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Table of Contents

1. SCOPE

This specification defines the technical and environmental requirements pertaining to the Modular Systems Furniture (MSF). MSF will be used in various State and government agencies' offices throughout the State of California.

2. APPLICABLE LAWS and INDUSTRY STANDARDS

The following standards, laws, regulations, and codes of the issue in effect on the date of the Invitation for Bid form a part of this specification to the extent specified herein. Any applicable laws, regulations, codes, industry standards, or manufacturing standards, though not specifically cited, shall apply.

2.1 Laws, Regulations, and Codes

2.1.1 California Code of Regulations (CCR), Title 17, §93120.2 – Air Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products

2.1.2 CCR, Title 20, §1601-1609 – California Appliance Efficiency Regulations

2.1.3 CCR, Title 24, Parts 1-12 – California Building Energy Efficiency Standards

2.1.4 California Health and Safety Code (HSC), Division 20, Chapter 6.5, Article 10.02. §25210.9-25210.12 – Lighting Toxics Reduction

2.1.5 California HSC, Division 104, Part 3, Chapter 10, §108920-108923 – Polybrominated Diphenyl Ethers

2.1.6 State of California, Technical Bulletin No. 116 – Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Upholstered Furniture

2.1.7 State of California, Technical Bulletin No. 117-2013 – Requirements, Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture

2.1.8 California Department of Public Health / Environmental Health Laboratory Branch, Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2 (CDPH/EHLB Standard Method V1.2)

2.2 Industry Standards

2.2.1 American National Standards Institute / Business and Institution Furniture Manufacturer's Association (ANSI/BIFMA) e3 Furniture Sustainability Standard ***(Version 2019 or later)***

2.2.2 ANSI/BIFMA M7.1 Standard Test Method for Determining Volatile Organic Compounds (VOCs) Emissions from Office Furniture Systems, Components and Seating ***(Version 2011 R-2016 or later)***

2.2.3 ANSI/BIFMA X7.1 Standard for Formaldehyde and Total Volatile Organic Compounds (TVOCs) Emissions of Low-emitting Office Furniture and Seating ***(Version 2011 R-2016 or later)***

2.2.4 ANSI/BIFMA X5.6 Panel Systems ***(Version 2016 R-2021 or later)***

2.2.5 ANSI/BIFMA X5.9 Storage Units ***(Version 2019 or later)***

2.2.6 Cradle to Cradle Certified® Product Standard ***(Version 3.1 or later)***

2.2.7 American Society for Testing and Materials (ASTM) C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method ***(Version 2017 or later)***

2.2.8 ASTM D5034 Standard Test Method for Breaking Strength and Elongation of Textile Fabrics ***(Version 2021 or later)***

2.2.9 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials ***(Version 2021 or later)***

2.2.10 Underwriters Laboratories (UL) 153 Portable Electric Luminaires ***(Edition 13 or later)***

2.2.11 UL 723 Standard for Testing for Surface Burning Characteristics of Building Materials ***(Edition 11 or later)***

2.2.12 UL 962 Household and Commercial Furnishings ***(Edition 4 or later)***

2.2.13 UL 1286 Office Furnishing Systems ***(Edition 5 or later)***

2.2.14 UL 2108 Low Voltage Lighting Systems ***(Edition 2 or later)***

2.2.15 Illuminating Engineering Society (IES) LM-79 Electrical and Photometric Measurements of Solid-State Lighting Products ***(Version 2008 or later)***

2.2.16 American Association of Textile Chemists & Colorists (AATCC) 16.3 Test Method for Colorfastness to Light: Xenon-Arc ***(Version 2020 or later)***

3. TECHNICAL REQUIREMENTS

3.1 Computer Aided Design and Design Work Requirements

3.1.1 CAD Specific Software Requirements

A graphic symbols library (or blocks) shall be provided to integrate with

AutoCAD software version 2013 or newer in .DWG format. The symbol blocks shall contain all MSF contract items including but not limited to: All sizes of panel frames, tiles, work-surfaces, shelving, pedestals, lateral files, wardrobe cabinets, accessories, electrical outlets, data outlets, and power feed symbols. The blocks can be broken up into the above listed categories and shall be downloaded to the State's electronic drawing file for use by the State's planners.

The symbols library provided shall be used only for design development of workstation typicals and schematic floor plans by DGS planners. The State does not require, nor does it request these symbols to have specific catalog numbers or extractable attributes for the purpose of generating parts lists. Symbols shall be used by DGS planners for schematic drawings only.

1) After award, the State shall be provided with graphic plan views and 3D views for a minimum of 10 common State workstation typicals. Sizes and general requirements shall be provided by DGS.

3.1.2 Scope Technical Specifications

This specification establishes the minimum technical requirements for the State of California for MSF (tile & frame). All MSF shall be complete with re-locatable components of systems furniture, including but not limited to the following table below:

Standard panels	Panel connectors
Corner posts	Work-surfaces
Vertical storage cabinets	File/storage units
Pedestals	Task lights
Work-surface support brackets	Wiring channels
Power feeds	Electronic support components
Top caps	Base covers
Miscellaneous connectors	

Intended for long-term use in offices occupied by the State, all MSF shall be designed for ease of field assembly, disassembly, and re-configuration, which shall be accomplished with a minimum number of tools and special hardware. All MSF shall also be designed to easily facilitate lifting for carpet installation.

3.2 MSF General Minimum Requirements

3.2.1 MSF and Components Requirements

All requirements throughout this specification for the offered MSF shall also include all applicable components necessary for the operation of the MSF. The MSF shall meet or exceed applicable test and performance standards prescribed throughout this specification. Details, finishes, colors, and materials shall be consistent throughout. The MSF shall display good quality workmanship. The MSF shall be free from sharp edges, burrs, and any other defects which compromises its use and/or operation. This includes any aspect that is harmful to the persons and/or materials in contact with them.

3.2.2 Panel System

The MSF shall be a tile and frame panel system with removable tiles that comes in an assortment of heights and widths, which are applied to a rigid metal frame.

3.2.3 Metal Components Requirements

All metal components shall be free from pits, scale, and other defects. All welds shall be ground smooth, and all seams shall be flush.

3.2.4 Mounting Hardware Requirements

All mounting hardware shall be concealed from view. Mounting hardware shall feature safety locking devices or be manufactured in such a manner to prevent accidental dislodging. Exposed fasteners (i.e., screw heads, bolts, and hinges) are not permitted. All connectors and fasteners shall be capable of being installed and dismantled without damage to panels or adjacent surfaces. All panel joints shall be designed to provide a continuous connection between panels, serving as an effective barrier against transmission of light and sound.

3.2.5 Fabric General Requirements

A minimum of three (3) grade level/price group fabrics, with “Grade A” or “Grade 1” being the lowest price group and “Grade C” or “Grade 3” being the highest price group. Each group shall be available in multiple patterns and in multiple colors including light colored fabrics. All offered fabric shall meet the following minimum requirements:

1) Fabrics shall meet:
    - Flammability Requirements listed in below Section 3.5.6.
    - Colorfastness to Light, AATCC 16.3: Class 4 minimum at 40 hours.
    - Breaking strength, ASTM D5034: 35 pounds, minimum in warp & weft.
2) Fabric shall be free from defects affecting service or appearance, such as:

- Weaving irregularities (filling bars, moiré effect, etc.)
- Dyeing or finishing irregularities (streaking, spotting, etc.)
- Other fabric flaws such as knots, burrs, slubs, etc.

Material shall be suited for its intended application allowing no bleed-through of adhesive, and no excessive freedom for bowing/skewing when applied according to manufacturer's instructions.

Samples of all fabric shall be provided upon request. All fabrics shall clearly be identified as proprietary and non-proprietary fabric.

3.2.6 Pulls Requirements

All pull requirements shall comply to the Americans with Disabilities Act (ADA) as applicable. Handles, pulls, latches, locks, and other operating devices on accessible doors and drawers shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Touch latches, integral pulls, or U-shaped pulls shall be available for all the desk storage compartments and storage units unless otherwise specified.

3.2.7 Standard Components Requirements

All components shall be standard products as shown in the most recent published price list, except for custom panels (Section 3.15.3).

3.2.8 Workstation Assembly and Disassembly Requirements

Workstations shall permit easy assembly and disassembly. Back-to-back workstations shall be able to be assembled in such a manner that components may be completely removed from one side without disturbing the workstation on the other side.

3.2.9 Storage Unit Requirements

All storage units shall comply to ANSI/BIFMA X5.9 Storage Units as applicable. This includes pedestals (floor supported and mobile), cabinets, laterals, and storage units.

3.3 Panels Minimum Requirements

3.3.1 Panel Assembly

Each panel shall be an independent assembly that is capable of being connected with another independent panel. Panel assemblies include interior and exterior tiles as well as stacking frames and all associated hardware.

3.3.2 Panel Stability

All panels shall stand erect and rest firmly on their bases to assure safety, good appearances, and provide for a stationary work position.

3.3.3 Panel Resistance to Impact and Loads

Each panel shall be constructed in a manner to prevent warping, twisting, sagging, and deflection, without necessitating a counter balanced load. All panel systems shall comply to ANSI/BIFMA X5.6 Panel Systems for mechanical strength and stability.

3.3.4 Panel and Accessories

All panels shall include all necessary accessories (such as side rails, connector hinges, leveling glides, top cap, base raceways cover, cover-brackets, clamps, braces, etc.). All panels shall be shipped with all necessary accessories for the assembly and layout in accordance with the manufacturer's recommendations.

All panels shall include all standard trim for all exposed panels ends, panel junctions, corners, and/or changes in height.

3.3.5 Powered Panel

Powered panels shall include a pre-wired electrical distribution system, flexible power connector, and raceway cover.

3.3.6 Panel Structural Soundness

Panels shall be structurally sound without the use of panel support legs or panel support components.

3.3.7 Panel Light and Acoustical Seal

Adjacent panels shall create a connection that is structurally sound and provides a continuous light and acoustical seal for the entire height of the panel.

3.3.8 Panel Assembly on Finished Flooring

Panels shall be capable of being assembled over finished flooring without penetration, demarcation, or the use of floor fasteners so as to allow for reconfiguration without any floor patching.

3.3.9 Connection Capability of Panel System

Panels shall be capable of connection in a variety of configurations, including connection of different height and connection of two (2), three (3), and four (4) panels from a single point.

3.3.10 Capability of Assembly and Disassembly

Each panel shall be capable of being connected and disconnected from other panels in a vertical position. A panel connected between two other panels shall be capable of being removed without disassembly of the entire panel run.

3.4 Tile and Frame Panel System Requirements

3.4.1 Tile and Frame Panel Systems General Requirements

The tile and frame panel system shall have removable tiles that come in an assortment of heights and widths, which are applied to a rigid metal frame. Each structural frame shall accept stacking frames. All tiles or frames shall have an enclosure that protects and prevents the tile material from dislodging.

3.4.2 Tile and Frame Panel Heights

Panels and tiles shall be available in a variety of heights. Shortest available frame height shall be ranging from twenty-eight (28) to thirty-two (32) inches. Total frame height shall be available to at least seventy-nine (79) inches using combination of base frame and stacking frames.

3.4.3 Tile and Frame Panel Systems Widths

Panels and tiles shall be available in a variety of widths, between the ranges from nominal twenty-four (24) inches to nominal sixty (60) inches.

3.4.4 Tile and Frame Panel Systems Thickness

Finished tile and frame panels thickness shall be a minimum of two (2) inches and a maximum of four (4) inches.

3.4.5 Tile and Frame Panel Finish Options

A minimum of six (6) total finish options shall be offered including tack-able acoustical fabric, technology, glazed tempered glass, and marker-board.

3.5 Panel System Requirements

3.5.1 Trim, Tops, and End Caps

Each panel assembly shall include removable plastic, nylon, painted steel or aluminum, or other durable material that is an industry standard. Each panel assembly shall include trim or end caps at both the top and exposed ends. Width of trim or endcap shall be equal to panel width. Corners and edges shall be eased, radiused, or chamfered ninety (90) degree to be free from sharp edges.

3.5.2 Metal Trim, End Caps, and Exposed Hardware Finish

The finish for metal trim, endcaps, and exposed hardware shall be either factory applied baked-on enamel or powder coat. All finishes shall be mar, fade, and chip resistant.

3.5.3 Suspended Components Support Channels

Each panel shall have vertical support channels along each side of the

panel for mounting work-surfaces, storage units, and other suspended components. These support channels are to be an integral part of the assembled panel and run the full height of both sides of the panel. The support channels shall allow suspended components and work-surfaces to be attached along the full length of the channels at one (1) inch space intervals. Support channels shall provide flush and level alignment of adjacent components.

3.5.4 Panel Leveling Glides

Each panel shall be equipped with a minimum of two (2) leveling glides, with at least one at each end to provide uniform height for adjacent panels on uneven floors. The glides shall be manufactured of steel and shall allow vertical adjustment of one (1) inch minimum. Connections to the floor shall not be permitted. Stabilizing feet are not permitted.

3.5.5 Panel Connections

All panel systems shall provide for “panel to panel” connection. Connectors shall be concealed within finished panel structure. Connections shall allow continuation of lay-in or pull through electrical and communications wiring between panels. Connectors shall be reusable to allow for reconfiguration. Connecting posts are allowed only at a ninety (90) degree, two-way, three-way, and four-way connections. All panel connectors “panel to panel” and panel connectors adjacent to a wall or column shall be continuous seals serving as an effective barrier against the transmission of light or sound. All panel connections adjacent to a wall or column shall be “free standing”, permanent connection to a wall, column, flooring, or the realty, will not be acceptable or permitted under the terms of this contract. Panels shall have the capability of assembly and disassembly in a vertical position and shall be non-progressive. All panels shall be capable of being retrofitted or re-configured in the field.

3.5.6 Panel System and Fabric Flammability Requirements

1) All panels shall comply with ASTM E-84 or UL Standard No. 723 having a maximum smoke development rating of 450 and a maximum flame spread rating of 25 (Class A).
2) All fabrics shall comply with ASTM E-84 or UL Standard No. 723 having a maximum smoke development rating of 450 and a maximum flame spread rating of 25 (Class A).
3) During the term of the contract if the MSF’s construction or the product’s material(s) are changed, then new fire tests shall be required. The test report shall state the MSF’s series and/or the revised product’s material(s) that has been tested.
4) The test shall be conducted on the entire assembled panel

including, but not limited to, the complete core, adhesive, decorative fabric, frame, and joining components.

5) Testing shall be conducted on a minimum of one (1) fabric as well as one (1) interior construction.

6) Additional fabrics may be offered for inclusion under the contract, but all shall comply with Section 3.5.6.

7) Offered product shall comply to State of California, Technical Bulletins No. 116 Test Procedure and Apparatus for Testing the Flame Retardance of Upholstered Furniture and No. 117-2013 Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture.

8) Offered product shall comply with California HSC, Division 104, Part 3, Chapter 10, §108922 that limits the presence of “pentaBDE” or “octaBDE” to not more than one-tenth (1/10) of 1 percent.

3.5.7 Panel Acoustics Requirements

1) The acoustical test for sound absorption and for the Noise Reduction Coefficient (NRC) or Speech Frequency Sound Absorption Average shall be tested per ASTM C423.

2) The test shall be conducted on the entire assembled panel.

3) Both sides of the panel shall be tested.

4) The test shall be conducted on each different construction offered as an acoustical panel.

5) All panels designated “acoustical” over sixty (60) inches shall meet the acoustical requirements and minimum NRC of 0.5.

3.6 Work-Surfaces Minimum Requirements

3.6.1 Work-Surfaces General Requirements

All work-surfaces shall permit easy access to cable management and electrical access at panel base and/or the beltline level of panel. Cable access cut outs or equivalent shall be provided in each work-surface.

3.6.2 Work-Surfaces Brackets and Components

All work-surfaces shall come pre-drilled from the factory with holes to accommodate support brackets and components. All brackets and components shall be attached to underside of work-surface utilizing the factory predrilled holes.

3.6.3 Work-Surfaces Mounting

All work-surfaces shall be mounted in a manner that ensures firm and rigid support. Work-surfaces shall be capable of being mounted to the

suspended component support channels of the panels. The mounting device(s) shall prevent the work-surfaces from being accidentally dislodged.

3.6.4 Work-Surfaces Brackets

Brackets shall be non-obstructive and not interfere with leg room.

3.6.5 Work-Surfaces Sizes

Work-surfaces shall be available in a variety of widths and depths to allow for a wide range of configurations and shapes.

3.6.6 Rectangular Work-Surfaces Width

Rectangular work-surfaces shall be available in widths to match panel widths.

3.6.7 Rectangular Work-Surfaces Depth

Rectangular work-surfaces shall be available in depths of twenty-four (24) inches ±1 inch and thirty (30) inches ±1 inch.

3.6.8 Corner Work-Surfaces

Corner work-surfaces shall be available in a variety of lengths and widths to allow for a wide range of configurations. At a minimum, all corner work-surfaces shall be available in widths to match panel widths.

3.6.9 Corner Work-Surfaces Depth

Corner work-surfaces shall be available in depths of twenty-four (24) inches ±1 inch and thirty (30) inches ±1 inch.

3.6.10 Work-Surfaces End Supports

Supplemental end supports shall be used only under work-surfaces when the workstation configuration does not permit full support by the panels. Both panel-supported and free-standing work-surfaces shall be included in standard product line, allowing for integration of both types within a workstation.

3.6.11 Work-Surfaces Edge Option

All panel systems work-surfaces edge options shall include flat and smooth edge trim, such as edge-band or a T-molding trim. Documentation shall include all standard edge options.

3.6.12 Work-Surfaces Panel Mounted

All panel mounted work-surfaces shall be height adjustable to allow for a wide range of applications. The systems shall allow work-surfaces to be mounted in approximately one (1) inch increments from twenty-three (23) inches from the floor to full height of the panel. Documentation shall provide minimum height to maximum height measures.

3.6.13 Work-Surfaces Material

Work-surfaces shall be a minimum of one (1) inch thick. The work-surfaces shall have a finished top surface of high-pressure plastic laminate and shall have a protective backing sheet on the bottom side. The work-surfaces shall not be affected by ordinary household solvents and shall be capable of being cleaned with ordinary household cleaning solutions. If metal support brackets are visible, they shall match the color and finish of the trim or shall be black in color.

3.6.14 Work-Surfaces Support Post Legs

Work-surfaces shall provide height adjustable post legs with options including casters and glides. Legs shall be adjustable from twenty-six (26) inches ±1 inch to thirty-two (32) inches ±1 inch heights. Legs shall be attached to underside of work-surfaces in factory pre-drilled holes.

3.6.15 Height Adjustable Bases

Electric height adjustable table shall be available in width and depth that are compatible with the typical workstation. The table shall be adjustable from the height of twenty-eight (28) inches or less to forty-three (43) inches or more. The table shall have a minimum travel speed of 1.0 inch/second. At a minimum, the table shall be equipped with a standard keypad with up/down control functions. The “Programmable Memory Keypad” shall be available as standard equipment as an optional add-on item. The table shall be rated to support, and height adjust a minimum static load of 300 pounds excluding the weight of the work-surface. Work-surfaces and base finishes shall be compatible with all available MSF product finishes.

3.7 Pedestals Minimum Requirements

3.7.1 Pedestals

Floor supported and mobile pedestals shall have a finished top. All file drawers shall have a minimum extension of 90% ball bearing suspension. All drawers shall be equipped with safety catches to prevent accidental removal. Pedestals shall have field changeable, front mounted locks and bumpers at closure. Pedestal file drawers shall accept both letter and legal-size file folders. Pedestals shall include a pencil tray and file compressor at no extra charge.

3.7.2 Pedestal Drawer Fronts

Pedestal drawer fronts may be either mitered steel with radius steel edges or other material with rounded edges.

3.7.3 Pedestal Types

Pedestal shall be available in three types:

- Suspended
- Floor supported
- Mobile

3.7.4 Pedestal Construction

Pedestals shall be of steel construction, except for drawer fronts.

3.7.5 Pedestal Height and Depth

Pedestal depth shall match work-surface depth (+ 0 inches / -2 inches). Pedestal height shall fit under a twenty-nine (29) inch high work-surface.

3.7.6 Pedestal Drawers

Pedestals shall be available with nominal drawer front dimension of six (6) inch high box and twelve (12) inch high file drawers. Maximum pedestal size shall have two (2) 12 inch high drawers.

3.7.7 Metal Frame

Metal frame assembly and exposed metal surfaces (including inside drawers) shall have either a factory applied baked-on enamel or powder coat finish. All finishes shall be mar, fade, and chip resistant.

3.7.8 Drawer Locking Option

All drawers shall have a locking option with a “keyed alike” configuration option to match all other storage components in the workstation with two (2) keys provided per workstation.

3.8 Shelf and Overhead Cabinets Requirements

3.8.1 Overhead Shelf and Flipper Cabinet

Overhead shelves and flipper cabinets shall have full back or backstop edges. Flipper cabinets shall have a locking mechanism for security purposes and be equipped with retractable door into or onto top of cabinet. Flipper cabinets shall have field changeable lock and bumpers at closure. Door shall utilize a ball bearing, rack-and-pinion, counterbalance, or scissors equalizer system. Door shall have an anti-racking design, which is easily operable from the seated position.

3.8.2 Overhead Shelf / Flipper Cabinet Mounting

Overhead shelf and flipper cabinet shall be able to be mounted to standard panels and lock into place mechanically to prevent accidental dislodging.

3.8.3 Overhead Flipper Cabinet Hardware

User shall be able to open the overhead flipper cabinet door with one hand.

3.8.4 Overhead Shelf and Flipper Cabinet Width Size

Overhead shelf and flipper cabinet shall match panel widths.

3.8.5 Overhead Flipper Cabinet Clearances

Overhead flipper cabinets shall have at least an interior clearance of twelve (12) inches (measured at center of the cabinet) when the retractable door is open (fully retracted).

3.8.6 Overhead Flipper Cabinet Finish

All exposed and semi-exposed surfaces shall be finished with either factory applied baked-on enamel or powder finish.

Doors shall be available in one or more of the following finishes:

- Factory applied baked-on enamel or powder coat finish. Color shall match pedestal and trim colors. All finishes shall be mar, fade, and chip resistant.
- High-pressure plastic laminate designed for durability, resistance to stains, and resistance to heat from ordinary sources. Color shall match work-surface colors.
- Acrylonitrile Butadiene Styrene (ABS) polymer designed for durability, resistance to marring, and resistance to stains. Color shall match work-surface colors.
- Fabric color/pattern shall match that of panels.

3.8.7 Shelf and Overhead Cabinet

Shelf and overhead cabinets shall have mechanical safety devices to prevent accidental disengagement from the wall panels and shall remain securely fastened to the wall panels when locked into position.

3.9 Lateral File and Storage Units Minimum Requirements

3.9.1 General Minimum

The manufacturer shall offer lateral files and storage units compatible in height with standard panels. Storage units shall have a finished top. Lateral file drawers shall be equipped with a full extension ball bearing suspension. All lateral file drawers shall be equipped with safety latches to prevent accidental removal. Storage units shall have field changeable, front mounted locks, and bumpers at closure. Lateral file drawers shall be easily gang-locked and shall accept both letter and legal-size filing system. Lateral file drawers shall be available with side-to-side or front-to-back options and shall be easily adjusted in the field to accommodate filing size changes.

3.9.2 Lateral File Drawer Front

Lateral file drawer fronts shall be available in the manufacturer's full range of paint finishes.

3.9.3 Lateral File and Storage Unit Dimensions

Lateral file and storage units' widths and depths shall be offered in a complete range of compatible sizes with the panel system and shall be compatible with the panel standard nominal heights.

3.9.4 Lateral File Metal Frame Finish

Lateral file metal frame assembly and exposed metal finish shall have a factory applied baked-on enamel or powder coat finish. All finishes shall be mar, fade, and chip resistant. Colors shall be from the manufacturer's full range of paint finishes.

3.10 Accessories Minimum Requirements

3.10.1 Paper Management Accessories

Paper management units, consisting of, but not limited to, twenty-four (24) to forty-eight (48) inch rail with in/out trays, vertical paper sorters, shelves, and bins shall be available. Paper management unit shall be easily added and moved without tools.

3.10.2 Keyboard Tray with Mouse Pad

All manufacturers' systems shall provide a fully articulating keyboard tray with mouse pad support. Keyboard tray shall raise, lower, pull forward, recess, and tilt. Keyboard tray sizes shall be compatible with all standard ergonomic keyboard types.

3.11 Locks and Keying Minimum Requirements

3.11.1 Pedestal Drawers and Overhead cabinets

Drawers, overhead cabinets, and pedestal drawer units shall be capable of having keyed locks. All locks shall be flush, recessed, or protrude no more than 1/4 of an inch.

3.11.2 Locks and Keying Requirements

Locks shall be field interchangeable. Two (2) matching keys shall be provided for each lock. Three (3) master keys and one (1) core-removal key/device shall be provided to the using department or local agency. All lock equipment shall be clearly labeled/tagged as to the workstation, key number, and location. A key schedule shall be submitted to the using department or local agency prior to the assembly of the lock cylinders.

3.11.3 Removable Lock Cylinders Requirements

Removable lock cylinders shall be field interchangeable and provided

with a minimum of one hundred (100) different key options. Keys and lock cylinders shall be factory numbered for ease of replacement. A minimum of one (1) master key shall be provided for each assembly as well as tools for removal of the cylinders.

3.12 Electrical System Requirements

3.12.1 Electrical System/Components Requirements

All electrical systems shall be in full compliance with UL Standard 1286.

3.12.2 Power Supply System

The power supply system shall provide a minimum of three (3) 20 Ampere (minimum 8-wire), three (3) circuit capability with two (2) 20 Ampere, 120 Volt general circuits and one (1) 20 Ampere, 120 Volt, isolated ground circuit or two (2) 20 Ampere, 120 Volt, isolated ground circuits and one (1) 20 Ampere, 120 Volt general circuit. A maximum of four (4) workstations shall be connected to any power distribution 8-wire circuit.

3.12.3 Power System

The power system shall be modular and be able to provide power selectively only at needed locations and be rearranged without altering or disassembling the panel system. The power system shall have access to any circuit via triplex, duplex, or simplex receptacles. The minimum 8-wire electrical system shall allow circuits to share a common ground or change to sharing an isolated ground in the field with only a change of an electrical harness or receptacle. Electrical components shall be non-handed for ease of assembly and reconfiguration.

3.12.4 Receptacles

Each powered panel, thirty (30) inches wide or wider, shall be capable of having a minimum of four (4) 15 Ampere grounded electrical plug-in locations per side. Receptacles shall be commercial grade and identified easily by line/circuit identification numbers, letters, or color-codes. Appropriate receptacles shall be indicated with an orange alpha symbol and triangle on the face to identify the isolated ground. Receptacles shall be field interchangeable anywhere along the wiring harness. All panels shall be capable of wire management and pass-through power harness.

3.12.5 Base-Feed Modules

Base-feed modules shall supply power to the base panels by plugging into either side or the end of the raceway through connection ports or doors.

3.12.6 Top-Feed Modules

Top-feed modules shall supply power to the panel base through a raceway which carries power from hard-wired connection at junction box in ceiling or wall to plug into base raceway.

3.12.7 Internal Panel to Panel Power Connections

Internal panel-to-panel power connections shall be straight or flexible plug-in and plug-out grounded connections and shall provide multiple circuit type configurations (i.e., 1+2, 2+1, 1+3, 2+2, 3+1, etc.).

3.12.8 Commercial Grade Receptacles

Receptacles shall be commercial grade and easily identified by line or circuit identification number, letters, or color-codes. Appropriate receptacles shall be indicated with an orange color alpha symbol and triangle on the face to identify the isolated ground. Receptacles shall be field interchangeable anywhere along the wiring harness. All panels shall be capable of wire management and pass-through power harness.

3.12.9 In-Feed Modules

In-feed modules shall supply power to the base panels by a conduit built into a panel or a conduit which attaches to a panel connection post. In-feed modules shall provide removable covers for routing the communication cables.

3.12.10 Wire Management Capacity Modules

Actual wire management capacity shall allow for wire twist and right-angle corner radius loss.

3.13 Power Communication Distribution Requirements

3.13.1 Raceways

All powered standard panels shall have a horizontal raceway capable of distributing a minimum of three (3) 20-Ampere electrical power circuits with the capability to expand to maximum available by the manufacturer and include eight to twelve (8-12) 25 pair communications and data cables. Tile and frame system’s standard powered panels shall be capable of delivering the aforementioned to the base as well as to the beltline of the panel.

3.13.2 Raceways General Requirements

All raceways shall be an integral part of the panel and not a modification to the panel.

3.13.3 Raceway Cable Capability

All raceways both horizontal and vertical shall permit the installation of

cables. All raceways shall provide capability of handling “Category 6a” cabling.

3.13.4 Raceway Data and Communication Cabling

In addition to power distribution system, the raceway shall also be capable of containing both data and communication cabling without interference from the raceway electrical system.

3.13.5 Non-Powered Raceway

All non-powered raceways shall be capable of easy field conversion to powered raceways without requiring the workstation to be disassembled.

3.13.6 Base Cutouts

Base cutout(s) with knockout or removable cover shall be provided on each panel assembly to receive back-to-back electrical outlets as required. The top edge of the cutout shall be located no more than eighteen (18) inches from the finished floor. Panels thirty (30) inches wide or wider, shall have a minimum of two (2) base cutouts, per panel, per side, for electrical or cable access. Panels twenty-four (24) to thirty (30) inches shall have one (1) base cutout per panel, per side. Easy access to the electrical harness and telecommunication cables shall be provided without special tools. Lowest part of the panel frame shall be covered with manufacturer’s standard metal or plastic trim. Standard trim shall not become dislodged by accidental knock/bump from a shoe or vacuum.

3.14 Communications and Data Minimum Requirements

3.14.1 Communication Modules

All standard panels shall be able to accommodate industry standard communication modules with knockouts for communication modules on each side of panel.

3.14.2 Cable Jacks

Panel bases shall be capable of accommodating cable jacks in a way in which they appear to be an integral part of the base.

3.15 Additional Mandatory Technical Requirements

3.15.1 Adjustable Column Support Legs Requirements

Adjustable column support legs shall be provided under peninsula type work-surfaces. Adjustable column support shall offer height adjustment in 1/2 to 1 inch increments to allow the work-surface to be positioned between twenty-seven (27) inches to thirty-one (31) inches above the finished floor.

3.15.2 List of Product Accessories Requirements

Documentation shall include a detailed list of all accessories available for the proposed systems. Accessories shall include, but not limited to:

- Tool bars
- Paper management
- Coat Hooks
- Markerboard (i.e., whiteboard)
- Tackboard
- Wardrobe Storage Tower: Provide a Height of fifty (50) inches to sixty-five (65) inches, Width of twenty-four (24) inches ±1 inch, and Depth of twenty-four (24) inches ±1 inch. Provide a variety of configurations including box drawer, file drawers, and wardrobe door with hanger.

3.15.3 Custom Panels

Custom panels and work-surfaces shall be available. Custom requirements may include changes to standard widths, heights, and height adjustments to panels and work-surfaces.

3.15.4 Panel System Features

Panels shall be available and/or include the following system features:

- Frosted glass or equivalent for applications that require privacy without blocking light.
- Open frame

4. ENVIRONMENTAL PREFERRABLE PURCHASING (EPP) REQUIREMENTS

4.1. Scope

All MSF shall comply with the EPP requirements outlined in each section. Third-party EPP certifications shall be valid at the time of bid and maintain validity throughout the lifetime of the contract. Certifications not listed in this EPP requirements section are unacceptable for demonstrating compliance. If the MSF includes components that are common among multiple product lines, these common components shall be certified with the same or better third-party certifications as the MSF. If the solicitation requires a third-party certification, scorecard, or other proof of compliance, then the applicable documentation shall be submitted at the time of bid. Refer to attachment questionnaire (7110-5826TQ, Attachment 4).

4.2. General Requirements

All MSF shall comply with CCR, Title 17 §93120.2 – Air Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products and CCR, Title 24, Parts 1-12 – California Building Energy Efficiency Standards as applicable.

4.3. Environmental Certification Requirements

All MSF shall comply with a minimum one (1) of the following subsections:

4.3.1. The MSF shall comply with the 2019 ANSI/BIFMA e3 Furniture Sustainability Standard, have 2019 BIFMA level® 2 or 3 Certification, and a 2019 BIFMA level® Scorecard shall be provided.

AND/OR

4.3.2. The MSF shall comply with the Cradle to Cradle Certified® Product Standard, have Cradle to Cradle Certified® Bronze, Silver, Gold, or Platinum Certification, and a Cradle to Cradle Certified® Product Scorecard shall be provided.

4.4. Indoor Air Quality (IAQ) Requirements

All MSF shall comply with a minimum one (1) of the following subsections:

4.4.1. If the MSF does not emit VOCs and other harmful pollutants established in the ANSI/BIFMA X7.1 Standard for Formaldehyde and TVOC Emissions, then documentation shall be submitted proving the MSF is exempt from meeting the other IAQ subsections.

AND/OR

4.4.2. The MSF shall be verified by a certified lab for meeting the requirements established in the ANSI/BIFMA X7.1 Standard for Formaldehyde and TVOC Emissions and using the CDPH/EHLB Standard Method V1.2.

A certified lab can be found at the following web address:

https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/AQS/Pages/VOCs.aspx

AND/OR

4.4.3. The MSF shall have 2019 BIFMA level® 2 or 3 Certification with full points awarded on the 2019 BIFMA level® Scorecard in all the following:

- Credit 7.6.3 Low Emitting Furniture – Advanced

AND/OR

4.4.4. The MSF shall have Underwriters Laboratories (UL) GREENGUARD Gold Certification.

AND/OR

4.4.5. The MSF shall have Scientific Certification Systems (SCS) Global Services Indoor Air Advantage™ Gold Certification.

AND/OR

4.4.6. The MSF shall have Materials Analytical Services (MAS) Certified Green® Certification.

4.5. Forestry Sustainability Requirements

All MSF shall comply with a minimum one (1) of the following subsections:

4.5.1. If the MSF, including its components, does not contain wood and/or wood-based materials, then documentation shall be submitted proving the MSF is exempt from meeting the other Forestry Sustainability Certification subsections.

AND/OR

4.5.2. The MSF shall have 2019 BIFMA level® 2 or 3 Certification with full points awarded on the 2019 BIFMA level® Scorecard in all the following:

- Credit 6.3.3.2 50% of the Product Weight

AND/OR

4.5.3. The MSF shall have Forest Stewardship Council Chain-of-Custody (FSC CoC) Certification.

AND/OR

4.5.4. The MSF shall have Sustainable Forestry Initiative Chain-of-Custody (SFI CoC) Certification.

4.6. Recycled Content Requirements

All MSF shall comply with a minimum one (1) of the following subsections:

4.6.1. The MSF shall have a minimum of 30% recycled content materials.

AND/OR

4.6.2. The MSF shall have 2019 BIFMA level® 2 or 3 Certification with full points awarded on the 2019 BIFMA level® Scorecard in all the following:

- Credit 6.3.4.1 30% Recycled Content

4.7. Task Light Requirements

4.7.1. Definitions

1) “Articulated Luminaire” means a portable luminaire with an adjustable arm that allows the lamp to be positioned in all directions.
2) “GU-24” means the designation of a lamp holder and socket configuration, based on a coding system by the International Energy Consortium.
3) “GU-24 adaptor” means a one-piece device, pig-tail, wiring harness, or other such socket/base attachment that connects to a GU-24 socket on one end and provides a different type of socket or connection on the other end.
4) “Lamp” means an electrical appliance that includes a glass envelope

and produces optical radiation for the purpose of visual illumination, designated to be installed into a luminaire by means of an integral lamp holder.

5) “Lamp Efficacy (LE)” means the measured lumen output of a lamp in lumens divided by the measured lamp electrical power in watts expressed in units of lumens per watt (LPW).

6) “LED lamp, non-integrated” means an assembly comprised of an LED array (module) or LED packages (components) and an ANSI standards base. The device is intended to connect to the LED driver of an LED luminaire through an ANSI standard lamp-holder (socket). The device cannot be connected directly to the branch circuit.

7) “LED lamp, integrated” means an integrated assembly comprised of LED packages (components) or LED arrays (modules), LED driver, ANSI standard base and other optical, thermal, mechanical and electrical components. The device is intended to connect directly to the branch circuit through a corresponding ANSI standard lamp holder (socket).

8) “LED luminaire” means a complete lighting unit consisting of LED-based Light emitting elements and a matched driver together with parts to distribute light, to position and protect the light emitting element, and to connect the unit to a branch circuit. The LED-based lighting emitting elements may take the form of LED packages (components), LED array modules), or LED lamps. The LED luminaire is intended to connect directly to a branch circuit.

9) “Luminaire efficacy” for LEDs means the luminous efficacy of the LED luminaire, or of the LED light engine with integral heat sink, when tested in accordance with IES LM-79. The test methods for LED luminaires using LED lamps and light engines are IES LM-79, “Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products,” at manufacturer's option.

10) “Lumens per watt” (LPW) means “average lamp efficacy (LPW)” as defined in Section 1602(k) of the California Appliance Efficiency Regulations.

11) “Luminaire” means a complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.

12) “Screw base” means an ANSI Edison screw base designed for North America.

13) “Task light” means an under-cabinet luminaire or an articulated luminaire designed for illuminating a specific work-surface.

4.7.2. General Requirements

4.7.2.1. California Appliance Efficiency Regulations

Each task light shall comply with all applicable requirements of CCR, Title 20, §1601-1609, as known as the California Appliance Efficiency Regulations. In accordance with these regulations, certain types of lamps, under-cabinet luminaires, and portable luminaires shall meet specific efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), and Compliance Score standards. Applicable luminaires shall be certified to the California Energy Commission (CEC) by the manufacturer before they can be sold or offered for sale in California.

4.7.2.2. California Lighting Toxics Reduction

Each task light shall comply with California HSC, Division 20, Chapter 6.5, Article 10.02. §25210.9-25210.12 – Lighting Toxics Reduction as applicable.

4.7.2.3. Luminaire Types

Each task light shall be an LED luminaire.

4.7.2.4. Minimum Luminaire Models

Proposed task lights shall include a minimum of one model for each of the following:

- LED under-cabinet luminaire
- LED articulated luminaire

4.7.2.5. Task Lights Standards

Task lighting shall be listed in accordance with UL-153, UL-962, or UL-2108 as applicable.

The proposed task lights efficacy shall be tested in accordance with IES LM-79 by a laboratory listed in the U.S. Department (DOE) LED Lighting Facts® Approved Testing Laboratories List under LM-79 sections 9, 10, and 12.

4.7.2.6. Task Lights Restrictions

Each task light shall not be equipped adapters that convert a screw base socket to any other kind of socket or connectors.

4.7.2.7. Luminaires

Each luminaire shall be a complete lighting unit consisting of a lamp, or a light emitting element, together with the parts designed to power and distribute the light, and to connect to the

power source via a standard power socket.

4.7.2.8. Electrical Circuit Requirement

Each task light shall be rated to operate on a 110-120 Volt general circuit, 50-60 Hertz circuit.

4.7.2.9. Lens, Baffle, and Reflector

Each task light shall have a built-in prismatic lens, baffle, reflector system, or other method configured to minimize glare and shield the lamp or light emitting element from the view of a seated user.

4.7.2.10. Power Switch

Each task light shall have a built-in power switch to allow the user to independently turn on and off the light.

4.7.2.11. Electrical Cord-set

The line-voltage electrical cord for each task light shall be a six (6) foot minimum length, factory installed, electrical cord-set. The cord-set shall be UL listed and California Electric Code compliant. The cord-set shall include a factory installed plug.

4.7.2.12. Appearance

Each task light shall be aesthetically compatible with the MSF. Task lights shall not adversely affect the performance of any workstation component.

4.7.2.13. General Mounting

Each task light shall have structurally sound mounting devices which prevent accidental displacement and shall allow easy removal and replacement when necessary to permit cleaning and replacement of the lamp or lighting element.

4.7.2.14. Defects and Hazards

All task lights shall be delivered free of all imperfections, defects, and hazards. This includes all affects to appearance, normal life, serviceability, or user safety.

4.7.3. Under Cabinet Task Lights

4.7.3.1. Under Cabinet Task Light Size

Each under cabinet task light shall be approximately the same length as the overhead storage units or shall have an adjustable mounting system that allows the task light to be located anywhere along the length of the overhead storage units.

4.7.3.2. Mounting

Each under cabinet task light shall be capable of mounting beneath overhead shelves and overhead storage units.

4.7.3.3. Mounting Orientation

Each under cabinet task light shall be capable of being mounted in orientations that allows the electrical cord can be placed along the left or right side of the luminaire.

4.7.4. Articulated Task Lights

4.7.4.1. Table Base

Each articulated task light shall be equipped with a fully adjustable arm mounted to a freestanding weighted table base appropriate for the selected MSF.

4.7.4.2. Adjustable Arm

The adjustable arm shall support the weight of the lamp and housing and shall remain in position without the tightening of knobs, thumb screws, clamps, or other types of fasteners.

4.7.4.3. Position Adjustment

The adjustable arm shall allow the lamp or lighting element to be positioned to point in all directions and to be moved vertically and horizontally.

4.7.5. Occupancy Sensor Requirements

Under-cabinet task lights shall be equipped with an occupancy sensor (OS). Articulated task lights may be equipped with an OS. A task light equipped with an OS shall meet all the following requirements:

4.7.5.1. OS Description

The OS shall be an occupancy sensing device that is an integrated part of the luminaire, or a modular unit specifically designed to be used with the luminaire.

4.7.5.2. Sensor Type Restriction

The luminaire shall not be equipped with or offered with a retrofit OS. A retrofit OS is an independent universal device that switches the power source on and off based on occupancy and it is not specifically designed to be used with the luminaire.

4.7.5.3. Sensor Capability

The luminaire shall be capable of sensing occupancy within a typical workstation.

4.7.5.4. Auto On/Off Function

The luminaire shall automatically turn on when occupancy is detected within the workstation. The luminaire shall automatically turn off no sooner than five (5) minutes after occupancy is not detected within the workstation.