pegboard to wall
4. Wall cabinet to slotted stud
5. Adjustable shelf to slotted stud
6. Pegboard to slotted stud

3.2 INSTALLATION OF ACCESSORIES

A. Install accessories according to Shop Drawings and manufacturer's written instructions. Turn screws to a flat seat; do not drive. Adjust moving parts to operate freely without excessive bind.
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.

3.3 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. Clean units, including wiping out of drawers and cabinet shelves. Clean counter tops per manufacturer’s instructions leaving tops free of grease and streaks.
B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches (1200 mm) o.c. Mark countertops in large lettering “NO STANDING.”

— END OF SECTION —