SECTION 115123 - LIBRARY STACK SYSTEMS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Steel-bracket shelving.

Wood-case shelving.

Steel-case shelving.

Steel four-post shelving.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 064113 "Wood-Veneer-Faced Architectural Cabinets" for custom-fabricated library shelving, end panels, and canopy tops.

Section 105613 "Metal Storage Shelving" for metal storage shelving for retail, commercial, and industrial uses.

Section 105626 "Mobile Storage Shelving" for shelving units mounted on wheeled carriages that roll back and forth on a track system.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for library stack systems and accessories.

* + - * 1. Sustainable Design Submittals:
				2. Shop Drawings:

Include plans, elevations, sections, and details.

Show clear-aisle widths from face of units.

Retain option in subparagraph below if library stack systems are installed in seismic areas.

Detail fabrication and installation of library stack systems, including methods of anchoring them to building structures at locations recommended by manufacturer and as required for seismic restraint.

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: For each exposed product and for each color and texture specified, **[6 inches]** in size.
				2. Samples for Initial Selection: For units with factory-applied finishes, **[6 inches]** in size.
				3. Samples for Verification: For the following products, one of each, in manufacturer's standard**[ full]** sizes:

Flat shelving.

Each type of specialized shelving.

End panels.

Top panels.

Retain "Seismic Design Calculations" paragraph below if seismic design calculations are required.

* + - * 1. Seismic Design Calculations: For seismic design of library stack systems, including analysis data signed and sealed by the qualified professional engineer, licensed in the State of New York, responsible for their preparation.

Coordinate "Qualification Data" paragraph below with "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.
				2. Sample Warranty: For manufacturer's special warranty.
			1. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For library stack systems to include in maintenance manuals.
			2. MAINTENANCE MATERIAL SUBMITTALS
				1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Shelf Units: Five percent of quantity installed for each size and type indicated, but no fewer than 10 units.

* + - 1. QUALITY ASSURANCE
				1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
			2. FIELD CONDITIONS

Retain first "Environmental Limitations" paragraph below if humidity will not be controlled during occupancy.

* + - * 1. Environmental Limitations: Do not deliver or install wood shelving until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
			1. WARRANTY
				1. Special Warranty: Manufacturer agrees to repair or replace components of library stack systems that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of metal finishes and other materials beyond normal wear.

Verify available warranties and warranty periods for units and components.

Warranty Period: Five years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Seismic Performance" paragraph below for projects requiring seismic design. Delete paragraph if performance requirements are indicated on Drawings. Model building codes and ASCE/SEI 7 establish criteria for buildings subject to earthquake motions. Coordinate requirements with structural engineer.

* + - * 1. Seismic Performance: Library stack systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

Loads as indicated on Drawings.

* + - 1. STEEL-BRACKET SHELVING
				1. Steel-Bracket Shelving: ANSI Z39.73 shelving designed for library use, consisting of two uprights and two spreaders per section forming a four-sided frame, with adjustable shelves on one or both sides of uprights cantilever-hung by brackets.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Aurora Storage Products, Inc.

Borroughs Corporation.

Spacesaver Corporation.

Approved equivalent.

Revise "Bookstack Units" paragraph below to match bookstacks retained for Project. Copy and re-edit if more than one type of bookstack is required; insert a unique designation for each type and indicate locations on Drawings.

* + - * 1. Bookstack Units **<Insert designation>**:

Type: **[Welded, self-supporting units] [Mechanically fastened, self-supporting units] [Starter units] [Adder units] [Sloped display units]**.

Configuration: **[Double] [Single]**-faced units**[ with gusset plates]**.

Width: **[36 inches]**.

Height: **[42 inches] [66 inches] [78 inches] [84 inches] [90 inches]**.

Shelf Depth: **[8 inches] [9 inches] [10 inches] [12 inches]** nominal.

Base Support: **[Base shelf] [Open base with support feet]**.

Retain "Base Shelf Style" subparagraph below for base shelf; delete for support feet.

Base Shelf Style: **[Flat] [Flat with integral backstop]**.

Shelves: Provide the following style and number of adjustable shelves:

Retain styles and number of shelves required from list below.

Flat**[ with integral backstops]; [six] [five] [four] [two]** shelves.

Sloping**[ with integral backstops]; <Insert number>** shelves.

Adjustable divider**[ with integral backstops]; <Insert number>** shelves.

Fixed periodical; **<Insert number>** shelves.

Hinged periodical; **<Insert number>** shelves.

Zigzag paperback shelf; **<Insert number>** shelves.

Cascade newspaper display; **<Insert number>** shelves.

Horizontal newspaper display; **<Insert number>** shelves.

Multimedia, [single] [double] tier; **<Insert number>** shelves.

Multimedia browser bin, [single] [double] tier; **<Insert number>** shelves.

Hinged flipper door unit; **<Insert number>** shelves.

Work shelf; **<Insert number>** shelves.

Revise "Wall-Hung Upright Units" paragraph below to match units retained for Project. Wall-hung uprights are mounted directly to wall; coordinate with blocking to assure secure attachment. Copy and re-edit paragraph if more than one type is required; insert a unique designation for each type and indicate locations on Drawings.

* + - * 1. Wall-Hung Upright Units **<Insert designation>**:

Configuration: **[Two upright starter units] [One upright adder unit]**.

Width: Space uprights to receive 36-inch- wide shelving.

Height: **[42 inches] [66 inches] [78 inches] [84 inches] [90 inches]**.

Shelf Depth: **[8 inches] [9 inches] [10 inches] [12 inches]** nominal.

Shelves: Provide the following style and number of adjustable shelves:

Retain styles and number of shelves required from list below.

Flat**[ with integral backstops]; [six] [five] [four] [two] <Insert number>** shelves.

Sloping**[ with integral backstops]; <Insert number>** shelves.

Adjustable divider**[ with integral backstops]; <Insert number>** shelves.

Fixed periodical; **<Insert number>** shelves.

Hinged periodical; **<Insert number>** shelves.

Zigzag paperback shelf; **<Insert number>** shelves.

Cascade newspaper display; **<Insert number>** shelves.

Horizontal newspaper display; **<Insert number>** shelves.

Multimedia, **[single] [double]** tier; **<Insert number>** shelves.

Multimedia browser bin, **[single] [double]** tier; **<Insert number>** shelves.

Hinged flipper door unit; **<Insert number>** shelves.

Work shelf; **<Insert number>** shelves.

Base shelf with kick plate; 1 shelf.

Picture book; **<Insert number>** shelves.

**<Insert shelf style>; <Insert number>** shelves.

* + - * 1. Frames:

Uprights: Steel channels, 0.060 inch (16 ga) thick, with slots to receive shelf bracket tabs at 1 inch o.c.

"Sloped Display Frames" subparagraph below describes frames with lower shelves angled to allow easy access to books on lower shelves.

Sloped Display Frames: Where indicated, provide upright post frames with additional steel angles, 0.060 inch (16 ga) thick, 36 inches high, slotted to receive shelving and welded to frame or gusset plates at 10-degree angle to allow better visibility of lower two shelves.

Spreaders: Tube steel, 0.060 inch (16 ga) thick.

Retain "Longitudinal Bracing" subparagraph below for mechanically fastened frames to prevent longitudinal deflection; delete for welded frame units. Rod in first option is often called "sway brace."

Longitudinal Bracing: Provide one **[diagonal steel rod with turnbuckles] [intermediate spreader] for each of [three] [four] [five]** units in each range of shelving.

Retain "Reinforcing Gusset Plates" subparagraph below if required in seismic areas to prevent lateral deflection under seismic forces. See the Evaluations for discussion.

Reinforcing Gusset Plates: Triangular steel plates, 0.060 inch (16 ga) thick, with return flange along bottom edge.

Units in "Wall-Hung Uprights" paragraph below are uprights directly attached to perimeter walls rather than configured as self-supporting frames; verify that blocking is coordinated with unit locations to provide secure anchorage.

* + - * 1. Wall-Hung Uprights: Steel channels, 0.060 inch (16 ga) thick, with a minimum of three recessed holes per column for screw attachment to wall surface. Each column will provide double rows of slots to receive shelving tabs at 1 inch o.c.
				2. Adjustable Shelves: 0.048-inch (18 ga) - thick cold-rolled steel sheet. Provide two brackets per shelf; 0.060-inch (16 ga) - thick cold-rolled steel.

Retain either "Base Shelves" or "Support Feet" paragraph below, or indicate locations on Drawings if retaining both.

* + - * 1. Base Shelves: One-piece shelves, 0.048-inch (18 ga) - thick cold-rolled steel sheet, designed to receive and fit snugly around uprights, with kick plate 3 inches high. Provide two brackets per base shelf; 0.060-inch (16 ga) - thick cold-rolled steel sheet, with return flange along bottom edge. Provide perforated bases at locations where base shelves cover supply-air grilles.
				2. Support Feet: Square steel tube, 0.060 inch (16 ga) thick, with black vinyl caps at open ends of tube shape, designed to receive and fit snugly around uprights, extending from both faces of double-faced units or one face of single-faced units.
				3. Levelers: Adjustable pin levelers at carpeted surfaces and adjustable glides elsewhere.
				4. End Panels: Provide **[one at end of each range] [where indicated]**.

Retain "Steel End Panels," "Solid-Wood End Panels," or "Veneer-Faced End Panels" subparagraph below.

Steel End Panels: Cold-rolled steel sheet, 0.048 inch (18 ga) thick, with [smooth] [patterned] finish.

Solid-Wood End Panels: 3/4 to 1 inch thick.

Veneer-Faced End Panels: 3/4 to 1 inch thick.

Style: **[Flat, square top] [Flat, arched top] [Shadowbox]**.

Face: **[Wood veneer] [High-pressure decorative laminate] [Thermoset decorative overlay] [Slatwall] [Fabric covered]**.

* + - * 1. Canopy Tops: Provide **[full length of each range] [where indicated]** with manufacturer's standard attachment brackets for type of top indicated.

Retain "Steel Top Panels" or "Veneer-Faced Top Panels" subparagraph below.

Steel Top Panels: Cold-rolled steel sheet, 0.048 inch (18 ga) thick, with **[smooth] [patterned]** finish.

Veneer-Faced Top Panels: 3/4 to 1 inch thick.

Face: **[Wood veneer] [High-pressure decorative laminate] [Thermoset decorative overlay]**.

Retain "Back Panels" paragraph below if required for single-faced units.

* + - * 1. Back Panels: Provide one-piece panels at each single-faced unit; 0.048-inch (18 ga) - thick cold-rolled steel sheet, with **[smooth] [patterned]** finish, sized to completely fill space between uprights.
			1. WOOD-CASE SHELVING
				1. Wood-Case Library Shelving: Shelving designed for library use, consisting of base frame and full end, top, and back panels, with end panels made to receive pins to support adjustable shelves.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Brodart Co.

Buckstaff Company.

Worden Company.

Approved equivalent.

Revise "Bookstack Units" paragraph below to match bookstacks retained for Project. Copy and re-edit if more than one type of bookstack is required; insert a unique designation for each type and indicate locations on Drawings.

* + - * 1. Bookstack Units <Insert designation>:

Type: **[Self-supporting] [Starter] [Adder]** units.

Configuration: **[Single] [Double]**-faced units.

Width: 36 inches.

Height: **[42 inches] [48 inches] [60 inches] [72 inches] [82 inches]**.

Shelf Depth: **[10 inches] [12 inches] [20 inches] [24 inches]** nominal.

Shelves: Provide the following style and number of adjustable shelves:

Retain styles and number of shelves required from list below.

Flat; **[six] [five] [four] [two] <Insert number>** shelves.

Adjustable divider; **<Insert number>** shelves.

Fixed periodical; **<Insert number>** shelves.

Hinged periodical; **<Insert number>** shelves.

Cascade newspaper display; **<Insert number>** shelves.

Horizontal newspaper display; **<Insert number>** shelves.

Multimedia; **<Insert number>** shelves.

Picture book; **<Insert number>** shelves.

* + - * 1. Base Frames: Solid hardwood toe kick, back rail, and two end cleats, 3 to 4 inches high, designed to support bottom shelf and fabricated to attach and tie together vertical panels.
				2. Bottom Shelf: Solid hardwood boards glued together, 3/4 inch thick, or veneer panels, 1 inch thick, with 1/4-inch solid-wood banding.
				3. Adjustable Shelves:

Retain "Adjustable Wood Shelves" or "Adjustable Steel Shelves" subparagraph below.

Adjustable Wood Shelves: Panels consisting of solid hardwood boards glued together, 3/4 inch thick, or veneer panels, 1 inch thick, with 1/4-inch solid-wood banding, and grooved on underside to rest securely on supporting pins.

Adjustable Steel Shelves: 0.048-inch (18 ga) - thick cold-rolled steel sheet.

* + - * 1. End Panels: Panels consisting of **[solid hardwood boards glued together, 3/4 inch thick,] [or] [veneer-faced panels, five or nine ply, 1 inch thick, with 1/4-inch solid-wood banding]**. Provide two rows of holes at 1-1/4-inch intervals for 5/16-inch shelf-support pins on one side of end panels and both sides of intermediate panels.
				2. Tops: 3/4- to 1-inch- thick **[veneer-] [plastic laminate-]**faced panels banded with 2- to 3-inch **[solid hardwood] [plastic laminate-faced]** fasciae on one side for single-faced units and on two sides for double-faced units, fabricated to attach and tie together vertical panels **[and for continuous horizontal shelving]**.

Retain "Back Panels" paragraph below for single-faced units.

* + - * 1. Back Panels: Veneer-faced panels, 1/4 inch thick, at each single-faced unit.

Retain "Divider Panels" paragraph below for double-faced units.

* + - * 1. Divider Panels: Veneer-faced panels, 1/4 inch thick, at each double-faced unit.
			1. STEEL-CASE SHELVING
				1. Steel-Case Library Shelving: Shelving designed for library use, consisting of full end, top, and back panels, with end panels made to receive adjustable shelves in slots or to receive clips to support adjustable shelves.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Adjustable Shelving; Karp Associates, Inc.

Borroughs Corporation.

Spacesaver Corporation.

Approved equivalent.

Revise "Bookstack Units" paragraph below to match bookstacks retained for Project. Copy and re-edit if more than one type of bookstack is required; insert a unique designation for each type and indicate locations on Drawings.

* + - * 1. Bookstack Units <**Insert designation**>:

Type: **[Self-supporting] [Starter] [Adder]** units.

Configuration: **[Single] [Double]**-faced units.

Width: 36 inches.

Height: **[42 inches] [60 inches] [84 inches] [90 inches]**.

Shelf Depth: **[9 inches] [10 inches] [12 inches]** nominal.

Shelves: Provide the following style and number of adjustable shelves:

Retain styles and number of shelves required from list below.

Flat; **[six] [five] [four] [two] <Insert number>** shelves.

Adjustable divider; **<Insert number>** shelves.

Fixed periodical; **<Insert number>** shelves.

Hinged periodical; **<Insert number>** shelves.

Multimedia; **<Insert number>** shelves.

Picture book; **<Insert number>** shelves.

**<Insert shelf style>; <Insert number>** shelves.

* + - * 1. End Panels: Double wall; 0.048-inch (18 ga) - thick cold-rolled steel sheet, with slots to accept **[shelves] [shelf-support clips]** at **[3/4-inch] [1-inch]** intervals.
				2. Base Shelf: One-piece, 0.036-inch (20 ga)- thick cold-rolled steel sheet, **[sloped] [flat]** with offset formed base.
				3. Adjustable Shelves: 0.036-inch (20 ga) - thick cold-rolled steel sheet.

Delete subparagraph below for systems that accept shelving directly into slots.

Provide manufacturer's standard attachment clips.

* + - * 1. Steel Back Panels: One- or two-piece panels, 0.024-inch (24 ga) - thick cold-rolled steel sheet, sized to completely fill space between uprights.
				2. Steel Tops: Formed into box shape; 0.036-inch (20 ga) - thick cold-rolled steel sheet.

Retain "Veneer-Faced Panels" paragraph below if required. Verify availability with manufacturers.

* + - * 1. Veneer-Faced Panels: 3/4- to 1-inch- thick veneer-faced panels at **[top] [back] [and] [ends]** of units over steel panels at each range, using manufacturer's standard method of connection.

Face: **[Wood veneer] [High-pressure decorative laminate] [Thermoset decorative overlay]**.

* + - 1. STEEL FOUR-POST SHELVING
				1. Steel Four-Post Shelving: Shelving designed for library use, consisting of four angle-iron uprights per section, with adjustable shelves resting on shelf supports hung on uprights.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Aurora Storage Products, Inc.

Borroughs Corporation.

Spacesaver Corporation.

Approved equivalent.

Revise "Bookstack Units" paragraph below to match bookstacks retained for Project. Copy and re-edit if more than one type of bookstack is required; insert a unique designation for each type and indicate locations on Drawings.

* + - * 1. Bookstack Units **<Insert designation>**:

Type: **[Self-supporting] [Starter] [Adder]** units.

Configuration: **[Open] [Open with center dividers] [Closed back and end]** units.

Width: **[30 inches] [36 inches] [42 inches] [48 inches]**.

Height: **[40 inches] [42 inches] [64 inches] [76 inches] [88 inches]**.

Shelf Depth: **[9 inches] [12 inches] [18 inches] [24 inches]** nominal.

Shelves: Provide the following style and number of adjustable shelves:

Retain styles and number of shelves required from list below.

Flat; **[six] [five] [four] [two] <Insert number>** shelves.

Adjustable divider; **<Insert number>** shelves.

* + - * 1. Uprights: Double-wall steel posts, 2 inches wide, 0.048 inch thick, in manufacturer's standard T-shape for common-post use or L-shape at range ends, with keyhole perforations on the inner wall at 1-1/2 inches o.c.

Retain "Closed Back and Ends" paragraph below for closed cabinet-style, four-post shelving to provide a more finished look for library use; open style is more common in nonpublic areas.

* + - * 1. Closed Back and Ends: 0.024-inch- thick cold-rolled steel sheet.

Retain "Steel Spacers" paragraph below for units without backs and ends.

* + - * 1. Steel Spacers: At units with open backs and ends, provide 0.048-inch- thick steel spacers, 3 inches high, welded to posts at bottom, center, and top to prevent deflection.

Retain "Center Divider" paragraph below if required. Center dividers are used to provide a full longitudinal panel at center of double-faced units.

* + - * 1. Center Divider: 0.024-inch- thick cold-rolled steel sheets.
				2. Base: Support for bottom shelf; 0.060-inch- thick steel channel; with kick plate 3 to 4 inches high and with holes for floor anchors.
				3. Adjustable Steel Shelves: 0.030-inch- thick cold-rolled steel sheet.

Shelf Supports: Full-shelf-width supports; 0.075-inch- thick steel, minimum 3/4 inch high, with flange to support shelf reinforcements, and with ear at each end containing two shoulder rivets with 7/16-inch heads spaced to set into keyhole slots on uprights.

Shelf Reinforcements: Channel shapes equal in length to depth of the supported shelf; 0.060-inch- thick steel channels, with notched ends to fit over inside lip of shelf support.

Retain "Veneer-Faced Panels" paragraph below if required. Verify availability with manufacturers.

* + - * 1. Veneer-Faced Panels: Provide veneer-faced panels at **[top] [back] [and] [ends]** of units over steel panels at each range, using manufacturer's standard method of connection.

Core Material: Particleboard, 3/4 to 1 inch thick.

Face: **[Wood veneer] [High-pressure decorative laminate] [Thermoset decorative overlay]**.

* + - 1. WOOD MATERIALS
				1. Solid Wood: Clear hardwood lumber, selected for compatible grain and color.

"Wood Species and Cut" subparagraph below is an example only; revise to suit products available from manufacturers. A variety of stain colors is available from most manufacturers.

Wood Species and Cut: Red oak, plain sliced.

Staining and Finish: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

"Veneer-Faced Panels" paragraph below refers to a wood-based panel with veneers applied to both faces; core may be made up of veneers (either hardwood or softwood), particleboard, medium-density fiberboard, hardboard, or glued-up lumber.

* + - * 1. Veneer-Faced Panels: HPVA HP-1, with face veneer of species indicated, with Grade A faces.

"Face Veneer Species and Cut" subparagraph below is an example only; revise to suit products available from manufacturers. A variety of stain colors is available from most manufacturers.

Face Veneer Species and Cut: Red oak, plain sliced.

Staining and Finish: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

Retain "High-Pressure Decorative Laminate" paragraph below for high-pressure decorative laminate cladding of particleboard end panels, canopy tops, and countertops. Retain "Grade VGS" option for vertical surfaces, such as end panels; retain "Grade HGL" option for horizontal surfaces such as countertops.

* + - * 1. High-Pressure Decorative Laminate: NEMA LD 3, Grade VGS and Grade HGL.

Colors, Textures, and Patterns: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

Retain "Thermoset Decorative Overlay" paragraph below for melamine cladding of particleboard end panels, canopy tops, and countertops.

* + - * 1. Thermoset Decorative Overlay: Thermally fused, melamine-impregnated decorative paper.

Colors: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

Retain "End Panel Fabric" paragraph below for fabric cladding of particleboard end panels over a particleboard core.

* + - * 1. End Panel Fabric: Manufacturer's standard fire-resistive fabric covering.

Colors: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

Retain "Edgebanding" paragraph below for edging of veneer-faced panels.

* + - * 1. Edgebanding: **[Rigid PVC T-molding, through color with satin finish] [Minimum 1/8-inch- thick solid wood of same species as face veneer] [Wood veneer of same species as face veneer]**.

Colors: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

Retain "Slatwall" paragraph below for slatwall panels used as end panels.

* + - * 1. Slatwall: Manufacturer's standard slatwall end panel, consisting of grooved medium-density fiberboard ready to accept slatwall hangers and display units.

Colors: **[As indicated by manufacturer's designations] [Match Director’s Representative's samples] [As selected by Director’s Representative from manufacturer's full range]**.

* + - 1. GENERAL FINISH REQUIREMENTS
				1. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
			2. STEEL FINISHES

Retain "Baked-Enamel or Powder-Coat Finish" paragraph below for factory-applied, baked-enamel or powder-coat finish for steel sheet.

* + - * 1. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard two-coat, baked-on finish, consisting of prime coat and thermosetting topcoat to achieve a minimum dry film thickness of 2 mils.

Color and Gloss: **[As indicated by manufacturer's designations] [Match Director’s Representative's sample] [As selected by Director’s Representative from manufacturer's full range]**.

For exact finish, insert names of coating manufacturers and products.

* + - 1. WOOD FINISHES

Retain first option in "Finishing" paragraph below for the more commonly used topcoat. Second option is claimed to be environmentally friendly topcoat available from some manufacturers. Verify availability of second option with manufacturers before specifying.

* + - * 1. Finishing: Apply manufacturer's standard, baked, clear finish, consisting of a sealer and a conversion varnish or nitrocellulose lacquer topcoat. Sand and wipe clean between applications of sealer and topcoat.
			1. ACCESSORIES
				1. Floor Anchors: Galvanized steel, post-installed expansion anchors, power-actuated fasteners, or threaded concrete screws.
				2. Wall Anchors: Manufacturer's standard galvanized-steel anchors.

"Top Bracing" paragraph below refers to top ties used with steel-bracket shelving. Retain if required.

* + - * 1. Top Bracing: Minimum 1- by 1-3/4-inch transverse struts, 0.048-inch- thick steel channels, welded or bolted to top of stack units and securely fastened to structure.

"Filler Panels" paragraph below describes panels used to close spaces where ends of bookstacks abut other bookstacks at an angle or where empty nonaccessible spaces remain open.

* + - * 1. Filler Panels: Provide corner, peninsula, and intermediate wall filler panels; 0.048-inch- thick cold-rolled steel, with fitted caps, in color and finish to match shelving. Locate where indicated to fill gaps at abutting shelving units.

"Findable Book Supports" paragraph below describes loose book supports.

* + - * 1. Findable Book Supports: Unattached book support, **[6 inches] [9 inches]** high, with cork pad on bottom, for use on shelf surface.

Provide two per shelf.

"Sliding Book Supports" paragraph below describes bookends designed to fit in slots on shelving.

* + - * 1. Sliding Book Supports: Movable, 3/16-inch- diameter wire supports**[ attached to plastic slider blocks]**, designed for insertion into track on **[backstop] [shelf]**.

Provide two per shelf.

Retain first option in "Adjustable Shelf Dividers" paragraph below for adjustable steel divider shelves; retain second option for adjustable wood divider shelves.

* + - * 1. Adjustable Shelf Dividers: One-piece, **[steel] [wood]** shelf partitions, with hooks or tabs to fit in slots in divider shelves.

Provide five per shelf.

Verify availability of shelves in "Sliding Reference Shelves" paragraph below with manufacturer. Sliding reference shelves are typically used only with bracket-style shelving.

* + - * 1. Sliding Reference Shelves: High-pressure laminate over particleboard core, 3/4 to 1 inch thick, mounted on sliding extension hardware to allow shelves to retract for storage when not in use.

Provide one per range.

Retain "Center Backstops" paragraph below only for double-faced steel shelving. Center backstops are used where no center divider panel is provided, to keep books from spilling onto shelf behind. Verify availability with manufacturer.

* + - * 1. Center Backstops: Adjustable steel shelf backstops, 0.048 inch (18 ga)c thick, with stiffening flanges and hooks for attachment to uprights.

Provide one per shelf.

* + - * 1. Shelf Label Holders: Clear plastic, 5 inches long, designed to snap over adjustable shelves.

Provide one per shelf.

* + - * 1. Adhesive Shelf Label: Blank labels, 3/4 inch high, backed with pressure-sensitive adhesive for direct attachment to shelf.

Provide one per shelf.

* + - * 1. Range Finders: Units attached to and extending from range end in V-shape, sized to hold 3-by-5-inch cards.

Provide one for each end of each range.

* + - * 1. Cardholders: Sized to hold 3-by-5-inch cards.

Provide one for single-faced units and two for double-faced units at each end of each range.

Retain "Furniture Casters" paragraph below for moveable units.

* + - * 1. Furniture Casters: Nonmarking; **[hooded] [nonhooded]; [single-wheel] [twin-wheel] [spherical-ball] type; [nylon] [urethane] [thermoplastic rubber] [polyolefin] tread; [and] [top plate] [stem] [hidden corner bracket]** attachment **[and integral brakes]**.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of the Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. PREPARATION
				1. Vacuum finished floor and wet mop resilient flooring over which shelving is to be installed.
				2. Before installing wood-case shelving or veneer-faced panels, condition materials to average prevailing humidity in installation areas for a minimum of 48 hours unless longer conditioning is recommended by manufacturer.
			3. INSTALLATION
				1. Install library stack systems at locations indicated on Drawings and according to manufacturer's written instructions.

Retain "Starter/Adder Units" paragraph below for mechanically fastened units in which the second and subsequent sections of a range share the upright of the preceding section.

* + - * 1. Starter/Adder Units: Connect groups together with standard fasteners according to manufacturer's written instructions, using concealed fasteners where possible.
				2. Enclosure Panels: Install end panels and canopy tops with concealed fasteners.
				3. Level and plumb bookstack units to a tolerance of 1/8 inch in 96 inches.

Retain "Filler Panels" paragraph below if required to enclose nonaccessible spaces that remain open after installation of abutting units.

* + - * 1. Filler Panels: Install corner, peninsula, and intermediate wall filler panels where indicated to fill gaps at abutting shelving units.
				2. Install type of shelves at locations indicated and at spacing indicated or, if not indicated, at equal spacing in each unit.
			1. ANCHORAGE

Retain this article if required. Anchorage may be required for nonfreestanding units, in seismic areas, and as recommended by manufacturer.

* + - * 1. Bookstack Anchorage: Install bookstacks using floor anchors, wall anchors, or top bracing in locations recommended by manufacturer and as indicated on Shop Drawings.
			1. CLEANING AND PROTECTING
				1. Repair or remove and replace defective work as directed on completion of installation.
				2. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Director’s Representative.
				3. Protect installed products from damage during remainder of the construction period.

END OF SECTION 115123