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 F-Series TeraFrame™ Cabinet System)

1. [Cabinets] Provide freestanding equipment cabinets to store computer, data storage and networking 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 steel and aluminum with welded and bolted frame construction. The horizontal frame members shall be aluminum extrusion with grooves that accept captive hardware to allow attachment of equipment mounting rails and thermal, cable and power management accessories. The captive hardware will slide within the groove allowing rails and accessories to be adjusted in depth without removal from the cabinet. The slide extrusions will be marked with a scale that allows easy top-to-bottom alignment of mounting rails and other accessories when adjusted in depth. The cabinet frame shall support 2500 lb (1134 kg) of equipment.

   The cabinet shall be 23.6" (600 mm) wide by 45.1" (1147 mm) deep by 83.5" (2121 mm) high when doors, top panel and side panels are installed. Leveler feet will add approximately 1" (25 millimeters) to the height of the frame/cabinet. Casters will add approximately 2.8" (71 millimeters) to the height of the frame/cabinet.

   Change cabinet laod, width, depth and height to match job requirements. Refer to the TeraFrame DataSheets or the CPI Product Configurator to see all TeraFrame options. F-Series TeraFrame Cabinet is available with or without top panel, side panels and doors. When cabinets include doors and top panels, use Cabinet dimensions. When cabinets do not include doors and top panels, use Frame dimensions.
   Cabinet Widths (all 19" EIA): 23.6" (600 mm), 27.6" (700 mm), or 31.5" (800 mm)
   Cabinet Depths: Varies from 35.3" (897 mm) to 51.1" (1295 mm); rail depth (2.1.A.3.) changes when cabinet depth changes.
   Frame Depths: Varies from 31.5" (800 mm) to 47.2" (1200 mm); rail depth (2.1.A.3.) changes when frame depth changes.
   Cabinet Heights: Varies from 46.8" (1189 mm) [24 RMU] to 94.0" (2388 mm) [51 RMU]; RMU (2.1.A.3.) changes when cabinet height changes.
   Equipment Load: changes with cabinet width: 23.6" (600 mm) wide is 2500 lb (1133.9 kg); 27.6"

(700 mm) wide is 2000 lb (907.2 kg);and 31.5" (800 mm) wide is 2000 lb (907.2 kg)

3. [Equipment Mounting Rails] Each cabinet shall include two pairs of equipment mounting rails. Mounting rails shall bolt to the side of the cabinet frame at the top and bottom of the frame and shall be 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 up to 38.4" (976 mm) of rail-to-rail depth for equipment. Mounting rails 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 45 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): varies with cabinet depth from 28.6" (726 mm) to 44.3" (1126 mm); cabinet depth (2.1.A.2) changes when rail depth changes. (Note that actual rail depth will be less. Reduce Maximum Rail Depth by mounting rail setbacks required by cable, power and thermal management accessories to determine actual rail depth. Vertify that the cabinet has sufficient depth for the required rail depth and accessory setback.)
   Rail Style: square-puched (for computers) OR #12-24 threaded (for patch panels); Strike the highlighted sentence when threaded rails are used.
   RMU (Height): 24 RMU, 36 RMU, and 42 RMU to 51 RMU in 1 RMU intervals; cabinet height (2.1.A.2) changes when RMU changes.

4. [Top Panel] *Choose one top panel [a., b., c., or d.] and make [4.]*
   a. [Server Top Panel – solid panel with two cable access ports] The cabinet shall include a solid top panel with two 3" x 11.5" (76 mm x 292 mm) cable access ports located near the rear corners of the frame. Each cable access port shall be plastic with a brush seal to allow easy addition and removal of cables while limiting bypass airflow.
   b. [Network Top Panel – solid panel with four cable access ports] The cabinet shall include a solid top panel with four 3" x 11.5" (76 mm x 292 mm) cable access ports located near the front and rear corners of the frame. Each cable access port shall be plastic with a brush seal to allow easy addition and removal of cables while limiting bypass airflow.
   c. [Vertical Exhaust Duct System – top-mount duct and Server Top Panel with two cable access ports. Only available for cabinet frames that are 1050 mm to 1200 mm deep, with a solid rear door] The cabinet shall include a solid top panel with two 3" x 11.5" (76 mm x 292 mm) cable access port located near the front corners of the frame and a Vertical Exhaust Duct located at the rear of the frame. Each cable access port shall be plastic with a brush seal to allow easy addition and removal of cables while limiting bypass airflow. The Vertical Exhaust Duct shall be rectangular and shall extend between 20" (508 mm) and 34" (863 mm) high or 34" (863 mm) and 60" (1523 mm) high to touch the overhead drop ceiling. A curved airflow director shall be included at the bottom rear of the cabinet to guide airflow towards the top of the cabinet. The cabinet frame shall have a seal around the rear door opening to limit bypass airflow around the closed door.
      Duct is available in two height ranges, pick one and delete the other from the spec.
   d. [Top Panel] The cabinet will not include a top panel.

5. [Side Panels] The cabinet shall include two locking solid side panels with spring loaded latches for easy installation and removal. The cabinet shall be

designed to allow baying with or without side panels installed.

Choose Side Panel Quantity and Style: one OR two; solid OR vented.

Use the alternate copy below for no side panels.

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

6. [Front Door] The cabinet shall include a single front door with a perforated metal panel, hidden tamper-resistant hinges with quick-release hinge pins and a swing handle. The door shall be removable and reversible to open from the right or left. The door shall open to 150° when the cabinet is bayed with other cabinets. The front door shall have a single-point slam latch with a keyed lock.

Choose the Front Door style, type of latch and type of lock.
Front Door styles: perforated metal, solid Lexan, solid metal
Latch/lock styles: single-point or two-point; slam or cam latch with a keyed, combination and keyed or keypad and electronic lock
The two point latch is cam only. The electronic lock is available with a single-point cam latch only.

Use the alternate copy below when designating the electronic lock option.

The cabinet shall include a single front door with a perforated metal panel, hidden tamper-resistant hinges with quick-release hinge pins and a swing handle. The door shall be removeable and reversible to open from the right or left. The door shall open to 150° when the cabinet is bayed with other cabinets. The front door shall have a single-point cam latch with a keypad and electronic lock. The front door shall be opened by entering a code on the keypad.

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 perforated metal rear door with a swing handle. The door shall be removeable and reversible to open from the right or left. The door shall open to 175° when the cabinet is bayed with other cabinets. The rear door shall have a single-point slam latch with a keyed lock.

Choose the Rear Door style, type of latch and type of lock. If the cabinet has a Vertical Exhaust Duct Top Panel, use a solid rear door and a perforated or no front door.
Rear Door styles: single solid, single perforated, double perforated
Latch/lock styles: single-point or two-point; slam or cam latch with a keyed, combination and keyed or electronic lock
*The rear door will have the same latch style as the front door unless the rear door is a double rear door or is part of the standalone electronic lock. The double rear door **must** have a two-point cam latch, but will have the same type of lock as the front door. The two-point latch is cam only. The electronic lock **cannot** be used with a double rear door.*

Use the alternate copy below for double doors.

[Rear Door] The cabinet shall include a double perforated metal rear door with a swing handle. The doors shall be removeable. The doors shall open to 175° when the cabinet is bayed with other cabinets. The double rear door shall have a two-point cam latch with a keyed lock.

Use the alternate copy below for doors with the electronic lock.

[Rear Door] The cabinet shall include a single perforated metal rear door with a swing handle. The door shall be removable and reversible to open from the right or left. The door shall open to 175° when the cabinet is bayed with other cabinets. The rear door shall have a single-point cam latch with an electronic lock. The rear door shall be opened by entering a code on a keypad on the front door.

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 and door frames shall be manufactured from steel and aluminum. The top panel and side panels shall be manufactured from steel. Door panels shall be steel or Lexan. The door handle, side panel latches, rear door hinges and top panel cable access ports shall be plastic. The cabinet frame and front door shall be welded and bolted. The rear door shall be welded. Cabinet components shall assemble with hardware.

9. [Grounding/Bonding] The mounting rails, top panel, side panels and doors shall be electrically bonded to the cabinet frame. The cabinet frame shall have a prepared location for attaching a grounding lug.

10. [Certifications] The cabinet shall be UL Listed as an Information Technology and Communications Equipment Cabinet, Enclosure and Rack System to standard UL 60950 under category NWIN. UL Listing will be stated in the manufacturer's product literature.

11. [Color/Finish] The metal components of the cabinet frame, top panel, side panels, and doors shall be painted black with epoxy-polyester hybrid powder coat paint. The mounting rails shall be zinc-plated and silver-colored. Plastic components shall be black. The Lexan door panel shall be tinted (not clear).

    Choose the cabinet color: black, signature blue, glacier white, steel gray
    Strike the highlighted sentence if the cabinet does not include a plexiglass or perforated door.

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

13. Design Make shall be:
    Chatsworth Products, Inc. (CPI),
    F-Series TeraFrame™ Cabinet System:

    Part Number **FF1L-112A-C42**, TeraFrame Cabinet, 23.6" (600 mm) wide x 45.1" (1147 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Server Top Panel, Two Solid Side Panels, Single Perforated Metal Front Door, Single Perforated Metal Rear Door, Slam Latch, Keyed Locks, Black.
    Part Number **FF2L-112A-C42**, TeraFrame Cabinet, 27.6" (700 mm) wide x 45.1" (1147 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Server Top Panel, Two Solid Side Panels, Single Perforated Metal Front Door, Single Perforated Metal Rear Door, Slam Latch, Keyed Locks, Black.

Part Number **FF3L-112A-C22**, TeraFrame Cabinet, 31.5" (800 mm) wide x 45.1" (1147 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Network Top Panel, Two Solid Side Panels, Single Perforated Metal Front Door, Single Perforated Metal Rear Door, Slam Latch, Keyed Locks, Black.

For the following part numbers, change depth in 2.1.A.2. to 51.0" (1297 mm) and rail-to-rail spacing in 2.1.A.3. to 44.3" (1126 mm). The following part numbers include a Vertical Exhaust Duct.

Part Number **FF1U-111A-C62**, TeraFrame Cabinet, 23.6" (600 mm) wide x 51.0" (1297 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Server Top Panel and 34"-60" (863 mm – 1523 mm) high Vertical Exhaust Duct, Two Solid Side Panels, Single Perforated Metal Front Door, Single Solid Metal Rear Door, Slam Latch, Keyed Locks, Black.

Part Number **FF2U-111A-C62**, TeraFrame Cabinet, 27.6" (700 mm) wide x 51.0" (1297 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Server Top Panel and 34"-60" (863 mm – 1523 mm) high Vertical Exhaust Duct, Two Solid Side Panels, Single Perforated Metal Front Door, Single Solid Metal Rear Door, Slam Latch, Keyed Locks, Black.

Part Number **FF3U-111A-C62**, TeraFrame Cabinet, 31.5" (800 mm) wide x 51.0" (1297 mm) deep x 83.5" (2121 mm) high frame, 19" EIA x 45 RMU, Square-Punched Equipment Mounting Rails, Server Top Panel and 34"-60" (863 mm – 1523 mm) high Vertical Exhaust Duct, Two Solid Side Panels, Single Perforated Metal Front Door, Single Solid Metal Rear Door, Slam Latch, Keyed Locks, Black.

The listed part numbers are examples of 600 mm, 700 mm and 800 mm cabinet descriptions. Select one cabinet description. Change variables to match cabinet requirements. Use the TeraFrame DataSheets or the CPI Product Configurator to choose your TeraFrame 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 (F-Series TeraFrame™ 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 equipment mounting rail in the cabinet. The vertical cable manager shall be a U-shaped trough with cable access ports along the rear of the manager to allow cables to exit the manager behind the equipment mounting rails.The vertical cable manager shall have cable openings along the side that align with each RMU space on the mounting rail. The openings shall be sized to allow 24 patch cords to enter each RMU space. The cable openings shall be separated by plastic T-shaped cable guides to route cables into each RMU space.

*Choose the number of Vertical Cable Managers to include in each cabinet and list the correct Vertical Cable Manager Part Number in 2.1.B.5 below. Vertical Cable Managers **must** match the width and height of the cabinet frame. 700 mm and 800 mm wide cabinets offer a choice of standard or extended finger cable managers (two depths). Each TeraFrame cabinet can support up to four vertical cable managers - one per mounting rail. The typical configuration is one cable manager in server cabinets at the rear of the cabinet or two or four cable managers in network or cabling cabinets.*

Vertical Cable Managers require a rail setback (a reduction in rail-to-rail depth or the overall equipment mounting depth (see 2.1.A.3 above) of 4.5" (115 mm) for standard fingers and 7" (178 mm) for extended fingers. If Vertical Cable Managers are used on the front and rear

mounting rails, there will be a rail setback at the front and the rear of the cabinet.

Omit 2.1.B.1 and the Vertical Cable Manager Part Number if it is not used.

2. [Front-to-Back Cable Managers – this option is **only** available for 700 mm and 800 mm wide cabinets.] Each installed cabinet shall be equipped with two horizontal U-shaped cable trays that shall connect the vertical cable managers at the front and rear of the cabinet. The trays shall be located along the side of the cabinet frame in between the front and rear vertical cable managers positioned near the top and middle of the cable managers. The trays shall be designed to adjust in depth to match the depths of the front and rear vertical cable managers.

   *Choose the number of Front-to-Back Cable Managers to include in each cabinet and list the correct Front-to-Back Cable Manager Part Number in 2.1.B.5 below. Front-to-Back Cable Managers **must** match the width and rail-to-rail depth of the cabinet. Front-to-Back Cable Managers attach to Vertical Cable Managers in 700 mm wide and 800 mm wide cabinets. To use a Front-to-Back Cable Manager, there must be a Vertical Cable Manager attached to the front and the rear mounting rail on the same side of the cabinet. Front-to-Back Cable Managers are usually used in network cabling cabinets when four Vertical Cable Managers are used in the cabinet – one cable manager per mounting rail. Front-to-Back Cable Managers are sold in pairs. TeraFrame can support up to four Front-to-Back Cable Managers - two pairs per side (four managers per side).*

   Omit 2.1.B.2 and the Front-to-Back Cable Managers listed under Item 2.1.B.5 when using a 23.6" (600 mm) wide F-Series TeraFrame cabinet or if not used.

3. [Vertical Cable Ring Manager] Each installed cabinet shall be equipped with a vertical cable ring manager to organize network cables. The vertical cable ring manager shall attach to the side of the equipment mounting rail in the cabinet. The vertical cable ring manager shall be a pair of brackets each with several plastic D-rings for securing cables.

   *Vertical Cable Ring Managers are an alternative to Vertical Cable Managers for applications with fewer cables. Choose the number of Vertical Cable Ring Managers to include in each cabinet and list the correct Vertical Cable Ring Manager Part Number in 2.1.B.5 below. Vertical Cable Ring Managers are available with small or large cable rings and **must** match the height of the cabinet frame. Large rings can only be used in 700 mm and 800 mm wide cabinets. Each F-Series TeraFrame cabinet can support up to four Vertical Cable Ring Managers - one per mounting rail.*

   Vertical Cable Ring Managers require a rail setback (a reduction in rail-to-rail depth or the overall equipment mounting depth (see 2.1.A.3 above) of 4.8" (122 mm) for small rings and 7.3" (185 mm) for large rings. If Vertical Cable Ring Managers are used on the front and rear mounting rails, there will be a rail setback at the front and the rear of the cabinet.

   Omit 2.1.B.3 and the Vertical Cable Ring Manager Part Number if it is not used.

4. [Cable Lashing Bracket] Each installed cabinet shall be equipped with a cable lashing bracket to organize network cables. The cable lashing bracket shall include three vertical columns of attachment points for securing cable bundles with Velcro straps or tie-wraps, shall attach to the side of the cabinet frame and shall adjust in depth front-to-rear independent of the equipment mounting rails.

   *Cable Lashing Bracket is an alternative to Vertical Cable Managers for applications with fewer cables.Cable Lashing Bracket will secure more cables than a Veritcal Cable Ring Manager. Choose the number of Cable Lashing Brackets to include in each cabinet and list the correct Part Number in 2.1.B.5 below. Cable Lashing Brackets **must** match the height of the cabinet frame.*

   Cable Lashing Bracket requires a rail setback (a reduction in rail-to-rail depth or the overall equipment mounting depth (see 2.1.A.3 above) of 5" (127 mm). If Cable Lashing Brackets are

used at the front and rear of the cabinet, there will be a rail setback at the front and the rear of the cabinet.

Omit 2.1.B.4. and the Cable Lashing Bracket Part Number if it is not used.

5. [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 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 Internal Air Duct to provide a front-to-rear pathway for cables.

   Omit 2.1.B.3 and the Rack-Mount Cable Shelf Part Number if it is not used.

6. [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 24 patch cords per RMU.

   Omit 2.1.B.4 and the Universal Horizontal Cable Manager Part Number if it is not used.

7. [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 they enter the tray from below. The jumper tray shall be at least 3.5" (89 mm) deep and will hold 48 patch cords.

8. Design Make shall be:
   Chatsworth Products, Inc. (CPI),
   F-Series TeraFrame™ Cabinet System,
   Cable Management Accessories:

   Part Number **34421-C01**, Vertical Cable Manager, Standard Fingers, for 23.6" (600 mm) wide x 45 RMU TeraFrame Cabinet, 1.9" Wide x 10.5" Deep (48 mm Wide x 267 mm Deep), Black.
   Part Number **35090-C05**, Vertical Cable Manager, Standard Fingers, for 27.6" (700 mm) wide x 45 RMU TeraFrame Cabinet, 3.1" Wide x 11.6" Deep (79 mm Wide x 295 mm Deep), Black.
   Part Number **35102-C05**, Vertical Cable Manager, Extended Fingers, for 27.6" (700 mm) wide x 45 RMU TeraFrame Cabinet, 3.1" Wide x 14.1" Deep (79 mm Wide x 358 mm Deep), Black.
   Part Number **35095-C05**, Vertical Cable Manager, Standard Fingers, for 31.5" (800 mm) wide x 45 RMU TeraFrame Cabinet, 5.0" Wide x

11.6” Deep (127 mm Wide x 295 mm Deep), Black.
Part Number **35103-C05**, Vertical Cable Manager, Extended Fingers, for 31.5” (800 mm) wide x 45 RMU TeraFrame Cabinet, 5.0” Wide x 14.1” Deep (127 mm Wide x 358 mm Deep), Black.
Other sizes are available. Match the width and height of the cabinet.

Part Number **35106-C01**, Front-to-Back Cable Manager, for 27.6” (700 mm) wide TeraFrame Cabinet, 2.4” Wide x 2.5” High (61 mm Wide x 64 mm High), Extends 10” (250 mm) to 17” (430 mm), Black.
Use with rails spaced 26” (660 mm) to 33” (840 mm) apart.
Part Number **35106-C02**, Front-to-Back Cable Manager, for 27.6” (700 mm) wide TeraFrame Cabinet, 2.4” Wide x 2.5” High (61 mm Wide x 64 mm Deep), Extends 6” (150 mm) to 10” (250 mm), Black.
Use with rails spaced 22” (560 mm) to 26” (660 mm) apart.
Part Number **35108-C01**, Front-to-Back Cable Manager, for 31.5” (800 mm) wide TeraFrame Cabinet, 4.0” Wide x 4.0” High (102 mm Wide x 102 mm Deep), Extends 10” (250 mm) to 17” (430 mm), Black.
Use with rails spaced 26” (660 mm) to 33” (840 mm) apart.
Part Number **35108-C02**, Front-to-Back Cable Manager, for 31.5” (800 mm) wide TeraFrame Cabinet, 4.0” Wide x 4.0” High (102 mm Wide x 102 mm Deep), Extends 6” (150 mm) to 10” (250 mm), Black.
Use with rails spaced 22” (560 mm) to 26” (660 mm) apart.

Part Number **35100-C05**, Vertical Cable Ring Manager with Small Rings, for 45 RMU F-Series TeraFrame Cabinet, 1.5” (38 mm) Wide x 4.2” (107 mm) Deep Rings, Black.
Part Number **35101-C05**, Vertical Cable Ring Manager with Large Rings, for 45 RMU F-Series TeraFrame Cabinet, 3.3” (83 mm) Wide x 6.8” (173 mm) Deep Rings, Black
Other sizes are available. Large Rings can only be used in 27.6” (700 mm) or 31.5” (800 mm) wide cabinets. Match the height of the cabinet.

Part Number **35087-C05**, Cable Lashing Bracket, for 45 RMU F-Series TeraFrame Cabinet, Black.
Other sizes are available. Match the height 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.

Double-Sided 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. Fiber Management (F-Series TeraFrame™ Cabinet)

1. [Fiber Module Bracket] Each installed cabinet that supports SAN fiber connectivity for rack-mount servers and data storage equipment shall be equipped with a fiber module bracket to support Corning Cable Systems CCH modules and organize jumper patch cords at the rear of the cabinet in the zero RMU space along the side of the cabinet. Each fiber module bracket shall attach to the top and bottom of the cabinet frame (on either side of the cabinet) behind the equipment mounting rails and shall be adjustable front-to-rear along the side of the cabinet. The fiber module bracket shall be an S-shaped bracket with multiple mounting locations for Corning Cable Systems Plug and Play CCH Modules, a trough for organizing jumper patch cords and tie points for securing jumper and fiber optic trunk cables.

   See the Fiber Management Data Sheet. Omit 2.1.C.1 and the Fiber Module Bracket part numbers if it is not used.

2. [Vertical Furcation Bracket] Each installed cabinet that supports SAN fiber connectivity for rack-mount servers and data storage equipment shall be equipped with a vertical furcation bracket to secure fiber trunk cables. Each vertical furcation bracket shall attach to the top and bottom of the cabinet frame (on either side of the cabinet) in between the equipment mounting rails and shall be adjustable front-to-rear along the side of the cabinet. The vertical furcation bracket shall be punched with a hole pattern that allows furcation plugs on Corning Cable Systems Plug & Play optical fiber trunk cables to snap onto the bracket in a vertical or horizontal orientation. Multiple attachment points will allow cables to be positioned to align with RMU spaces in the cabinet.

   See the Fiber Management Data Sheet. Omit 2.1.C.2 and the Vertical Furcation Bracket part numbers if it is not used.

3. [Horizontal Furcation Bracket] Each installed cabinet that supports SAN fiber connectivity for rack-mount servers and data storage equipment shall be equipped with a horizontal furcation bracket to secure fiber trunk cables. Each horizontal furcation bracket shall attach to the outside of the equipment mounting rails in the zero RMU space between rack-mount equipment and the cabinet's side panel and shall be adjustable top-to-bottom along the side of the cabinet. The horizontal furcation bracket shall be punched with a hole pattern that allows furcation plugs on Corning Cable Systems Plug & Play optical fiber trunk cables to snap onto the bracket in a vertical or horizontal orientation. Multiple attachment points allow cables to be positioned at various depths along the side of the cabinet.

   See the Fiber Management Data Sheet. Omit 2.1.C.6 and the Horizontal Furcation Bracket part numbers if it is not used.

4. Design Make shall be:
   Chatsworth Products, Inc. (CPI),
   F-Series TeraFrame™ Cabinet System,

Fiber Management Accessories:

Part Number **34718-C05**, Fiber Module Bracket, supports 9 CCH modules, for 45 RMU F-Series TeraFrame Cabinet, Black.
Other sizes are available. Match the height of the cabinet.

Part Number **34707-C05**, Vertical Furcation Bracket, for 45 RMU N-Series TeraFrame Network Cabinet, Black.
Other sizes are available. Match the height of the cabinet.

Part Number **34708-C08**, Horizontal Furcation Bracket, 28.3" (718 mm) long, Black.
Other sizes are available. Select length to match the cabinet's mounting rail depth.

D. Power Management (F-Series TeraFrame™ Cabinet System)

1. [Vertical Power Strip/Cord Manager] Each installed cabinet shall be equipped with a vertical power strip and cord manager to store power strips and power cord slack. The vertical power manager shall attach to the side of the cabinet frame and shall include mounting points for two power strips. The mounting points shall orient power strips so that the outlets on the power strips face the center of the cabinet frame.

   *Vertical Power Strip/Cord Managers support CPI Power Strips For Cabinets P/Ns 128XX-XXX, 131XX-XXX and 132XX-XXX. P/Ns 356XX-XXX and 358XX-XXX include mounting brackets or can be supported on the Power Strip Lashing Bracket listed in 2.1.D.3. Choose the number of power strips (one, two or four) to include in the cabinet and list the correct Power Cord/Strip Manager Part Number in 2.1.C.5 below. The Power Strip/Cord Manager **must** match the height of the cabinet frame. The Power Strip/Cord Manager is usually used at the rear of a Server Cabinet. A mounting rail setback is required.*

   There are four styles of Power Strip/Cord Managers to choose from: Narrow Vertical Power Cord Manager supports one power strip and requires a 6" (152 mm) rail setback; Wide Vertical Power Cord Manager supports two power strips and requires an 11" (279 mm) rail setback, Dual Vertical Power Strip Manager supports two power strips and requires a 6.3" (160 mm) rail setback, Quad Vertical Power Strip Manager supports four power strips and requires an 8.7" (221 mm) rail setback.

   Omit item 2.1.D. if no power strips are included in the cabinet.

2. [Power Strip] Each installed cabinet shall be equipped with two single-phase, single-inlet, 20-outlet vertical power strips rated for 125/250 Vac and 16 A. The power strips shall have a built-in current meter with digital display, one IEC-320 C-20 power inlet and (20) IEC-320 C-13 power outlets, no circuit breakers and no surge protection. The installer will provide a power cord that matches connection requirements.
   Other power strips are available. Change the description and part number to match the facility requirements.

3. [Power Strip Lashing Bracket] Each installed cabinet shall be equipped with a vertical PDU and power cord manager to store PDUs and power cord slack. The vertical power manager shall attach to the side of the cabinet frame and shall include mounting points for two PDUs. The mounting points shall orient PDUs so that the outlets on the PDUs face the center of the cabinet frame.

   *Power Strip Lashing Bracket is an alternative to the Vertical Power Strip/Cord Managers listed under 2.1.D.1. Power Strip Lashing Brackets supports two 2.3" (58 mm) wide or one 3.5" (89 mm) wide CPI PDUs For Cabinets P/Ns 356XX-XXX and 358XX-XXX. Choose the number of PDUs (one or two) to include in the cabinet and list the correct Power Strip Lashing Bracket Part Number in 2.1.C.5 below. The Power Strip Lashing Bracket **must** match the height of the cabinet frame. The Power Strip Lashing Bracket is usually used at the rear of a Server Cabinet.*

A minimum 5" (127 mm) mounting rail setback is required, but an 8.5" (216 mm) mounting rail setback is recommended to allow easy access to bundled power cables.

4. [PDU] Each installed cabinet shall be equipped with two single-phase, single-inlet, 28-outlet vertical power distribution units (PDUs) rated for 250 Vac and 24 A. Each PDU shall have a 10'L (3.0 m) attached power cord with a NEMA L6-30P plug and two circuit segments with 12 IEC-320 C-13 power outlets and 2 IEC-320 C-19 power outlets each. Each circuit segment will have a circuit breaker and a built-in current meter with digital display. The PDU will have an Ethernet connection and individually metered and controlled outlets accessible through a Web browser or CPI SEMA software.
Other power strips/PDUs are available. Networked PDUs, with controlled and metered outlets are available. Change the description and part number to match the facility requirements.

5. Design Make shall be:
   Chatsworth Products, Inc. (CPI),
   F-Series TeraFrame™ Cabinet System,
   Power Managers and Vertical Power Strips:

   Part Number **34595-C05**, Dual Vertical Power Strip Manager, for 45 RMU TeraFrame Cabinet, 4.3" Wide x 1" Deep (110 mm Wide x 25 mm Deep), Black.

   Part Number **34596-C05**, Quad Vertical Power Strip Manager, for 45 RMU TeraFrame Cabinet, 8.4" Wide x 1.7" Deep (213 mm Wide x 43 mm Deep), Black.

   Part Number **34581-C45**, Narrow Vertical Power Cord Manager, for 45 RMU TeraFrame Cabinet, 2.5" Wide x 2.5" Deep (63 mm Wide x 63 mm Deep), Black.

   Part Number **34582-C45**, Wide Vertical Power Cord Manager, for 45 RMU TeraFrame Cabinet, 8" Wide x 2" Deep (203 mm Wide x 51 mm Deep), Black.

   Part Number **13179-771**, Single-Input Vertical Power Strip with Digital Current Meter, Single-Phase, 125/250 Vac~16 A, with (1) IEC-320 C20 inlet and (20) IEC-320 C13 Outlets.
   Use with Power Strip Mangers listed above. Order power cord separately to match plug to site requirements.

   Part Number **35086-C05**, Power Strip Lashing Bracket, for 45 RMU TeraFrame Cabinet, 8.375" Wide x 1.7" Deep (213 mm Wide x 42 mm Deep), Black.

   Part Number **35822-583**, Single-Input Vertical PDU, Single-Phase, 250 Vac~24 A, with (1) NEMA L6-30P Plug, (24) IEC-320 C13 Outlets and (4) IEC-320 C19 Outlets, with Circuit Breakers, Digital Current Meters, Network Connection, Controlled and Metered Outlets.
   Use with Power Strip Lashing Bracket listed above.

E. Thermal Management (F-Series TeraFrame™ 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. [Internal Air Duct – this option is **only** available for 600 mm and 700 mm wide cabinets. Cabinet frames must be at least 39.4" (1000 mm) deep] Each installed cabinet shall be equipped with internal air ducts that deliver additional cold air from the plenum below the raised access floor to the top half of the cabinet. The rectangular ducts shall be located at the front of the cabinet along both sides of the equipment mounting rails. Adjustable doors at the top of the ducts will guide cold air from the ducts towards the front of equipment. The ducts shall also block hot air re-circulation from the back of the cabinet to the front of the cabinet by sealing the space between the equipment mounting rails and the top, bottom and sides of the cabinet enclosure. The ducts shall be able to deliver a combined airflow of up to 210 CFM (356 CMH) when raised floor static pressure is .1" of water (.02 kPa) without the assistance or use of an attached blower or fan.

   Change Internal Air Duct airflow to match cabinet width.
   23.6" (600 mm) wide cabinets: 210 CFM at .1" of water (356 CMH at .02 kPa)
   27.6" (700 mm) wide cabinets: 510 CFM at .1" of water (865 CMH at .02 kPa)

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.

   *Choose either 2.1.D.1 or 2.1.D.2 and list the appropriate part numbers in 2.1.D.4 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 Managers cannot be placed on the front rails or at the front of the cabinet frame when Air Dam Kit or Internal Air Duct 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.3., Rack-Mount Cable Shelf).*

   Air Dam Kit or Internal Air Duct 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, Internal Air Duct 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.

   Use Air Dam Kit with perforated front and rear doors for cabinets in conventional hot aisle/cold aisle environments with low heat loads up to 4 kW. Also, use Air Dam Kit with perforated front door and solid rear door and the Vertical Exhaust Duct System top panel (2.1.A.4) for cabinets with high heat loads over 7 kW. (The Vertcal Exhaust Duct System attaches to a drop ceiling to isolate and remove hot air from the room.) Air Dam Kit requires a 1.7" (43 mm) front rail setback. Vertical Exhaust Duct System requires an 8.7" (221 mm) rear rail setback.

   Use Internal Air Duct with perforated front and rear doors in a conventional hot aisle/cold aisle environment with a raised floor cold air delivery system for cabinets with heat loads between 4 kW and 7 kW. Internal Air Duct delivers additional cold air to the top half of a cabinet. Internal Air Duct requires a 2.5" front rail setback.

4. [Bottom Panel] Each installed cabinet that is supported on leveling feet or casters (elevated above the floor) shall be equipped with a bottom panel to block airflow into and out of the base of the cabinet.

5. [Seal Kit] Each installed cabinet that is bayed to another cabinet without a side panel shall be equipped with a seal kit to block airflow out of the side of the cabinet frame.

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

   Part Number **34521-C05**, Air Dam Kit, for 23.6" (600 mm) wide x 45 RMU TeraFame Cabinet, Black.
   Part Number **34522-C05**, Air Dam Kit, for 27.6" (700 mm) wide x 45 RMU TeraFame Cabinet, Black.
   Part Number **34523-C05**, Air Dam Kit, for 31.5" (800 mm) wide x 45 RMU TeraFame Cabinet, Black.
   Other sizes are available. Match the height of the cabinet.

   Part Number **34470-C05**, Internal Air Duct, for 23.6" (600 mm) wide x 45 RMU TeraFame Cabinet, Black.
   Part Number **34470-C17**, Internal Air Duct, for 27.6" (700 mm) wide x 45 RMU TeraFame Cabinet, Black.
   Other sizes are available. Match the height of the cabinet.

   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

   Part Number **35085-C10**, Bottom Panel, for 23.6" (600 mm) wide x 45.1"D (1147 mm) TeraFame Cabinet, Black.
   Part Number **35085-C27**, Bottom Panel, for 27.6" (700 mm) wide x 45.1"D (1147 mm) TeraFame Cabinet, Black.
   Part Number **35085-C44**,Bottom Panel, for 31.5" (800 mm) wide x 45.1"D (1147 mm) TeraFame Cabinet, Black.
   Other sizes are available. Match the depth of the cabinet.

   Part Number **35081-000**, Seal Kit for TeraFrame Cabinets bayed with one or no side panel in between cabinets using the Zero Spacing Baying Kit (P/N 35078-001), Black
   Part Number **35081-001**, Seal Kit for 23.6" (600 mm) wide TeraFrame Cabinets bayed with one side panel in between the cabinets using the 24" (610 mm) Baying & Facia Kit (P/N 35080-XXX) or the 24" (610 mm) Baying Brackets (P/N 35079-X01), Black
   Part Number **35081-002**, Seal Kit for 23.6" (600 mm) wide TeraFrame Cabinets bayed with no side panels in between the cabinets using the 24" (610 mm) Baying & Facia Kit (P/N 35080-XXX) or the 24" (610 mm) Baying Brackets (P/N 35079-X01), Black
   Part Number **35081-003**, Seal Kit for TeraFrame Cabinets bayed with one or no side panel in between the cabinets using the Narrow Baying Brackets (P/N 35079-X02), Black

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

1. [Temperature Sensors] Each installed cabinet shall 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 temperatures. The temperature sensor shall have a digital display and shall take temperature readings in degrees Fahrenheit (Celsius).

Select the unit of measure: Fahrenheit or Celsius. 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 connection, 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 **60052-002**, 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.

G. Shelves (CPI F-Series TeraFrame 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. [LCD Panel and Keyboard] Each installed cabinet shall be equipped with a 19” EIA rack-mount, 1 RMU high keyboard, video and mouse (KVM) console with a 15” TFT LCD flat panel monitor, an integrated keyboard tray and a touch pad in a folding laptop-style design. The console shall have a single 15-pin DB-style connector and shall include a 6’L (1.8 m) cable that breaks out into (1) DB-15 video and (2) PS/2 mouse/keyboard connectors for a computer or KVM switch connecton.

4. [LCD Panel, Keyboard and KVM Switch] Each installed cabinet shall be equipped with a 19” EIA rack-mount, 1 RMU high combination LCD console and keyboard, video and mouse (KVM) switch that includes a 15” LCD panel with keyboard tray and touch pad, and a keyboard, video, mouse (KVM)

switch with connections for 8 or 16 computers. The LCD panel and keyboard tray will slide in and out of the rack and will fold closed like a laptop when in the closed position using only 1 RMU of space. The KVM switch shall be password protected and shall support one user or two users. Provide KVM signal cables for computer connections.
Select the number of computers (8 or 16) and number of users (one user or two users).

5. Design Make shall be:
   Chatsworth Products, Inc. (CPI),
   F-Series TeraFrame 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.

   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.

   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.

   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.

   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 mounting rails set 23" to 39" (580 mm to 990 mm) in depth.

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 mounting rails set 23” to 39” (580 mm to 990 mm) in depth.

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 mounting rails set 22” to 39” (560 mm to 990 mm) in depth.

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 mounting rails set 24” to 39” (610 mm to 990 mm) in depth. 2 RMU and 4 RMU shelves are also available.

Part Number **35920-001**, CenterView KVM Console, with 15” LCD Monitor, Keyboard and Touch Pad, 19” EIA wide x 1 RMU, Black.
Fits cabinets with rail depth set 24” to 36” (610 mm to 910 mm).

Part Number **35910-811**, CenterPoint KVM Switch/Console, with 1-user, 8-port KVM Switch, 15” LCD Monitor, Keyboard and Touch Pad, 19” EIA wide x 1RMU, Black.
Part Number **35910-161**, CenterPoint KVM Switch/Console, with 1-user, 16-port KVM Switch, 15” LCD Monitor, Keyboard and Touch Pad, 19” EIA wide x 1RMU, Black.
Part Number **35910-832**, CenterPoint KVM Switch/Console, with 2-user, 8-port KVM Switch, 15” LCD Monitor, Keyboard and Touch Pad, 19” EIA wide x 1RMU, Black.
Part Number **35910-162**, CenterPoint KVM Switch/Console, with 2-user, 16-port KVM Switch, 15” LCD Monitor, Keyboard and Touch Pad, 19” EIA wide x 1RMU, Black.
Part Number **35941-006**, KVM Signal Cable, PS/2, 6 ft (1.8 m) long
Part Number **35941-009**, KVM Signal Cable, PS/2, 9 ft (2.7 m) long
Part Number **35941-012**, KVM Signal Cable, PS/2, 12 ft (3.7 m) long
Part Number **35941-020**, KVM Signal Cable, PS/2, 20 ft (6.1 m) long
Part Number **35941-121**, Converter for KVM Signal Cable, PS/2-to-USB
Fits cabinets with rail depth set 24” to 36” (610 mm to 910 mm). Provide one KVM Signal Cable of appropriate length for each computer. Include one PS/2-to-USB Converter for KVM Signal Cable with each computer that has a USB keyboard and mouse connection instead of PS/2 connections.

H. Installation Hardware (F-Series TeraFrame™ 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" (75 mm) in height to the cabinet.

2. Provide clamps for securing the leveling feet on each cabinet to the floor.

3. Provide baying kits when cabinets connect together side-by-side to form multi-cabinet rows. Use a color-matched fascia in between 23.6" (600 mm) wide cabinets when the cabinets are centered over 24" wide raised access floor tiles.

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

5. Design Make shall be:
   Chatsworth Products, Inc. (CPI),
   F-Series TeraFrame™ Cabinet System:

   Part Number **35051-C01**, 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 **34587-001**, Floor Anchor Brackets, Set of 4, Brushed Aluminum.
   Use to attach cabinets with leveling feet to the floor.Order 1/4" floor installation hardware separately. A set of 4 Floor Anchor Brackets is included with each cabinet.

   Part Number **35078-001**, Zero Spacing Baying Kit, M6 Hardware, Zinc.
   Part Number **35079-C02**, Narrow Baying Brackets, Black
   Part Number **35080-C05**, 24" (610 mm) Baying & Fascia Kit, 45 RMU, Black.
   Zero Spacing Baying Kit includes four M6 screws/washers/nuts used to bay cabinets that are the same height and depth side by side with or without side panels. Include a Seal Kit (P/N 35081-001) when the side panel is omitted.
   Narrow Baying Brackets are two C-shaped brackets and installation hardware used to bay cabinets that are the same height side by side with or without side panels. If cabinets are different depths, include a side panel on the deeper cabinet and use a seal kit (P/N 35081-003) on the other cabinet.
   24" (610 mm) Baying & Fascia Kit is only used to bay and align two 23.6 in (600 mm) wide F-Series TeraFrame Cabinets over 24 in (610 mm) wide raised floor tiles. Include a Seal Kit (P/N 35081-001) when one side panel is omitted between cabinets. Include a Seal Kit (P/N 35081-002) when both side panels are omitted between cabinets.
   Baying/Spacer Kit must match cabinet height and color. Other sizes are available.

   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 (F-Series TeraFrame™ Cabinet System)

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

2. Install and adjust to position all accessories including vertical cable and power strip/cord managers, vertical power strips/PDUs, equipment-mounting rails, airflow baffles, bottom panel and the vertical exhaust duct 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 accessory baying kits according to the manufacturer's installation instructions. If side panels are omitted between bayed cabinets, seal kits will be used between cabinets.

5. Attach overhead ladder rack or cable tray to the ceiling, independent of the cabinet. Maintain a 3" (75 mm) minimum clearance between the top of the cabinet and the bottom of the ladder rack/cable tray. 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.