UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2014
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SECTION TABLE OF CONTENTS

DIVISION 12 - FURNISHINGS

SECTION 12 50 00

FURNITURE SYSTEMS

02/09

2.1.5 Paints and Coatings
2.2 [PANEL SYSTEM] [SPINE WALL SYSTEM] [DESK-BASED SYSTEMS]
2.2.1 Panel System
2.2.2 Stacking Panel-Frame System
2.2.3 Spine Wall System
2.2.4 Desk-Based Systems
2.2.5 Finishes
2.2.5.1 Panels
2.2.5.2 Stacking Panel-Frames
2.2.5.3 Spine Wall Frames
2.2.6 Raceways
2.2.7 Leveling Glides
2.2.8 Connection System
2.2.9 Wall Mounted Panels
2.2.10 Glazed Panel Inserts
2.2.11 Door Panels
2.2.12 Sliding Doors
2.3 WORK SURFACES
2.3.1 General Requirements
2.3.2 Finishes
2.4 PEDESTALS
2.4.1 Construction
2.4.2 Finishes
2.4.3 Drawer Requirements
2.5 STORAGE CAPACITY
2.5.1 Shelf Unit Construction
2.5.2 Overhead Cabinet Construction
2.5.3 Lateral File[, Vertical File][, Pedestal][and Book Case] Construction
2.5.4 Personal Storage Tower Construction
2.5.5 Finish
2.6 ACCESSORIES
2.6.1 Coat Hook
2.6.2 Keyboard Tray
2.6.3 Computer Turntables
2.6.4 Tackboards
2.6.5 Erasable Marker Boards
2.6.6 Paper Management Unit
2.6.7 Wall Mounted Components
2.6.8 CPU Holder
2.6.9 Signage
2.6.10 Slat Tile
2.6.11 Monitor Arm
2.7 MISCELLANEOUS HARDWARE
2.8 LOCKS AND KEYING
2.9 POWER AND COMMUNICATIONS
2.9.1 Panel Raceways
2.9.2 Spine Wall
2.9.3 Power Distribution
2.9.3.1 Receptacles
2.9.3.2 Power Cabling Variations
2.9.4 Electrical Connections
2.9.4.1 Internal Connections
2.9.4.2 Connections to Building Services
2.9.5 Wire Management
2.9.6 Circuit Layout
2.9.7 Service Entry Poles
2.9.8 Task Lighting
2.9.8.1 Luminaire Configuration

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USACE / NAVFAC / AFCEC / NASA | **UFGS-12 50 00 (February 2009)**

Preparing Activity: USACE | **Superseding UFGS-12 50 00 (January 2007)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 12 50 00

FURNITURE SYSTEMS
02/09

****
NOTE: This guide specification covers the requirements for furniture systems which include panel-supported, stackable panel, spine wall and desk-supported furniture systems.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
****

PART 1 GENERAL

****
NOTE: Various provisions of this guide specification may be irrelevant to or in conflict with the requirements of any given project. This spec should be carefully edited to fit the needs of each specific application. Portions must be deleted, if not applicable, and additional material inserted where necessary to adequately delineate requirements. Brackets and blanks identify provisions which involve alternates; the editor must select and/or insert the appropriate requirements.
****

1.1 REFERENCES

****
NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.
****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1	(2009; Errata 2010) Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 189.1	(2011; Errata 1-2 2012; INT 1 2013; Errata 3-8 2013) Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings
ASHRAE 90.1 - IP	(2013l INT 1 2013; Errata 1-3 2013; Errata 4 2014) Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE 90.1 - SI	(2013; Errata 1-3 2013; Errata 4-5 2014) Energy Standard for Buildings Except Low-Rise Residential Buildings

ASTM INTERNATIONAL (ASTM)

ASTM C1048	(2012; E 2012) Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
ASTM C423	(2009a) Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

ASTM D7611/D7611M	(2013) Standard Practice for Coding Plastic Manufactured Articles for Resin Identification
ASTM E290	(2013) Bend Testing of Material for Ductility
ASTM E84	(2014) Standard Test Method for Surface Burning Characteristics of Building Materials

BIFMA INTERNATIONAL (BIFMA)

ANSI/BIFMA X5.5	(2008) Desk Products
ANSI/BIFMA X5.6	(2010) Panel Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA WD 1	(1999; R 2005; R 2010) Standard for General Color Requirements for Wiring Devices
NEMA WD 6	(2012) Wiring Devices Dimensions Specifications

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2012; Amendment 1 2012) Life Safety Code
NFPA 265	(2011) Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3 2014) National Electrical Code

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-569	(2012c; Addendum 1 2013; Errata 2013) Commercial Building Standard for Telecommunications Pathways and Spaces

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

UNDERWRITERS LABORATORIES (UL)

UL 1286	(2008; Reprint Sep 2013) Office Furnishings
UL 723	(2008; Reprint Aug 2013) Test for Surface Burning Characteristics of Building Materials

1.2 SYSTEM DESCRIPTION

1.2.1 Workstations

This specification establishes the minimum requirements for the acquisition and installation of a complete and usable system of workstations composed of panels, stacking panel-frames, spine walls, freestanding work surfaces or base units, supporting components, electrical hardware, communications, special electrical features, and accessories. Workstation requirements and configurations shall be in accordance with the furniture layout and typical workstation types shown in drawings and specified herein. Provide components and hardware from a single manufacturer; they shall be standard products as shown in the most recent published price lists or amendments; submit complete listing of part/model numbers for all components to be provided, including names and codes of components referenced on updated drawings. Electrical components shall be 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). The completed installation shall comply with NFPA 70 and NFPA 101. Coordinate the work of this section with that to be performed under other sections. This specification may include items which are not manufactured by the furniture manufacturer; provide any such items under this section. Submit two complete sets of certificates attesting that the proposed workstation meets specified requirements. The certificate shall be dated after the award of contract, shall name the project, and shall list specific requirements being certified.

1.2.2 Samples

Submit samples as required to obtain final approval. The Government reserves the right to reject any finish samples that do not satisfy the construction or color requirements. Work shall not proceed without sample approval in writing from the Contracting Officer. Submit four sets of the finish samples listed below:

a. Panel, tackboard and overhead door fabric. Minimum 150 by 150 mm 6 by 6 inches with label designating the manufacturer, color, fiber content, fabric weight, fire rating, and use (panel and/or tackboard).

b. Panel, spine wall, work surface, modesty panel, and component finish. Minimum 60 by 75 mm 2-1/2 by 3 inches with label designating the manufacturer, material composition, thickness, color, and finish.

c. Task lights.

d. Panel and spine wall glazing. Glazing samples with label designating the material and safety ratings.

1.2.3 Mock-up

Submit a Mock-up of an actual workstation. Reflecting approved finishes and fabrics in the workstation mock-up . Locate the mock-up installation at [the local dealership][approved off-site location][_____]. Do not order furniture systems for the project until the mock-up has been approved; submit manufacturer's product and construction specifications which provide technical data for furniture system and components specified, including task lighting and illumination performance information. Literature shall include adequate information to verify that the proposed product meets the

specification. Review of the mock-up may result in adjustments to the product, layout and finishes. The approved mock-up can be used in installation.

1.2.4 ALTERNATE DESIGN

****
NOTE: Minor differences exist among different manufacturer's product. This paragraph pertaining to an "alternate design" was written in order not to exclude a manufacturer when an equally acceptable solution is proposed.
****

Manufacturers who are unable to provide workstations that conform exactly to the furniture layouts and typical workstation types shown in the contract drawings, may submit alternate designs for consideration by the Contracting Officer. Alternate designs shall meet or exceed the following criteria. Alternate designs that are submitted but do not meet these criteria will be rejected. The alternate design shall provide 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 or site conditions.

1.2.4.1 Component Requirements

The types of components or elements utilized shall be as shown on the drawings and as specified in PART 2 PRODUCTS of this specification. The storage capacity, number of workstations accommodated, width of aisles, or workstation configuration shall not be reduced.

1.2.4.2 Wiring Configuration

Alternate configurations shall support the circuiting and connection capabilities identified under the provisions pertaining to power distribution of paragraph POWER AND COMMUNICATIONS. Generally any alternate will be acceptable which involves only a variation in size or quantity that exceeds the specified configuration.

1.2.5 Performance Requirements

Panels, spine walls, frames and frame covers, connection system, work surfaces, pedestals, shelf units, overhead door cabinets, lateral files, locks, accessories, and miscellaneous hardware shall meet testing as specified. ISO 9001 certified manufacturers may perform inhouse testing. Manufacturers not ISO 9001 qualified will be required to produce testing by an independent testing laboratory. Component specific requirements are listed in appropriate paragraphs.

1.2.5.1 Selected Components

Workstations shall conform to the requirements of ANSI/BIFMA X5.5 and ANSI/BIFMA X5.6 with the following exceptions: Panels, spine walls and panel, or spine wall supported components shall be tested and pass in accordance with the requirements of ANSI/BIFMA X5.6 and representative items shall be selected for testing based on worst case situations (i.e., the deepest and widest work surface or shelf). Perform the keyboard drawer or shelf test applying a 19 kg 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.

1.2.5.2 Panel Acoustics

****
NOTE: Consider using non-acoustical panels when storage units cover more than half of the panel surface as the acoustical advantage is lost and the stronger non-acoustical unit is less expensive.

Acoustical performance ratings should be based upon the workstation design. While NRC and STC ratings contribute to overall acoustical performance, the acoustical role of panels is relatively minimal in the overall environment when compared to sound absorptive properties of other finish surfaces. Most major manufacturers do not comply with the higher 0.80 NRC and 24 STC without providing their more costly high performance panels. The designer must determine if the additional acoustical performance is worth the added cost to the Government. Designer must coordinate NRC and STC requirements for panel heights above 1200 mm (48 inches).

Delete paragraph if acoustical panels are not required.
****

Provide acoustical panels with a minimum noise reduction coefficient (NRC) of [0.65] [0.80] [_____] when tested in accordance with ASTM C423 and a minimum sound transfer coefficient (STC) of [14] [20] [24] [26] [_____] 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).

1.2.5.3 Panel Glazing

****
NOTE: Curved glazed panels should not be specified since most products utilize an acrylic glazing. Acrylic glazing is not acceptable since it does not meet flame spread and smoke development requirements.
****

Tempered glass shall conform to ASTM C1048, Kind FT, Condition A, Type I, [Class 1 Transparent] [Class 3 - Light reducing, tinted or translucent].

1.2.6 Pattern and Color

****
NOTE: Include a reference to Section 09 06 90 COLOR SCHEDULE or drawings for all items requiring a finish color. This includes the following items when applicable: Work surfaces, Storage Units, Tackboards, Erasable Marker Boards, Signage, Slat Tile, Panels, Stacking Panel Frames, Spine walls, Screens, Connectors, Trim and Accessories. Specify

both sides of panels.
****

Pattern and color of finishes and fabrics for panels [and spine walls], components, and trim shall be [in accordance with Section 09 06 90 COLOR SCHEDULE] [as shown on the drawings] [_____].

1.3 SUSTAINABILITY REQUIREMENTS

****
NOTE: The bracketed items are representative of LEED material documentation and requirements that may apply to this project. These items should be edited to reflect the project requirements.
****

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

See Section 01 33 29 LEED DOCUMENTATION for project LEED NC [local/regional materials,] [low-emitting materials,] [recycled content,] [certified wood,] [optimize energy performance,] [____] [and] [rapidly renewable materials] requirements.

1.3.2 EPA Comprehensive Procurement Guidelines

See Section 01 62 35 RECYCLED/RECOVERED/BIOBASED MATERIALS for requirements associated with EPA designated products.

1.3.3 USDA Biobased

See Section 01 62 35 RECYCLED/RECOVERED/BIOBASED MATERIALS for requirements associated with USDA Biobased designated products.

1.4 SUBMITTALS

****
NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for

Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings[; G][; G, [_____]]
Installation[; G][; G, [_____]]

SD-03 Product Data

Furniture Systems[; G][; G, [_____]]
Warranty
Workstations
Materials; (LEED NC)
[Composite Wood and Fiberboard; (LEED NC)]
[Emissions; (LEED NC)]
[Refurbished Furniture Systems; (LEED NC)]
[Linoleum]
[Fabric]

SD-04 Samples

Workstations[; G][; G, [_____]]
Mock-up[; G][; G, [_____]]

SD-06 Test Reports

Selected Components[; G][; G, [_____]]
Panel Acoustics[; G][; G, [_____]]
Fire Safety[; G][; G, [_____]]
Electrical System[; G][; G, [_____]]
Emissions

SD-07 Certificates

Workstations

SD-08 Manufacturer's Instructions

Material Safety Data Sheets

SD-10 Operation and Maintenance Data

Assembly Manuals[; G][; G, [_____]]
Maintenance Manuals[; G][; G, [_____]]
Cleaning[; G][; G, [_____]]
Electrical System[; G][; G, [_____]]
Plastic Identification
Maintenance Service

SD-11 Closeout Submittals

LEED Documentation

1.5 QUALITY ASSURANCE

1.5.1 General Safety

Provide workstation products free of rough or sharp edges. [Panel and spine wall supported components shall have 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.] [Desk-based workstation components shall have the option for a positive, integral locking device that secures components to the base units.]

1.5.2 Fire Safety

****
NOTE: Select flame spread and smoke development in accordance with UFC 3-600-01. Verify that flame spread and smoke development ratings can be met with fabric specified.
****

Components shall meet requirements for flame spread and smoke development as specified by NFPA 101 except as follows. Testing shall have been conducted in accordance with either ASTM E84 or UL 723 on the entire assembled panel and each different combination of fabric and interior construction. In addition, fabric shall meet the requirements of NFPA 265. Panel flame spread shall not exceed [[25 for Class A] [75 for Class B] [200 for Class C]] and panel smoke development shall not exceed 450 for Class A, B and C.

1.5.3 Electrical System

Task lights shall be UL approved and shall meet the requirements of NFPA 70. The electrical system shall meet the requirements of UL 1286. Submit three sets of electrical system manuals describing the functions, configuration, and maintenance of the electrical system (power [, communications] [, data]). This material may be included in the above manuals at the Contractor's option.

1.5.4 Detail Drawings

Submit detail drawings showing communications, electronic data processing (EDP) and local area network (LAN); locations may be provided as a separate submittal from remaining workstation drawings. Drawing requirements, which are the furniture manufacturer's responsibility, shall be provided as a single submittal. Provide electronic drawings to the user for future re-configuration in the software package requested by the user. The electronic drawings shall include all modifications made during

installation. As a minimum, submit the following:

a. Overall reference drawings: Drawings showing workstation locations and overall plan view within each floor. The scale shall be [1:400 (1/16 inch = 1 foot) 1/16 inch = 1 foot] [1:200 (1/8 inch = 1 foot) 1/8 inch = 1 foot]. Layouts shall reflect field verified conditions.

b. Installation drawings: Drawings showing workstations, panels, spine walls, components, and plan view within each floor. Workstations shall be identified by workstation type; submit drawings showing the proposed workstation installation at a scale of 1:100 (1/4 inch = 1 foot) 1/4 inch = 1 foot, unless otherwise specified.. Scale of other drawings shall be identical to Architectural plans. Installation drawings shall reflect field verified conditions.

c. Workstation elevations: Dimensioned workstation elevations showing each type of workstation with panel frame [and spine wall frame] configurations and all components identified with manufacturer's catalog numbers. Elevations shall be drawn at 1:50 (1/2 inch = 1 foot) 1/2 inch = 1 foot scale.

d. Panel drawings: Panel [and Spine Wall] drawings showing panel [and spine wall] locations and critical dimensions from finished face of walls, columns, panels, including clearances and aisle widths. Assemblies shall be keyed to a legend which shall include width, height, configuration and composition of frame covers finishes and fabrics (if different selections exist within a project), power or nonpower, connectors and wall mount hardware. Panel placement shall be coordinated with location of electrical, voice/date LAN,[SIPRNet,][NIPERNet,] mechanical and fire protection fixtures. Drawings shall reflect field verified conditions.

e. Electrical drawings: Drawings showing power provisions including type and location of feeder components (service entry poles, base or ceiling feeds), activated power receptacles and other electrical components. Wiring configuration (circuiting, switching, internal and external connections) shall be identified and a legend provided as applicable.

f. Wire management capacity drawings.

g. Communication drawings showing telephone provisions: Drawings indicating the type and location of feeder components and communications jacks with wiring configuration identified where applicable.

h. Communication drawings showing electronic data processing provisions: Drawings indicating the type and location of feeder components, communications jacks, or accessories with wiring configuration identified where applicable.

i. Communication drawings showing local area network provisions: Drawings indicating the type and location of feeder components and data jacks with extra ports for future expansion with wiring configuration identified where applicable.

j. Reflected ceiling plan for projects specified with power poles.

1.6 DELIVERY, STORAGE, AND HANDLING

****
NOTE: Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paint, wood preservatives, and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders. Absorbent systems furniture includes, among others, fabric-covered components.
****

Deliver components to the jobsite in the manufacturer's original packaging with the brand, item identification, and project reference clearly marked thereon. Remove furniture system components from packaging and store in an unoccupied, dry location that is ventilated. Storage shall be free from dirt and dust, water, and other contaminants, and in a manner that permits easy access for inspection and handling.

1.7 WARRANTY

Warrant the furniture systems for a period of 10 years with the following exceptions: fabrics and other covering materials, and paper handling products shall be guaranteed for 3 years. [Electromagnetic ballasts shall be warranted for 2 years.] [Electronic ballasts shall be warranted for 3 years.] [The electronic ballast warranty shall include a $10 labor allowance for each ballast.] Warranties shall be signed by the authorized representative of the manufacturer. Present warranties, accompanied by document authenticating the signer as an authorized representative of the guarantor, to the Contracting Officer 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.Submit two copies of the warranty.

1.8 MAINTENANCE SERVICE

****
NOTE: Maintenance agreements are standard practice in the building industry. Under a green lease, when the customer no longer requires the use of the particular product or requires an updated model, the manufacturer is obligated to reclaim it and refurbish it or disassemble it for recycling as appropriate. Using one of these manufacturer's services contributes to the following LEED credit: MR2. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.
****

Collect information from the manufacturer about [maintenance agreement] [green lease] options, and submit to Contracting Officer. Submit documentation that includes contact information, summary of procedures, and the limitations and conditions applicable to the project. Indicate manufacturer's commitment to reclaim materials for recycling and/or reuse. Services shall reclaim materials for recycling and/or reuse. Services

shall not landfill or burn reclaimed materials. When such a service is not available, local recyclers should be sought after to reclaim the materials.

PART 2 PRODUCTS

****
NOTE: The workstation layout must conform to NFPA 101, and for buildings not excluded by TI 800-01 Design Criteria should be accessible in accordance with 36 CFR 1191. Considerations for height adjustable work surfaces and storage design must be made when ADA conformance within the workstation is required. Consider the use of existing reconditioned furniture systems when appropriate. The aesthetics and function of all componetry within this specification shall be compatible.
****

2.1 MATERIALS

****
NOTE: The marking system indicated below is intended to provide assistance in identification of products for making subsequent decisions as to handling, recycling, or disposal.
****

Plastic Identification: Verify that plastic products to be incorporated into the project are labeled in accordance with ASTM D7611/D7611M. Where products are not labeled, provide product data indicating polymeric information in the Operation and Maintenance Manual.

Type 1	Polyethylene Terephthalate (PET, PETE)
Type 2	High Density Polyethylene (HDPE)
Type 3	Vinyl (Polyvinyl Chloride or PVC)
Type 4	Low Density Polyethylene (LDPE
Type 5	Polypropylene (PP)
Type 6	Polystyrene (PS)
Type 7	Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

2.1.1 Composite Wood and Fiberboard

****
NOTE: Using formaldehyde-free products contributes to the following LEED credit: EQ4. Include submittal if pursuing this LEED credit, and coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.

****

[Provide documentation that composite wood and agrifiber products [are third-party certified as meeting ANSI standard requirements for formaldehyde emissions. Submit manufacturer's product data indicating VOC and formaldehyde content.] [contain no added urea-formaldehyde resins.]] [Virgin wood products shall be FSC-certified.]

2.1.2 Refurbished Furniture Systems

****
NOTE: Using salvaged or recovered materials contributes to the following LEED credit: MR3. Include submittal if pursuing this LEED credit, and coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.
****

[When available, use salvaged furniture systems.] Provide light colored furniture and panel fabric with a minimum reflectivity of 40 percent. Wood casework shall be [FSC-certified] [salvaged].

2.1.3 Fabric

****
NOTE: The 2002 Farm Bill - Section 9002, Federal Procurement Of Biobased Products, requires each Federal Agency to develop a procurement program which will assure that items composed of biobased products will be purchased to the maximum extent practical and which is consistent with applicable provisions of Federal procurement law. Use of biobased materials that are rapidly renewable (including cotton) contributes to the following LEED credit: MR6. Include submittal if pursuing this LEED credit, and coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION.
****

[Biobased fabrics shall be a minimum of [85] [95] [_____] percent organically grown cotton, wool, or ramie.] Synthetic fabrics shall contain 100 percent post-consumer recycled content. Dyes shall be nontoxic, containing no mutagens, carcinogens, bioaccumulative or persistent toxins, heavy metals, or endocrine disrupters. Chemical treatments, including wrinkle-resistant treatment, fire-resistant treatment, and moth treatment, are [permitted with written approval from the Contracting Officer.] [not permitted.] [Submit documentation indicating type of biobased material in product and biobased content. Indicate relative dollar value of biobased content products to total dollar value of products included in project. Submit documentation indicating relative dollar value of rapidly renewable materials to total dollar value of products included in project.] Submit Material Safety Data Sheets for fabrics.

2.1.4 Linoleum

As specified in Section 09 65 00 RESILIENT FLOORING.

2.1.5 Paints and Coatings

As specified in Section 09 90 00 PAINTS AND COATINGS.

2.2 [PANEL SYSTEM] [SPINE WALL SYSTEM] [DESK-BASED SYSTEMS]

****
NOTE: A spine wall system may be used in combination with a panel system. In these applications, the spine wall serves as the core of a cluster of workstations.
****

2.2.1 Panel System

Accessories and appurtenances for a completely finished panel assembly shall be supplied complete with the system. Provide a system capable of structurally supporting cantilevered work surfaces, shelves, files, overhead cabinets, and other components in the configurations shown on the drawings plus more than one fully loaded component per panel per side. Panels shall be [tackable][capable of accommodating fabric covered tackboards,] [acoustical,] [stackable,] [segmented [as designated on the drawings] and segments shall be field removable from both sides of the panel]. The panel system shall be available in a variety of nominal widths and heights as designated on the drawings. Heights shall be measured from the finished floor to the top of the panel. Powered and nonpowered panels shall be compatible in height. Coordinate panel heights with the HVAC and electrical designs.[System shall have 100 percent off-modular capability with no defacement of any element caused by components when used in an off-modular application. Off modular connections shall not require a unique panel frame.] Submit three sets of Assembly Manuals describing assembly and reconfiguration procedures.

2.2.2 Stacking Panel-Frame System

Supply accessories and appurtenances for a completely finished panel assembly within the system. Provide a system capable of structurally supporting cantilevered work surfaces, shelves, files, and other components in the configurations shown on the drawings plus more than 1 fully loaded component per panel per side. Panels shall be [tackable,] [capable of accommodating fabric covered tackboards,][acoustical,][stackable,] [segmented [as designated on the drawings]and segments shall be field removable from both sides of the panel]. The system shall be capable of lowering or raising the overall panel assembly height, at horizontal connections, by either removing or adding panel-frames on-site without disturbing adjacent panel components. The panel system shall be available in a variety of nominal widths and heights as designated on the drawings and shall be vertically stackable. Heights shall be measured from the finished floor to the top of the panel assembly. Coordinate panel heights with the HVAC and electrical designs.[System shall have 100 percent off-modular capability with no defacement of any element caused by components when used in an off-modular application. Off modular connections shall not require a unique panel frame.] Submit Assembly Manuals as specified in the Submittals paragraph.

2.2.3 Spine Wall System

Supply accessories and appurtenances for a completely finished spine wall assembly within the system. Provide a wall system capable of structurally

supporting cantilevered work surfaces, shelves, files, and other components in the configurations shown on the drawings, as well as allow various off module attachment locations horizontally for these components plus more than one fully loaded component per panel per side. Spine wall covers shall be easily removable while panels and workstation components are attached. Panels shall be [tackable,] [capable of accommodating fabric covered tackboards,][acoustical,][stackable,] [segmented [as designated on the drawings]and segments shall be field removable from both sides of the panel]. The spine wall panels shall be available in a variety of nominal widths and heights as designated on the drawings. [Wall height may be lowered or raised at horizontal connections by either removing or adding wall tiles on-site without disturbing adjacent wall components.] Heights shall be measured from the finished floor to the top of the panel. Coordinate wall heights with the HVAC and electrical designs. Electrical and data management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Cables shall be laid in the system, not threaded through the frame.[System shall have 100 percent off-modular capability with no defacement of any element caused by components when used in an off-modular application. Off modular connections shall not require a unique panel frame.] Submit Assembly Manuals as specified in the Submittals paragraph.

2.2.4 Desk-Based Systems

Supply accessories and appurtenances for a completely finished desk-based assembly within the system. The desk-based system shall be free-standing, independent of panel system support and capable of structurally supporting work surfaces, shelves, and other components in the configurations shown on the drawings. The system shall be available in a variety of nominal widths as defined on drawings.

2.2.5 Finishes

****

NOTE: Specify a finish and fabric for applicable items. Include fabric content, ex: 50 percent Nylon, 50 percent Wool. The designer must verify that fabric content, pattern, and color specified are not proprietary and that several manufacturers can provide a similar product to that specified.

Filler trim incurs added cost.

****

2.2.5.1 Panels

The panels shall be available in the following options: [safety glazed,] [open frame] [_____]. Exposed panel trim shall have a [factory baked enamel or epoxy powder] [wood,] finish. [Filler trim shall either match the panel trim or be fabric covered to match the panel fabric.] [Filler trim shall not be provided.] Each fabric-faced panel shall have a seamless width of fabric stretched over the entire face of the panel and the color of each fabric utilized shall be consistent throughout the installation. Curved panels may use adhesives on curved sections. The fabric shall be attached securely and continuously along the entire perimeter of the panel and shall allow for easy removal and replacement in the field (with the exception of curved panels). Fabric shall be factory installed and panel fabric content shall be [_____]. [Provide perforated metal panels [below worksurface height][within workstations] [not to include corridor side of

workstation].]

2.2.5.2 Stacking Panel-Frames

The stacking panel-frames shall accommodate covers which are available in the following options: [safety glazed,] [open pass through frames,] [wood veneer,] [upholstered,] [laminate/vinyl,] [cable access channels,] [marker surface,] [tackable surface,] [slat tile,] [_____].[Frame covers may have different options on either side of the frame.] Exposed panel trim shall have a [factory baked enamel or epoxy powder][wood] finish.[Filler trim shall either match the panel trim or be fabric covered to match the panel fabric.][Filler trim shall not be provided.] Each upholstered frame cover shall have a seamless width of fabric stretched over the entire face of the cover, and the color of each fabric used shall be consistent throughout the installation. The fabric shall be attached securely and continuously along the entire perimeter of the cover and shall allow for easy removal and replacement in the field. Fabric shall be factory installed and panel fabric content shall be [_____].

2.2.5.3 Spine Wall Frames

The spine wall frames shall accommodate covers which are available in the following options: [safety glazed,] [painted] [wood veneer] [upholstered] [laminate/vinyl] [tackable surface] [marker surface] [paper management] [vertical storage] [cable access] [_____]. Frame covers may have different options on either side of the frame. Exposed trim shall have a [factory baked enamel or epoxy powder] [wood] [metal] finish. Each fabric-faced frame cover shall have a seamless width of fabric stretched over the entire face of the cover, and the color of each fabric used shall be consistent throughout the installation. The fabric shall be attached securely and continuously along the entire perimeter of the cover and shall allow for easy removal and replacement in the field. Fabric shall be factory installed and have a content of [_____].

2.2.6 Raceways

Raceways shall be an integral part of the panel and spine wall. Provide panels and spine walls, whether powered or nonpowered, with a raceway cover. Magnet held base covers will not be accepted.

2.2.7 Leveling Glides

The system shall provide precise alignment of adjacent panels and spine walls and shall include leveling glides to compensate for uneven floors. On panel-to-panel products, each panel shall have 2 leveling glides. On panel-to-post products each connector shall contain a leveling glide. On stacking panel frames each vertical panel assembly shall have two leveling guides. A minimum 19 mm 3/4 inch adjustment range is required for all systems.

2.2.8 Connection System

****
NOTE: Delete "...connection of 2 panels for setting the panels at any angle" if not required. This connection limits sources.
****

The system shall have connectors which accommodate a variety of

configurations as indicated. 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),[angle connection of 2 panels (120 degrees),][and a connection of 2 panels for setting the panels at any angle]. The connector system shall provide tight connections with continuous visual and acoustical seals. All two-way and T connections should have plastic, painted metal, fabric or wood finish to match system. The connector system shall allow removal of a single panel or spine wall within a typical workstation configuration, without requiring disassembly of the workstation or removal of adjacent panels or spine walls. The connector system shall provide for connection of similar or dissimilar heights. Provide dissimilar height panel assemblies with trim pieces to finish the exposed edge. Right angle (90 degree) connections between panels shall not interfere with the capability to hang work surfaces and other components on any adjacent panel. The connector system shall provide, as required, for the continuation of electrical and communications wiring within workstations and from workstation to workstation. Filler posts shall be level with the top rail.

2.2.9 Wall Mounted Panels

Use wall-mount accessories when it is necessary to attach panels or vertical panel-frame assemblies to the building walls. Wall panels shall have structural support as required.

2.2.10 Glazed Panel Inserts

Glazed panel inserts shall be comprised of tempered glass in accordance with ANSI Z97.1. Acrylic glazing will not be accepted.

2.2.11 Door Panels

Door panels shall have a rigid metal frame with rails, a threshold, and a [wood] [laminate] [safety glazed] [_____] clad door adaptable to either hand swing. Door panels shall be of a dimension that will allow for a 810 mm 32 inch clear opening. Door panels shall include connectors, hinges, and [brushed chrome] [epoxy powder] [baked enamel] finished ADA compliant door knob.

2.2.12 Sliding Doors

Sliding or rolling doors shall be attached to the panel [in locations shown on the drawings][_____]. The direction in which door slides shall be able to be changed in the field. Door shall be [translucent][_____] and shall be the same width or wider than the opening to be covered. Door pulls shall be provided for each side of door. Door frame shall match the panel frame color.

2.3 WORK SURFACES

2.3.1 General Requirements

Construct work surfaces to prevent warpage.[Work surfaces shall be either fully supported from the panels [or spine wall] or supported jointly by the panels[or spine wall] and supplemental legs, pedestals, or furniture end panels. Supplemental end supports shall be used only under work surfaces when the work station configuration does not permit full support by the panels[or spine wall]. Use metal support brackets to support work surfaces from the panels[or spine wall], provide metal-to-metal fitting to

the vertical uprights of the panels[or spine wall], vertically adjustable, to lock the work surfaces in place without panel[or spine wall] modifications.][Work surfaces shall be fully floor supported with legs, pedestals, or furniture end panels.] Abutting work surfaces shall mate closely and be at equal heights when used in side-by-side configurations in order to provide a continuous and level work surface. Work surfaces shall either have pre-drilled holes to accommodate storage components, pedestals and additional supports, or holes shall be able to be drilled at the job site to accommodate these items. Work surfaces shall be provided in sizes and configurations shown on the drawings. Work surfaces shall be available in nominal depths of [510 mm20 inches,][and][610 mm24 inches,][and][760 mm30 inches,] plus or minus 50 mm2 inches, nominal lengths from 610 to 1830 mm24 to 72 inches, and a nominal thickness from 25 to 45 mm1 to 1-3/4 inches. Work surfaces shall be height adjustable in 25 to 40 mm1 to 1 1/2 inch increments from 630 to 1040 mm25 to 41 inches above the finished floor. Work surfaces abutting at equal heights shall provide a continuous and level work surface. [Corner work surfaces,] [peninsula work surfaces,] [and][counter/transaction work surfaces] shall be provided as shown on the drawings and shall include hardware necessary to provide firm and rigid support.[Work surfaces shall have 100 percent off-modular capability with no defacement of any element caused by components when used in an off-modular application.][Mobile half round round table shall have casters of which a minimum 2 shall be locking[, and table shall lock to the adjacent worksurface].]

2.3.2 Finishes

The work surfaces shall have a finished top surface of [high pressure plastic laminate], [veneer] and shall have a smoothly finished underside. The work surface shall not be affected by ordinary household solvents, acids, alcohols, or salt solutions, and shall be capable of being cleaned with ordinary household cleaning solutions. Metal support brackets shall match the color and finish of trim. Edges shall be [post formed or vinyl molding] [solid wood].

2.4 PEDESTALS

Drawer configurations and pedestal height shall be as shown on the drawings. The deepest possible pedestal shall be provided for each work surface size specified. [Mobile pedestals shall be free standing, and have[an attached upholstered seat cushion,][a handle for moving,][and] casters. Mobile pedestals shall be load bearing and be equipped with counterbalance as standard. Mobile pedestals shall be of a height to be stored under standard height worksurface.]

2.4.1 Construction

Pedestals and drawers shall be of steel construction[with the exception of drawer fronts]. Drawer faces shall be securely attached to the drawer front.

2.4.2 Finishes

The finish of steel surfaces shall be a factory baked enamel finish or powder coated. Drawer fronts shall be [either steel, plastic laminate, or molded plastic] [veneer].

2.4.3 Drawer Requirements

Pedestals shall be field interchangeable from left to right, and right to left, and shall retain the pedestal locking system capability. Design pedestals to protect wires from being damaged by drawer operation. Pedestals shall be [work surface hung,][support work surfaces,][free standing][mobile]; as shown. Drawers shall stay securely closed when in the closed position and each drawer shall contain a safety catch to prevent accidental removal when fully open. File drawers shall have either a cradle type or full extension ball bearing suspension with hanging folder frames or compressor dividers. File drawers shall be 305 mm12 inch high.[Box drawers shall be provided with pencil trays.] [Center pencil drawer shall be mounted under the work surface.]

2.5 STORAGE CAPACITY

Provide Storage Units in the sizes and configurations shown on the drawings. [Overhead cabinets][and][shelf units] shall accommodate task lighting and shall have a [depth to accommodate a standard three ring binder][depth to accommodate [_____]].[Attached storage shall have 100 percent off-modular compatibility with no defacement of any element caused by components when used in an off-modular application.]

2.5.1 Shelf Unit Construction

The shelf pan shall be of metal construction with formed edges. Shelf supporting end panels shall be constructed of metal, high density particle board, molded phenolic resin, or molded melamine. Shelf units shall accommodate relocatable shelf dividers.

2.5.2 Overhead Cabinet Construction

Provide metal construction overhead cabinets. Units shall remain securely fastened when in the locked position. Doors shall utilize a suspension system. [Overhead cabinet door shall retract over the top of the cabinet[and shall be curved].][Overhead cabinet door shall retract into the cabinet.] [Overhead cabinet shall be ADA accessible.]

2.5.3 Lateral File[, Vertical File][, Pedestal][and Book Case] Construction

Units shall be of steel construction and file fronts, top and end panels shall be of metal construction. File drawers shall have full extension ball bearing drawer slides or rack and pinion suspension. File drawers shall have hanging folder frames or rails and shall be capable of hanging side-to-side or front-to-back. [Vertical files shall have dividers.]

2.5.4 Personal Storage Tower Construction

Personal storage tower and components shall be of steel construction. The personal storage tower shall be [the same height as the surrounding panels][_____] and include the following: One full height wardrobe unit with coat rod, two file drawers, bookcase with two adjustable shelves and hinged lockable doors [_____].

2.5.5 Finish

****

NOTE: Designer should not remove an option for a factory baked enamel overhead cabinet from this

paragraph since a limited number of manufacturers offer a fabric door. If fabric doors are not desired for maintenance reasons, the fabric option may be eliminated since a metal overhead cabinet door is readily available.

****

Shelves, dividers and top dust cover shall have a factory baked enamel or epoxy powder coat finish. Shelf supporting end panels shall have either a factory baked enamel, epoxy powder coat or laminate finish. Shelf bottom shall match end panel color. Metal doors shall have an exterior finish of [factory baked enamel][factory installed fabric covering] and an interior finish of factory baked enamel or epoxy powder coat. Metal drawers shall have a factory baked enamel finish or epoxy powder coat.[Overhead cabinet doors shall have fabric finish.] Fabric content of overhead cabinet doors shall be [_____]. [[Overhead cabinets][and][lateral files] shall have a wood veneer surface.]

2.6 ACCESSORIES

2.6.1 Coat Hook

Provide one mounted coat hook per workstation.

2.6.2 Keyboard Tray

Work surfaces shall be capable of accepting an articulating keyboard in locations as shown on the drawings. The keyboard tray shall have the capability to be fully recessed under the work surface and extend to give the user full access to the keyboard. Side travel rotation shall be a 180-degree swing. The keyboard tray shall have tilting capability and shall contain a wrist support. The keyboard tray shall include a mouse pad at the same level as the keyboard tray and accommodate either right or left-handed users.

2.6.3 Computer Turntables

Turntables shall be provided on workstations as shown on the drawings. Turntables shall contain a stop mechanism to prevent tangled cords.

2.6.4 Tackboards

Fabric shall be factory installed and fabric content, fabric pattern and color of tackboards shall be [_____]. Location and size shall be [as shown on the drawings][_____].

2.6.5 Erasable Marker Boards

Marker boards shall have a white writing surface which can be easily written on and erased and shall be unaffected by common marker board cleaning/conditioning agents and shall contain a storage tray. Size and location shall be [as shown on the drawings][_____].

2.6.6 Paper Management Unit

Provide paper management units as indicated [on the drawings][herein][_____]. Construct these units of coated steel or injection molded plastic to accommodate either legal or letter size lengths.

2.6.7 Wall Mounted Components

Wall tracks shall be utilized when components are shown attached directly to wall surfaces. Tracks shall be of heavy duty extruded metal. Finish and color of tracks shall match the panel trim. Vertically aligned tracks shall be slotted on 25 mm 1 inch centers in heights required. Slot spacing shall match slot spacing for wall panels.

2.6.8 CPU Holder

A mounting device shall be provided to support the computer hard drive. Desk top and floor locations are not acceptable.

2.6.9 Signage

Signage shall be [panel mounted][_____]. Signage shall be composed, at a minimum, of aluminum frame, back panel, clear plastic cover, and hanging device. Signage shall be approximately [_____] high x [_____] long and capable of receiving [standard white][_____] paper insert. Text type shall match [_____].[Signage shall be provided with name of occupant for each workstation. Names to be [provided by customer prior to installation][_____].][Software for creating text in PC computers for owner production of paper inserts after project completion shall be provided.]

2.6.10 Slat Tile

Slat tile shall have channels to accommodate attachments such as monitor arm, task light and organizer accessories. Slat tile height shall be a maximum [_____]and a length [as shown on the drawings][_____]. Slat tile shall be integral to the panel and not attached to the surface of the panel. [Slat tile shall be able to support the weight of two monitor arms and two flat panels simultaneously.]

2.6.11 Monitor Arm

Monitor Arm shall allow 360 degree monitor rotation for portrait and landscape viewing. Monitor arm shall allow 60 degree range of lateral and vertical monitor tilt for additional viewing adjustability. Monitor arm shall be calibrated to support monitors weighing [7 to 18 lbs.][_____]. Mount monitor arm on [slat walls][work surface].

2.7 MISCELLANEOUS HARDWARE

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

2.8 LOCKS AND KEYING

****
NOTE: The quantity of different key operations required is dependent on the size of the project. The number specified should not exceed the quantity of workstations. The maximum quantity utilized must not exceed 150.
****

Provide drawers, [overhead cabinets,][vertical files,][personal storage

towers,] pedestals and lateral files with keyed locks, unless otherwise noted. Provide field changeable lock cylinders with a minimum of [100] [_____] different key options. Each workstation shall be individually keyed, and locks within a workstation shall be keyed alike. Drawers within a pedestal shall be lockable either by a central lock that controls all pedestals under one work surface or an individual keyed lock in each pedestal. Central file and storage units which are grouped together but are not a part of a workstation shall be keyed alike unless otherwise specified. Provide two keys for each lock or two keys per workstation when keyed alike, and provide three master keys per area as indicated. Number keys and lock cylinders for ease of replacement. Clearly label locks with a key number, except for those manufacturers who have removal format locks. [Door panels shall have keyed [door knob][_____] set.]

2.9 POWER AND COMMUNICATIONS

****

NOTE: It is recommended that the type of cabling assembly (wiring, harnesses, or buses) be left as a Contractor selection unless necessary to restrict for compatibility with existing equipment.

****

Provide both powered and nonpowered panels [and spine walls] with base raceways capable of distributing power circuits, [communication cables] [and] [data lines]. Nonpowered bases shall be capable of easy field conversion to powered base without requiring the panel [spine wall] to be dismantled or removed from the workstation. The system shall use copper [cable assemblies,] [wiring harnesses][or][electrified bus] and shall meet requirements of UL 1286 and NFPA 70, Article 605. Conductors shall consist of 20 amp [90] [75] degree C, #12 AWG wires (unless indicated otherwise) or the equivalent in the bus configuration. The label or listing of Underwriter's Laboratories, Inc. will be accepted as evidence that the material or equipment conforms to the applicable standards of that agency. In lieu of this label or listing, submit 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. Electrical work not addressed in this section shall conform to the requirements of Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

2.9.1 Panel Raceways

****

NOTE: Raceways are available in various locations, such as base, desk height and top-of-panel. Revise to meet project requirements.

When specifying desk height raceways the overhead storage unit requirements should be carefully coordinated.

****

Panels shall have 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. The raceway shall not extend past either [panel face] [frame cover] by more than 13 mm 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. Raceways [in full size

over 610 mm 24 inches powered panels] [on panel frames] shall have a minimum of 2 knockouts (doors) per side for power receptacles and communications jacks as indicated elsewhere. Other raceways shall be flush with [panel face][frame covers].

2.9.2 Spine Wall

Provide spine walls able to support lay-in cabling and having a large capacity for power and data. The interior of the spine wall frame shall provide ample space for storing excess wires and fiber optic cables. Power and data systems shall be easily accessed in the spine wall without having to move return panels or components. The spine wall system shall have the ability to provide power to a wall-attached panel system and/or an adjacent desk system. Locate raceways in numerous places such as the base, beltline, and below and above the beltline. Spine wall frames shall have 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. The base raceway shall not extend past the spine wall face by more than 13 mm 1/2 inch. Other raceways shall be flush with the wall face. Metal or plastic raceways covers shall match the finish and color of the panel trim, unless otherwise stated. A termination center or utility closet may be utilized in the wall or at the end of a spine wall run.

2.9.3 Power Distribution

****

NOTE: The 8-wire system is currently the most common system utilized for applications serving mixed loads including electronic data processing equipment. This is available in several configruations from which to choose. Since EDP equipment generates high levels of harmonics (* see footnote below), a full size neutral should be provided for each EDP circuit. Alternately, it is recommended that the phase conductor not be loaded to more than 12A or that an oversized neutral be specified. To minimize interference from electronic noise to sensitive data processing components, the EDP equipment should be placed on the dedicated circuits.

In the absence of other criteria, use of an isolated ground conductor is not recommended for the EDP circuits (See IEEE Std. 1100). If the amount of EDP load is extensive and the conventional load is minimal, a modified 8-wire system should be provided.

Non-linear loads such as computers, copiers, laser printers, electronic lighting ballasts, and uninterruptible power supplies cause harmonic distortion on power distribution systems. The majority of workstation loads are non-linear, harmonic producing loads. Designers must ensure that the building power distribution equipment can support these non-linear loads. IEEE 519 and 1100 provide details concerning the causes, effects, and means of compensation for non-linear, harmonic producing loads on power systems. Harmonic

compensation may include, but is not limited to: specifying K-rated transformers, derating transformers, oversizing neutrals to 200 percent of the ampacity of the phase conductors or phase bus, using phase conductors and terminals with higher ampacities and/or higher temperature ratings, supplying non-linear loads from dedicated isolation transformers, and installing shunt filters. See UGGS-16415A for further guidance.

Surge suppression and power conditioning receptacle modules are available. However power conditioning for specific loads (particularly portable equipment) is normally a User responsibility and is not provided as part of the construction contract. The Air Force has identified specific responsibilities of the user and suppliers of end-use equipment. (See Air Force ETL 89-6 for specific criteria or verify specific requirements for electrical support.)

****

Provide power distribution as indicated on the drawings. The panels[and][spine wall] shall have an internal [power][and][communications] raceway and the capability of disconnecting and connecting external circuits to the electrified raceway in the panel[and][spine wall]. The communications receiving raceway shall have capacity for at least [six][twelve][twenty] 4-pair category 5 cables. Power and communications wiring may share a common wireway if a metal divider is included to ensure electrical isolation. Doors or access openings shall be included for entry of communications cable. The electrified power raceway shall be of the [8-wire][6-wire][or][5-wire] configuration indicated.[Unless otherwise indicated, conductors of the 8-wire system shall be allocated as follows: the three-phase system shall have one equipment ground, one isolated ground, [one neutral] [one oversized (133 percent minimum) neutral], and two each dedicated phase.] [Unless otherwise indicated, conductors of the 8-wire system shall be allocated as follows: the three-phase system shall have one equipment ground, one isolated ground, [one neutral per phase] [one oversized (133 percent minimum) neutral per phase], and one each dedicated phase.]

2.9.3.1 Receptacles

****

NOTE: 15 AMP receptacles are the current industry standard. If 20 amp receptacles are required, the channel depth for the receptacle may have to be increased. Coordinate with the panel and/or spine wall thickness.

****

Provide power receptacles in the powered panels [and spine walls]. Place devices at the locations indicated on the plans connected to the designated circuits. [Electrical power receptacles and communications jacks should have the ability to be hung at [200 mm 8-inch] [multiple] [_____] vertical increments throughout the frame via power harnesses.] Unless otherwise indicated, receptacles shall be [15 amp (NEMA 5-15R)] [20 amp (NEMA 5-20R)] commercial grade conforming to NEMA WD 1 and NEMA WD 6. If receptacles are not interchangeable or will not permit field adjustment of phase and circuit selection, 10 percent spare devices of each type shown

on these plans shall be provided. [All][General use] receptacles shall be of the duplex configuration; unless otherwise indicated, special use receptacles shall be 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 [and spine wall] trim. Isolated ground receptacles shall [be orange] [or] [have distinct markings] [be of a different color than other receptacles]. Field applied identification shall be permanent; stick-on or non-setting adhesives shall not be used. Provide [5][_____] percent spare devices for each configuration and type of receptacle. A minimum of [5][_____] receptacle removal tools shall be provided for systems that require special tools for proper receptacle removal.

2.9.3.2 Power Cabling Variations

The paragraph Power Distribution has identified specific cabling configurations. Since universal conventions have not been established, variant configurations available from various manufacturers will be considered. Alternates shall allow the same circuiting, device connections, neutral and ground separation, and upstream feeder connections as shown on the plans. Variations shall be approved in advance. See paragraph ALTERNATE DESIGN. An example of an acceptable variation includes the use of a manufacturer's configuration which allocates individual conductors differently, but which has the same quantity of conductors and allows devices to be physically connected in the field as shown on the plans. It is not necessary that the manufacturer's labeling codes or terminology match the designations used on project plans or in the specifications; however, neutrals and grounds shall have insulation color coded per standard practice or be provided with tags, colored tape, colored ribbons or similar identification. (The reference to "dedicated" conductors in this specification pertains to circuit connections upstream and load connections downstream of panels; it is not necessary that manufacturer's designations correspond.)

2.9.4 Electrical Connections

****

NOTE: The direct wired configurations should be suitable for most applications. All wiring should be contained within raceways or wireways. The exposed cord/plug arrangement should not be used, unless specifically requested by the user. If used, ensure that the design conforms to the limitations of Article 605-8 of NFPA 70.

Code-enforcing personnel in some areas require separate hard wired junction box interfaces from building services to furniture system installations. If the facility will be under their jurisdiction, the design must conform and the junction box configuration must be provided in lieu of the direct wired. If the facility will not be under local jurisdiction, the direct wired configuration could be provided per User request; however, it is preferred that the Government design be consistent with local practice. If top entry service poles are used for power interfacing, the junction box configuration is preferred for all

locations.

****

2.9.4.1 Internal Connections

****

NOTE: Some local codes require hardwired connections with the panels and/or spine walls. If local codes are to be followed, this item will need to be verified.

****

Internal panel-to-panel [spine wall-to-spine wall] [spine wall-to-panel] power connections shall utilize [straight or flexible plug/receptacle connector assemblies] [hardwired connections] and shall be installed to provide the powered configurations shown on the drawings.

2.9.4.2 Connections to Building Services

Supply external [power][and][communications] services to the panels [spine walls] via [direct-wired [top][base] entry modules.][hard wired [top][base] entry junction box assemblies.][Wiring from building services shall be extended to the entry modules or panel [spine wall] bases in metal conduit or tubing or in flexible liquidtight conduit 1830 mm 6 foot maximum.][Wiring from building services shall be extended to junction box assemblies in metal conduit or tubing. Wiring from junction boxes shall be flexible liquid-tight conduit 1830 mm 6 foot maximum or in metal conduit or tubing.] Cord and plug assemblies shall not be used for any portion of external links.[Base feed modules shall plug into the end or either side of the raceway at receptacle doors.][Top entry [modules][junction box assemblies] shall extend the [power][and][communications] wiring into service entry poles attached to the electrified panels.] External wiring shall conform to Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

2.9.5 Wire Management

Provide wire management capability at all workstations. Actual wire management capacity shall accommodate all cable types specified, including the applicable manufacturer required bending radius at corners. Raceways and interfaces to the raceways shall be designed to accommodate the bend radius as shown in TIA-569 for Category [5][5e] [_____][and][fiber optic cables] communication wiring [whichever is greater]. The capability may be accomplished by cable access cutouts (1 minimum per work surface), covered wire management troughs in vertical end panels, horizontal wiring troughs, internal midpanel (beltline) raceways, or rear gaps (between the back edge of the work surface and the facing support panel). Grommet kits or another suitable finish arrangement shall be provided for all cable cutouts. Accessories for an externally mounted vertical and horizontal wire management and concealment system shall be provided [as indicated on the contract drawings] [as recommended by the manufacturer]. Horizontal wire managers shall be supplied for mounting under all work surfaces. The wire managers shall be attached either to the underside of the work surface or to the vertical panel [and spine wall] without damaging the face. Exposed or loose wiring will not be acceptable. Wire managers shall be prefinished and shall secure, conceal, and accommodate outlet cords as well as electrical and communications wiring. Wire channels shall match color of panel [and spine wall] trim, attach by means of clip-on attachment, and shall conceal wires routed vertically. Power wiring shall be separated from communication wiring by use of separate raceways or by placement of

channels in joint use troughs or wireways.

2.9.6 Circuit Layout

The circuit layout for workstations shall be as shown on the drawings. Devices shall be connected to the designated circuits in the neutral and ground configurations indicated. Connections shall be made to the building electrical distribution system as shown on the contract drawings and in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

2.9.7 Service Entry Poles

****
NOTE: Coordinate requirements with paragraph Power Distribution. Power and communications separation is required if the power is not in any metallic conduit when run in the pole or channel.
****

Provide service poles, as indicated on the contract drawings, and capable of minimally accommodating the [8-wire][_____] power configuration and the equivalent of [six] [twelve] [twenty] 4-pair category 5 cables.[Poles shall have metal barriers or channels to separate power and communications wiring.] Pole dimensions shall be allowed to be equal to maximum panel [spine wall] thickness. The pole finish and color shall [match the finish and color of the panel [spine wall] trim][conform to requirements shown on the plans]. Designated poles shall have the capability of being opened along the vertical access to permit the lay-in of wiring. Each pole shall have a wiring interface, an end cap and a ceiling trim plate which extends a minimum of 40 mm1-1/2 inches from all sides of the pole. Poles for power service shall include a junction box either as part of the pole assembly or in a field installed configuration. Service poles shall be securely attached to the panels [spine wall] and shall be installed plumb. Wiring and interface components shall be provided as required to connect the building power supply to power poles.

2.9.8 Task Lighting

Provide under-shelf task lights[and adjustable arm task lights with adjustable, fully articulated and balanced head and arms]. Task light size and placement shall be provided as indicated on the contract drawings. Such lights shall be a standard component of the manufacturer's workstation products. The ends of the task light length shall not extend beyond the edges of the overhead cabinet. Task lights shall have structurally sound [wall bracket] [panel bracket] [table clamp] mounting devices which will prevent accidental displacement, but will allow easy removal and replacement when necessary. Luminaires shall be UL approved for use in the configurations indicated on the drawings.

2.9.8.1 Luminaire Configuration

****
NOTE: The lamp and ballast types should be indicated on the drawings. Use of electronic ballasts and T8 lamps is strongly encouraged as a means of meeting energy conversation goals for the building. Although there are no national standards for electronic ballasts, technical requirements are covered in Section 26 20 00 INTERIOR DISTRIBUTION

SYSTEM. Electronic ballasts are the most efficient fluorescent ballasts, eliminate visual flicker and are quiet. When used, the electrical design must consider the harmonics and electromagnetic energy generated by these ballasts. Specific areas which should not have electronic ballasts are medical electronic equipment areas and areas equipped with infrared remote control or security devices. It is important to inform Users of the benefits and risks of electronic ballasts and to involve them in the decision regarding their use.

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Luminaires and lamps shall be as specified in Section 26 51 00 INTERIOR LIGHTING and as modified herein. Luminaires shall be linear, circular, or compact fluorescent type and shall have prismatic lenses, baffles, or other shielding device configured to minimize glare by shielding the lamp from the view of a seated user. Provide a built-in reflector. Task lights for each workstation shall provide a minimum of [810] [650] lx [75] [60] foot candles of light (horizontally measured), without veiling reflections, on the work surface directly below and a maximum of 500 mm 20 inches from the luminaire.[Personal luminaires (non-undercabinet type) shall be constructed of aluminum and plastic. The luminaire shall articulate at three distinct joints. The minimum adjustable arm range shall be 10 inches. The luminaire shall be [slat tile mounted][desk mounted][panel mounted][freestanding][_____].] All diffusers, grilles or other coverings shall be easily removable to permit cleaning and relamping. If the type is not identified on the plans, use F32T8 lamps in 1220 mm 4 foot units . Each luminaire shall have an easily accessible on-off switch and one ballast. A variable intensity control is acceptable if the low setting is equivalent to "off" with zero energy consumption. Multiple switching is also acceptable. Ganged luminaires or shared ballasts shall not be used.

2.9.8.2 Wiring

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NOTE: If the facility will be under the jurisdiction of a city code, verify requirements. Some locations require hard wired connections.

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Each luminaire shall have a 1830 mm6 foot minimum, factory installed, heavy duty electrical cordset with a grounded plug for luminaries that are mounted on the same wall as the receptacle. Luminaires mounted on non-powered wall shall have a 2743 mm9 foot minimum, factory installed heavy duty electrical cordset with a grounded plug. Direct or hard wire connections are not acceptable. Unless otherwise indicated, cords shall be concealed. Cord concealment shall be built-in within panels [and spine walls] or shall utilize field installed, manufacturer approved accessories. Cords may be extended through dedicated channels located at any point within panels [and spine walls] or may be placed in vertical slots or in the space between panels [and spine walls] if held in place by retainers and concealed by a cover plate. Vertical wire managers shall be prefinished and cut to size and shall extend from the task light level down to the top of the work surface below the task light. Each manager shall be attached to a panel vertical edge or connector strip without damage to the surfaces.

2.9.8.3 Control Device

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NOTE: Use the bracketed options for projects where ASHRAE 189.1 is applicable.
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Provide task lighting with an automatic shutoff control device integral to the luminaires complying with the requirments of ASHRAE 90.1 - SI ASHRAE 90.1 - IP, Paragraph 9.4.1.4.d.[Provide occupancy sensors with "manual ON", "automatic OFF" controls.][Where occupancy sensor is within a daylit area and daylighting controls are utilized, the occupancy sensors shall work in conjunction with the daylighting controls complying with ASHRAE 189.1, Paragraph 7.4.6.5.]

2.9.9 Communications

Communications wiring shall be extended to, and installed in, the electrified panels [and spine walls] as shown on the plans. Communications jacks shall be installed at designated locations.[Provide a communication consolidation point at the end of the cubicle. The consolidation point shall consist of a [24][48] port patch panel that is rated for Category [5][5e]. The panel that covers the consolidation panel shall be lockable. All locks shall be keyed alike. these locks shall not be keyed the same as any other item associated with the workstations.] Communications work may be performed in conjunction with the installation of workstations or may be separately executed at the Contractor's option; however, equipment, materials, and installation shall conform to the requirements of [Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM] [Section 27 10 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM] [_____] and all interfaces shall be properly coordinated.

2.9.10 Special Systems

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NOTE: Include this paragraph only in projects where requirements for shielded facilities (TEMPEST, Red/Black, EMP, etc.) and secure wiring have been called out in project criteria. Specific requirements for cable arrangement, separation of Red/Black lines, etc., need to be verified for each project. Provide metal raceway, channels, etc. throughout. Separation distances required for exposed cable or wiring in nonmetallic raceways are much greater than for wiring installed in totally enclosed metal raceway. Site specific details and/or notes should be prepared for each project.
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Designated raceway systems shall provide management for secure and nonsecure power, computer and telecommunications cabling. Secure distribution shall be separated from nonsecure distribution [in accordance with details shown on the plans] [by running secure lines along top located raceway and nonsecure along the bottom of the workstation panel [and spine wall]].

PART 3 EXECUTION

3.1 INSTALLATION

Install the workstations using certified installers in accordance with manufacturer's recommended installation instructions. Workstation components shall be installed level, plumb, square, and with proper alignment with adjoining furniture. The components shall be securely interconnected and securely attached to the building where required. Provide three sets of special tools and equipment necessary for the relocation of panels and other components. Verify that equipment is properly installed, connected, and adjusted.

3.2 CLEANING

As specified in Section 01 78 00 CLOSEOUT SUBMITTALS. Upon completion of installation, all products shall be cleaned and polished and the area shall be left in a clean and neat condition. Any defects in material and installation shall be repaired, and damaged products that cannot be satisfactorily repaired shall be replaced. Submit three sets of Maintenance Manuals describing proper cleaning and minor repair procedures.

-- End of Section --