## 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 ULstandards. 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.

**1.02 SYSTEM DESIGN REQUIREMENTS**

 A. Modular dimensioned system of tubular frame style support structures, tables and cantilevered storage units.

 B. Tubular Frames: Support structure for tables, 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. Rear frame can be supported with structural tables or anchored to the wall structure.

 3. Equipped with easy to remove work surface frame. Work surface frame can accommodate Add-a-Leg members to function as a free standing structural table.

 4. Moveable bench system shall be pre-wired and pre-plumbed, equipped with cabling plug-ins and service line quick connects.

 C. Tables Frames: Modular, interchangeable work surface support structures in both frame attached and free standing adjustable height configurations.

 1. Adjustable height tables incorporate fixed mechanical adjustment.

 2. Levelers are included on both free standing and adjustable height work surface frames.

1. 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. Tubular frame structures support service fixtures, electrical/data outlets and supply lines utilizing the frame system as a 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 vertical support.

 6. All support frames shall bolt together or to the wall at the top horizontal rail.

7. The bench system shall ship complete with minimal final assembly. Assembly shall be accomplished with simple hand tools.

**1.03 SUBMITTALS**

Include number of each type of submittal required if this information is not covered in Division 1 or elsewhere.

 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 produced 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 of similar product type specified.

 C. Laboratory furniture systems and systems components must be UL 962 submitted, approved and listed. Products must bear the UL Mark and shall be identified to those products that were evaluated by UL and found to comply with UL’s requirements. The testing standard shall include Dielectric, Grounding Impedance, Stability, Strain Relief and Strength tests.

**1.05 REFERENCE STANDARDS**

1. 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:
SEFA 1.2 – Laboratory Fume Hoods
	1. SEFA 2.3 – Installation of Scientific Laboratory Furniture and Equipment.
	2. SEFA 3 – Work Surfaces
	3. SEFA 7 – Laboratory and Hospital Fixtures
	4. SEFA 8 – Laboratory Furniture

**1.06 DELIVERY, STORAGE AND HANDLING**

 A. Schedule delivery of laboratory furniture system 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.

**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. Ceiling, overhead ductwork and lighting are installed.

 3. All painting is completed and floor tile is installed.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURER**

1. Design, materials, construction and finish of laboratory furniture specified is the minimum acceptable standard of quality for flexible laboratory casework. The basis of this specification is Hamilton Laboratory Solutions, 825 East Albert Drive, Manitowoc, WI 54220.

**2.02 WORK SURFACE TABLES FRAMES**

1. General requirements for table frames:
	1. Work surface support frame: 2” outside diameter wall and 1.75” inner telescoping leg 11 gauge cold rolled and/or #304 stainless steel tubing. ASTM A513 type 1, 1010-1018 tubing. Levelers are 3/8” - 16 nc X 2.5” long.

 a. Finish: Chemical resistant urethane powder paint or #4 on the #304 stainless steel.

 2. Work surface support frame (Specifier’s Option): 2” outside diameter wall and 1.75” inner telescoping leg 11 gauge stainless steel tubing. ASTM A554 type 304 stainless – polished to #4 finish or 180 grit. Levelers are 3/8” - 16 nc X 2.5” long.

1. Work surface Table Frame:

 1. Nominal table frame dimensions:

 a. Width: [42”] [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. Front upright member is 2” outside diameter, 11 ga. wall tubing with telescoping 11 ga. inner leg. The upright is capable of vertical adjustment in two-inch increments.

 3. Worksurface frames 11 ga. formed steel. Rear corners shall have 2.25” diameter X 6” high 11 ga. collar. The front half of the collar shall be welded to the worksurface frame with supporting gussets and the back half mechanically fastened to the rear uprights with socket head button cap and bolt.

* + 1. 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.
		2. Load rating – 100 lbs. per linear foot of width to maximum of 800 lbs. With 800 lbs. of uniformly distributed load applied to an 8’ wide worksurface, the maximum allowable deflection shall be .125” measured at the front center rail.
1. Four Leg Adjustable‑Height Add-A- Leg Table

1. Nominal table frame dimensions:

 a. Width: [42”] [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. Work surface table frame shall be able to detach from the rear frame and form a four-leg adjustable height table with the addition of two Add-a-Legs.

3. Add-a-Leg member and front upright member are 2” outside diameter 11 ga. wall tubing with telescoping 11 ga. inner leg. Capable of vertical adjustment in two inch increments.

4. Work surface frames 11 ga. formed steel.

**2.03 REAR FRAME SUPPORT STRUCTURE**

 A. General requirements for rear frame support structures:

1. Vertical uprights shall allow for plumbing, electrical and data cabling
2. Single uprights supports shall be 11 ga. tubular steel 2” outside diameter. Shared rear frame upright shall be 11 ga. cold-rolled steel formed to a 2” X 6” structural support with a full-height removal side cover.

3. Levelers are 3/8” - 16 nc X 2.5” long.

1. Single and shared rear frames (60”, 72”, 96”) shall have a center support to accommodate split shelving.

5. Uprights have slots punched on 1” increments starting at nominal 55” above the floor to the top of the upright.

1. Upper and lower horizontal cross rails shall be 11 ga. steel.

7. Lower structural cross rail for the single frame shall house an integral two-channel raceway. Structural cross rails for the shared frames shall incorporate junction boxes for electrical conduit and 20 amp duplex outlets.

8. Raceways for both single and shared frames to have 2 -10 amp hospital grade duplexes on 4’ and 5’ units, 3 – 20 amp hospital grade duplexes on 6’ and 8’ wide units and an optional 20 amp duplex located in the vertical upright under the worksurface.

9. Wiring to the 20 amp duplexes is in one upright with plumbing, phone and data cables in the opposite upright support.

10. Raceway shall have one CAT 3 phone and CAT 6 data connection.

 B. Rear Frame:

 1. Nominal dimensions:

 a. Width: [42”] [48"] [60"] [72"] [96"].

 b. Height: [84"].

1. Wall Frame - General requirements for wall frame support structures:

1. Wall frames shall have the same general requirements as the rear frame in performance and construction.

2. Wall frames can be created by removing the work surface table frame and mounting the existing rear frame directly to the wall structure by mechanically fastening the top horizontal support rail.

3. Wall frames shall be orderable as a separate entity as part of the standard product offering.

1. Wall Frame:

 1. Nominal dimensions:

 a. Width: [42”] [48"] [60"] [72"] [96"]

 b. Height: [84"]

1. 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.
	4. **PLUMBING/FIXTURES**
2. General requirements:
	1. The upright frame structure shall house a maximum of three plumbing services.
	2. Needle Valves – chromed brass straight pattern instrumentation needle with serrated hose end.
	3. Plumbing lines – (1/4” OD single frame) (3/8“OD shared frame) wall copper tubing with quick disconnect attached to the tube with compression fittings at the top of the upright. Each half of the quick disconnect (coupler and nipple) are valved.
	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. **SERVICE CONNECTIONS**
3. General requirements:
4. All services (plumbing, power, phone and data) terminate at the top of the plumbing upright.
5. Power services will have a 20 amp cord plug extending 4’ above the top of the upright. Plug end to be twist lock on single frame and 24 pin Deutsch plug for the shared frame.
6. Phone CAT 3 line will have a female receptacle extending 4’ above the upright. (Connections to the facility to be provided by others).
7. Data CAT 5 line will have a male plug extending 4’ above the upright. (Connections to the facility to be provided by others)

	1. **CEILING MANIFOLD SYSTEM**

1.General requirements – Ceiling utility panel shall integrate within most standard-duty T-grid acoustical suspended ceiling systems.

2. Utility panel shall provide a means to mount and connect electrical outlets, data outlets and quick connect service fixtures.

1. Utility panels shall accommodate single sided and back-to-back bench configurations.
2. Utility panels will ship with junction boxes factory attached. Electrical outlets, data outlets, cover plates and service fixtures shall be ordered separately and field installed.
3. Utility panel shall be a minimum 18-gauge cold rolled steel with a urethane powder coat finish or #304 stainless steel.
4. Nominal Dimensions:
a. Widths – 24” x 24”
b. Height (including junction boxes) – 3”
5. Ceiling manifold systems shall be equipped with quick disconnect fitting for service tube ends. Each disconnect shall include nipple and coupler with color-keyed band marking media.
6. Service lines: polyurethane for non-burning gases and braided stainless steel for burning gases will attach to quick-connects from the ceiling utility panel and the rear frame disconnects.

**2.07 SHELVES**

 A. General requirements for shelves:

1. All shelves supports shall be available in #304 stainless steel (#4 finish) or powder coated cold rolled steel.

2. Shelf platforms shall be available in glass, phenolic resin or plastic laminate with 3mm wood edge banding.

3. Shelves shall overhang 2” behind the face of the vertical tubular support.

4. Shelf brackets: 11 gauge stainless steel or cold rolled powder coated steel.

5. Vertical shelf adjustment: 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.

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

 8. Load capacity: 40 lbs per linear ft. up to 200 lbs. on a 48” wide unit.

1. Outside Shelf:

1. Nominal dimensions:

 a. Widths: [29"] [35"] [46"] [47"]

 b. Depth: [12"] [15"]

2. Shelf brackets shall rise above the shelf surface to provide sides.

1. Shelf Types (Specifier Option):
2. Glass shelf with steel (stainless or cold rolled) frame:
	1. Frame to be made up of 11 ga. steel and ¾” square 11 ga. tubing.
	2. Glass to be .50” laminated.

2. Phenolic resin shelf with steel (stainless or cold rolled) frame:

a. Frame to be made up of 11 ga. steel and ¾” square 11 ga. tubing.

 b. Phenolic resin shelf to be ¾” thick.

* 1. Wood shelf with steel (stainless or cold rolled) frame:

a. Frame to be made up of 11 ga. steel and ¾” square 11 ga. tubing.

* + 1. Wood laminated shelf to be 1” thick with 3mm hardwood banding.
1. Shelf Retainer Options (Specifier’s Option):

1. Cold rolled powder coated steel or #304 stainless steel shelf options:

* 1. Lower and middle shelves shall have a removable 18 ga. steel back rail which acts as a back stop and can be turned upside down to provide a flush worksurface when units are back-to-back.
	2. Upper shelf to have a removable 18 ga. steel back rail.
	3. Optional front .375” diameter retaining rod shall be 1.25” above the shelf.
1. Wood shelf options:

a. Lower and middle shelves shall have a removable/reversible rear 1” solid hardwood lip which can act as a stop and can turn upside down to provide a flush surface when units are back-to-back.

* + - 1. Upper shelf shall have removable 1” high solid hardware lip.
			2. Front .375” diameter retaining rod shall be 1.25” above the shelf.
	1. **WORK SURFACES AND SPLASH GUARDS**

A. General requirements for shelves:

1. All work surface table frames supports and backsplash support hardware shall be available in #304 stainless steel (#4 finish) or powder coated cold rolled steel.

2. Work surfaces shall be available in glass, phenolic resin or wood.

3. Work surfaces shall be corner notched to the tube profile and hang 1” behind the face of the vertical tubular support.

4. Load capacity: the work surface load rates are dependent of the work surface table frame and performance ratings (2.02).

1. Work surfaces:

1. Nominal dimensions:

 a. Widths: [42”] [48"] [60"] [72"] [96"]

 b. Depth: [30"]

1. Work surface Types - Material Options (Specifier Option):

1. Laminated safety glass - .50” thick with ¾” X ¾” 11-gauge 4-sided steel frame

2. Phenolic resin – 1”, .75” thick

1. Epoxy resin - .1”, .75” thick
2. Side and Back Splashes:

1. Nominal dimensions:

 a. Heights: [1 7/8”] [3 7/8”] [5 7/8”] [12 7/8”]

1. Side and Back Splashes Types - Material Options (Specifier Option):

1. Laminated safety glass - .50” thick

2. Phenolic resin - . 50” thick

3. Epoxy resin - .50” thick (finished both sides)

**2.09 MOBILE BASE CABINETS**

A. Design requirements, performance requirements, materials, fabrication and hardware shall comply in all respects with fixed wood and/or steel casework specifications as manufactured and cataloged. The basis of this product specification is Hamilton Laboratory Solutions, 825 East Albert Drive, Manitowoc, WI 54220.

B. 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.

1. 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.
2. Base cabinets shall, except as noted, incorporate a flush overlay design in which the cabinet body is completely concealed.
3. 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 configuration 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 ¾” 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.
4. 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. 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 SEFA 8 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

###  1.1 Purpose of Test

 The purpose of the chemical spot test is to evaluate the resistance a finish has to chemical spills.

 **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.

###  1.2 Test Procedure

 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.

 Place panel on a flat surface, clean with soap and water and blot dry. Condition the panel for 48-hours at 73+ 3F (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:

 **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.

 **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.

 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 No. 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

###  1.3 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

### 2.1 Purpose of Test

 The purpose of this test is to insure the coating is resistant to hot water.

### 2.2 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.

### 2.3 Acceptance Level

 After cooling and wiping dry, the finish shall show no visible effect from the hot water.

##  3. Impact Test

### 3.1 Purpose of Test

 The purpose of this test is to evaluate the ductility of the coating.

### 3.2 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.

### 3.3 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

### 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.

### 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.

### 4.3 Acceptance Level

 Ninety or more of the squares shall show finish intact.

##  5. Paint Hardness on Steel Test

### 5.1 Purpose of Test

 The paint hardness test is used to determine the resistance of the coatings to scratches.

### 5.2 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.

### 5.3 Acceptance Level

 The paint shall have a hardness of 4-H minimum.

**2.11 Bulletin Boards**

* 1. General requirements – Bulletin boards are a dyed linoleum material framed in either powdercoated steel or #304 stainless steel. Bulletin boards shall be both acoustical and tackable. Refer to drawing details. For fabric selection, provide color samples for owners review.

2. Nominal dimensions:

a. Widths: [42”] [48"] [60"] [72"] [96"]

b. Heights: [20"] [18"] [16"] [14"](from top of work surface to horizontal raceway

**2.12 MODESTY PANELS**

 1. General requirements – Steel (stainless steel or painted) shall mount directly to rear frame. Modesty panel will mount with a simple clamp mechanism with simple hand tool.

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 T5HQ type. Task lights shall be gangable with an integral on/off switch. 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: [29"] [35"] [47"]

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

 A. Furniture system installation:

 1. Install system in strict accordance with manufacturer's instructions.

 2. Set system components level on two planes with no distortion. Securely anchored to building structure using concealed shims where necessary in wall mount.

 B. Install applications casework, work surfaces and accessory items per Section 12345.

**3.02 ADJUSTING**

 A. Repair or remove and replace defective work, as directed by [Architect] [Owner] 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.

#  END OF SECTION