

SECTION 10 56 13.23 - CANTILEVER METAL STORAGE SHELVING

* ALL FIELDS IN [] MUST BE EDITED

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Related Specifications Sections, apply to this Section.

1.2. SUMMARY

- A. This section includes the following:
 - 1. Cantilever fixed shelving units, fabrication and installation including leveling.
- B. Related Work, Not Furnished:
 - 1. Structural floor system capable of supporting loads required by prevailing building codes, including loads of storage units to be installed. Provide a maximum allowable sub floor deflection of L/480 under specified storage loads.
- C. Related Sections:
- D. Allowances:
- E. Alternates

1.3. PERFORMANCE REQUIREMENTS

- A. Due to the user's preference and requirements for safety, performance, and flexibility, all following specification line items are mandatory.
- B. Seismic Performance: Provide fixed shelving capable of withstanding the effects of earthquake motions as determined according to IBC 2006 and local building codes.
- C. Design Requirements: All shelving elevations as [per attached drawings] or [described in the specifications].
- D. Color Samples: Provide sample for each exposed product and for each color required.
- E. Selection Samples: For selection of colors and textures, submit manufacturer's color charts consisting of actual product samples, showing full range of colors and textures available. Vendors must provide a minimum of 12 color selections in powder coat paint finish.
- F. Installer Qualifications: Engage an experienced installer who is the manufacturer's authorized and certified representative.
 - 1. Minimum Qualifications: 1-year experience installing systems of similar size and complexity to specified project requirements
 - 2. Manufacturer Certification: Required by manufacturer on manufacturer's letterhead required at time of bid. Certifications by sales representatives, dealers, or distributors are unacceptable. Qualification must include resume of certified installation supervisor.
 - 3. Provide support within 24 hours for service call.
- G. Warranty: Submit a written warranty, executed by contractor, installer and manufacturer, agreeing

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to repair or replace units that fail in materials or workmanship within the specified warranty period. This warranty shall be in addition to, not limitation of other rights the owner may have against the contractor under contract documents.

Lifetime Limited Warranty: The entire shelving installation will be warranted against defects in materials for the life of the installation from the date of acceptance by the Owner.

- H. Reference List: Provide a list of three (3) minimum fixed storage installations to be contacted or visited by owner, architect and contractor. Installation must be of similar size, scope of specified system. Visit is intended to inspect operation, quality of installation and verify the suitability of manufacturer's products and comparison with materials and products specified. Manufacturer is required to address all issues raised by owner, architect and contractor. List must include contact names, phone numbers or e-mails, size and quantity of shelving units.
- I. LEED Data: Provide complete environmental data included recycled material content, VOC data, and other product related information. Describe all manufacturing processes or policies that contribute to environmental sustainability
- J. Project Schedule: Provide a project achievement plan detailing all critical elements necessary to plan, manufacture, ship, and install shelving product. Include critical project milestones and risk mitigation plan.
- K. Manufacturer Qualifications:
 - 1. ISO 9001:2008: Engage an experienced manufacturer who is ISO 9001:2008 certified for the design, production, installation and service of powered mobile systems. Submit manufacturer's ISO 9001:2008 quality system registration certificate.
 - 2. ISO 14001:2004: Engage an experienced manufacturer who is ISO 14001:2004 certified. This international standard defines a process for monitoring and improving an organization's environmental performance. This process minimizes adverse impacts on the environment caused by the activities of the enterprise and helps to continually improve the environmental performance of the organization. Submit manufacturer's ISO 14001:2004 registration certificate, certifying the environmental performance of manufacturer.
 - 3. Underwriters Laboratories Inc.: Entire powered mobile system shall be C-UL US listed certified. Manufacturer shall submit C-UL US certification with proposal.

1.4. SUBMITTALS

- A. Product Data: Submit manufacturer's product literature, schematics, testing data, and other items as described in this specification. Include data substantiating that products to be furnished comply completely with requirements of the contract documents and specifications. Include installed weight, load criteria, furnished specialties, and accessories.
- B. Shop Drawings: Prepared and detailing fabrication, assembly, and installation of storage shelving, as well as procedures and diagrams. Include details of layout and installation, as well as clearances, spacing, relation to adjacent construction in plan, elevation, and section, components, assemblies, connections, attachments, reinforcements, and anchorage. Furnish floor layouts, technical, and installation manuals for every unit shipment.

1.5. QUALITY ASSURANCE (Submittals due from all bidding contractors at time of bid, failure to do so shall be cause for disqualification.)

- A. Manufacturer Certifications: Provide written certification by manufacturer on manufacturer's letterhead at time of bid required stating compliance with all specifications of shelving systems. Shelving certifications must confirm compliance with all shelf sizes and gauges as noted in these specifications.

1.6. PROJECT CONDITIONS

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- A. Field Measurements: Verify shelving unit location by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating shelving units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.
- B. Delivery, Storage, & Handling: Comply with instructions and recommendations of manufacturer for special delivery, storage and handling requirements.
- C. Sequence & Scheduling: Sequence storage shelving system installation with other work to minimize possibility of damage and soiling during remainder of construction period.
- D. Pre-installation Conference: Conduct conference at project site. Review methods and procedures related to installation of fixed storage units including, but not limited to, the following:
 - 1. Inspect and discuss condition and levelness of flooring and other preparatory work performed under other contracts.
 - 2. In addition to the Contractor and the installer, arrange for the attendance of the following :
 - a. Other installers affected by the work of this section.
 - b. The Owner's representative.
 - c. The [Architect] [Architect/Engineer] [Engineer/Architect] [Engineer] [Designer].
 - d. Manufacturer's representative.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

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

2.2. MANUFACTURED COMPONENTS – CANTILEVER SHELVING

- A. Column Uprights: Formed of 16-gauge steel into a channel shape with 1/2" stiffening flanges, the channel to measure 2" in the web and 1 5/16" at the front and rear faces. They present a smooth, closed box shape 2" x 2 5/8" in cross section with eight right angle bends when bolted to the adjoining column of the next unit, or bolted to an end cover. When bolted to adjacent welded frames, exposed open channels of uprights are unacceptable. Each column is perforated full-height on both faces with a row of slots spaced 1" on vertical centers to receive hooks and lugs of shelf brackets, thus permitting 1" adjustment of shelves. In adjoining columns, the rows of slots are 5/8" on lateral centers. Columns are marked every three (3) inches to facilitate visual positioning and adjustment of shelves. Corresponding holes for bolting columns into ranges are provided. Two (2) uprights are required for each section of a range, since no adjacent sections may share a common upright and be truly modular. Bolted column uprights must create a vertical concealed chase for wiring and cabling.
- B. Top Spreader Tube: The top spreader is a fully closed tube of 16-gauge, 2" x 2" square. This tube is securely electric welded with continuous welds to the upright columns to permit unit arrangements and maximum non-sway capabilities. The length of this tube is variable for any unit width (36" standard). The top spreader is tubular to assure a closed surface where books or patrons may come in contact with the tube and visually pleasing from the top on low units and

from the bottom on high units. This closed tubular shape additionally provides a chase for wiring and cabling. Field modifications to accommodate potential wiring or cabling are unacceptable.

- C. Bottom Spreader Channel: To be channel shaped, open to the floor, of minimum 14-gauge steel. This spreader is electric welded on the two (2) vertical faces with continuous welds to the upright columns at a height to assure continuous through shelving on the base shelves. The length of the channel shall be as above for the top spreader. Slots in bottom spreader channel are provided to perform leveling function at the column, without having to remove base shelf. The above top and bottom spreaders are electrically welded to the uprights with a full-bead of each of the four (4) joints to form a rectangular frame of one (1) piece construction without the use of nuts, bolts or any other type of fastener. The completed frame is rigid without the use of sway braces, gusset plates, angle braces, or any other device that will obstruct the use of any or all shelves anywhere in the bookstack.
- D. Levelers: An 11-gauge steel threaded clip is welded to each of the frame uprights below the bottom channel spreader. Such clip accommodates a 5/16" – 18 gauge leveling glide with optional neoprene cap. Such glides allow for maximum leveling on irregular floor conditions. Base brackets will be leveled when anchoring to the floor. Each initial double face section in a range must receive six (6) levelers. Each initial single faced section in a range must receive four (4) levelers. All sections, single or double face must receive levelers at every upright.
- E. Base Shelf (LwwddBSA): Made of 18-gauge steel and formed with front and rear faces formed 3/4" high & box formed with no less than four (4) 90-degree bends. The surface of the bottom shelf is flush with the top surface of the bottom spreader, presenting a continuous storage surface. Side flanges of the base shelf will engage formed lugs in the base shelf support neatly and securely to render full-support to the side surfaces of the shelf. Two (2) piece base shelves are used for double face units to provide flexibility for future rearrangement from double face to single face. Base shelves must provide flush and uniform surface without the use of "fillers". Base shelves are designed to carry book loads of 50 pounds per square foot without deflection in excess of 3/16". In addition, an 18-gauge adjustable separate recessed kick strip 3" high is provided with return flanges at the top & bottom for stiffening. Kick strip is painted black in color or matching shelving color. Slotted flanges at both ends engage with a slot in the base shelf supports to allow for adjustability and presentation of a neat closed appearance with the surface of the floor. For maximum flexibility, base shelves must have capability to be exchanged or interchanged with adjustable shelves. Base shelves may not be unique or otherwise limited in placement or usage.
- F. Base Shelf Bracket (LddBSKLA or LddBSKRA): Made of 16-gauge steel with front and top faces flanged on a 5/16" radius and the exposed corner smoothly rounded. Brackets will have three (3) projections at the rear, two (2) hooks at the top and right-angle tab at the bottom with a hole to accept a 5/16" bolt. With the bottom tab bolted to the column, the hook shall tightly engage its slot in the column. Adjoining base shelf brackets shall be bolted together to preserve alignment, with bolts, placed in indentations deep enough to prevent damage to books on the base shelf. Two (2) right-hand and two (2) left-hand base shelf brackets shall be used on double face units to provide flexibility for future rearrangement from double face to single face. Compact (high density) units do not require base brackets as standard adjustable shelves are used with gussets.
- G. Adjustable Shelf (LswwddA): Made of 18-gauge steel and formed with front and rear faces formed 3/4" high and box-formed with no less than four (4) 90-degree bends (i.e. down 3/4", return 5/8", return 3/8" and return 5/16"). They shall present a smooth, closed appearance on both faces inside as well as outside with all sharp edges eliminated, yet formed to receive book supports and label holders. Adjustable book shelves are designed to carry books loads of 50 pounds per square foot without deflection in excess of 3/16". The nominal depth of bookshelves is 1" greater than the actual depth from face of column to front of shelf. The shelves should be reversible, front to back, for maximum shelf life.
- H. Adjustable Shelf Bracket (LSddR or LSddL): Made of 16-gauge steel with front, top and bottom faces flanged with an approximate 5/16" return. Brackets have three (3) projections at the rear, two (2) hooks and two (2) safety lugs, to engage the column slots and permit easy adjustment of shelves with maximum possible protection against dislodgment. Brackets are fastened to the

shelves with tabs. An impression is furnished to serve as an automatic bracket spacer, eliminating the possibility of adjacent bracket overlap. The bracket design allows for shelf adjustment upward or downward (i.e. walking the shelf) without disturbing adjacent shelves.

- I. Gusset (G90ddSF or G90ddDF): Made of (1) piece 16-gauge steel, 32" or 48" high, triangular 2" at the top and depth of base at the bottom. A 1 1/2" bend with holes will allow anchoring to the floor. Provide minimum (3) gussets per double face range unless shelving height and seismic zone dictates otherwise. 2-piece Gusset with butt joint is unacceptable.
- J. Canopy Top (LwwddUCTA or LwwddUCTLA): When required, canopy top shall be provided for all sections, one (1) for single-faced sections and two (2) for double-faced sections, in order that any rearrangement of sections at a later date may be accomplished without requiring new parts. Note that on lower height units such as 42", 48", 54" or 66" a one (1) piece top shall be used for double-faced sections, if canopy top is required. Canopy top shall be of 18-gauge steel. The faces of the canopy top shall be 1 1/2" high. Inverted type bracket supports for canopy top shall be formed of 12-gauge steel. A suitable hole shall be provided on either side of the canopy top so that adjacent tops may be bolted together for uniform alignment.
- K. Bracket for wood top or plastic laminate top: Inverted type bracket supports for canopy tops shall be formed of 12-gauge steel. Brackets shall have four (4) projections at the rear, two (2) hooks and one (1) safety lug, to engage the column slots and permit easy adjustment of top with maximum possible protection against dislodgment. Brackets shall be fastened to the top with zinc plated steel angles.
- L. End Panels (LhddEPA-PAT): When required, end panel is provided at exposed ends. They are formed of 18 gauge patterned steel with 1 1/2" faces, a returned 3" stiffening flange inside each face, and suitable stiffening flanges top and bottom. Double face finished ends are further reinforced by a full-vertical hat shaped channel. Panels are also available in plain steel (non-patterned) and/or perforated designs as specified.
- M. Findable Book Support (LMhS): Shall be 16-gauge steel, one (1) piece construction, 6" or 9" high, with a 6 1/4" long "T" shaped base. The top and side faces shall be flanged and have a 1/4" radius. Sides shall be taper-flanged 7/8" at base to 5/16" at top for added strength.
- N. Wire Book Support (LdW): Shall be formed of 6-gauge (.203) bright basic steel wire, plated, and shall be held in place by the front and back flanges of the adjustable shelf above.
- O. Options:
 1. Universal Display Shelf (LSwwddUDA): Shall be dual purpose. Shelf when used in flat position provides 8" storage with a 5 1/2" integral back. In 55-degree sloped position, shelf shall be bolted to side bracket and shall provide 5 1/2" storage with 8" integral back. All universal shelves must be interchangeable with conventional shelves. Shall be formed with front and rear faces formed 3/4" high and box formed with no less than four (4) 90 degree bends (i.e. down 3/4", return 9/16", return 3/8" and return 5/16"). They shall present a smooth, closed appearance on both faces inside as well as outside with all sharp edges eliminated, yet be arranged to receive book support and label holder.
 2. Universal Display Base Shelf (LwwddUDBSA): Shall be dual purpose (same description than LSwwssUDA). In 55 degree sloped position, the shelf should sit on the 4" kick strip at the front, and the side flange of the shelf should insert between the base bracket and the special shim, at the back. This base shelf is then easy to change from one (1) position to the other without the use of hardware or tools. All universal display base shelves must be interchangeable.
 3. Adjustable Divider Shelf (FswddA): Shall be formed of not less than 18-gauge steel, with front face formed 3/4" high and box formed with no less than four (4) 90 degree bends (i.e. down 3/4", return 9/16", return 3/8", and return 5/16"). The rear of the shelf shall be formed with a vertical flange 4 9/16" high, a 5/16" return to the rear, a 1/4" return down. They present a smooth, closed appearance on both faces, inside as well as outside, with all

sharp edges eliminated. The shelf surface and rear vertical flange shall be punched on 1" horizontal centers for three-point reception of adjustable divider lugs. The shelf shall carry a load of 50 pounds per square foot without deflection in excess of 3/16". Letter-size shelves shall be 10 3/4" actual depth and legal size shelves shall be 13 3/4" actual depth.

4. Divider Base Shelf (FwwddBSA): Shall be formed of no less than 18-gauge steel. The front face shall be the same as the adjustable divider type shelf. The shelf surface, slots, rear vertical flange and all other features of the base shelf shall be the same as the specification for adjustable shelf. Side flanges of the base shelf shall engage formed lugs in the base shelf bracket neatly and securely to render full-support to the side surfaces. In addition a kick strip shall be provided as specified under closed base shelf.
5. Shelf Divider (Fhdd): Shall be formed of 20-gauge (until 14" deep) or 18-gauge steel (15" deep and more) with one (1) lug at the top rear side and two (2) lugs on the bottom to engage slots in the shelf for easy adjustment on 1" horizontal centers. The front top corner of the divider shall be neatly rounded with an approximate 2" radius. Exposed edges of the divider shall be smooth and free from burrs.
6. Storage Shelf (LwwddUA): 8", 9", 10", 11", 12" and 16" nominal shelf depth. Shall be formed of not less than 18-gauge steel with front and rear faces formed 3/4" high and box-formed with no less than four (4) 90-degree bends (i.e. down 3/4", return 5/8", return 3/8" and return 5/16"). The front face shall present a smooth closed appearance inside as well as outside, with all sharp edges eliminated. Adjustable storage shelf shall be designed to carry loads of 40 pounds per square foot without deflection in excess of 3/16". The nominal depth shall be 1" greater than the actual shelf depth, which is from face of column to front face of shelf. The rear face shall be notched at both ends to allow clearance for the 12-gauge inverted support brackets. The shelves shall have 11/16" side flanges formed down and shall be punched for fastening to the inverted shelf bracket slots with two (2) 1/4" - 20 x 1/2" cadmium R.H.M.S. with hex nuts.
7. Deep Storage Shelf (UwwddA): 16", 17", 18", 22" and 24" nominal shelf depth. The nominal depth shall be 1" greater than the actual shelf depth measuring from face of column to front face of shelf and shall be formed of not less than 18-gauge steel with front and rear faces formed at 1 1/8" high and box-formed with no less than four (4) 90-degree bends (i.e. down 1 1/8", return 1/2", return 3/8" and return 1/4"). The front face shall present a smooth closed appearance inside as well as outside, with all sharp edges eliminated. The rear face shall be notched at both ends to allow clearance for the 12 gauge inverted support brackets. The shelves shall have 1 1/8" side flanges formed down and shall be punched for fastening to the inverted shelf bracket slots with two (2) 1/4" - 20 x 5/8" cadmium R.H.M.S. with hex nuts. A 20 gauge steel hat shaped stiffener 2 1/16" in width and 5/8" in height after forming, shall be spot welded to the underside of the shelf surface. The stiffener shall extend the length of the shelf, except that it shall allow clearance for the horizontal leg of the shelf support brackets.
8. Inverted Storage Shelf Support Bracket (LddU): 8", 9", 10", 12" and 16" nominal shelf depth. Shall be of not less than 12-gauge steel. All exposed edges shall be rounded. Bracket shall have three (3) projections at the rear, one (1) hooks and one (1) safety lug to engage the column slots. The horizontal leg of the bracket shall be of 1" minimum and provided with two (2) 9/32" x 5/8" slots. The vertical leg shall be a minimum of 1 1/2" wide by 3 5/8" long. The length of the bracket shall be approximately 1" less than the nominal depth of the shelf.
9. Inverted Storage Shelf Support Bracket (Udd): 18", 22" nominal shelf depth. Shall be of not less than 12-gauge steel. All exposed edges shall be rounded. Bracket shall have three (3) projections at the rear, two (2) hooks and one (1) safety lug to engage the column slots. The horizontal leg of the bracket shall be of 1" minimum and provided with two (2) 1/4" x 2" slots. The vertical leg shall be a minimum of 1 1/2" wide by 3 5/8" long. The length of the bracket shall be approximately 1" less than the nominal depth of the shelf.
10. Low Profile Adjustable Shelf (LSwwddLPA).

11. Microfilm Shelf (LwwddMF): 4" or 6" nominal depth shall be formed of not less than 18 gauge steel with the front face formed $\frac{3}{4}$ " high and box formed with no less than four (4) 90 degree bends (i.e. down $\frac{3}{4}$ ", return $\frac{5}{8}$ ", return $\frac{3}{8}$ " and return $\frac{5}{16}$ "). The actual shelf depth shall be $3\frac{1}{2}$ " or $5\frac{1}{2}$ ", with a 1" high rear flange formed upward to provide a backstop for the microfilm, and the shelf shall have $\frac{11}{16}$ " end flanges formed downward. The shelf bracket shall be of not less than 14 gauge steel and is spot-welded to the shelf and flanges. The exposed corner of the bracket is smoothly rounded, and there shall be three (3) projections at the rear to engage the column slots. The brackets shall have a bottom flange to provide additional shelf support. All sharp edges on shelves or brackets shall be eliminated.
12. Sloped Microfilm Shelf (LwwddMFS): 4" or 6" nominal depth shall be formed of not less than 18 gauge steel with the front face formed 1" high and box formed with no less than four (4) bends (i.e. down 1", return $\frac{1}{2}$ ", return $\frac{3}{8}$ " and return $\frac{1}{4}$ "). The shelf shall be sloped at approximately 8 degrees and the actual shelf depth shall be $3\frac{1}{2}$ " or $5\frac{1}{2}$ ", with a $\frac{7}{8}$ " high rear flange formed upward at 90 degrees from the sloped surface to provide a backstop for the microfilm. The shelf shall have $\frac{1}{2}$ " end flanges formed downward. The shelf bracket shall be of not less than 14 gauge steel and is spot-welded to the shelf and flanges. The exposed corner of the bracket is smoothly rounded, and there shall be three (3) projections at the rear to engage the column slots. The brackets shall have a bottom flange to provide additional shelf support. All sharp edges on shelves or brackets shall be eliminated.
13. Microfilm / Cassette Shelf (LwwddTTSA): Shall be formed of not less than 18 gauge steel with front face formed $\frac{3}{4}$ " high and box formed with no less than three (3) 90 degree bends (i.e. down $\frac{3}{4}$ ", return $\frac{1}{2}$ " and a return of $\frac{3}{8}$ "). The rear of the shelf shall be formed with a vertical flange 3" high, a $\frac{1}{4}$ " return to the rear, a $\frac{3}{8}$ " return down, and $\frac{1}{4}$ " side flanges returned to the rear. They shall present a smooth closed appearance on both faces, inside as well as outside, with all sharp edges eliminated. The shelf shall carry a load of 50 pounds per square foot without deflection in excess of $\frac{3}{16}$ ". The front face of the shelf shall be formed to receive label holders.
14. Integral Backstop Shelf (FSwwddNSA).
15. Paperback Display Shelf (LP2A): Shall be formed of not less than 18 gauge steel, with front face formed $1\frac{1}{2}$ " high with no less than (4) four bends: one (1) 82-degree bend (down $1\frac{1}{2}$ ") and three (3) 90-degree bends: returns of $\frac{1}{2}$ ", $\frac{3}{8}$ " and $\frac{1}{4}$ ". The rear of the shelf shall be formed with a vertical 5" high flange a $\frac{1}{4}$ " return to the rear, a $\frac{1}{4}$ " return down, and $\frac{1}{4}$ " side flanges returned to the rear. They present a smooth, closed appearance on both faces, inside as well as outside, with all sharp edges eliminated. The shelf surface and rear vertical flange shall be punched on 1" horizontal centers for three-point reception of adjustable divider lugs. The shelf carries a load of 50 pounds per square foot without deflection in excess of $\frac{3}{16}$ ". The shelf shall be welded to the side brackets to create an 8° sloped area. The shelf storage area is $9\frac{7}{8}$ " Deep. A label holder shall be welded to the front of the shelf. It shall be $35\frac{1}{4}$ " wide with a $1\frac{3}{8}$ " high front flange. It shall be designed to fit snugly to the front return of the adjustable shelves with no encroachment on storage surface.
16. Sliding Reference Shelf (LwwddSRA): Shall be 11" deep by 32" wide of minimum 20 gauge steel reinforced on each side with steel angles for securing to slides. All neatly welded and grinded to remove all sharp edges and corners. The shelf shall operate on double extension ball-bearing slides equipped with rubber bumpers on each end of travel. The assembly shall be securely attached to a standard adjustable shelf with 14 gauge "Z" brackets and at least two (2) screws at each end. This shelf is easy to change from one (1) position to the other without the use of hardware or tools
17. Fixed Periodical Display Shelf (LwwddPF): The display shelf shall be formed of not less than 18 gauge steel, and shall be $10\frac{29}{32}$ " in actual depth. The front face shall be formed 1" high to retain display material, with the top edge having a $\frac{3}{8}$ " hem bend formed to the outside to give added strength and provide a smooth clean seam. The side flanges shall

be 1" and formed down. The back flange shall be formed down $\frac{3}{4}$ " with the bottom edge having a $\frac{3}{8}$ " hem bend formed to the inside to give added strength and provide a smooth clean surface. Shelf end bracket plates shall be of 16 gauge steel having a height of $7 \frac{7}{8}$ " and a base projection dimension of $10 \frac{1}{8}$ ". The bracket plates shall be sheared to provide a slope of 55 degrees. The bracket shall have three (3) projections at the rear, two (2) hooks and two (2) safety lugs to engage the column slots. All edges shall be deburred and have a smooth clean finish. The bracket plates shall be attached to the inside of the display shelf side flanges to conceal the sloped edge of the bracket and to provide a smooth display surface. The shelf end bracket shall be securely bolted to the shelf.

18. Fixed Periodical Display Base Shelf (LwwddPFBA).
19. Hinged Periodical Display Shelf (LSwwddPHA): With 12" nominal depth storage shelf; shall be 14" actual depth, formed of not less than 18 gauge steel. The front face shall be formed 1" high with the top edge having a $\frac{3}{8}$ " hem bend on the outside surface to give added strength and to provide a smooth clean seam. The sides are formed up 1". The back flange is $\frac{1}{2}$ " and formed downward to provide a smooth flush surface for display material. A 16 gauge pivot is provided on the underside of the shelf at each side, located so that the display shelf will rest unaided in a horizontal position. The pivot is secured to the storage shelf bracket with a $\frac{1}{4}$ " - 20 shoulder bolt and lock nut. The 18 gauge storage shelf and the 16 gauge storage shelf brackets are 12" nominal depth (11" actual) and are constructed similar to the standard 18 gauge adjustable shelf and 16 gauge adjustable shelf bracket except that the shelf brackets are punched to receive the shoulder bolts for attaching the pivots. Specification for 16" nominal depth (15" actual) hinged periodical display adjustable shelf similar to above.
20. Hinged Periodical Display Base Shelf (LwwddPHBA): With 12" nominal closed base storage shelves. The hinged shelf shall be of the same construction as the hinged periodical display adjustable shelf except that the 12" nominal (11" actual) storage portion will be constructed similar to the standard 18 gauge closed base shelf and 16 gauge closed base shelf bracket except that the shelf bracket shall be punched to received the shoulder bolts for attaching the pivots.
21. Divider Type Hinged Periodical Display Shelf (LSwwddPHA-DVdd).
22. Divider for Hinged Periodical Display Shelf (FHhdd): Shall be formed of 18 gauge steel with one (1) lug at the top rear side and two (2) lugs on the bottom to engage slots in the shelf for easy adjustment on 1" horizontal centers. The front top corner of the divider shall be sloped at 45 degrees to prevent any obstruction with the hinged periodical shelf. Exposed edges of the divider are smooth and free from burrs.
23. Hinged Periodical Display Shelf with Plexiglas Cover (LSwwddPHA-dd-P).
24. Sloped Display Shelf with Front Edge 3" (LwwddLPF): Shall be formed of 18-gauge steel. The back of the shelf is bent $\frac{3}{4}$ " down at 90 degrees with a flat hem of $\frac{3}{8}$ ". The front of the shelf is formed to obtain a 3" lip with a flat hem of $\frac{3}{8}$ ". The sides are formed down 1" and have holes to fix the shelf to the side brackets with $\frac{1}{4}$ " diameter truss head screws. The side brackets are $7 \frac{5}{8}$ " high and made of 16 gauge flat steel. They are cut out to create a 27-degree sloped shelf. The overall dimension of the shelf assembly is $12 \frac{11}{16}$ " from the face of the upright frame to the edge of the lip.
25. Periodical Display Tilt-up Shelf (LSwwddPDTU): Shall be formed of not less than 18 gauge steel and is 15" nominal depth and 14" actual depth. The front face shall be formed 1" high with the top edge having a $\frac{1}{2}$ " hem bend on the outside surface to give added strength and to provide a smooth clean seam. The sides shall be formed up $\frac{7}{8}$ ". The back flange shall be $\frac{7}{16}$ " and formed downward to provide a smooth flush surface for display material. The tilt-up display shall be supported with two (2) side brackets 16-gauge. Each bracket shall be assembled with two (2) ball bearing wheels at the front portion and 1 rubber stop at the rear. These bracket guides include a road pivot $\frac{1}{4}$ " "O" to secure the pull-out and tilt-up movement.

26. Picture Book Shelf (LSwdddBRAA): Shelf shall be made of a 18-gauge steel, with a 3-inch high front lip (20-gauge) welded to the 3/4" box formed edge of the shelf, a self-hanging removable 10-inch high inclined back (20 gauge) and two 16-gauge shelf supports, 7-3/8" high, designed to provide a 5-degree slope to the shelf.
27. Media Shelf Single Tier (FSwdddMSA).
28. Media Base Shelf Single Tier (FwdddMSBA).
29. Media Shelf Double Tier (FSwdddMSA).
30. Divider for Media Shelf (FMS67).
31. Adjustable Sloped Shelf (FSwdddSNSA): Shall be formed of not less than 18 gauge steel with front face formed 3/4" high and box formed with no less than four (4) 90-degree bends (i.e. down 3/4", return 9/16", return 3/8" and return 5/16"). The rear of the shelf shall be formed with a vertical flange 5 1/2" high, a 3/4" return to the rear, a 3/8" return down, and 11/16" side flanges returned to the rear. They present a smooth, closed appearance on both faces, inside as well as outside, with all sharp edges eliminated. The shelf carries a load of 50 pounds per square foot without deflection in excess of 3/16". This shelf is sloped 11 degrees.
32. Sloped Base Shelf (FwdddSNSBSA): Shall be formed of not less than 18-gauge steel. The front face is formed 3/4" high with no less than four (4) 90-degree bends. The rear of the shelf shall be formed with a vertical flange 5" high, 5/16" return to the rear, and a 1/4" return down. Side flanges of the base shelf engages formed lugs in the base shelf support brackets neatly and securely to render full-support to the side surfaces of the shelf. In addition a kick strip shall be provided as specified under closed base shelf. This shelf is sloped by the insertion of two (2) lateral plate supports 20-gauge at the end bracket hook support. These lateral plates provide 5 degree slope to base shelf.
33. Adjustable Divider Sloped Shelf (FSwdddSA): Shall be formed of not less than 18 gauge steel, with front face formed 3/4" high and box formed with no less than four (4) 90-degree bends (i.e. down 3/4", return 9/16", return 3/8", and return 5/16"). The rear of the shelf shall be formed with a vertical flange 5" high, a 1/4" return to the rear, a 1/4" return down, and 1/4" side flanges returned to the rear. They present a smooth, closed appearance on both faces, inside as well as outside, with all sharp edges eliminated. The shelf surface and rear vertical flange shall be punched on 1" horizontal centers for three-point reception of adjustable divider lugs. The shelf carries a load of 50 pounds per square foot without deflection in excess of 3/16". Letter size shelf is 10 3/4" actual depth and legal size shelf is 13 3/4" actual depth. This shelf is sloped 5 degrees by the insertion of two (2) 20 gauge lateral plate supports at the end bracket hook support.
34. Divider Sloping Base Shelf (FwdddSBSA): Shall be formed of no less than 18 gauge steel. The front face shall be the same as the adjustable divider type shelf. The shelf surface, slots, rear vertical flange and all other features of the base shelf shall be the same specification as the adjustable shelf. Side flanges of the base shelf shall engage formed lugs in the base shelf support neatly and securely to render full-support to the side surfaces. In addition a kick strip is provided as specified under closed base shelf. This shelf is sloped 5 degrees by the insertion of two (2) 20 gauge lateral plate supports at the end bracket hook support.
35. Fixed Media Browsing Box Shelf (FwdddFDA): Browser box for CD's, videocassettes, paperback books, audio tapes and various computer tape cartridges. Units shall be cantilever type, freestanding steel multimedia shelving. Each browser configuration shall be offered in a fixed style and a pull-out version. The single tier browser boxes shall be 33 13/16" wide x 10" deep x 5" high. A rubber mat longitudinally corrugated is installed on the shelf and will act as a non-skid surface. All browser box formations in both fixed and pull-out versions shall be formed of 18 gauge steel, with ends bolted to the formed box. Ends are 16 gauge steel on all boxes, and on fixed browser boxes are formed as brackets for

attaching to shelving frames. The box formations have a 2 1/2" high front face. All browser boxes shall have a sloping back support angled back at approximately 15 degrees from vertical. A 3/4" x 13/16" U-shaped cross-member shall be mechanically attached between ends and in line with front boxing on browser unit. A series of 1/4" diameter holes shall be aligned along the inside facing horizontal center line of this tube, and matching holes shall be inserted at the same elevation along the sloped back support. Front to back compartment dividers shall be installed by inserting 1/4" diameter steel rods into the hole placements, and are to be adjustable with ease. The fixed browser box versions shall be 35 5/16" wide.

36. Pull-out Media Browsing Box Shelf (FwwddSDA): The pull out browser box versions shall be 33 13/16" wide, and shall have a saddle type support structure of 18 gauge steel. The saddle shall produce a fixed, fully closed bottom to the assembly, and the continuous formed ends shall be formed as brackets for attaching to shelving frames. The pull-out box portion shall operate on full-extension ball bearing slide mechanisms 10", mounted to box and the saddle end brackets at each end. The design of all browser box versions shall produce a clean finished appearance. No sharp edges or exposed assembly hardware shall be acceptable.
37. Sliding Drawer with Single Tray (FwwddSTDA).
38. Sliding Drawer with Double Tray (FwwddDTDA).
39. Adjustable Integral Back Shelf (FSwwddLBA): Shall be formed of not less than 18 gauge steel with front face formed 3/4" high and box-formed with no less than four (4) 90-degree bends (i.e. down 3/4", return 5/8", return 3/8" and return 5/16"). The rear of the shelf shall be formed with a vertical flange 1 1/2" high, and a 5/16" return to the rear. The integral back shall be designed to receive a sliding wire book support. They shall present a smooth, closed appearance on both faces, inside as well as outside, with all sharp edges eliminated. The shelf carries a load of 50 pounds per square foot without deflection in excess of 3/16".
40. Base Shelf with Integral Back (FwwddLBBSA): Shall be formed of not less than 18 gauge steel. The front face shall be formed 3/4" high with no less than four (4) 90 degree bends (i.e. down 3/4", return 5/8", return 3/8" and return 5/16"). The rear of the shelf shall be formed with a vertical flange 1 1/2" high, 5/16" return to the rear, and an 11/16" return down. The integral back is designed to receive a sliding wire book support. Side flanges of the base shelf shall engage formed lugs in the base shelf bracket neatly and securely to render full-support to the side surface of the shelf. In addition a kick strip shall be provided as specified under closed base shelf.
41. Sliding Wire Book Support (L8-9LBWB).
42. Shelf Backstop (LwwX or LwwRX): Shall be formed of not less than 18 gauge steel. The top and bottom edges shall have a 5/16" return formed at 90 degrees and a 3/16" return formed down. The front face shall be 3" high after forming. The backstop shall be formed at both edges with two (2) hooks that will engage into upright slots, allowing for backstops to be installed after shelves and bases are installed.
43. Base Bracket Cover (LddSC): When required, the base bracket cover shall be provided at exposed range ends to finish off the exposed ends of base shelf bracket. They shall be fabricated in the same manner as base shelf bracket, and of the same gauge, except that shelf supporting lugs and bottom flange shall be eliminated.
44. Wall Angle (LWAA): Shall be of at least 11-gauge and measuring at least 3" x 2" x 1" wide and shall be provided for all single faced sections in the quantity of one (1) per section
45. Floor Anchor Angle (19.200.026.01).
46. Transverse Top Bracing (TTS92): Shall be channel shaped made of 16-gauge and

measuring at least 1 5/8" in the web and 1 1/8" at the flanges. When required they are provided in quantity of one (1) length of at least eight feet for every three (3) sections of double faced bookstack on all open base installations or any installation where the base shelf is the same depth as the adjustable shelves. Transverse top bracing should only be omitted where base shelves are at least 2" deeper than adjustable shelves, or where the base shelf supports are securely fastened to the floor on both sides through the outermost hole in the bottom flange, and the base plates are fastened to the floor at least every other section.

47. Range Finder Double Face Aluminum (L2RFA): Shall be formed "V" shaped of one (1) piece construction of either .025 aluminum or 22-gauge steel. The four (4) horizontal edges shall be designed to accept a 3" x 5" card on both vertical exposed faces.
48. Card Holder (L2CHA): Shall be polished aluminum designed to accept 3" x 5" card.
49. Label Holder Snap-on (LwLHP): Shall be 24 gauge aluminum (anodized finish) 5" wide with a 3/4" high front flange. It shall be designed to fit snugly to the front return of the adjustable shelves with no encroachment on storage surface. Also available in clear acrylic plastic.
50. Sloped Base for Periodical Display (DUBwwA): The display is made of four (4) components: a display back plate, a support angle, two foot base brackets and a kickplate. The whole assembly makes a 10degree inclined display where shelves shall be added. The display back plate is made of 18-gauge steel. It is perforated on both extremities by increments of 1" in order to admit shelf bracket's hooks. The support angle made of 16-gauge steel is "L" shaped at 100degrees and has inserts. It is fixed to the shelving frame with hardware, and the back plate's upper end is bent to be fixed to the angle for integral support. The bottom of the back plate is fixed to the foot base bracket, which are made of 16-gauge steel and fixed to the bottom of the shelving frame to give stability. The kickplate is made of 18-gauge steel and is used to provide an aesthetic look.
51. T-Base with wheels (WTPxxSA for starter, WTPxxAA for adder). T-Base shall have a minimum depth of 18" and shall made for double face units. T-Base assembly shall be 17.5" high (without wheels), 23-1/16" with wheels and is made of three (3) main parts: base, upright and wheels. The base is a 16 gauge steel tube 1" x 2.5" and shall be perforated to allows wheels insertion and fixation. Open ends are protected by platis caps. The upright shall be welded to the base and is made of two (2) components welded together. For a starter, it is two (2) pieces 14 gauge steel bent in U and welded to create a cavity in which the shelving upright is inserted. For an adder, a 16 gauge steel 1" x 1 1/2" tube is welded. Each T-Base shall have two (2) 5" diameter swivel wheels.
52. Browsing Box (LwwddBBA): Made of 18 gauge steel, the box is 6 1/4" high inside. The front wall is vertical and has four (4) 90-degree bends to protect both user and content. A reinforcement is welded at the botom of the box and it can admit a book support. The rear wall is tilted 102 degrees backward, so that books can lean attractively. A black rubber mat is placed at the bottom of the box to prevent the contents from sliding. 6 5/1" high pupport brackets made of 16 gauge steel close the side of the box and are welded to it. Bracket shall have two (2) hooks and two (2) safety lug to engage the column slots.
53. Paperback Zig Zag Backstop (LwwPDA): This display unit in made of 18 gauge steel and has a zig zag shape. It shall be 5" high and is place verticallu on an existing shelf. Bends have an alternate width of 4.5" and 5.25". Is shlla be avalaible in 3 formats: 5 peaks for 36" wide shelf, 4 peaks for 30" wide shelf and 3 peaks for 24" wide shelf. Returns of 0.625" at the botom helps for equilibrium and allow to fix the display with double face tape.

2.3. FINISH SPECIFICATIONS

- A. Shall be the finest of their respective kinds and those best adapted to the construction for which they are employed to meet ISO 9001:2008 quality standards. All steel shall be superior quality mild, cold rolled, pickled, and double annealed, free from scale and buckle. All plating used on

exposed parts shall be metallic furniture stock. All gauges are U.S. standard. The design of all parts shall be such that the completed installation shall present a neat and finished appearance and shall be free from exposed sharp edges or projections. All other special materials shall be as hereinafter specified.

- B. All components shall be painted with an electrostatically applied powder coat finish. All steel parts shall be machined smooth and thoroughly cleaned by a process of completely washing in a phosphatizing solution to insure removal of oil, grease or other foreign material which in any way would interfere with the adhesion of the priming coat. Following the cleaning process, all parts shall be coated and confirming every part is thoroughly and completely covered with fine powder coat, and baked to the paint manufacturer's recommendation. The finish for powder coat shall be medium gloss, giving a reading of 50 to 60 degrees on a standard gloss meter and must be capable of withstanding severe hammer and bending test without flaking. The finish for epoxy-polyester hybrid powder coat shall be a minimum 1.2 mil thickness capable of resisting acetic acid, household ammonia, 10 % lye, alcohol, salt spray, abrasion and printing, and all normal usage resistant requirements of a good finish. In addition, powder coat shall not be off gassing to prevent deterioration of collection and other stored materials. Colors to be selected by owner.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Examine subfloor surfaces, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fixed storage units.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of fixed storage units.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2. INSTALLATION

- A. Install components and accessories after finishing operations, including painting, have been completed. Install shelving units to comply with final layout drawings, in strict compliance with manufacturer's printed instructions and structural calculations. Position unit's level and plumb at proper location relative to adjoining units and related work
- B. Field Quality Control: Remove and replace components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Provide new matching units, installed as specified and in manner to eliminate evidence of replacement.
- C. Adjust: Adjust components and accessories to provide smoothly operating, visually acceptable installation.
- D. Cleaning: Immediately upon completion of installation, clear components and surfaces. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.
- E. Protection: Protect system against damage during remainder of construction period. Advise Owner of additional protection required to ensure shelving units will be without damage or deterioration at time of substantial completion.

3.3. DEMONSTRATION/CUSTOMER TRAINING

- A. Provide complete training to end-user's staff. Training shall include general safety and operation instructions, and basic preventative maintenance procedures.

END OF SECTION

