

## SECTION 12 31 00.4

### Manufactured Metal Casework FLEXIBLE LABORATORY FURNITURE SYSTEM (OPTIMA) – USA VERSION

#### PART 1 – GENERAL

##### Summary:

This Specification identifies the minimum material and construction standards that are required to deliver a quality installation of the flexible laboratory furniture system. Laboratory furniture shall be supplied in accordance with the requirements of this Specification. The laboratory furniture identified in this Specification shall include the miscellaneous metal panels and other related components as identified on the drawings and that are necessary for the complete installation.

#### 1.1 SECTION INCLUDES

- A. Modular Support Structure
- B. Structural Table Base
- C. Mobile Base / Wall Cabinets
- D. Shelves
- E. Fixtures
- F. Service Connections

#### 1.2 RELATED SECTIONS

- A. Division 06 Section 10 00, "Rough Carpentry"
- B. Division 06 Section 40 00, "Architectural Woodwork"
- C. Division 11 Section 53 00, "Laboratory Equipment"
- D. Division 12 Section 36 00, "Countertops"
- E. Division 12 Section 35 53, "Manufactured Metal Casework"
- F. Division 12 Section 32 00, "Manufactured Wood Casework"
- G. Division 22 Section 40 00, "Plumbing Fixtures"
- H. Division 26 Section 05 00, "Common Work Results for Electrical"

**I. Related Work To Be Performed By Others:**

1. Final installation of all plumbing, service and electrical fixtures attached to service carriers.
2. Final connection to service lines of all plumbing, service and electrical fixtures attached to service carriers.

**1.3 REFERENCES**

- A. SEFA 8: Laboratory Furniture – Casework, Shelving and Tables Guidelines  
Science Equipment and Furniture Association (SEFA)
- B. ISO 9001:2000 – Quality Management  
International Standards Organization (ISO)
- C. ADA (ATBCB ADAAG) Americans with Disabilities Act Accessibility Guidelines  
Americans with Disabilities Act (ADA)

**1.4 SUBMITTALS**

*Refer to Section 01 33 00, "Submittal Procedures," for requirements, procedures, etc.*

**A. Product Data:**

Drawings shall include data and details for construction of the laboratory furniture as well as information regarding the name, quantity, type and construction of materials (such as hardware, gauges, etc), that will be used to complete the project.

**B. Shop Drawings:**

1. The laboratory furniture manufacturer shall furnish shop drawings illustrating the layout and placement of all laboratory furniture, casework and fume hoods as well as any products included in this section.
2. Indicate the type and location of all service fittings and associated supply connections.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods.

**C. Selection Samples:**

Submit the following:

1. One complete set of color chips representing the manufacturer's full range of available colors.  
Minimum sample size 2 inches by 2-1/2 inches (50mm x 76mm).

#### **D. Quality Assurance/Control**

1. Design Data/Test Reports: Manufacturer shall submit test data and design criteria which are in compliance with the project specifications.
2. Certificates: All certifications required in the specifications shall be submitted with the original submittal package under separate cover. Certificates must be provided with the signature of a qualified individual of the supplier.
3. Manufacturers' Instructions: Provide manufacturer's instructions for installation and maintenance of all products provided and installed within this section. Instructions will be in bound form, tabbed and organized by section number.

### **1.5 QUALITY ASSURANCE**

#### **A. Manufacturer Qualifications:**

The following list of information will be provide to the Architect at least ten (10) days prior to the bid opening:

1. List of manufacturing facilities;
2. Construction details depicting the materials, sizes and methods of construction;

#### **B. Mock-Ups**

1. Area mockups shall be as indicated on the shop drawings. Post bid mockup areas must be priced for disassembly and reassembly and used within the project.
2. Do not proceed with remaining work until installation is approved by Architect.
  - a) Install service carrier post assembly with specified hardware.
  - b) Install service carrier body with specified hardware.
  - c) Install all supports and cover panels as required.

### **1.6 DELIVERY, STORAGE AND HANDLING**

#### **A. Packaging, Shipping, Handling and Unloading**

1. Packaging: Products shall have packaging adequate enough to protect finished surfaces from soiling or damage during shipping, delivery and installation.
2. Delivery: Casework delivery shall only take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.

3. Handling: Care such as the use of proper moving equipment, experienced movers, etc., shall be used at all times to avoid damaging the casework. Until installation takes place, any wrapping, insulation or other method of protection applied to products from the factory will be left in place to avoid accidental damage.

**B. Acceptance at Site:**

Casework will not be delivered or installed until the conditions specified under Part 3, Installation section of this document have been met.

**C. Storage:**

Casework shall be stored in the area of installation. If, prior to installation, it is necessary for casework to be temporarily stored in an area other than the installation area, the environmental conditions shall meet the environmental requirements specified under the Project Site Conditions article of this section.

**D. Waste Management and Disposal:**

The supplier of the laboratory casework is responsible for removing any waste or refuse resulting from the installation of, or work pertaining to laboratory casework; thereby leaving the project site clean and free of debris. Trash container(s) to be provided by others.

## 1.7 PROJECT SITE CONDITIONS

- A. Building must be enclosed (windows and doors sealed and weather-tight);
- B. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place;
- C. Adjacent and related work shall be complete;
- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as "wet work";
- F. Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

## 1.8 WARRANTY

- A. Furnish a written warranty that work performed under this section shall remain free from defects as to materials and workmanship for a period of two (2) years from date of shipment. 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. Slippage, shift, or failure of attachment to wall, floor, or ceiling
  5. Weld or structural failure
  6. Warping or unloaded deflection of components
  7. Failure of hardware
- B. The warranty with respect to products of another manufacturer sold by Mott Manufacturing is limited to the warranty extended by that manufacturer to Mott Manufacturing.

## **PART 2 – PRODUCTS**

### **2.1 MANUFACTURER**

**A. Acceptable Manufacturer:**

1. Mott Manufacturing Ltd. Optima Series as distributed by New England Laboratory Casework Co., Inc. 781-932-9980. [www.newenglandlab.com](http://www.newenglandlab.com) email [info@newenglandlab.com](mailto:info@newenglandlab.com)

**B. Substitutions:**

1. Must meet all specification requirements and have prior approval.
2. Must meet the minimum design and performance requirements of SEFA and UL 962.

**C. Requests for substitutions:**

All requests will be considered in accordance with provisions of Section 01 60 00.

### **2.2 MATERIALS**

**A. Sheet Steel:**

Mild steel, cold rolled furniture grade to requirements of ASTM A1008/A1008M, Grade C or higher, with smooth surfaces to furniture quality.

**B. Galvanized Sheet Steel:**

Commercial quality galvanised sheet steel to ASTM 653, Designation Z275.

**C. Stainless Steel:**

1. Sheet: ASTM A240, type 304 and 316 alloy.
2. Finish: Unless otherwise indicated, AISI No. 4 brushed finish.

**D. Glass:**

Glass, ½" thick with steel frame work to protect edges.

## 2.3 DESIGN REQUIREMENTS:

### \*Basis of design: Mott Manufacturing Optima Series Table system\*

- A. Modular system shall be made of tubular style framing combined with [D shape] [rectangular] or tubular formed steel uprights.
  - 1. To be used in island, wall or peninsula situations.
- B. Tubular Frames: Table supports.
  - 1. Table supports to be adjustable height in 1" increments.
  - 2. Table support frames to have levelers equipped.
- C. Rear frame to be used for carrying services and electrical conduit.
  - 1. Rear upright supports to be equipped with slots for adjustable shelving and levelers.
  - 2. All services must terminate at the top of the rear tubular support frame.
- D. Assembled frame to be self supporting without needing to be anchored to the building.
- E. The modular system must ship complete from the factory with minimal on-site assembly.
- F. Double sided benches designed to be divided into two self-supporting single sided benches

## 2.4 '[2100] [1100] SERIES' CONSTRUCTION

### A. Rear Support Structure:

- 1. Nominal rear frame dimensions:
  - a) Width: 48", 60", 72", 96"
  - b) Depth: 2" diameter
  - c) Height: 84"
- 2. Rear and Center Uprights:
  - a) 2" [outside diameter] [square tube] 11ga. powder coated cold rolled steel or stainless steel
  - b) Center uprights apply to units 60", 72" or 96" wide to accommodate split shelving
  - c) 2" diameter nylon leveling glide 3/8" x 2-1/2" long
- 3. Upper and Lower Cross Rails:
  - a) 11ga. powder coated cold rolled steel or stainless steel.

4. Load Capacity: Rear Upright to support up to 3 shelves loaded to a maximum of 180lbs per 12" deep shelf. The total load capacity for the Rear Upright is 540lbs.
5. Uprights to house services, electrical and data cables.
  - a) High voltage cabling to be in a separate upright from gas piping.
6. Lower cross rail shall house an electrical circuit raceway.
7. Rear posts have slots punched on 1" increments starting at nominal 59" above the finished floor, to the top of the post.

## **B. Tubular Table Assembly:**

1. Nominal table assembly dimensions:
  - a) Width: 48", 60", 72", 96"
  - b) Depth: 29" or 35"
  - c) Height: Adjustable from 29" – 36" (not including work surface)
2. Tubular Table Legs:
  - a) 2" [outside diameter] [square tube], 12ga. powder coated cold rolled steel or stainless steel outer leg
  - b) 1-3/4" [outside diameter] [square tube], 11ga. powder coated cold rolled steel or stainless steel inner telescoping leg
  - c) 2" diameter nylon leveling glide 3/8" x 2-1/2" long
3. Capable of vertical height adjustment in 1" increments.
4. Primary table assembly shall be fastened to the rear upright with four (4) hex 3/8" socket head bolts
5. Leveling Bolt: Frame shall be fitted with a leveling bolt which will allow the legs to be adjusted for proper alignment of work surface height.
6. Load Capacity: Table frame shall support the work surface plus 100lbs/linear ft of table length up to a maximum load rating of 800lbs.

## **C. Shelves:**

1. Nominal shelf dimensions:
  - a) Width: 30", 36", 48"
  - b) Depth: 13" Top, 12" or 15" for remaining shelves
  - c) Thickness: 1"
2. Shelf requirements:
  - a) Shelves shall be constructed of powder coated cold rolled steel, stainless steel, steel framed 6mm laminated safety glass, or a selected wood species.
  - b) Shelves shall have a 1" overhang behind the face of the rear tubular posts.

- c) Shelf brackets to be constructed of 14ga. powder coated cold rolled steel or stainless steel.
- d) Shelves shall have a rear 1" high retaining lip. Top shelf assemblies do not require retaining lip.
- e) Vertical shelf adjustment in 1" increments.
- f) Optional 1" tall x 5/16" dia. shelf retainer rods, available in #304 stainless steel or #304 powder coated stainless steel.

**D. Suspended/Mobile/Base Cabinets:**

- 1. Design and construction shall be as in section 12 35 53 - Laboratory Metal Casework.
- 2. Mobile cabinets shall have casters in lieu of a toe kick. Casters shall be rated for 165lbs minimum each and shall be locking type. Cabinet height must ensure 2-½" of clearance under the table frame.
- 3. Suspended base cabinets: Provide a system of cold-rolled steel hanger rails attached to the casework frames. Installation and removal to be accomplished without the use of tools.
- 4. Base cabinets: provide cabinets with nylon glides on levelling feet. Level cabinets to underside of table assembly.

**E. Plumbing/Fixtures:**

- 1. Rear upright structure to support a maximum of three plumbing fixtures.
- 2. Fixtures shall be needle valve style with a single serrated hose end.
- 3. Plumbing lines shall be ¼" copper tubing running the length of the upright.
- 4. All burning gas tubing shall be specified as stainless steel.
- 5. All plumbing shall have quick disconnect at the top of the upright.
- 6. Plumbing shall be arranged in such a fashion that they services can not be intermixed.
- 7. All service valves and quick disconnects shall be keyed and color coded. Only plug and body connects of the same key will couple and allow flow.

**F. Service Connections:**

- 1. Electrical, data and plumbing services shall terminate at the top of the rear support upright.



2. Electrical services shall have a 20 amp cord extending 4' above the top of the upright.
3. Data services shall have a male plug extending 10' above the top of the upright.

#### **G. Ceiling Service Panels:**

1. Panels shall be compatible with most T-grid acoustical suspended ceiling structures.
2. Panel shall provide a means to mount and disconnect quick connect service fixtures, electrical and data outlets.
3. Panel shall accommodate single sided and back to back bench configurations.
4. Panels ship with cover plates. Data outlets, electrical outlets, junction boxes and service fixtures shall be ordered separately.
5. Panels shall be 23-3/4" x 23-3/4" x 1", 14 gauge cold rolled steel with a powder coated finish.

### **2.5 '2550 [1550] SERIES' CONSTRUCTION**

#### **A. Rear Support Structure:**

1. Nominal rear frame dimensions:
  - a) Width: 48", 60", 72", 96"
  - b) Depth: 6"
  - c) Height: 84"
2. Rear and Center Uprights:
  - a) 2" x 6" 14ga. powder coated cold rolled steel or stainless steel
  - b) Removable end panels shall be ordered separately
  - c) Center uprights apply to units 60", 72" or 96" wide to accommodate split shelving
  - d) 2" diameter nylon leveling glide 3/8" x 2-1/2" long
3. Upper and Lower Cross Rails:
  - a) 11ga. Powder coated steel or stainless steel
4. Load Capacity: Rear Upright to support up to 3 shelves loaded to a maximum of 180lbs per 12" deep shelf. The total load capacity for a single sided Rear Upright is 540lbs. The total load capacity for a double sided Rear Upright is 1080lbs.
5. Uprights to house services, electrical and data cables.
  - a) High voltage cabling to be in a separate upright from gas piping.
6. Lower cross rail shall house an electrical circuit raceway.
7. Rear posts have slots punched on 1" increments starting at nominal 59" above the finished floor, to the top of the post.

## B. Tubular Table Assembly:

1. Nominal table assembly dimensions:
  - a) Width: 48", 60", 72", 96"
  - b) Depth: Single sided assembly -32" or 38" (not including work surface)  
Double sided assembly -58" or 70" (not including work surface)
  - c) Height: Adjustable from 29" – 36" (not including work surface)
2. Tubular Table Legs:
  - a) 2" [outside diameter] [square tube], 12ga. powder coated cold rolled steel or stainless steel outer leg
  - b) 1-3/4" [outside diameter] [square tube], 11ga. powder coated cold rolled steel or stainless steel inner telescoping leg
  - c) 2" diameter nylon leveling glide 3/8" x 2-1/2" long
3. Capable of vertical height adjustment in 1" increments.
4. Table assembly shall be fastened to the rear upright with four (4) hex 3/8" socket head bolts.
5. Secondary table assembly shall be a four leg table designed to mate with the contoured uprights of the main table to form the appearance of one complete assembly with two work surfaces, while remaining independent and self-supporting. Interlocking hooks shall be provided to ensure that the entire assembly is stable. It shall be possible to move the secondary table to another location as use as an independent four-leg table.
6. Leveling Bolt: Frame shall be fitted with a leveling bolt which will allow the legs to be adjusted for proper alignment of work surface height.
7. Load Capacity: Table frame shall support the work surface plus 100lbs/linear ft of table length up to a maximum load rating of 800lbs.

## C. Shelves:

1. Nominal shelf dimensions:
  - a) Width: 30", 36", 48"
  - b) Depth: 14" Top, 12" or 15" for remaining shelves
  - c) Thickness: 1"
2. Shelf requirements:
  - a) Shelves shall be constructed of powder coated cold rolled steel, stainless steel, steel framed 6mm laminated safety glass, or a selected wood species..
  - b) Shelves shall have a 1" overhang behind the face of the rear tubular posts.
  - c) Shelf brackets to be constructed of 14ga. powder coated cold rolled steel or stainless steel.
  - d) Shelves shall have a rear 1" high retaining lip. Top shelf assemblies do not require retaining lip.

- e) Vertical shelf adjustment in 1" increments.
- f) Optional 1" tall x 5/16" dia. shelf retainer rods, available in #304 stainless steel or #304 powder coated stainless steel.

**D. Suspended/Mobile Base Cabinets:**

1. Design and construction shall be as in section 12 35 53 - Laboratory Metal Casework.
2. Mobile cabinets shall have casters in lieu of a toe kick. Casters shall be rated for 165lbs minimum each and shall be locking type. Cabinet height must ensure 2-½" of clearance under the table frame.
3. Suspended base cabinets: Provide a system of cold-rolled steel hanger rails attached to the casework frames. Installation and removal to be accomplished without the use of tools.

**E. Plumbing/Fixtures:**

1. Rear upright structure to support a maximum of three plumbing fixtures.
2. Fixtures shall be needle valve style with a single serrated hose end.
3. Plumbing lines shall be ¼" copper tubing running the length of the upright.
4. All burning gas tubing shall be specified as stainless steel.
5. All plumbing shall have quick disconnect at the top of the upright.
6. Plumbing shall be arranged in such a fashion that they services can not be intermixed.
7. All service valves and quick disconnects shall be keyed and color coded. Only plug and body connects of the same key will couple and allow flow.

**F. Service Connections:**

1. Electrical, data and plumbing services shall terminate at the top of the rear support upright.
2. Electrical services shall have a 20 amp cord extending 4' above the top of the upright.
3. Data services shall have a male plug extending 10' above the top of the upright.

**G. Ceiling Service Panels:**

1. Panels shall be compatible with most T-grid acoustical suspended ceiling structures.

2. Panel shall provide a means to mount and disconnect quick connect service fixtures, electrical and data outlets.
3. Panel shall accommodate single sided and back to back bench configurations.
4. Panels ship with cover plates. Data outlets, electrical outlets, junction boxes and service fixtures shall be ordered separately.
5. Panels shall be 23- $\frac{3}{4}$ " x 23- $\frac{3}{4}$ " x 1", 14 gauge cold rolled steel with a powder coated finish.

## **2.6 STEEL FURNITURE FINISH**

1. Metal finish to be as in Appendix 1 - Laboratory Steel Furniture Finish.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

1. Install casework within system, align and set level with levelling devices, in accordance with shop drawings.
2. At wall locations secure wall cabinets to face of finished walls and partitions, applying self-tapping screws through wall finish material into each concealed stud flange.
3. Install components to effect a secure, neat and complete installation.

**END OF SECTION**