

UNIVERSITY OF CALIFORNIA HASTINGS COLLEGE OF THE LAW
LIBRARY HIGH DENSITY SHELVING

SPECIFICATIONS

SECTION 00 01 10

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DIVISION 10 - SPECIALTIES

SECTION 105626.13 – MOBILE STORAGE SHELVING UNITS (MECHANICALLY-ASSISTED BY SPACESAVER)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Mechanically assisted, carriage mounted high-density mobile storage units, support rails, fabrication, and installation including leveling of support rails.
- B. Related Work, Not Furnished:
 - 1. Structural floor system capable of supporting live and dead loads required by prevailing building codes, including rolling loads of storage units to be installed.
 - 2. Finish floor covering materials and installation [on raised floors and ramps or when on concrete with recessed rail installation.]
- C. Related Sections:
 - 1. Section 115123 – Library Stack Systems – Cantilever Shelving
- D. Allowances:
- E. Alternates:
 - 1. Provide price to include required engineering calculations for the floor system and for the shelving system and its attachment..

1.3 REFERENCES

- A. American Library Association (when applicable)
 - 1. Cantilever Bracket Type Metal Library Bookstacks; Library Technology Reports.]
- B. American National Standards Institute (ANSI) Standards:
 - 1. Applicable standards for fasteners used for assembly.
- C. American Society for Testing and Materials (ASTM) Standards:
 - 1. Applicable standards for steel materials used for fabrication.
- D. American Institute Of Steel Construction (AISC) Standards:
 - 1. Applicable standards for steel materials used for fabrication.

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1.4 SYSTEM DESCRIPTION

- A. General: The system consists of [manufactured][owner furnished] storage units mounted on manufacturer's track-guided carriages to form a compact storage system. System design permits access to any single aisle by manually 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 machined and balanced wheels riding on steel rails [recessed][surface] mounted to the floor. Rails shall be types selected by the manufacturer to ensure smooth operation and self-centering of mobile storage units during travel without end play or binding. Rail types, quantities and spacing shall be selected by the manufacturer to suit installation conditions and requirements. All bearings used in the drive mechanism shall be permanently shielded and lubricated.
- C. Movement Controls: Triple or single arm operating wheels with rotating hand knobs shall be provided on the accessible (drive) ends of shelf units, centered on the end panel, located 40 inches (1051MM) from the base of each unit to permit units to be moved to create a single aisle opening. Turning the handle transmits power through chain drive to drive wheels on each carriage.
- D. Drive System: The system shall be designed with a positive type mechanically-assisted drive which minimizes end play, ensures there is no play in the drive handle, and that carriages will stop without drifting.
 - 1. 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 lb. of force applied to the drive handle to move a minimum of 4,000 lbs. of load.
 - 2. A tensioning device shall be provided on each chain drive with provision for adjusting tension without removing end panels.
 - 3. All bearings used in the drive mechanism shall be permanently shielded and lubricated.
- E. Safety Features:
 - 1. Color-coded visual indicators shall provide verification that carriages are in a locked or unlocked mode.
 - 2. A single safety lock 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.
 - 3. [Optional safety sweep system, automatic disk locks, and electric braking devices are available; see "Accessories" under Part 2.]
- F. Finishes:
 - 1. Fabricated Metal Components And Assemblies: Manufacturer's standard powder coat paint finish.
 - 2. End Panels, Accessible Ends: [Plastic laminate, manufacturer's standard textures and patterns.] [Manufacturer's standard powder coat paint finish.]

DIVISION 10 - SPECIALTIES

1.5 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
 - 1. Limit overall height to [__78__] inches [____] MM.
 - 2. Limit overall length to [__390__] inches [____] MM.
- B. Ease of Movement: Provide mechanically assisted units capable of being moved by exerting a maximum horizontal force of 5 pounds on the operating wheel.
- C. Seismic Performance: Provide mobile storage units capable of withstanding the effects of earthquake movement when required by applicable building codes.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of shelving, track and installation accessory required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Shop Drawings: Show fabrication, assembly, and installation details including descriptions of procedures and diagrams. Show complete extent of installation layout including clearances, spacings, and relation to adjacent construction in plan, elevation, and sections. Indicate clear exit and access aisle widths; access to concealed components; assemblies, connections, attachments, reinforcement, and anchorage; and deck details, edge conditions, and extent of finish flooring within area where units are to be installed.
 - 1. Show installation details at non-standard conditions. Furnish floor layouts, technical and installation manuals for every unit shipment with necessary dimensions for rail layout and system configuration at the project site. Include installed weight, load criteria, furnished specialties, and accessories.
 - 2. Provide layout, dimensions, and identification of each unit corresponding to sequence of installation and erection procedures. Specifically include the following:
 - a. Location, position and configuration of tracks on all floors.
 - b. Plan layouts of positions of carriages, including all required clearances.
 - c. Details of shelving, indicating method and configuration of installation in carriages.
 - 3. Provide location and details of anchorage devices to be embedded in or fastened to other construction.
 - 4. Provide installation schedule and complete erection procedures to ensure proper installation.
- C. Samples: Provide minimum 3 inch (76MM) square example of each color and texture on actual substrate for each component to remain exposed after installation.
- D. Selection Samples: For initial selection of colors and textures, submit manufacturer's color charts consisting of actual product pieces, showing full range of colors and textures available.
- E. Warranty: Submit draft copy of proposed warranty for review by the [Architect] [Architect/Engineer] [Engineer] [Designer].

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- F. Maintenance Data: Provide in form suitable for inclusion in maintenance manuals for mobile storage units. Data shall include operating and maintenance instructions, parts inventory listing, purchase source listing, emergency instructions, and related information.
 - 1. Submit manufacturer's instructions for proper maintenance materials and procedures.
 - 2. Submit manufacturer's printed instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use conditions. Include precautions against using materials and methods which may be detrimental to finishes and performance.
- G. Reference List: Provide a list of recently installed mobile storage units to be visited by owner, architect, and contractor. Intent of list is to aid in verifying the suitability of manufacturer's products and comparison with materials and product specified in this section.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of carriage mounted high-density mobile storage units and support rails. Furnish certificate attesting manufacturer's ISO 9001 quality system registration.
- B. Installer Qualifications: Engage an experienced installer who is a manufacturer's authorized representative for the specified products for installing carriages and anchoring shelving units to carriages.
 - 1. Minimum Qualifications: 5-year experience installing systems of comparable size and complexity to specified project requirements.
 - 2. Guaranteed 24-hour service response time.

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 dimensions 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 mobile storage units. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 SEQUENCING AND SCHEDULING

- A. Sequencing: Coordinate storage shelving system installation with other work to minimize possibility of damage and soiling during remainder of construction period.
- B. Scheduling: Plan installation to commence after finishing operations, including painting have been completed.

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- C. Built-In Items: Provide components which must be built in at a time which causes no delays general progress of the Work.
- D. Pre-installation Conference: Schedule and conduct conference on project site to review methods and procedures for installing mobile storage units including, but not limited to, the following:
 - 1. Review project conditions and levelness of flooring and other preparatory work performed under other contracts.
 - 2. Review and verify structural loading limitations.
 - 3. Recommended attendees include:
 - a. Owner's Representative.
 - b. Prime Contractor or representative.
 - c. The Architect.
 - d. Manufacturer's representative.
 - e. Subcontractors or installers whose work may affect, or be affected by, the work of this section.

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. Warrant the entire movable compact shelving installation against defects in materials and workmanship for a period of five years from date of acceptance by the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 BASIC MATERIALS

- A. General: Provide materials and quality of workmanship which meet or exceed established industry standards for products specified. Material thicknesses/gauges are manufacturer's option unless indicated otherwise.
- B. Plastic Laminates: NEMA LD-3, GP-28, Vertical Grade.
- C. [Other]

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2.3 GROUT

- A. General: Provide non-shrink, non-staining hydraulic cement compound conforming to the following requirements, based on the performance of the test specimens at room temperature and in laboratory air.
 - 1. Linear Movement: No shrinkage while setting; maximum expansion limited to .002 inches per linear inch.
 - 2. Compressive Strength: Based on two inch cubes made following ASTM standards, tested on a Balding-Southward machine of 60,000 pounds capacity, meet or exceed the following:
 - a. Age: 1 hour ---- 4,500 psi
7 days ---- 8,000 psi

2.4 MANUFACTURED COMPONENTS

- A. Rails:
 - 1. Material: ASTM/AISI Type 1035 or 1045 steel, manufacturer's selection.
 - 2. Capacity: 1,000 pounds per lineal foot (1385kg/M) of carriage.
 - 3. Minimum Contact Surface: 5/8 inch (16MM) wide.
 - 4. Provide rail sections in minimum 6 foot (1.83M) lengths.
 - 5. Rail configuration shall permit attachment to top of structural floor system with provision for leveling rails to compensate for variations in floor surface level.
 - 6. Provide rail connections designed to provide horizontal and vertical continuity between rail sections, to gradually transfer the concentrated wheel point load to and from adjoining rail sections. Butt joints are not permitted.
 - 7. Anti-Tip Rail plates required.
- B. Floor / Ramp:
 - 1. Floor/Ramp Sheathing: Minimum 3/4 inch (19MM), 5-ply underlayment grade plywood. Particle board sheathing materials are not permitted.
 - 2. Provide fire retardant treated floor/ramp materials when required by code.
 - 3. Finished flooring materials shall be provided by [the Owner] [others].
- C. Carriages:
 - 1. Provide manufacturer's design movable carriages fabricated of welded or bolted steel construction. Galvanized structural components and/or riveted carriages are unacceptable.
 - 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 (19MM). Top mount carriages are unacceptable.
 - 5. Provide each carriage with two wheels per rail.
- D. Drive / Guide System:

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1. Design: Provide drive system which prevents carriage whipping, binding and excessive wheel/rail wear under normal operation.
 - a. If line shafts are used, all wheels on one side of carriage shall drive.
 - b. If synchronized drives are used, a minimum of one wheel assembly driving both sides of carriage at center location required. Drive shaft shall exhibit no play or looseness over the entire length of that assembly.
 2. Shafts: Solid steel rod or tube.
 3. Shaft Connections: Secured couplings.
 4. Bearing Surfaces: Provide rotating load bearing members with ball or roller bearings. Provide shafts with pillow block or flanged self-aligning type bearings.
- E. Wheels:
1. Capacity: Minimum load capacity per wheel: 3200 lbs (1455kg).
 2. Size: Minimum 5 inches (127MM), outside diameter drive wheels.
 3. Guides: Determined by manufacturer; minimum 2 locations.
- F. Face Panels:
1. Materials: Plastic laminate clad particle board with plastic edging on vertical edges.
 2. Finishes: [Selected from manufacturer's standard available colors and patterns.] [(Optional) Selected by the [Architect] [Architect/Engineer] [Engineer] [Designer].]
- G. Accessories:
1. Anti-Tip Devices: Provide manufacturer's standard fixtures.
 2. Provide 2 Metal Shelf Dividers per shelf.

2.5 FABRICATION

- A. General: Coordinate fabrication and delivery to ensure no delay in progress of the Work.
- B. Wheels: Provide precision machined and balanced units with permanently shielded and lubricated bearings.
- C. Carriages: Fabricate to ensure no more than 1/4 inch (6MM) maximum deviation from a true straight line. Splice and weld to ensure no permanent set or slippage in any spliced or welded joint when exposed to forces encountered in normal operating circumstances.
- D. Shelving, Supports and Accessories: Provide (2) metal dividers per shelf.

2.6 FINISHES

- A. Colors: Selected from manufacturer's standard available colors.
- B. Paint Finish: Provide factory applied electrostatic powder coat paint. Meet or exceed specifications of the American Library Association.
- C. Laminate Finish: Provide factory applied laminate panels at locations indicated on approved shop drawings.

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- D. Edgings: Provide preformed edging, color-matched to unit colors selected.
- E.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine floor surfaces with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units.
- B. Verify that building structural system is adequate for installing mobile storage units at locations indicated on approved shop drawings.
 - 1. [In new construction, ensure that recesses for rails in floors are at proper spacing and depths, with allowance for grouting.]
 - 2. [For installations on existing floors, ensure that rail spacings indicated on shop drawings are in proper locations so existing load-bearing structural members are not over stressed.]
- C. Verify that intended installation locations of mobile storage units will not interfere with nor block established required exit paths or similar means of egress once units are installed.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to proper performance of mobile storage units, once installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Rails:
 - 1. Lay out rails using full length units to the maximum extent possible. Use cut lengths only at ends to attain total length required. Locate and position properly, following dimensions indicated on approved shop drawings. Verify thickness of finished floor materials to be installed (by others) and install level 1/16 inch (0.6MM) above finished floor surfaces.
 - 2. Verify level, allowing for a minimum 1/4 inch (6MM) of grout under high points. Position and support rails so that no movement occurs during grouting.
 - 3. Set rails in full grout bed, completely filling any voids entire length of all rails including rail connectors. Trim up sides flush with rails to ensure proper load transfer from rail to supporting floor. Using shims in lieu of full grouting is not permitted.
 - 4. Installation Tolerances: Do not exceed levelness of installed rails listed below:
 - a. Maximum Variation From True Level Within Any Module: 3/32 inch (2.4MM).
 - b. Maximum Variation Between Adjacent (Parallel) Rails: 1/16 inch (1.6MM), perpendicular to rail direction.
 - c. Maximum Variation In Height: 1/32 inch (.8MM), measured along any 10 foot (3.05M) rail length.
 - 5. Verify rail position and level; anchor to structural floor system with anchor type and spacings indicated on approved shop drawings.

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B. Floors/Ramps:

1. General: Finished elevation shall be 1/16 inch (1.6MM) below top of rails.
2. Place floors and ramps to the extent indicated on approved shop drawings. Extend ramps under all movable ranges. [Extend under stationary ranges if dual control access is required.] Provide ramp at both ends of mobile system. Do not extend ramps beyond the ends of carriages.
3. Construct floors and ramps to prevent warping or deformation of floor panels in a normal operating environment. Support panels on levelers at maximum 16 inches on center.
4. Ramp Slope: Do not exceed the following:
 - a. ADA Accessible Ramps: Maximum 1:12 slope (4.76 degrees).
 - b. Other Ramps: Maximum 9 degree slope (1.9:12).
 - c. Vertical Transition, Ramp edge to floor: Maximum 1/8 inch (3MM).

C. Shelving Units Installation:

1. General: Follow layout and details shown on approved shop drawings and manufacturer's printed installation instructions. Position units level, plumb; at proper location relative to adjoining units and related work.
2. Carriages:
 - a. Place movable carriages on rails. Ensure that all wheels track properly and centering wheels are properly seated on centering rails. Fasten multiple carriage units together to form single movable base where required.
 - b. Position fixed carriage units to align with movable units.
3. Shelving Units:
 - a. Permanently fasten shelving units to fixed and movable carriages with vibration-proof fasteners.
 - b. Stabilize shelving units following manufacturer's written instructions. Reinforce shelving units to withstand the stress of movement where required and specified.

3.3 FIELD QUALITY CONTROL

- A. Verify shelving unit alignment and plumb after installation. Correct if required following manufacturer's instructions.
- B. Remove components which are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new matching units, installed as specified and in manner to eliminate evidence of replacement.

3.4 ADJUSTING

- A. Adjust components and accessories to provide smoothly operating, visually acceptable installation.

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3.5 CLEANING

- A. 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.

3.6 DEMONSTRATION/TRAINING

- A. Schedule and conduct demonstration of installed equipment and features with Owner's personnel.
- B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair 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 or deterioration at time of substantial completion.

END OF SECTION

DIVISION 11 - EQUIPMENT

SECTION 115123 – LIBRARY STACK SYSTEMS – CANTILEVER (LIBRARY BOOKSTACK) SHELVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
Cantilever bracket type metal library bookstack shelving as defined by the American Library Association and published in their Library Technology Reports
- B. Related Work, Not Furnished:
Finish floor covering materials and installation.
- C. Related Sections:
 - 1. Section 105626 Mobile Shelving
- D. Allowances:
- E. Alternates:

1.3 REFERENCES

- A. American Library Association (ALA) Standards:
Applicable standards for Cantilever Bracket Type Metal Library Bookstack; Library Technology Reports.
- B. American National Standards Institute (ANSI) Standards:
Applicable standards for fasteners used for assembly.
- C. American Society for Testing and Materials (ASTM) Standards:
Applicable standards for steel sheet materials used for fabrication.
- D. American Institute Of Steel Construction (AISC) Standards:
Applicable standards for steel materials used for fabrication.

1.4 DESCRIPTION

- A. General: Cantilever Bracket Type Metal Library Bookstack as defined by the American Library Association and published in their Library Technology Reports.
- B. Finishes: Selected from Standard manufacturers color range.

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Fabricated Metal Components and Assemblies: All components to be painted with an electrostatically applied Powder Coat paint that meets or exceeds specifications set forth by the American Library Association for Cantilever Bracket Type Metal Library Bookstacks published in their Library Technology Reports.

Fabricated Laminate Components and Assemblies: Manufacturer's standard low-pressure or high-pressure laminate finishes.

1.5 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
 - Limit overall width to [__36__] inches
 - Limit overall depth to [__10__] inches
 - Limit overall height to [__72__] inches
- B. Seismic Performance: Provide library bookstacks capable of withstanding the effects of earthquake movement when required by applicable building codes.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of library bookstack required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Shop Drawings: Show fabrication, assembly, and installation details including descriptions of procedures and diagrams. Show complete extent of library bookstack installation layout including quantities, locations and types of accessory units required. Include notations and descriptions of all installation items and components.
 - Show installation details at non-standard conditions, if any.
 - Provide layout, dimensions, and identification of each unit corresponding to sequence of installation and erection procedures.
 - Provide installation schedule and complete erection procedures to ensure proper installation.
- C. Samples: Provide minimum 3 inch (76MM) square example of each color and texture on actual substrate for each component to remain exposed after installation.
- D. Selection Samples: For initial selection of colors and textures, submit manufacturer's color charts consisting of actual product pieces, showing full range of colors and textures available.
- E. Warranty: Submit draft copy of proposed warranty for review by the [Architect] [Architect/Engineer] [Engineer] [Designer].
- F. Maintenance Data: Provide in form suitable for inclusion in maintenance manuals for library bookstack shelving. Data shall include operating and maintenance instructions, parts inventory listing, purchase source listing, emergency instructions, and similar information.
 - Submit manufacturer's instructions for proper maintenance materials and procedures.
 - Submit manufacturer's printed instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated

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use conditions. Include precautions against using materials and methods, which may be detrimental to finishes and performance.

- G. [Reference List: Provide a list of recently installed library bookstacks to be visited by owner, architect, and contractor. Intent of list is to aid in verifying the suitability of manufacturer's products and comparison with materials and product specified in this section.]

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of library bookstacks. Furnish manufacturer's certification attesting ISO 9001 quality system registration.
- B. Installer Qualifications: Engage an experienced installer who is a manufacturer's authorized representative for the specified products for installing library bookstacks.

Minimum Qualifications: 1-year experience installing library bookstacks of comparable size and complexity to specified project requirements.

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 library bookstack 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 library bookstack units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 [SEQUENCING AND SCHEDULING

- A. Sequence library bookstack units [with other work] to minimize possibility of damage and soiling during remainder of construction period.
- B. Schedule installation of specified library bookstack shelving after finishing operations; including painting have been completed.
- C. Provide components, which must be built in at a time, which causes no delays general progress of the Work.
- D. Pre-installation Conference: Schedule and conduct conference on project site to review methods and procedures for installing library bookstack units including, but not limited to, the following:

Recommended attendees include:
 - 1. Owner's Representative.
 - 2. Prime Contractor or representative.

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3. The Architect.
4. Manufacturer's representative.
5. Subcontractors or installers whose work may affect, or be affected by, the work of this section.

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 shelving.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. General: Products are based upon library bookstack shelving manufactured by Spacesaver Corporation.

2.2 BASIC MATERIALS

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

2.3 MANUFACTURED COMPONENTS

- A. Welded Frame Upright:
 1. The welded frame shall consist of 2 vertical upright columns constructed of min. 14-gauge (1.9MM) steel. Upright column shall be 2" (51MM) deep with a 1 1/4" face with 1/2" (13MM) return flanges. The uprights are fully welded to a tubular top spreader and a channel bottom spreader. The uprights shall have shelf attachment slots on 1" (25MM) increments the entire length of the upright. Slots shall be 5/8" x 1/4" (16MM x 6MM). Uprights shall include location indicators the entire length of upright on a minimum of 6" (152MM) centers.
 2. The tubular top spreader shall be a minimum of 14-gauge (1.9MM) steel tube 2 1/2" tall x 1" wide (64MM tall x 25MM wide).
 3. The bottom spreader channel shall be a 16-gauge (1.5MM) channel 1-3/4" tall x 1" wide (44MM tall x 25MM wide) with two 1/2" (12MM) square holes provided for cage nuts for use with optional levelers.

Non-welded frame cantilever type shelving units are unacceptable.

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B. Base supports:

1. A base support shall be provided to provide lateral unit stability. The support shall be minimum of 14-gauge (1.9MM) steel 9" (228MM) high with a 1" (25MM) return on the bottom for support. Support shall attach to frame upright with two 3/8" (10MM) – 16 UNC bolts and 3/8" (10MM) keps nuts. Support shall be designed and constructed with shear tabs that interlock/mate with the upright to provide a positive connection that will give additional stability to welded frame in addition to the bolted connectors. Shear tabs ensure squareness and alignment of the base support to the welded frame. Base support design must allow the frame to transfer loads to floor or levelers. Base support brackets that put the bolted connection in shear are unacceptable.
2. [A gusseted base support shall be provided between every unit on mobile to provide lateral unit stability. The gusset will be a minimum 14-gauge (1.9MM) steel welded to the top of the standard base support.]

C. Leveler Kits:

1. Single-Faced: Consists of one or two 3/8 (10MM) -16 UNC cage nut(s) and leveler(s) held by the single faced base support. Two additional cage nuts and levelers are provided to be used in the welded frame itself.
2. Double-Faced: Consists of two or four 3/8 (10MM) -16 UNC cage nuts and levelers held by the double-faced base support. Two additional cage nuts and levelers are provided to be used in the welded frame itself.

D. Shelf end brackets:

1. Shall be made of minimum 16-gauge (1.5MM) steel of a depth not less than that of the shelf on which they are used and shall extend not less than 6" (152MM) above the top surface of the shelf. The top and front edges shall be flanged outwardly to a half round profile to prevent accidental knifing of material. Shelf brackets shall have a minimum of two hooks at the top for engaging into the column (post) and one safety lug to prevent accidental dislodgment at the bottom. Outward embossment in the upper front corner of the shelf brackets shall act as shelf spacers and prevent overlapping of shelf end brackets. For aesthetic reasons as well as to prevent sharp corners, the upper front corner of the shelf brackets shall have a radius of not less than 1 inch (25MM). The base of the end brackets will have two lanced tabs that interlock with the shelf and provide firm support for the shelf. Lance tabs and shelf shall be provided with 1/4" (64MM) diameter holes for optional bolting of components. The front edge of the end bracket shall have a 15-degree slope.

E. Base Shelves for Static:

1. Shelves shall be formed from minimum 18-gauge (1.2MM) cold rolled steel with a triple 90-degree bend on the rear of shelf and a double bend with a 3" (76MM) surface at the front. Shelf ends to be turned down 90-degrees to engage and interlock into the shelf end brackets.
2. Base shelves on mobile shall be 3/4" (19MM) to sit flush with top of carriage profile. Base shelves shall be individual on both faces of double face or single face units, with center filler channels. Each base shelf shall be supported by shelf end brackets for maximum strength and support.

F. Plain Shelves:

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1. Shelves shall be formed from minimum 18-gauge (1.2MM) cold rolled steel with a triple 90-degree bend on both front and rear edges with a shelf thickness to be 3/4" (19MM). Shelf ends to be turned down 90-degrees to engage and interlock into the shelf end brackets. Shelves shall be no less than 1/4" (6MM) from actual dimension specified.

G. Metal canopy tops:

1. Shall be formed from minimum 18-gauge (1.2MM) cold rolled steel with a triple 90-degree bend on front edges with a maximum edge thickness of 3/4" (19MM). Single face and double face units to be one-piece design.

H. Card Holders:

1. As specified, shall be painted steel to hold 3" x 5" (76MM x 127MM) cards (by others). One shall be provided for each single faced and two for each double faced end panel.

All parts of identical dimensions shall be totally interchangeable without modification.

I. ACCESSORIES:

1. Centerstop (Offset for back-to-back shelving): Provide manufacturer's standard.]
2. "W" Hanging Wire Support: Provide manufacturer's standard. Provide (2) Per Shelf

J. Face Panels:

Materials: Metal End Panel [Plastic laminate clad particleboard with plastic edging on vertical edges].

1. Finishes: Selected from manufacturer's standard available colors and patterns.

2.4 FABRICATION

- A. General: Coordinate fabrication and delivery to ensure no delay in progress of the Work.

2.5 FINISHES

- A. Colors: Selected from manufacturer's standard available colors
- B. Paint Finish: Provide factory applied electrostatic powder coat paint. Meet or exceed specifications of the American Library Association.
- C. Low-Pressure Laminate Finish: Selected from manufacturer's standard available colors and patterns.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine shelving units scheduled to receive accessories [with Installer present] for compliance with requirements for installation tolerances and other conditions affecting performance of specified accessory items.

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- B. Verify that intended installation locations of sorter unit units will not interfere with or block established required exit paths or similar means of egress once units are installed.
- C. Proceed with accessory installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Follow manufacturer's written instructions for installation of each type of accessory item specified.

3.3 FIELD QUALITY CONTROL

- A. Verify accessory unit alignment and plumb after installation. Correct if required following manufacturer's instructions.
- B. Remove components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new matching units, installed as specified and in manner to eliminate evidence of replacement.

3.4 ADJUSTING

- A. Adjust all accessories to provide smoothly operating, visually acceptable installation.

3.5 CLEANING

- A. Immediately upon completion of installation, clean 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.

3.6 DEMONSTRATION/TRAINING

- A. Schedule and conduct demonstration of installed accessory items and features with Owner's personnel.
- B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair 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 or deterioration at time of substantial completion.

END OF SECTION