

SECTION 10 56 26

MOBILE STORAGE SHELVING, MANUAL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Manual operated mobile storage shelving units.
- B. Related Sections:
 - 1. Section 09 65 00 - Resilient Flooring: Resilient flooring on raised floors and ramps.

1.02 REFERENCE STANDARDS

- A. AISI - American Iron and Steel Institute.
- B. ASTM International:
 - 1. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- C. CBC - California Building Code.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate mobile storage shelving with partition framing.
 - 2. Coordinate mobile storage shelving with floor covering work.
- B. [Preinstallation Meeting:]
- C. [Sequencing:]
- D. [Scheduling:]

1.04 SYSTEM DESCRIPTION

- A. The system consists of storage units mounted on track-guided carriages to form a compact storage system. System design permits access to any single aisle by moving units until the desired aisle is opened. The carriage/rail system provides uniform carriage movement along the total length of travel, even with unbalanced loads.
- B. Carriage System Design and Features: The carriage system consists of a formed structural steel frame with hardened steel wheels riding on steel rails attached to the floor. Rails shall ensure smooth operation and self-centering of mobile storage units during travel without end play or binding. All bearings used in the drive mechanism shall be permanently shielded and lubricated.

1.05 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
 - 1. Seismic Performance: Provide mobile storage units capable of withstanding the effects of earthquake movement when required by applicable building codes.

1.06 [SUSTAINABLE CHARACTERISTICS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:

1. [Recycled Content Materials: Furnish materials with maximum available recycled content including:

SPEC NOTE *List materials specified in this section required to have recycled content.*

a. [_____.]

2. [Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.]

SPEC NOTE *List materials specified in this section required to be regional materials.*

a. [_____.]

1.07 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures, for submittal procedures.

B. Product Data including installation instructions.

C. Certifications: Submit the following certifications indicating that:

1. Installer meets qualifications specified in this Section.

D. Shop Drawings: Show dimensions, elevations, method of attachment, hardware, and requirements of related work.

E. Samples: Manufacturer's color palette for selection; other Samples only as requested.

1.08 [SUSTAINABLE DESIGN SUBMITTALS]

A. Section 01 35 63 - Sustainability Project Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.

1. Materials Resources Certificates:

a. Certify source and origin for [salvaged][and][reused] products.

b. Certify recycled material content for recycled content products.

c. Certify source for regional materials and distance from Project site.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.

1. Provide cost data for the following products:

a. Salvage products.

b. Reused products/

c. Products with recycled material content.

d. Regional products.

1.09 QUALITY ASSURANCE

A. Installer's Qualifications: Installer shall be experienced in and equipped to install and service mobile storage shelving for at least 10 years and shall be licensed or otherwise certified by the mobile storage shelving.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original containers with seals unbroken and labels intact until time of use.
- B. Store delivered products in clean, safe, dry area.

PART 2 PRODUCTS

2.01 MOBILE STORAGE SHELVING

- A. Description:
 - 1. Heavy-duty filing/storage system mounted on rails
 - 2. Storage shelving to be mechanically operated by means of a crank system
 - 3. Shelving Widths: As indicated on Drawings.
 - 4. Shelving Units: 24 inches deep (12 inches back to back).
 - 5. Shelving Height: 84 inches, unless otherwise indicated on Drawings.
 - 6. Number of Vertical Shelf Spaces: As indicated on Drawings.
 - 7. Vertical Shelf-To-Shelf Spacing: As indicated on Drawings.
- B. Product: Spacesaver Corp.'s "Mechanical Assist Mobile Storage System"; or equal.

2.02 COMPONENTS

- A. Rails.
 - 1. Material: AISI type 1035 or 1045 steel, manufacturer's selection.
 - 2. Capacity: 1,000 pounds per lineal foot of carriage
 - 3. Rail shall be one-piece, cold drawn structural "T" section steel extrusion 1-1/16 inch high with a 2-1/8 inch base flange, a 5/8 inch top surface and two anti-tip grooves. Rail shall disperse the wheel point load to a minimum 4-1/4 square inch area at the base of the rail. Two piece rail with square bar stock is not permitted
- B. Floor and Ramp:
 - 1. Floor Panels: Provide plywood floor panels to raise finished floor flush to top of track. Floor shall have integrated leveling screws maximum 16 inches on center.
 - 2. Ramp:
 - a. Provide a ramp at front of assembly.
 - b. Ramp to extend ramp the full length of assembly and does not extend beyond any face panel.
 - c. Ramp to be accessible by the physically disabled people meeting requirements of CBC. Metal ramps are not permitted.
 - 3. Floor and Ramp Panels: Minimum 3/4 inch, 7-ply AC grade plywood. Particleboard sheathing materials are not permitted.
 - 4. Floor and ramp materials are to be fire retardant treated meeting requirements of CBC. Non fire-retardant materials are not permitted
- C. Wheels:
 - 1. Materials: AISI Type 1045 solid steel with minimum load capacity per wheel of 3200 pounds.
 - 2. Size: Minimum 5 inches outside diameter drive and guide wheels.
 - 3. Roller Guide: Provide four roller type guide bearings per wheel channel assembly, two at the end of each wheel channel. Guide bearings shall be precision machined; cam follower type of hardened steel, permanently lubricated and adjustable to ensure proper alignment of the carriages. Maximum profile of recess adjacent to rail for guide bearings and anti-tip system: 1-1/8 inch wide by 3/4 inch deep.

- D. Carriages:
1. Provide manufacturer's design movable carriages fabricated of welded steel construction. Galvanized structural components and/or riveted carriages are unacceptable. 1,000 pound per foot minimum capacity.
 2. Provide fixed carriages of same construction and height as the movable carriages, anchored to rails. Setting fixed shelving directly on floors is not permitted.
 3. When required, provide bolted carriage splices designed to maintain proper unit alignment and weight load distribution.
 4. Design carriages to allow the shelving uprights to recess and interlock into the carriages a minimum of 3/4 inch. Top mount carriages are unacceptable.
 5. Provide each carriage with two wheels per rail.
- E. Drive Systems:
1. Provide drive system which prevents carriage whipping, binding and excessive wheel/rail wear under normal operation.
 2. All wheels on one side of carriage shall drive.
 3. Shafts: Solid steel rod or tube.
 4. Shaft Connections: Secured couplings.
 5. Bearing Surfaces: Provide rotating load bearing members with ball or roller bearings. Provide shafts with pillow block or flanged self-aligning type bearings.
- F. Movement Controls:
1. The system shall be designed with a positive type mechanically assisted drive, which minimizes endplay, ensures there is no play in the drive handle, and that carriages will stop without drifting.
 2. System shall include a chain sprocket drive system for each movable carriage to ensure that carriages move uniformly along the total length of travel, even with unbalanced loads. All system components shall be selected to ensure a smooth, even movement along the entire carriage length. Drive system gearing shall be designed to permit 1 pound of force applied to the drive handle to move a minimum of 4,000 pounds. of load.
 3. A tensioning device shall be provided on each chain drive with provision for adjusting tension without removing end panels.
 4. All bearings used in the drive mechanism shall be permanently shielded and lubricated.
 5. Each moveable carriage shall be equipped with one ergonomically designed, mechanical assist three-spoke, hub-type operator that rotates with easy up or down user effort from any possible starting position of any moveable carriage.
 6. Each spoked hand crank shall have a rotating, soft-touch, thermoplastic hand grip ergonomically designed to fit the hand, 1-3/4 inch in diameter and 2 inches long.
- G. Safety Features:
1. A single safety lock color-coded button, mounted on each operating wheel hub, will permit moving a carriage in either direction to create a new access aisle when pulled out (unlocked), or locking the carriage when pushed in. Color-coded button shall provide verification that carriages are in a locked or unlocked mode
 2. Every potential aisle shall be protected with a 3 inch extruded aluminum safety sweep, hinged from the carriage using spring steel leaf springs, with the base edge
- H. Shelving:
1. Design: Four post wedge-locking design consisting of three basic parts; uprights, shelves, and shelf supports, which are assembled without fasteners or clips of any kind and without sway braces or gussets. There shall be no holes on any exposed surfaces. Front and back flanges shall be flush with outside faces of posts. Design shall permit individual shelf adjustment and/or removal anywhere along the entire height of uprights.
 2. Load Carrying Capabilities: Provide shelf units capable of supporting 40 pounds per lineal foot with maximum deflection of L/140. Shelves shall exhibit no permanent deflection under fully loaded conditions.

3. Materials: Fabricate units from Class 1, cold-rolled steel sheet. with all bends sharp and true and no exposed “knife” edges.
 4. Uprights: Formed from steel sheet to a hollow “tee” shape for intermediate supports and formed angles for end supports. Uprights shall have keyhole slots on inner wall only. Provide with sheet steel panels full height and depth of end uprights. Provide intermediate “tee” uprights between adjacent units.
 5. Shelves:
 - a. Form from sheet steel with flanges on all sides and return hem on front and back flanges. Ends shall be formed to clear inside of upright offset panels. Shelves shall be independently adjustable. Provide all shelves with slots for file dividers.
 - b. Vertical Adjustment Increment of Shelves: 1-1/2 inches.
 6. Canopy Tops: Same construction as shelf units.
 7. Shelf Supports: Form from heavy gauge steel sheet with four solid steel shoulder rivets, two per ear, that interlock with inner wall of uprights.
 8. [Accessories: Provide [] file dividers per shelf.]
 9. Workmanship:
 - a. Make all bends sharp and true and no exposed “knife” edges.
 - b. All units shall be free of burrs, sharp edges and projecting hardware with smooth, non-abrasive surfaces and edges.
 - c. After fabrication, shelving shall exhibit no dents, “oil canning”, buckling or other surface irregularities.
- I. Face Panels:
1. Covered with a high-pressure laminate in a color to match the shelving. Finished with a rubber molding on the edges to resist damage.
 2. Installed to cover the full height and width of the front of the carriage and/or platform.
 3. Installed on the exposed face of every carriage and platform.
 4. Securely attached to the shelving and carriage.
 5. Supported by the carriage, not the shelving.
 6. Equipped with two 3 by 5 inch cardholders, one per side, for identifying shelf contents.

2.03 RELATED MATERIALS

- A. Grout: Provide non-shrinking, non-staining hydraulic cement compound conforming following requirements, based on the performance of the test specimens at room temperature and in laboratory air, as stated by the grout manufacturer.
1. Linear Movement: No shrinkage while setting; maximum expansion limited to .002 inches per linear inch.
 2. Compressive Strength: Based on ASTM C109/C109M, meet or exceed the following
 - a. Age: 1 hour ---- 4,500 psi.
7 days ---- 8,000 psi.

2.04 FINISHES

- A. Fabricated Metal Components and Assemblies: Manufacturer’s standard powder coat paint finish.
- B. End Panels: Plastic laminate, manufacturer’s standard available textures and patterns.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine receiving areas and verify that:

1. Locations and dimensions are correct.
2. Floor surfaces are in compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units.
3. Building structural system is adequate for installing mobile storage units at locations indicated on reviewed Shop Drawings
4. Conditions are otherwise satisfactory for proper installation.

B. Do not start work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install mobile storage shelving In accordance with manufacturer's instructions.
- B. Installation of steel rail shall be level to plus or minus 1 millimeter both horizontally and vertically.
- C. Once rails are leveled, install grout completely filling any voids under the entire length of all rails including rail connectors. Shims are not permitted.
- D. Completed system to plumb and level.

3.03 ADJUSTING

- A. After installation, adjust mobile storage shelving as required for proper operation.

3.04 CLEANING

- A. Thoroughly clean surfaces in accordance with Section 01 74 00 - Cleaning.

3.05 PROTECTION

- A. Protect work from damage to surface, profile, and shape.
- B. Replace any defective or damaged items not acceptable to University's Representative.

3.06 DEMONSTRATION

- A. Demonstrate operations and required maintenance procedures to University's designated personnel in accordance with Section 01 79 00 - Demonstration and Training.

END OF SECTION