Section 27 11 00

COMMUNICATION EQUIPMENT ROOM FITTINGS

Section 27 11 16

Communications Cabinets, Racks, Frames and Enclosures

PART 1 – GENERAL

1.1 WORK INCLUDED

  A. Provide all labor, materials, and equipment for the complete installation of work called for in the Contract Documents.

1.2 SCOPE OF WORK

  A. This section includes the minimum requirements for cabinets, racks, frames and enclosures in data centers, computer rooms, and communications equipment rooms.

  B. Included in this section are the minimum composition requirements and installation methods for the following:

  1. Freestanding Cabinets.

1.3 QUALITY ASSURANCE

  A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner or Owner Representative. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified and subject to approval.

  B. Strictly adhere to all Building Industry Consulting Service International (BICSI), Electronic Industries Alliance (EIA) and Telecommunications Industry Association (TIA) recommended installation practices when installing communications/data cabling.

  C. Material and work specified herein shall comply with the applicable requirements of:

  1. ANSI/TIA/EIA – 568-B *Commercial Building Telecommunications Cabling Standard*, 2000-2004

  2. TIA – 569-B *Commercial Building Standard for Telecommunications Pathways and Spaces*, 2004

  3. ANSI/TIA/EIA – 606-A *Administration Standard for the Telecommunications Infrastructure of Commercial Buildings*, 2002

4.   ANSI-J-STD – 607-A *Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications*, 2002

5.   ANSI/TIA-942-2005 *Telecommunications Infrastructure Standard for Data Centers*, 2006

1.4   SUBMITTALS

1.1   Provide product data for the following:

1.   Manufacturers data sheets/cut sheets, specifications and installation instructions for all products (submit with bid).

PART 2 – PRODUCTS

2.1   CABINETS

A.   Free-standing Equipment Cabinets (CPI C-Series SlimFrame Cabinet System)

1.   [Cabinets] Provide freestanding equipment cabinets to store computer and data storage equipment in the data centers, computer rooms and equipment rooms. Each cabinet enclosure shall have a rectangular frame with removable top panel, side panels and doors. Installed cabinets shall include thermal, power, and cable management accessories that control airflow through the cabinet and keep network and power cables separate and organized.

2.   [Cabinet Frame] The cabinet frame shall be rectangular with four corner posts, manufactured from aluminum with bolted frame construction. The sides of the frame shall have three supports located near the top, middle and bottom to allow attachment of equipment mounting rails and thermal, cable and power management accessories. The cabinet frame shall have a static load limit of 2000 lb (907.2 kg).

The cabinet shall be 24" (610 mm) wide by 39.62" (1006.3 mm) deep by 78.00" (1981.2 mm) high when doors, top panel and side panels are installed. Leveler feet will add approximately 1" (25 mm) to the height of the frame/cabinet. Casters will add approximately 3.7" (94 mm) to the height of the frame/cabinet.

Change cabinet depth and height to match job requirements. Refer to the SlimFrame Cut Sheet or the CPI Product Configurator to see all SlimFrame options. Note that SlimFrame can be ordered with or without top panel, side panels and doors. Use the cabinet depth dimensions when the cabinet includes doors; use the frame depth dimensions if doors are not included with the cabinet (when ordering a "frame only" cabinet).
Cabinet Width (for 19" EIA wide cabinets): 24" (610 mm)
Cabinet Depths: 25.46" (646.7 mm), 33.62" (853.9 mm), or 39.62" (1006.3 mm); rail-to-rail depth (2.1.A.3) changes when cabinet depth changes.
Frame Depths: 23.96" (608.6 mm), 32.12" (815.8 mm), or 38.12" (968.2 mm); rail-to-rail depth (2.1.A.3) changes when cabinet depth changes.
Cabinet Heights: 72.00" (1828.8 mm) [37 RMU], 78.00" (1981.2 mm) [40 RMU], or 84.00" (2133.6 mm) [43 RMU]; RMU (2.1.A.3) changes when cabinet height changes.

3.   [Equipment Mounting Rails] Each cabinet shall include two pairs of equipment mounting rails. Mounting rails shall bolt to the supports located near the top, middle and bottom of the frame and shall be fully adjustable in depth to provide front and rear support for equipment. Equipment Mounting

Rails shall be spaced horizontally to support 19" (482.6 mm) wide EIA-310-D compliant rack-mount equipment and shall provide 36" (910 mm) of rail-to-rail depth for equipment. Mounting rails will be L-shaped. The front flange shall be square-punched according to the EIA-310-D Universal hole pattern with equipment mounting holes on alternating 5/8" – 5/8" – 1/2" (15.9 mm – 15.9 mm – 12.7 mm) vertical hole centers. Square-punched holes shall accept cage nut hardware with various threads. Rack mount spaces or units (RMU) shall be 1-3/4" (44.45 mm) high and shall be marked and numbered on the mounting rails. Numbering shall start at the bottom of the rail. Mounting rails shall provide 42 RMU for equipment.

Change rail-to-rail depth, type of mounting rail and number of RMU to match job requirements.
Maximum Rail-to-Rail Depth (depth): 22" (560 mm), 30" (760 mm), or 36" (910 mm); Cabinet depth (2.1.A.2) changes when rail depth changes..
Rail Style: square-puched (for computers) OR #12-24 threaded (for patch panels); Strike the highlighted sentence when threaded rails are used.
RMU (Height): 37 RMU, 40 RMU, or 43 RMU; Cabinet height (2.1.A.2) changes when RMU changes.

4. [Top Panel] The cabinet shall include a solid top panel with a vented section for a top-mount fan near the front and rear of the panel and edge-protected cable access ports near the corners of the panel.

    Use the alternate copy below for no side panels.

    [Top Panel] The cabinet will not include a top panel.

5. [Side Panels] The cabinet shall include two locking solid side panels. Each side panel will have a keyed latch for easy installation and removal.

    Use the alternate copy below for no side panels.

    [Side Panels] The cabinet will not include side panels.

    The side panel must be removed when baying cabinets side-by-side. To create a bay of cabinets specify one cabinet with side panels and the rest without. Transfer one side panel to the end of the cabinet bay. Note that bayed cabinets must be the same height and depth.

6. [Front Door] The cabinet shall include a single front door with a perforated metal panel and quick-release hinge pins. The door shall be removable and reversible to open from the right or left. The front door shall have a single-point, spring-loaded, push-button latch with a keyed lock.

    Choose the Front Door style.
    Front Door styles: perforated metal, solid plexiglass, solid metal, vented plexiglass

    Use the alternate copy below if the cabinet does not include a front door.

    [Front Door] The cabinet will not include a front door.

7. [Rear Door] The cabinet shall include a single rear door with a perforated metal panel and quick-release hinge pins. The door shall be removable and reversible to open from the right or left. The rear door shall have a single-point, spring-loaded, push-button latch with a keyed lock.

    Choose the Rear Door style.
    Rear Door styles: perforated metal, solid metal

    Use the alternate copy below if the cabinet does not include a rear door.

[Rear Door] The cabinet will not include a rear door.

8. [Material/Construction] The cabinet frame, top panel, side panels and doors shall be manufactured from aluminum. Door panels shall be aluminum or plexiglass. The door latch, door hinges and top panel cable access ports will be plastic. The cabinet frame, doors and components shall assemble with hardware.

9. [Color/Finish] The cabinet frame and door frames shall be anodized aluminum. The top panel, side panels, mounting rails and door panels shall be painted black with epoxy-polyester hybrid powder coat paint. Plastic components shall be black. The plexiglass door panel shall be tinted (not clear).

    Choose the cabinet color: black, computer white, gray
    Strike the highlighted sentence if the cabinet does not include a plexiglass door.

10. [Included Hardware] The cabinet shall include (4) leveling feet, (4) clamps for securing the leveling feet to the floor, a baying kit, and a means for bonding the cabinet to the Telecommunications Grounding Busbar. The manufacturer of the cabinet shall sell compatible casters and equipment mounting hardware as an accessory.

    Each cabinet includes a baying kit. Note that the side panel must be removed when baying cabinets side-by-side. To create a bay of cabinets specify one cabinet with side panels and the rest without. Transfer one side panel to the end of the cabinet bay. Note that bayed cabinets must be the same height and depth.

11. Design Make shall be:
    Chatsworth Products, Inc. (CPI),
    C-Series SlimFrame Cabinet System:

    Part Number **C1153-742**, SlimFrame Cabinet, 24" (610 mm) wide x 39.62" (1006.3 mm) deep by 78.00" (1981.2 mm) high, with a 19" EIA x 42 RMU x 36" (910 mm) deep equipment space, Square-Punched Equipment Mounting Rails, Top Panel, Two Solid Side Panels, Single Perforated Metal Front Door, Single Perforated Metal Rear Door, Black.

    The listed part number is an example of a C-Series SlimFrame Cabinet description. Change variables to match job requirements. Use the SlimFrame Cut Sheet or the CPI Product Configurator to choose your SlimFrame Cabinet. Product Configurator lets you choose product features and pick accessories, then creates a detailed Bill of Material based on your cabinet and accessory selections. You can substitute part numbers from the Bill of Material into this specification and change descriptions to match the selected items.

B. Cable Management (CPI C-Series SlimFrame Cabinet System)

1. [Vertical Cable Managers] Each installed cabinet shall be equipped with a vertical cable manager to store network cables. The vertical cable manager shall attach to the side of the cabinet frame in the space between the frame and the side panel and shall be adjustable in depth to match equipment requirements. The vertical cable manager shall have individual C-shaped plastic cable rings. The rings shall be able to align with the side or the front/rear of the cabinet.

    One vertical cable manager is included with each cabinet. Choose the number of additional

==Narrow Vertical Cable Managers to include in each cabinet and list the correct Narrow Vertical Cable Manager Part Number in 2.1.B.5 below. Narrow Vertical Cable Managers **must** match the height of the cabinet frame.==

2. ==[Rack-Mount Cable Shelf]== Each installed cabinet shall be equipped with ==a== rack-mount shelf with brush-sealed cable pass-through ports along the front surface to create a front-to-back pathway for cables. The shelf shall be 19" EIA rack-mount and 1 RMU high. The shelf shall attach to the front and rear pair of equipment mounting rails. The shelf shall adjust in depth to attach to mounting rails located between 22" (558 mm) and 40" (1016 mm) apart. The brush-sealed cable pass-through ports shall be sized to hold 48 patch cords.

    ==*Choose the number of Rack-Mount Cable Shelves to include in each cabinet. Rack-Mount Cable Shelves are used in cabinets equipped with Thermal Management Accessories Air Dam Kit or Air Diverter Kit to provide a front-to-rear pathway for cables.*==

    ==*Omit 2.1.B.2. and the Rack-Mount Cable Shelf Part Number if it is not used.*==

3. ==[Universal Horizontal Cable Manager]== Each installed cabinet shall be equipped with a rack-mount horizontal cable manager to organize cables in the RMU above and below each patch panel or network switch within the cabinet. The horizontal cable manager shall be 19" EIA rack-mount and 1 RMU, 2 RMU or 3 RMU high. The horizontal cable manager shall be a single-sided U-shaped trough with a front-facing snap on cover or a double-sided H-shaped trough with front and rear snap on covers. Plastic T-shaped cable guides along the top and bottom edge of the cable manager shall divide cable openings that allow cables to exit or enter the top or bottom of the manager. The cable manager shall be at least 4" (100 mm) deep and shall be sized to hold at least 24 patch cords per RMU.

    ==*Omit 2.1.B.3. and the Universal Horiozntal Cable Manager Part Numbers if it is not used.*==

4. ==[Jumper Trays]== Each installed cabinet shall be equipped with a rack-mount jumper tray above each modular network switch chassis within the cabinet. The jumper tray shall be 19" EIA rack-mount and 2 RMU high. The jumper tray shall be a U-shaped trough that is open on the top. The jumper tray will provide an open side-to-side pathway for patch cords. Each side of the tray shall be fitted with an adjustable, downward-facing radius to guide cables as the cables enter the tray from below. The jumper tray shall be at least 3.5" (89 mm) deep and shall hold 48 patch cords.

    ==*Omit 2.1.B.4. and the Jumper Tray Part Numbers if it is not used.*==

5. Design Make shall be:
    Chatsworth Products, Inc. (CPI),
    C-Series SlimFrame Cabinet System,
    Cable Management Accessories:

    Part Number **11809-702**, Narrow Vertical Cable Manager, for 72" H (1828.8 mm), ==37 RMU== SlimFrame Cabinet, 1.75" Wide x 4.13" Deep (44 mm Wide x 104 mm Deep), Black.
    Part Number **11809-701**, Narrow Vertical Cable Manager, for 78" H (1981.2 mm), ==40 RMU== SlimFrame Cabinet, 1.75" Wide x 4.13" Deep (44 mm Wide x 104 mm Deep), Black.
    Part Number **11809-700**, Narrow Vertical Cable Manager, for 84" H (2133.6 mm), ==43 RMU== SlimFrame Cabinet, 1.75" Wide x 4.13" Deep (44 mm Wide x 104 mm Deep), Black.
    ==*Match the height (RMU) of the cabinet.*==

Part Number **13517-701**, Rack-Mount Cable Shelf, 19" EIA x 1 RMU, Extends 22" (558 mm) to 40" (1016 mm) Deep, Black.
Use with rails spaced 22" (558 mm) to 40" (1016 mm) apart.

Part Number **30139-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 1 RMU, 5.0" (127 mm) deep, Black.
Part Number **30130-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 2 RMU, 5.1" (130 mm) deep, Black.
Part Number **30131-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 3 RMU, 5.1" (130 mm) deep, Black.
Part Number **30339-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 1 RMU, 6.3" (160 mm) deep, Black.
Part Number **30330-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 2 RMU, 6.4" (163 mm) deep, Black.
Part Number **30331-719**, Universal Horizontal Cable Manager, Single-Sided, 19" EIA x 3 RMU, 6.4" (163 mm) deep, Black.
Part Number **30529-719**, Universal Horizontal Cable Manager, Double-Sided, 19" EIA x 1 RMU, 11.7" (298 mm) deep, Black.
Part Number **30530-719**, Universal Horizontal Cable Manager, Double-Sided, 19" EIA x 2 RMU, 11.7" (298 mm) deep, Black.
Part Number **30531-719**, Universal Horizontal Cable Manager, Double-Sided, 19" EIA x 3 RMU, 11.7" (298 mm) deep, Black.
Universal Horizontal Cable Managers require a 5.0" minimum rail setback.

Part Number **12183-719**, Upper Jumper Tray, 19" EIA x 2 RMU, 3.5" (89 mm) deep, Black.
Part Number **13183-719**, Upper Jumper Tray, 19" EIA x 2 RMU, 6.0" (152 mm) deep, Black.

C.   Thermal Management (CPI C-Series SlimFrame Cabinet System)

1.   [Air Dam Kit] Each installed cabinet shall be equipped with an internal airflow baffle to block airflow around the top, bottom and sides of equipment in the cabinet. The airflow baffle shall seal the space at the front of the cabinet between the equipment mounting rails and the top, sides and bottom of the cabinet enclosure.

2.   [Air Diverter Kit – this option is **only** used when air is delivered through a vented tile placed under the cabinet] Each installed cabinet shall be equipped with an internal airflow baffle that guides cold air from the bottom of the cabinet to the space at the front of the cabinet between the door and equipment. The baffle shall also block airflow around the top and sides of equipment in the cabinet. The airflow baffle shall seal the space at the front of the cabinet between the equipment mounting rails and the top and sides of the cabinet enclosure. A 2 RMU high tray at the bottom of the cabinet shall guide cold air entering the bottom of the cabinet (through a vented raised access floor tile) to the space at the front of the cabinet between the door and the front of equipment.

3.   [Snap-In Filler Panels] Each installed cabinet shall be equipped with filler (blanking) panels that seal any open RMU spaces (RMU spaces not occupied by other equipment). The filler (blanking) panels shall be made of plastic and shall be designed to attach to square-punched equipment mounting rails without hardware. The filler (blanking) panel design shall allow

the panels to be installed and removed from the equipment mounting rails without tools. Panels shall be sized to fit 19" EIA x 1 RMU and 19" EIA x 2 RMU rack-mount panel spaces.

4. [Top-Mount Fan Kit] Each installed cabinet shall be equipped with a top-mount fan kit to help remove hot air from the cabinet. The fan kit shall include four 100 CFM fans in two housings that attach to the cabinets top panel. The fan kit shall include a single attached 15' (4.6 m) long power cord.

5.

Use Air Dam Kit with perforated front and rear doors for cabinets in conventional hot aisle/cold aisle environments. Use filler panels to close all open RMU spaces. Substitute Air Diverter Kit when the cabinet is placed over a vented tile to increase airflow into the front of the cabinet. Use top-mount and bottom-mount fans to address hot spots.

*Choose either 2.1.D.1 or 2.1.D.2 and list the appropriate part numbers in 2.1.D.5 below. Air Dam Kit (airflow baffles) or Internal Air Duct **must** match the width and height of the cabinet frame. Vertical Cable Managers and Power Strips cannot be placed at the front of the cabinet frame when Air Dam Kit or Air Diverter Kit are used. However, a Rack-Mount Cable Shelf can be used with either product to route cables front-to-back or back-to-front (see section 2.1.B.4., Rack-Mount Cable Shelf).*

Air Dam Kit or Air Diverter Kit and Snap-In Filler Panels should be used in all server cabinets that support rack-mount servers and require front-to-rear, cold-to-hot airflow. Air Dam Kit, Air Diverter Kit and Snap-In Filler Panels help control airflow through cabinets by blocking the space around equipment so that cold air goes through equipment and so that hot air does not re-circulate to the front of the cabinet and recycle through equipment. Top-mount fans should be used sparingly to address hot spots.

6. Design Make shall be:
    Chatsworth Products, Inc. (CPI),
    C-Series SlimFrame Cabinet System,
    Thermal Management Accessories:

    Part Number **13336-710**, Air Dam Kit, for 19" EIA wide x 84" H (2133.6 mm), 43 RMU SlimFame Cabinet, Black.
    Part Number **13336-711**, Air Dam Kit, for 19" EIA wide x 78" H (1981.2 mm), 40 RMU SlimFame Cabinet, Black.
    Part Number **13336-712**, Air Dam Kit, for 19" EIA wide x 72" H (1828.8 mm), 37 RMU SlimFame Cabinet, Black.

    Part Number **13337-710**, Air Diverter Kit, for 19" EIA wide x 84" H (2133.6 mm), 43 RMU MegaFame Cabinet, Black.
    Part Number **13337-711**, Air Diverter Kit, for 19" EIA wide x 78" H (1981.2 mm), 40 RMU MegaFame Cabinet, Black.
    Part Number **13337-712**, Air Diverter Kit, for 19" EIA wide x 72" H (1828.8 mm), 37 RMU MegaFame Cabinet, Black.

    Part Number **34537-000**, Snap-In Filler Panel, 19" W x 1 RMU, Black
    Part Number **34538-000**, Snap-In Filler panel, 19" W x 2 RMU, Black
    For square-punched equipment mounting rails only. Standard filler panels are also available.

    Part Number **12480-701**, Top-Mount Fan Kit, 115 VAC, NEMA 5-15P Plug, Black.
    Part Number **12480-702**, Top-Mount Fan Kit, 230 VAC, NEMA 6-15P Plug, Black.

Part Number **12729-001**, Foam Gasket Kit. *Includes 12 pieces of 2" x 3" x 40" foam to seal the base of the cabinet to the floor, etc.*

D.   Environmental Monitoring (RIM-600 Remote Infrastructure Management System)

1.   [Temperature Sensors] Each installed cabinet will be equipped with a temperature sensor that connects to an environmental monitoring appliance. The temperature sensor shall be located at the front of the cabinet near the top of the cabinet centered in the rack-mount space (or rack-mounted on the equipment mounting rails) to provide air temperature readings for monitoring equipment inlet air temperature. The temperature sensor shall have a digital display and shall display temperature readings in degrees Fahrenheit (Celsius).

Choose the number of Temperature Sensors per cabinet. Select the unit of measure: Fahrenheight or Celcius. Strike the highlighted section of the last sentence if the sensor does not have a digital display.

2.   [Power Monitoring Sensors] Each installed cabinet shall be equipped with two power monitoring sensors that connect to an environmental monitoring appliance. The power monitoring sensors shall be attached to the branch circuits (A and B) that provide power to the cabinet. The power monitoring sensors shall provide power readings for monitoring power on each branch circuit.
Choose the number of power monitoring sensors.

3.   [Door Opened/Closed Sensors] Each installed cabinet shall be equipped with a door opened/closed sensor that connects to an environmental monitoring appliance. The door opened/closed sensor shall provide opened or closed condition readings for monitoring the opened or closed condition of the front and rear door of the cabinet.

4.   [Environmental Monitoring Appliance] The environmental monitoring appliance shall provide continous automated monitoring of the environmental sensors, shall allow a low and high range to be set for each sensor, and shall notify technicians with an alarm when sensor readings exceed set limits. The environmental monitoring appliance shall have eight connections for external sensors and separate network and voice connections. The environmental monitoring appliance shall send alarms by email or direct voice call to technicians according to specific user contact schedules. The environmental monitoring appliance shall have an internal backup battery that shall allow the appliance to continue monitoring for up to three hours on a full battery charge if main power to the unit is interrupted. The environmental monitoring appliance shall record sensor readings, alarms and alarm acknowledgements and shall include monitoring software that allows sensor/alarm history to be reviewed for analysis and archived for record keeping. The environmental monitoring appliance and software shall allow individual sensors to have specific operating schedules and shall allow individual users to have multiple contact points and specific contact schedules. The environmental monitoring appliance shall be expandable with up to 31 additional nodes that provide eight additional external sensor connections each. Each expansion unit shall have a separate network conection, but will be supervised by the primary unit. The included software shall allow the environmental monitoring appliance, all expansion units and all attached sensors to be accessed and controlled from a single software

interface. Each appliance or expansion unit shall be rack-mount, 19" EIA x 1 RMU, and shall have separate power connections.

5. Design Make shall be:
Chatsworth Products, Inc. (CPI),
Remote Infrastructure Management (RIM-600) System:

Part Number **60000-001**, RIM-600 Host Module, 100-250 Vac, 50-60 Hz, 1 network connection, 1 voice connection, 8 external sensor connections, 19"W x 1 RMU x 9.6" (244 mm) Deep, Black.

Part Number **60001-002**, RIM-600 Node Module, 100-240 Vac, 50-60 Hz, 1 network connection, 8 external sensor connections, 19"W x 1 RMU x 7" (179 mm) Deep, Black.

Part Number **60011-001**, Room Temperature Sensor, 32°F to 95°F Range, With Display, White.
Part Number **60013-001**, Room Temperature Sensor, 0°C to 50°C Range, With Display, White.
Part Number **60012-007**, Miniature Temperature Sensor, 5°F to 140°F Range, No Display, Black.
Part Number **60012-057**, Miniature Temperature Sensor, -15°C to 60°C Range, No Display, Black.
Part Number **60052-001**, Dual (Front/Rear) Door Sensor, Magnetic Reed, Black.
Part Number **60040-002**, Power Monitoring Sensor, 0-250 Vac, 50-60 Hz, with (1) IEC-60320 C14 Inlet, Black.

Part Number **60075-720**, Sensor Mounting Bracket, 3 Positions, 19" W x 1 RMU, Black.

Select the correct part numbers for the RIM-600 system. Other sensors are available, see the RIM-600 Data Sheet.

E. Shelves (CPI C-Series SlimFrame Cabinet System):

1. [Equipment Shelves] Each installed cabinet shall be equipped with shelves for equipment that does not rack-mount directly to the equipment mounting rails. Cabinet shelves shall be sliding or fixed with a vented or solid mounting surface. Cabinet shelves shall be sized to fit the rack-mount width and depth of the cabinet and shall have adjustable depth mounting brackets that allow attachment to the front and rear pair of equipment mounting rails within the cabinet. Cabinet shelves shall be wider and deeper than the equipment placed on the shelf and shall have a load bearing capacity that exceeds the fully populated weight of equipment. Equipment shall be secured to the shelf with a bracket.
Shelf sizes, mounting depth ranges and load bearing capacities are listed below.

2. [Drawer] Each installed cabinet shall be equipped with a locking storage drawer. The drawer shall be enclosed in a rack-mount shelf and shall be attached to drawer slides that extend the full depth of the drawer. The storage drawer shall be sized to fit the rack-mount width and depth of the cabinet and shall have adjustable depth mounting brackets that allow attachment to the front and rear pair of equipment mounting brackets within the cabinet.
Drawer sizes, mounting depth ranges and load bearing capacities are listed below.

3.   Design Make shall be:
Chatsworth Products, Inc. (CPI),
C-Series SlimFrame Cabinet System,
Shelves:

Part Number **12336-119**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.
Part Number **12336-219**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **12336-719**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 18" deep (430 mm wide x 460 mm deep). Fits cabinets with mounting rails set 13" to 24" (330 mm to 610 mm) in depth. Use in 19" EIA Wide x 22" (560 mm) Deep SlimFrame Cabinets.

Part Number **12337-119**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.
Part Number **12337-219**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **12337-719**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 18" (460 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 18" deep (430 mm wide x 460 mm deep). Fits cabinets with mounting rails set 13" to 24" (330 mm to 610 mm) in depth. Use in 19" EIA Wide x 22" (560 mm) Deep SlimFrame Cabinets.

Part Number **12334-119**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.
Part Number **12334-219**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **12334-719**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 24" deep (430 mm wide x 610 mm deep). Fits cabinets with mounting rails set 17" to 28" (430 mm to 710 mm) in depth. Use in 19" EIA Wide x 30" (760 mm) Deep SlimFrame Cabinets.

Part Number **12335-119**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.
Part Number **12335-219**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **12335-719**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 24" (610 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 24" deep (430 mm wide x 610 mm deep). Fits cabinets with mounting rails set 17" to 28" (430 mm to 710 mm) in depth. Use in 19" EIA Wide x 30" (760 mm) Deep SlimFrame Cabinets.

Part Number **14070-119**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.
Part Number **14070-219**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **14070-719**, Fixed Shelf, Solid, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 29" deep (430 mm to 740 mm). Fits cabinets with moutning rails set 23" to 39" (580 mm to 990 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) Deep or 39" (990 mm) Deep SlimFrame Cabinets.

Part Number **14072-119**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Gray.

Part Number **14072-219**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Computer White.
Part Number **14072-719**, Fixed Shelf, Vented, 19" EIA wide x 1RMU x 29" (740 mm) Deep, 250 lb (113.4 kg) Capacity, Black.
Shelf surface is 17" wide by 29" deep (430 mm to 740 mm). Fits cabinets with moutning rails set 23" to 39" (580 mm to 990 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) Deep or 39" (990 mm) Deep SlimFrame Cabinets.

Part Number **12338-119**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 18" (460 mm) Deep, 140 lb (63.5 kg) Capacity, Gray.
Part Number **12338-219**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 18" (460 mm) Deep, 140 lb (63.5 kg) Capacity, Computer White.
Part Number **12338-719**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 18" (460 mm) Deep, 140 lb (63.5 kg) Capacity, Black.
Shelf surface is 17" wide by 18" deep (430 mm wide x 460 mm deep). Fits cabinets with mounting rails set 14" to 24" (360 mm to 610 mm) in depth. Use in 19" EIA Wide x 22" (560 mm) Deep SlimFrame Cabinets.

Part Number **12339-119**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 18" (460 mm) Deep, 140 lb (63.5 kg) Capacity, Gray.
Part Number **12339-219**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 18" (460 mm) Deep, 140 lb (63.5 kg) Capacity, Computer White.
Part Number **12339-719**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 18" I460 mm) Deep, 140 lb (63.5 kg) Capacity, Black.
Shelf surface is 17" wide by 18" deep (430 mm wide x 460 mm deep). Fits cabinets with mounting rails set 14" to 24" (360 mm to 610 mm) in depth. Use in 19" EIA Wide x 22" (560 mm) Deep SlimFrame Cabinets.

Part Number **12345-119**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Gray.
Part Number **12345-219**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Computer White.
Part Number **12345-719**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Black.
Shelf surface is 17" wide by 24" deep (430 mm wide x 610 mm deep). Fits cabinets with mounting rails set 18" to 30" (460 mm to 760 mm) in depth. Use in 19" EIA Wide x 30" (760 mm) Deep SlimFrame Cabinets.

Part Number **12346-119**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Gray.
Part Number **12346-219**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Computer White.
Part Number **12346-719**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 24" (610 mm) Deep, 140 lb (63.5 kg) Capacity, Black.
Shelf surface is 17" wide by 24" deep (430 mm wide x 610 mm deep). Fits cabinets with mounting rails set 18" to 30" (460 mm to 760 mm) in depth. Use in 19" EIA Wide x 30" (760 mm) Deep SlimFrame Cabinets.

Part Number **11914-119**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Gray.
Part Number **11914-219**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Computer White.
Part Number **11914-719**, Sliding Shelf, Solid, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Black.
Shelf surface is 17" wide by 32" deep (430 mm wide x 810 mm deep). Fits cabinets with moutning rails set 28" to 40" (710 mm to 1020 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) Deep SlimFrame Cabinets.

Part Number **11913-119**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Gray.
Part Number **11913-219**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Computer White.
Part Number **11913-719**, Sliding Shelf, Vented, 19" EIA wide x 2RMU x 32" (810 mm) Deep, 160 lb (72.6 kg) Capacity, Black.
Shelf surface is 17" wide by 32" deep (430 mm wide x 810 mm deep). Fits cabinets with moutning rails set 28" to 40" (710 mm to 1020 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) Deep SlimFrame Cabinets.

Part Number **14061-119**, Seismic Equipment Bracket for Cabinets, 19" EIA wide x 1RMU, 15" to 32" (380 mm to 810 mm) Deep, Gray.
Part Number **14061-219**, Seismic Equipment Bracket for Cabinets, 19" EIA wide x 1 RMU, 15" to 32" (380 mm to 810 mm) Deep, Computer White.
Part Number **14061-719**, Seismic Equipment Bracket for Cabinets, 19" EIA wide x 1 RMU, 15" to 32" (380 mm to 810 mm) Deep, Black.
Secure a single piece of equipment up to 16" (410 mm) wide or two pieces of equipment with a combined width of 15" (380 mm). Equipment must be 15" to 32" (380 mm to 810 mm) in depth. Fits cabinets with moutning rails set 22" to 39" (560 mm to 990 mm) in depth. Use in 19" EIA Wide x 22" (560 mm), 30" (760 mm) or 36" (910 mm) Deep SlimFrame Cabinets.

Part Number **13083-119**, Lockable Storage Drawer, 19" wide x 3 RMU x 20" (510 mm) Deep, 100 lb (45.4 kg) Capacity, Gray.
Part Number **13083-219**, Lockable Storage Drawer, 19" wide x 3 RMU x 20" (510 mm) Deep, 100 lb (45.4 kg) Capacity, Computer White.
Part Number **13083-719**, Lockable Storage Drawer, 19" wide x 3 RMU x 20" (510 mm) Deep, 100 lb (45.4 kg) Capacity, Black.
Drawer top surface is 17.2" wide by 20" deep (530 mm wide x 510 mm deep). Drawer extends 20" (510 mm). Fits cabinets with mountning rails set 24" to 39" (610 mm to 990 mm) in depth. Use in 19" Wide x 30" (760 mm) or 36" (910 mm) Deep SlimFrame Cabinets. 2 RMU and 4 RMU shelves are also available.

F.   Installation Hardware (CPI C-Series SlimFrame Cabinet System)

1.   Provide casters on each cabinet. Use casters to move the cabinet into place before installing equipment in the cabinet. Casters will add no more than 3.7" (94 mm) in height to the cabinet.

2.   Provide additional equipment mounting hardware to attach equipment to the equipment mounting rails in the cabinet.

3.   Design Make shall be:
      Chatsworth Products, Inc. (CPI),
      C-Series SlimFrame Cabinet System:

Part Number **13204-001**, Caster, Set of 4, Black.
Casters are used to move empty cabinets into place. Cabinets must be secured to the floor before loading.

Part Number **12637-001**, Cage Nuts and Screws, M6, 25 Pack, Gold.
Part Number **12638-001**, Cage Nuts and Screws, #10-32, 25 Pack, Zinc.
Part Number **12639-001**, Cage Nuts and Screws, #12-24, 25 Pack, Black.
Use in cabinets with square punched equipment mounting rails.

Part Number **40605-001**, Equipment Mounting Screws, Combination Pan Head/Pilot Point, #12-24, 50 Pack, Zinc.
Part Number **40605-005**, Equipment Mounting Screws, Combination Pan Head/Pilot Point, #12-24, 50 Pack, Black.
Use in cabinets with threaded equipment mounting rails.

3.1   INSTALLATION

A.   Free-standing Equipment Cabinets (CPI C-Series SlimFrame Cabinet System)

1.   Provide all components of the cabinet system (cabinet, mounting rails, shelves, cable managers, PDUs or power strips, environmental sensors, and thermal management accessories) from a single manufacturer.

2.   Install and adjust to position all accessories including vertical cable managers, vertical PDUs or power strips, equipment-mounting rails, airflow baffles using the manufacturer's installation instructions prior to baying and/or placing the cabinet for attachment to the building. Shelves, horizontal cable managers and filler panels, if used, may be installed after the cabinet is placed.

3.   Cabinets shall be secured to the structural floor using manufacturer's installation instructions and appropriate hardware as defined by local code or the authority having jurisdiction (AHJ). Installers shall provide installation hardware. When placed over a raised floor, secure the cabinet to the structural floor through the raised floor panels using threaded rod.

4.   When used in a multi-cabinet bay, cabinets shall be attached side-by-side using included baying kits according to the manufacturer's instructions.

5.   Attach overhead ladder rack or cable tray to the ceiling, independent of the cabinet. A 3" (75 mm) minimum clearance between the top of the cabinet and the bottom of the ladder rack/cable tray shall be maintained. Ladder rack/cable tray shall be positioned so that it does not interfere with hot air exhaust through the cabinet's top panel. Use radius drops where cable enters/exits the ladder rack/cable tray. Alternately, attach ladder rack/cable tray to the top of cabinets using an elevation kit so that ladder rack/cable tray is a minimum of 3" (75 mm) above the cabinet.

Note: Seismic installations require additional bracing of cabinets and overhead cable runways to building structure as advised by and certified by a licensed structural engineer.

6.   Cabinets shall be securely bonded to the Telecommunications Grounding Busbar (TGB). Attach a bonding conductor sized as defined in J-STD-607-A and as defined by local code or the authority having jurisdiction (AHJ) between the Telecommunications Grounding Busbar and the cabinet. Attach the bonding conductor to the cabinet using included hardware according to the manufacturer's installation instructions. The installer shall provide the bonding conductor and other necessary hardware required to make the connections between the cabinet and the Telecommunications Grounding Busbar.