

SECTION 105613 (10675) – METAL STORAGE SHELVING (Four-Post)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the contract, including general and supplementary conditions and related specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes the following:
Four-Post Metal Shelving

1.3 REFERENCES

- A. American National Standards Institute (ANSI) Standards
- B. American Society for Testing and Materials (ASTM) Standards

1.4 DESCRIPTION

- A. General: Four-Post Metal Shelving
- B. Finishes:
 - 1. Metal Components and Accessories: All shelving components including accessories shall be finished with an electrostatically applied Gloss-Tek™ powder coat as outlined in Section 2.5 A and B.
 - 2. Laminate End Panels and Tops: Select from manufacturer's standard high-pressure and low-pressure laminate finishes as outlined in Section 2.5 C.
- C. Sizes: Per manufacturer's standard offering as outlined in Section 1.5.

1.5 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
 - 1. A minimum of _____ linear storage inches must be provided. Consult drawing for plan view and elevation details.
 - 2. Available in standard heights of 40-1/4 inches (1022 mm), 64-1/4 inches (1632 mm), 76-1/4 inches (1937 mm), 85-1/4 inches (2165 mm), 88-1/4 inches (2242 mm), 97-1/4 inches (2474 mm), 100-1/4 inches (2546 mm), and 121-1/4 inches (3080 mm). Other heights shall be available variable on 1-1/2 inch (38 mm) increments as required to meet application needs.
 - 3. Available in nominal widths of 24 inches (610 mm), 30 inches (762 mm), 36 inches (914 mm), 42 inches (1067 mm), and 48 inches (1219 mm).
 - 4. Available in nominal depths of 12 inches (305 mm), 13 inches (330 mm), 15 inches (381 mm), 16 inches (406 mm), 18 inches (457 mm), 24 inches (610 mm), 26 inches (660 mm), 30 inches (762 mm), 32 inches (813 mm), and 36 inches (914 mm).

DIVISION 10 - SPECIALTIES

- B. **Seismic Performance:** Provide four-post metal shelving capable of withstanding the effects of earthquake motion as required by applicable building codes.

1.6 SUBMITTALS

- A. **Product Data:** Submit manufacturer's product literature and installation instructions.
- B. **Drawings:** Provide layout of shelving including notations and descriptions. Provide dimensional drawings of all shelving quoted.
- C. **Initial Selection Samples:** For initial selection of colors and textures, submit manufacturer's color chart(s) showing full range of colors and textures available.
- D. **Samples:** Provide minimum 3 inch (76 mm) square sample of each color and texture selected.
- E. **Warranty:** Submit a copy of manufacturer's warranty.
- F. **Maintenance Data:** Provide manufacturer's instructions for care and cleaning of the finish. Provide manufacturer's instructions for shelf relocation and/or spacing adjustments.
- G. **Reference List:** Provide list of recently installed similar type of shelving projects.

1.7 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Engage an experienced manufacturer who has been manufacturing this type of shelving continuously at the same location for a period of not less than 50 years.
- B. **Manufacturing Qualifications:** Engage an experienced manufacturer whose internal processes meet or exceed ISO 9001 requirements.
- C. **Installer Qualifications:** Engage an experienced installer who is authorized by the manufacturer to install four-post shelving and who has done so for a minimum of one year.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Follow manufacturer's instructions and recommendations for delivery, storage and handling requirements.

1.9 PROJECT CONDITIONS

- A. **Field Measurements:** Verify quantities of four-post shelving units before fabrication. Indicate verified measurements on shop drawings. Coordinate fabrication and delivery to ensure no delay in progress of the work.
- B. **Established Dimensions:** Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating four-post shelving units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 SEQUENCING AND SCHEDULING

DIVISION 10 - SPECIALTIES

- A. Sequence four-post shelving units with adjoining work to minimize possibility of damage and soiling during remainder of construction period.
- B. Schedule installation of specified four-post shelving after finishing operations; including painting have been completed.
- C. Delivery, Storage, and Handling: Comply with all instructions and recommendations made by manufacturer or manufacturer's representative for delivery, storage, and handling requirements.
- D. Pre-installation Conference: Schedule and conduct conference on project site to review methods, procedures, and logistic details for installing four-post shelving units.

Recommend attendees:

1. Owner's Representative
2. Prime Contractor or representative
3. Architect, Engineer, or person responsible for the layout design
4. Manufacturer's representative
5. Subcontractors or installers whose work may affect, or be affected by the installation of this shelving

1.11 WARRANTY

- A. Provide a written warranty, executed by Contractor, Installer, and Manufacturer, agreeing to repair or replace units, which fail in materials or workmanship within the established warranty period. This warranty shall be in addition to, and not a limitation of, other rights the owner may have under general conditions provisions of the contract documents.
- B. Limited Lifetime warranty: Subject to the terms in the written warranty, warrant the original purchaser exclusively that the shelving manufactured by it will be free from defects in materials and workmanship for the lifetime of the four-post shelving.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. General: Products are based upon Quik-Lok™ four-post shelving supplied by Material Handling USA, 222 S Main St, 5th Floor, Salt Lake City, UT 84101

2.2 BASIC MATERIALS

- A. General: Provide materials and quality of workmanship, which meet or exceed established industry standards for products specified. Use furniture grade sheet metal, wood panels, plastic laminate and fasteners for component fabrication unless indicated otherwise. Material thickness/gauges are manufacturer's option unless indicated otherwise.

2.3 MANUFACTURED COMPONENTS

- A. Design:

1. Four-post type consisting of uprights, shelves, shelf supports, and Quik-Bases™, designed to be assembled without fasteners or clips. Shelves (except for divider locating slots where applicable) and upright posts shall have no holes on any exposed surface faces. Cross-bracing of any sort shall be unacceptable. Shelf fronts and backs shall be flush with outside faces of upright posts. Back Panels when required shall be flush with the post face and require no additional tools or hardware to install. Design shall permit individual shelf adjustment or removal anywhere along the entire height of the shelving unit. Shelving shall require no tools to erect or make adjustments to, including relocation or removal of individual shelves.
- B. Materials and Workmanship:
1. Fabricate units from ASTM Class 1, cold-rolled commercial grade sheet or coil steel with all bends and radiuses consistent and true. There shall be no sharp edges and shelving shall exhibit no irregular seams, oil-canning, dents or distortion in any manner.
- C. Uprights:
1. Formed from steel sheet to tubular "T" (tee) shape posts for intermediate supports and tubular "L" (angle) shape posts for end supports. Posts shall have keyhole slots on inner wall only and shall have either a full size sheet steel panel or tie strips linking the posts and forming an upright. Upright quantities, sizes, and types are to be determined by plan view and elevations.
 2. Open Uprights:
 - a. Single unit (starter) and/or row end uprights on a range of shelving shall consist of two 1 inch (25 mm) wide 18 gauge cold rolled steel posts roll-formed into a tubular "L" formation. Keyhole slots shall be punched on the inner wall only located on 1-1/2 inch (38 mm) centers. There shall be no holes in the outside face surface of the posts. The front and back posts shall be joined by welding 3-1/8 inch (79 mm) high by nominal shelf depth 18 gauge spacers to provide the required upright depth and structural rigidity. Open "L" (angle) uprights to be manufactured to heights specified.
 - b. Intermediate (adder) uprights located between and linking shelf sections within a range of shelving shall consist of two 2 inch (51 mm) wide 18 gauge cold rolled steel posts roll-formed into a tubular "T" formation. "T" uprights shall be used as a common upright between units. Keyhole slots shall be punched on the inner wall only located on 1-1/2 inch (38 mm) centers. There shall be no holes in the outside face surface of the posts. The front and back posts shall be joined by welding 3-1/8 inch (79 mm) high by nominal shelf depth 18 gauge spacers to provide the required upright depth and structural rigidity. Open "T" (tee) uprights to be manufactured to heights specified.
 3. Closed Uprights:
 - a. Single unit (starter) and/or row end uprights on a range of shelving shall consist of two 1 inch (25 mm) wide 18 gauge cold rolled steel posts roll-formed into a tubular "L" formation. Keyhole slots shall be punched on the inner wall only located on 1-1/2 inch (38 mm) centers. There shall be no holes in the outside face surface of the posts. The front and back posts shall

be joined by welding a full height 24 gauge closure sheet to provide the required upright depth and structural rigidity. Closed "L" (angle) uprights to be manufactured to heights specified.

- b. Intermediate (adder) uprights located between and linking shelf sections within a range of shelving shall consist of two 2 inch (51 mm) wide 18 gauge cold rolled steel posts roll-formed into a tubular "T" formation. "T" uprights shall be used as a common upright between units. Keyhole slots shall be punched on the inner wall only located on 1-1/2 inch (38 mm) centers. There shall be no holes in the outside face surface of the posts. The front and back posts shall be joined by welding a full height 24 gauge closure sheet to provide the required upright depth and structural rigidity. Closed "T" (tee) uprights to be manufactured to heights specified.

D. Shelves:

1. Shelf shall be formed from 22 gauge (18 gauge optional) cold rolled sheet steel with 5/8 inch (16 mm) flanges on all sides and a return hem on the front and back flanges. Shelves shall be independently adjustable on 1-1/2 inch (38 mm) centers. If slotted, single entry shelves shall have two rows, and double entry 4 rows of slots to accept file divider tabs. If plain, no holes shall be permitted on shelf surface for shelf depths less than 18 inches (457 mm).

E. Canopy Tops:

1. Same construction as shelf. Must be plain, exhibiting no holes on surface for depths less than 18 inches (457 mm).

F. Shelf supports:

1. Formed from heavy gauge sheet steel. 24 inch (610 mm), 30 inch (762 mm) and 36 inch (914 mm) widths shall be formed of 14 gauge and 42 inch (1067 mm) and 48 inch (1219 mm) shall be formed of 11 gauge hot rolled pickled steel to the specified width x 3/4 inch (19 mm) or optional 1-1/4 inch (32 mm) high with two additional return flanges to form a structural channel. A 13/16 inch (21 mm) flange at each end shall be left unformed to accept two shoulder rivets. Rivets shall be 7/16 inch (11 mm) diameter at the head, solid steel, and spaced to interlock into keyhole slots on the inner wall of upright post.

G. Nominal Shelf Dimensions:

1. Width: As indicated on the drawing(s). 24 inches (610 mm), 30 inches (762 mm), 36 inches (914 mm), 42 inches (1067 mm), and 48 inches (1219 mm) as required to best meet available room area and media dimensions.
2. Depth: As indicated on the drawing(s). 12 inches (305 mm), 13 inches (330 mm), 15 inches (381 mm), 16 inches (406 mm), 18 inches (457 mm), 24 inches (610 mm), 26 inches (660 mm), 30 inches (762 mm), 32 inches (813 mm), and 36 inches (914 mm).
3. Shelf Edge Vertical Profile: 3/4 inch (19 mm) maximum.
4. Vertical Adjustment increment: 1-1/2 inches (38 mm)

DIVISION 10 - SPECIALTIES

5. Width of Intermediate uprights: 2 inches (51 mm)
 6. Clearance Between Uprights: Nominal shelf section width minus 2 inches (51 mm)
 7. Levelness of Completed Shelf Units: Maximum of 1/8 inch (3.2 mm) top to bottom, measured at any upright.
 8. Number of Vertical Shelf Spaces: As indicated on the drawings.
 9. Vertical Shelf-To-Shelf Spacing: As indicated on the drawings.
- H. Load Carrying Capabilities:
1. Provide shelf units capable of supporting a minimum of 40 pounds per lineal foot (18 kg per 305 mm) with maximum deflection of L/140. Shelves shall exhibit no permanent deflection under fully loaded conditions.
- I. Accessories: (optional)
1. Provide manufacturer's standard. Location and quantity as indicated on the drawings.
 - a. Reference Shelves
 - b. File Dividers
 - c. Back Stops
 - d. Center Stops
 - e. Hinged Doors
 - f. Sliding Doors
 - g. Rolling (Tambour) Doors
 - h. Retractable Doors
 - i. Filing Drawers
 - j. Divided Drawers
 - k. Aisle Ties
 - l. Wall Ties
 - m. Leveling Feet
 - n. Touch-Up Paint

2.4 FABRICATION

- A. General: Coordinate all parties to ensure timely execution of this project and to related work.

2.5 FINISHES

- A. Colors:

DIVISION 10 - SPECIALTIES

1. To be selected from manufacturer's standard available colors. A minimum of 29 standard manufacturer's colors shall be offered at no additional charge and a minimum of 3 standard metallic colors shall be provided at an additional charge not to exceed 15%. Available custom color matching is optional. All components shall be finished with an electrostatically applied powder coat.
- B. Powder Coat Finish:
1. Provide electrostatically applied Gloss-Tek™ powder coat. Finish shall consist of a non-glare raised surface that provides fingerprint resistance. Finish shall be a non-VOC emitting hybrid powder coat which meets or exceeds ASTM test criteria for adhesion, flexibility, hardness, and humidity resistance.
 2. (optional) An antimicrobial powder coat finish which shall hinder the growth of gram positive and gram negative bacteria. This shall also include molds and yeasts. The antimicrobial properties shall be present and fully active for the life of the finish. All other Gloss-Tek™ powder coat characteristics shall apply.
 3. An ESD powder coat finish which shall dissipate an electrostatic charge. The electrostatic dissipation properties shall be present and fully active for the life of the finish. Availability shall be limited to black or granite colors. All other Gloss-Tek™ powder coat characteristics shall apply.
- C. Laminate Finish:
1. High Pressure Laminate Finish: To be selected from manufacturer's standard high-pressure WilsonArt™ available colors and patterns.
 - a. (optional) Other laminate manufacturers colors and pattern selection.
 2. Low Pressure Laminate Finish: To be selected from manufacturer's standard Thermal Fused low-pressure laminate finishes.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. For stationary shelving installations, with installer present, examine floor surfaces where shelving will be located for compliance with manufacturer's requirements for fixed shelving.
- B. For mobile shelving installations, with installer present, examine mobile carriages for proper sizing, proper placements of support members for the shelving, and to ensure that mounting surface is square and level.
- C. For all installations it shall be the installer's responsibility to know and to execute all phases of the installation in compliance with local building codes.

3.2 INSTALLATION

- A. General: Follow manufacturer's documented instructions and procedures.

3.3 FIELD QUALITY CONTROL

- A. Verify all uprights, shelves, components and accessories are plumb and level. Correct if necessary.

DIVISION 10 - SPECIALTIES

- B. Replace components that are scratched, dented, or damaged in any manner with new items from the manufacturer. Surface scratches may be touched up but repair must be complete and undistinguishable.

3.4 ADJUSTING

- A. Adjust all components and accessories to provide smooth operation and proper alignment.

3.5 CLEANING

- A. Upon completion of installation, clean all components and surfaces. Remove all packaging material, rubbish and debris resulting from installation immediately upon completion of work and leave area(s) of installation in neat, clean condition.

3.6 DEMONSTRATION/TRAINING

- A. Schedule and conduct demonstration of case-type shelf adjustment by manufacturer or dealer authorized representative. Review features and proper operation of accessory items with owner's personnel.
- B. Schedule and conduct maintenance training with owner's maintenance personnel. Training session should include demonstration of four-post shelf adjustment and proper surface cleaning and preservation procedures that end user personnel would normally perform.

3.7 PROTECTION

- A. Protect system against damage during remainder of construction period. Advise owner of additional protection needed to ensure that system will be without damage for remainder of work within the area.

END OF SECTION