Installation Guide

Cage System Assembly

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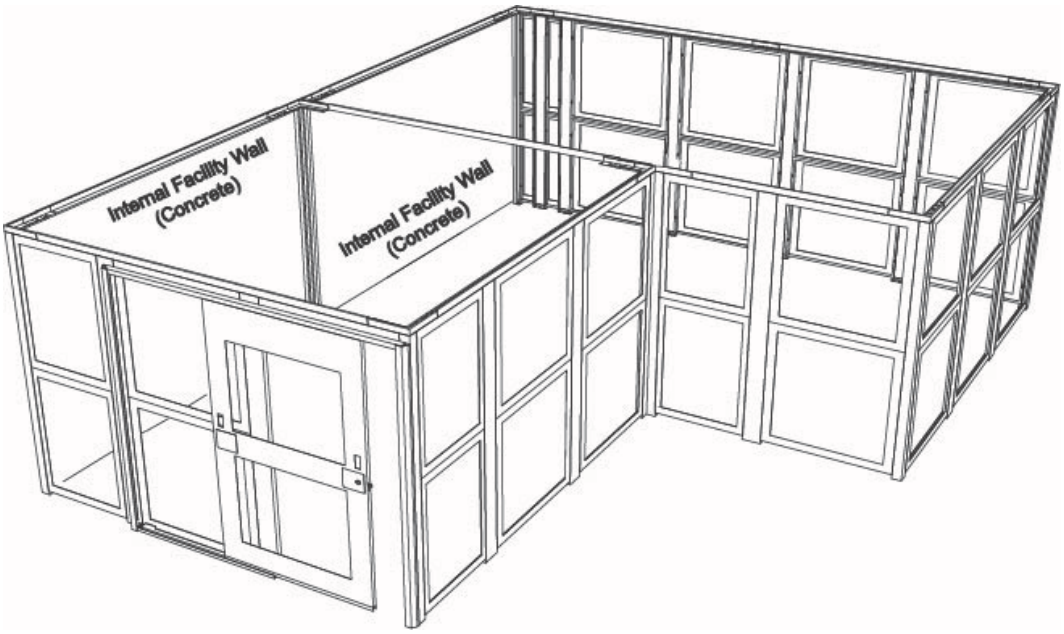

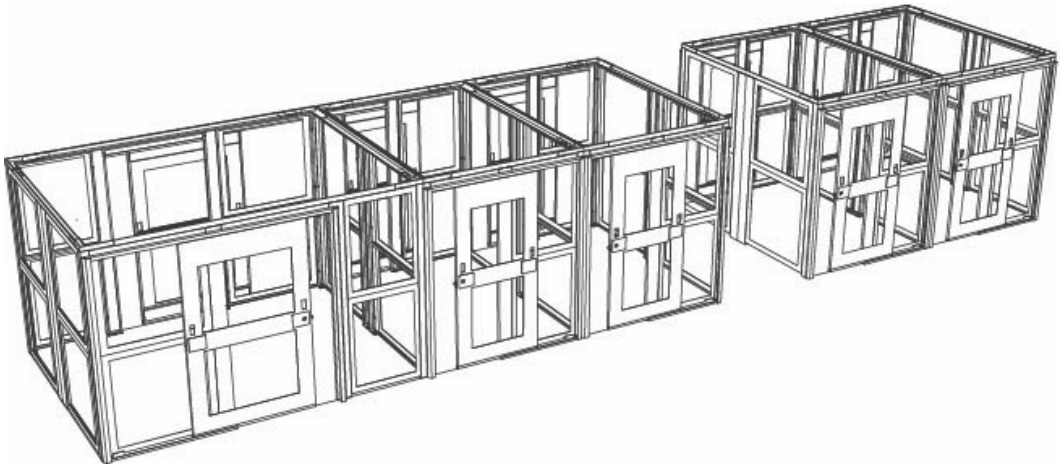

Powering Business Worldwide

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About this Guide

This document contains general and detailed information about Eaton's cage system product. As such, an overview of the cage system is provided followed by detailed descriptions and diagrams of each component available for constructing and installing an Eaton cage system. The last section of the document contains recommended installation steps.

Intended Audience

This document is intended primarily for personnel responsible for installing an Eaton cage system. In addition, the component descriptions contained within this document may also be useful for IT facility managers interested in purchasing a cage system, or for personnel responsible for ordering components to construct an Eaton cage system.

Technical Support

If you encounter any problems with this installation, send an email and detailed description of the problem as well as contact information to Technical Support at dc.support@eaton.com.

Sales Representative and Contact Information

Contact your Eaton Sales representative using one of the methods below:

Phone	Call us toll free at 800.225.7348 (US Only) or 508.852.4300
Mail	Eaton 160 Gold Star Boulevard Worcester, MA 01606
Email	InfoESWorcesterMA@Eaton.com
Web	Visit us at www.eaton.com/wrightline and click on "Contact Us." Simply complete and submit the form as directed on our website.

Before You Begin

Before installing an Eaton cage system, it is recommended that you familiarize yourself with the various cage system components described within this document. Some of the components look similar and you want to make sure you are installing the correct components for each section of the cage. Also, it would benefit installers to read and review the section titled, Installation Best Practices and Helpful Hints, found on page 4. In particular, pay attention to the topics covering anchoring hardware. For a recommended approach to installing an Eaton cage system, see Installation Steps (Recommended), on page 44.

Tools Required

The following tools are required to complete the installation of an Eaton cage system:

- A power wrench-drill with attached 3/8” socket. Used for tightening 1/4 – 20 x1/2” hex head self-threading screws (Part # 54348);
- A 5/32” Allen Key. Used for tightening 1/4 - 20 x1/2” button head screws with 1/4 -20 hex KepNut and star washer (Part# 82703);
- Metal cutting tool/saw with a metal cutting blade. Used for cutting top frame channel rails to customize channel rail lengths.
- #2 flat head screw driver and pliers used for punching out and removing slugs from knock-out holes.

Cage System Overview

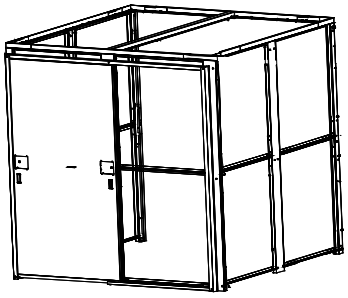
The Eaton cage system provides a solution for data center environments requiring high levels of security. This includes creating secure physical subdivisions to prevent unwanted access to IT and other sensitive equipment companies' house in colocation facilities.

This section provides an overview of the Eaton cage system.

Cage System Design

Eaton Cage System components are modular and scalable. As such, the cage system supports the following designs:

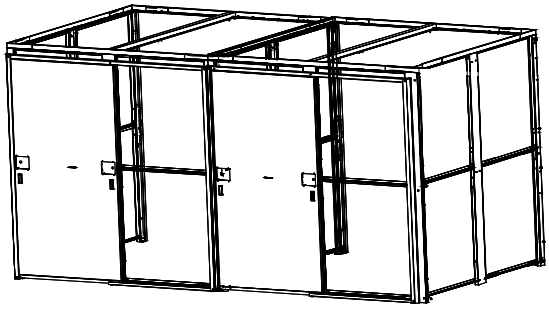
- Standard four sided stand-alone cage;
- Multiple stand-alone cages, cascaded together to create larger, four sided, stand-alone cages;
- Customized one, two, and three sided cage systems, anchored to one or more facility walls.



Standard Four Sided 8' x 8'
Stand-Alone Cage

Cage Composition

Eaton cage components are constructed entirely of steel ensuring structural integrity. In addition, cage wall panels are manufactured with 3/8" perforated holes, too small for fingers to fit into, making it very difficult to climb the cage walls to gain illegal access. Designed for security purposes, the small perforated holes are large enough to provide ample airflow in and out of the cage area.



Four Sided 16' x 16'
Two Stand-Alone Cages Side by Side

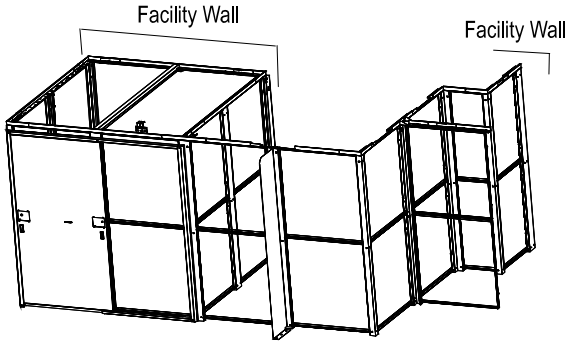
Modular Heights and Widths

Cage system designs support:

- 8, 9, and 10 ft. heights

Component widths are manufactured in one foot increments and include:

- Wall Panels in1, 2, 3, and 4 ft. widths
- Door Assemblies in 3 and 4 ft. widths
- Ceiling Panels in 3, 4, and 5 ft. widths



Customized Multi-Sided Cage
Anchored to Facility Walls

Introduction to Cage System Components

This section contains brief descriptions of the components used to construct an Eaton cage system. For detailed information, diagrams, and assembly instructions, see Cage System Components - Detailed Descriptions, on page 6.

Wall Mount Brackets

Used for anchoring cage wall components, such as corner and linear uprights, to a facility wall. Enables the ability to use one or more facility walls as part of the cage system design.

Corner and Linear Uprights

Anchored to the floor when installed. Provides the vertical support structure for all corner and cage wall runs throughout the cage system.

Top Frame Channel Rails

2” wide rails, manufactured in one to ten foot lengths. Installed around the top perimeter of the cage system to help provide interlocking support for underlying components.

Door and Lock Assemblies

Door frame with sliding doors. Provides secure access to the inside of the cage. Door assemblies come with Medeco high security mechanical locks with master key capability.

Wall Panels

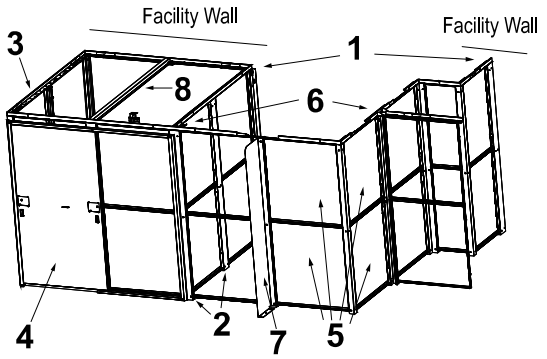
Steel panels with 3/8” perforated holes. Manufactured in one to four foot widths. Attaches easily and quickly to corner and linear uprights.

Inside and Outside Tee Assemblies

Attaches directly to the inside or outside face of a linear upright. Used as a branching point (instead of the traditional corner post), to create internal and external cage wall runs.

Ceiling Rod Anchor Brackets

Used for attaching ceiling rods to top frame channel rails for lateral support.



1. Wall Mount Brackets
2. Uprights
3. Top Frame
4. Door Assembly
5. Wall Panels
6. Tee Sections
7. Wall Side Support
8. Ceiling Spreader
9. Celing Panels (not shown)

Wall Side Supports

15” wide panel that attaches directly to the inside or outside face of a linear upright. Provides point specific lateral support for lengthy cage wall runs.

Ceiling Spreaders

Attaches to top frame channel rails across the open interior of a cage. Provides lateral support for cage walls exceeding 32 feet in length. Also used for constructing the ceiling matrix to which ceiling panels are attached.

Ceiling Panels

Manufactured in three to five foot rectangles. Attaches to ceiling spreaders to provide a fully enclosed secure cage system.

Wall Mount Anchor Brackets

Used for anchoring top frame channel rails directly to a facility wall.

End Cover Assembly

Attaches to the inside face of a linear upright when the linear upright is used to terminate the end of a cage wall run.

Installation Best Practices and Helpful Hints

This section contains an assortment of best practices and helpful hint topics that should be read before installing an Eaton cage system.

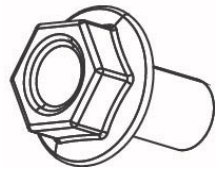
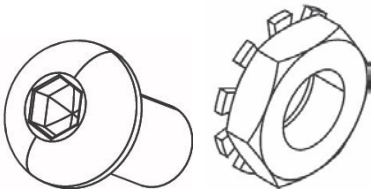
More Than a One Person Job	It is possible for one very experienced installer to install an Eaton cage system. To accomplish a one person install, some type of framing support device is required for propping up and holding cage walls while measuring, leveling, and anchoring uprights to the floor. A one person install can be accomplished, but it is difficult and not recommended. For reasons of safety, cage quality, measuring and leveling, and to speed up the installation process, it is highly recommended that two or more installers work together to complete the installation of an Eaton cage system.
Review CAD Drawings and Cage Floor Plans	Prior to installing the cage system, take the time to review the cage system CAD drawing to see where specific components are located within the design. In particular, note or identify where corner uprights are located and if any cage wall runs are to be physically anchored to a facility wall. For co-location facilities, note where tee assemblies are located when branching off of existing cage walls. Also take a look at the floor plans showing the facility area where the cage is to be installed. Note any physical, overhead, or electrical obstructions. Discuss any issues found with the site facility manager. Using both the CAD drawing and site floor plan, take note of cage dimensions, height, door locations, and cage wall length measurements. Adhere to and follow all local building and facility code specifications.
Anchoring Cage Components to the Wall and Floor	**IMPORTANT!** If there is additional hardware required to complete the installation of the cage system (floor, wall, and/or ceiling anchoring support), and the specified hardware is NOT itemized and included on the cage system quote, then the required hardware must be included and priced by the Installation Team on the installation quote. The hardware required for anchoring cage components to a facility wall or floor depends upon the wall and floor material. Anchoring hardware required for each facility is site specific and MUST BE SPECIFIED AND/OR APPROVED by facility management; preferably during the planning, design, and cage system ordering phase. When identifying anchoring hardware, take into consideration the type and length of anchoring screws used on a raised floor. The floor material may be steel, concrete, aluminum, or wood-core. The proper screw type should be used based on the floor type. The length of anchor screws is also important to provide the proper structural

	support for cage uprights. In addition, raised floors generally have items installed underneath the floor and using screws much longer than the thickness of the floor panel may puncture conduits or air flow ducts. **IMPORTANT!** If prior to arrival, the installation team is not provided with details about the type of anchoring hardware required to conduct the installation, it is possible the team will arrive at the installation site without the necessary/proper anchoring hardware and the installation will be delayed until the proper anchoring hardware is either provided or acquired.
Ceiling Hanging Rod Support	Some facility customers require the cage top frame channel rails to be physically connected to threaded rods hanging from the ceiling. ⚠ **IMPORTANT** Threaded rod material is not supplied within the installation kit. Threaded rod must be obtained and installed by site-facility personnel. It is highly recommended that only stainless steel, 1/2", threaded rods be used, NOT zinc plated or galvanized. The cage installation team is only responsible for interconnecting the cage top frame channel rails to pre-installed ceiling rods using the ceiling rod anchor brackets provided (ordered) within the cage system installation kit. One ceiling rod anchor bracket must be ordered for each ceiling rod to be interconnected to the cage system's top frame channel rail structure.
Custom Cuts and Fine Tuning Cage Wall Lengths	Eaton cage system components are manufactured in one foot increments. If connecting a cage to a facility wall and the wall is not straight, or if the facility specifies a cage wall length that doesn't conform to the one foot increment rule, it may be necessary for installation personnel to make use of existing cage components to satisfy the non-standard cage wall length. This includes cutting the top frame channel rails to match. To cut top frame channel rails, use a metal cutting tool/saw; preferably a power saw with a metal cutting blade. Do not cut the tapered end. The tapered end fits into the next adjacent top frame channel rail component and is used for fastening the channel rails together. Instead cut the non-tapered end and make sure to maintain alignment for screw attachment locations. Drilling holes through channel rails may be necessary if alignment (holes) is not achieved after cutting.

Cage System Components - Detailed Descriptions

Screws, Nuts, and Washers

This section identifies the types of screws, nuts, and washers supplied with the cage system installation kit.

Hex Head Self-Threading Screws Part (54348); 1/4 – 20 x1/2” Hex Head Self-Threading Screw The 54348 self-threading screw is used the majority of the time during cage installation. This includes securing wall panels to uprights, interconnecting top frame channel rails, and attaching ceiling spreaders and top frame wall mounting brackets to top frame channel rails. A power wrench-drill with attached 3/8” socket is recommended for tightening this screw during installation.	
Button Head Screw, Keps Nut, and Star Washer Part (82703); 1/4 - 20 x1/2” Button Head Screw with 1/4 - 20 Hex Keps Nut and Star Washer The button head screw, nut, and washer are used for fastening cage components to corner and linear uprights through knock-out holes. This includes door and lock assemblies, inside/outside tee assemblies, and wall side supports. Once knock-out holes are removed, the button head screw is inserted from the outside face of the upright and threaded into the washer and Keps nut which are on the inside face of the upright. A 5/32” Allen Key is required for tightening. See Removing Knock-Out Holes on page 47 for an illustration of how to remove knock-out holes from the outside face of a corner or linear upright.	

Outside Corner Upright (SSCU*nn*)

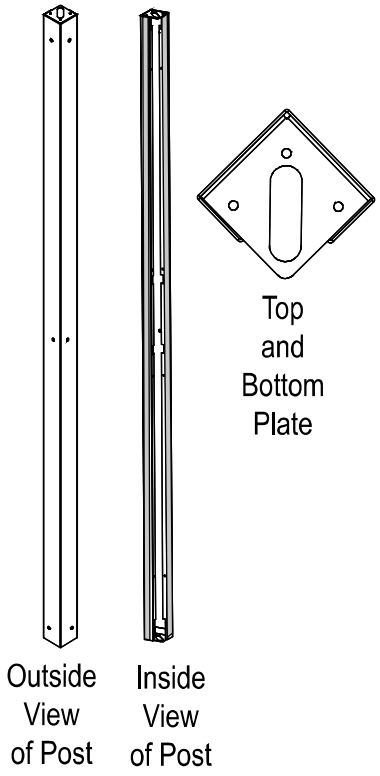
Outside corner uprights (SSCUnn) are used for changing the cage wall direction 90 degrees; as in a rectangle or square. Outside corner uprights are manufactured in three lengths to support 8', 9', and 10' high cage designs.

Outside Corner Upright Post

The outside corner upright post has a smooth side that faces outward from the internal area of the cage when installed. The smooth outside surface is equipped with additional knock-out holes which are used when attaching other cage components to the upright, such as the door assembly, or the wall mount bracket if the upright is to be physically anchored to a facility wall.

The inside of the upright is concave with a "v-shape" frame-like structure. Each edge of the frame-like structure has pre-drilled holes for attaching wall panels.

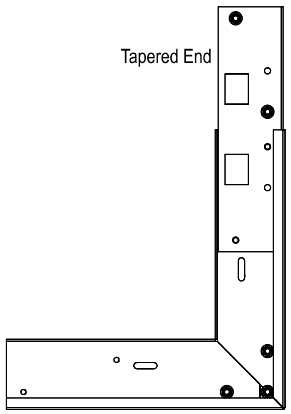
At the top and bottom of the upright are welded mounting plates. The bottom plate is used for anchoring the upright to the floor and the top plate is used for attaching the outside corner top frame assembly to the upright.



Outside Corner Top Frame Assembly

The outside corner top frame assembly attaches to the outside corner upright post.

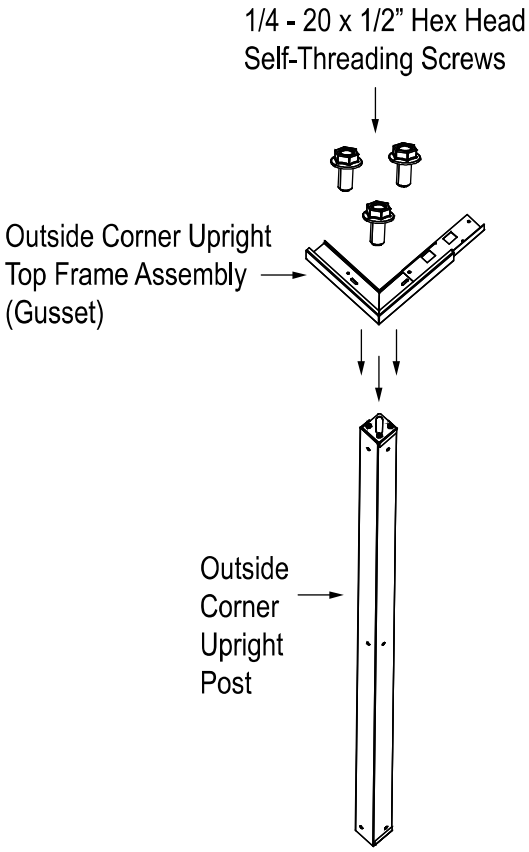
The three screw holes in the corner are used for attaching the assembly to the corner post (three self-threading screws). Both ends of the top frame assembly attach to top frame channel rails. The tapered end inserts into the non-tapered end of a channel rail while the non-tapered end receives the tapered end of an adjacent channel rail. Once inserted, two self-threading screws are used on each end to interconnect the channel rails to the assembly.



Outside Corner
Top Frame Assembly (Gusset)

Assembling the Outside Corner Upright

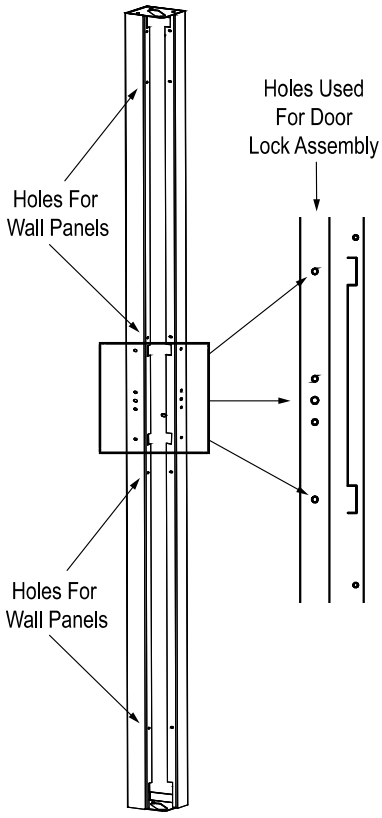
The outside corner upright top frame assembly attaches to the top of the outside corner upright post using three 1/4 – 20 x 1/2" hex head self-threading screws. The screws are inserted through the top frame assembly and then threaded into the mounting plate at the top of the upright.



Outside Corner Post Pre-Drilled Holes

The interior side of the outside corner upright post has several pre-drilled holes. The illustration to the right identifies which holes are used for attaching Wall Panels (8), and which holes are used for attaching the door lock assembly; that is, if a door is to be attached to the post.

Eight 1/4 – 20 x1/2" hex head self-threading screws are required when attaching wall panels to each upright; four screws for each inside edge of the upright. When attaching wall panels, insert the self-threading screws half-way into the upright then attach the wall panel using tear drop holes on the panel. Once the wall panel is attached, tighten the screws to secure the wall panel to the upright.



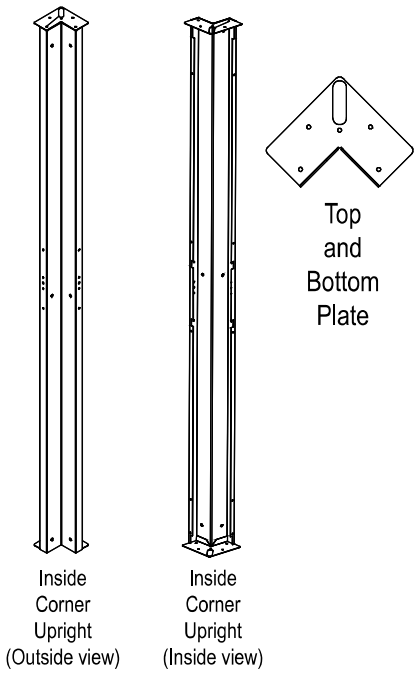
Inside Corner Upright (SSCU*nn*R)

The Inside Corner Upright (SSCUnnR) is similar to the outside corner upright in that it changes the cage wall direction 90 degrees. The physical difference between the two is the inside corner upright has a smooth side shaped like an inverted v, whereas the outside corner upright has a smooth side shaped like a square 90 degree corner. The top and bottom of each upright is also shaped to match the post design. Inside corner uprights are manufactured in three lengths to support 8', 9', and 10' high cage designs.

Inside Corner Upright Post

The smooth inverted side of the inside corner upright has knock-out holes used for attaching other cage components to the post. The interior side consists of a frame-like structure and has pre-drilled holes used for connecting wall panels

At the top and bottom of the upright are welded mounting plates. The bottom plate is used for anchoring the upright to the floor and the top plate is used for attaching the inside corner top frame channel assembly to the upright.

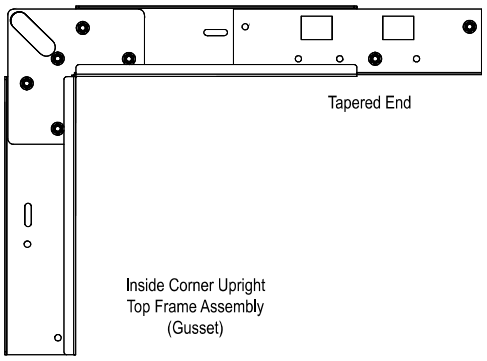


Inside Corner Upright Top Frame Assembly

The inside corner upright top frame assembly attaches to the top of the inside corner upright post.

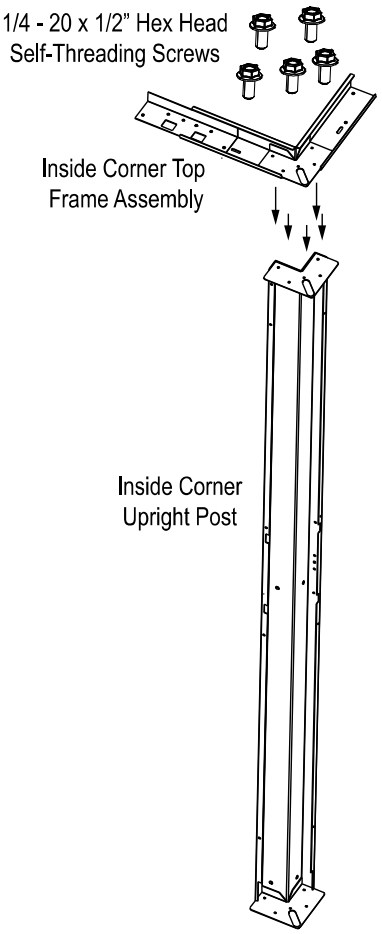
Five screw holes in the corner are used for attaching the assembly to the corner post (five self-threading screws).

Both ends of the top frame assembly attach to top frame channel rails. The tapered end inserts into the non-tapered end of a channel rail while the non-tapered end of the assembly receives the tapered end of an adjacent channel rail. Once inserted, two self-threading screws are used on each end to interconnect the channel rails to the assembly.



Assembling the Inside Corner Upright

The inside corner upright top frame assembly attaches to the top of the inside corner upright post using five 1/4 – 20 x 1/2” hex head self- threading screws. The screws are inserted through the top frame assembly and then threaded into the mounting plate at the top of the upright.



Linear Upright (SSLU*nn*)

Linear uprights (SSLU*nn*) are the primary structural component installed along straight wall runs. Linear uprights are manufactured in three lengths to support 8’, 9’, and 10’ high cage designs.

About Linear Uprights

Linear uprights are primarily used for interconnecting wall panels.

When installed, the smooth side of the linear upright faces away from the interior of the cage. The smooth side contains knock-out holes that are used when attaching other cage components to the upright. This includes inside tees, outside tees, cage door, wall side supports, and wall mount brackets. The edge of each linear upright has holes for

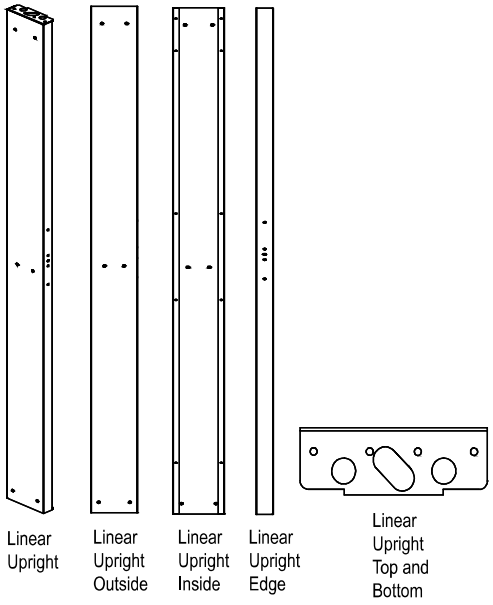
The inside of the linear upright consists of a frame-like structure and faces inward when installed. Each inside edge of the frame-like structure has holes used for attaching wall panels to the upright.

Eight 1/4 – 20 x1/2” hex head self-threading screws are required when attaching wall panels to each upright; four screws for each inside edge of the upright. When attaching wall panels, insert the self-threading screws half-way into the upright then attach the wall panel using tear drop holes on the panel. Once the wall panel is attached, tighten the screws to secure the wall panel to the upright.

Two additional self-tapping screws are required for attaching top frame channel rails to the top of each linear upright.

At the top and bottom of the upright are welded mounting plates. The bottom plate is used for anchoring the upright to the floor and the top plate is used for attaching the top frame channel assembly to the upright.

In some cage designs, the linear upright may need to be physically anchored to a facility wall. To anchor an upright to a facility wall, the upright must be attached to a wall mount bracket then the wall mount bracket is anchored to the wall.



Wall Mount Bracket (SSENDBKT*nn*)

Wall Mount Brackets (SSENDBKT*nn*) enable installers to anchor cage walls to facility walls. To anchor a cage wall to a facility wall, one half of the wall mount bracket is attached to either an outside corner upright, a linear upright, or an inside corner upright, and the other half of the wall mount bracket is anchored to the wall. The type of anchoring hardware required depends on the type of facility wall; cement, metal, wood, or sheetrock.

NOTE: The hardware necessary to secure and anchor a wall mount bracket to a facility wall is **NOT** supplied in the cage installation kit.

About the Wall Mount Bracket

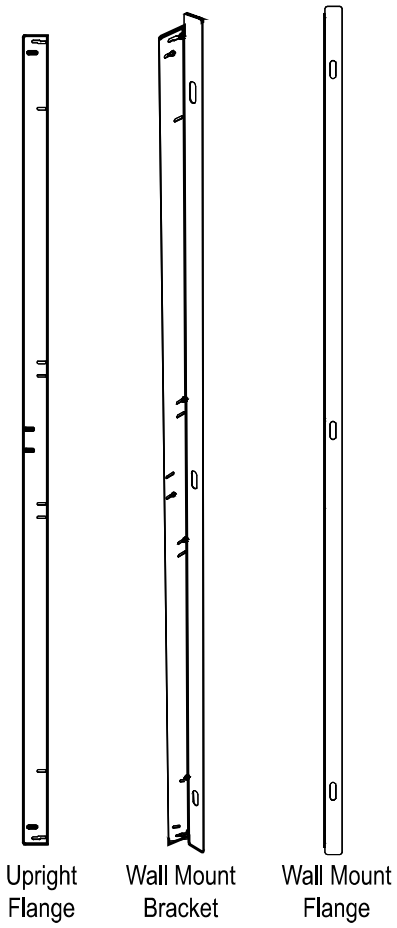
The wall mount bracket has two flange plates; the wall mount flange and the upright flange.

The wall mount flange plate is slightly longer than the upright flange plate and contains three elongated holes used for anchoring the bracket to a facility wall.

The upright flange has several holes available for attaching an upright to the wall mount bracket. Some holes match up to the pre-drilled holes found on corner and linear uprights while other holes match up to the upright's knock-out holes. Installers can use either set depending on how the cage wall and facility wall measurements line up.

The upright flange is also universal in that it can be attached to an upright on the inside face or the outside face. When attaching to the inside face, the pre-drilled holes on the upright are used to attach the wall mount bracket to the upright. When attaching to the outside face, the knock-out holes on the upright must be used.

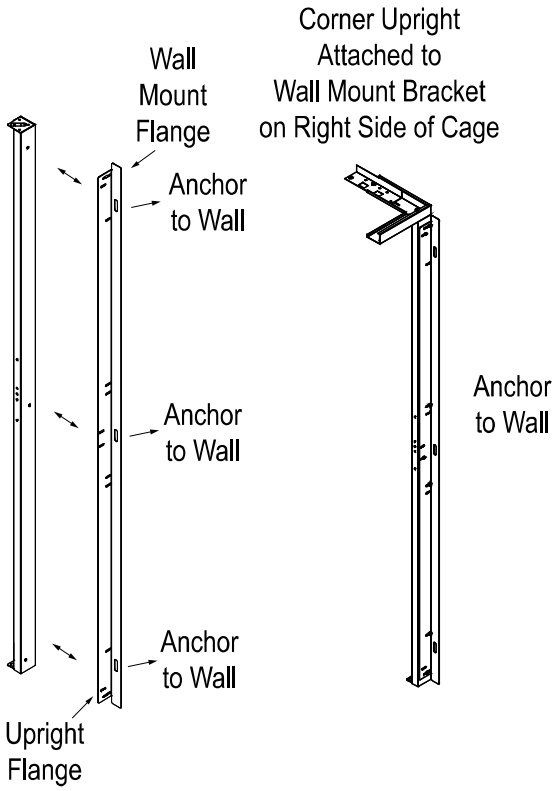
Use self-threading screws when attaching the wall mount bracket to the upright via the upright's pre-drilled holes. Use button head screws, nuts, and washers when attaching through the upright's knock-out holes.



Corner Upright Attached to Wall Mount Bracket "Right Side"

For walls on the right side of a cage, attach the wall mount bracket to the right side of the upright as shown in the diagram to the right.

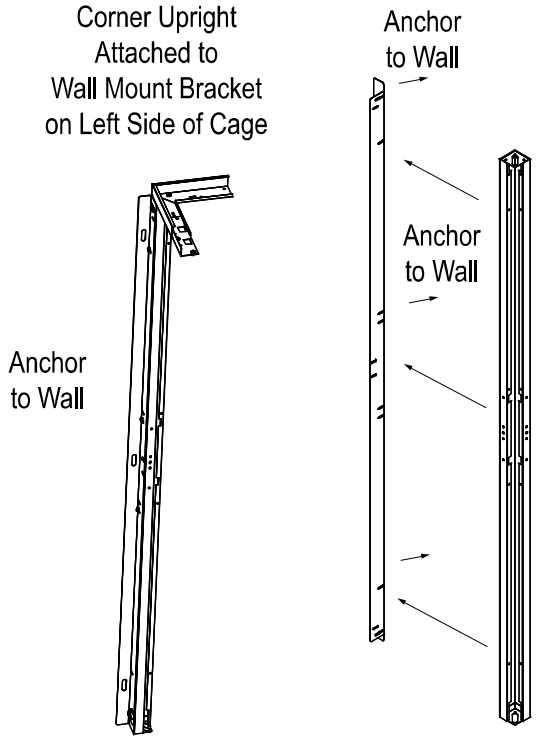
NOTE: For ease of measurement, alignment, and leveling, it is recommended that the wall mount bracket be anchored to the facility wall first, prior to attaching the corner upright and top frame assembly to the wall mount bracket.



Corner Upright Attached to Wall Mount Bracket "Left Side"

For walls on the left side of a cage, attached the wall mount bracket to the left side of the upright as shown in the diagram to the right.

NOTE: For ease of measurement, alignment, and leveling, it is recommended that the wall mount bracket be anchored to the facility wall first, prior to attaching the corner upright and top frame assembly to the wall mount bracket.



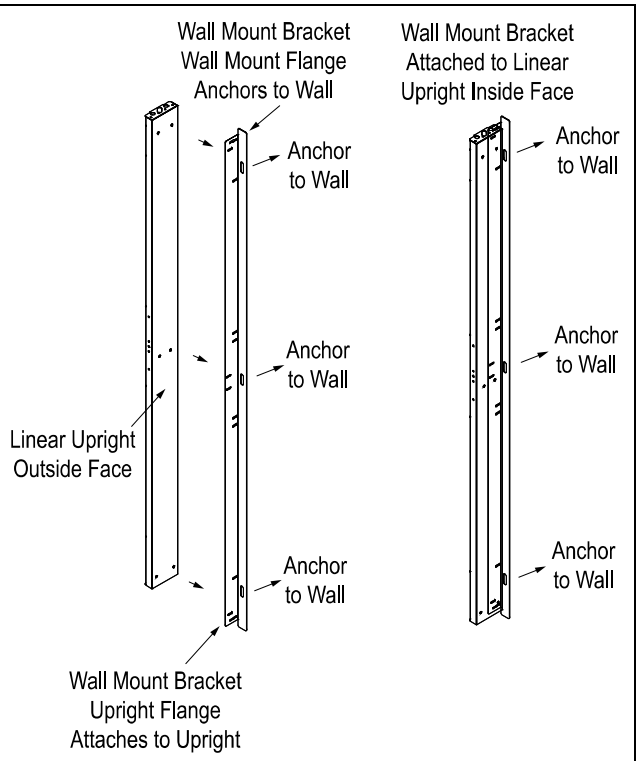
Linear Upright Attached to Wall Mount Bracket

In some situations, it may be necessary to anchor a linear upright to a facility wall instead of a corner upright.

As shown in the diagrams to the right, the wall mount bracket can be attached to either the outside or inside face of the linear upright.

Use self-threading screws and the pre-drilled holes if attaching to the inside face. Button head screws, nuts, and washers will be required if attaching to the outside face using knock-out holes.

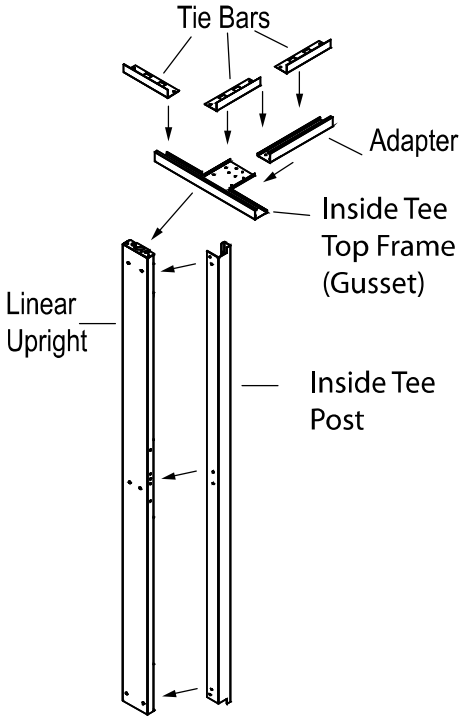
NOTE: For ease of measurement, alignment, and leveling, it is recommended that the wall mount bracket be anchored to the facility wall first, prior to attaching the linear upright to the wall mount bracket.



Inside Tee Assembly (SSIT*nn*)

The inside tee assembly (SSIT*nn*) is used for creating a perpendicular, inside wall run, within the interior of a cage system. In newer cage system designs, the inside tee assembly is replacing the outside corner upright for inside wall runs.

Unlike corner uprights, the inside tee must be assembled. It is not a welded assembly. The diagram to the right identifies the components that make up the inside tee assembly.



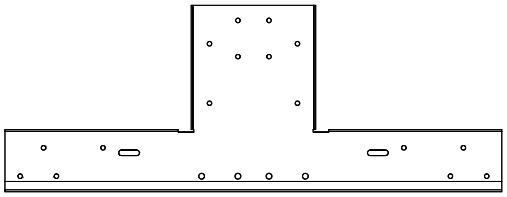
Inside Tee Post

The inside tee post attaches to the inside of a linear upright using knock-out holes on the linear upright. As such, knock-out slugs must be removed from the linear upright before the post can be attached to the upright. Three 1/4 - 20 x1/2" button head screws, nuts, and washers are required to attach the post to the upright.

Once attached, the inside tee post enables wall panels to be connected to the inside face of a linear upright. The post has the same dimensions (3" wide) as a corner upright.

Inside Tee Top Frame (Gusset)

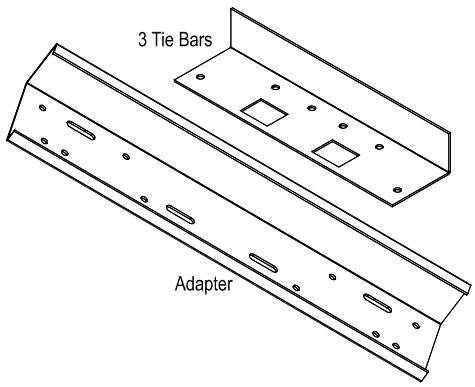
The inside tee top frame (gusset) attaches to the top of a linear upright (using two self-threading screws) and rests on top of the inside tee post.



Tie Bars and Adapter

The remainder of the inside tee top frame is composed of three tie bars and one adapter. The adapter abuts the inside tee top frame (gusset) and is attached using a tie bar and four self-threading screws.

The reason the adapter and tie bars are not welded to the inside tee top frame (gusset) is to provide flexibility when interconnecting top frame channel rails. Top frame channel rails have a tapered end and a non-tapered end. If the non-tapered end is adjacent to the inside tee assembly, the installer can fasten a tie bar to the inside tee to change it to a tapered end.

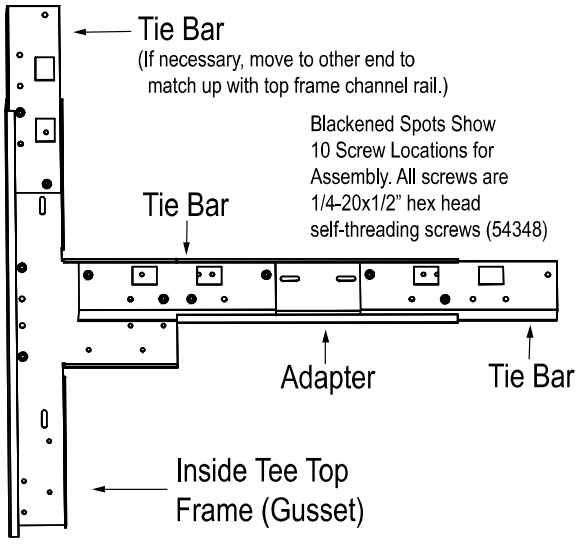


Inside Tee Top Frame Assembly Screw Locations

The dark spots in the diagram to the right show the screw locations used when assembling the inside tee top frame assembly.

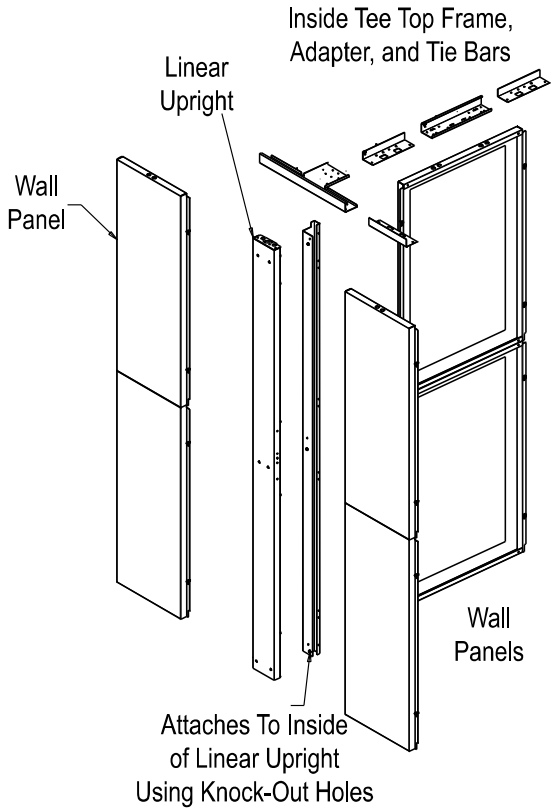
If necessary, the Tie Bar on the top can be moved to the bottom to match tapered and non-tapered ends of adjacent top frame channel rails.

All screws required for assembly of the inside tee top frame components are 1/4 – 20 x 1/2" hex head self-threading screws (54348). The two screws shown on the left edge of the inside tee top frame (gusset), screw into the top of the linear upright.



Inside Tee Assembly with Wall Panels

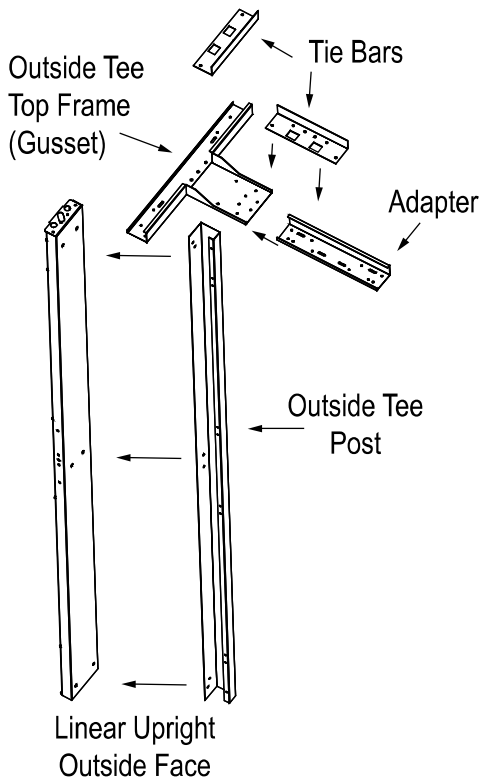
The diagram to the right shows an inside tee assembly with wall panels adjacent and perpendicular to a linear upright.



Outside Tee Assembly (SSOT*nn*)

The outside tee assembly (SSOT*nn*) is used for creating a perpendicular, outside wall run, exterior to the cage system.

Similar to the inside tee, the outside tee is not a welded assembly; it must be assembled. The diagram to the right identifies the components that make up the outside tee assembly.



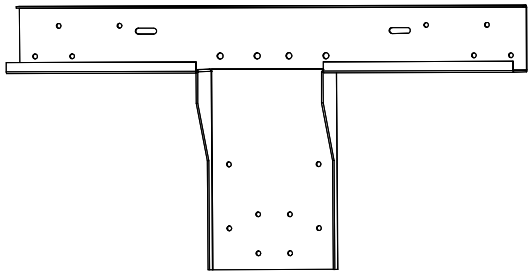
Outside Tee Post

The outside tee post attaches to the outside face of a linear upright, using the upright's knock-out holes. As such, knock-out slugs must be removed from the linear upright before the post can be attached to the upright. Three 1/4 - 20 x1/2" button head screws, nuts, and washers are required to attach the post to the upright.

Once attached, the outside tee post enables wall panels to be connected to the outside face of the linear upright. The post has the same dimensions (3" wide) as a corner upright.

Outside Tee Top Frame (Gusset)

The outside tee top frame (gusset) attaches to the top of a linear upright (using two self-threading screws) and rests on top of the outside tee post.

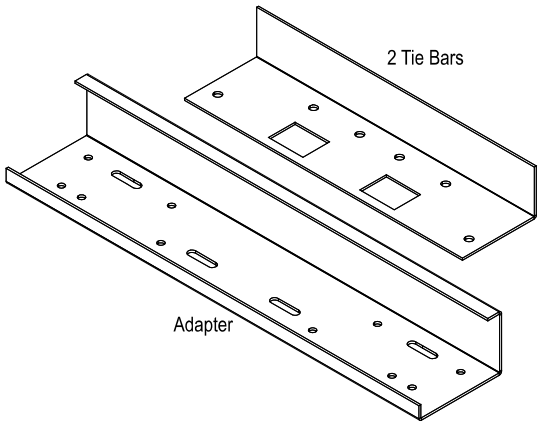


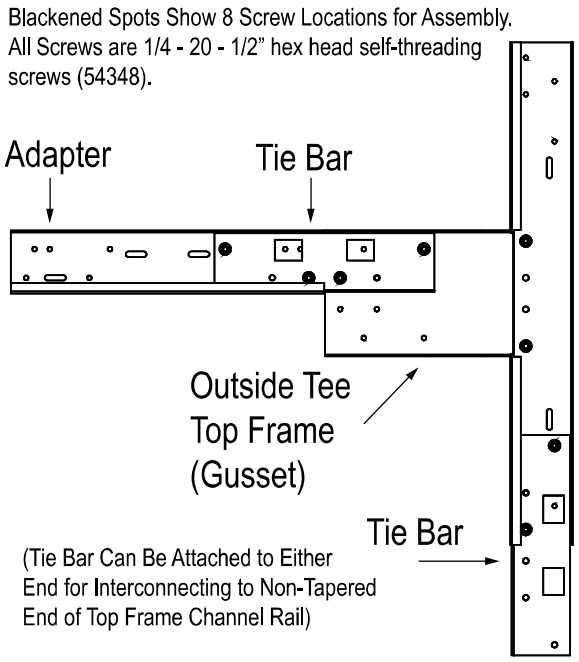
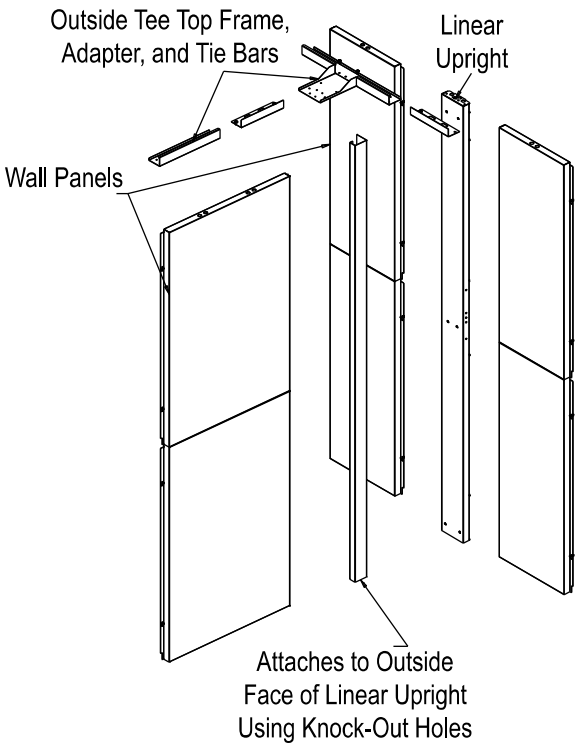
Outside Tee Top Frame (Gusset)

Tie Bars and Adapter

The remainder of the outside tee top frame is composed of two tie bars and one adapter. The adapter abuts to the outside tee top frame (gusset) and is attached using a tie bar and four self-threading screws.

Like the outside tee, the adapter and tie bars for the inside tee are not welded to the top frame (gusset) to provide flexibility when interconnecting to top frame channel rails. Top frame channel rails have a tapered end and a non-tapered end. If the non-tapered



end of a channel rail is adjacent to the outside tee assembly (also a non-tapered end), the installer can fasten a tie bar to the end of the tee to change it to a tapered end.	
Outside Tee Top Frame Assembly Screw Locations The dark spots in the diagram to the right show the screw locations used when assembling the outside tee top frame assembly. The tie bar shown at the bottom right of the diagram can be attached to either end of the top frame assembly for interconnecting to channel rails. All screws required for assembly of the outside tee top frame components are 1/4 – 20 x 1/2" hex head self-threading screws (54348). The two screws shown in the center of the outside tee top frame (gusset), screw into the top of the linear upright.	
Outside Tee Assembly with Wall Panels The diagram to the right shows an outside tee assembly with wall panels adjacent and perpendicular to a linear upright.	

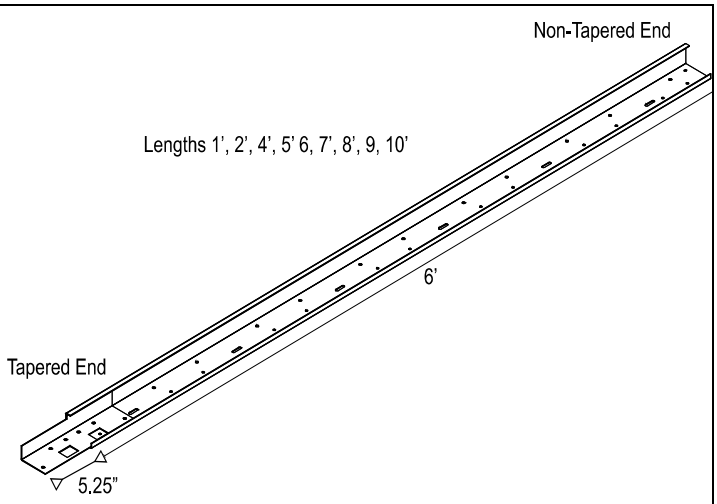
Top Frame Channel Rails (SSTF*nn*)

Top frame channel rails (SSTF*nn*) attach to the top of a cage system and provide interlocking support around the upper perimeter of the cage. Top frame channel rails are part of the cage's underlying support structure and as such, top frame channel rails should be installed and interconnected as the "cage frame structure" is being assembled, along with all corner and linear uprights. The cage frame structure should be assembled and anchored first, before installing or attaching other cage components such as doors and wall panels.

About Top Frame Channel Rails

Top frame channels rails come in 1, 2, 4, 5, 6, 7, 8, 9, and 10 foot lengths. Channel rails have a tapered end and a non-tapered end. The diagram to the right shows a six foot channel rail.

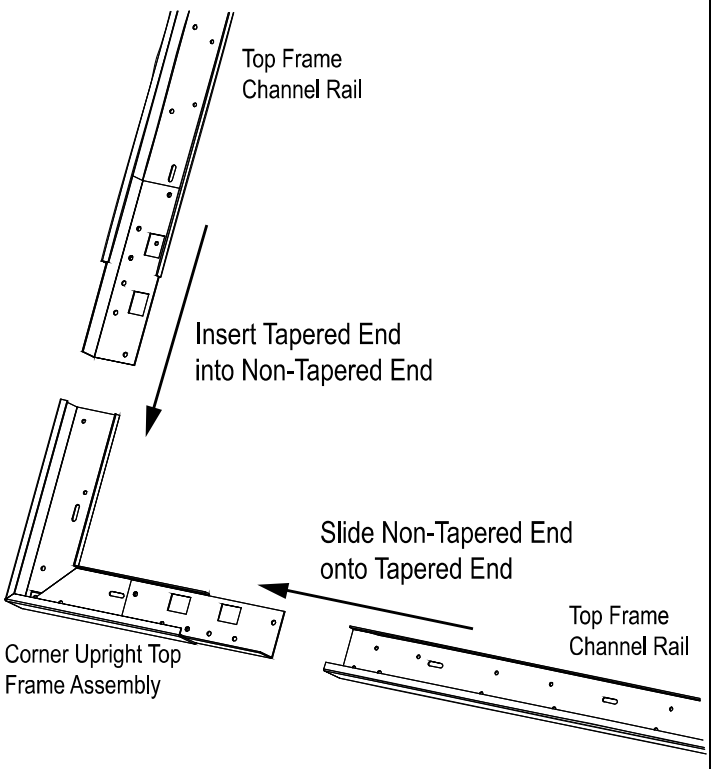
As shown to the right, the tapered end of a channel rail extends 5.25". The tapered end slides easily inside the non-tapered end of other top frame components. This includes other channel rails, corner upright top frame assemblies, and inside/outside tee top frame assemblies.



Attaching Top Frame Channel Rails to Top Frame Assemblies

As shown to the right, tapered ends insert into non-tapered ends, and non-tapered ends slide onto tapered ends.

Once top frame tapered and non-tapered ends are joined together, match up the holes and use two 1/4 – 20 x 1/2" hex head self-threading screws (54348) to secure the interconnection.

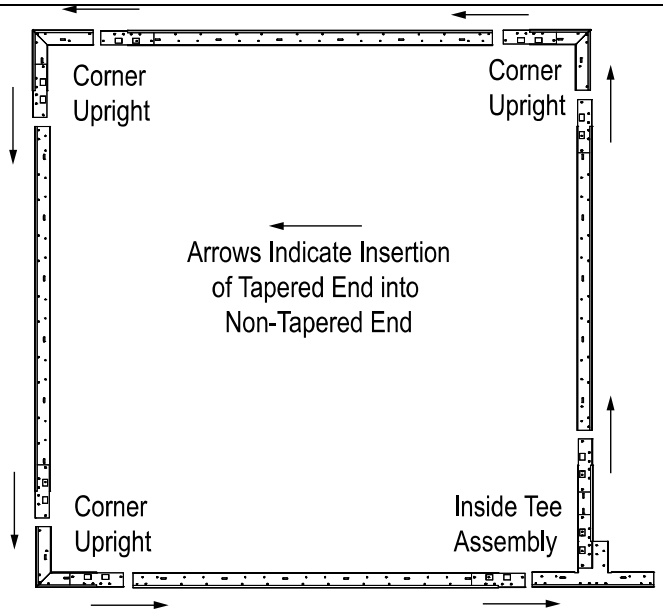


Square Cage Example: Top Frame Support Structure

The diagram to the right shows a

square cage layout with the interconnecting top frame support structure. The top frame support structure includes top frame channels rails connecting to three corner upright top frame assemblies and one inside tee top frame assembly.

As shown, at each interconnecting point, tapered ends are inserted into non-tapered ends. Two 1/4 – 20 x 1/2" hex head self-threading screws (54348) are used at each junction to complete the connection.



Calculating Channel Rail Lengths

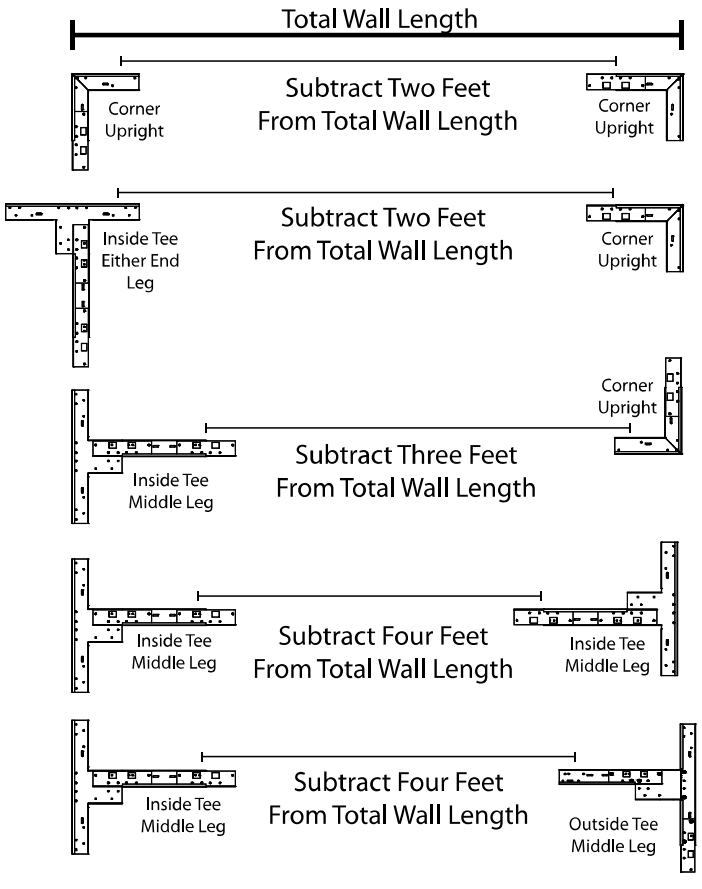
The length of top frame channel rail required between two cage wall endpoints can be found by measuring the full length of the cage wall, then subtracting a value based the components located at each endpoint.

The diagram to the right identifies the possible endpoint combinations using corner uprights, inside and outside tee end legs, or inside and outside tee middle legs.

Example: When measured, the length of a cage wall is 12 feet. The components that make up the endpoints are the middle leg of an inside tee and a corner upright. Using the diagram to the right:

12' - 3' = 9' Channel Rail

NOTE: For cage walls that require channel rails longer than 10', connect two channel rails together to achieve the desired length.



Top Frame Wall Mount Bracket (SSTFWMK)

The top frame wall mount bracket (SSTFWMK) enables installers to anchor top frame channel rails directly to a facility wall. Anchoring channel rails to a facility wall may be necessary when the cage design incorporates the use of facility walls on one or more sides of a cage system.

In this section, two techniques are described for anchoring top frame channel rails to a facility wall. The first technique describes how to anchor top frame channel rails to a wall when the length of the wall is 10 feet or less. The second technique describes how to anchor top frame channel rails to a wall when the length of the wall is longer than 10 feet.

About the Top Frame Wall Mount Bracket

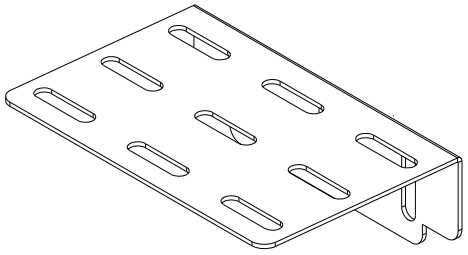
The top frame wall mount bracket is a multi-purpose bracket with two flange plates bent at a 90 degree angle. The bracket is multi-purpose because it is also used with the ceiling rod anchor bracket.

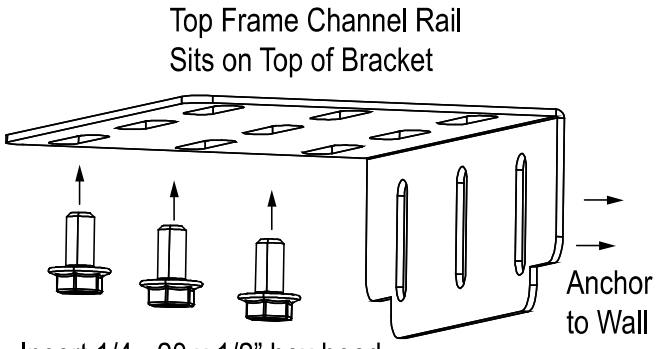
The larger flange is positioned under the top frame channel rail and fastened to the rail using three 1/4 - 20 x 1/2" hex head self-threading screws. As shown to the right, the screws are inserted and threaded from the bottom of the flange, through the flange holes, and into the top frame channel rail.

Once the bracket is attached to the channel rail, the smaller flange is used to anchor the bracket to the facility wall.

ANCHORING HARDWARE

The hardware required for anchoring cage components to a wall or floor depends on the type of wall and floor material. Before using anchoring hardware, it is highly recommended that installation personal obtain approval from the onsite facility manager. Obtaining the proper anchoring hardware is the responsibility of the installation team. Anchoring hardware is NOT supplied in the cage installation kit.





Insert 1/4 - 20 x 1/2" hex head self-threading screws from the bottom of the wall mount bracket, through bracket holes and into top frame channel rail.

Anchoring Channel Rails 10 Feet Long or Less

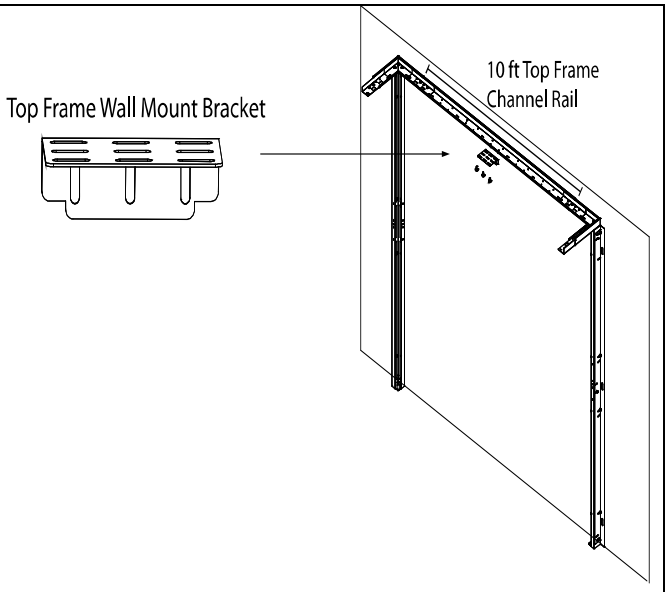
When anchoring channel rails to a facility wall, and the length of the channel rail is10 feet long or less, it is only necessary to use one top frame wall mount bracket to secure

the channel rail to the wall.

NOTE: Using a second bracket is only required if it appears a single bracket cannot support the channel rail adequately. This is sometimes the case when the wall is made of material other than cement, steel, or solid wood.

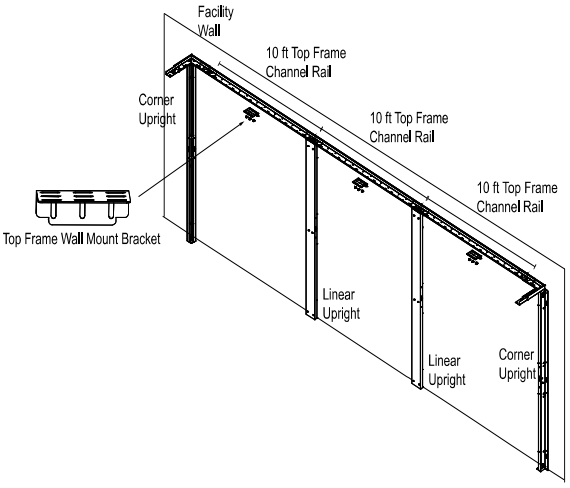
Procedure for Anchoring Channel Rails 10 Feet Long or Less

1. Position bracket against the wall under the top frame channel rail.
2. Attach the bracket to the top frame channel rail using three 1/4 – 20 x 1/2" self-threading screws (54348). **NOTE:** Screws must be threaded from the bottom up.
3. Make sure channel rail is level.
4. Anchor the top frame channel rail to the wall through the lower flange of the wall mount bracket.



Anchoring Channel Rails Longer Than 10 Feet

As shown in the diagram to the right, when anchoring channel rails longer than 10 feet to a facility wall, in addition to top frame wall mount brackets, linear uprights must also be anchored to the wall (flat) directly below each channel rail seam. When using this method, top frame wall mount brackets are installed mid-way between each upright, including the space between linear uprights and the uprights at each corner endpoint.



Procedures for Anchoring Channel Rails Longer than 10 Feet

First, anchor linear uprights flat to the wall (below channel rail seams), then attach and anchor wall mount brackets. Specific step by step instructions are located in the following paragraphs.

Anchor Linear Uprights Flat to the Wall

1. Remove all six knock-out holes from the linear upright.
2. Place linear upright flat against the

Attach and Anchor Top Frame Wall Mount Brackets

1. On the wall, just below the channel rail, mark the half-way point between linear uprights, and

wall with the smooth surface facing outward. 3. Center linear upright below seam where two channel rails meet. 4. Make sure channel rail is level. 5. Anchor linear upright to wall through all six knock-out holes. 6. Attach top frame channel rail to top of linear upright using two 1/4 – 20 x 1/2" self-threading screws (54348). 7. Repeat above steps for each channel rail seam.	between linear uprights and corner uprights. 2. Position wall mount bracket against wall, below channel rail, on mark representing half-way point. 3. Attach wall mount bracket to the top frame channel rail using three 1/4 – 20 x 1/2" self-threading screws (54348). **NOTE:** Screws must be threaded from the bottom up. 4. Make sure channel rail is level. 5. Anchor the top frame channel rail to the wall through the lower flange of the wall mount bracket. 6. Repeat steps 2 through 5 at each marked point.

Ceiling Spreaders (SSTS*nn*)

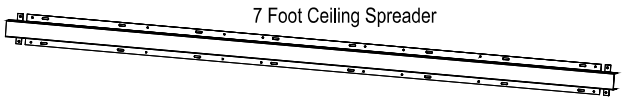
Ceiling spreaders attach to the top frame channel structure and provide lateral stability for cage walls. For cage designs that include ceiling panels, ceiling spreaders are used to form the three to five foot matrix to which ceiling panels are attached.

About Ceiling Spreaders

Ceiling spreaders come in four to ten foot lengths and can be interconnected to form lengths up to 20 feet long.

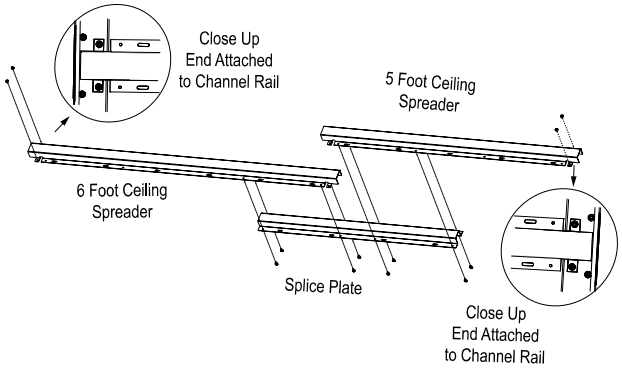
In four to ten foot lengths, the ceiling spreader is a single piece of steal. Above ten feet, ceiling spreaders must be assembled using two smaller pieces connected together.

When assembling an 11-12 foot spreader, a splice plate is used. For longer spreaders a stiffener rail is required.



Splice Plate

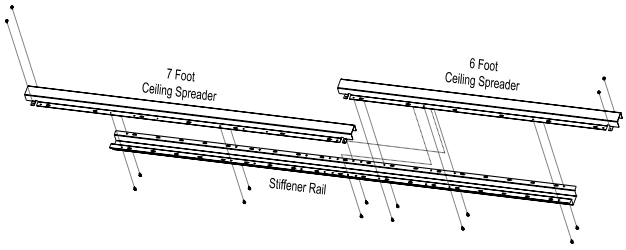
The diagram to the right shows a five foot and a six foot ceiling spreader interconnected by a splice plate to create an 11 foot ceiling spreader. Eight 1/4 – 20 x 1/2” self-threading screws (54348) are threaded upward from the bottom of the splice plate into each ceiling spreader. Four self-threading screws, two at each end, are used for attaching the 11 foot spreader to the top frame channel rail structure.



Stiffener Rail

Given the need for more strength over longer spans, when interconnecting ceiling spreaders to create 13 to 16 foot lengths, a stiffener rail must be used.

The adjacent diagram shows six foot and seven foot ceiling spreaders inter-connected by a stiffener rail. Twelve 1/4 – 20 x 1/2” self-threading screws are threaded upward through the stiffener rail into each ceiling spreader. Four self-threading screws are used to attach the spreader to the top frame channel rails.



Install Ceiling Spreaders for Lateral Support

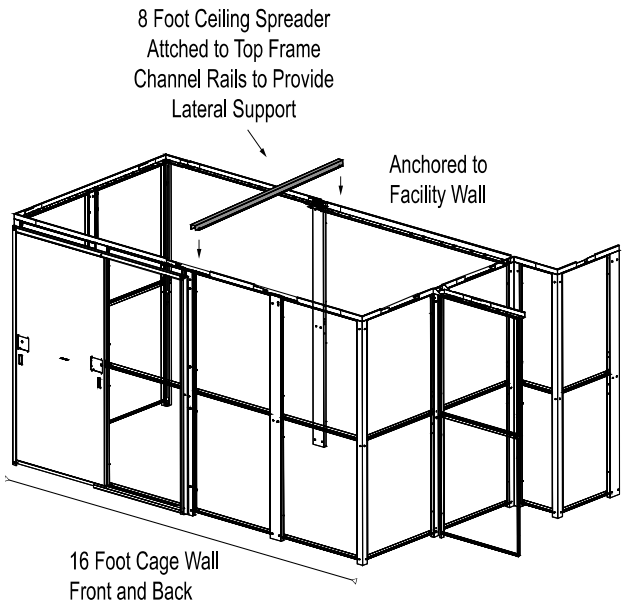
It is recommended that a minimum of one ceiling spreader be installed for every 32 feet of cage wall.

Most 16’ x 16’ designs install a ceiling spreader every 8 feet to maintain sturdy lateral support for all cage walls.

The diagram to the right shows a 16 x 8 foot cage. To provide lateral support, an 8 foot long ceiling spreader is attached to top frame channel rails from the front to the back of the cage. The channel rail at the back of the cage is anchored to a facility wall which will provide solid lateral support for the front cage wall once the ceiling spreader is installed.

Four 1/4 – 20 x 1/2” self-threading screws, two at each end, are used for attaching the spreader to the top frame channel rail structure.

Basically, the more ceiling spreaders installed the more rigid and sturdy the walls become.

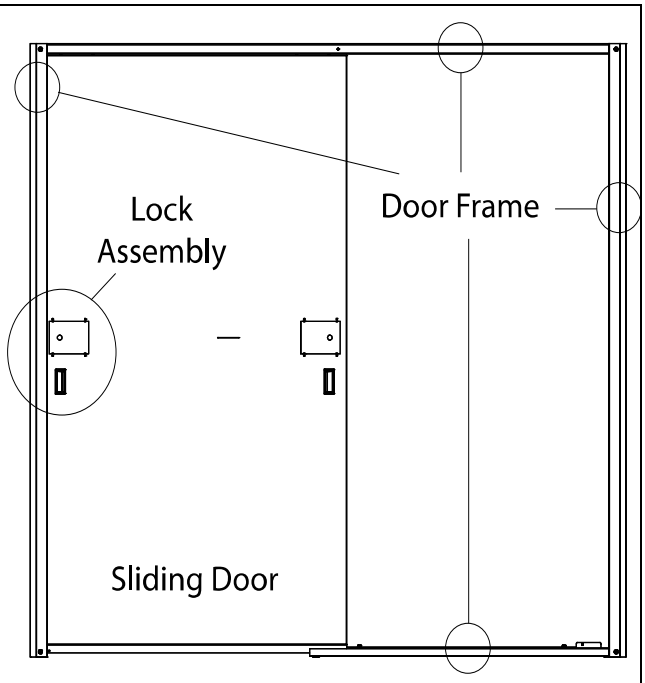


Door Frame, Sliding Doors, and Lock Assembly (SSPW*nn*)

Once all uprights (corner and linear), top frame channel rails, and ceiling spreaders are installed, the cage support infrastructure should be sturdy and complete. The next step in the installation process is to install door frame(s), sliding doors, and lock assemblies.

About the Door Assembly

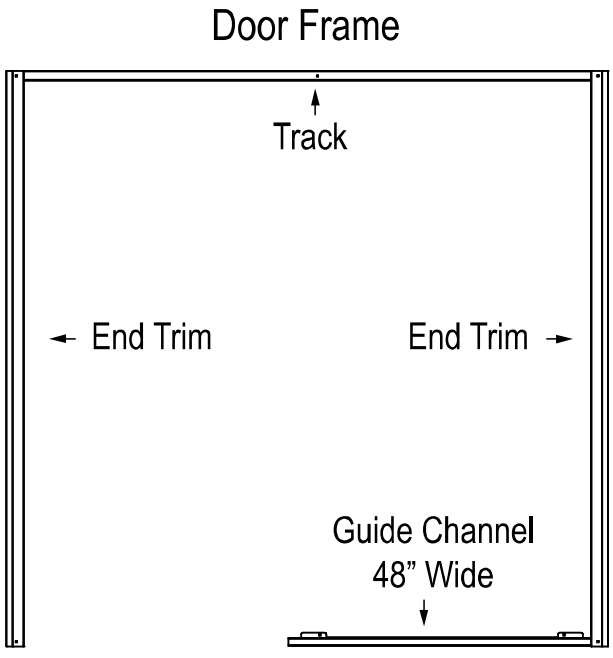
The cage door assembly includes the door frame, the sliding door, and the lock assembly.



Door Frame

The door frame consists of the guide channel at the bottom right, two end trim pieces, one left and one right, and the track component at the top.

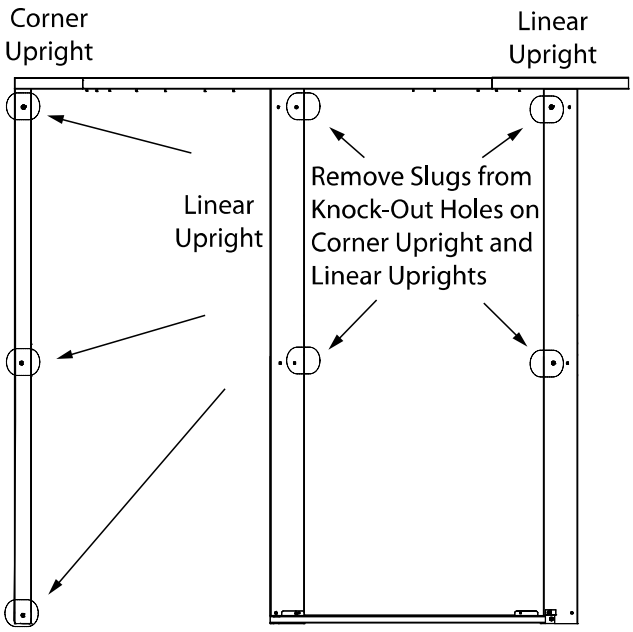
Door frame components attach to corner uprights, linear uprights, and wall panels.



Remove Knock-out Holes

Before installing the end trim and upper track components, use a flat blade screwdriver and pliers to remove slugs from knock-out holes on corner and linear uprights, as shown in the diagram to the right.

See Removing Knock-Out Holes on page 47 for more details.



Lock Assemblies for Left and Right Hand Sliding Doors

The lock assembly consists of two parts:

- Emergency Lock Release Handle
- Lock Plate Assembly

The diagram to the right shows door lock assemblies for a right to left sliding door (top) and left to right sliding door (bottom).

Emergency Lock Release Handle

The emergency lock release handle attaches to the inside edge of an upright; either a linear upright or a corner upright, depending on where the sliding door is positioned along the cage wall run. The emergency lock release handle is attached to the upright directly adjacent to where the lock plate assembly is to be installed.

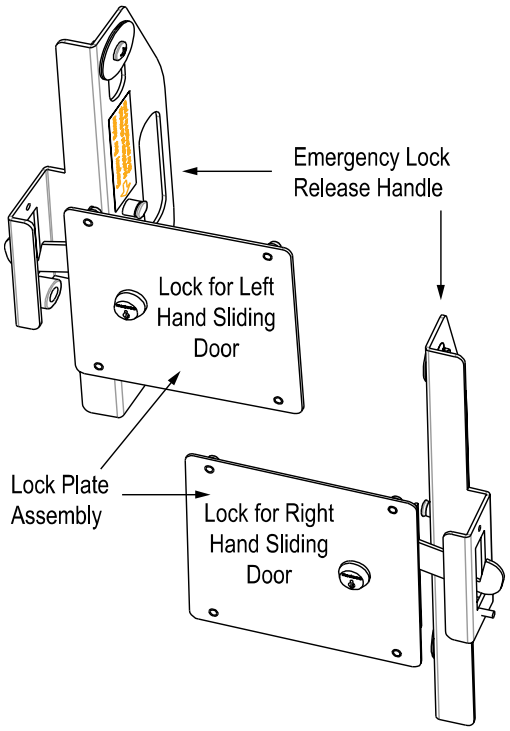
For an installation diagram, see, Attach Emergency Lock Release Handle to Upright, on page, 29. For an itemized component level diagram, see, Emergency Lock Release Handle Components, on page, 29.

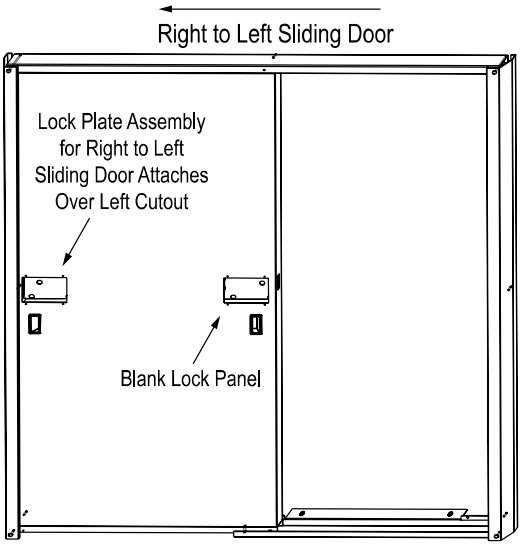
Lock Plate Assembly

The lock plate assembly is interchangeable and attaches to the face of the door over the left or right square cutout. The cutout used depends on the direction the door slides closed. If it is a right to left sliding door, the lock plate assembly is installed over the left cutout, as shown in the diagram to the right. For a left to right sliding door, the right cutout is used. A blank plate is installed over the cutout that is not used.

NOTE: If installing a left door lock on a right sliding door, the internal lock components must be disassembled and reversed to operate correctly. The same holds true if installing a right door lock on a left sliding door. The best way to avoid this is to order a lock assembly that matches the direction of the sliding door.

For an installation diagram, see Attach Lock Plate Assembly to Door, on page, 30. For an itemized component level diagram see, Lock Plate Assembly Components, on page, 30.

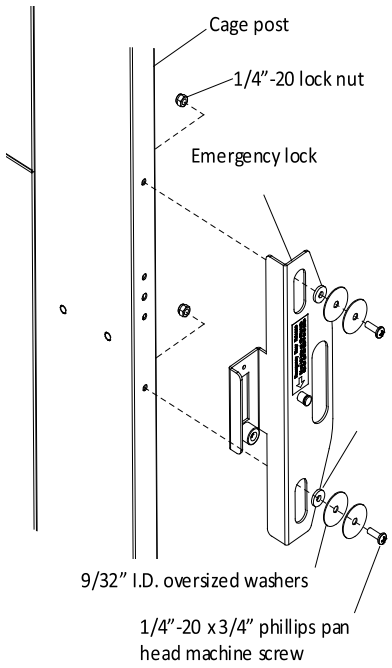




Attach Emergency Lock Release Handle to Upright

Prior to installing the sliding door, attach the emergency lock release handle to the inside edge of the upright, as shown in the diagram to the right.

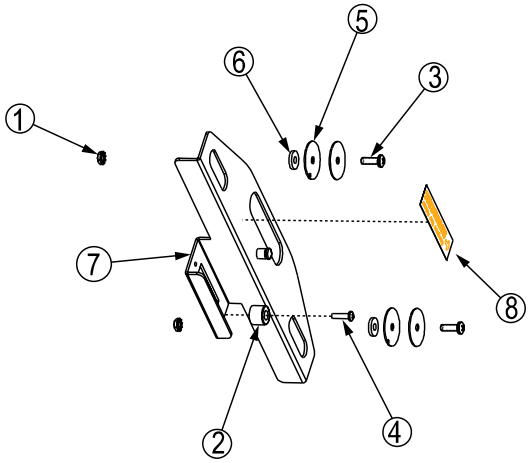
See, Emergency Lock Release Handle Components, on page 29, for an itemized list and detailed diagram.



Emergency Lock Release Handle Components

Below is an itemized list of the components, with part numbers, that comprise the emergency lock release handle. A diagram showing each part is located to the right.

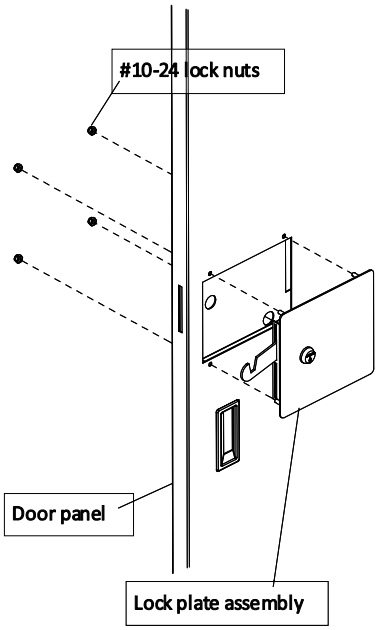
1. KEP nut, hex, 1/4 - 20, (18209)
2. Molded recess bumper (21053)
3. Pan Head screw, 1/4 - 20 x 3/4” (53956)
4. Screw, #10 – 24 x 3/4 (80023)
5. Fender Washer 1/4” x 1.5 (88590)
6. Spacer - Cage Lock (10779x)
7. Lock Strike – Sliding Door (10682x)
8. Label – Cage Lock (88592)



Attach Lock Plate Assembly to Door

Locate the edge of the sliding door closest to the upright. Attach the lock plate assembly as shown in the diagram to the right. Secure the lock plate to the door with four 10 – 24 lock nuts.

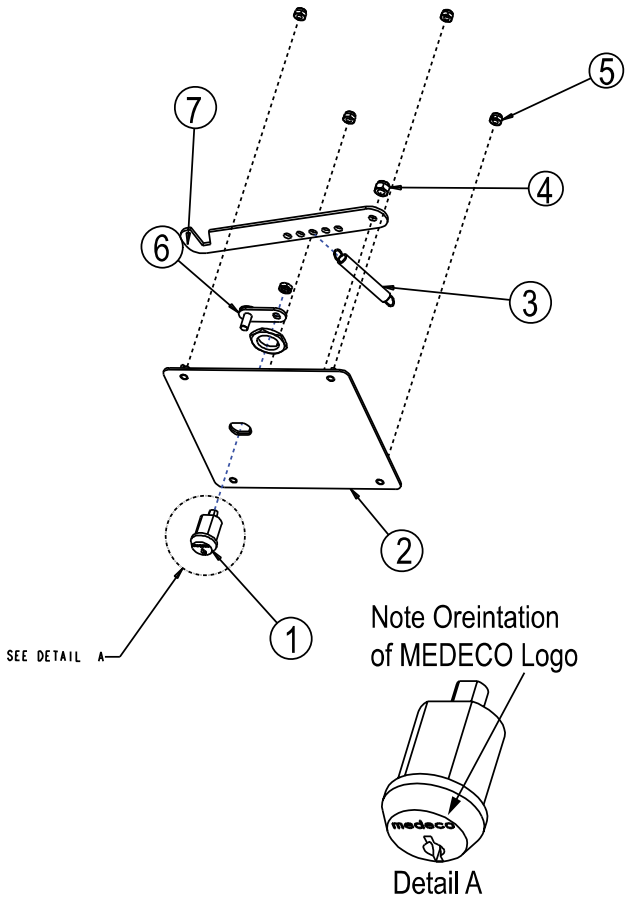
See, Lock Plate Assembly Components, on page 30, for an itemized list and detailed diagram.



Lock Plate Assembly Components

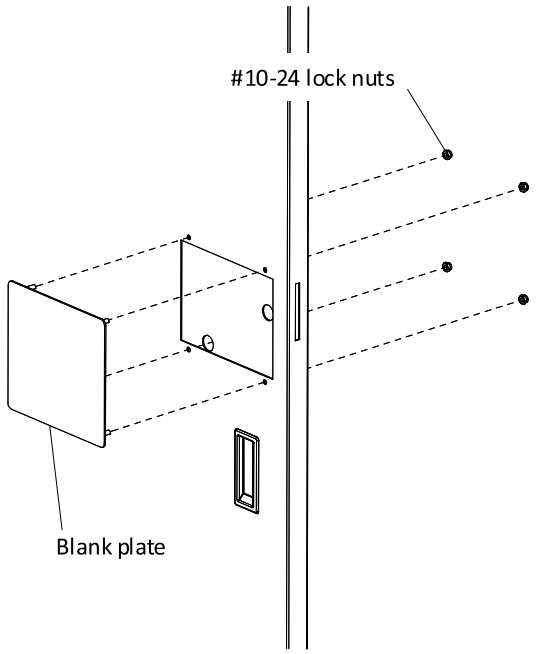
Below is an itemized list of the components, with part numbers, that comprise the lock plate assembly. A diagram showing each part is located to the right.

1. Medeco Lock Assembly (MEDKA)
2. Welded Lock Plate (10130x)
3. Extension Spring (88413)
4. Nut, 1/4 – 20 Nylon Insert (80724)
5. Nut, #10 – 24 Nylon Insert (87799)
6. Lockpawl (10131x)
7. Lock Cam (10132x)



Attach Blank Plate to Door

Position the blank panel over the remaining door cutout. Secure the blank panel to the door using four 10 – 24 lock nuts.



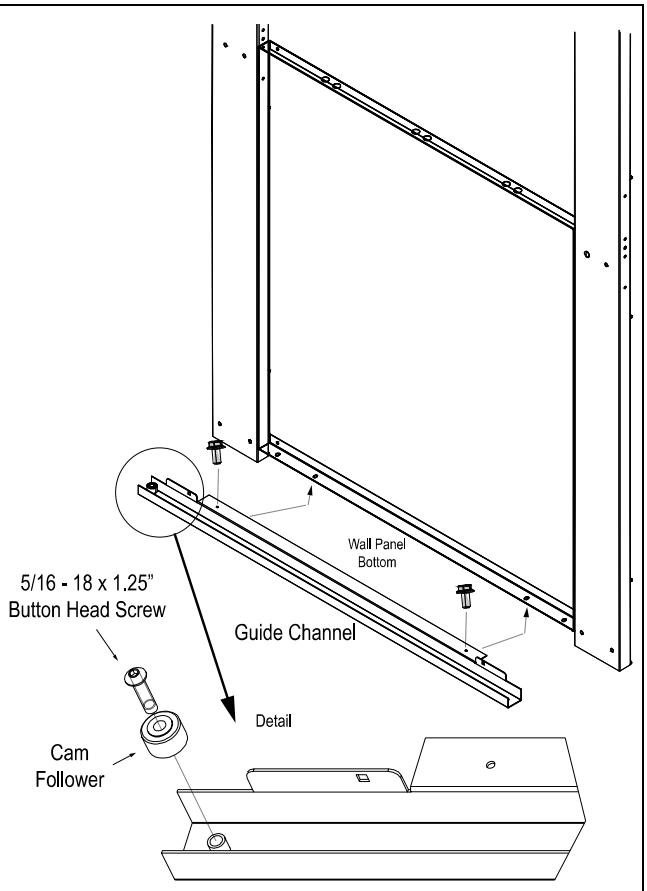
Install Door Channel Guide

The channel guide is installed at the bottom right of the door frame for doors that slide from left to right. For right to left sliding doors, the channel guide is installed on the bottom left.

Prior to installing the channel guide, attach the cam follower inside the channel guide tray using a 5/16” – 18 x 1.25” button head screw.

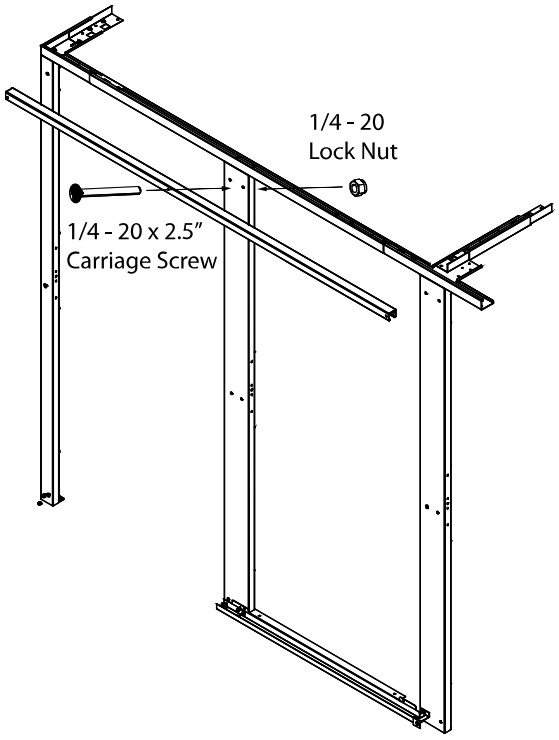
As shown to the right, the channel guide is attached to the bottom of the lower wall panel using two 1/4 – 20 x 1/2” self-threading screws.

To attach the channel guide, slide the flange on the channel guide under the bottom edge of the wall panel. Then thread the two screws from the top down <u>from inside the cage.</u> Tighten with 3/8” socket.



Attach Middle of Upper Track to Top of Upright

As shown in the diagram to the right, insert a 1/4 – 20 x 2.5” screw through the middle of the upper track, then through the knock-out hole on the upright. Secure the upper track component using a 1/4 - 20 lock nut on inside of the upright.

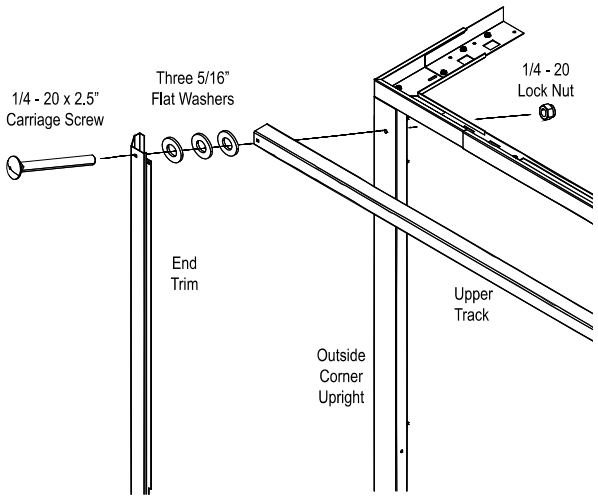


Attach Upper Track and End Trim Components

The diagram to the right shows how to attach the upper track and end trim components to a corner upright.

1. Insert the carriage screw through the top of the end trim, then place three 5/16” flat washers over the end of the screw on the inside of the trim plate.
2. Slide the end of the upper track over the carriage screw and insert the screw through the knock-out hole on the corner upright.
3. Secure the end trim, washers, and upper track component to the corner upright using a 1/4 – 20 lock nut.
4. Repeat the above steps to attach the other end of the upper track and end trim to the upright.

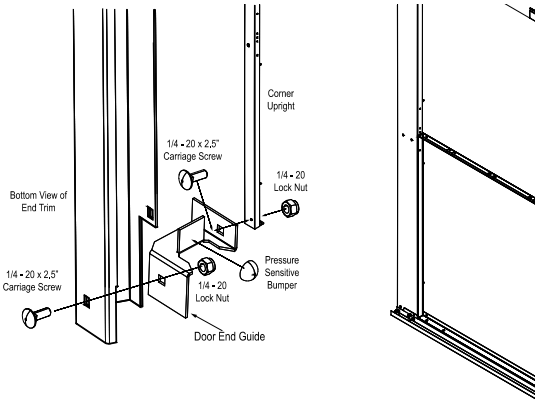
When completed, the upper track should be attached to top area of the cage with the end trim pieces hanging down adjacent to the corner and linear uprights.



Attach End Trim and Door End Guides to Corner and Linear Uprights

With the end trim components attached, install the door end guides at the bottom of each end trim component.

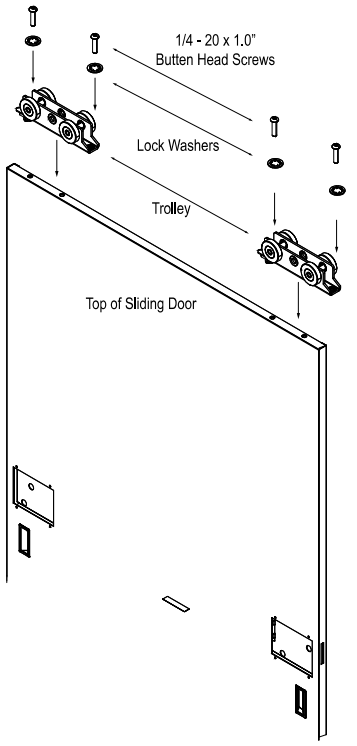
1. Affix the pressure sensitive bumper to the door end guide as shown to the right.
2. Position the door end guide against the bottom of the upright as shown, and attach using 1/4 - 20 x 2.5” carriage screw and 1/4 - 20 lock nut.
3. Position bottom of the end trim component over door and guide as shown, and attach using 1/4 - 20 x 2.5” carriage screw and 1/4 - 20 lock nut.
4. <u>Before attaching the other end trim</u>, assemble and insert the sliding door (next steps). Once the door is inserted and functional, come back and repeat the above steps to attach the door guide to the bottom of the opposite trim end component.



Attach Trollies to Top of Sliding Door

Before the sliding door can be inserted into the track and guide, trollies must be attached at the top of the door.

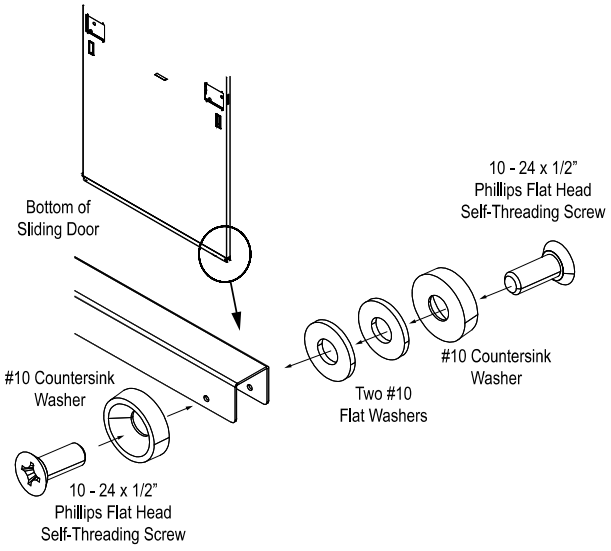
1. As shown in the diagram to the right, stand the door up.
2. Position trolley on the top end of the door.
3. Attach trolley to top of sliding door using two ¼ - 20 x 1.0” button head screws.
4. Repeat the steps above to attach the second trolley to the top of the door.



Attach Countersink Washers to Bottom of Sliding Door

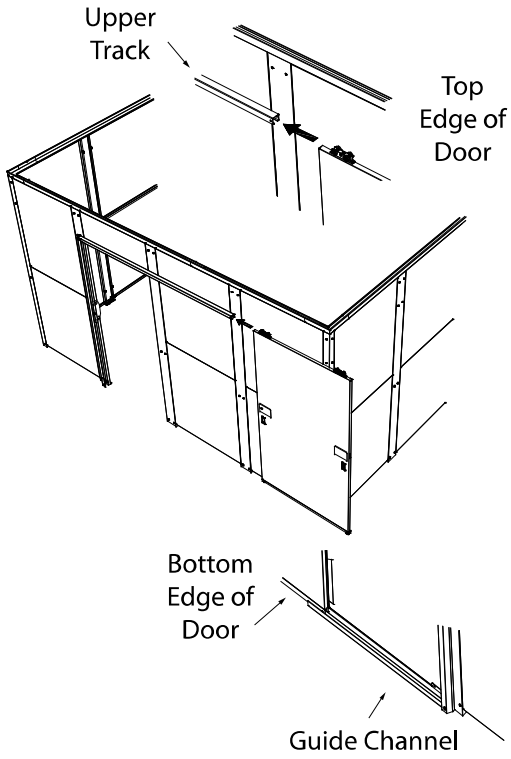
Before the sliding door can be inserted into the guide channel, countersink washers must be attached to the bottom edge of the door.

1. Locate the bottom edge of the door to be inserted into the channel guide.
2. As shown in the diagram to the right, at the front edge of the door, insert a 10 – 24 x1/2” Phillips flat head self-threading screw through a #10 countersink washer.
3. Thread the screw into the hole and tighten with #2 Phillips screwdriver.
4. At the rear edge of the door, insert a 10 – 24 x1/2” Phillips flat head self-threading screw through a #10 countersink washer, followed by two #10 flat washers.
5. Thread the screw into the backside hole and tighten with a #2 Phillips screwdriver.



Insert Sliding Door into Upper Track and Guide Channel

Insert the bottom of the door into the guide channel and the top of the door in the upper

track.	 Upper Track Top Edge of Door Bottom Edge of Door Guide Channel

Wall Panels (SSPW*nn*)

Wall panels are steel modular panels with 3/8” perforated holes. When installed, they attach to both sides of corner and linear uprights to provide secure enclosed walls around the perimeter of the cage.

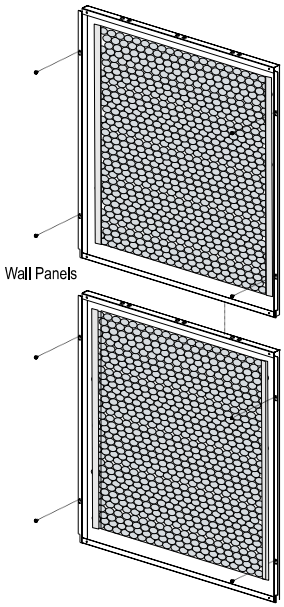
NOTE: It is recommended that wall panels be installed as one of the last steps (along with ceiling panels) in the overall installation process. This enables installers to work from the inside, outside, and above the cage system without visual or physical obstructions.

Wall Panel Sizes

Wall panels are installed in pairs, one above the other. Both, the lower and upper wall panel pair are the same size.

Wall panel pairs are manufactured to support 8, 9, and 10 foot high cage walls and support widths of 1, 2, 3, and 4 feet.

Eight 1/4 – 20 x 1/2” self-threading screws are required when attaching a pair of wall panels to corner and linear uprights.

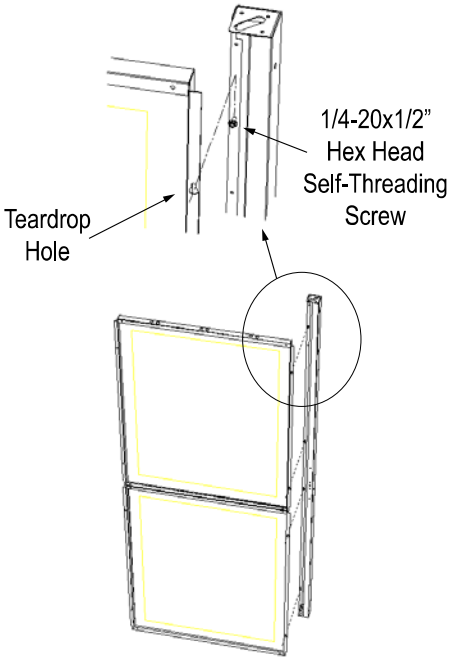


Attaching Wall Panels to Corner Uprights

To attach wall panels to a corner upright, insert and thread four 1/4 – 20 x 1/2” hex head self-threading screws halfway into each hole on the inside edge of the corner upright.

Attach the bottom wall panel first, followed by the upper wall panel.

To attach each wall panel, slip the teardrop holes located on the edge of the wall panel over each screw. Tighten the screws to secure the wall panel to the corner upright.

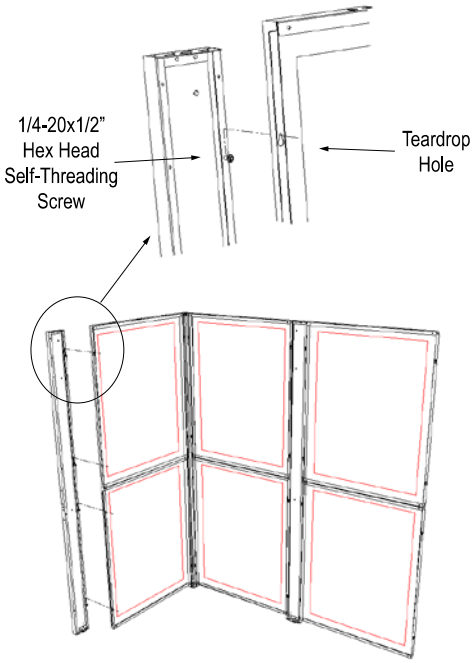


Attaching Wall Panels to Linear Uprights

To attach wall panels to a linear upright, insert and thread four 1/4 – 20 x 1/2” hex head self-threading screws halfway into each hole on the inside edge of the linear upright.

Attach the bottom wall panel first, followed by the upper wall panel.

To attach each wall panel, slip the teardrop holes located on the edge of the wall panel over each screw. Tighten the screws to secure the wall panel to the linear upright.



Ceiling Panels (SSPC*nn*)

Ceiling panels can be installed across the ceiling of a cage system to provide total enclosed cage security.

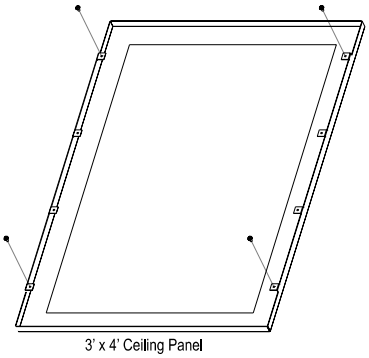
NOTE: It is recommended that ceiling panels be installed as one of the last steps (along with wall panels) in the overall installation process. This enables installers to work from the inside, outside, and above the cage system without visual or physical obstructions.

Ceiling Panel Sizes

Ceiling panels come in the following sizes:

- 3’ x 3’, 3’ x 4’, 3’ x 5’
- 4’ x 3’, 4’ x 4’, 4’ x 5’

Four 1/4 – 20 x 1/2” self-threading screws are required when attaching ceiling panels to ceiling spreaders.



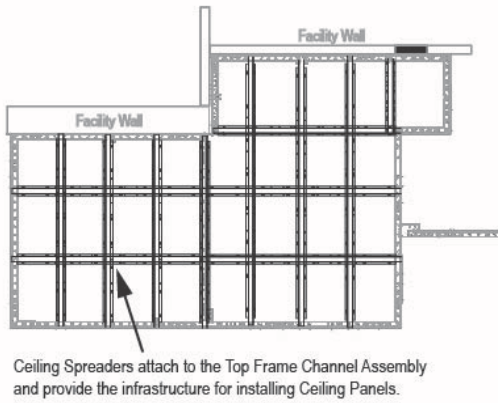
Installing a Ceiling Spreader Matrix to Support Ceiling Panels

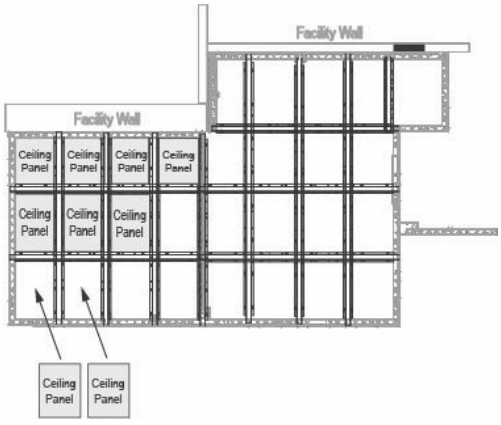
For cage designs that include a ceiling, ceiling spreaders are interconnected to form a matrix of 3 to 5 foot rectangles. The size of each rectangle depends on the size of the ceiling panels to be installed.

To create the matrix, ceiling spreaders are first attached to top frame channel rails across the full length of the cage in one direction. Typically, this is from front to back, but can be side to side if necessary, and only for a maximum width of 20 feet. Once full length spreaders are installed, short spreaders are then attached in a perpendicular direction.

Full length spreaders should be installed at intervals matching the dimensions of the ceiling panels. For instance, if the cage is 12’ x 12’ and 3’ x 4’ ceiling panels are to be installed, start from the edge of the cage and install full length ceiling spreaders every 3 feet. Once completed, install short spreaders every 4 feet, working from the back of the cage to the front.

After the ceiling spreader matrix is installed, ceiling panels can be inserted and fastened into each space to enclose the ceiling area.





Ceiling Rod Anchor Bracket (SSTFTRK)

The ceiling rod anchor bracket (SSTFTRK) enables installers to attach top frame channel rails to metal rods hanging from the ceiling. Attaching the top frame structure to hanging ceiling rods helps provide stability to a cage wall. This is particularly useful when there are no other means available for providing wall support to lengthy cage wall runs; that is, for cage walls exceeding 32 feet in length, constructed without corner uprights, inside tee assemblies, ceiling spreaders, or wall side supports.

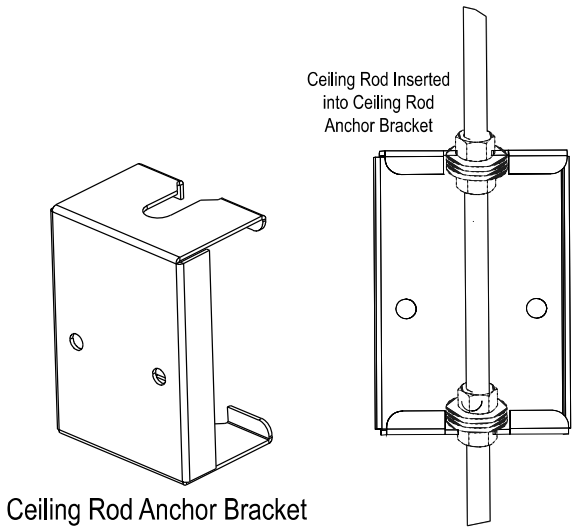
NOTE: The installation of ceiling rods are the responsibility of facility personnel and facility management, not the cage installation team. Cage installation teams are only responsible for attaching ceiling rod anchor brackets to previously hung ceiling rods.

About the Ceiling Rod Anchor Bracket

The ceiling rod anchor bracket is a hollow rectangular shaped bracket with a solid face on one side. The solid face has two holes used when attaching the bracket to the wall mount bracket described in the following paragraph.

The hollow side has clamp-like ends with open slots at the top and bottom for inserting the threaded section of a hanging ceiling rod. The open slots will accept ceiling rods up to 1/2” in diameter. As shown to the right, the threaded/adjustable portion of the ceiling rod slides into the slots on the hollow side of the bracket.

Prior to inserting the ceiling rod, the threaded/adjustable portion of the ceiling rod should be turned to achieve the approximate height of the channel rail to which the bracket will be connected.

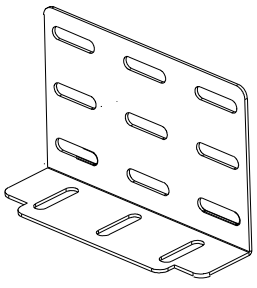


Top Frame Wall Mount Bracket

The top frame wall mount bracket is a multi-purpose bracket with two flange plates bent at a 90 degree angle.

When used with the ceiling rod anchor bracket, the smaller flange is attached underneath the channel rail, directly below the hanging ceiling rod. The larger flange is used for attaching the ceiling rod anchor bracket to the wall mount bracket.

As shown to the right, the wall mount bracket has several elongated holes on both flanges which provide flexibility for lining up screw holes on channel rails and the ceiling rod



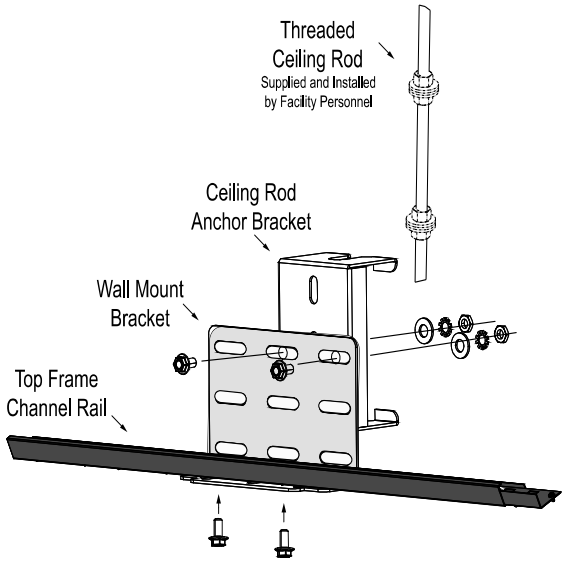
anchor bracket.

Use two 1/4 – 20 x 1/2” self-threading screws when attaching the wall mount bracket to the channel rail.

Use two 1/4 – 20 x 1/2” button head screws, 5/16 flat head washers, star washers, and Keps nuts when attaching the ceiling rod anchor bracket to the wall mount bracket.

Attaching Ceiling Rods to Channel Rails

1. Locate ceiling rod above channel rail.
2. Position wall mount bracket flange below channel rail as shown in the diagram to the right.
3. Attach wall mount bracket to channel rail using two 1/4 – 20 x 1/2” self-threading screws. Thread from the bottom, through the bracket, upward into the channel rail.
4. Adjust nuts on threaded ceiling rod to approximate height.
5. Insert hanging ceiling rod into top and bottom slots on hollow side of ceiling rod anchor bracket. Adjust anchor bracket height (using nuts/threads on ceiling rod) to line up with holes on wall mount bracket.
6. Attach ceiling rod anchor bracket to wall mount bracket using two 1/4 – 20 x 1/2” button head screws, 5/16 flat head washers, star washers, and Keps nuts.
7. Make final adjustments to remove any slack from the ceiling rod and ceiling.
8. Repeat above steps to attach additional ceiling rods to top frame channel rails.



Wall Side Support (SSWSS*nn*)

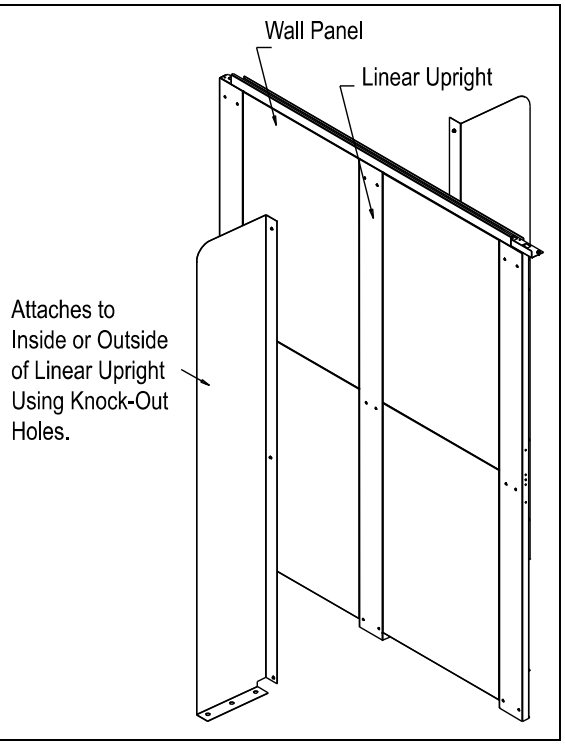
The wall side support (SSWSS*nn*) is used to provide lateral support for lengthy cage wall runs that span a distance of 16 feet or longer.

About the Wall Side Support

The wall side support is a 15 inch wide panel that can be attached to either side of a linear upright to provide stability to a lengthy cage wall run.

It may be necessary to attach one or more wall side supports to a lengthy cage wall run when other methods of wall support cannot be facilitated. That is, if ceiling spreaders and/or ceiling tie rods cannot be used to provide wall stability.

To attach a wall side support to a linear upright, use the upright's knock-out holes and three 1/4 - 20 x1/2" button head screws, nuts, and washers.



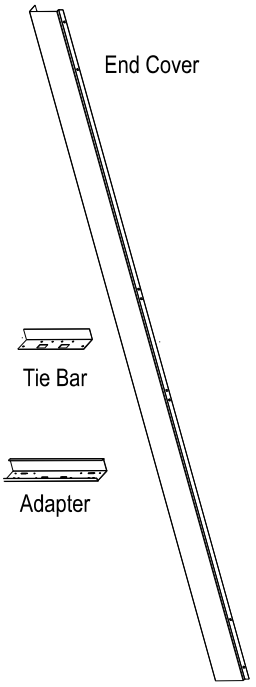
End Cover Assembly (SSENDCVR*nn*)

The end cover assembly (SSENDCVR*nn*) is attached to the inside face of a linear upright whenever a linear upright is used as the terminating endpoint for a cage wall run. Included with the end cover are short top frame channel rail components that cover the top of the linear upright and interconnect to the adjacent top frame channel rail.

About the End Cover Assembly

The end cover is a thin metal plate, molded to fit over the inside face of a linear upright.

Included in the end cover assembly is a 15 inch top frame adapter and tie bar. These components are used to extend and terminate the top frame channel structure over the linear upright.



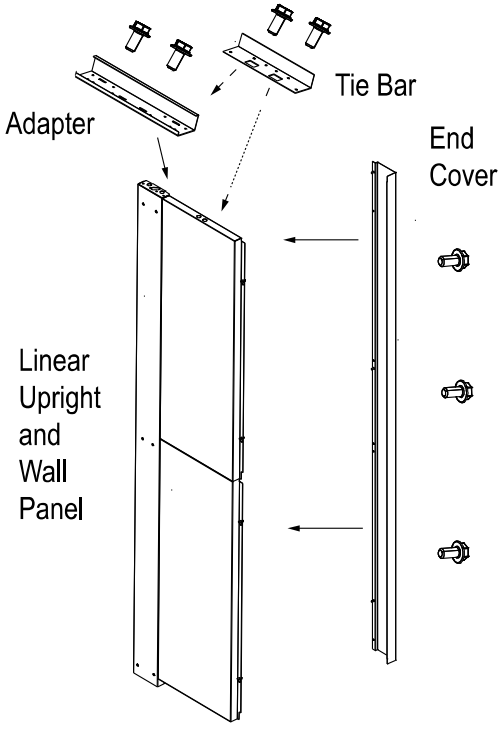
Attaching End Cover to a Linear Upright

The end cover attaches to the inside face of a linear upright using three 1/4 – 20 x 1/2” self-threading screws.

The adapter attaches to the top of the linear upright using two 1/4 – 20 x 1/2” self-threading screws.

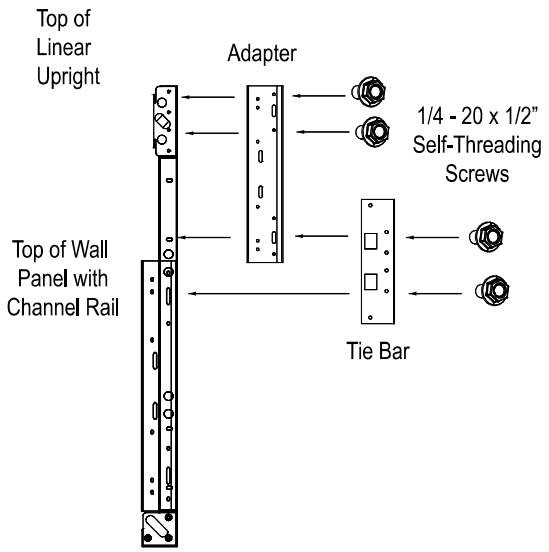
The adapter has no tapered end, therefore if the adjacent channel rail has a tapered end, the tapered end slides into the adapter and two 1/4 – 20 x 1/2” self-threading screws are used to attach the channel rail components together.

If the adjacent channel rail has a non-tapered end, then the adapter abuts to the channel rail and the tie bar is used to attach the two components together using two 1/4 – 20 x 1/2” self-threading screws.



End Cover Top Frame Detailed View

The diagram to the right shows an overhead view of the end cover top frame components and how they attach to an adjacent channel rail.



Installation Steps (Recommended)

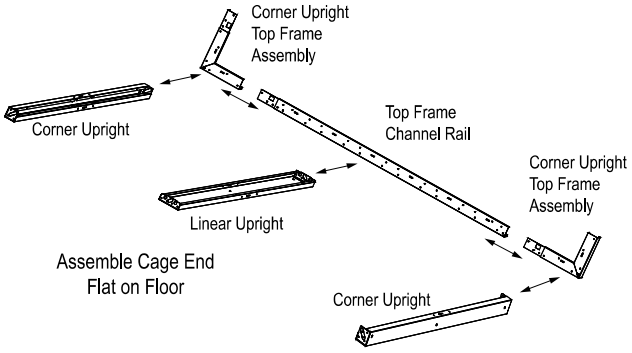
The following steps outline a recommended approach to installing an Eaton cage system.

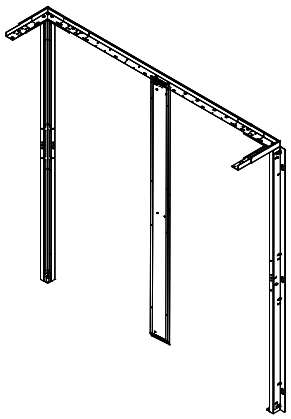
<table>
<tr>
<td>Step 1: Review Site and Cage Floor Plans</td>
<td>

Measure distances from walls and floor tiles to determine where corner uprights and cage wall runs will be erected.
Mark the floor where cage wall corners will be anchored.
Snap chalk lines to identify path for cage wall runs.
Note if any cage walls are to be anchored to facility walls.
Confer with facility manager to identify proper anchoring hardware to use.

</td>
</tr>
<tr>
<td>Step 2: Assemble and Frame One End of the Cage System

Assembly of a cage system generally begins by framing one end wall of the cage “on the floor”, then erecting the wall and anchoring it to a facility wall and/or floor.

This generally includes:
Two corner uprights;
One or more linear uprights installed between the corner uprights;
Top frame assemblies and channel rail(s), interconnecting the upper perimeter of the cage.
The wall should be assembled and framed flat on the floor. Once assembled, stand wall upright and position the corner uprights over the spots where they will be anchored to the floor. Re-check measurements and alignment. Anchor both corner posts to the floor, followed by linear uprights.</td>
<td> 


Once Assembled on the Ground Stand Frame Up and Anchor Corner Posts and Linear Upright to the Floor</td>
</tr>
<tr>
<td>Step 3: Install Entire Cage Skeleton FIRST

Before attaching or installing other cage components, complete the</td>
<td></td>
</tr>
</table>

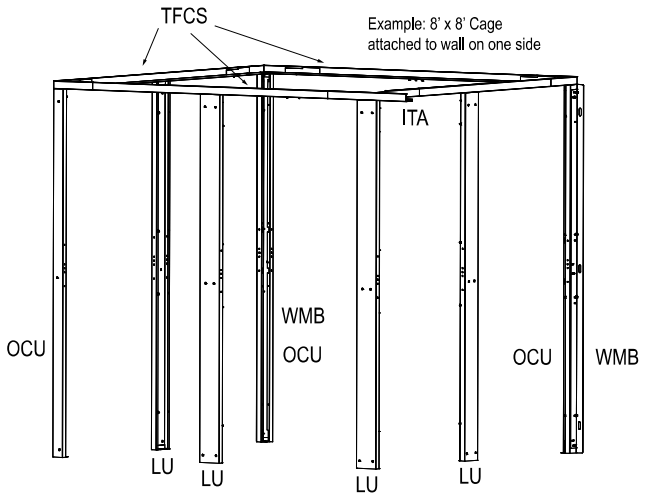
installation of the cage skeleton "frame structure" first.

This includes all corner uprights, linear uprights, tee assemblies, and the entire top frame structure around the upper perimeter of the cage.

This also includes anchoring corner and linear uprights to the floor and wall mount brackets to the wall. That is, if a facility wall is part of the cage design.

The diagram to the right shows a basic 8' by 8' cage system, with the frame completely installed.

Install Cage Skeleton Structure **FIRST**
Includes Corner Uprights, Linear Uprights, Wall Mount Brackets, Inside Tee Assemblies, and the Top Frame Channel Structure



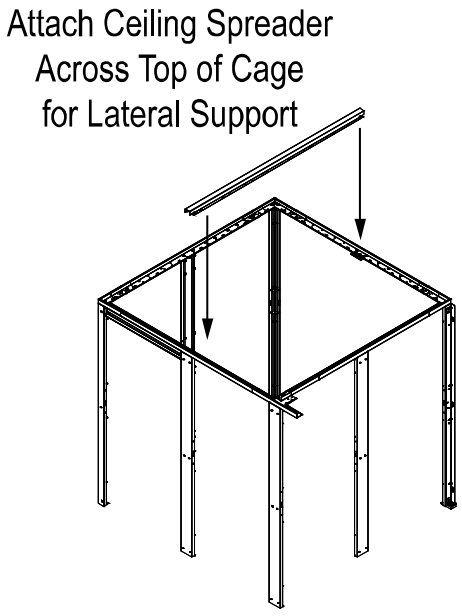
OCU = Outside Corner Upright
LU = Linear Upright
WMB = Wall Mount Bracket
TFCS = Top Frame Channel Structure
ITA = Inside Tee Assembly

Note: Installing the skeletal structure first not only provides a solid foundation on which to add additional components, it also makes it much easier for installers to work fluidly on the inside and outside of the cage without being hampered by visual and physical obstructions.

Step 4: Install Ceiling Spreaders for Lateral Support

Once the cage skeleton is installed and anchored to the floor (and wall), attach a ceiling spreader to the top frame channel rails to provide lateral support for the cage walls.

At a minimum, ceiling spreaders should be attached every 32 feet.

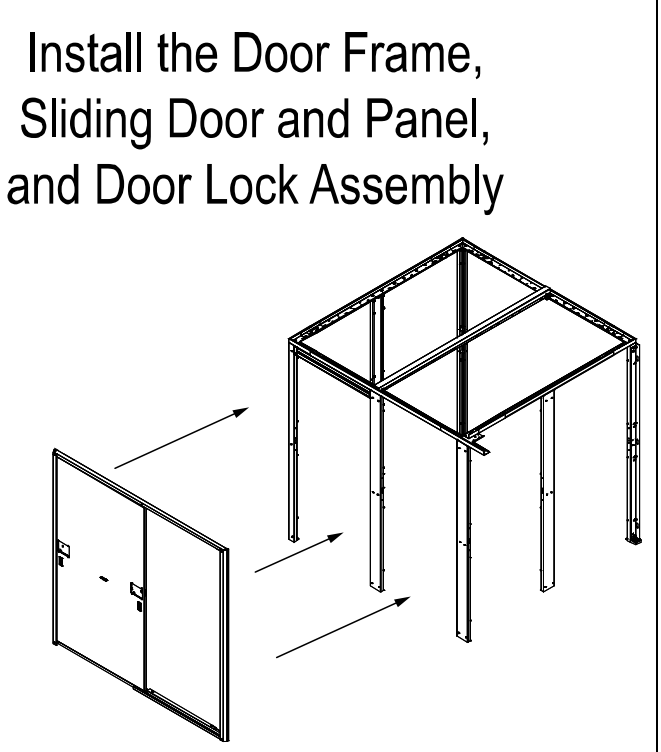


Step 5: Install Door Frame, Door, and Lock Assembly

Attach the door frame (guide and track) to the corner and linear uprights.

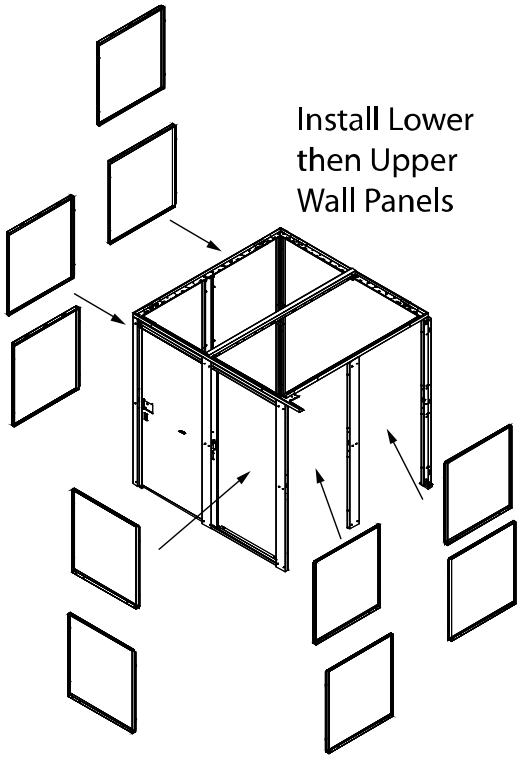
Attach the sliding door to the door frame and install door panel above the door.

Attach the lock assembly to the door.



Step 6: Install Wall Panels

After the frame structure, ceiling spreaders, and door/lock assemblies have been installed, install the lower and upper wall panels throughout the cage system.



Miscellaneous Tasks and Procedures

This section describes miscellaneous tasks and procedures installers may use from time to time when installing a cage system.

Removing Knock-Out Holes

On the outside face of all corner and linear uprights are six knock-out holes; three vertical holes down the left face and three down the right face.

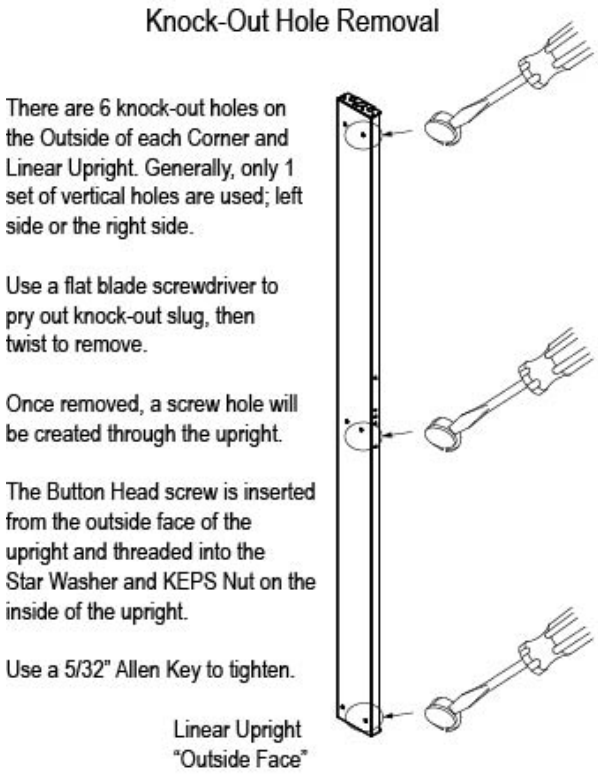
The knock-out holes are primarily used when attaching the following components to a linear upright:

- Outside Tee Assembly
- Inside Tee Assembly
- Wall Side Support
- Door Assembly
- Wall Mount Bracket (only if bracket is to be connected to outside face of upright)

Note: Knock-out holes on corner uprights are typically only used when attaching door assemblies or wall mount brackets to the upright.

Generally, only one set of vertical knock-out holes are used to install a component, not all six. The set of holes used depends on how the component lines up with the rest of the cage system layout (wall) once installed.

As shown in the diagram, before knock-out holes can be used, the knock-out-hole slugs must be removed with a flat blade screwdriver. Once the knock-out slugs are removed, screw holes will be visible completely through the upright.



When attaching components to an upright through knock-out holes, installers must use button head screws (82703), hex KEPS nuts, and star washers (generally three each).

Button head screws are inserted from the outside face and threaded into the washers and KEPS Nuts located on the inside face of the upright. A 5/32” Allen Key is required for tightening.

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