SPEC NO. ANZY0400361-SF
26 June 2008

# GENERAL SPECIFICATION

# FOR

# RENOVATE OPS BUILDING

# OFFICE AREA BUILDING 1099

# SYSTEMS FURNITURE

# AEDC

ARNOLD ENGINEERING DEVELOPING CENTER

ARNOLD AIR FORCE BASE, TENNESSEE  37389-9998

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SECTION 01010
SUMMARY OF WORK

## PART 1 GENERAL

1.1 Provide all materials, equipment, and labor to install approximately 118 systems furniture workstations and two floor-to-ceiling movable partition offices for a 17,900 square feet open office on the second floor in Building 1099 at Arnold Engineering Development Center, Arnold Air Force Base, Tennessee. Perform work in two phases. The extent of the work is contained in the drawings and specifications. Major items of work include, but are not limited to, the following:

A. Furnish and install systems furniture panels and components.

B. Furnish and install floor-to-ceiling movable partition offices with doors.

C. Power and communication connections in the floor-to-ceiling walls.

D. Other incidental tasks and repair necessary to complete the work as required by the specifications and drawings.

1.2 CODES AND STANDARDS

A. AEDC Safety Standard*:

| | | |
|---|---|---|
| 1. | A6 with Supplement | User and Subcontractor Safety (Mandatory Documents/Submittals), 2002. |
| 2. | B1 | Master Work Permit, 2003. |
| 3. | B2 | Logout Tagout – LOTO, 2004. |
| 4. | B10 | Safety Signs, Markers, and Tags, |
| 5. | D8 | Portable Power Tools, 2002. |
| 6 | D9 | Fixed and Portable Ladders, 2004. |
| 7. | E18 | Managing Wastes Containing Chemical or Petroleum Products, 2004. |
| 8. | F2 | Eye and Face Protection, 2002. |
| 9. | F6 | Fall Protection, 2004. |
| 10. | F8 | Hand Protection, 2002. |
| 11. | F9 | Head Protection, 2003. |
| 12. | F10 | Foot Protection, 2004. |

* The Government representative will furnish a copy of this Safety Standard to the contractor upon request.

B. Air Force Federal Acquisition Regulation (AFFARS):

| | | |
|---|---|---|
| 1. | 5352.223-9000 | Elimination of Use of Class I Ozone Depleting Substances (ODS), April 2003. |

C. Code of Federal Regulations (CFR):

| | | |
|---|---|---|
| 1. | 29 CFR 1926.1101 | Asbestos, 2004. |

2. 40 CFR 261 Identification and Listing of Hazardous Waste, 2004.
3. 40 CFR 370 EPA Hazardous Chemical Reporting and Community Right to Know Requirement, 2004.

4. U. S. Army Corp of Engineers (CoE) Standard:
   1. EM 385-1-1 Safety and Health Requirements Manual, 2003.

## 1.3 RECORD (AS-BUILT) DRAWINGS

A. Provide electronic copy of the drawings (red-line) in AutoCAD 2000 or newer version to accurately show as-built conditions during the progress of the job. Show all changes, additions, and deviations from the original drawings. If no changes occur, furnish certification to that effect. Submit to the Contracting Officer for approval prior to applying for final payment.

## 1.4 DEFINITIONS

A. Certain terms used in the contract documents are defined in the following paragraphs. Definitions and explanations contained in this section are not complete, but are general for the work to the extent that they are not stated more explicitly in another element of the contract documents.
   1. Furnish. The term "furnish" means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations.
   2. Install. The term "install" describes operations at the project site, including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimensions, finishing, curing, protecting, cleaning, and similar operations.
   3. Provide. The term "provide" means "provide complete in place"; that is, "furnish and install."
   4. Indicated. Where "as indicated" or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise.

## 1.5 JOB CONDITIONS

A. Plan and execute this project in a manner to minimize downtime. Furnish new components and devices, complete, with all necessary materials for installation to meet this objective. Schedule all work in advance with the Government representative.

B. Place all sanitary waste from lunches in local area dumpsters.

## 1.6 ASBESTOS PRODUCTS

A. Do not use products or materials that contain asbestos on this project except as expressly authorized by the Contracting Officer. If no substitutes for asbestos products are available, and the Contracting Officer approves

the use of asbestos products, highlight and detail their exact location on the drawings and identify their location in the field following 29 CFR 1926.1101 guidelines.

1.7 HAZARDOUS WASTE

A. Where hazardous waste (as identified in 40 CFR 261) is generated, follow the procedures in AEDC Safety Standard E18, Chemical and Petroleum Products Waste Management, for storing and turning in hazardous waste. These procedures include the requirement to complete Forms GC-565 and GC-1337, which will be furnished by the Government representative.

1.8 DISALLOWED PRODUCTS

A. Do not use products or materials that contain lead, chromium, mercury, cadmium, silver, barium, or arsenic on this project except as expressly authorized by the Contracting Officer. If no substitutes for products containing the listed materials are available, and the Contracting Officer approves the use of products containing the listed materials, highlight and detail their exact location on the drawings.

1.9 ELIMINATION OF ODS

A. The use of Class I ozone depleting substances (ODS) is prohibited. Reference text of AFFARS clause 5352.223-9000 (April 2003).

1.10 SAFETY REQUIREMENTS:

A. All work shall be accomplished in compliance with AEDC Safety Standards A6 with supplement, B1, B2, B10, D8, D9, F2, F6, F8, F9, and F10. Provide a safety and health program in compliance with CoE EM 385-1-1.

1.11. SECURITY REQUIREMENTS

A. Advise prospective bidders that failure to comply with established security rules and procedures while on the property of Arnold Air Force Base could result in disbarment from the base. The work is not being done in a secure, classified area.

1.12 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA

A. The following procedures shall be followed to meet 40 CFR 370, EPA Hazardous Chemical Reporting and Community Right to Know Requirement.
   1. Procedures:
      a. The contractor shall provide information on the hazardous materials he brings on AEDC property prior to beginning on-site work. Hazardous materials may include solvents, paints, adhesives,

acids, or any other substance which could be included within the definitions in paragraph 2.

b. The information required is:
   1) Company name, point of contact, and phone number.
   2) Brief statement indicating how the hazardous material will be used within the scope of the contract.
   3) List of all hazardous materials to be used (product name, manufacturer's name, and address).
   4) Amount of each material to be stored on site and where it will be stored.
   5) Where the product Material Safety Data Sheets (MSDS) will be maintained.

c. All unused product is the responsibility of the contractor and shall be removed from AEDC property at the completion of the project.

d. The contractor shall coordinate with the Government representative and the Hazardous Waste Operations Group (454-3628) if any hazardous waste is to be generated.

2. Definitions

a. Hazard communication standard. A chemical right-to-know law under OSHA that requires chemical manufacturers and importers to assess the hazards of chemicals they make or import and to distribute this information to inform workers of the hazards associated with these chemicals. This written information is a Material Safety Data Sheet (MSDS).

b. Hazard classes. Hazardous materials that have been grouped into classes by the Department of Transportation (DOT). These classes include explosives, flammables, oxidizers and organic peroxides, compress gases, corrosives, and poisons.

c. Hazardous material. Any substance that may be harmful when used. Specific substances have been designated as hazardous under the Clean Water Act, the Resource and Conservation and Recovery Act, and the hazardous air pollutants under the Clean Air Act.

d. Hazardous waste. Any waste that may cause or significantly contribute to serious illness or death or that may pose a substantial threat to human health or the environment, if not properly managed. Hazardous wastes may be solids, liquids, semi-solids, or compressed gases.

END OF SECTION

SECTION 01060
REGULATORY REQUIREMENTS

## PART 1 GENERAL

1.1 This section lists regulations, codes, and standards which specify procedural and administrative requirements imposed upon the work.

1.2 The contractor shall comply with provisions of the following documents to the extent referenced herein.

A. Government documents:

1. AEDC Safety Standards*:

| | | |
|---|---|---|
| a. | A6 with Supplement | User and Subcontractor Safety (Mandatory Documents/Submittals), 2002. |
| b. | B1 | Master Work Permit, 2003. |
| c. | B2 | Logout Tagout – LOTO, 2004. |
| d. | B10 | Safety Signs, Markers, and Tags, |
| e. | D8 | Portable Power Tools, 2002. |
| f | D9 | Portable Ladders, |
| g. | E18 | Managing Wastes Containing Chemical or Petroleum Products, 2004. |
| h. | F2 | Eye and Face Protection, 2002. |
| i. | F6 | Fall/Restraint Protection, |
| j. | F8 | Hand Protection, 2002. |
| k. | F9 | Head Protection, 2003. |
| l. | F10 | Foot Protection, 2004. |

* The Government representative will furnish a copy of these Safety Standards to the contractor upon request.

2. Air Force Federal Acquisition Regulations (AFFARS):

| | | |
|---|---|---|
| a. | 5352.223-9000 | Elimination of Use of Class I Ozone Depleting Substances (ODS), April 2003. |

3. Code of Federal Regulations (CFR):

| | | |
|---|---|---|
| a. | 29 CFR 1926.1101 | Asbestos, 2004. |
| b. | 40 CFR 261 | Identification and Listing of Hazardous Wastes, 2004. |
| c. | 40 CFR 370 | EPA Hazardous Chemical Reporting and Community Right to Know Requirement, 2004. |

4. U. S. Army Corp of Engineers (CoE) Standard:

| | | |
|---|---|---|
| a. | EM 385-1-1 | Safety and Health Requirements Manual, 2003. |

B. Non-Government documents:

1. American with Disabilities Act (ADA) Standard, 1990:

2. American Society For Testing And Materials (ASTM) Standards:
   a. B221-04 — Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   b. C423-02 — Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   c. E84-04 — Surface Burning Characteristics of Building Materials.
   d. E290-04 — Bend Testing of Material for Ductility.
3. Architectural Woodwork Institute (AWI) Standard:
   a. Quality Standards, 2005.
4. BIFMA International (BIFMA) Standards:
   a. X5.5-89 — Desk Products – Tests.
   b. X5.6-93 — Panel Systems – Tests.
5. International Code Council (ICC) Standard:
   a. A117.1-03 — Guidelines for Accessible and Useable Buildings and Facilities.
6. National Electrical Manufacturers Association (NEMA) Standards:
   a. WD 1–99 — General Color Requirements for Wiring Devices.
   b. WD 6-02 — Wiring Devices – Dimensional Specifications.
7. National Fire Protection Association (NFPA) Standards:
   a. 70-05 — National Electrical Code.
   b. 101-03 — Life Safety Code.
   c. 255-00 — Test of Surface Burning Characteristics of Building Materials.
   d. 265-02 — Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls.
8. Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA) Standards::
   a. 569-B-04 — Commercial Building Standard for Telecommunications Pathways and Spaces.
9. Underwriters Laboratories (UL) Standards:
   a. 723-03 — Test for Surface Burning Characteristics of Building Materials.
   b. 1286-04 — Office Furnishings.

C. Drawings:
   1. LET32289 Renovate Ops Building Office Area Building 1099
      12 Sheets

END OF SECTION

SECTION 01340
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

## PART 1 GENERAL

1.1 DESCRIPTION OF REQUIREMENTS. This section specifies procedural requirements for non-administrative submittals, including shop drawings, product data, samples, and other miscellaneous work-related submittals. These submittals are required to amplify, expand, and coordinate other information contained in the contract. Non-work-related submittals are addressed elsewhere in the contract rather than in the specification and may include items such as: contract progress schedule, permits, payment applications, performance and payment bonds, insurance certificates, and progress reports.

A. Shop drawings. These are technical drawings and data specially prepared for this project including fabrication and installation drawings, setting and seaming diagrams, and coordination drawings (for use on-site).

B. Product data. This data includes standard printed information on manufactured products that has not been specially prepared for this project, including manufacturers' product specifications and installation instructions, standard color charts, catalog cuts, standard wiring diagrams, and standard product operating and maintenance manuals.

C. Samples. These are physical examples of work, including swatches showing color, texture, and pattern; color-range sets; and units of work to be used for independent inspection and testing.

D. Miscellaneous submittals. These are work-related, non-administrative submittals that do not fit in the three previous categories, including the following:
1. Maintenance agreements.
2. Survey data and reports.
3. Project photographs.
4. Record drawings (as-built drawings).
5. Field measurement data.
6. Operating and maintenance manuals.
7. Keys and other security protection devices.
8. Maintenance tools and spare parts.
9. Overrun or maintenance stock.
10. Qualification certificates.

1.2 SUBMITTAL PROCEDURES

A. Coordination. Coordinate the preparation and processing of submittals with the performance of the work. Coordinate each submittal with other submittals and related activities, such as testing, purchasing, fabricating, and delivering, that require sequential activity.

B. Listing. At the end of this section is a summarized listing of the submittals required for the work. The listing is included for the convenience of users of the contract documents.

C. Transmittal timing. Prepare and transmit each submittal to the Contracting Officer sufficiently in advance of the scheduled performance of related work and other applicable activities. Transmit different kinds of submittals for the same unit of work so that processing will not be delayed by the Government's need to review submittals concurrently for coordination.

D. Review time. Allow sufficient time so that contract performance will not be delayed as a result of the time required to properly process submittals, including time for re-submittals, if necessary. Allow 10 working days for initial Government processing of each submittal. No extension of time will be authorized because of the contractor's failure to transmit submittals to the Government sufficiently in advance of the work.

E. "Approval" submittals. Submittals requiring approval by the Contracting Officer are so designated in the applicable sections and the submittal list at the end of this section. When brand names or equal are specified, any "equal" submitted will require approval. Any submittal requesting a deviation will require approval. Do not install any equipment or material requiring approval submittals until approvals are received from the Contracting Officer. The Government will status receipt or approval of all submittal requirements in the last two columns.

F. "Information only" submittals. Submittals not requiring the Contracting Officer's approval are considered to be "information only" submittals.

1.3 SPECIFIC SUBMITTAL REQUIREMENTS. Submittal requirements for individual units of work are specified in the applicable specification section. Except as otherwise indicated in the individual sections, comply with the following requirements for each type of submittal.

A. Shop drawings. Information required on shop drawings includes dimensions, identification of specific products and materials which are included in the work, compliance with specified standards, and notations of coordination requirements with other work. Provide special notations of dimensions that have been established by field measurements. Highlight, encircle, or otherwise indicate deviations from the contract documents on the shop drawings. Furnish one reproducible and four copies.

B. Product data. General information required specifically as product data includes manufacturers' standard printed recommendations for application and use, compliance with recognized standards of trade associations and testing agencies, the application of their labels and seals (if any), special notation of dimensions which have been verified by way of field

measurement, and special coordination requirements for interfacing the material, product, or system with other work. Furnish four copies.

C. Samples. Submit samples for the Contracting Officer's visual review of general kind, color, pattern, and texture for a final check of the coordination of these characteristics with other related elements of the work and for quality control comparison of these characteristics between the final sample submittal and the actual work as it is delivered and installed.

D. Miscellaneous submittals. These submittals include the following:
1. Inspection and test reports. Furnish three copies of such reports.
2. Record drawings.
3. Operating and maintenance data. Furnish three bound copies of operating data and maintenance manuals.
4. Materials and tools. Refer to individual sections of the specification for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.
5. Certifications, reports, instructions, and lists. Furnish three copies of such submittals.

1.4 REQUIRED SUBMITTALS

| No. | Section Reference | Submittal Description | App | Info |
|---|---|---|---|---|
| 1 | 01010 para 1.3A | Record Drawings | X | |
| 2 | 10615 para 1.3A | Shop Drawings | X | |
| 3 | 10615 para 1.3B | Product Data | X | |
| 4 | 10615 para 1.3C | Samples | X | |
| 5 | 10615 para 1.3D | Manufacturer’s Installation Instruction | X | |
| 6 | 12705 para 1.3A | Shop Drawings | X | |
| 7 | 12705 para 1.3B | Product Data | X | |
| 8 | 12705 para 1.3C | Samples | X | |
| 9 | 12705 para 1.3D | Workstation Certificates | X | |
| 10 | 12705 para 1.3E | Operation and Maintenance Data | X | |

Table I. Required submittal list - Completed.

END OF SECTION

SECTION 10615
MOVABLE PARTITION SYSTEMS

## PART 1 GENERAL

### 1.1 GENERAL

A. This section Includes: Unitized, movable partition system, wood doors, frames and hardware, provision for power and communication systems within panels, markerboard accessories, Integrated and after market installation, integrated ceiling support system.

B. Related sections:
   1. Section 12705 – Systems Furniture.

### 1.2 CODES AND STANDARDS

A. American with Disabilities Act (ADA) Standard, 1990.

B. International Code Council (ICC) Standard:
   1. A117.1-03 Guidelines for Accessible and Useable Buildings and Facilities.

C. American Society for Testing and Materials (ASTM) Standards:
   1. B221-04 Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

D. Architectural Woodwork Institute (AWI) Standard:
   1. Quality Standards, 2005.

E. National Fire Protection Association (NFPA) Standard:
   1. 70-05 National Electrical Code (NEC).

### 1.3 SUBMITTALS

A. Shop drawings: Include panel layout in plan and elevation, opening locations, special panels, conditions at adjacent construction, and accessories.

B. Product data: Provide data on panel system, components, and accessories.

C. Samples: Two samples 12 by 12 inches in size illustrating panel facing and trim finish.

D. Manufacturer's Installation Instruction: Indicate procedures, special conditions, and protection.

1.4 QUALITY ASSURANCE

A. Installer qualifications: Installation performed by factory personnel or others authorized by partition system manufacturer.

B. Factory installed electrical components:
   1. UL Listed.
   2. UL Classified in accordance with requirements of NFPA 70.

C. Conform to ICC A117.1 (ADA) for mounting heights and location of components.

1.5 PROJECT CONDITIONS

A. Do not begin installation until site conditions provide complete protection from weather and environmental conditions in building are approximately equivalent to those which will exist after installation:
   1. Temperature: 60 to 85°F.
   2. Relative humidity: Maximum 70 percent.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components to the jobsite in the manufacturer's original packaging with the brand, item identification, and project reference clearly marked thereon. Store components in a dry location that is adequately ventilated and free from dirt and dust, water, and other contaminants, and in a manner that permits easy access for inspection and handling.

1.7 WARRANTY

A. Provide manufacturer’s warranty against defects in materials and workmanship for a period of 10 years.

**PART 2 PRODUCTS**

2.1 MATERIALS

A. Gypsum board: 1/2-inch thick, ends and edges square cut.

B. Aluminum extrusions: ASTM B221, alloy and temper best suited to application.

C. Panel surfacing: Manufacturer’s standard or pre-approved scrim backed vinyl fabric wall covering, color to be selected from standard selections.

D. Flush wood doors: U.S.A. Type: Meet or exceed AWI Section 1300, Type PC-5, Particleboard core with stiles and rails bonded to core, Custom Grade.

2.2 COMPONENT SPECIFICATIONS

A. Standard panel frames: Extruded aluminum tubular beam extrusions. Minimum 1.27mm main frame corner brackets installed for full frame rigidity. 1/2-inch flanges around perimeter both sides to protect gypsum board panel face edges.

B. Panel faces:
   1. 1/2-inch gypsum board, square cut, bonded to frame with hot press glue panel faces filled, sanded and primer coated prior to finish applications.
   2. Glue permits vinyl and fabric striping upon change.

2.3 PANEL TYPES AND DATA

A. Panel types: Solid panels for plumbed areas.

B. Solid panel widths: Minimum 6 inches to maximum of 48 inches; off-sizes accommodated to 1/16 inch increments.

2.4 CONNECTION METHODS

A. Ceiling: 1.27mm thickness, continuous 10 feet aluminum ceiling track. Attached to T-Bar using non-marking ceiling clip. Lined with closed cell, foam sound and light seals. Track features built in 1/2-inch ribbed flanges on each side to provide host surface for ceiling trim continuous mounting. Slotted stabilizer bars set into ceiling track and bolts locked.

B. Unitized base assembly: 1.27 minimum thickness aluminum floor channel (lengths correspond to panel width) with preformed and punched steel carpet gripper plates (8-teeth, 2 plates per panel). Threaded, zinc plated, steel, adjustable leveling legs. When in place, assembly allows lateral panel movement for installation adjustments without loss of centering. 12 gauge zinc plated steel leveler saddles set into floor channel – accepts panel leg bottoms and provides even panel weight distribution.

C. Other vertical wall surfaces: 1.40mm thick aluminum wall start channel, standard or spring loaded, depending on site conditions. Closed cell, foam light and sound seal material full height of channel.

D. Panel to panel: Vinyl/fabric wrapped or clear PVC connector strips connect all panels and extruded aluminum 2, 3, 4 way posts, and 3 way modular connectors, door frames and other conditions. 90 degree and 135 degree square or radiused 2 way posts available. 180 degree square or radiused

"end of run" posts are 'snap-on' single component PVC extrusions not requiring connector strip. All posts and connector conditions available in finishes to match panels.

2.5 COMPONENT MOUNTING

A. Extruded aluminum and steel mounting rails: Universal mounting rail for off-module mounting of markerboards suitable for Haworth systems furniture or equal.

2.6 TRIM

A. Ceiling: 1.00mm thick extruded PVC standard, 2 inches high, in 9 feet lengths. contour extruded shape to hug panel face. Alligator jaw channel with friction ribs at top of trim allows tight continuous clipping of trim to ceiling track flanges.

B. Base: 1.5mm thick extruded PVC standard, 4 inches high, trim 9 feet lengths. contour extruded shape to hug panel surface. Full length, extruded J- channel on back allows continuous trim mounting to floor channel side walls. Factory mounted clips on back allow continuous clipping to floor channel side wall. Pre-formed outside corners and end of runs: 90 degree square pre-formed corners.

C. Cornice trims: 2 inches extruded aluminum top rail, powder coated, serves as trim and structural top beam at top of panels for partial height installation. Factory pre-assembled corners. Square finished end caps finish exposed rail ends.

2.7 DOORS, FRAMES and HARDWARE

A. Veneer faced doors: Full height or transom high, solid core door of 28 pcf density particle board, bull nosed (90 degree), reversible pivot door leaf with full top and bottom pivot assemblies supplied. Stiles of solid lumber and plywood rails. 1/8-inch hardboard face dadoed into solid edge with full width 0.65mm thick closed grain face veneer (suitable for VM-4 Mahogany Satin finish to match Haworth finishes). Overall thickness 1-3/4 inch nominal. Meets or exceeds AWI, Section 1300, Type PC5 and AWMAC, Part 3 standards. Door must meet ADA width standards.

B. Door frames (single):
   1. Pivot hinge door frames: Telescoping (adjustable to 1-1/4 inches), aluminum frame assembly complete with reversible cast strike plate to accommodate left and right hand swing. Top pivot assembly spring loaded stem to allow snap in installation, 0.300 inch height kerf mounted nylon pile light and sound seals installed full inside perimeter of all metal

frame types. Die-cast reversible-hand door strike body with inserts available for all types of door hardware, adjustable for latching position. Frame to match TR-G Haworth graytone trim.

C. Hardware:
   1. Pivot and butt-hinged doors: Schlage AL series Saturn lever sets are standard with 626 finish.
   2. All hardware keyed separately unless otherwise specified. Master keying by others.

2.8 ELECTRICAL SYSTEM and COMPONENTS

A. Wall boxes and conduit:
   1. Provide power and communication conduit factory installed with wall boxes flush mounted in panel faces. Wiring, cable and devices shall be installed by contractor.
   2. Provide factory installed 1 and 2 gang boxes as shown on drawings.
   3. Wall boxes shall be conventional style. Devices and face plates shall be installed by contractor.

B. Lighting switches:
   1. Color of switches shall be smooth ivory plastic.
   2. Lighting switches shall be 277-VAC in accordance with NEC Article 404, quiet type, 20-ampere, back and side wires grounding type with toggle handle.
   3. Device plates shall be smooth finish, ivory thermoplastic, a minimum of 0.100-inch thick. Plates shall be secured to devices or boxes with matching color screws.

**PART 3 EXECUTION**

3.1 INSTALLATION

A. Install walls in two phases as shown on drawings.

B. Install the walls using certified installers in accordance with manufacturer's instructions. Install components level, plumb, square, and with proper alignment with adjoining furniture. Securely attach panels back to window mullions.

C. Mount all switches 4 feet above the finished floor unless otherwise shown.

D. Mount all wall boxes 18 inches above finished floor unless otherwise shown.

E. Devices and boxes shall be mounted plumb.

## 3.2 CLEANING

A. Clean and polish all products upon completion of installation and leave the area in a clean and neat condition. Repair any defects in material and installation, and replace any damaged products that cannot be satisfactorily repaired.

END OF SECTION

SECTION 12705
FURNITURE SYSTEMS

## PART 1 GENERAL

### 1.1 GENERAL

A. This specification establishes the minimum requirements for the acquisition and installation of a complete and usable system of workstations composed of panels, supporting components, electrical hardware, communications, special electrical features, and accessories. Provide workstation requirements and configurations in accordance with the furniture layout and typical workstation types shown in drawings and specified herein. Provide components, and hardware by a single manufacturer and a standard product as shown in the most recent published price lists or amendments. Furnish electrical components products of a single manufacturer to the extent practicable (different types of components may be of different manufacturers, but all units of a given component shall be from a single source). Comply with NFPA 70 and NFPA 101 for the complete installation.

### 1.2 CODES AND STANDARDS:

A. American Society For Testing And Materials (ASTM) Standards:
1. C423-02 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
2. E84-04 Surface Burning Characteristics of Building Materials.
3. E290-04 Bend Testing of Material for Ductility.

B. BIFMA International (BIFMA) Standards:
1. X5.5-89 Desk Products – Tests.
2. X5.6-93 Panel Systems – Tests.

C. National Electrical Manufacturers Association (NEMA) Standards:
1. WD 1–99 General Color Requirements for Wiring Devices.
2. WD 6-02 Wiring Devices – Dimensional Specifications.

D. National Fire Protection Association (NFPA) Standards:
1. 70-05 National Electrical Code.
2. 101-03 Life Safety Code.
3. 255-00 Test of Surface Burning Characteristics of Building Materials.
4. 265-02 Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls.

E. Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA) Standards::
1. 569-B-04 Commercial Building Standard for Telecommunications Pathways and Spaces.

F. Underwriters Laboratories (UL) Standards:
   1. 723-03 Test for Surface Burning Characteristics of Building Materials.
   2. 1286-04 Office Furnishings.

1.3 SUBMITTALS

A. Shop drawings: Show drawings of the proposed workstation installation at a scale of 3/16 inch = 1 foot, unless otherwise specified. Provide as a single submittal, drawing requirements, which are the furniture manufacturer's responsibility. Provide electronic drawings to the user for future re-configuration in AutoCAD 2004 format. Include all modifications made during installation on the electronic drawings.
   1. Overall reference drawings: Show workstation locations and overall plan view on the floor plan. Reflect field verified conditions in the layouts.
   2. Installation drawings: Show workstations, panels, components, and plan view on the floor plan. Reflect field verified conditions on the installation drawings.
   3. Panel drawings: Show panel locations and critical dimensions from finished face of walls, columns, panels, including clearances and aisle widths on the drawings. Key assemblies to a legend which includes width, height, configuration and composition of frame covers finishes and fabrics, power or non-power, connectors and wall mount hardware. Reflect field verified conditions on the drawings.
   4. Electrical drawings: Showing power provisions including type and location of ceiling feeds, activated outlets and other electrical components on the drawings. Identify wiring configuration (circuiting, switching, internal and external connections) and provide a legend as applicable.

B. Product data: Provide manufacturer's product and construction specifications including technical data for furniture system and components specified, and task lighting and illumination performance information. Include in the literature adequate information to verify that the proposed product meets the specification. Furnish two copies of the warranty. Furnish a complete listing of part/model numbers for all components to be furnished, including names and codes of components referenced on updated drawings.

C. Samples: Provide two sets of the following finish samples. The Government reserves the right to reject any finish samples that do not satisfy the construction or color requirements. Submit additional samples as required to obtain final approval. Do not proceed with the work without sample approval in writing from the Contracting Officer.
   1. Provide panel tackboard and flipper door fabric. Minimum 6 by 6 inches with label designating the manufacturer, color, fiber content, fabric weight, fire rating, and use (panel and/or tackboard).

2. Provide panel, work surface, and component finish. Minimum 2-1/2 by 3 inches with label designating the manufacturer, material composition, thickness, color, and finish.

D. Certificates: Provide two complete sets of certificates attesting that the proposed workstation meets specified requirements. Furnish a certificate to be dated after the award of contract, name the project, and list specific requirements being certified.

E. Operation and maintenance data:
1. Provide two sets of assembly manuals describing assembly and reconfiguration procedures.
2. Provide two sets of maintenance manuals describing proper cleaning and minor repair procedures.
3. Provide two sets of electrical system manuals describing the functions, configuration, and maintenance of the electrical system including power and communications data. This material may be included in the above 2 manuals at the contractor's option.

## 1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver components to the jobsite in the manufacturer's original packaging with the brand, item identification, and project reference clearly marked thereon. Store components in a dry location that is adequately ventilated and free from dirt and dust, water, and other contaminants, and in a manner that permits easy access for inspection and handling.

## 1.5 PATTERN AND COLOR

A. Provide pattern and color of finishes and fabrics for panels components, and trim in accordance with the parts list.

## 1.6 ALTERNATE DESIGN

A. Alternate designs may be submitted for consideration by the Contracting Officer if manufacturers are unable to provide workstations that conform exactly to the furniture layouts and typical workstation types shown in the contract drawings. Alternate designs must meet or exceed the following criteria. Alternate designs that are submitted but do not meet these criteria will be rejected.
1. Workstation size and configuration: Provide in the alternate design workstations and components of the same basic size and configuration shown, with only the sizes of the individual components within the workstation changed to meet the standard product of the manufacturer.
2. Component requirements: Provide types of components or elements utilized as shown on the drawings and as specified in PART 2 PRODUCTS of this specification.

3. Layout: Provide designs which do not reduce the storage capacity, number of workstations accommodated, width of aisles, or workstation configuration.
4. Wiring configuration: Alternate configurations must support the circuiting and connection capabilities identified under the provisions pertaining to power distribution of paragraph ELECTRICAL. Generally any alternate will be acceptable which involves only a variation in size or quantity that exceeds the specified configuration.

1.7 WARRANTY

A. Warrant the furniture systems for a period of 10 years with the following exceptions: Guarantee fabrics and other covering materials for 3 years, and guarantee task lights for 2 years. Warrant electromagnetic ballasts for 2 years. Include in the electronic ballast warranty a $10 labor allowance for each ballast. Provide warranties signed by the authorized representative of the manufacturer. Present the Contracting Officer warranties accompanied by document authenticating the signer as an authorized representative of the guarantor, upon the completion of the project. Guarantee that the workstation products and installation are free from any defects in material and workmanship from the date of delivery.

**PART 2 PRODUCTS**

2.1 PERFORMANCE AND SAFETY REQUIREMENTS

A. Test panels, frames and frame covers, connection system, work surfaces, pedestals, shelf units, flipper door units, lateral files, locks, accessories, and miscellaneous hardware as specified. In-house testing may be performed by ISO 9001 certified manufacturers. Produce testing by an independent testing laboratory, if the manufacturers are not ISO 9001 qualified. Component specific requirements are listed in appropriate paragraphs.
   1. Selected components: Conform to the requirements of BIFMA ANSI/BIFMA X5.5 and BIFMA ANSI/BIFMA X5.6 for workstations with the following exceptions: Test panels and pass in accordance with the requirements of BIFMA ANSI/BIFMA X5.6 and representative items which are selected for testing based on worst case situations (i.e., the deepest and widest work surface or shelf). Test the keyboard drawer or shelf by applying a 19 kg (50 lb) 50 lb load to the center of the keyboard shelf for a period of 5 minutes. Any loosening of attachments, permanent deflection or damage to the operation of the drawer or shelf will be cause for rejection.
   2. Panel acoustics: Provide acoustical panels with a minimum noise reduction coefficient (NRC) of 0.65 when tested in accordance with ASTM C423 and a minimum sound transfer coefficient STC of 22 when tested in accordance with ASTM E290. Conduct the test on the entire assembled panel, full-face area (the complete core, adhesive, decorative fabric, frame and joining components).

3. Fire safety: Meet components requirements for flame spread and smoke development as specified by NFPA 101 except as follows. Conduct testing in accordance with either ASTM E84, UL 723, or NFPA 255 on the entire assembled panel and each different combination of fabric and interior construction. In addition meet the requirements of NFPA 265. Do not exceed panel flame spread of 25 for Class A and do not exceed panel smoke development of 450 for Class A.
4. General safety: Provide workstation products free of rough or sharp edges. Provide panel supported components with a positive, integral locking device which secures components without the use of additional screws or clamps to prevent the components from being accidentally pulled or knocked off the panels.
5. Electrical system: Provide task lights which are UL approved and meet the requirements of NFPA 70. Meet the requirements of UL 1286 for the entire electrical system.

## 2.2 PANEL SYSTEM

A. Panel system: Supply accessories and appurtenances for a completely finished panel assembly. Furnish a system capable of structurally supporting cantilevered work surfaces, shelves, files, and other components in the configurations shown on the drawings. Furnish a panel system capable of structurally supporting more than one fully loaded component per panel per side. Furnish panels that can be either tackable or capable of accommodating fabric-covered tackboards. Furnish a panel system in a variety of nominal widths and heights as designated on the drawings. Measure the heights from the finished floor to the top of the panel. Furnish powered and nonpowered which are compatible in height.

B. Finishes: Furnish panels that are acoustical. Furnish exposed panel trim with a factory baked enamel finish. Match filler trim with either the panel trim or cover with fabric to match the panel fabric. Furnish each fabric-faced panel with a seamless width of fabric stretched over the entire face of the panel and the color of each fabric utilized will be consistent throughout the installation. Attach fabric securely and continuously along the entire perimeter of the panel and allow for easy removal and replacement in the field. Factory install fabric and furnish panel fabric content of 100 percent polyester and 60 percent polyester/40 percent polyproplylene.

C. Raceways: Provide raceways that are an integral part of the panel. Provide all panels with a raceway cover, whether powered or non-powered. Do not furnish magnet held base covers, they are not acceptable.

D. Leveling glides: Provide a system with precise alignment of adjacent panels and include leveling glides to compensate for uneven floors. Furnish two leveling glides on panel-to-panel products. Furnish each connector with a leveling glide on panel-to-post products. Provide a minimum 3/4-inch adjustment range for all systems.

E. Panel connection system: Furnish panels with connectors which accommodate a variety of configurations as shown on the drawings. A straight line connection of 2 panels (180 degrees), corner connection of 2 panels (90 degrees), T connection of 3 panels (90 degrees), cross connection of 4 panels (all 90 degrees). Provide the connector system with tight connections with continuous visual and acoustical seals. Furnish all two-way and T connections with plastic, painted metal, or fabric finish to match system. Furnish a connector system which will removal of a single panel within a typical workstation configuration, without requiring disassembly of the workstation or removal of adjacent panels. Provide a connector system for connection of panels of similar or dissimilar heights. Furnish right angle (90 degree) connections between panels which will not interfere with the capability to hang work surfaces and other components on any adjacent panel. Provide a connector system, as required, for the continuation of electrical and communications wiring within workstations and from workstation to workstation. Level all filler posts with the panel top rail. Furnish wood topcaps on panels located inside floor-to-ceiling offices.

## 2.3 WORK SURFACES

A. Construct work surfaces to prevent warpage. Fully support work surfaces from the panels or supported jointly by the panels and supplemental furniture end panels. Use supplemental end supports only under work surfaces when the workstation configuration does not permit full support by the panels. Use metal support brackets to support work surfaces from the panels. Metal-to-metal fitting to the vertical uprights of the panels will be vertically adjustable, and lock the work surfaces in place without panel modifications. Closely mate abutting work surfaces and furnish at equal heights when used in side-by-side configurations in order to provide a continuous and level work surface. Furnish pre-drilled holes in the work surfaces to accommodate storage components, pedestals and additional supports, or drill holes at the job site to accommodate these items. Provide work surfaces in sizes and configurations shown on the drawings. Provide work surfaces which are available in nominal depths of 24 inches and 30 inches, 30 inches nominal lengths from 24 to 72 inches, and a nominal thickness from 1 to 1-3/4 inches. Furnish work surfaces that are height adjustable in 1 to 1-1/2 inch increments from 25 to 41 inches above the finished floor. Provide a continuous and level work surface for work surfaces abutting at equal heights. Provide curved corner work surfaces as shown on the drawings and include all hardware necessary to provide firm and rigid support.

1. Finishes: Provide work surfaces with a finished top surface of high-pressure plastic laminate, and a smoothly finished underside. Furnish work surfaces not affected by ordinary household solvents, acids, alcohols, or salt solutions, and capable of being cleaned with ordinary household cleaning solutions. Match metal support brackets with the color and finish of trim. Provide vinyl and wood molding for the edges, see drawings for locations.

## 2.4 PEDESTALS

A. Provide drawer configurations and pedestal height as shown on the drawings.
   1. Construction: With the exception of drawer fronts, furnish pedestals and drawers of steel construction. Securely attach drawer faces to the drawer front.
   2. Finishes: Furnish the finish of steel surfaces with a factory baked enamel finish or powder coated. Furnish steel drawer fronts..
   3. Drawer requirements: Furnish pedestals which are field interchangeable from left to right, and right to left, and capable of retaining the pedestal locking system capability. Design pedestals to protect wires from being damaged by drawer operation. Hang pedestals from work surfaces. Furnish drawers that stay securely closed when in the closed position and each drawer contains a safety catch to prevent accidental removal when fully open. Furnish file drawers with full extension ball bearing suspension with hanging folder frames. Furnish 12 inch high file drawers. Provide box drawers with pencil trays.

## 2.5 STORAGE

A. Provide lateral files, flipper door cabinets, and shelf units in the sizes and configurations shown on the drawings. Furnish flipper door and shelf unit cabinets that accommodate task lighting and have a depth to accommodate a standard three ring binder.
   1. Shelf unit construction: Furnish shelf pans of metal construction with formed edges. Construct shelf supporting end panels of metal, high-density particleboard, molded phenolic resin, or molded melamine.
   2. Flipper door unit construction: Provide flipper door unit of equal construction to shelf units. Furnish units that remain securely fastened when in the locked position. Utilize a suspension system for the doors.
   3. Lateral file unit construction: Furnish lateral files of steel construction. Provide file fronts, top and end panels of equal construction to shelf units. Furnish file drawers with full extension ball bearing drawer slides or rack and pinion suspension. Furnish file drawers capable of accommodating hanging folder frames, compressor dividers or rails and capable of hanging side-to-side or front-to-back.
   5. Finish: Provide a factory backed enamel finish on shelves. Furnish shelf supporting end panels with either a factory-baked enamel or laminate finish. Provide shelf bottom to match end panel color. Furnish metal doors with an exterior finish of factory-baked enamel or a factory-installed fabric covering and an interior finish of factory baked enamel. Furnish metal drawers with factory baked enamel finish.

## 2.6 ACCESSORIES

A. Furnish one panel mounted coat hook per workstation occupant at each workstation.

B. Keyboard tray: Provide work surfaces capable of accepting an articulating keyboard on workstations as shown on the drawings. Furnish keyboard tray with the capability to be fully recessed under the work surface and extend to give the user full access to the keyboard. Provide side travel rotation with 180-degree swing. Furnish keyboard tray with tilting capability and a wrist support. Include space for a mouse on the tray.

C. Tackboards: Factory install fabric on tackboards. Furnish tackboard fabric content of 60 percent polyester/40 percent polypropylene. Locate and size tackboards as shown on the drawings.

D. Sign holders: Provide one plastic covered sign holder for each workstation, mount adjacent to opening into workstation.

E. Conference tables: Furnish conference tables as shown on the drawings with plastic laminate top and wood edging to match systems furniture work surface. Base to match systems furniture trim color.

## 2.7 MISCELLANEOUS HARDWARE

A. Provide brackets, supports, hangers, clips, panel supported legs, connectors, adjustable feet, cover plates, stabilizers, and other miscellaneous hardware.

## 2.8 LOCKS AND KEYING

A. Provide drawers and flipper door cabinets with keyed locks. Furnish field changeable lock cylinders with a minimum of 100 different key options. Individually key and lock all locks keyed alike within a workstation. Lock all drawers within a pedestal either by a central lock that controls all pedestals under one work surface or an individual keyed lock in each pedestal. Key central file and storage units which are grouped together but are not a part of a workstation alike unless otherwise specified. Provide two keys for each lock or 2 keys per workstation when keyed alike, and 3 master keys per office. Factory number keys and lock cylinders for ease of replacement. Clearly label locks with a key number.

## 2.9 ELECTRICAL

A. Provide both powered and non-powered panels with base raceways capable of distributing power circuits, communication cables and data lines. Furnish non-powered bases capable of easy field conversion to powered base without requiring the panel to be dismantled or removed from the workstation. Provide a system with copper cable assemblies, wiring harnesses or electrified bus and

meet requirements of UL 1286 and NFPA 70, Article 605. Furnish conductors consisting of 20-amp degree C, #12 AWG wires or the equivalent in the bus configuration. Provide the label or listing of Underwriter's Laboratories, Inc. as evidence that the material or equipment conforms to the applicable standards of that agency. Submit in lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures of UL and that the materials and equipment comply with contract requirements.

B. Panel raceways: Furnish panels with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Furnish raceways that do not extend past either panel face by more than 1/2 inch. Provide metal or plastic covers which attach securely to the raceway as required and match the finish and color of the panel trim. Furnish raceways with a minimum of 2 knockouts (doors) per side for electrical connections or outlets as indicated elsewhere.

C. Power distribution: Provide power distribution as indicated on the drawings. Furnish panels with an internal power and communications raceway and the capability of disconnecting and connecting external circuits to the electrified raceway in the panel. Furnish communications receiving raceway with capacity for at least six 4-pair category 5 cables. Provide a power and communications wiring with a common wireway if a metal divider is included to ensure electrical isolation. Include doors or access openings for entry of communications cable. Furnish an electrified power raceway with the 8-wire configuration indicated. Allocate conductors of the 8-wire system as follows: furnish the three-phase system with one equipment ground, one isolated ground, one neutral and two each dedicated phase.
   1. Receptacles: Provide power receptacles in the powered panels. Place devices in the raceway. Conform 15 amp commercial grade receptacles to NEMA WD1 and NEMA WD6. If receptacles are not interchangeable or will not permit field adjustment of phase and circuit selection, furnish 10 percent spare devices of each type shown on these plans and parts list. Furnish all receptacles in the duplex configuration; unless otherwise indicated, furnish special use receptacles of the simplex configuration with the blade/pin arrangement identified on the plans. Coordinate the color of receptacle bodies with the color of the panel trim. Provide distinct markings on isolated ground receptacles. Furnish permanent on field applied identifications; do not use stick-on or non-setting adhesives.

D. Electrical connections:
   1. Internal Connections: Utilize straight or flexible plug/receptacle connector assemblies in internal panel-to-panel power connections to provide the powered configurations shown on the drawings.
   2. Connections to building services: Supply external power and communications services to the panels via direct-wired top entry modules. Do not use cord and plug assemblies for any portion of external

links. Provide top entry junction box assemblies to extend the power and communications wiring into service entry poles attached to electrified panels.

E. Wire management: Provide wire management capability at all workstations. Accommodate all cable types specified in wire management, including the applicable manufacturer required bending radius at corners. Design raceways and interfaces to the raceways to accommodate the bend radius as shown in EIA ANSI/TIA/EIA-569-B for Category 5 and fiber optic cables communication wiring whichever is greater. Accomplish this capability by cable access cutouts 1 minimum per work surface, covered wire management troughs in vertical end panels, horizontal wiring troughs, or rear gaps (between the back edge of the work surface and the facing support panel). Conceal loose lighting wiring behind tack boards, exposed or loose wiring will not be acceptable. Separate power wiring from communication wiring by use of separate raceways or by placement of channels in joint use troughs or wireways.

F. Circuit layout: Connections to the building electrical distribution system will be provided by others.

G. Service entry poles: Provide service poles as indicated on the contract drawings and capable of minimally accommodating the 8-wire power configuration described in paragraph Powered Panels and the equivalent of six 4-pair category 5 cables. Furnish poles with metal barriers or channels to separate power and communications wiring. Provide pole dimensions to be equal to maximum panel thickness. Match the pole finish and color with the finish and color of the panel trim. Provide each pole with a wiring interface, an end cap and a ceiling trim plate which extends a minimum of 40 mm 1-1/2 inches from all sides of the pole. Include poles for power service with a junction box either as part of the pole assembly or in a field installed configuration. Securely attach service poles to the panels and install plumb. Wiring and interface components will be provided by others to connect the building power supply to power poles.

H. Task lighting: Provide task light size and placement as indicated on the contract drawings. Provide lights which are a standard component of the manufacturer's workstation products. Do not extend the ends of the task light length beyond the edges of the overhead unit. Furnish task lights with structurally sound mounting devices which will prevent accidental displacement, but will allow easy removal and replacement when necessary. Furnish fixtures that are UL approved for use in the configurations indicated on the drawings.

1. Luminaire configuration: Provide luminaires that are fluorescent type and shall have prismatic lenses, baffles, or reflector systems configured to minimize glare by shielding the lamp from the view of a seated user. Provide task lights for each workstation with a minimum of 60 foot candles of light (horizontally measured), without veiling reflections, on the

work surface directly below and a maximum of 20 inches from the fixture. Furnish all diffusers, grilles or other coverings which are easily removable to permit cleaning and relamping. Provide fixtures with energy efficient ballasts and lamps as indicated. If the type is not identified on the plans, use F32T8 lamps in 1220 mm 4 foot units with electronic ballasts. Provide each luminaire with an easily accessible on-off switch and one rapid-start ballast. Furnishing a variable intensity control is acceptable if the low setting is equivalent to "off" with zero energy consumption. Multiple switching is also acceptable. Do not use ganged fixtures or shared ballasts

2. Wiring: Furnish each fixture with a 1830 mm 6 foot minimum, factory installed, heavy duty electrical cordset with a grounded plug. Direct or hard wire connections are not acceptable. Unless otherwise indicated, conceal all cords. Build-in cord concealment within panels or utilize field installed, manufacturer approved accessories. Cords may be hidden behind tack boards.

I. Communications: Communications wiring to the panels will be installed by others.

## PART 3 EXECUTION

### 3.1 INSTALLATION

A. Install furniture in two phases as shown on drawings.

B. Install the workstations using certified installers in accordance with manufacturer's recommended installation instructions. Install workstation components level, plumb, square, and with proper alignment with adjoining furniture. Secure interconnected components and securely attached to the building where required. Provide three sets of any special tools and equipment necessary for the relocation of panels and other components.

C. Install lateral files ensuring all cabinets are level and plumb and all backing material has been removed.

### 3.2 CLEANING

A. Clean and polish all products upon completion of installation and leave the area in a clean and neat condition. Repair any defects in material and installation, and replace any damaged products that cannot be satisfactorily repaired.

END OF SECTION