

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 T-Series SteelFrame Cabinet)

1. **[Cabinets]** Provide freestanding equipment cabinets to store computer, data storage, networking and security equipment in the data centers, computer rooms and equipment rooms. Each cabinet enclosure shall have a rectangular frame and removable 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 with welded frame construction. The sides of the frame shall have three aluminum 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 support 2000 lb (907.2 kg) of equipment.

The cabinet shall be 24" (610 mm) wide by 42.4" (1077 mm) deep by 78.0" (1981 mm) high when doors and side panels are installed. Leveler feet will add approximately 1" (25 mm) to the height of the frame/cabinet. Casters will add approximately 4.3" (72 mm) to the height of the frame/cabinet.

Change cabinet width, depth and height to match job requirements. Refer to the SteelFrame Cut Sheet or the CPI Product Configurator to see all SteelFrame options. Note that SteelFrame can be ordered with or without side panels. 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 Widths (both 19" EIA; T1 or T2): 24" (610 mm) or 27.3" (693 mm)

Cabinet Depths: 26" (660 mm), 33.4" (848 mm), 39.4" (1001 mm), 42.4" (1077 mm), or 47.4" (1204 mm); Maximum Rail Depth (2.1.A.3) changes when cabinet depth changes.

Frame Depths: 24" (610 mm), 31.4" (798 mm), 37.4" (950 mm), or 40.4" (1026 mm), or 45.4" (1153 mm); Maximum Rail Depth (2.1.A.3) changes when cabinet depth changes.

Cabinet Heights: 78.0" (1981 mm) [42 RMU] or 84.0" (2134 mm) [45 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 up to 39" (990 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 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): 23" (580 mm), 30" (760 mm), 36" (910 mm), 39" (990 mm), or 44" (1120 mm); cabinet depth (2.1.A.2) changes when maximum rail depth changes. Rail Style: square-punched (for computers) OR #12-24 threaded (for patch panels); Strike the highlighted sentence when threaded rails are used. RMU (Height): 42 RMU, or 45 RMU; cabinet height (2.1.A.2) changes when RMU changes.

4. [Top Panel] Choose one top panel [a., b., c., d., or e.] and make [4.]
- a. [Standard Cabinet, T1, 24"W (610 mm)] The cabinet shall include a solid top panel with a vented section at the center of the panel for an accessory top-mount fan and six round 2.7" (69 mm) diameter, grommet-protected cable access ports located in the corners of the panel (2 rear/1 front on each side). The top panel shall be part of the cabinet frame and shall not be removable.
 - b. [Standard Cabinet, T2, 27.3"W (693 mm)] The cabinet shall include a solid top panel with a vented section at the center of the panel for an accessory top-mount fan and six rectangular 3"W x 5.3"D (76 mm x 135 mm), edge-protected cable access ports along the sides of the panel (front/middle/rear on each side). The top panel shall be part of the cabinet frame and shall not be removable.
 - c. [Cabinet with Short Vertical Exhaust Duct] The cabinet shall include a solid top panel and a rectangular Vertical Exhaust Duct that is 20" (508 mm) high and extends up to 34" (863 mm) high. The top panel shall have a large rectangular open area located at the rear of the panel for airflow into the Vertical Exhaust Duct, four round 2.7" (69 mm) diameter grommet-protected cable access ports located in the front corners of the panel (2 on each side), one 3" x 11.5" (76 mm x 292 mm) brush-sealed cable access port located near the center of the top panel in front of the opening for the Vertical Exhaust Duct, and one set of attachment holes for 12" (300 mm) wide cable tray or ladder rack located at the front of the panel along both sides of the panel. The top panel shall be part of the cabinet frame and shall not be removable. The Vertical Exhaust Duct shall bolt to the top of the frame, shall allow infinite adjustment between 20" (508 mm) and 34" (863 mm) height, and shall include a flexible seal at the top to help prevent hot exhaust air from escaping the space between the duct and the drop ceiling. The cabinet shall also include a pre-installed airflow baffle (air dam kit) at the front of the cabinet to block airflow between the cabinet frame and the equipment mounting rails and a seal between the rear door and the frame to help prevent hot air from escaping around the rear door.
This top panel is only available for 39" (990 mm) and 44" (1120 mm) deep cabinets and must be used with a Perforated Front Door and a Solid Rear Door.
 - d. [Cabinet with Tall Vertical Exhaust Duct] The cabinet shall include a solid top panel and a rectangular Vertical Exhaust Duct that is 34" (863 mm) high and extends up to 60" (1523 mm) high. The top panel shall have a large rectangular open area located at the rear of the panel for airflow into the Vertical Exhaust Duct, four round 2.7" (69 mm) diameter

grommet-protected cable access ports located in the front corners of the panel (2 on each side), one 3" x 11.5" (76 mm x 292 mm) brush-sealed cable access port located near the center of the top panel in front of the opening for the Vertical Exhaust Duct, and one set of attachment holes for 12" (300 mm) wide cable tray or ladder rack located at the front of the panel along both sides of the panel. The top panel shall be part of the cabinet frame and shall not be removable. The Vertical Exhaust Duct shall bolt to the top of the frame, shall allow infinite adjustment between 34" (863 mm) and 60" (1523 mm) height, and shall include a flexible seal at the top to help prevent hot exhaust air from escaping the space between the duct and the drop ceiling. The cabinet shall also include a pre-installed airflow baffle (air dam kit) at the front of the cabinet to block airflow between the cabinet frame and the equipment mounting rails and a seal between the rear door and the frame to help prevent hot air from escaping around the rear door.

This top panel is only available for 39" (990 mm) and 44" (1120 mm) deep cabinets and must be used with a Perforated Front Door and a Solid Rear Door.

- e. **[Frame Only]** The cabinet will not include a top panel.

This top panel is only available for Frame Only versions of the cabinet. No doors or side panels are included with the Frame Only version of the cabinet.

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

Choose one or two side panels. Cabinets of the same height and depth can be bayed side-by-side with one side panel in between cabinets. 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 **curved perforated metal** front door with quick-release hinge pins. The primary door panel shall be constructed using a single perforated sheet (63% open) with a solid outer perimeter. The primary door panel shall be embossed with a 4.6" diameter concave feature along the entire vertical height and include a protruding logo badge. The door assembly shall include upper and lower metal caps that follow the curved contour of the primary door panel. The door shall be removable and reversible to open from the right or left. The front door shall have a swing handle with a single-point cam latch and a keyed lock.

Choose the Front Door style: curved perforated metal, solid plexiglass, or vented plexiglass. Strike the highlighted sentences when specifying any door other than the curved perforated metal door. Use the alternate (no door) copy below for a Frame Only cabinet.

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

7. **[Rear Door]** The cabinet shall include a single **perforated metal** rear door with quick-release hinge pins. The primary door panel shall be constructed using a single perforated sheet (63% open) with a solid outer perimeter. The door assembly shall include upper and lower metal caps that follow the contour of the primary door panel. The door shall be removable and reversible to open from the right or left. The rear door shall have a swing handle with a single-point latch and a keyed lock.

Choose the Rear Door style: perforated or solid. Strike the highlighted sentences when specifying any door other than the perforated metal rear door. Use the alternate (double door) copy below for double doors or no doors. Note that there are specific front/rear door combinations. Cabinets with Vertical Exhaust Ducts must use a curved perforated metal front

door and a single solid metal rear door. Refer to the product data sheet or CPI Product Configurator for options.

[Rear Door] The cabinet shall include a double perforated metal rear door with quick-release hinge pins. The doors shall be removable. The double rear door shall have a swing handle with a two-point latch and a keyed lock.

[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 steel. The rail supports in the frame shall be manufactured from aluminum. Door panels shall be steel or plexiglass. The door latch and door hinges shall be plastic. The cabinet frame shall be welded. The cabinet frame, mounting rail supports, doors and side panels shall assemble with hardware.
9. **[Color/Finish]** The cabinet frame, top panel, side panels, mounting rails and doors shall be painted black with epoxy-polyester hybrid powder coat paint. The Vertical Exhaust Duct shall be painted black. The mounting rail supports shall be anodized aluminum. 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 sentences if the cabinet does not include a Vertical Exhaust Duct or a plexiglass door.

10. **[Included Hardware]** The cabinet shall include (4) leveling feet and a baying kit. The manufacturer of the cabinet shall sell compatible casters and equipment mounting hardware as an accessory.

Each cabinet includes a baying kit. Cabinets can be bayed side-by-side with one side panel between the cabinets. Alternately, cabinets can be bayed without side panels between the cabinets. Bayed cabinets must be the same height and depth.

11. Design Make shall be:
Chatsworth Products, Inc. (CPI),
T-Series SteelFrame Cabinet:

Part Number **T1143-742**, MegaFrame Cabinet, 24" (610 mm) wide x 42.4" (1077 mm) deep x 78" (1981 mm) high, with a 19" EIA x 42 RMU x 39" (990 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 T-Series SteelFrame Cabinet description. Change variables to match job requirements. Use the SteelFrame Data Sheet or the CPI Product Configurator to choose your T-Series SteelFrame 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 T-Series SteelFrame Cabinet)

1. **[Vertical Cable Managers]** Each installed cabinet shall be equipped with one 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 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 height of the cabinet frame.*

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

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 24 patch cords per RMU.

Omit 2.1.B.3 and the Universal Horizontal 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),
T-Series SteelFrame Cabinet,
Cable Management Accessories:

Part Number **11809-701**, Narrow Vertical Cable Manager, for 78" H (1981 mm), **42 RMU** SteelFrame 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

(2134 mm), **45 RMU** SteelFrame Cabinet, 1.75" Wide x 4.13" Deep (44 mm Wide x 104 mm Deep), Black.

Use in 24" (610 mm) wide T1 SteelFrame Cabinets. Match the height (RMU) of the cabinet.

Part Number **12465-706**, Vertical Cable Manager, for 78" H (1981 mm), **42 RMU** SteelFrame Cabinet, 2.3" Wide x 5.5" Deep (58 mm Wide x 140 mm Deep), Black.

Part Number **12465-707**, Vertical Cable Manager, for 84" H (2134 mm), **45 RMU** SteelFrame Cabinet, 2.3" Wide x 5.5" Deep (58 mm Wide x 140 mm Deep), Black.

Use in 27.3" (693 mm) wide T2 SteelFrame Cabinets. 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 T-Series SteelFrame Cabinet**)

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.

An Air Dam Kit is included with each Cabinet that has a Vertical Exhaust Duct Top Panel.

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 three 100 CFM fans in a single housing that attaches to the cabinet top panel. The fan kit shall include a single attached 12' (3.7 m) long power cord. *Top-Mount Fan Kit cannot be used with cabinets that have a Vertical Exhaust Duct Top Panel.*
- 5.
6. **[Bottom Panel Kit]** Each installed cabinet shall be equipped with a bottom panel to block airflow through the bottom of the cabinet. The panel will have 3" x 11.5" (76 mm x 292 mm) brush-sealed cable access port located near the rear edge of the panel.
7. **[Airflow Director]** Each installed cabinet shall be equipped with a baffle that directs airflow from the bottom, rear of the cabinet towards the top of the cabinet. The baffle will be designed for tool-less mounting to the bottom of the cabinet frame.

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.7 below. Air Dam Kit (airflow baffles) or Air Diverter Kit **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.2., 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.

Cabinets that have a Vertical Exhaust Duct top panel include an Air Dam Kit and Rear Door Seal. These cabinets are configured for front-to-top airflow through the duct. Use Snap-In Filler Panels to seal all open RMU spaces in these cabinets. Use Airflow Director if equipment that uses front-to-rear airflow is placed near the bottom of the cabinet. Top-mount fans cannot be used in cabinets that include a duct.

Use Bottom Sealing Panel Kit on cabinets that are not directly attached to the floor (cabinets that are supported on leveling feet or casters) to block airflow into and out of the base of the cabinet.

Cables can enter the rear, center of the cabinet through a cable access port in the panel.

8. Design Make shall be:
Chatsworth Products, Inc. (CPI),
T-Series SteelFrame Cabinet,
Thermal Management Accessories:

Part Number **13338-710**, Air Dam Kit, for 19" EIA wide x 84"H (2134 mm), **45 RMU** SteelFame Cabinet, **Black**.

Part Number **13338-711**, Air Dam Kit, for 19" EIA wide x 78"H (1981 mm), **42 RMU** SteelFame Cabinet, **Black**.

Part Number **13339-710**, Air Diverter Kit, for 19" EIA wide x 84"H (2134 mm), **45 RMU** MegaFame Cabinet, **Black**.

Part Number **13339-711**, Air Diverter Kit, for 19" EIA wide x 78"H (1981 mm), **42 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 **12724-701**, Top-Mount Fan Kit, 115 VAC, NEMA 5-15P Plug, Black.

Part Number **12724-702**, 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.*

Part Number **14274-701**, Bottom Panel Kit, for T1 24"W (610 mm) x 44"D (1120 mm) SteelFrame Cabinet, **Black**.

Part Number **14274-702**, Bottom Panel Kit, for T2 27.3"W (693 mm) x 44"D (1120 mm) SteelFrame Cabinet, **Black**.

Part Number **14274-703**, Bottom Panel Kit, for T1 24"W (610 mm) x 39"D (990 mm) SteelFrame Cabinet, **Black**.

Part Number **14274-704**, Bottom Panel Kit, for T2 27.3"W (693 mm) x 39"D (990 mm) SteelFrame Cabinet, **Black**.

Part Number **14272-701**, Airflow Director, Tool-less, for T1 24"W (610 mm) SteelFrame Cabinet, Black.

Part Number **14272-702**, Airflow Director, Tool-less, for T2 27.3"W (693 mm) SteelFrame Cabinet, Black.

D. 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 continuous 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](#).

E. Shelves **(CPI T-Series SteelFrame Cabinet):**

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),
 T-Series SteelFrame Cabinet,
 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 23" (580 mm) Deep T-Series SteelFrame 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 23" (580 mm) Deep T-Series SteelFrame 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 T-Series SteelFrame 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 T-Series SteelFrame 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 mounting 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 T-Series SteelFrame 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 mounting 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 T-Series SteelFrame 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 23" (580 mm) Deep T-Series SteelFrame 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" (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 23" (580 mm) Deep T-Series SteelFrame 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 T-Series SteelFrame 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 T-Series SteelFrame 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 mounting rails set 28" to 40" (710 mm to 1020 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) or 39" (990 mm) Deep T-Series SteelFrame 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 mounting rails set 28" to 40" (710 mm to 1020 mm) in depth. Use in 19" EIA Wide x 36" (910 mm) or 39" (990 mm) Deep T-Series SteelFrame 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 mounting rails set 22" to 39" (560 mm to 990 mm) in depth. Use in 19" EIA Wide x 23" (580 mm), 30" (760 mm), 36" (910 mm) or 39" (990 mm) Deep T-Series SteelFrame 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 mounting rails set 24" to 39" (610 mm to 990 mm) in depth. Use in 19" Wide x 30" (760 mm), 36" (910 mm) or 39" (990 mm) Deep T-Series SteelFrame Cabinets. 2 RMU and 4 RMU shelves are also available.

F. Installation Hardware (CPI T-Series SteelFrame Cabinet)

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 4.28" (105 mm) in height to the cabinet.
2. Provide additional equipment mounting hardware to attach equipment to the equipment mounting rails in the cabinet.
3. Provide grounding and bonding kit that electrically bonds the side panels and doors to the cabinet frame and provides a ground terminal block for connecting the cabinet to the Telecommunications Ground.
4. Design Make shall be:
Chatsworth Products, Inc. (CPI),
T-Series SteelFrame Cabinet:

Part Number **14275-001**, Caster, Set of 4, Black.

Must be installed before equipment is installed in the cabinet. 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.

Part Number **12725-001**, Grounding Kit, for CPI T-Series SteelFrame Cabinet.

Must be installed before equipment is installed in the cabinet.

3.1 INSTALLATION

A. Free-standing Equipment Cabinets (CPI T-Series SteelFrame Cabinet)

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. When attached to the structural floor, the installer shall provide installation hardware.
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.

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 a bonding and grounding kit 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.