PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Biological safety cabinets

1.2 RELATED SECTIONS

A. Section 115343: Laboratory Fittings and Fixtures

B. Division 22: Plumbing

C. Division 23: HVAC

1.3 REFERENCES

A. NSF/ANSI 49: Class II (Laminar Flow) Biohazard Cabinetry.

B. Comply with UL 61010-1, Electrical Equipment For Measurement, Control, and Laboratory Use.

1.4 DESCRIPTION

A. Provide equipment complete with accessories as described herein and shown on Laboratory Furnishings drawings.

B. Biological safety cabinets with accessories shall be pre-piped and pre-wired. Pre-pipe service fittings to single point connection at 6 inches (150 mm) above top of cabinet or as otherwise shown.

1. Refer to Section 115343 and details on Laboratory Furnishings drawings for service fittings.

C. Work of this Section requires close coordination with Work of Divisions 22, 23 and 26 as well as installation of Owner furnished components and Work specified in other Sections. Sequence all Work to ensure an orderly progress in the project without removal of previously installed Work and so as to prevent damage to finishes and products.

1.5 SUBMITTALS

A. Refer to the General Conditions and Division 1 “Submittal Procedures” for submittal requirements. In addition to these requirements, provide submittal requirements specified herein.

B. Submittal requirements:

1. Submittal shall be prepared individually for this specification section. Arrange product data, drawings and information for submission in a complete set for this specification section.

2. Submittal shall contain complete data for all items of this specification section. Periodic or partial submittals of individual components within this specification section will be returned as incomplete and rejected.

3. Submittals shall be organized by specification sequence with section and paragraph number identified.

4. Equipment and components being proposed shall be clearly labeled with all options and accessories indicated and shall be for this specific project. All non-applicable options, items and components shall be deleted or struck.

C. Materials List/Product Data: Submit complete materials list, including catalog data of all materials, equipment, and products for Work specified in this Section.

D. Shop Drawings: Submit complete shop fabrication and installation drawings, including plans, elevations, sections, details and schedules. Show relationship to adjoining materials and construction. Shop Drawings shall be in the form of reproducibles or photocopies, not to exceed 11 inches x 17 inches (A3) in size. Blueline prints are not acceptable.

E. Submit detailed anchorage and attachment drawings and calculations provided by a licensed Structural Engineer complying with the Uniform Building Code Earthquake Regulations and the California Administrative Code, Title 24 Seismic Restraint requirements.

F. Samples: Submit two (2) samples of each type of specified finish and color range available.

G. Test reports: Submit the following performance test reports.

1. Factory Testing: Each unit shall be factory-tested for NSF Class II requirements.

2. Certification: Submit certification by an independent testing company stating that equipment is installed per applicable and referenced codes and standards, tested, adjusted and balanced for design operations, and is complete and ready for intended function.

3. Sound Level Certification: Provide certification of biological safety cabinet compliance with design criteria for maximum allowable noise within laboratories. Test data of octave band analysis verifying cabinet is capable of a 50 NC value. Measurements shall be taken 36 inches in front of open sash at 100 fpm face velocity.

H. Operations/Maintenance Manuals: Submit under provisions of Division 01. Submit for Owner's use, complete operating and maintenance manuals that describe proper operating procedures, maintenance and replacement schedules, component parts list, and closest factory representative for components and service.

1.6 QUALIFICATIONS

A. Work in this Section shall be performed by a firm having a minimum eight years documented experience, and an established organization and production facilities including all tools, equipment and special machinery necessary for specializing in the fabrication and installation of the type of equipment required with skilled personnel, factory trained workmen and an experienced engineering department. Each shall have the demonstrated knowledge, ability and the proven capability to produce the specified equipment of the required quality and the proven capacity to complete an installation of this size and type within the required time limits.

1.7 SUBSTITUTIONS

A. Approved Substitution/Approved Equal: In addition to the items required in Division 1, all substitution requests shall include item-by-item comparison of the proposed substitution to this project specification. A copy of the project specification shall be submitted, with each item and subsection of the project specification marked as “Comply” or “Not Comply.” In any cases where “Not Comply” is indicated, an explanation of the relative advantages of the proposed design shall be provided.

B. Substitution shall not affect dimensions shown on Drawings.

C. The Contractor shall pay for changes to the building design, including engineering design, detailing, utility and service requirements, and construction costs caused by the requested substitution.

D. Substitutions shall have no adverse affect on other trades, the construction schedule, or specified warranty requirements.

E. Maintenance and service parts shall be locally available for the proposed substitution.

PART 2 - PRODUCTS

2.1 ACCESSIBILITY FOR PERSONS WITH DISABILITIES

A. Where indicated on Laboratory Furnishings drawings, biological safety cabinets shall be furnished and installed in a manner to make them accessible to persons with disabilities in accordance with the Americans with Disabilities Act and any state or local building code or regulation having jurisdiction. The height of the highest point of access to the work surface above finished floor shall not exceed 34 inches. Fittings for piped services and electrical receptacles shall be of a design and in a location in order to be considered accessible.

2.2 BIOLOGICAL SAFETY CABINETS

A. Manufacturers: Products complying with this specification may be provided by the following manufacturers. All products specified in this section shall be provided by a single manufacturer.

1. The Baker Company, Inc., P.O. Drawer E, 161 Gatehouse Road, Sanford, ME 04073 Tel: 800 992-2537.

2. Labconco Corporation, 8811 Prospect Avenue, Kansas City, MO 64132 Tel: 800 821-5525.

3. NuAire, Inc., 2100 Fernbrook Lane, Plymouth, MN 55447 Tel: 800 328-3352.

4. Thermo Fisher Scientific, 81 Wyman Street, Waltham, MA 02451 Tel: 866 984-3766.

5. Approved substitution.

B. Class II, Type A2 Vertical Laminar Flow Biological Safety Cabinets.

1. Subject to compliance with the requirements listed below, acceptable models include:

a. SterilGARD e3 by the Baker Company.

b. Purifier Logic Class II by Labconco Corporation.

c. Labgard Series by Nuaire, Inc.

d. Thermo Scientific 1300 Series A2 by Thermo Fisher Scientific.

2. Features:

a. 60% to 70% of air recirculated in cabinet; the balance is filtered and exhausted from a common plenum.

3. Dimensions:

a. Interior Work Height: 28 inches, nominal.

b. Overall Height: 63 inches, nominal, not including stand.

c. Overall Width: 78 inches, maximum.

4. Materials:

a. Work Surface: 16 gauge, Type 304 stainless steel, with No. 4 finish.

b. Liner/Interior Sidewalls: 16 gauge, minimum, Type 304 stainless steel, with No. 4 finish.

c. Cold rolled steel: 16 gauge, minimum. Exterior finish: white baked enamel.

d. Glass: 1/4 inch tempered safety glass. Glass shall not be etched with manufacturer's name, logo, or any other permanent markings, other than to identify the glass as safety glass.

e. Piping: Comply with Division 22 requirements for piping and installation requirements for respective pre-piped services.

5. Construction:

a. Cabinet: Work surface and interior wall and rear panels shall be integral one-piece construction. All corners coved. Provide exterior removable side panels and enclosure of cold rolled steel to conceal exposed service piping. Each cabinet component to be welded, gasketed or assembled with air-tight, hermetically sealed joints to provide a gas- and soap bubble-tight sealed assembly.

1). Sealant or caulking is not acceptable.

2). Telescoping legs. If legs adjust to preset positions, positions shall be at 1 inch increments. Work surface height shall be adjustable between 30 inches and 36 inches above finished floor.

b. Work Surface Height:

1). Initial height position for adjustable height work surface shall be at 30 inches above finished floor.

c. Screen Style: Vertical sliding viewscreen. Full-open viewscreen shall be 18 ½ inches high for equipment access and cleaning.

1). Access Opening: 8 inches access opening with face velocity of 100 to 110 fpm.

d. Airfoil: Airfoil should be provided at lower front work area to improve access opening containment capability.

e. Drain Pan: Provide stainless steel ball valve for effective drainage of drain pan.

f. Provide stainless steel or aluminum air diffuser and filter protector in work area.

g. Provide automatic blower motor speed control to compensate for changing resistance of exhaust and supply filters to maintain nominal air volume set points.

6. Features:

a. Negative pressure plenum.

b. Access Opening Alarm: Provide audible alarm to sound when viewscreen is above its proper operating access opening height.

c. Service Fittings: Provide ball valve fitting with single lever handle mounted on the work area side wall, factory-installed and complete with all gaskets, grommets, and sleeves. Fitting manufacturer shall be the same as providing the Laboratory Fittings specified under Section 115343. Petcock not acceptable.

d. Lighting: Provide light levels of 80 foot-candles minimum at the work surface.

e. Electrical: Provide one GFI-protected duplex receptacle with covers and stainless steel faceplate in each sidewall, connected to a separate circuit breaker. Provide 10 foot (3657 mm) minimum power cord with NEMA 5-20P plug.

f. Blower motor: Provide an energy-efficient design, digital ECM-controlled DC motor, or 3-phase AC motor.

1). The blower shall be positioned to allow for even filter loading, and shall deliver more than 80% of the initial HEPA filter static pressure with no more than a 10% decrease of the total volume airflow rate. The cabinet controller shall automatically provide volume adjustments increase of 250% minimum of the initial HEPA filter static pressure.

g. Filters: Front-loading, HEPA 99.99%, efficient on all particles 0.3 micron by DOP test (both exhaust and supply). Filters shall be front-loaded. A neoprene gasket shall provide an airtight seal between the filter assembly and the metal plenum.

h. Non-Exhausted Unit: Unit shall recirculate HEPA filtered exhaust air to room; connection to building exhaust system is not required. Refer to Laboratory Furnishings drawings for locations.

i. Control panel shall be electronic type and shall include:

j. Control panel shall be digital microprocessor type and shall include:

1). Control functions shall be centered at eye-level.

2). Monitor and display airflow system performance through dual thermister probes.

3). Control blower, lights, and receptacles with solid state membrane switches.

4). Digital control of blower motor to compensate for changing resistance of supply and exhaust filters in order to maintain nominal air volume set points.

5). Alarm set point high/low for error conditions with visual and audible alarms.

6). Clock display (24 hour) and timer function.

7). UV light timer (if UV light is included).

8). Remote contacts and interlock features.

9). Complete diagnostic functions.

k. Germicidal ultraviolet light with UV light interlock, allowing UV illumination only when sash is fully closed.

l. Flexible duct connection shall allow for work surface height adjustment within specified range, and without the use of tools. Flexible duct connection shall be attached to thimble device and be connected to ductwork under Division 23 work.

m. Flexible hose connection(s) shall allow for work surface height adjustment within specified range, and without the use of tools. Flexible hose connection(s) shall be attached to cabinet factory-installed piping and be connected to building piping under Division 22 work.

n. Seismic restraint.

7. Listings:

a. Unit must be listed by NSF International as meeting NSF/ANSI Standard #49.

b. Underwriters Laboratories.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

A. Prior to installation of the Work of this Section, carefully inspect the installed Work specified in other sections and verify that all such Work is complete to the point where this installation may properly commence.

B. Verify that all Work has been installed in complete accordance with the original design, received submittals, and the manufacturer's recommendations.

C. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

A. Work in this Section requires close coordination with Work specified in Division 22, 23 and Division 26, as well as installation by Owner of Owner furnished components. Coordinate all Work to ensure an orderly process in the Project, without removal of previously installed Work, and so as to prevent damage to finishes and products.

B. Coordinate location and alignment of biological safety cabinets for proper connection of all piping and duct work.

C. Install all equipment in accordance with applicable codes and regulations, accepted Shop Drawings, and as necessary for a complete operating system.

3.3 FIELD TESTING

A. Balance, test and certify each biological safety cabinet in accordance with Annex F Field Tests appended to National Sanitation Foundation (NSF) Standard 49 “Class II (Laminar Flow) Biohazard Cabinetry”.

B. Biological safety cabinet field tests shall be performed by an independent NSF-accredited testing company.

3.4 CLEANING AND PROTECTION

A. Repair or remove and replace defective work as approved by the Architect upon completion of installation.

B. Adjust all moving or operating part to function within their design parameters.

C. Clean equipment, touch up as required.

D. Protect all units before, during, and after installation. Damaged materials due to improper protection shall be cause for rejection.

END OF SECTION