

Section 12 50 00
Furniture System

PART 1 --GENERAL

1.01 Description

A. Section includes

1. Furnish all labor, materials, tools, equipment, and design and installation services for all components of Systems Furniture as indicated, in accord with provisions of the Contract Documents.
2. Completely coordinate with work of all other trades.
3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to, or necessary for sound, secure, and complete installation.
4. Provide foremen to supervise installation.
5. Furnish and install wiring flexible metal conduit and other wired electrical distribution system and install all baseline receptacles.

1.02 System Description

A. Support components

1. Panel System
2. Vertical Support Elements

B. Counter Surfaces

1. Work Surfaces

C. Storage Assemblies

1. Shelving Systems (Shelf Storage Units)
2. Drawers, Pedestals and Filing (Modular Storage)

D. Accessory items

1. Display Surfaces.
2. Lighting
3. Information Processing Accessories
4. Other Accessories

E. Seating

1.03 References and Quality Assurance

A. References

1. Building and Institutional Furniture Manufacturers Association (BIFMA)
2. National Electrical Code (NFPA 70-1990)
3. Underwriter's Laboratory (UL)
4. Electrical Testing Laboratory (ETL)

B. Design criteria

1. The intent of this specification is to provide quality and functional interior furnishings for this health care facility. These products should enable the health care facility to avoid product replacement cost and at the same time avoid product obsolescence. The interior furnishings must respect this intent in addition to providing maximum product integration and flexibility to accommodate changing medical technology. The products must have the inherent qualities of durability, aesthetic value, and safety while being most functional within the health care setting.
2. The hospital has been designed to be space efficient and permit maximum internal flexibility which will facilitate cost efficient reconfiguration of space and traffic patterns..
3. Additionally, a wide selection of components and accessories are required to solve the administrative requirements. Products must be fully compatible and interchangeable with each other to avoid costly reconfiguration expenses. All components shall exhibit a high degree of modularity so that components can be used anywhere within the facility..
4. System will allow hospital to be space efficient by making maximum use of vertical space and by providing a highly organized and versatile way of storing materials.
5. All components shall be modular and shall be interchangeable with each other together.

C. Installer qualifications

1. Furnish proof of familiarity with equipment to be installed.
2. Provide list of at least three previous projects, giving names of projects, scope, and name and telephone number of individual at facility to contact.
3. Furnish proof of financial and technical resources to assure prompt performance in delivery and installation and in-service training of hospital personnel.
4. Provide competent supervision and installation persons.

D. Source quality control

1. Systems furniture manufacturer must have minimum five years' continuous experience in manufacture of all systems components and accessories.
2. Manufacturer furnish proof of successful completion of at least three projects of similar scope within that time; furnish names of projects, scope, and name and telephone number of individual at facility to contact.
3. Furnish proof of financial and technical resources to assure prompt performance in production and delivery.

1.04 Submittals

A. Shop drawings

1. Provide complete shop and installation drawings, giving all dimensioning, details of construction, and accessory items.
2. Indicate electrical, mechanical, and telecommunication entry locations.
3. Indicate wall reinforcement and anchorages.

B. Product data

1. Provide catalog and model numbers for all components.
2. Provide addresses and phone numbers of nearest stocking/service parts locations.

C. Samples

1. Provide samples of all fabrics, finishes, and colors as requested by Owner.
2. Provide samples of chemical resistant materials.

D. Project information

1. Certificates: copies of UL and/or ETL cards on listed components.

E. Project close-out data

1. Operating and maintenance data.
 - a. Provide Owner's personnel with an implementation and education program, minimum 5 hours, given by manufacturer's representatives.
 - b. Provide technical and operational instruction and user's manuals for all components.
2. Provide physical demonstration of interchangeability of components. .
3. Warranties. See Section 1.07
4. Minimum of two copies of manufacturer's complete catalogs and price lists.

5. Location and phone of nearest service organization.
6. Provide a copy of final drawings of all product installed under this specification.

1.05 Delivery Storage and Handling

- A. Deliver all components to site in manufacturer's clearly identified containers.
- B. Deliver, receive, and store in a secured space in a manner to prevent damage.
- C. Time delivery to assure components are available at site when required for installation.

1.06 Job Conditions

- A. Existing conditions
- B. Protection.
 1. Assure that adjoining work is not damaged by installation of this work.
 2. Provide temporary protection as required, and repair all damage to such work.
- C. Sequencing.
 1. Sequence this work to allow work by other contractors to be performed without interference.
 2. Coordinate this work with other operations in same area to avoid conflicts.

1.07 Warranty

- A. All warranties run from date of Substantial Completion.
- B. Written warranty on entire system, signed jointly by installer, manufacturer, and Contractor, for period of one year.
- C. Written warranty on all system components from manufacturer, for a period of 10 years, with 24-hour-per-day, 7-days-per-week usage.
- D. Written warranty on items incorporated into system, not manufactured by contractor or subcontractor for a period of one year.

PART 2 -- PRODUCTS

2.01 Manufacturer

- A. Acceptable manufacturers.
 1. Systems furniture System
 - a. Furniture System, by Herman Miller Healthcare, Inc., 855 East Main Avenue, PO Box 302, Zeeland, Michigan 49464-0302.

- b. Other manufacturers desiring approval shall demonstrate compliance of essential characteristics with requirements of bid and contract documents.

2.02 Modularity Requirements

- A. All systems furniture components must be provided by one manufacturer.
 - 1. If products of several manufacturers are used to satisfy this section, then all items shall meet the specified flexibility and interchangeability requirements.
 - 2. Supplier of the system is responsible for performance of all components.
- B. All systems furniture components shall be modular, on 24" and 48" increments and shall be interchangeable to form a flexible system which will accommodate change.
 - 1. Dimensions of products are nominal and are located on the appropriate equipment drawings and schedules.
- C. All hanging components must also be modular on same increments.
 - 1. Provide units which are selectively removable and replaceable, without disturbing adjacent components.

2.03 Fabrication

- A. Basic Support Components
 - 1. Panel System
 - a. General Performance Requirements
 - (1) Shall meet class A requirements for flame spread and smoke development as specified by ASTM E-84 and the 1988 National Fire Protection Association National Life Safety Code No. 101. This requirement is necessary to provide assurances that employee's safety will not be placed in additional danger during an emergency.
 - (2) Shall have preassembled steel hangers with slots at a maximum of one inch intervals for suspension of work surfaces and shelf storage. This requirement provides assurances that the hangers will not fail and cause injury to employees and permits reconfiguration without having to replace

connections among work surfaces, shelves and panels.

- (3) Shall have adjustable leveler glides to provide uniform height assurance for adjacent units on uneven floors, and the capability of easily relocating an entire run of panels by sliding over the floor without disassembly of panels and suspended modular counters and shelf storage units.
- (4) Shall be designed to permit installation to begin with any partition in the run. Once erected, any partition can be removed, replaced, or relocated without removing any other partition or without violating the integrity of the panel system. This requirement will decrease the hours needed to reconfigure.
- (5) Shall be of sufficient width to permit one person to easily carry, skid, transport or relocate with minimum risk of bodily strain or harm.
- (6) Shall be capable of being installed on top of finished flooring without the penetration of the finished floor or the use of floor fasteners; and shall have complete flexibility for future changes without having to patch floor material. This requirement will minimize the repair and maintenance cost associated with reconfiguration.
- (7) The base raceway shall be sized to hold at least twenty -25 pair data cables. If twenty-25 pair cables can not be accommodated through the base raceway the offeror must bring this to the attention of the contracting officer and provide an acceptable equivalent with the use of an add or an internal top cap raceway.
- (8) The system must offer optional panel-top cable raceway for additional cable

capacity. They must feature continuous lay-in for up to ten 25-pair cables in straight-line and corner conditions. Complex computer and other communication systems demand adequate solutions to changing administrative requirements.

- (9) The electrical system shall meet the National Electric Code and be UL listed.
- (10) The power system must offer both ceiling access and end of panel access since both wall and ceiling power are available and interior offices must be served by electrical connections in the both the ceiling and walls.
- (11) The electrical system shall be capable of reconfiguration without the need for an electrician.
- (12) The electrical system shall have as a minimum the capacity for four outlets on all panels wider than 24 inches. This is required to accommodate the need for additional receptacles in the work station and to eliminate the need for extension cords.
- (13) The baseline cable management channel shall be plastic or a similar material to minimize damage from ordinary floor maintenance; e.g., vacuum cleaners, buffers, etc.
- (14) The baseline cable management channel shall have hinged side covers to provide quick and easy access to electrical harnesses and telecommunications. This provides the ability to quickly modify the electrical and telecommunications for new equipment and services.
- (15) The cable management shall have a "lay-in" design to eliminate tenuous, time-consuming "fishing through" cables into the panels.

- (16) The electrical system will come with preset circuit receptacles to eliminate individuals from contaminating dedicated lines by switching circuits. Electrical systems that contain user-changeable receptacles are not acceptable. This is required to prevent damages to equipment and data.
- (17) The panel power system must offer cable management at the work surface as well at the floor level to accommodate the various power requirements at the work station.
- (18) The panel system must feature eight-wire, four-circuit capability with up to three circuits of isolated ground protection and one general circuit and an optional surge suppression for computers (with LED indicator). To support a variety of electronic equipment, a ten gauge neutral wire is required. The system must be able to offer up to 80 amps of power with three isolated circuits and 20 25-pair cables in the base of the powered panel. The increased need for management personnel to have access to new technology requires better management of the electrical power.
- (19) The appropriate receptacles must be indicated with an orange alpha symbol and triangle on the face to identify the isolated ground. This insures that equipment that requires grounding is powered with appropriate receptacles.
- (20) A non-conductive barrier(s) in the raceway to maintain voice\data isolation from the electrical system shall be provided. If a non-conductive barrier(s) is not provided through the base raceway the offeror must bring this to the attention of the contracting officer and provide an acceptable equivalent with the use of an

add or an internal top cap raceway to achieve data and electrical isolation.

- (21) The power system must have an optional metal barrier that separates data lines from power lines within the cable management space to avoid electrical interference and tapping of data lines.
- (22) The power system must be modular and be able to provide power selectively only at needed locations, and be rearranged without altering or disassembling the panel system. Power system must have access to any circuit via duplex or simplex receptacles. The eight wire electrical system must allow circuits to share a common ground or change to sharing an isolated ground in the field for future electronic equipment protection.
- (23) Panels must meet or exceed ANSI/BIFMA requirements for mechanical strength and decrease the risk of employee injury.
- (24) Return panels used for system structural stability must match or exceed the width of the work surfaces. Work surfaces must be able to be attached with proper return panels without the need for counterbalancing. This provides assurances that the structural integrity of the work station will not be compromised.
- (25) Panel's base raceway must permit a 6" bend radius to permit the installation of fiber optics communication cable.
- (26) Panels shall be pre-wired at the factory to save installation time and costs, but power components must be retrofittable in the field.

b. Types Required

- (1) Standard panels shall be modular units available in a minimum of

- (a) five heights from 34" to 80"
 - (b) six widths from 12" to 60"
 - (2) Panels shall be modular, and available in a minimum of
 - (a) Fabric covered, Acoustic and Tackable Acoustical
 - (b) 20 fabric options
 - (c) .80 NRC for acoustic rating
 - (d) 22 STC Rating
 - (e) three heights from 34 " to 80"
 - (f) three widths from 12" to 60"
 - (3) Glazed panels shall be modular, and available in a minimum of
 - (a) two glazing options
 - (b) two heights from 62" to 80"
 - (c) two widths from 24" to 48"
- c. Hardware
 - (1) Connectors shall be made of a material to withstand the weight of loaded components and the stress of movement under loaded conditions. Connectors shall accommodate a variety of panel configurations, including:
 - (a) straight line connection (180 degrees) of two panels
 - (b) L connections (90 degrees) of two panels
 - (c) T connections (all 90 degrees) of three panels
 - (d) X connection (all 90 degrees) of four panels
 - (2) Connectors shall be able to connect panels of differing heights. Connector system shall allow continuation of electrical and communications wiring within a work station and from work station to work station. Connectors shall be reusable.
 - (3) The finish of all filler post shall have the capability to match the finish and the color of the panel trim.

- (4) Right angle (90 degrees) connections shall not interfere with the capability to hang work surfaces and other components on any adjacent panel.

B. Support components

1. Vertical Support Elements

a. General Performance Requirements

- (1) Wall attachments to support shelves, work surfaces, tackboards and etc. where functional or operational procedure requirements do not require panels.
- (2) Wall attachment to connect a panel to a structure, i.e. wall or other architectural structure.

b. Types Required:

- (1) Wall attachments which must support at least 600 pounds of supplies in addition to the empty weight of the work surfaces, storage cabinets, and shelves typically configured for use as a work station. This will provide for a work station in an area where panels are not required or desired.
- (2) Wall attachments which shall permit 1" vertical height adjustments of hanging component to permit the employee to adjust their work station to meet their needs.
- (3) The wall attachment which shall be available in a minimum of 2 lengths from 5' to 7' to accommodate a variety of hanging components.
- (4) A wall attachment which connects a panel to connect to wall. This wall attachment must come in at least four heights

C. Counter Surfaces

1. Work Surface

a. General Performance Requirements

- (1) Work surfaces shall be manufactured with a warp resistant composition that will provide sufficient weight-bearing capabilities as functionally required. At a minimum, a 24" X 48" cantilevered work surface shall be able to support a load of 40 pounds per square foot with

a maximum deflection of 1/200 of its free span. This is required to support a variety of office machines and equipment.

- (2) Work surfaces shall be available to have self edged impact resistant material on exposed edges to prevent damage to other equipment and to staff or squared edge as determined by the contracting officer.
- (3) Work surfaces shall be capable of being suspended from similar width standard panels, wallstrips, or used with leg supports to be freestanding.
- (4) Work surfaces shall be capable of being easily relocated and installed without tools at various heights as required by either staff or function.
This provides for the ability to change rapidly from one function to another without incurring additional expense.
- (5) Work surfaces shall be capable of being "stacked" one on top of another to provide multiple writing or storage surfaces as required.
- (6) Work surfaces shall have capability to suspend under counter mounted storage assemblies.
- (7) Work surfaces shall have a positive locking support system to eliminate potential of being accidentally dislodged.
- (8) Work surfaces shall have leveling adjustment capability so units can be brought into a level position to compensate for wall conditions and excessive weight loads.
- (9) Work surfaces shall provide clearance at rear of surface for electrical, and CRT cabling.
- (10) Work surfaces shall be available in a minimum of five nominal widths from 24" to 72" and shall be available in 24" and 30" depths.
- (11) Work surfaces shall be finished with a minimum of .050-inch thick standard grade high plastic laminate on top and high pressure laminate on under surface.
- (12) Work surfaces shall have the ability to have

grommets installed during installation.

b. Types Required

- (1) Work Surfaces shall hang from panels, wall strips, or be freestanding and support a live load weight of 200 pounds. This is required to support a variety of office machines, work in progress and other material. They shall be adjustable at one-inch increments enabling the work station to meet different functional needs. General-purpose work surfaces shall be designed to support suspended components.

D. Storage Assemblies

1. Shelving Systems (Shelf Storage Units)

a. General Performance Requirements

- (1) Shelf Storage Units to have rounded exposed surfaces free from sharp edges to prevent injury to patients, visitors and staff.
- (2) Shelf Storage Units to operate safely under maximum load of at least 145 pounds and can be readily installed, removed, and relocated without disturbing adjacent modular componentry.
- (3) End panels on shelf units shall be of an integral color to keep the product from looking aged when chipped or scratched.
- (4) Shelf Storage must be able to attach and be interchangeable on panel systems and wall strips.
- (5) All storage components shall be master keyed to provide for the necessary security and loss prevention programs at this facility.

b. Types Required

- (1) General purpose shelving
 - (a) Unit to be available in a minimum of four nominal widths from 2' to 4'. Please refer to the equipment drawings for specific finishes and sizes.
 - (b) Unit to be available in a minimum of two nominal depths from, including a depth to accommodate a standard 3 ring binder for 8 1/2" x 11" paper and a depth to

accommodate a large binder of
approximately 15" x 15"..

- (c) All units to have door covers available with locks for security and cleanliness. Door shall recede on top of units to allow maximum use of interior cubic space. Covering on door shall be either fabric or vinyl for wet environments.
- (d) Selected units to be available without additional hardware to be converted to angled display shelving, with front lip.

(2) Rail-hanging shelf

- (a) Unit to provide modular storage capabilities where rail assemblies are used. This shelf must offer lateral flexibility and may be easily adjusted or relocated. It must be capable of accepting accessories and a cover door

2. Drawers, Pedestals and Filing (Modular Storage)

a. General Performance Requirements

- (1) Modular Storage units to be manufactured to provide specific paper/form or clinical supply storage.
- (2) Modular Storage units to have rounded, exposed surfaces free from sharp edges to prevent injury to patients, visitors and staff.
- (3) Modular Storage units to operate smoothly and freely under maximum load, and be readily installed, removed, and relocated without disturbing Modular Counter Surface units or Modular Rail Attach units on which the pedestal units may be affixed.
- (4) Modular Storage units to provide adequate floor clearance or adequate mobility for housekeeping staff to adequately maintain a clinical environment.

b. Types Required

- (1) Lateral Files (Cabinet Style)
 - (a) Provide a minimum of four drawer with "lateral file" capability, side-to side filing of standard letter size hanging

file folders that can be easily converted to front-to-back filing both standard, legal or European hanging file folders.

- (b) The cabinet shall be constructed of 20 gauge, cold-rolled steel finished in baked enamel.
- (c) The drawers and slides shall be constructed of 22 gauge cold-rolled steel with a rack-and pinion mechanism which permits easy opening and prevents the drawer from being jammed.
- (d) Unit to be capable of locking.
- (e) Unit shall be available in a minimum of two and four drawer "lateral file" and a width of 30" - 42". Please refer to the equipment drawings for specific finishes and sizes.

(2) Drawers and Pedestal

- (a) Pencil drawer shall provide at minimum pencil and small paper handling storage capability. Unit to have integral divider to subdivide drawer into several compartments. A pencil tray located in a top drawer is an acceptable option.
- (b) Pedestal shall be available for attachment under a work surface or mobile on casters. Mobile pedestals shall be design to prevent instability and tipping when drawers are extended.
- (c) All drawers within a pedestal shall be lockable either by a central lock that controls all pedestals under one work surface or individual keyed lock in each pedestal.
- (d) Mobile and pedestal units shall be a minimum of 20" deep, 15 inches wide and 20" -27" high depending upon the number and sizes of drawers within the unit.
- (e) Pedestal drawer units shall have available at least one three drawer unit of drawers of a nominal 6 inches high and 12 inches

high; and one two drawer unit of drawers of a nominal 12 inch high drawer.

- (f) Pedestal shall be constructed with a minimum of 22 gauge steel and shall be available in at least five surface baked enamel finishes and if required accommodate veneer fronts

(3) Work Surface Drawers

- (a) Drawers shall mount on the underside of the work surface and be available in pencil, box and file types.
- (b) Each drawer, with the exception of the pencil drawer, shall have individual keyed locks, keyed alike or uniquely as per needs.
- (c) Each drawer, with the exception of the pencil drawer, shall be capable of being divided by stationery inserts.
- (d) File drawers to be capable of filing letter, legal or European size hanging folders.
- (e) Units shall be available in either undercounter or mobile on caster forms.

3. Miscellaneous System Furniture Components

a. Display Surfaces

(1) Performance requirements

- (a) Surfaces shall provide operational areas a convenient mechanism for displaying notices, procedures, policies, schedules, etc.
- (b) Unit shall be capable of being easily relocated and installed without tools at various heights as required by staff or function.

(2) Types Required

(a) Tackboards

- (i) Shall be available in several widths and heights.
- (ii) Shall be fabric covered.

- (iii) Shall be of various sizes of 24"-60" in width and a nominal height from 1'- 5'.

b. Lighting

(1) General Performance Requirements

- (a) UL listed unit shall provide individual lighting capability to selected location with a minimum of one fluorescent tube.
- (b) Unit shall have cord outlet that can be utilized on either right or left side.
- (c) Unit shall be easily changed and relocated with the use of tools as needed.
- (d) Unit shall have individual on-off switch at convenient location.

(2) Types Required Task lighting shall mount on the underside of shelving and shall be available in a minimum of three widths of 24" - 48", provided with a diffusing lens to reduce glare and eye fatigue. Shall be available in color rendition index of 52 or 75.

- (a) A light shall be available to attach to the underside of a transition surface to illuminate a work surface.

(3) All lights shall be shipped with bulbs installed.

4. Locks and keying.

- a. Key all locks alike (differently).
- b. Furnish each lock with two keys.

5. Seating

- a.** The chair must be able to support task-intensive, multi-task, general, and semi-reclined work postures.
- b.** The chair must come in different sizes to accommodate people from the 1st percentile female through the 99th percentile male (according to 1988 Anthropometric Survey of U.S. Army Personnel). The chair must lower to at least 15 inches to accommodate the 5th percentile female. Within the same line, the chair must lower to at least 14.3 inches to accommodate the 1st percentile female.
- c.** The chair must allow for body heat to flow through the entire seat and back. This "breathability factor,"

designed to avoid the buildup of body heat, enhances long-term comfort and productivity.

- d. The chair's tilt mechanism must allow the body to naturally and simultaneously pivot at the ankles, knees, and hips. Kinemat tilt preferred.
- e. The backrest and seat pan must move in proper relation for correct lumbar support in all seated positions, in order to support whatever posture a person prefers, from a work-intensive forward position through semi-recline, whether the user is in motion or at rest.
- f. The chair must provide a 5-degree forward tilt without a lowering of the front edge of the seat pan.
- g. The chair must be able to be locked in fully upright, task-intensive postures.
- h. The chair must provide a tilt limiter to limit the amount of recline throughout the recline range.
- i. The chair's pneumatic lift must have a height range of more than 5 inches to properly support various task positions (e.g., 14.3- to 19.5-inch range in a smaller chair and 15- to 20.8-inch range in a larger chair.)
- j. The chair must have an adjustable lumbar support (vertical adjustment of 4.5 inches and depth adjustment from 3/4 to 1 1/4 inches).
- k. The chair must feature pivoting arms to accommodate various task postures, including 15 degrees outward (for mousing) to 17 1/2 degrees inward (for keying).
- l. The chair must allow 30 degrees of recline to allow the user to transfer weight from iscural tuberosities (sitting bones) to the thoracic area (back and shoulders). This is necessary for health-supporting comfort in long-term sitting.
- m. The tilt-tension adjustment must allow the user to control the resistance felt while leaning back-to-accommodate more users more comfortably.
- n. . The chair must feature a minimum 10-year, three-shift, limited warranty.

2.04 Finish

- A. Colors shall be selected from manufacturer's standard line.
- B. Colors may be specified to identify areas for materials management.
- C. Finishes to meet need for infection control.

2.05 Extra Material - None

PART 3--EXECUTION

3.01 Inspection

- A. Inspect areas in which work is to be performed for acceptability to receive work.
- B. Report all discrepancies to Contractor for correction.
- C. Proceeding with work constitutes acceptance of existing conditions.

3.03 Installation

- A. Assemble and install all items in strict accord with manufacturer's printed instructions.
 - 1. Anchor all fixed components firmly, square, level, plumb.
- B. Horizontal support elements.
 - 1. Install at heights indicated with all tops, shelves, and writing surfaces level within 1/8" across width.
- C. Vertical support elements.
 - 1. Install plumb, spaced as indicated on shop drawings.
 - 2. Align slots to assure hanging units are level.

3.04 Field Quality Control

- A. Adjust components to assure proper alignment and operation.
- B. Repair, if acceptable, or replace all damaged or improperly operating items.

3.05 Cleaning

- A. Immediately after installation and adjustment; clean all surfaces to remove all marks, soil, and foreign matter.
- B. Just prior to Substantial Completion, recheck all components and perform all required additional cleaning.