WARNING

In order to make the proper use of the Mobile Shelving Storage – Powered (Electrical / Cantilever Shelving) technical specifications, please edit the document at the following points prior to print or email the document :

1.3.B.	Select the appropriate term.
2.1.D.	Select the floor option (1 or 2). **If option 1 chosen : Select plywood thickness.*
2.1.H.	Select the control keyboard option.
2.1.J.	Items 1 to 3 : Select the appropriate options to the project.
2.2.E. to 2.2.O.	Select the accessories applicable to the project.

SECTION 10 56 28 (10681)

MOBILE SHELVING STORAGE – POWERED (ELECTRICAL)

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. Mobile Storage Units with cantilever.

1.3 PERFORMANCE REQUIREMENTS

A. Seismic Performance : Provide mobile storage units capable of withstanding the effects of earthquake motions determined according to the building codes.

B. Design Requirements : All shelving elevations as [per attached drawings] or [described in the specifications].

C. Color Card : All available color selections. Vendors must provide a minimum of 12 color selections [powder coat paint finish].

D. Installer Certificates : Signed by manufacturer certifying that installers comply with specified requirements.

E. Product Certification : Submit manufacturer's certification that products comply with requirements of the specifications. A list of deviations must be provided for all items not meeting the specifications. The document must include appropriate justification of the alternate proposed design.

F. Warranty : Submit a written warranty, executed by Contractor, Installer and Manufacturer, agreeing 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: For the lifetime of the shelving and mobile carriages ("structural frames"). For the purposes of this warranty, structural frames shall be deemed to exclude all moving parts, controls and guides that have immediate contact with any moving parts.

10-year Limited Warranty: For ten (10) years from the date written hereafter*, for all carriage drive motors. During the 10-year warranty period, all parts are included at no cost for 10 years. Labor installation is included at no cost during the first year of the 10-year warranty period.

5-year Limited Warranty: For five (5) years from the date written hereafter*, for all equipment, other than structural frames and motors, During the 5-year warranty period, all parts are included at no cost for 5 years. Labor installation is included at no cost during the first year of the 5-year warranty period.

*10-year limited warranty and 5-year limited warranty are applicable from the date of invoice. Warranty registration must be completed by the end-user at www.montel.com. As indicated on the registration form, registration constitutes the customer's written acceptance of installation.

G. Reference list : Provide a list of three (3) mobile storage installations to be called or visited by Owner, Architect and Construction Manager. Installation must be of similar size, scope of specified system. Visit is intended to witness operation and quality of installation. Manufacturer is required to address all issues raised by Owner, Architect and Construction Manager. List must include contact names, phone numbers, size and quality of carriages and system operation.

H. Mandatory : Manufacturers must be ISO 9001:2008 certified. Submit ISO certification with proposal.

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

A. Manufacturer's Certifications : Separate written Certifications 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. If bidding different manufacturers for mobile and shelving, two (2) certifications are required. Preference will be given to one-source supplier.

1.5 PROJECT CONDITIONS

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. Preinstallation Conference : Conduct conference at project site. Review methods and procedures related to installation of mobile 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. Review structural loading limitations.
   3. 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.
      d. Manufacturer's representative.

PART 2 PRODUCTS

2.1 MATERIALS – MOBILE STORAGE UNITS

A. Basis of Design : Products are based upon Electrical Movable Shelving Systems. Provide products complying with requirements of the following specifications and made by Montel Inc.

B. Grout
   1. General : The compound shall be a hydraulic type cement which, when mixed with water, will harden to produce a permanent bolt setting anchor. The compound shall conform to the following specifications, all of which are based on the performance of the test specimens at room temperature and in laboratory air.
   2. Linear Movement : It shall not shrink on setting, but shall exhibit a slight expansion of not more than .002 inch per linear inch.
   3. Compression Strength : Two (2) inch cubes made in accordance with ASTM standards tested on a Balding-Southward machine of 60,000 pounds capacity shall have the following minimum average compression strengths :

      Age : 1 hour - 4500 psi
      7 days - 8000 psi

   4. All tracks must be grouted the entire length of each run, including all rail joints. As the grout slightly expands during the cure process, it will be in permanent contact with the structural members being grouted. This will provide a continuous support to the system, and optimal weight distribution on the existing floor slab.

C. Track :
   1. Rails shall be designed and manufactured to carry loads of 1000 pounds per linear foot of carriage. Made of minimum cold rolled steel (CRS) rail assembly of ¾" high x 1" wide is inserted in an aluminum sub rail treated against oxidation caused by concrete. Rail contact surface shall be minimum 1" wide. Anti-tip device is required to meet local building code.
   2. Rails shall be leveled with and not project above or below the walking surface.
   3. Rails shall be designed to be anchored on top of structural concrete floor and to allow for adjustment so rails can be leveled over an uneven floor.
   4. Maximum profile of recess adjacent to rail to accommodate manufacturer's carriages guidance system and/or anti-tip system not exceeding 7/16" wide x ¾" deep.
   5. All rail connection joints shall be designed to provide horizontal and vertical continuity between rail sections, to gradually transfer the concentrated wheel point load to and from adjoining sections.
   6. Rail shall be located and positioned properly, leveled and grouted, allowing at least ¼" for grout under high point. Grout to be worked under rail, any voids completely filled and trimmed upsides and flush with rails. This will allow proper weight distribution from rail to existing slab.
   7. Levelness of rails : 3/32" maximum variation from true level within any module; 1/16" maximum variation between adjacent rails, perpendicular to rail direction; 1/32" maximum variation in 10' 0" of rail length, along any rail.
   8. Rails to be rechecked for integrity of position and levelness and anchored into structural concrete slab, using anchors in sizes and quantities as determined by manufacturer.
   9. Main rail section shall be a minimum of 10' 0" each with shorter sections used to terminate each individual rail assembly.

D. Floor **[option 1 or 2]**
   1. Floor/Ramp (Raised floor) :
      a. Finished elevation of the raised floor shall be flush with the top of the rails.
      b. The ramp shall not extend beyond the end of the carriages and shall have a maximum slope of nine (9) degrees. The vertical transition from the ramp edge to the floor shall be a maximum of 1/8". Ramps shall extend under all moveable and stationary ranges except as noted differently. Ramps shall be made of steel 12-gauge.
      c. Floor panels shall be constructed of a minimum [5/8"] or [¾"] thick, underlayment grade plywood. Floor panels must be provided between all rails the full-width of modules, except under stationary platforms.
      d. The floor and ramp shall be constructed in a manner that will absolutely prevent any warping or deformation of the floor panels in a normal operating environment.
      e. Floor covering is to be installed and supplied by the Owner.
   2. Embedded rails:
      a. Finished elevation of the raised floor shall be flush with the top of the rails.
      b. Rail shall be protected with steel covers during the pouring process.
      c. Concrete topping shall be poured in order to fill the gap between existing slab and top of the rail (NIC).

E. Carriages :
   1. All carriages shall be riveted construction for flexibility. Welded carriages are unacceptable. Carriages and stationary platforms shall be constructed of "C" shape profiles 1 ½" deep x 5" high, minimum 12-gauge steel, with 1000 pounds per linear foot minimum capacity. Wheel support sections shall be 12-gauge (minimum) steel and shall be riveted between the main support face sections, one per aisle assembly. Support sections shall be embossed to eliminate the need of filler plates between the shelving/cabinet and the C shape supports.
   2. Fixed carriages, as shown on the drawings, shall be of same construction and height as the moveable carriages and anchored to rails. Setting of shelving on floor at ends of mobile runs in unacceptable.
   3. Necessary carriage splices shall be bolted type designed to maintain proper unit alignment and weight load distribution. Carriage face sections shall provide a smooth, clean appearance without any assembly holes or protruding hardware.
   4. Carriage straightness shall have no more than ¼" maximum deviation from a true straight line. There shall be no permanent set or slippage in any spliced or welded joint when exposed to forces encountered in normal operating circumstances.
   5. Carriage construction shall be so designed to allow the shelving uprights to be secured to the carriage frame with vibration proof anch assemblies (Two (2) per upright).
   6. Each carriage shall have two (2) wheels per rail.
   7. Carriages shall be powder coat (1.5 mil) inside and out. Color selection by Owner to match shelving. Powder coat paint finish is required for finish durability and elimination of any off gassing. Finish has to be inert, with no volatiles present in finished product. Visible galvanized steel structural carriage components are unacceptable.

F. Wheels :
   1. Wheels shall be constructed of solid minimum 1045 cold rolled steel (CRS) for smooth operation. Minimum load capacity per wheel 3200 pounds. Wheels shall be precision ground, balanced. All bearings shall be permanently shielded and lubricated.
   2. All wheels shall be minimum 5" diameter (outside dimension). They shall be double flanged and sloped to insure efficient guidance. Load wheels are spherical to reduce friction; drive wheels shall be flat.
   3. Due to carriage length and shelving heights, guide wheels shall be at all wheel locations.

G. Face Panels :
   1. All exposed face panels shall be steel (mandatory). End panels shall be full-depth and height of shelving units. Panels to be located on all operating ends of ranges as shown on drawings.

H. Keypad control **[option 1 or 2 or 3]** :
   1. One (1) keypad control with digit per module
      a. Each module shall have one (1) 4-digit keypad control centered in the master face panel and located 52" from the base. The keypad shall have a 32-character display, two (2) arrow shaped OPEN buttons, a STOP button, a RESET button with a backlit red reset light and digits from 0 to 9. This

master keypad will control the movement of all carriages in the module. The 32-character display will give the status of the system at any time.

b. To operate the system, the user shall reach the master keypad, select the aisle to be open (aisles as to have to be numbered) and then press one (1) of the two (2) arrows. The master control shall have the capability to open any aisle within the module. Aisle shall open automatically regardless of the position of the carriages.

2. Keypad controls with digits on the master carriage and standard controls on the other carriages :
   a. Each carriage shall have one (1) keypad control centered in the face panel and located 52" from the base. The master keypad shall have a 32-character display, two (2) arrow shaped OPEN buttons, a STOP button, a RESET button with a backlit red reset light and digits from 0 to 9. The other keypads shall have a 32-character display, two (2) arrow shaped OPEN buttons, a STOP button and a RESET button with a backlit red reset light. The LCD display on the keypads will give the status of the module at any time.
   b. To operate the system, the software offers two (2) possibilities. First option, pressing the arrow pointing the selected aisle will open any moveable carriage in order to access the aisle selected. Second option, pressing the left or right arrow will determine the carriage movement in the chosen direction. Aisle shall then open automatically regardless of the position of the carriages.
3. Keypad controls with digits on all carriages :
   a. Each carriage shall have one (1) keypad control centered in the master panel and located 52" from the base. All the keypad controls shall have a 32-character display, two (2) arrow shaped OPEN buttons, a STOP button, a RESET button with a backlit red reset light and digits from 0 to 9. Each LCD display keypad will constantly give the status of the module and its related carriage.
   b. The software shall offer two (2) programmable options to operate the system. As a first option, pressing the arrow pointing the selected aisle will initiate the proper carriage movement to access the aisle pointed by the arrow. As the second option, pressing the left or right arrow will initiate the proper carriage movement in the direction pointed by the arrow. In all cases, aisle shall open automatically regardless of the position of the carriages. Both options can be modified easily without requiring factory technician support.

I. Operations and Controls :
   1. Each carriage shall provide controlled acceleration and deceleration to protect stored books or objects. Each motor shall have a dynamic braking system which will stop the carriage whenever a safety feature is activated.
   2. Each module/carriage can be easily programmed or locked simply by pressing different button sequences on the master keypad, not requiring the utilization of special software.
   3. All controls and indicator lights shall be solid state and shall provide visual indication of safety system operation.

4. System controls shall start motors sequentially to minimize power demand. Infrared proximity switches (mandatory) shall be adjustable. Mechanical plungers are not acceptable in order to minimize maintenance.
5. Each carriage to be equipped with a minimum of one (1) 90 VDC current limited, fractional horsepower gear motor.
6. Gear motor shall be connected to a full-length shaft at all rail locations to avoid potential distortion.
7. Controls shall provide sequential movement with a controlled running speed of 3" per second.
8. System shall operate on 115 Volts 50/60 Hertz, 15 or 30 Amp dedicated circuit, depending on the quantity of carriages.
9. Every potential aisle can be protected with an infrared foot-level safety beam, mounted on both sides of each moveable carriage, ¾" from floor. Safety sweep using mechanical switches are not acceptable.
10. Buttons with membrane technology are mandatory to ensure maximum life duration of controls. Mechanical push button keypads are not acceptable.
11. Human presence detectors shall be used to secure the opened aisle.
12. Manual Ratchet : Carriage can be moved with a ratchet tool connected to the full-length shaft.
13. Ground embedded wire track (eliminates the need for scissor arms)
    a. Electrical system shall include two conduits made of 6063-T5 aluminum extrusions integrated in the sub-floor underneath the carriages. Conduits shall be located at the back of the system and run the full-length of the module. Extrusions shall be leveled and interconnected to the aluminum sub-rail by means of anchor bolts to ensure proper integrity.
    b. All the wiring carrying the 12V communication cables and the 120V power cables between the carriages shall run into the aluminum conduits.
    c. Communication cables shall be RJ45 retractable type and shall run in the ¾" diameter circular aluminum conduit.
    d. Power cables carrying 120 V power shall be continuous heavy duty Flex Control type and shall run into the 5/8" high x 7" wide aluminum conduit.
    e. Both cables shall run through a protective pipe that shall be anchored to the structure of the moveable carriage.
    f. Flexible sealing PVC strips shall close the openings to protect the wires during and after the carriage movement.
    g. The exterior height of the aluminum extrusions shall not exceed 1-3/16".

J. Optional items :
1. Overhead scissor arms will distribute the power and provide communication between the carriages. [Scissor arms replace the ground embedded wire track concept].
2. Additional safeties :
    a. Entry Sensor : Shall lock the system when a user enters an aisle. The next user will have to check the open aisle and press the reset before selecting a new aisle.
    b. Counting Device : Shall monitor users entering and exiting an aisle. The system will reset automatically once all users have left the aisle.
    c. Every potential aisle shall be protected with an infrared hip-level safety beam, mounted on the both sides of each moveable carriage.
3. Controlled access :

a. PIN Code Controlled Access – HIPAA Compliant : The HIPAA compliant PIN code access shall provide security for confidential documents or materials. Different PIN codes can be allocated, allowing access to specific modules only.
b. Electro-Mechanical Lock for Controlled Access : The whole system shall be closed and locked during designated time periods using an electro-mechanical lock (*Note : This feature requires the PIN code controlled access option*).
c. Automatic Lock/Relock Timer Active Safety : Shall be programmed for a predetermined period to automatically lock or relock the system if inactive for more than the determined period. The next user will have to check the aisle and press the RESET button before selecting a new aisle.
d. Magnetic Card Access Reader : Users can operate the system with a card swipe access.

4. Other options :
   a. Wire raceways shall be installed full-length within each carriage to protect the wires during the carriage movement.
   b. Hinged Front Panels : Designed to facilitate access to controls, made of 18-gauge steel, mounted on hinges, requiring a special tool to be opened.
   c. Auxiliary Power :
      - Built-in Battery Back-Up Override : Electrical mobile system shall be always operational even during power failures. Battery must always be recharging. Requires one (1) per module. All standard and optional safeties must remain operational while system is in Battery Back-up mode and UPS is engaged.
   d. Overhead Aisle Lighting : Each aisle shall be equipped with automatic lighting. Can be interfaced with the counting device, entry sensor, motion detector or the building lighting system.
   e. Auto-Park : System shall be preprogrammed to close all ranges after a predetermined period of inactivity to protect stored material from sprinkler systems, light, dust, etc. This feature gives the option to close the system at specific times to prevent unauthorized access after work hours.
   f. Auto-Spacing : Once activated, aisle spacing shall be evenly distributed. The sequence shall be activated by an internal timer (preset time), a key switch located on the master panel or a dry contact from the customer building interface.
   g. Building Interface : System shall be linked to the building interface (alarm, fire, police station, sprinkler system, power generator, lighting system).
   h. Various Languages : Digital keypad control safety messages shall be available in at least 3 languages : English, Spanish And French.
   i. Main Aisle Access : System shall be programmed so the most frequently used aisle is always opened by default after a predetermined period of inactivity.
   j. Off-Site Monitoring : System shall offer capability to diagnose, monitor and service installed systems from a distance via modem.
   k. Upgradeable Settings : Control boards shall offer capability to be upgraded.
   l. Programmable Speed Parameters : Shall be accomplished by using the keypad.

m. Programmable Mobile/Fixed Carriage : One (1) or multiple moveable carriage(s) shall offer the possibility to be modified into one (1) or multiple fixed carriage(s).

2.2 MATERIALS – CANTILEVER SHELVING

A. Columns 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. 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. Intermembering 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.

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 characteristics. 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 people may come in contact with the tube and visually pleasing from the top on low units and from the bottom on high units.

C. Bottom spreader channel : To be channel shaped, open to the floor, of minimum 16-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 book stack.

D. Leveling : 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 leveling glide. Such glides allow for maximum leveling on irregular floor conditions. Base brackets will be leveled when anchoring to the floor. Each initial double faced section in a range receives six (6) levelers; each additional double faced section receives four (4) levelers. Each initial single faced section in a range receives four (4) levelers; each additional single face section receives three (3) levelers. All sections, single or double face should 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 neat 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 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 kick strip 3" high is provided with return flanges at the top & bottom for stiffening. 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.

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. They 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 ½", return 3/8" and return ¼"). They shall present a smooth, closed appearance on both faces inside as well as outside with all sharp edges eliminated, yet arranged 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 17/64" 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 16-gauge steel, 48" high, triangular 2" at the top and depth of base at the bottom. A 1 ½" bend with holes will allow anchoring to the floor.

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 accumulating extra parts or 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 ½" 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 neat alignment.

K. Bracket for wood top or plastic laminate top : Inverted type bracket supports for canopy tops shall be formed of 11-gauge steel. Brackets shall have four (4) projections at the rear, three (3) 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 (LhhddEPA-PAT) : When required, end panel is provided at exposed ends. They are formed of 18-gauge patterned steel with 1 ½" 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).

M. Findable book support (LMhS) : Shall be 16-gauge steel, one (1) piece construction, 6" or 9" high, with a 6 ¼" long "T" shaped base. The top and side faces shall be flanged and have a ¼" 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 5 ½" integral back. In 55-degree sloped position, shelf shall be bolted to side bracket and shall provide 5 ½" storage with 8" integral back. All universal shelves must be interchangeable with conventional shelves. Shall be formed with front and rear faces formed ¾" high and box formed with no less than four (4) 90-degree bends (i.e. down ¾", return ½", return 3/8" and return ¼"). 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. Adjustable book shelf shall be designed to carry a book load of 50 pounds per square foot without a deflection in excess of 3/16". The shelf shall be reversible, front to back for maximum shelf life.
   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 any screw or tools. All universal display base shelf must be interchangeable.
   3. Adjustable divider shelf (FswwddA) : Shall be formed of not less than 18-gauge steel, with front face formed ¾" high and box formed with no less than four (4) 90-degree bends (i.e. down ¾", return ½", return 3/8", and return ¼"). The rear of the shelf shall be formed with a vertical flange 5" high, a ¼" return to the

rear, a ¼" 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 ¾" actual size depth and legal size shelves shall be 13 ¾" actual size depth.

4. Divider type 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 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 neatly rounded with an approximate 2" radius. Exposed edges of the divider shall be smooth and free from burrs. Letter-size dividers are 6" high x 10" deep. Legal-size dividers are 6" high x 12" deep.
6. Storage shelf (LwwddUA) : 8", 9", 10", 16" nominal shelf depth. Shall be formed of not less than 18-gauge steel with front and rear faces formed 1 1/8" high and box-formed with no less than four (4) 90-degree bends (i.e. down 1 1/8", return ½", return 3/8" and return ¼"). 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 that is from face of column to front face of shelf. The rear face shall be notched at both ends to allow clearance for the 11-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) ¼ - 20 x 3/8" cadmium R.H.M.S. with hex nuts.
7. Deep storage shelf (UwwddA) : 18", 22" nominal shelf depth. The nominal depth shall be 1" greater than the actual shelf depth which is from face of column to front face of shelf shall be formed of not less than 18-gauge steel with front and rear faces formed 1 1/8" high and box-formed with no less than four (4) 90-degree bends (i.e. down 1 1/8", return ½", return 3/8" and return ¼"). 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 11-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) ¼ - 20 x 3/8" cadmium R.H.M.S. with hex nuts. A 24-gauge steel hat shaped stiffener 2 ¼" in width and ¾" 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", 16" nominal shelf depth. Shall be of not less than 11-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) ¼” x ½” slots. The vertical leg shall be a minimum of 1 ½” wide by 3 5/8” long. The length of the bracket shall be approximately 2” 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 11-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) ¼” x 2” slots. The vertical leg shall be a minimum of 1 ½” wide by 3 5/8” long. The length of the bracket shall be approximately 3” 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 19-gauge steel with the front face formed ¾” high and box formed with no less than four (4) 90-degree bends (i.e. down ¾”, return ½”, return 3/8” and return ¼”). The actual shelf depth shall be 3 ½” or 5 ½”, with a 1” high rear flange formed upward to provide a backstop for the microfilm, and the shelf shall have 11/16” end flanges formed downward. The shelf bracket shall be of not less than 16-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 19-gauge steel with the front face formed 1” high and box formed with no less than four (4) 90-degree bends (i.e. down ¾”, return ½”, return 3/8” and return ¼”). The shelf shall be sloped at approximately 8 degrees and the actual shelf depth shall be 3 ½” or 5 ½”, with a 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 ½” end flanges formed downward. The shelf bracket shall be of not less than 16-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 ¾” high and box formed with no less than four (4) 90-degree bends (i.e. down ¾”, return ½”, return 3/8” and return ¼”). The rear of the shelf shall be formed with a vertical flange 5” high, a ¼” return to the rear, a ¼” return down, and ¼” 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 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 ½” high with no less than (4) four bends : one (1) 82-degree bend (down 1 ½”) and three (3) 90-degree bends : returns of ½”, 3/8”and ¼”. The rear of the shelf shall be formed with a vertical 5” high flange a ¼” return to the rear, a ¼” return down, and ¼” 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". The shelf shall be welded to the side brackets to create a 8° sloped area. The shelf storage area is 9 7/8" Deep. A label holder shall be welded to the front of the shelf. It shall be 35 ¼" wide with a 1 ½" 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 at least 18-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) bolts at each end. The assembly shall be installed so that the front edge of the sliding shelf extends 1" beyond the face of the adjustable shelf for ease in locating. After the shelf is installed it shall be possible to move the assembly to a new location without the use of tools.
17. Fixed periodical display shelf (LwwddPF) : The display shelf shall be formed of not less than 18-gauge steel, and shall be 10 29/32" in actual depth. The front face shall be formed 1'' high to retain display material, with the top edge having a 7/8" hem bend formed to the outside to give added strength and provide a smooth clean seam. The side flanges shall be ¾" and formed down. The back flange shall be formed down ¾" with the bottom edge having a 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 7/8" and a base projection dimension of 10 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 one (1) safety lug 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 ½" 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 ½" 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 in a horizontal position (without handholding) when referring to storage shelf material. The pivot is secured to the storage shelf bracket with a ¼ - 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 ¾” down at 90 degrees with a flat hem of 3/8”. The front of the shelf is formed to obtain a 3” lip with a flat hem of 3/8”. The sides are formed down 1” and have holes to fix the shelf to the side brackets with ¼” diameter truss head screws. The side brackets are 7 3/8” 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 11 ¾” 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 ½” hem bend on the outside surface to give added strength and to provide a smooth clean seam. The sides shall be formed up 1”. The back flange shall be ½” 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 ¼” “O” to secure the pull-out and tilt-up movement.
26. Picture book shelf BRA : 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 (FSwwddMSA).
28. Media base shelf single tier (FwwddMSBA).
29. Media shelf double tier (FSwwddMSA).
30. Divider for media shelf FMS67).
31. Adjustable sloped shelf (FSwwddSNSA) : Shall be formed of not less than 18-gauge steel with front face formed ¾” high and box formed with no less than four (4) 90-degree bends (i.e. down ¾”, return ½”, return 3/8” and return ¼”). The rear of the shelf shall be formed with a vertical flange 5” high, a ¼” return to the rear, a ¼” return down, and ¼” 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 5 degrees by the insertion of two (2) 18-gauge lateral plate supports at the end bracket hook support.

32. Sloped base shelf (FwwddSNSBSA) : Shall be formed of not less than 18-gauge steel. The front face is formed ¾" high with no less than four (4) 90-degree bends. The rear of the shelf shall be formed with a vertical flange 5" high, ¼" return to the rear, and a ¼" 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 18-gauge at the end bracket hook support. These lateral plates provide 5-degree slope to base shelf.
33. Adjustable divider sloped shelf (FSwwddSA) : Shall be formed of not less than 20-gauge steel, with front face formed ¾" high and box formed with no less than four (4) 90-degree bends (i.e. down ¾", return ½", return 3/8", and return ¼"). The rear of the shelf shall be formed with a vertical flange 5" high, a ¼" return to the rear, a ¼" return down, and ¼" 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 ¾" actual depth and legal size shelf is 13 ¾" actual depth. This shelf is sloped 5 degrees by the insertion of two (2) 18-gauge lateral plate supports at the end bracket hook support.
34. Divider sloped base shelf (FwwddSBSA) : 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) 18-gauge lateral plate supports at the end bracket hook support.
35. Fixed media browsing box shelf (FwwddFDA) : 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 35 5/8" 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 ¾" high front face. All browser boxes shall have a sloping back support angled back at approximately 15 degrees from vertical. A ¾" diameter tube shall be mechanically attached between ends and in line with front boxing on browser unit. A series of ¼" 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 produced by inserting ¼" diameter steel rods into the hole placements, and are made to be adjustable at will. The fixed browser box versions shall be 35 5/8" wide.

36. Pull-out media browsing box shelf (FwwddSDA) : The pull out browser box versions shall be 33 ½" 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 Jack Moore 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 ¾" high and box-formed with no less than four (4) 90-degree bends (i.e. down ¾", return ½", return 3/8" and return ¼"). The rear of the shelf shall be formed with a vertical flange 1 ½" high, and a ¼" 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 ¾" high with no less than four (4) 90-degree bends. The rear of the shelf shall be formed with a vertical flange 1 ½" high, ¼" return to the rear, and a ¼" 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 ¼" return formed at 90 degrees and a ¼" return formed down. The front face shall be 3" high after forming. The backstop shall be formed at both edges with two (2) hooks which 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 12-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 18-gauge and measuring at least 1 ½" 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 book stack 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 faced aluminum (L2RFA) : Shall be formed "V" shaped of one (1) piece construction of either .050 aluminum or 20-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 ¾" 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).

2.3 FINISH SPECIFICATION

A. Shall be the finest of their respective kinds and those best adapted to the construction for which they are employed to meet ISO 9001:2000 Quality standards. All steel shall be the best 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 :
[B-a) Powder coat finish]

All steel parts shall be made 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 by spraying, making certain 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 great value books. 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 mobile storage units.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of mobile storage units.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EXAMINATION

A. Fully grout tracks.

B. Permanently attach shelving units to carriages. Stabilize shelving units to comply with mobile storage unit manufacturers written requirements. Reinforce shelving units to withstand the stress of movement where required and specified.

C. Track and infill between tracks shall be installed prior to covering. Install system to comply with final layout drawings, in strict compliance with manufacturer's printed instructions. Position units level and plumb, at proper location relative to adjoining units and related work.

D. 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.

E. Adjust : Adjust components and accessories to provide smoothly operating, visually acceptable installation.

F. 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.

END OF SECTION