

## SECTION 05 45 00 - METAL SUPPORT ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This section includes the following support framing systems:
1. Overhead rail-mounted X-ray machine.
  2. Pendant-mounted surgical lights.
  3. Pendant-mounted microscope with vibration isolators.
  4. T.V. monitor.
  5. Gas columns.
- B. Related Sections:
1. Structural steel framing system components are specified in another Division 05 Section.
  2. Acoustical panel ceiling components are specified in Division 09.
  3. Field painting of exposed members is specified in Division 09.
  4. Medical gas systems are specified in Division 22.
  5. Grilles, diffusers, and HVAC ductwork and piping are specified in Division 21.
  6. Lighting fixtures are specified in Division 26.

#### 1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design, engineer, fabricate, and install support framing systems to withstand structural loads of ceiling mounted equipment without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each support system.
1. Design support structure to support concentrated loads and associated moments provided by ceiling-mounted equipment manufacturer.
  2. Design support structure to support required loads at any single point along exposed rails, with maximum deflection of 1/720th of the span in either plane when maximum loading conditions are applied.
  3. Design support structure with a minimum safety factor of 3 based on ultimate strength under static loading conditions.
  4. Provide spacing of exposed rail members to accommodate standard modular 24" ceiling panels, fixtures, and equipment.
  5. Design support structure with seismic restraint in accordance with code requirements for seismic zone.
  6. Provide all-welded fabrication to applications with more than 2000 ft. lbs. of moment.

1.3 SUBMITTAL

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for products used in support framing system.
- C. Shop drawings detailing fabrication and erection of each support framing system indicated. Include plans, elevations, sections, and details of support framing systems and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.
  - 1. Include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for their preparation.
- D. Samples representative of materials and finished products as may be requested by Architect.
- E. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name, addresses, names of Architects and Owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Arrange for installation of support framing systems specified in this section by same firm that manufactured them.
  - 2. Installer shall have a minimum of 5 years experience in the design, manufacture, and installation of adjustable support framing systems.
  - 3. Installer shall provide single source responsibility for design, materials, and workmanship, and provide a guarantee period of two years from date of Substantial Completion.
- B. Engineer Qualifications: Professional engineer licensed to practice in jurisdiction where project is located and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of support framing systems similar in material, design, and extent to that indicated for this Project.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated. Other manufacturers' systems complying with requirements may be considered. Refer to Division 1 Section "Product Requirements."
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

## 1.5 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls, ceilings, and other construction to which support framing systems must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.
  - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

## 1.6 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate installation of support framing systems to prevent conflicts with electrical, mechanical, medical gas, plumbing, or other systems. Install prior to any ceiling framing or room finishes.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Products: The design for Support Framing Systems is based on the products named.
- B. Support Framing Systems: Design, engineering, fabrication, and installation of support framing systems:
  - 1. Basis-of-Design Product: Unistrut Medical Support Systems, Unistrut Corporation:
    - a. Model UXR-140, Universal rail system x-ray supports.
    - b. Model UMS-220, pendant-mounted microscope with isolators.
    - c. Model UML-310, Track mount surgical lights.
    - d. Model USC-410, T.V. monitor, service column.
    - e. Model USC-450, Retractable medical service column.
    - f. Model UEC-510, Universal support system.

### 2.2 MATERIALS

- A. Ferrous Metals:
  - 1. Hot Rolled Structural Sheet Steel: ASTM A570. Grade 33, 12, and 14 ga.
  - 2. Steel Bars: ASTM A575; ASTM A675, Grade 50.
  - 3. Cold Rolled Commercial Sheet Steel: ASTM A366, 16 and 19 ga.
  - 4. Fittings: ASTM A575, A576, A570.
- B. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

- C. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.
- D. Acoustical Panel Ceiling Edge Moldings: 14 ga. steel angle shape with 15/16" flange painted to match color of adjacent ceiling suspension system. Weld molding to framing system channels.

### 2.3 FASTENERS

- A. General: Select fasteners for the type, grade, and class required.
- B. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, non-drilling), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.
- C. Lock Washers: Helical spring type carbon steel, FS FF-W-84.
- D. Fasteners: SAE J429, Grade 2.

### 2.4 PAINT

- A. Shop Paint: Manufacturer's standard rust inhibiting acrylic enamel paint electro-deposited and baked over a phosphate coat.

### 2.5 FABRICATION, GENERAL

- A. Form metal fabrications from materials of size, thickness, and shapes needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Ease exposed edges to a radius of approximately 1/32 inch. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Remove sharp or rough areas.
- F. Provide for anchorage of type required; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- G. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and

handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

- H. Fabricate vertical supports to provide for both basic and micro vertical adjustment.

## 2.6 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B. Finish metal fabrications after assembly.

## 2.7 STEEL FINISHES

- A. Galvanizing: For those items indicated for galvanizing, apply zinc-coating by the hot-dip process compliance with the following requirements:
  - 1. ASTM A 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing both fabricated and un-fabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.
- B. Preparation for Shop Painting: Prepare uncoated ferrous metal surfaces to comply with minimum requirements of SSPC-SP3 "Power Tool Cleaning, for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications.
- C. Apply shop paint to phosphate coated surfaces of metal fabrications. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.
  - 1. Stripe paint all edges, corners, crevices, bolts, welds, and sharp edges.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

### 3.2 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing support framing systems to in-place construction; in-

clude threaded fasteners for concrete and masonry inserts, through-bolts, and other connectors as required.

- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of support framing systems. Set support systems accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

### 3.3 ADJUSTING AND CLEANING

- A. Touch-Up Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA-1 requirements for touch-up of field painted surfaces.

END OF SECTION