

## **PART 1 GENERAL**

### **1.00 SUMMARY**

- A. Section Includes:
  - 1. Tables
  - 2. Support structures
  - 3. Shelves
  - 4. Mobile base cabinets
  - 5. Ceiling manifold system
  
- B. Related sections:
  - 1. Section 11610 - Laboratory Fume Hoods are a part of the work of this section.
  - 2. Section \_\_\_\_\_ - \_\_\_\_\_: Furnishing and installation of plumbing utilities and final connections.
  - 3. Section \_\_\_\_\_ - \_\_\_\_\_: Furnishing and installation of exhaust ductwork and equipment, and final connection to fume hood(s).
  - 4. Section \_\_\_\_\_ - \_\_\_\_\_: Furnishing and installation of electrical utilities and final connections.

### **1.01 ALTERNATE PROPOSALS**

Proposals are invited from alternate manufacturers only if they comply with the minimum design requirements and the minimum performance requirements set forth by SEFA and UL 962 standards. The system must include a modular method of installing or changing service fittings. A notarized letter stating full compliance must be included in alternate proposals signed by an independent testing laboratory recognized by ASTM E 548 to ensure compliance.

A copy of UL (Underwriters Laboratories) certification must be submitted with any alternate proposal noting full compliance to UL 962 testing and approvals of the table system including electrical power distribution.

### **1.02 SYSTEM DESIGN REQUIREMENTS**

- A. Modular dimensioned system of 11 gauge steel components that allow for a variety of work bench and storage options upon assembly.

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- B. Modular Support Legs: Shall support table frames, shelves and service chase for all service lines, data and electrical cables.
1. Modular units shall be suitable for wall, peninsula or island configurations.
  2. Adaptable system shall contain a modular wiring system and be capable of accepting pre-plumbed utility service modules. All connections shall be plug-ins or quick connects.
  3. Equipped with easy to remove work surface frame. Work surface frame shall be adaptable and capable of accepting four legs to become a free standing structural table.
- C. Table Frames: Shall be a one piece construction with integral gussets for additional support. Both front and rear legs shall be removal for shipping and storage. Frame shall have the ability to accept a worksurface extender/backsplash when used in a single sided application.
1. Height adjustment shall be accomplished with simple hand tools without the need to gain access to the interior of the rear modular leg. System must provide for periodical tightening of attachment bolts without the need to move the unit or gain access to the back side of the bolt.
  2. Levelers are included on both free standing and adjustable height work surface frames.
- D. System requirements:
1. The system shall consist of a welded framework with slotted uprights to support work surfaces and overhead shelving components and integrate with mobile undercounter cabinets.
  2. Structural components are self-supporting and independent of the building structure.
  3. The modular rear legs shall accommodate service fixtures, electrical/data outlets and supply lines utilizing the system as a self contained utility chase.
  4. The vertical height of table work surfaces and shelves can be adjusted from sitting to standing height in 2" increments.
  5. All services (plumbing, power, phone and data) terminate at the top of the modular leg.
  6. All support frames shall bolt together.
  7. The bench system shall consist of a minimal number of modular components that can be assembled into a large array of functional units with minimal field assembly required. Assembly shall be accomplished with simple hand tools. System shall support later field adaptation with minimal disruption to adjacent and surrounding units.

**1.03 SUBMITTALS**

- A. Shop Drawings: Provide 3/4"=1'-0" scale elevations of all components, cross sections, rough-in and anchor placements, tolerances and clearances. Provide 1/4"= 1'-0" rough-in plan drawings for coordination with trades. Rough-in shall show free area.

**1.04 QUALITY ASSURANCE**

- A. Single source responsibility: Laboratory furniture system, casework, work surfaces, laboratory equipment, chemical fume hoods and accessories shall be manufactured or furnished by a single laboratory furniture manufacturer.
- B. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:
  - 1. Five years or more experience in manufacture of laboratory casework and equipment.
- C. Laboratory furniture systems and systems components must be UL 962 submitted, approved and listed. Products must bear the UL Mark, evaluated by UL and found to comply with UL's requirements for both the table system and its electrical distribution system. The testing standard shall include Dielectric, Grounding Impedance, Stability, Strain Relief and Strength tests.

**1.05 REFERENCE STANDARDS**

- A. All casework, worksurface and service fixture construction and performance characteristics shall be in full compliance with SEFA (Scientific Equipment and Furniture Association) standards. At the owner's request, independent, third part testing must be submitted validating compliance and adheres to the architectural specifications:
  - 1. SEFA 1.2 – Laboratory Fume Hoods
  - 2. SEFA 2.3 – Installation of Scientific Laboratory Furniture and Equipment.
  - 3. SEFA 3 – Work Surfaces
  - 4. SEFA 7 – Laboratory and Hospital Fixtures
  - 5. SEFA 8 – Laboratory Casework

## **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Schedule delivery of laboratory furniture system so that spaces are sufficiently complete that products can be installed immediately following delivery.
- B. Protect finished surfaces from soiling or damage during handling and installation.

## **1.07 PROJECT CONDITIONS**

- A. Do not deliver or install equipment until the following conditions have been met:
  - 1. Windows and doors are installed and the building is secure and weather tight.
  - 2. The building has climate control and the temperature and humidity are suitable for wood and painted steel products.
  - 3. Ceiling, overhead ductwork and lighting are installed.
  - 4. All painting is completed and floor tile is installed.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURER**

- A. Design, materials, construction and finish of laboratory furniture specified is the minimum acceptable standard of quality for flexible laboratory casework. The basis of this product specification is Advanced Lab Concepts, Inc, **ALC-Collegedale** branded product. ALC-Collegedale, PO Box 732 Ooltewah, TN 37363 ([www.collegedale.com](http://www.collegedale.com)) – ALC-Collegedale, 15900 Bratton Lane, Austin, TX 78728 ([www.alc\\_corp.com](http://www.alc_corp.com))

### **2.02 WORKSURFACE TABLES FRAMES**

- A. General requirements for table system:
  - 1. Modular Legs: 2" by 6" obround formed from 11 gauge cold rolled steel with levelers that are 3/8" X 2.5" long. Legs are to have a 16 gauge internal channel designed to accept add-on components. Legs are to be independent system components and not part of an assembly.
    - a. Finish: Chemical resistant urethane powder paint.
  - 2. Removable Front Leg: 2" outside diameter 11 gauge tubing with

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telescoping lower member for height adjustment and a 3/8"X 2.5" long leveler. Leg to be attached to worksurface frame using bolts that are not visible from the front. The leg is capable of vertical adjustment in two-inch increments.

**B. Worksurface Table Frame:**

1. Nominal table frame dimensions:
  - a. Width: [36"] [48"] [60"] [72"] [96"]
  - b. Depth: [30"] (27" projecting in front of the uprights and 1" behind the upright)
  - c. Adjustable Height: [30 to 37"] AFF including .75" thick top
2. Worksurface frames 11 gauge formed steel. Both front and rear corners shall have 6" high 11 gauge saddles for attachment to the front and rear legs. The attachment shall be mechanical by means of a socket head button cap and bolt.
4. A back stop angle, with full length bumper, shall be located under the worksurface frame to position the 24" deep mobile base cabinet 1" behind the front edge of the worksurface.

**C. Four Leg Adjustable-Height Table**

1. Nominal table frame dimensions:
  - a. Width: [36"] [48"] [60"] [72"] [96"]
  - b. Depth: [30"]
  - c. Adjustable Height: [30 to 37"] AFF including .75" thick top
2. Worksurface table frame shall be able to have four round (front legs) attached to form a four-leg adjustable height table.
3. Legs are 2" outside diameter 11 gauge wall tubing with telescoping 11 gauge inner leg. Capable of vertical adjustment in two inch increments.
4. Worksurface frames 11 gauge formed steel.
5. All four legs are to be removable and are mechanical attached by means of a socket head button cap and bolt and not visible from the front.

**2.03 REAR MODULAR LEGS AND UTILITY CHANNELS**

**A. General requirements for rear/shared frame support structures:**

1. Modular rear/shared legs shall allow for plumbing, electrical and data cabling
2. Modular rear/shared legs shall be 11 gauge steel 2" x 6". All legs shall be capable of accepting service modules (gases, water, vacuum and low voltage cabling) or high voltage electrical

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components. In assembled unit, high voltage and services shall be separated in opposite legs.

3. Modular rear/shared legs shall be 11 gauge cold-rolled steel formed to a 2" X 6" structural support with removable access panels on the inside (worksurface side) of the leg, with 2 levelers per leg.
4. Modular rear/shared legs used in (60", 72", 96") assemblies shall have a center support to accommodate split shelving. The center support shall be available in heights to provide nominal 12", 18", 24" clearance between the worksurface and the bottom shelf.
5. Uprights have slots punched on 1" increments starting at nominal 55" above the floor to the top of the upright.
6. Upper Utility Channel shall accommodate wiring for four 20A electrical circuits per table unit. System components shall utilize quick connect modular connectors for quick assembly and disassembly in the field.
7. Modular rear/shared legs shall have a threaded insert integral to the leg that allows the worksurface to added, removed, or adjusted without having to gain access to the interior of the leg.
8. Worksurface frames to accept a backsplash/worksurface extender. In the application where a one sided table is used, this worksurface extender shall fill the space between the top and the back edge of the leg. This allows the same worksurface to used for both single and double sided applications.
9. Modular rear/shared legs shall allow service fittings to be field changed to accommodate one, two or three services per leg and two, four or six fixtures depending on whether it is configured single or double sided.
10. Lower Utility Channel shall house wiring to support six AC duplex outlets (three on each side) on three independent circuits. Access shall be through a removable bottom cover. There are to be 2-20 amp hospital grade duplexes per side on 36", 48" wide units and 3-20 amp hospital grade duplexes per side on 60", 72" and 96".
11. Modular Powered Legs shall have a 20 amp duplex outlet located below the worksurface and it shall be on a separate circuit.
12. Lower Utility Channel shall house a CAT 3 phone and one CAT 6 data cable connecting to 2-port receptacle located in the horizontal raceway.

**E. Wall Standards:**

1. Wall standard shall mount directly to interior wall when wall-mounted shelves are required.
2. Wall standards shall have the same general requirements, profile and performance requirements as the frame assemblies.
3. Two wall standards are required for each shelf assembly.

## **2.04 PLUMBING/FIXTURES**

### **A. General requirements:**

1. The modular rear/shared legs shall house a maximum of three plumbing services.
2. Needle Valves – chromed brass straight pattern instrumentation needle with serrated hose end.
3. Plumbing lines –Shared frame (3/8" OD wall) polyethylene tubing with tube-to-tube union attached to the tube with compression fittings at the top of the upright.
4. The plumbing lines with the quick disconnects are to be arranged so services cannot be intermixed.
5. All service valves and quick connects shall be media keyed and color coded. Keyed media connects cannot be accidentally be switched.
6. All burning gases tubing shall be specified as #316 stainless steel.

## **2.05 SERVICE CONNECTIONS**

### **A. General requirements:**

1. All services (plumbing, power, phone and data) terminate at the top of the plumbing and upright support.
2. Power services will have a 20 amp cord plug extending 4' above the top of the upright. Plug end to be twist lock.
3. Phone CAT 3 line will have a male plug-in extending 4' above the upright. (Connections to the facility to be provided by others).
4. Data CAT 6 line will have a male plug-in extending 4' above the upright. (Connections to the facility to be provided by others)

## **2.06 CEILING SERVICE COLUMN AND MODULAR FLOOR SUPPLY/DRAIN BOX**

### **A. General requirements:**

1. Ceiling service column shall allow for the unit to be installed and plumbed and wired before the suspended ceiling is installed. Units to be installed 1" below the plane of the ceiling and directly above the table units. When the suspended ceiling is installed, the unit will be treated as if it were a fixed column.
2. Ceiling service column shall provide a means to mount and connect electrical outlets, data outlets and quick connect service fixtures.
3. Ceiling service column shall accommodate back-to-back bench configurations.

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4. Utility panels will ship with junction boxes factory attached. Electrical outlets, data outlets, cover plates and service fixtures shall be field installed.
5. Utility panel shall be minimum 18-gauge cold rolled steel with a urethane powder coat finish.
6. Nominal Dimensions:
  - a. Widths – 24" x 24"
  - b. Height – 8"
7. Ceiling service column shall be equipped with quick disconnect fitting for service tube ends. Each keyed disconnect shall include nipple and coupler with color-keyed band marking media.
8. Service lines: polyurethane and/or for non-burning gases and braided stainless steel for burning gases will attach to quick-connects and/or tube-to-tube unions from the ceiling utility panel and the rear frame disconnects.
9. Modular floor boxes shall be 11 gauge stainless steel and shall have a removable cover with access doors. The box shall be capable of supporting foot traffic when not in use. The unit shall contain, at minimum, a quick disconnect drain (see drawings for details). Box must be capable of handling up to a maximum of four services and a drain. Box shall be fully welded and watertight.

## **2.07 SHELVES**

### **A. General requirements:**

1. All shelf supports shall be 11 gauge powder coated cold rolled steel.
2. Shelf platforms shall be available in glass, phenolic resin with bull nosed front edge, plastic laminate bull nosed front edge or 3/4" or 1" wood panels. Wood panels shall be minimum 7-ply veneer core plywood with a 5/8" solid wood edge banding and a bull nosed front edge and finished to match the casework in Section           .
3. Shelves shall overhang 2" behind the face of the vertical tubular support.
4. Shelf brackets shall be designed to fill the void created by the thickness of the leg, allowing the shelf to be rectangular without the need for notches to clear the rear leg.
5. Vertical shelf adjustment to be in one-inch increments.
6. All shelves shall incorporate a reversible shelf retainer lip that is capable of being positioned in the raised or flush position. Shelf lips can be repositioned with the use of simple hand tools. In addition, the shelves shall have seismic restraint rods. These rods shall be stainless steel and shall have the ability to be removed without tools.

7. Shelves can be mounted to wall frames, wall standards or rear frames.

B. Shelf Types:

1. Shelves to be 1" plywood (minimum 9-ply) with 5/8" solid wood edgebanding and a full radius profile on the front edge.

## **2.08 WORK SURFACES AND SPLASH GUARDS**

A. General requirements:

1. Worksurfaces shall be available in glass, phenolic resin, epoxy resin or natural stone.
2. Worksurfaces shall be corner notched to accommodate the profile of the leg
3. Worksurfaces shall have a 1" overhang in the front and be flush with the outside of the legs on the sides.
4. Load capacity: the work surface load rates are dependent on the work surface table frame and performance ratings (2.02).

B. Worksurfaces:

1. Nominal dimensions:
  - a. Widths: [36"] [48"] [60"] [72"] [96"]
  - b. Depth: [30"]

C. Worksurface Type

1. Granite (Color to be selected by Architect/Owner) .75" thick with a bull nosed front edge.

## **2.09 MOBILE BASE CABINETS**

- A. Cabinets with casters shall be constructed without toe spaces. The cabinet shall be constructed with a reinforced base capable of supporting a 4" high caster assembly in each corner. Casters shall be swivel locking type and rated for minimum 250 pounds load each. Cabinets with casters shall be completely finished on four sides and top since surfaces are considered visible.
- B. The entire cabinet assembly shall be reinforced to permit mobility without twisting, and achieve an industry standard height of 31" or 37" including the flush 1" counter top.

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- C. Base cabinets shall, except as noted, incorporate a flush overlay design in which the cabinet body is completely concealed.
- D. The mobile base unit shall incorporate a 6" high "Add-A-Drawer" furniture design to allow the casework to be used in both standing height and sitting height configurations and shall be constructed as follows:
  - 1. Base cabinet shall be nominally 29" high.
  - 2. A 6" high, fully enclosed drawer box made to the same widths as the cabinet below shall sit on top of each base cabinet to create a standing height cabinet. The drawer box frame shall be 3/4" thick on all four sides.
  - 3. The drawer box frame shall be aligned with two mechanical pins or fasteners that engage the cabinet's top rail through pre-drilled holes with metal inserts. In addition, a cam lock mechanism shall be located at the rear of the base cabinet to lock the add-a-drawer unit to the cabinet.
- F. Units with drawers must be equipped with an anti-tipping mechanism that shall include an interlock so that only one drawer in a vertical stack can be opened at one time.

**2.10 FINISHES**

- A. Finish shall be the same as specified for the fixed wood casework.

**2.11 BULLETIN BOARDS**

- 1. General requirements – Bulletin boards are a dyed linoleum material framed in powder painted steel. Bulletin boards shall be both acoustical and tackable. Bulletin boards are added or removed by attachment to the modular leg utilizing the attachment point of the modular access panels. Refer to drawing details. For fabric selection, provide color samples for owners review.
- 2. Nominal dimensions:
  - a. Widths: [36"] [48"] [60"] [72"] [96"]
  - b. Heights: [18"] [16"] [12"] (from top of work surface to horizontal raceway).

**2.12 MODESTY PANELS**

- 1. General requirements – Wood panels shall mount directly to rear modular leg utilizing the attachment point of the modular access panels. Modesty panel will mount with a simple hand tool and can easily be added or removed.

2. Nominal dimensions:
  - a. Widths: [42"] [48"] [60"] [72"] [96"]
  - b. Heights: [19"] mounts directly below the worksurface

### **2.13 TASKLIGHTS**

1. General requirements – Task light shall be a T5 HQ type. Task lights shall be gangable with an integral on/off switch. Master light switch will turn on/off all lights ganged to it.
2. Task light minimum performance levels shall be as follows: with 40 foot candle room lighting at the work surfaces, the task light shall increase the work surface illumination to 80/100 foot candles.
3. Nominal dimensions:
  - a. Widths: [24"] [35"] [47"]

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Furniture system installation:
  1. Install system in strict accordance with manufacturer's instructions.
- B. Install application casework, work surfaces and accessory items per Section 12345.

### **3.02 ADJUSTING**

- A. Repair or remove and replace defective work, as directed by Architect upon completion of installation.

### **3.03 CLEANING**

- A. Clean shop finished laboratory furniture system surfaces and touch up as required.

### **3.04 PROTECTION OF FINISHED WORK**

- A. Provide all necessary protective measures to prevent exposure of laboratory furniture system and attached components from exposure to other construction activity.
- B. Advise contractor of procedures and precautions for protection of the installed laboratory furniture system and related components from damage by work of other trades.

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END OF SECTION