

**SECTION 10 56 26 - MOBILE STORAGE SHELVING (MODULAR FLOOR)**

\* 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. High-density mobile storage units with modular floor, fabrication and installation including leveling.
  - 2. 4-Post shelving units, fabrication and installation on mobile carriage.
- B. Related Work, Not Furnished:
  - 1. Structural floor system capable of supporting live and dead loads required by prevailing building codes, including loads of storage units to be installed. Provide a maximum allowable sub floor deflection of [L/480] [L/360 with Automatic Brake] under specified mobile storage loads.
  - 2. Fire suppression system is by others
- C. Related Sections:
  - 1. [Section 033000 – Concrete Work]
- 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 mobile carriages and shelving capable of withstanding the effects of earthquake motions as determined according to IBC 2006 and local building codes.
- C. Design Requirements: All mobile carriage and 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

## DIVISION 10 - SPECIALTIES

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.

- 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:** For the lifetime of the shelving and mobile carriages ("structural frames"). For the purposes of this warranty, structural frames shall be deemed to exclude all moving parts, controls and guides that have immediate contact with any moving parts.

**5-year Limited Warranty:** For five (5) years from the date written hereafter\*, for all equipment, other than structural frames and motors. During the 5-year warranty period, all parts are included at no cost for 5 years. Labor installation is included at no cost during the first year of the 5-year warranty period.

\* 5-year limited warranty is applicable from the date of invoice. Warranty registration must be completed by the end-user at [www.montel.com](http://www.montel.com). As indicated on the registration form, registration constitutes the customer's written acceptance of installation.

- H. **Reference List:** Provide a list of three (3) minimum installed mobile 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 mobile carriages

## DIVISION 10 - SPECIALTIES

and 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 separate written certifications 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. If bidding different manufacturers for mobile and shelving, two (2) certifications are required. Preference shall be given to one-source supplier.

1.6. PROJECT CONDITIONS

- A. Field Measurements: Verify mobile carriages and shelving unit location by field measurements before fabrication and 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 mobile carriage and 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 mobile carriage and 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 mobile carriage and storage units including, but not limited to, the following:

1. Inspect and discuss condition and levelness of flooring and other preparatory work performed under other contracts.
2. In addition to the Contractor and the installer, arrange for the attendance of the following:
- a. Other Installers affected by the work of this section.
  - b. The Owner's Representative.
  - c. The [Architect] [Architect/Engineer] [Engineer/Architect] [Engineer] [Designer].
  - d. Manufacturer's representative.

## PART 2 - PRODUCTS

2.1. MANUFACTURERS

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

2.2. BASIC MATERIALS

- A. Grout:

1. No grout, cement, shims or any other material or process damaging to the floor is used.

2.3. MANUFACTURED COMPONENTS – MOBILE

A. Modular Floor:

1. Design: The mobile system shall consist of a rail and deck assembly with two (2) or more parallel rails and a platform surface between them, and wheeled carriages, which ride on the rails. All systems are constructed of modular components such that any system can be expanded in both length and width, moved or reconfigured in shape, without the need to discard or replace any parts of the original system.
2. Modular floor: The structural frame of the modular floor shall consist of aluminum sub-rail with a steel rail 1/8" x 7/8", and reinforcement tubes. The deck shall consist of 5/8" plywood covered with commercial grade carpet. The reinforcement tubes shall be of no less than 16 gauge steel 3/4" x 1 1/2". To facilitate moving or rearrangement of the installed mobile system, the rails and decking shall not require fastening in any manner to the building floor nor the use of any material or process damaging to the underlying surface.
3. Built-in leveling device: Each rail has pairs of leveling screws (one on each side of the centerline of the rail) spaced along the rail not more than 14" apart. The lower ends of the screws rest on a 14-gauge galvanized steel channel placed on the building floor and running the full length of the rails so as to prevent marring or gouging of the floor. Leveling screws are accessible from the top surface of the deck and may be adjusted at any time during installation or after the system is installed, fully loaded and in use. Deck panels are similarly equipped with levelers midway between the rails. No removal of equipment or disassembly is required to make leveling adjustments.

B. Carriages:

1. The carriages are made to support shelving and they shall have a capacity of 750 pounds per linear foot, as a maximum. The wheel-housing member shall be constructed of no less than 12-gauge steel, at least 2 3/4" high x 2 1/2" wide. The wheel-housing are welded to two (2) 14-gauge steel cross members 3" high x 1 1/2" deep at the top and 7/8" at the bottom. Design of the carriage is such that the weight-bearing of the upright rests directly over the wheel channels, thus transmitting the load directly to the rail. A built-in anti-tip system shall prevent the shelving from tipping.
2. Stationary carriages, as shown on the drawings, shall be of same construction and height as the mobile carriages and anchored to rails. Setting of shelving on floor at ends of mobile runs is unacceptable.
3. Carriage face sections shall provide a smooth, clean appearance without any assembly holes or protruding hardware.
4. Carriage straightness shall have no more than 1/4" (6.35mm) maximum deviation from a true straight line. There shall be no permanent set or slippage in any spliced or welded joint when exposed to forces encountered in normal operating circumstances.
5. Carriage construction shall be designed to allow the shelving uprights to be secured to the carriage frame with two assembly kits per upright of vibration-proof graded 5" bolt, nut, and clamp anchor assemblies and so that there is no visible hardware on carriage face. Recess design carriages are not permitted. Self-drilling screw attachment is not acceptable method of attachment shelving units to the carriage. No shelving or cabinet attachment hardware shall be visible on exterior face of carriages
6. Each carriage shall have two wheels per rail.
7. Carriages shall have powder coat (1.5 mil) finish on all surfaces. Color selection by the [ Owner] [Architect] [Architect/Engineer] [Engineer/Architect] [Engineer] [Designer] to match

shelving. Powder coat paint finish is required for finish durability and elimination of any off gassing. Finish shall be inert, with no volatiles present in finished product. Visible galvanized steel structural carriage components are unacceptable.

C. Face Panels:

1. Materials: All exposed face panels shall be steel. Face panels shall be located on all operating ends of ranges as shown on drawings.
2. Finishes: [Selected from manufacturer's standard available colors and patterns.] [(Optional) Selected by the [Architect] [Architect/Engineer] [Engineer] [Designer].]
3. Face panels must cover the full height and width of shelving.
4. [(Optional) Front Shelving Unit: The front end of each mobile shall be equipped with a shelving section. The shelving shall be cabinet style, cantilever installed on carriage and not deeper than 15" (381mm). The front shelving shall present a reserved space without shelf in the middle to hold the handle or the control.]

D. Movement Controls:

1. Mechanical-assist drive : The mechanical-assist drive shall consist of a three-spoke handwheel turning a chain and sprocket assembly connected to a 5/8" steel axle driving all wheels and one side of the carriage. Each moveable carriage shall be equipped with a safety locking pin integrated in the handle.

E. Accessories:

1. [(Optional) Overhead Aisle Lighting: Each aisle shall be equipped with automatic or manual lighting. Lighting system shall illuminate upon activation of this device : [human presence detector] [magnetic proximity detector] [rocker switch] .]

2.4. MANUFACTURED COMPONENTS – 4-POST SHELVING

- A. Upright frames: Upright frames are made of two or more cross members welded to the top and bottom (and center if necessary) of the post and form a rectangular upright frame. Each post shall be made of 16-gauge 1 ¼" x 1 ½" rectangular shaped cold rolled steel. The lateral sides of the posts are slotted at every one inch increment. The slots are 3/16" wide x 5/8" long and are designed to accommodate a variety of shelf and roll-out drawer configurations. The back of the post is also slotted at every 1 ½" increment with two rows of slots side by side from top to bottom. They are 3/16" wide x 5/8" long with 3/8" between the two rows. The uprights must allow for component integration on either 1" or 1 ½" increment depending only on the selected shelf component. Due to aesthetic concerns, user's performance requirements, safety of users and stored materials, and to provide maximum flexibility, "L & T 4-Post" utility shelving system styles are unacceptable.
- B. Cross members: Cross members are 4" high x ½" wide. They are made of 16-gauge steel folded to create a "U" shape channel. At both ends, hook type design allows to snap the cross members in both rows of slots at the same time. In seismic zones, the cross members are welded to the post. Non-welded frames must be available to minimize shipping volume, thus reducing truck pollution.
- C. Levelers: Each post shall have an integrated leveler, inserted into formed upright tube, which allows for ¾" adjustment to accommodate for uneven floor surface. No temporary shims or other third party leveling device will be accepted.
- D. Center back panel [optional on double face sections]: Center back panels are made of 20-gauge steel and constructed in such a way as to form an integral finished product.
- E. Full-back panel [optional for single sections]: Full-back panels are made of 20-gauge steel box

formed ½" thick and affixed to the post to form an integral finished product.

F. Supported type:

1. Full-depth shelves: Full-depth shelves are made of box rolled formed 22-gauge steel, with "Four Bend" ¾" edge construction which adds additional strength and capacity as well as it creates a hidden safety edge to protect people and items. The full-depth shelves are supported by two longitudinal shelf supports and the appropriate number reinforcement channels. Shelves are also available in 18-gauge steel as an option.
2. Longitudinal supports: [¾" high supports] or [1 ¼" high supports for heavy duty application] are made of one "U" shaped 12-gauge steel channel. A standard formed steel claw is welded at each end to form a complete support. These supports are inserted into the slots located at the back of the post.
3. Front-to-back reinforcement channels: [¾" high reinforcement channels] or [1 ¼" high reinforcement channels for heavy duty application] are made of 12-gauge steel formed in a "U" shaped channel and are sitting on the longitudinal shelf supports.
4. Base support: A 12-gauge steel special "U" shaped channel is provided for the bottom shelf. The support is inserted at the bottom of each post and anchored to the floor or to the carriage, in compliance with seismic standards.

G. Hooked type:

1. All shelves and canopy tops shall be constructed of minimum 18-gauge steel with "Four Bend" ¾" edge construction and clipped on the uprights with use of steel hooks. No raw steel edge shall be visible or felt under each shelf's surface. Welded reinforcement can be added to accept heavier loads. Shelves floating on support are unacceptable (1" thick shelf with 3 bends also available). No portion of shelf storage capacity can be obstructed or otherwise blocked by support posts. (Shelves shall be installed between uprights for maximum unimpeded usage.)
2. All shelving shall be back-to-back shelves and must be designed in a manner that will allow removal of shelves, trays, and drawers without the use of tools or otherwise disruptive actions. Shelves must have the ability to be individually added, removed, or adjusted without disrupting or otherwise impacting adjacent shelves' placement. Canopy tops required on all sections.
3. To provide maximum flexibility, all shelves must be adjustable on 1" centers along the entire height of upright.
4. Maximum deflection under load; must maintain L/140 based on a uniform distributed load of 50 pounds per square foot.

H. Sway brace (required with back-to-back hooked type): 1 1/8" wide sway braces are made of two 16-gauge steel bars, assembled with a rivet. Sway braces are connected to the posts by means of mechanical rivet or dowel pins. Sway braces are positioned where needed on taller shelving sections to add lateral stability.

I. End panels: Shall be constructed of 20 gauge steel, 2" thick, they are bolted to bottom and top upright cross members.

J. Side closure panels (optional): Shall be constructed of 20-gauge steel, they are formed to be flush with the edge of the shelving upright and bolted to bottom and top upright cross members.

K. Plain back stops (single entry): Shall be 5 17/32" high formed of 20-gauge steel with a 3/8" bend on top and bottom and a 1 3/16" bend on each side.

L. Slotted back stops (single entry): Shall be 5 17/32" high formed of 20-gauge steel with a 3/8"

## DIVISION 10 - SPECIALTIES

bend on top and bottom and a 1 3/16" bend on each side. Slots are located on 1" increments for divider adjustment.

- M. Plain center stops (double entry): Shall be 4 3/16" high formed of 20-gauge steel with offsets bends to center on upright frame.
- N. Slotted center stops (double entry): Shall be 4 3/16" high formed of 20-gauge steel with two offset bends. Slots are located on 1" increments for divider adjustment.
- O. File dividers: Shall be formed of 20-gauge steel with one lug at the top rear and two lugs on the bottom to engage slots in the shelf for easy adjustment on 1" horizontal centers. The front top corner of the divider is rounded with an approximate 2" radius.
- P. Sliding reference shelf: Shall be 11" deep and made of 20-gauge steel reinforced on each side with steel angles to secure slides. Shall operate on double extension ball bearing slides equipped with rubber bumpers on each end of travel. The assembly is securely attached to underneath the storage shelf, flush with the front edge.
- Q. Modular drawers: All drawers shall be easily relocated at 1" increments without using any tools. They are made of 18-gauge steel with 3 bends at the front and side top-lips. Each top-lip shall have perforations on the inside upper edge at every 1" increments to receive partitions. A front cover made of 18-gauge steel shall be bolted to each drawer and shall incorporate a 5" wide x 1 1/4" high flush mounted handle. The clear inside space have to be as a minimum overall : nominal dimensions less 1/8" in height, 2" in depth and 4" in width. The load capacity shall be 180 pounds per drawer. Drawers shall be available on 1" height increments from 4" to 12" high. The sliding ball bearing support shall provide a smooth pull-out extension up to a maximum of 28" of stroke for deeper drawers. The sliding ball bearing glide shall be mounted on a hook-support made of 16-gauge steel. An interlock system can be incorporated to a group of drawers and will prevent to open more than one drawer at a time. A locking device can be added to a group or individual drawers.
- R. Modular Trays: All trays shall be easily relocated at 1" increments without using any tools. They are made of 18-gauge steel with 3 bends at the front and the side top-lips. Each side top-lip is designed to provide a smooth pull-out and push-in movement (using a nylon strip or a low friction coating). This 3-bend lip shall be 15/16" wide with two additional 9/16" bends to act as a reinforcement channel and support the tray pan. The front and back of the tray will incorporate a 5" wide x 1" high opening with a round edge which will act as pull handles. The front and the back of the top-lips will be formed of two 3/8" bends to provide adequate rigidity and a smooth finish. The clear inside space shall be as a minimum overall: nominal dimensions less 1/4" in height, 3/4" in depth and 4" in width. The load capacity shall be 75 pounds per tray. Trays shall be available on 1" height increments from 2" to 8" high. A pair of guide supports will provide the adjustability for the trays. Each support shall consist of a "U" channel welded to a 16-gauge steel plate and shall be designed to prevent the tray from tipping when pulled out.

### 2.5. 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 methyl ethyl ketone, 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 mobile storage units.
  - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of mobile storage units.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2. INSTALLATION**

- A. Position, assemble and level modular floor and tracks.
- B. 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
- C. 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.
- D. Adjust: Adjust components and accessories to provide smoothly operating, visually acceptable installation.
- E. 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.
- F. 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**