

SECTION 10 56 13 - METAL STORAGE SHELVING

* ALL FIELDS IN [] MUST BE EDITED.

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Related Specifications Sections, apply to this Section.

1.2. SUMMARY

- A. This section includes the following:
 - 1. Wide span semi-industrial fixed shelving units, fabrication and installation including leveling.
- B. Related Work, Not Furnished:
 - 1. Structural floor system capable of supporting loads required by prevailing building codes, including loads of storage units to be installed. Provide a maximum allowable sub floor deflection of L/480 under specified storage loads.
- C. Related Sections:
- D. Allowances:
- E. Alternates

1.3. PERFORMANCE REQUIREMENTS

- A. Due to the user's preference and requirements for safety, performance, and flexibility, all following specification line items are mandatory.
- B. Seismic Performance: Provide fixed shelving capable of withstanding the effects of earthquake motions as determined according to IBC 2006 and local building codes.
- C. Design Requirements: All shelving elevations as [per attached drawings] or [described in the specifications].
- D. Color Samples: Provide sample for each exposed product and for each color required.
- E. Selection Samples: For selection of colors and textures, submit manufacturer's color charts consisting of actual product samples, showing full range of colors and textures available. Vendors must provide a minimum of 12 color selections in powder coat paint finish.
- F. Installer Qualifications: Engage an experienced installer who is the manufacturer's authorized and certified representative.
 - 1. Minimum Qualifications: 1-year experience installing systems of similar size and complexity to specified project requirements
 - 2. Manufacturer Certification: Required by manufacturer on manufacturer's letterhead required at time of bid. Certifications by sales representatives, dealers, or distributors are unacceptable. Qualification must include resume of certified installation supervisor.
 - 3. Provide support within 24 hours for service call.

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- G. Warranty: Submit a written warranty, executed by contractor, installer and manufacturer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. This warranty shall be in addition to, not limitation of other rights the owner may have against the contractor under contract documents.

Lifetime Limited Warranty: The entire shelving installation will be warranted against defects in materials for the life of the installation from the date of acceptance by the Owner.

- H. Reference List: Provide a list of three (3) minimum fixed storage installations to be contacted or visited by owner, architect and contractor. Installation must be of similar size, scope of specified system. Visit is intended to inspect operation, quality of installation and verify the suitability of manufacturer's products and comparison with materials and products specified. Manufacturer is required to address all issues raised by owner, architect and contractor. List must include contact names, phone numbers or e-mails, size and quantity of shelving units.
- I. LEED Data: Provide complete environmental data included recycled material content, VOC data, and other product related information. Describe all manufacturing processes or policies that contribute to environmental sustainability
- J. Project Schedule: Provide a project achievement plan detailing all critical elements necessary to plan, manufacture, ship, and install shelving product. Include critical project milestones and risk mitigation plan.
- K. Manufacturer Qualifications:
1. ISO 9001:2008: Engage an experienced manufacturer who is ISO 9001:2008 certified for the design, production, installation and service of powered mobile systems. Submit manufacturer's ISO 9001:2008 quality system registration certificate.
 2. ISO 14001:2004: Engage an experienced manufacturer who is ISO 14001:2004 certified. This international standard defines a process for monitoring and improving an organization's environmental performance. This process minimizes adverse impacts on the environment caused by the activities of the enterprise and helps to continually improve the environmental performance of the organization. Submit manufacturer's ISO 14001:2004 registration certificate, certifying the environmental performance of manufacturer.

1.4. SUBMITTALS

- A. Product Data: Submit manufacturer's product literature, schematics, testing data, and other items as described in this specification. Include data substantiating that products to be furnished comply completely with requirements of the contract documents and specifications. Include installed weight, load criteria, furnished specialties, and accessories.
- B. Shop Drawings: Prepared and detailing fabrication, assembly, and installation of storage shelving, as well as procedures and diagrams. Include details of layout and installation, as well as clearances, spacing, relation to adjacent construction in plan, elevation, and section, components, assemblies, connections, attachments, reinforcements, and anchorage. Furnish floor layouts, technical, and installation manuals for every unit shipment.

1.5. QUALITY ASSURANCE (Submittals due from all bidding contractors at time of bid, failure to do so shall be cause for disqualification.)

- A. Manufacturer Certifications: Provide written certification by manufacturer on manufacturer's letterhead at time of bid required stating compliance with all specifications of shelving systems. Shelving certifications must confirm compliance with all shelf sizes and gauges as noted in these specifications.

1.6. PROJECT CONDITIONS

- A. Field Measurements: Verify shelving unit location by field measurements before fabrication and

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indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating shelving units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.
- B. Delivery, Storage, & Handling: Comply with instructions and recommendations of manufacturer for special delivery, storage and handling requirements.
- C. Sequence & Scheduling: Sequence storage shelving system installation with other work to minimize possibility of damage and soiling during remainder of construction period.
- D. Pre-installation Conference: Conduct conference at project site. Review methods and procedures related to installation of fixed storage units including, but not limited to, the following:

PART 2 - PRODUCTS

2.1. MANUFACTURERS

- A. General: Products are based on fixed shelving units products manufactured by Montel Inc. Contingent on meeting all specification requirements, other acceptable manufacturers may be included.

2.2. MANUFACTURED COMPONENTS – WIDE SPAN SHELVING

- A. Upright frame: A semi-industrial upright frame shall be made of three or more* cross members to join the top, bottom and center of the posts and form a rectangular upright frame; two or more* braces are added to enhance rigidity; and two foot plates for stability. All parts shall be welded together.
* from 96"(2.44m) unit height
- B. Posts: The post is made of 16-gauge 2" (51mm) x 1 5/16" (33mm) C shaped cold rolled steel. On the wider side, the post is slotted at every 2"(51mm) increment. The slots are trapeze shaped 1" (25.4mm) long by 3/8" (9.5mm) wide in their shorter edge, and are designed to accommodate the shelf beam. [(Optional) The sides of the post are also slotted at every 1" (25.4mm) increment. The slots are 3/16" (4.7mm) wide x 5/8" (16mm) long, and are designed to accommodate cantilever or standard four-post accessories.]
- C. Cross members: Cross members shall be the horizontal link between two posts. The upper cross member shall be flush to the top of the post, the lower one be 6 3/4" (171.5mm) from the ground and the middle one is 45 7/8" (1165mm) from the ground. If the upright frame is higher than 96" (2.44m), a fourth cross member is added between the top and the middle one. A cross member shall be 1" (25.4mm) by 1 3/32" (28mm) U shaped channel made of 16-gauge steel. It shall have four oblong perforations on each side to fix end panels, mobile carriage or to connect units one above the other.
- D. Brace: A brace shall be a 1" (25.4mm) by 1 3/32" (28mm) U shaped channel made of 16-gauge steel. Braces are placed in diagonal, between two cross members to reinforce the upright frame. One end of the brace shall be welded on a post at 4 3/4" (121mm) from the cross member above, while the other end is welded on the opposite post at the same distance of the cross member below. Each brace shall be place in the opposite sense of the other. The units shall not need sway braces to link two upright frames together in order to keep them accessibles from both sides.
- E. Foot plate: The L shaped foot plate shall be made of 12-gauge steel. The overall dimensions shall be 2.75" (69mm) long, by 1" (25mm) high by 2" (51mm) wide. Foot plates shall be welded toward the interior of the frame so they are not visible from outside.

- F. [(Optional) Reinforcement : If needed, reinforcements can be added to reach extra height or meet special requirements. Reinforcements products already exist for the foot plate and posts. Usually it consists of an extra part welded. More details shall be furnish on demand.]
- G. Top 500 lb shelf beam: The shelf beams are longitudinal supports made to store large or heavy items directly on them for a total up to 500lb. They shall be made with a 14-gauge steel 6 faces tube, made of 2 pieces welded together. The overall tube dimensions shall be minimum 2" (51mm) by 1.906" (48mm) and shall present a recess to support drop panels. A standard formed 12-gauge steel claw with 3 hooks is welded at each end to form a complete support. These J shaped claws shall be 5 1/8" (130mm) high by 2 5/16" (59mm) long and are inserted into the slots located at the front of the post. Shelf beam shall be easy to install without welding or tool. In top configuration, the tube is welded at 1/4" (6.3mm) from the top of the claw.
- H. Bottom 500 lb shelf beam: The shelf beams are longitudinal supports made to store large or heavy items directly on them for a total up to 500lb. They shall be made with a 14-gauge steel 6 faces tube, made of 2 pieces welded together. The overall tube dimensions shall be minimum 2" (51mm) by 1.906" (48mm) and shall present a recess to support drop panels. A standard formed 12-gauge steel claw with 3 hooks is welded at each end to form a complete support. These J shaped claws shall be 5 1/8" (130mm) high by 2 5/16" (59mm) long and are inserted into the slots located at the front of the post. Shelf beam shall be easy to install without welding or tool. In bottom configuration, the tube is welded at 2 7/8" (73mm) from the top of the claw, in order to gain space near the ground.
- I. Top 1500 lb shelf beam: The shelf beams are longitudinal supports made to store large or heavy items directly on them for a total up to 1500lb. They shall be made with a 14-gauge steel 6 faces tube, made of 2 pieces welded together. The overall tube dimensions shall be minimum 3" (76mm) by 1.906" (48mm) and shall present a recess to support drop panels. A standard formed 12-gauge steel claw with 3 hooks is welded at each end to form a complete support. These J shaped claws shall be 5 1/8" (130mm) high by 2 5/16" (59mm) long and are inserted into the slots located at the front of the post. Shelf beam shall be easy to install without welding or tool. In top configuration, the tube is welded at 1/4" (6.3mm) from the top of the claw.
- J. Bottom 1500 lb shelf beam: The shelf beams are longitudinal supports made to store large or heavy items directly on them for a total up to 1500lb. They shall be made with a 14-gauge steel 6 faces tube, made of 2 pieces welded together. The overall tube dimensions shall be minimum 3" (76mm) by 1.906" (48mm) and shall present a recess to support drop panels. A standard formed 12-gauge steel claw with 3 hooks is welded at each end to form a complete support. These J shaped claws shall be 5 1/8" (130mm) high by 2 5/16" (59mm) long and are inserted into the slots located at the front of the post. Shelf beam shall be easy to install without welding or tool. In bottom configuration, the tube is welded at 1 7/8" (48mm) from the top of the claw, in order to gain space near the ground.
- K. Locking hook: The shelf beam shall be assembled without use of tools or on-site welding. However, a specially designed locking hook shall be used to mechanically secure the shelf beam in place. The hook overall dimensions are 1 5/8" (41mm) x 1" (25.4mm) and it shall be made of 3/8"(9.5mm) thick aluminum.
- L. Drop panel: Semi-industrial racking is made to store large or heavy items directly on beams. If the storage area needs to be fully supported, many drop panels placed side by side perpendicularly to shelf beams, shall act as a shelf. However, they are not made to withstand the load capacity of beam. A drop panel is made of 18-gauge steel and two bends on each side make it 1"(25,4mm) thick. Its depth and width are designed to fit the application. Oblong holes on each flange shall afford to bolt two or more drop panels together if needed.
- M. [(Optional) Four-post accessories: The semi-industrial frame shall be compatible with all Montel's four post components and accessories (shelves, brackets, trays, canopy top, end panels, closed back, etc). Requires the optional post with two types of perforation.]
1. [See four-post shelving specifications for details. As the semi-industrial product is usually wider than standard four post components, special design may be necessary.]

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- N. [(Optional) Cantilever accessories: At the front free end, the semi-industrial frame shall be compatible with Montel's cantilever shelving (shelves, brackets, trays, canopy top). Requires the optional post with two types of perforation.]
 - 1. [See cantilever shelving specifications for details. As the semi-industrial post's slots position is slightly different than cantilever slots position, special design may be necessary.]

2.3. FINISH SPECIFICATIONS

- A. Shall be the finest of their respective kinds and those best adapted to the construction for which they are employed to meet ISO 9001:2008 quality standards. All steel shall be superior quality mild, cold rolled, pickled, and double annealed, free from scale and buckle. All plating used on exposed parts shall be metallic furniture stock. All gauges are U.S. standard. The design of all parts shall be such that the completed installation shall present a neat and finished appearance and shall be free from exposed sharp edges or projections. All other special materials shall be as hereinafter specified.
- B. All components shall be painted with an electrostatically applied powder coat finish. All steel parts shall be machined smooth and thoroughly cleaned by a process of completely washing in a phosphatizing solution to insure removal of oil, grease or other foreign material which in any way would interfere with the adhesion of the priming coat. Following the cleaning process, all parts shall be coated and confirming every part is thoroughly and completely covered with fine powder coat, and baked to the paint manufacturer's recommendation. The finish for powder coat shall be medium gloss, giving a reading of 50 to 60 degrees on a standard gloss meter and must be capable of withstanding severe hammer and bending test without flaking. The finish for epoxy-polyester hybrid powder coat shall be a minimum 1.2 mil thickness capable of resisting acetic acid, household ammonia, 10 % lye, alcohol, salt spray, abrasion and printing, and all normal usage resistant requirements of a good finish. In addition, powder coat shall not be off gassing to prevent deterioration of collection and other stored materials. Colors to be selected by owner.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Examine subfloor surfaces, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fixed storage units.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of fixed storage units.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2. INSTALLATION

- A. Install components and accessories after finishing operations, including painting, have been completed. Install shelving units to comply with final layout drawings, in strict compliance with manufacturer's printed instructions and structural calculations. Position unit's level and plumb at proper location relative to adjoining units and related work
- B. Field Quality Control: Remove and replace components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Provide new matching units, installed as specified and in manner to eliminate evidence of replacement.
- C. Adjust: Adjust components and accessories to provide smoothly operating, visually acceptable installation.
- D. Cleaning: Immediately upon completion of installation, clear components and surfaces. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.

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- E. Protection: Protect system against damage during remainder of construction period. Advise Owner of additional protection required to ensure shelving units will be without damage or deterioration at time of substantial completion.

3.3. DEMONSTRATION/CUSTOMER TRAINING

- A. Provide complete training to end-user's staff. Training shall include general safety and operation instructions, and basic preventative maintenance procedures.

END OF SECTION