

# LANscape® EDGE™ Solutions Vertical Manager Compatibility and Selection for the Data Center

## Proper Selection of Vertical Managers for the EDGE Solution

### AEN143, Revision 1

This Application Engineering note provides information on the appropriate selection of vertical managers for your datacenter when using EDGE high density solution.

### EDGE Solution

Corning Optical Communications created a set of innovative products for the datacenter. EDGE Solutions consist of optical trunks, harnesses, modules, housings and jumpers, all enabled by reduced cable diameters and Corning® ClearCurve® optical fiber. These revolutionary solutions address the concerns of data center owners and operators, helping them increase revenue, reduce expenses and minimize risk.

Data centers are being tasked with managing more and more data, but data center real estate is not growing at the same rate. In order to handle growing applications in a finite amount of space, owners and operators are placing increasing importance on equipment density. LANscape® EDGE Solutions feature industry-leading density: 100 percent more density than current systems. The 4U housing can manage up to 576 fibers, while the 1U housing manages up to 144 fibers, to optimize your data center real estate. Modules are also significantly smaller, with four modules fitting into only one-third U of rack space. Sliding trays in the housing offer improved finger access to the connectors when compared to current high-density fixed panels. Corning® ClearCurve® optical fiber allows for a minimum bend radius of five times the cable outer diameter in EDGE Solutions trunk cables (compared to 10 times the OD in traditional trunks), and eight times the OD in interconnect cables. With an average of 30 percent smaller trunk cable diameters, and 50 percent smaller jumpers, more cables can be routed and stored in the same amount of space without interfering with initial installation or MACs. Extra slack can be coiled so it doesn't interfere with cable routing, and the cable can be more tightly routed around corners and bends. Since the EDGE solution offers a 100% density increase there are certain considerations that need to be taken into account when selecting a vertical manager.

### General Criteria for Equipment Frames compatible with EDGE

- EDGE chassis are compatible with Standard and Zone 4 rated 19-inch equipment frames
- EDGE Mounting brackets fit "Universal" and "Alternative" hole spacing per ANSI/EIA-310-D-1992 (See Figure 1) and reference: <http://www.server-racks.com/eia-310.html>
- "U" rack spacing based on 1.750-inches
- Panel Height (H) typically specified in Rack Units "U" where:

$$H = 1.750(U)_{-0.031}^{+0}$$

- For example:
  - For (1) EDGE-04U, “U” = 4 Rack Units and maximum panel height of chassis specified as:

$$H = 1.750(4) = 7.000^{+0}_{-.031}$$

$$H = 7.000 - .031$$

$$\text{PanelHeight}(H) = 6.969 - \text{inches}$$

- Figure 2: left to right dimensions on a standard 19-inch equipment frame per ANSI/EIA-310-D-1992

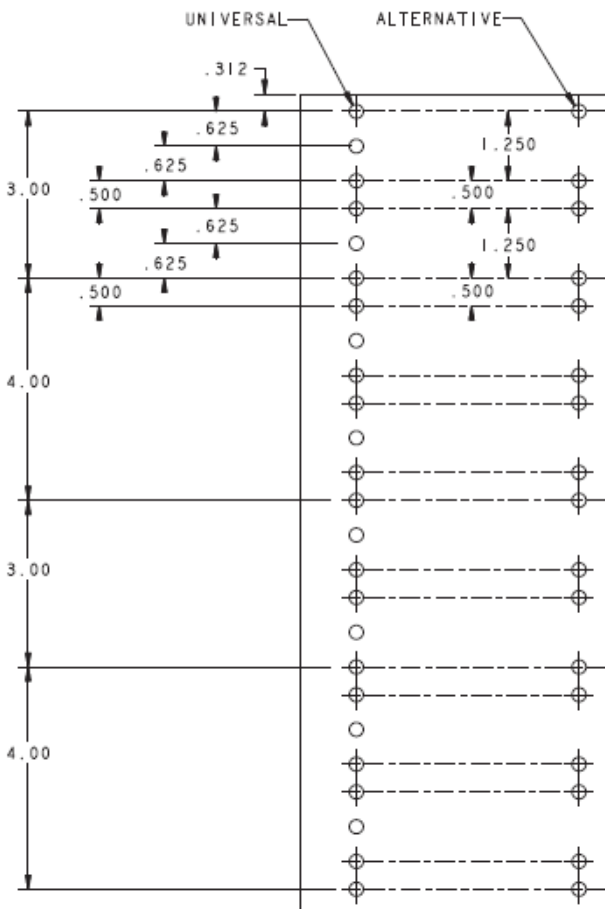


Figure 1

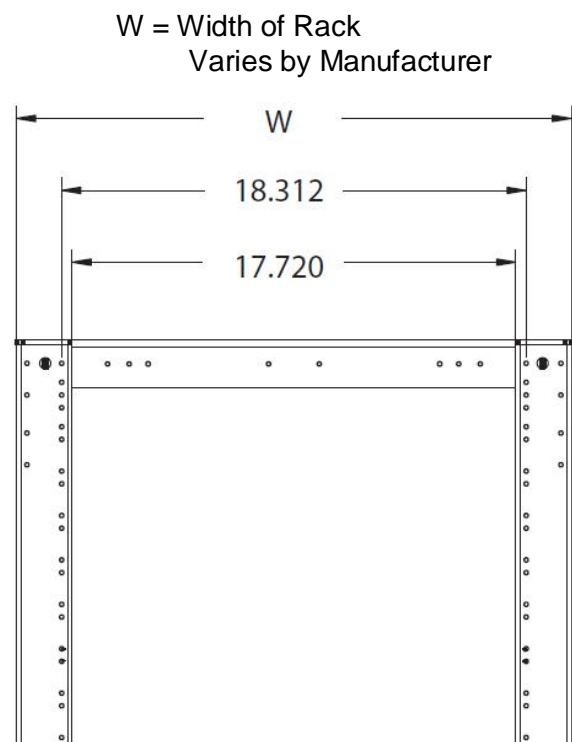


Figure 2

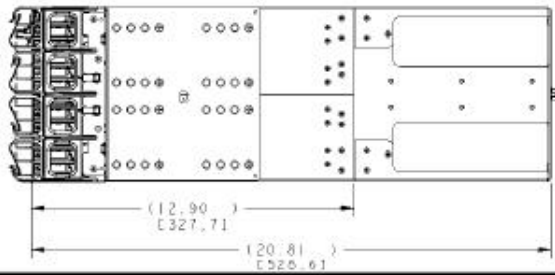
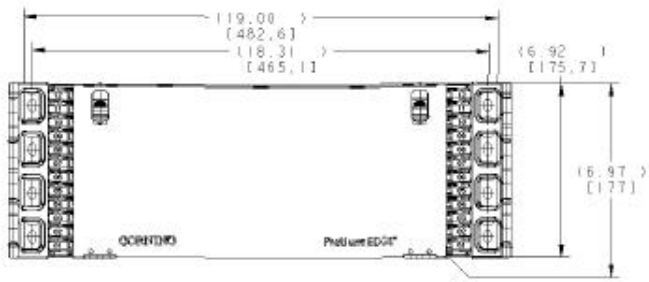
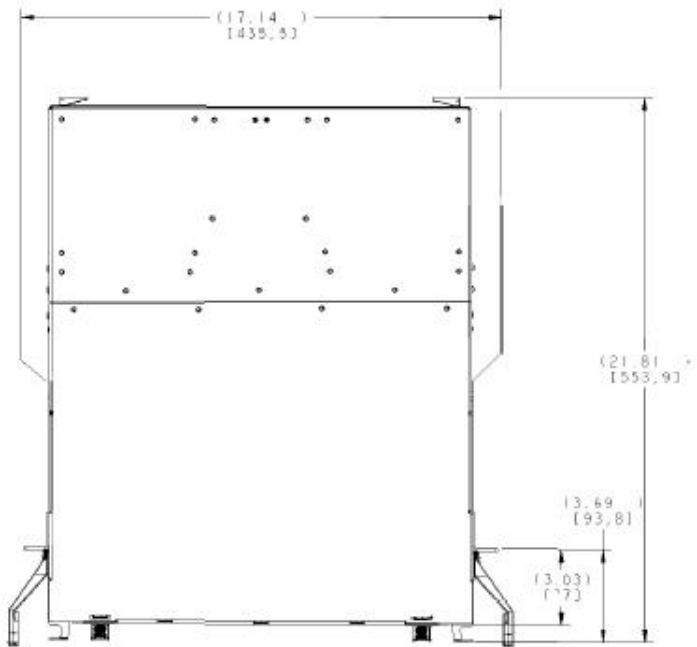
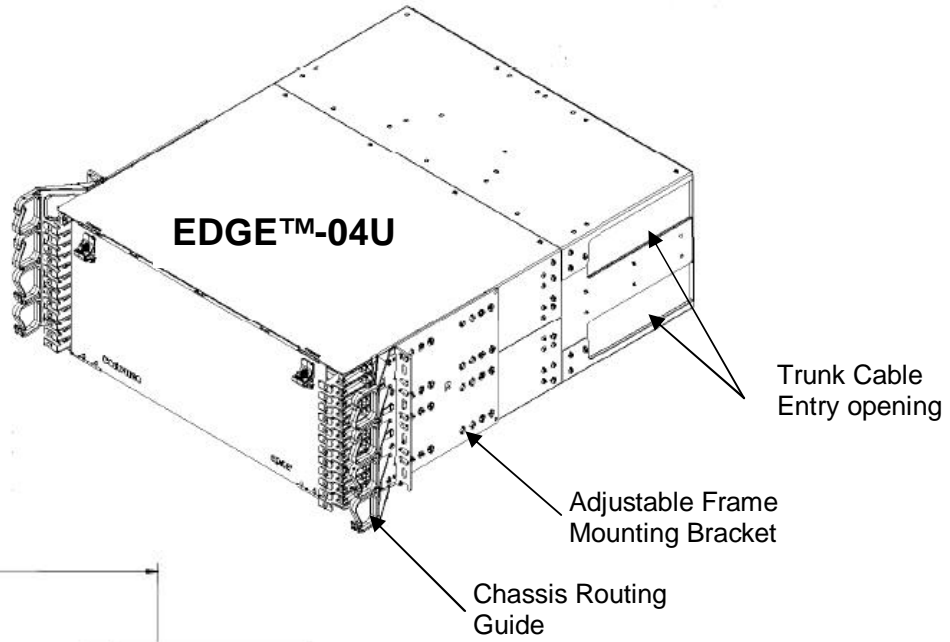
## General Criteria for Vertical Managers compatible with EDGE

NOTE(s): Dimensional layout of the EDGE-04U Chassis shown below  
Consider in the selection process for compatible vertical managers

- For High Density Solutions:
  - For front fiber management, systems employing 1,440 (2.0 mm) jumpers or more should use a vertical manager with a minimum 10-inch width and offer at least 60-inch<sup>2</sup> of area
    - (i.e. Vertical Manager that is at least 10 x 6 or 9 x 8 )
  - Fully populated systems employing 2,880 jumpers (10 chassis with 288-patch chords per chassis) may use 10-inch wide vertical managers but larger is recommended

NOTE: Vertical managers are typically shared between 2 frames in cross connect applications and 1,440 jumpers may transition from each frame into the vertical manager

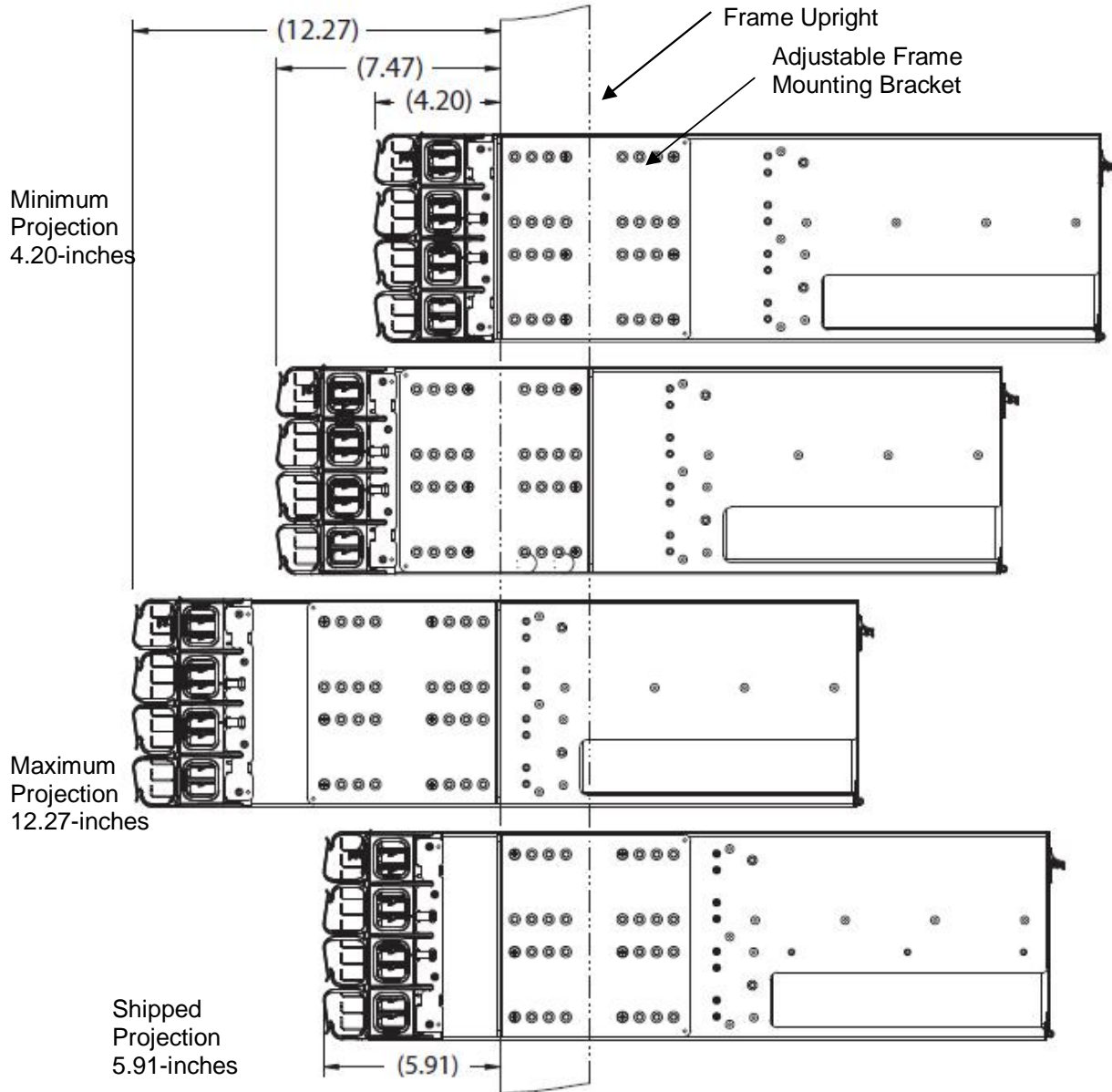
- For back fiber management and systems employing 10 chassis with (24) 24-f trunk cables and 240 cables total, 60-inch<sup>2</sup> of area minimum is required ( i.e. 10 x 6 )
- Vertical managers come in a variety of configurations:
  1. Cable management fingers on the front and back, or
  2. Gated (or, Buckle) on the front and back, or
  3. Cable management fingers on the front and gated on the back
- For Front Fiber management, Finger style vertical managers work best
- For Back Fiber management, Gated style vertical managers work best
  - Gate should not interfere with trunk cable entry on the rear of the chassis
  - If the Gate extends into the trunk cable entry of the chassis, some vertical managers offer gates that may be vertically repositioned within the channel to avoid interference
- Installation of the Chassis within the frame should begin at the proper “U” position such that exiting jumpers from the chassis routing guides are not obstructed (by Cable management fingers or gates) as they transition into the front channel of the vertical manager
- EDGE Chassis Routing Guides are based on a 1U pitch opening to align with cable management fingers of vertical managers for front fiber management
- Single and Double sided vertical managers are compatible
- Doors of Vertical Managers should hinge at top and bottom and not within the 7-foot span of the vertical manager...unless the hinge is located on the end of the cable management finger and extends beyond the front edge of the chassis routing guide
- Rear doors on vertical managers are typically not compatible and generally pose obstruction when transitioning cable from the vertical manager to the trunk cable entry location on the rear of the chassis
- For front fiber management with finger or gated style vertical managers, the front of the cable management finger or gate must extend to be even or beyond the front edge of the chassis routing guide with the front door of the vertical manager attached
- For cable management finger style vertical managers, minimum 6-inch fingers are recommended
- EDGE Chassis have Adjustable Frame Mounting Brackets for front to back placement of the chassis within the frame to assist in proper alignment of the chassis routing guide with respect to the front of the cable management finger or gate of the vertical manager
- For front fiber management, gated style vertical managers will always create an obstruction to jumpers passing from the chassis routing guide and into the channel of the vertical manager. This may be alleviated by positioning the chassis above or below the gate, thus sacrificing rack space for chassis's within the frame
- For back-side fiber management, finger style vertical managers work but must not interfere with trunk cable entry opening on the rear of the chassis. These are typically not as functional as gated style vertical managers.

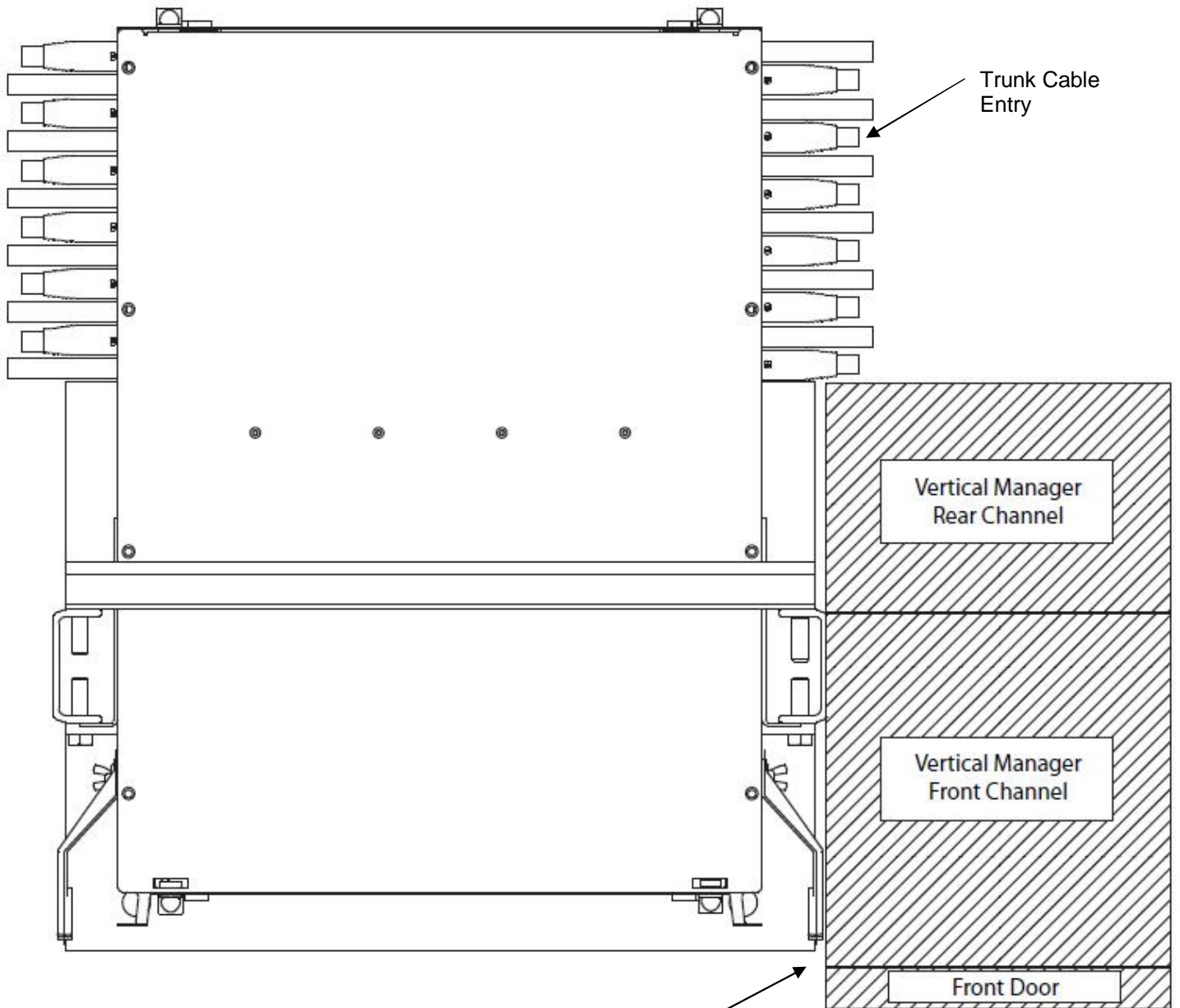


### Adjustable Frame Mounting Bracket

- Frame Mounting Bracket may be moved to 4 basic positions in .375-inch increments
- Bracket may be mounted to the front or back of the frame upright

- Bracket may be rotated 180-degrees and assembled to the chassis
- Adjustment promotes proper alignment front to back within the frame and vertical manager





Trunk Cable Entry

Vertical Manager Rear Channel

Vertical Manager Front Channel

Front Door

Cable Management Fingers of Gate should be even or extend beyond front edge of chassis routing guide with front door attached

Example of Vertical Manager Front: 10 W x 6 - 9 D (min)  
Back: 10 W x 6 D (min)

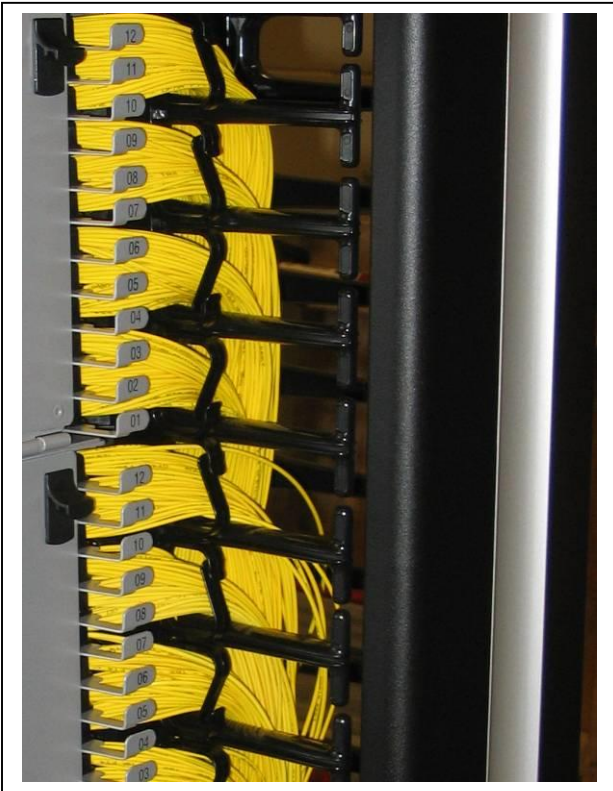
## Front Management

### Finger Style Vertical Managers

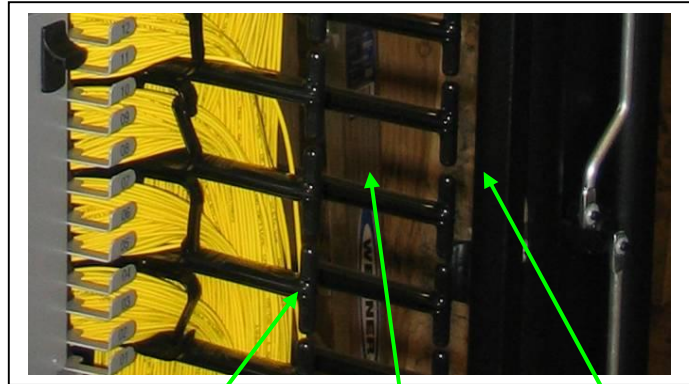
- Chassis routing guide opening vertically aligns with cable management fingers



- Cable management fingers must be even or extend beyond routing guide
- Front door of vertical manager must be even or extend beyond routing guide
- Front Door of Vertical Manager hinges within the 7-foot span of the frame but on the front of the cable management finger posing no obstruction to fiber entering the front channel
- Finger style vertical managers are most compatible and should have cable management fingers at least 6+ inches in length



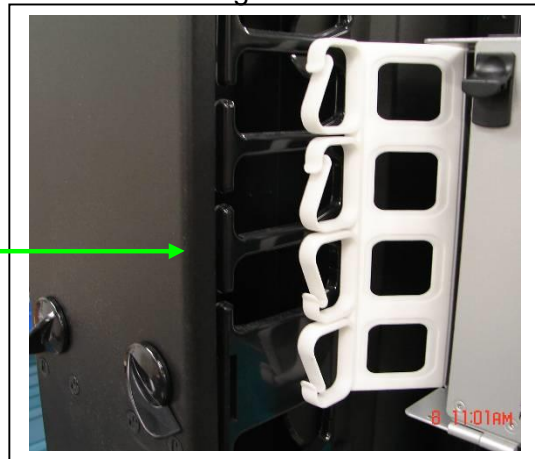
Jumper Transition to channel



Routing Guide      Cable Management Finger      Front Door

- Below, the Front Door of Vertical Manager hinges within the 7-foot span of the frame and on the front of the cable management finger but poses obstruction to jumpers exiting the chassis routing guide and into the vertical manager

Front Door Hinge on end of Cable Management Finger



## Gated style Vertical Managers

- Gate of vertical manager does not extend even or beyond the front of the Chassis Routing Guide
- Gate blocks clear passage of jumpers transitioning from the chassis routing guide to the vertical manager
- Pinch points or sharp edges may be introduced for fiber transitioning into the front channel
- IF:
  1. Gate extends even or beyond front edge of the Chassis Routing Guide and,
  2. Chassis is positioned above or below the gate so as not to block jumpers exiting the chassis routing guide
- THEN:

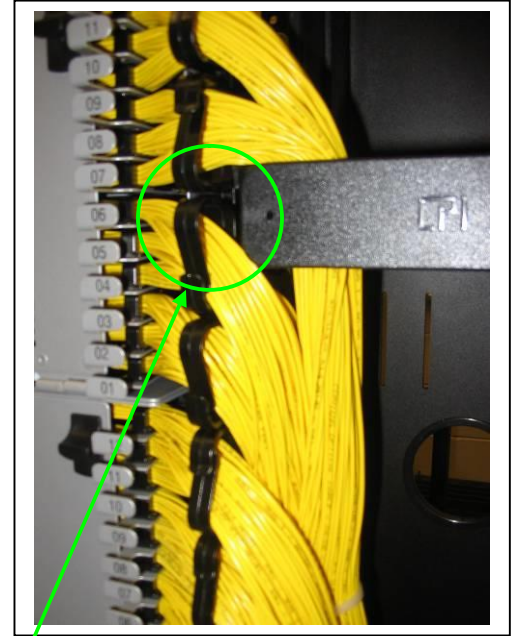
1. Gated style Vertical Manager are compatible
  2. User sacrifices rack space for chassis placement within the equipment frame
  3. Pinch points and sharp edges for fiber transitioning into the vertical manager should be eliminated
- Gated style vertical managers are conditionally compatible if:
    1. Not fully populating a frame, and
    2. Gate extends even or beyond front edge of the chassis routing guide, and
    3. Chassis is positioned above or below the gate



Gate



Pinch points and sharp edges



Gate located behind chassis routing guide  
Obstructed jumper transition

NOT SHOWN: Chassis should be located above or below gate

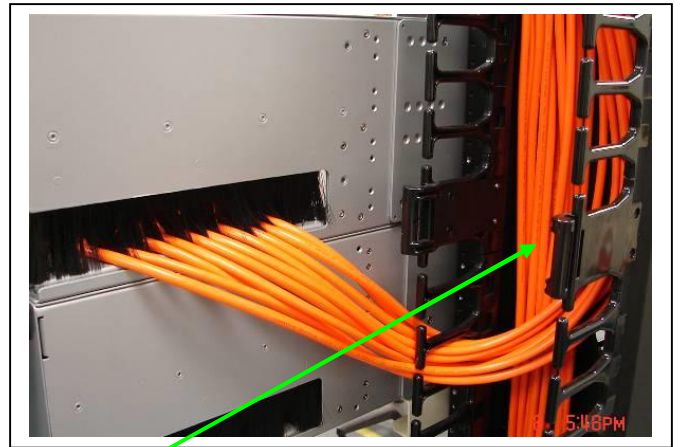
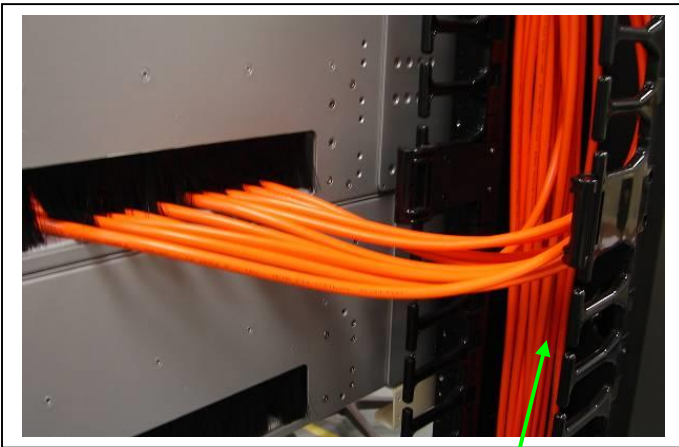
## Back Management

### Finger Style Vertical Managers

- Fingers of vertical manager do not protrude into trunk cable entry opening of the chassis
- Fingers may be used to tie and organize fiber within the channel
- Best practice and transition of exiting fiber is not through finger opening of the Vertical Manager
- IF: Using a rear door
- THEN: Fiber must exit through the vertical manager through a finger opening
- IF: Fingers extend into the rear cable entry opening of the chassis
- THEN:
  1. Fingers will obstruct trunk cable entry
  2. Fingers are most generally immovable and cannot be relocated to avoid blocking the rear cable entry of the chassis
- IF: Fingers extend to the back surface of the rear door of the chassis



- THEN: Fingers will impose obstruction to rear cable entry in vertical alignment

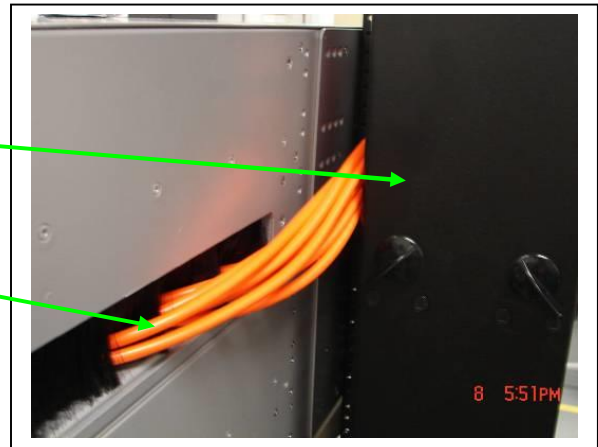


Cable Management Fingers

Rear Door Hinge

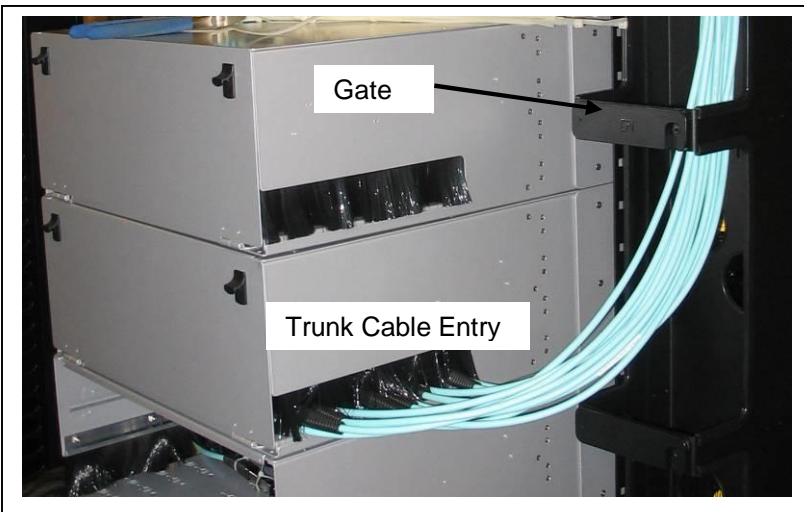
Trunk Cable Entry

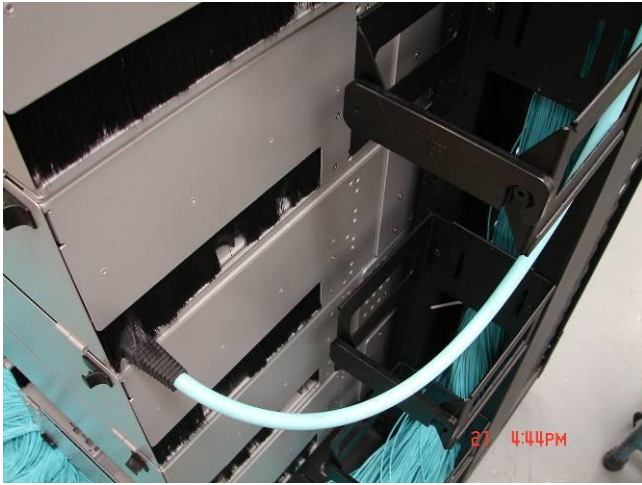
Rear Door



## Gated Style Vertical Managers

- Best configuration. Allows easy access and smooth transition of cable trunks
- IF: Gates protrude into the rear cable entry opening of the chassis
- THEN: Some systems allow for vertical relocation of the gate to avoid interference





Below and Far Right:

- 10 x 6 Gated style vertical manager
- (240) 24-f cables installed in 10 chassis
- Top view of vertical manager attached to a frame

