SECTION 10 56 26

MOBILE STORAGE SHELVING AND STATIONARY SHELVES

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\*\* NOTE TO SPECIFIER \*\* Spacefile International Corp.; High-Density storage products.
This section is based on the products of Spacefile International Corp., which is located at:
18 Huddersfield Rd.
Toronto, ON, Canada M9W 5Z6
Toll Free Tel: 866-905-5539
Tel: 905-625-5539
Fax: 905-625-6894
Email: [request info (info@spacefile.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Spacefile+International+Corp.&coid=52808&rep=&fax=905-625-6894&message=RE:%20Spec%20Question%20(10562sfl):%20%20&mf=)
Web: <https://spacefile.com>
 [ [Click Here](https://www.arcat.com/arcatcos/cos52/arc52808.html) ] for additional information.
Spacefile International is a world leader in high-density storage innovation, providing insights into how to successfully integrate Mobile, Static and Customized modules into comprehensive storage solutions.
Our designers work closely with architects to make things easier.
You can count on Spacefile International for:
 - Maximizing space efficiency with exceptional Designers and Engineers on staff.
- Early project design assistance - no charge.
- Full specifications available - without exclusionary language.
- Large project expertise - 50 years' experience.
- Custom designs.
- Quality - best in class.
- Safety - anti-tip built into all mobile systems.
- Track options - most in the industry.
We are ready to provide you with designs that will impress your clients.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Mobile Storage Systems:
			1. Mechanical-assist shelving.
			2. Electric Powered-assist shelving.
			3. Manually operated shelving.
		2. Stationary Metal Shelving:
			1. Steel four-post shelving.
			2. Steel case shelving.
			3. Cantilever shelving.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications.
		2. Section 03 54 00 - Cast Underlayment. Floor leveling at recessed track.
		3. Section 11 21 53 - Barber and Beauty Shop Equipment.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* 1. ASTM International (ASTM):
		1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
	2. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
		2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
		3. Delegated Design Submittal: For seismic design of mobile storage shelving system, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the type indicated.
		4. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
	2. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	3. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	4. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	5. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
			1. Manufacturer will repair or replace components that fail in materials or workmanship within warranty period.
			2. Failures include, but are not limited to: Deterioration of metals, metal finishes, and other materials beyond normal wear.
				1. Warranty Period: Five years from date of Substantial Completion.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Spacefile International Corp., which is located at: 18 Huddersfield Rd.; Toronto, ON, Canada M9W 5Z6; Toll Free Tel: 866-905-5539; Tel: 905-625-5539; Fax: 905-625-6894; Email: [request info (info@spacefile.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Spacefile+International+Corp.&coid=52808&rep=&fax=905-625-6894&message=RE:%20Spec%20Question%20(10562sfl):%20%20&mf=); Web: <https://spacefile.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete basis of design options not required.

* 1. MOBILE STORAGE SHELVING
		1. Basis of Design: SDS Mechanical Assist, mobile storage shelving system as manufactured by Spacefile International.
			1. Performance Requirements:
				1. Carriage Loading: 1000 lbs per ft (1488 kg per m).
				2. Carriage Loading: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
				3. Total Load per Carriage: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
			2. Where components are not indicated or specified, manufacturer is to provide components as required for a complete system.
			3. Tracks: Steel rails.
				1. Tops: Machined to mate with guide wheels.
				2. Ends: Provide smooth, secure continuity between sections without field welding.
				3. Mounting brackets, cross-channels, adjustable leveling devices, and positive stops preventing carriages from running off track.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - * 1. Mounting: Surface mounted, demountable.
				2. Mounting: Surface mounted, grouted, and anchored.
				3. Mounting: Recessed and anchored.

Inserts: Concrete inserts and anchorage devices for installing permanent track system.

* + - * 1. Mobile Carriages: Rigid frames. C-shaped cold-formed steel beams and cross beams, allowing secure anchorage of shelving units.

Carriage Width: \_\_\_\_ inches (\_\_\_\_ mm).

Carriage Length: \_\_\_\_ inches (\_\_\_\_ mm).

Steel Wheels: Bearing-mounted, precision ground to mate with tracks.

Bumpers: Two rubber bumpers. Depth of 1/2 inch (13 mm) each side.

* + - * 1. Anti-Tip Brackets: Carriage mounted. Engages track to prevent unit tipping.
				2. Carriage End Panels: Full depth and height of shelving units.

\*\* NOTE TO SPECIFIER \*\* Delete one of the two following options not required. Delete Material option not required.

At operating end of ranges.

At both ends of each range.

Material: Cold-rolled steel sheet, 0.048 inch (1.22 mm) thick,

Material: Cold-rolled steel sheet, \_\_\_\_ inch (\_\_\_\_ mm) thick

* + - * 1. Floor Decking: As required. Aisle floor to be flush with rail tops.

Removable Decking Panels: 0.080-inch (2.0 mm) thick, cold-rolled steel.

Finish: Powder-coat, slip resistant coating.

DOC PS 1 Plywood Decking: Interior, underlayment, 3/4 inch (76 mm) thick.

Fire-Retardant-Treated Plywood by Pressure Process:

Per ASTM E84: Flame-Spread Index: 25 or less

Ramps: Match floor decking materials. Slope: 1:12 maximum.

* + - 1. Mechanical-Assist Drive: Geared transmission chain carriage operation with automatic tensioning device.
				1. For assistance and uniform movement along length of carriages.
				2. Drive Handle: 1.0 lbs (0.45 kg) applied force, to move a 4,000 lbs (1,814.37 kg) load.
				3. Bearings: Lubricated with permanent shielding.
				4. Drive Shaft: Coupled solid-steel rod. Transmits drive system torque without distortion.
				5. Hub Locking System: Color-coded safety lock button, on operating wheel hubs. Permits carriage movement in either direction creating an access aisle when pulled out (unlocked), or locking carriage when pushed in.
				6. Wheels: 5 inch (125 mm) outside diameter.

Load Capacity per Wheel: 3200 lbs (1455 kg).

* + - * 1. Movement Controls: Operating wheels with rotating hand knobs on accessible drive ends of shelf units. Units move to create aisle openings. Turning handle transmits power through chain drive to drive wheels on each carriage.
				2. Safety Features: Internal Aisle Mechanical Brakes. No power requirements. 3 lbs (1.35 kg) of pressure applied to actuator fully stops carriages.

Actuator: Full carriage length, stopping carriage anywhere in open aisle.

* + 1. Basis of Design: SDSe Electrical Assist, mobile storage shelving system as manufactured by Spacefile International.
			1. Performance Requirements:
				1. Carriage Loading: 1000 lbs per ft (1488 kg per m).
				2. Carriage Loading: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
				3. Total Load per Carriage: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
			2. Where components are not indicated or specified, manufacturer is to provide components as required for a complete system.
			3. Tracks: Steel rails.
				1. Tops: Machined to mate with guide wheels.
				2. Ends: Provide smooth, secure continuity between sections without field welding.
				3. Mounting brackets, cross-channels, adjustable leveling devices, and positive stops preventing carriages from running off track.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - * 1. Mounting: Surface mounted, demountable.
				2. Mounting: Surface mounted, grouted, and anchored.
				3. Mounting: Recessed and anchored.

Inserts: Concrete inserts and anchorage devices for installing permanent track system.

* + - * 1. Mobile Carriages: Rigid frames. C-shaped cold-formed steel beams and cross beams, allowing secure anchorage of shelving units.

Carriage Width: \_\_\_\_ inches (\_\_\_\_ mm).

Carriage Length: \_\_\_\_ inches (\_\_\_\_ mm).

Steel Wheels: Bearing-mounted, precision ground to mate with tracks.

Bumpers: Two rubber bumpers. Depth of 1/2 inch (13 mm) each side.

* + - * 1. Anti-Tip Brackets: Carriage mounted. Engages track to prevent unit tipping.
				2. Carriage End Panels: Full depth and height of shelving units.

\*\* NOTE TO SPECIFIER \*\* Delete one of the two following options not required. Delete Material option not required.

At operating end of ranges.

At both ends of each range.

Material: Cold-rolled steel sheet, 0.048 inch (1.22 mm) thick,

Material: Cold-rolled steel sheet, \_\_\_\_ inch (\_\_\_\_ mm) thick

* + - * 1. Floor Decking: As required. Aisle floor to be flush with rail tops.

Removable Decking Panels: 0.080-inch (2.0 mm) thick, cold-rolled steel.

Finish: Powder-coat, slip resistant coating.

DOC PS 1 Plywood Decking: Interior, underlayment, 3/4 inch (76 mm) thick.

Fire-Retardant-Treated Plywood by Pressure Process:

Per ASTM E84: Flame-Spread Index: 25 or less

Ramps: Match floor decking materials. Slope: 1:12 maximum.

* + - * 1. Powered, Electrical-Assist Drive System: UL listed, DC voltage, geared, in-line motors. 115 Vac power source. Size as required for loads indicated.

Drive Shaft: Coupled solid-steel rod, Transmit drive system torque without distortion.

Wheels: 5 inch (125 mm) outside diameter.

Load Capacity per Wheel: 3200 lbs (1455 kg).

Control System Basis of Design: LOGIC PLUS Control System as manufactured and supplied by Spacefile International Corporation. Automatically open aisles with controlled acceleration and deceleration of carriages.

Touchpad-activated operation.

Single controls centrally mounted on end panels.

Dual controls centrally mounted on end panels.

Features:

Limiting Aisle-Access Security: Allow only authorized users.

Interface with aisle lights.

Interface with building environmental systems.

Fire park and night park.

* + - * 1. Safety Devices: As required to stop carriage motion.

Passive Safety Button: Operator must visually inspect and touch touchpads on both sides of open aisle prior to creating a new aisle.

Motor Current Monitoring System: Recognizes changes in motor current as a result of 25 lb. (11.40 kg) of minimum pressure applied against moving carriage and stops.

Aisle Length Presence Detector: Pulsed infrared, sender-receiver assembly operating along length of open aisle. Prevents motion in adjacent carriages while aisle is occupied.

* + 1. Basis of Design: SDSm Manual Assist, mobile storage shelving system as manufactured by Spacefile International.
			1. Performance Requirements:
				1. Carriage Loading: 1000 lbs per ft (1488 kg per m).
				2. Carriage Loading: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
				3. Total Load per Carriage: \_\_\_\_ lbs per ft (\_\_\_\_ kg per m).
			2. Where components are not indicated or specified, manufacturer is to provide components as required for a complete system.
			3. Tracks: Steel rails.
				1. Tops: Machined to mate with guide wheels.
				2. Ends: Provide smooth, secure continuity between sections without field welding.
				3. Mounting brackets, cross-channels, adjustable leveling devices, and positive stops preventing carriages from running off track.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - * 1. Mounting: Surface mounted, demountable.
				2. Mounting: Surface mounted, grouted, and anchored.
				3. Mounting: Recessed and anchored.

Inserts: Concrete inserts and anchorage devices for installing permanent track system.

* + - * 1. Mobile Carriages: Rigid frames. C-shaped cold-formed steel beams and cross beams, allowing secure anchorage of shelving units.

Carriage Width: \_\_\_\_ inches (\_\_\_\_ mm).

Carriage Length: \_\_\_\_ inches (\_\_\_\_ mm).

Steel Wheels: Bearing-mounted, precision ground to mate with tracks.

Bumpers: Two rubber bumpers. Depth of 1/2 inch (13 mm) each side.

* + - * 1. Anti-Tip Brackets: Carriage mounted. Engages track to prevent unit tipping.
				2. Carriage End Panels: Full depth and height of shelving units.

\*\* NOTE TO SPECIFIER \*\* Delete one of the two following options not required. Delete Material option not required.

At operating end of ranges.

At both ends of each range.

Material: Cold-rolled steel sheet, 0.048 inch (1.22 mm) thick,

Material: Cold-rolled steel sheet, \_\_\_\_ inch (\_\_\_\_ mm) thick

* + - * 1. Floor Decking: As required. Aisle floor to be flush with rail tops.

Removable Decking Panels: 0.080-inch (2.0 mm) thick, cold-rolled steel.

Finish: Powder-coat, slip resistant coating.

DOC PS 1 Plywood Decking: Interior, underlayment, 3/4 inch (76 mm) thick.

Fire-Retardant-Treated Plywood by Pressure Process:

Per ASTM E84: Flame-Spread Index: 25 or less

Ramps: Match floor decking materials. Slope: 1:12 maximum.

* + - * 1. Manually Operated System: Grasping handle activated carriage operation.

Bearings: Permanently lubricated and shielded.

Drive Shaft: Coupled solid-steel rod, Transmit drive system torque without distortion.

Wheels: 5 inch (125 mm) outside diameter.

Load Capacity per Wheel: 3200 lbs (1455 kg).

Safety Features: Spring-loaded carriage foot stop. Prevents unwanted movement.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. STATIC SHELVING
		1. Steel Four Post Shelving:
			1. Basis of Design: LT Adjustable Steel Four-Post Shelving as manufactured and supplied by Spacefile International Corporation.
				1. Four angle-iron uprights per section.
				2. Adjustable Shelves: Rest on shelf supports hung on uprights.
				3. Units configure for mounting on mobile carriages.
				4. Shelving Units: \_\_\_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

Type: Self-supporting unit.

Type: Starter unit.

Type: Adder unit.

Configuration: Open.

Configuration: Open with center dividers.

Configuration: Closed back and ends.

Width: 24 inches (610 mm).

Width: 30 inches (762 mm).

Width: 36 inches (914 mm).

Width: 42 inches (1067 mm).

Width: 48 inches (1219 mm).

Height: 64-1/4 inches (1632 mm).

Height: 76-1/4 inches (1937 mm).

Height: 85-1/4 inches (2165 mm).

Height: 88-1/4 inches (2242 mm).

Height: 97-1/4 inches (2470 mm).

Height: 121-1/4 inches (3080 mm).

Shelf Depth: 12 inches (305 mm).

Shelf Depth: 15 inches (381 mm).

Shelf Depth: 18 inches (457 mm).

Shelf Depth: 24 inches (610 mm).

Shelf Depth: 30 inches (762 mm).

Shelf Depth: 36 inches (914 mm).

Shelf Styles: Provide the following styles and numbers of adjustable shelves:

\*\* NOTE TO SPECIFIER \*\* Insert shelf style and number of shelves required; 2, 4, 5, 6,

Shelf Style: \_\_\_\_\_\_\_\_. Number of Shelves: \_\_\_\_

Flat Shelves: Number of Shelves: \_\_\_\_ shelves.

Adjustable Divider Shelves: Number of Shelves: \_\_\_\_ shelves.

Number of adjustable Partitions per shelf: \_\_\_\_.

Partitions to have tabs to fit in slots in divider shelves.

* + - * 1. Uprights: Cold-rolled steel double-wall posts. Width: 2 inches (51 mm). Thickness: 0.048 inch (1.2 mm).

T-Shape: Common post use.

L-shape: At range ends.

Keyhole Perforations: On inner wall 1-1/2 inches (38 mm) on centers.

* + - * 1. Steel Spacers: Deflection prevention. Cold-rolled steel.

Height: 3 inches (76 mm). Thickness: 0.048 inch (1.2 mm).

Welded to posts at bottom, center, and top of open units.

\*\* NOTE TO SPECIFIER \*\* Closed Back and Ends are for fixed, single-faced units used at end of a bank of shelving ranges. Delete if not required.

* + - * 1. Closed Back and Ends: Cold-rolled steel sheet, 0.028 inch (0.7 mm) thick.

\*\* NOTE TO SPECIFIER \*\* Center dividers are used to provide a full longitudinal panel at center of double-faced units. Delete if not required.

* + - * 1. Center Divider: Cold-rolled steel sheets, 0.036 inch (0.9 mm) thick.
				2. Base: Manufacturer's standard for attachment to mobile carriages.
				3. Adjustable Steel Shelves: Cold-rolled steel sheets, 0.028 inch (0.7 mm) thick.

Full Shelf Width Supports: Cold-rolled steel 0.104 inch (2.6 mm) thick.

Height: 3/4 inches (19 mm) minimum.

Flanged to support shelf reinforcements.

Tabs with 1/4 inch (6.4 mm) heads shoulder rivets at each end of shelf for insertion in the keyhole slots in the uprights.

Shelf Reinforcements: Cold-rolled steel, 0.080 inch (2.0 mm) thick channel shapes the length and depth of supported shelves. Notched ends to fit over inside lip of shelf support.

* + 1. Steel Case Shelving:
			1. Basis-of-Design: S-Line Wide Span Steel-Case Shelving as manufactured by Spacefile International Corp. Wedge-lock type shelving consisting of uprights, shelves, and shelf supports. Assemble without fasteners or clips except for center stops.
				1. Shelves: Solid. No slots except where dividers are used.

Front and Back Flanges: Flush with outside faces of posts. Permit individual shelf adjustment or removal anywhere along entire height of uprights. Configure units for mounting on mobile carriages.

* + - * 1. Shelving Units:

\*\* NOTE TO SPECIFIER \*\* Delete shelving unit options not required.

Type: Self-supporting.

Type: Starter.

Type: Adder unit.

Configuration: Single faced units.

Configuration: Double faced units.

Width: 24 inches (610 mm).

Width: 30 inches (762 mm).

Width: 36 inches (914 mm).

Width: 42 inches (1067 mm).

Width: 48 inches (1219 mm).

Width: 54 inches (1372 mm).

Width: 60 inches (1524 mm).

Width: 66 inches (1676 mm).

Width: 72 inches (1829 mm).

Width: 84 inches (2134 mm).

Width: \_\_\_\_\_\_\_.

Height: 72 inches (1829 mm).

Height: 96 inches (2438 mm).

Height: 120 inches (3048 mm).

Height: 144 inches (3656 mm).

Height: \_\_\_\_\_\_\_\_.

Shelf Depth: 12 inches (305 mm).

Shelf Depth: 15 inches (381 mm).

Shelf Depth: 16 inches (406 mm).

Shelf Depth: 18 inches (487 mm).

Shelf Depth: 24 inches (610 mm).

Shelf Depth:

Shelf Depth: 36 inches (914 mm).

Shelf Depth: 42 inches (1067 mm).

Shelf Depth: 48 inches (1219 mm).

Shelf Styles:

\*\* NOTE TO SPECIFIER \*\* Insert shelf styles and quantity of shelves, 2, 3, 4, 5, 6, etc.

Shelf Style: \_\_\_\_\_\_\_\_. Number of Shelves: \_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Starter posts are roll-formed into a 1-1/2 inch (38 mm) wide angle upright typically used at row ends. Adder posts are roll-formed into a 3 inch (76 mm) wide double angle upright used as a common upright between shelf units. Both starter and adder posts have keyhole slot holes punched on 1-1/2 inch (38 mm) centers, as well as an identifiable pair of punched holes every 6 inches (152 mm) on center, allowing a visual confirmation for proper shelf spacing. Front and rear starter and adder posts are joined together with a minimum of three 3 inch (76 mm) high spacers maintaining proper upright spacing along the entire length of upright to add rigidity and strength. Delete post options not required.

* + - * 1. Uprights:

Posts: 1.89 inch (47 mm) thick, cold-rolled steel, in manufacturer's standard angle shape, with keyhole perforations at 1-1/2 inches (38 mm) o.c.

Post Type: Starter.

Post Type: Adder.

Post Type: Starter and adder.

Post Width: 1-1/2 inch (38 mm).

Post Width: 3 inches (76 mm ).

* + - * 1. Cold-Rolled Steel Spacers: 0.048 inch (1.2 mm) thick, 3 inches (76 mm) high, welded to posts at bottom, center, and top of open units to prevent deflection.
				2. Base: Manufacturer's standard for attachment to mobile carriages.
				3. Adjustable Shelves:

\*\* NOTE TO SPECIFIER \*\* Delete steel sheet thickness not required.

Cold-Rolled Steel Sheet: 0.028 inch (0.7 mm) thick.

Cold-Rolled Steel Sheet: 0.048 inch (1.2 mm) thick.

\*\* NOTE TO SPECIFIER \*\* Delete subparagraph below for systems that accept shelving directly into slots.

Full-Shelf-Width Supports: Cold-rolled steel, 0.080 inch (2.0mm) thick, 3/4 inches (19 mm) high. Flange to support shelf reinforcements and with ears at each end containing two shoulder rivets with 1/4 inch (6.4 mm) heads spaced to set into keyhole slots on uprights.

Shelf Reinforcements: Cold-rolled steel, 0.080 inch (2.0mm) thick, channel shapes equal in length to depth of supported shelf; with notched ends to fit over inside lip of shelf support.

Steel Deck Shelving: Independently adjustable. Cold-rolled steel sheet 0.080 inch (2.0 mm ), thick. Flanged on all sides with return hem on front and back flanges. Ends to clear inside of upright channel supports. All shelves to have slots for file dividers. Maximum width of individual shelf decking pieces to be 12 inches (305 mm). Shelf decking must support the intended loading without any external shelf reinforcements or supports. Shelf decking must be supported only by channel supports.

* + - * 1. Channel Supports: Formed cold-rolled steel sheet, 0.104 inch (2.6 mm ) thick, with four solid-steel shoulder rivets, two per ear, that interlock with inner wall of uprights. Channel supports to be located on all four sides of the steel shelf decking.
				2. Canopy Tops: Formed into box shape; cold-rolled steel sheet, 0.036 inch (0.9 mm ) thick.
		1. Cantilever Shelving:
			1. Basis of Design: Supreme Cantilever Shelving as manufactured by Spacefile International Corp
				1. Adjustable bookshelves: Carry loads of 50 lbs per sq ft (23 kg per sq m) without deflection more than 3/16 inch (5 mm).

Completed Frame: Rigid without use of sway braces, gusset plates, angle braces, or other devices that obstruct use of and access to shelves.

Units to mount on mobile carriages.

* + - * 1. Welded Frames, Column Uprights: Cold-rolled steel, 0.064 inch (1.6 mm) thick, shaped into channels with 1/2 inch (13 mm) stiffening flanges.

Channels: Web: 2 inches (51 mm). Front and Rear Face: 1-5/16 inches (33 mm).

Smooth Box Shape: 2 x 2-5/8 inches (51 x 67 mm) in cross section. Eight right angle bends when bolted to adjoining column of the next unit.

Columns: Perforated slots the full height on both faces spaced on 1 inch (25 mm) vertical centers.

Slots to receive hooks and lugs of shelf brackets, permitting 1-inch (25-mm) adjustment of shelves.

Adjoining Columns: Rows of slots are 11/16 inch (17 mm) on lateral centers.

Columns are marked every 3 inches (76 mm) to facilitate visual positioning and adjustment of shelves.

Corresponding holes for bolting columns into ranges are provided.

Two uprights are required for each section of a range, since no adjacent sections may share a common upright and be truly modular.

* + - * 1. Top Spreader Tubes: Cold-rolled steel, 0.064 inch (1.6 mm) thick, 1 x 3 inch (25 x 76-mm) rectangular shape.

Continuously welded to upright columns permitting unit arrangements and maximum nonsway.

Tube length: Varies depending on unit width; 36 inch (914 mm) length is standard.

* + - * 1. Bottom Spreader Channels: Cold-rolled steel, 0.080 inch (2.0 mm) thick.

Continuously welded on two vertical faces of upright columns to permit unit arrangements and maximum nonsway capabilities.

Forms a one-piece rectangular frame without the use of fasteners.

Channel Length: Varies depending on unit width. 36 inch (914 mm) length is standard.

Slots in Bottom Spreader Channel: Allow leveling at column, without having to remove base shelf.

* + - * 1. Adjustable Shelves: Cold-rolled steel, 0.048-inch- (1.2-mm-) thick.

Formed with front and rear face flanges 3/4 inch (19 mm) high with fully closed box profile and no less than four 90 degree bends.

No sharp edges allowed. Faces to receive label holders.

* + - * 1. Adjustable Base Shelves: Cold-rolled steel, 0.048 inch (1.2 mm) thick, with two 90 degree bends. 3 inch (76 mm) face at front and rear flanges, 3/4 inch (19 mm) high, with fully closed box profile with no less than four 90-degree bends.
				2. Adjustable Shelf Brackets: Cold-rolled steel, 0.064-inch- (1.6-mm-) thick, designed to maximize storage space.

Brackets: To have four projections at rear, two hooks, and two safety lugs to engage column slots and permit adjustment of shelves, with protection against dislodgment.

Fasten to shelves with tabs. Bracket design must allow shelf adjustment upward or downward without disturbing adjacent shelves.

* + - * 1. Gusset Base Supports: Cold-rolled steel, 0.080-inch- (2.0-mm-) thick.

Height: Varies with upright height. Triangular shape, measuring 2 inches (51 mm) at the top and the depth of base at the bottom. 5/8-inch (16-mm) bend with 1/2-inch (13-mm) stiffening flange and holes to allow anchoring to floor decking.

Supports: Constructed with shear tabs that interlock with uprights providing stability to welded frame. Shear Tabs: Ensure squareness and alignment of gusset base support to welded frame.

* + - * 1. Canopy Tops: Cold-rolled steel, 0.036 inch (0.9 mm) thick.

Faces to be 1-1/4 inch (32 mm) high.

Bracket supports formed of 0.080-inch- (2.0-mm-) thick, cold-rolled steel.

Holes on each side of canopy top allow adjacent tops to be bolted together for uniform alignment.

1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturer's recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION