

## SECTION 105613 - METAL STORAGE SHELVING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:

- 1. Four-post metal storage shelving.

- B. Related Sections:

- 1. Section 114000 "Foodservice Equipment" for metal shelving in kitchen, dry food storage, and refrigerated spaces.

## 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance for Four-Post Metal Storage Shelving: Capable of withstanding the loads indicated according to MH 28.1.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal storage shelving.
- B. Samples for Initial Selection: For units with factory-applied color finishes. Include similar Samples of accessories involving color selection.
- C. Product Schedule: For metal storage shelving. Use same designations indicated on Drawings.

## 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal storage shelving to include in maintenance manuals.

## 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Shelves: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than five shelves.
2. Shelf-to-Post Connectors: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 10 connectors.

## 1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain metal storage shelving from single source from single manufacturer.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install metal storage shelving until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

# PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating.
- D. Steel Wire: ASTM A 899.
- E. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304.

## 2.2 FOUR-POST METAL STORAGE SHELVING

- A. Open Four-Post Metal Storage Shelving : Factory-formed, field-assembled, freestanding system, designed for shelves to span between and be supported by corner posts, with shelves adjustable over the height of shelving unit. Fabricate initial shelving unit with a post at each corner. Fabricate additional shelving units as add-on units, designed to share two corner posts with initial shelving unit. Provide fixed top and bottom shelves, adjustable intermediate shelves, and accessories indicated.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Adjustable Shelving Products; a division of Karp Associates, Inc.
    - b. Borroughs Corporation.

- c. Edsal.
  - d. Equipto.
  - e. Jeter Systems Corporation.
  - f. Lyon Workspace Products, LLC.
  - g. Penco Products, Inc.
  - h. Richards-Wilcox, Inc.
  - i. Unicor; Federal Prison Industries, Inc.
2. Load-Carrying Capacity per Shelf: 350 lb (159 kg).
  3. Posts: Fabricated from hot-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches (38 mm) o.c. to receive shelf-to-post connectors.
    - a. Steel Thickness, Nominal: As required for load-carrying capacity per shelf and number of shelves.
    - b. Add-On Shelf Posts: Fabricated from hot-rolled steel, manufacturer's standard shape; perforated to match main posts and of same thickness.
  4. Bracing: Manufacturer's standard, double diagonal cross bracing at back; as required for stability, load-carrying capacity of shelves, and number of shelves.
  5. Solid-Type Shelves: Fabricated from steel sheet as follows:
    - a. Metallic-Coated Steel-Sheet Thickness, Nominal: As required for load-carrying capacity per shelf.
    - b. Fabricate fronts and backs of shelves with box-formed edges, with corners lapped and welded.
    - c. Fabricate fronts and backs of shelves with vertical edges that are flanged and returned, with edges reinforced with steel angles.
  6. Shelf Quantity: Three shelves per shelving unit in addition to top and bottom shelf.
  7. Shelf-to-Post Connectors: Manufacturer's standard connectors.
  8. Base: Open, with exposed post legs .
  9. Overall Unit Width: As indicated on Drawings.
  10. Overall Unit Depth: As indicated on Drawings.
  11. Overall Unit Height: 84 inches (2134 mm).
  12. Finish: Powder coat.
    - a. Color and Gloss: As indicated by manufacturer's designations.

## 2.3 FABRICATION

- A. Fabricate metal storage shelving square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.
  1. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
  2. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

3. Build in straps, plates, brackets, and other reinforcements as needed to support shelf loading.
  4. Cut, reinforce, drill, and tap metal fabrications to receive hardware, fasteners, and similar items.
- B. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- C. Form edges and corners free of sharp edges or rough areas. Fold back and crimp exposed edges of unsupported sheet metal to form a 1/2-inch- (13-mm-) wide hem on the concealed side; ease edges of metal plate to radius of approximately 1/32 inch (0.8 mm). Shear and punch metals cleanly and accurately. Remove burrs.
- D. Weld corners and seams continuously to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

## 2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.5 METALLIC-COATED STEEL-SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780.
- B. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry thickness.

## 2.6 STEEL FINISHES

- A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling."
- B. Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry thickness.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where metal storage shelving will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Vacuum finished floor and wet mop resilient flooring over which metal storage shelving is to be installed.

### 3.3 INSTALLATION

- A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.
  - 1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
  - 2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
  - 3. Connect side-to-side shelving units together.
  - 4. Install shelves in each shelving unit at spacing indicated on Drawings or, if not indicated, at equal spacing.
    - a. Four-Post Metal Storage Shelving: Install four clips, one at each post, for support of each shelf; with clips fully engaged in post perforations.

### 3.4 ERECTION TOLERANCES

- A. Erect four-post metal storage shelving to a maximum tolerance from vertical of 1/2 inch (13 mm) in up to 10 feet (3 m) of height, not exceeding 1 inch (25 mm) for heights taller than 10 feet (3 m).

### 3.5 ADJUSTING

- A. Adjust metal storage shelving so that connectors and other components engage accurately and securely.
- B. Touch up marred finishes or replace metal storage shelving that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal storage shelving manufacturer.

- C. Replace metal storage shelving that has been damaged or has deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 105613