

## MODELS:

V2KSD, V4JSD, V4YHD, V4YVD

## General Notes

1. These instructions are for mounting of louvered equipment screens directly to air handling units. Framing has been designed to fit the specific air handler(s) on your project.
2. Maximum overall size is unlimited. However, overall dimensions larger than the maximum single section size require joining of smaller sections to create the overall size.
3. Framing and louvers provided are designed for 30 lbs per square foot live load and 30 lbs per square foot wind load (unless otherwise noted for your project). The framing requires support from the air handling unit to provide the overall structural integrity. In some cases, additional posts, support feet, or structural framing may be required to meet the wind load requirements.
4. Some structural members, mounting angles, clips, fasteners, and installation hardware may be required and supplied by the installing contractor. The details shown herewithin are recommendations only. Consult project submittal drawings for specific instructions about the installation for your project.
5. Read the entire installation instruction and review the project submittal drawings prior to proceeding with installation.

## General Installation Requirements

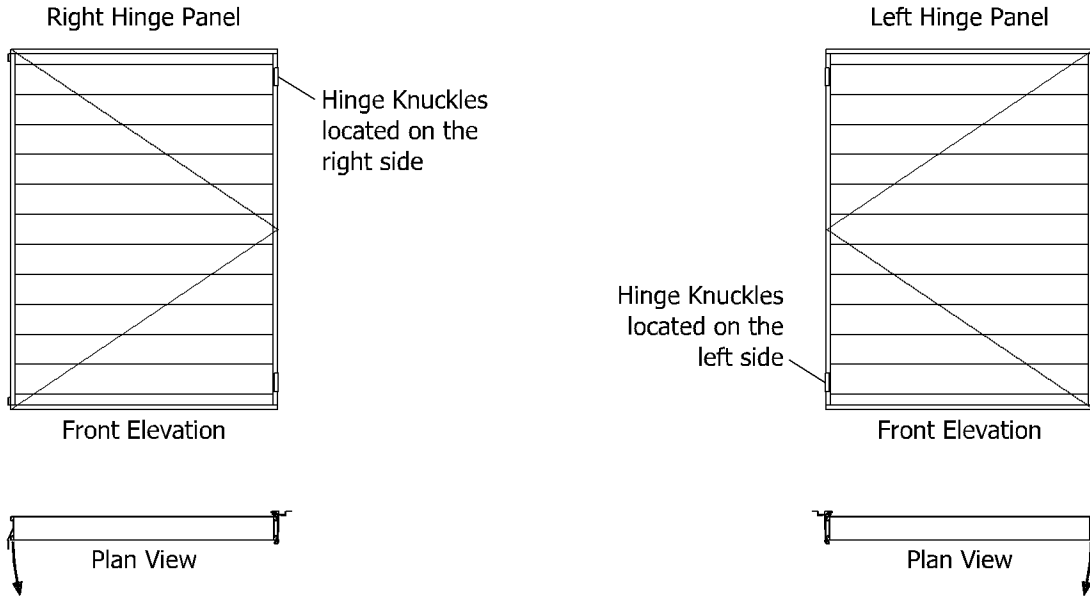
1. Use a carpenter's level to verify if the air handler is mounted level. If not, then mount the screens in the same plane as the air handler. Use the top surface of the air handler as the guide for mounting the standoff supports.
2. Fasteners to the air handler are not provided with the framing. Typical fasteners are 2" long #14 stainless steel tek screws with a #3 tip. Smaller diameter fasteners are not recommended. Ensure that the length of your fastener will fully penetrate the air handler skin and framing.
3. Penetrations through air handling units require special care. Avoid using fasteners in areas where the screw may hit cooling coils, electrical wiring, or other internal components of the air handler.
4. Caulk all penetrations through the skin of the air handler to minimize air leakage.
5. The size and quantity of fasteners provided is determined by the load on each connection. Connect joints with the proper fasteners to maintain the structural integrity of the assembly.

## Table of Contents

<u>Page(s)</u>	<u>Description</u>
2	Louver Panel and Screen Configurations
3-6	Assemble Standoff Supports (framing)
7-10	Mount Standoff Supports to the Air Handler
11-14	Mount Rails to the Standoff Supports
15-19	Mount Louver Panels to the Rails

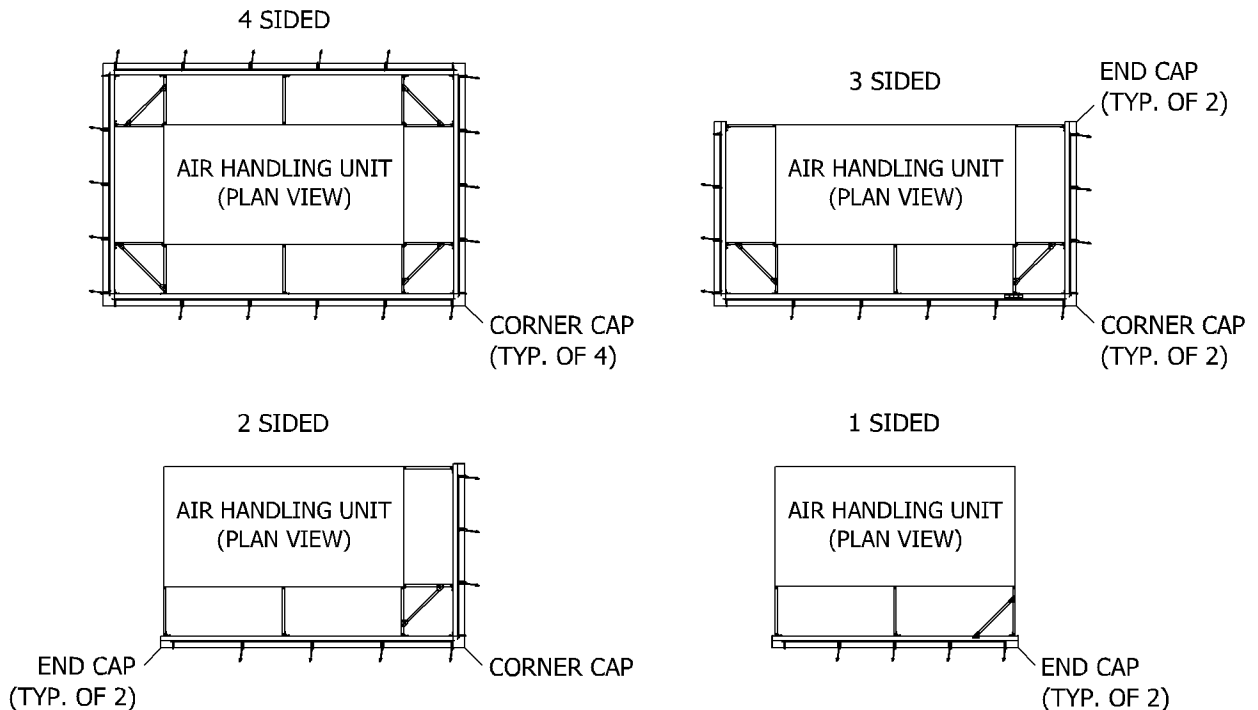
Louver Panel Configurations

Right hinge panels have the hinge knuckle located on the exterior right side of the louver panel. Left hinge panels have the hinge knuckle location on the left side of the panel. Hinging is noted on each line item of your project drawings and on the parts list provided with your shipment.



Typical Screen Configurations

Typical screen configurations are 1 sided, 2 sided, 3 sided, or 4 sided. However, review your project drawings for deviations and location of all standoff supports, racking braces, end caps, and corner caps.

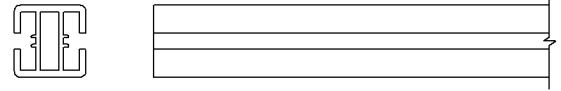


Assemble Standoff Supports

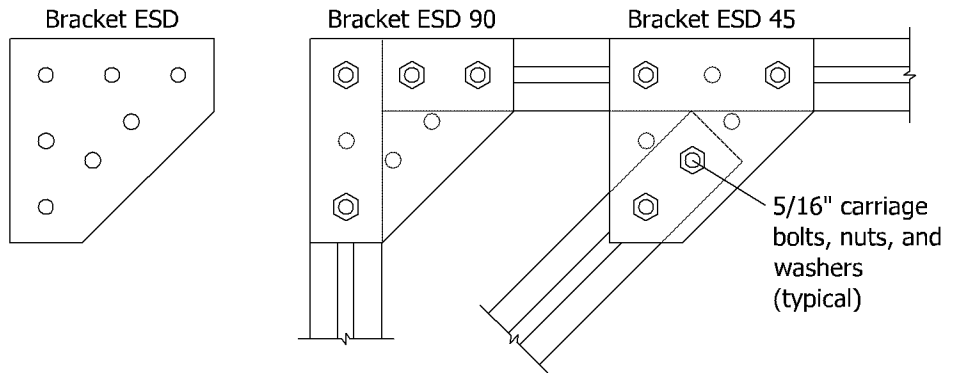
Parts list:

- A- vertical structural member slotted (1.5" x 1.5" modular frame)
- B- horizontal structural member slotted (1.5" x 1.5" modular frame)
- C- cross bracing structural member slotted (1.5" x 1.5" modular frame)

1.5 Structure



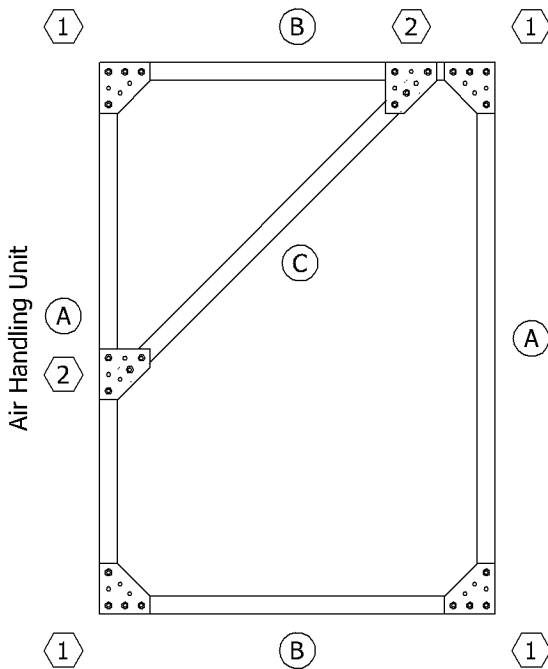
- 1- 90 degree corner bracket (Bracket ESD)
- 2- 45 degree cross bracket (Bracket ESD)
- 5/16" carriage bolts, nuts, and lock washers



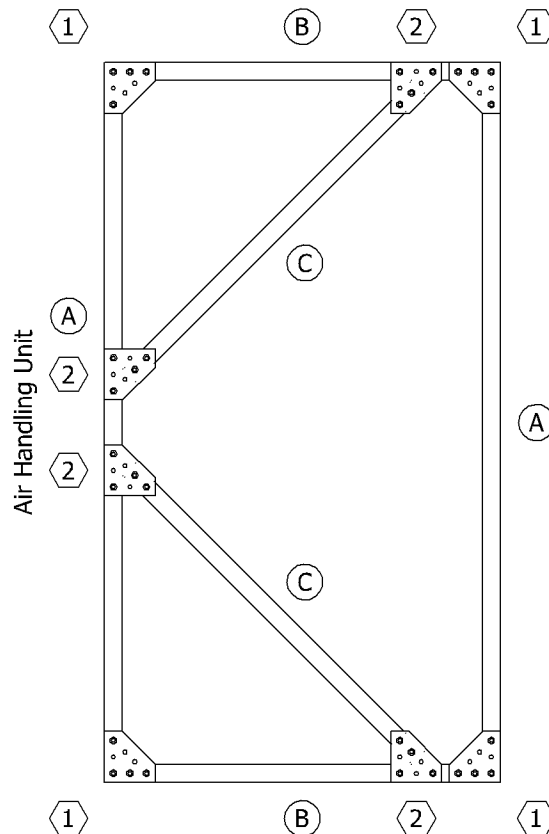
Standoff Support Configurations:

NOTE: The quantity of right and left support is dependent on the overall configuration of the screen. Please see the cut sheets and drawings for the number of each required.

Standoff Support with One Cross Brace  
Left Shown - Right is Mirror Image



Standoff Support with Two Cross Braces  
Left Shown - Right is Mirror Image



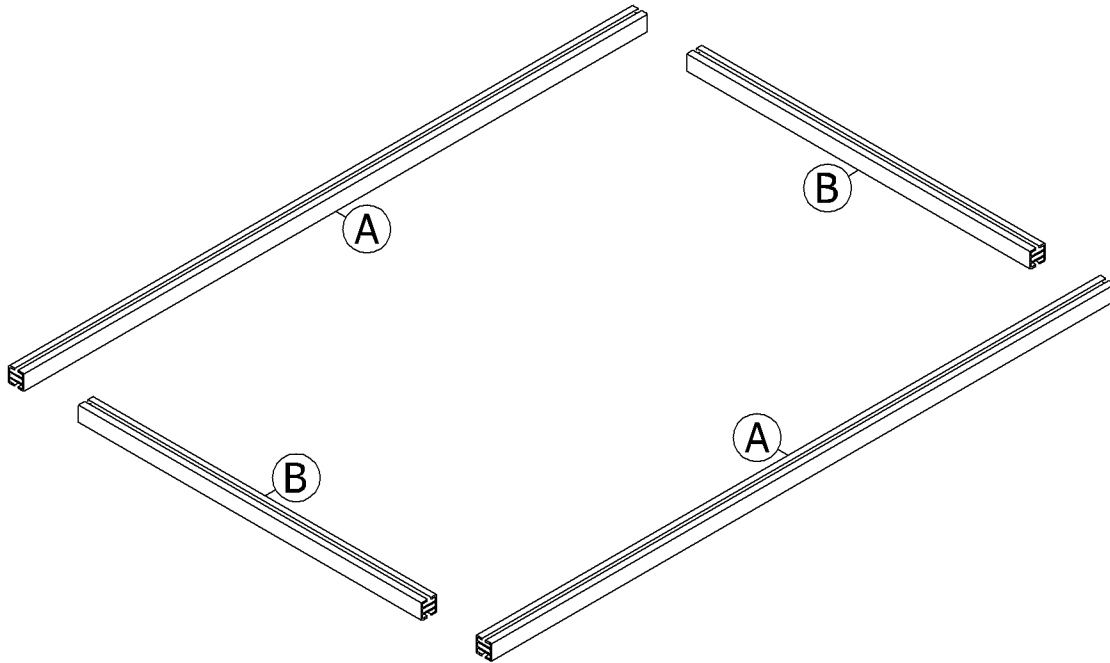
NOTE: Since this standoff bracket configuration is symmetrical, a "left" can be inverted to make a "right". Therefore, all standoff supports can be made the same (all lefts as shown) and inverted when needed for a right.

## Assemble Standoff Supports

Assembly Steps:

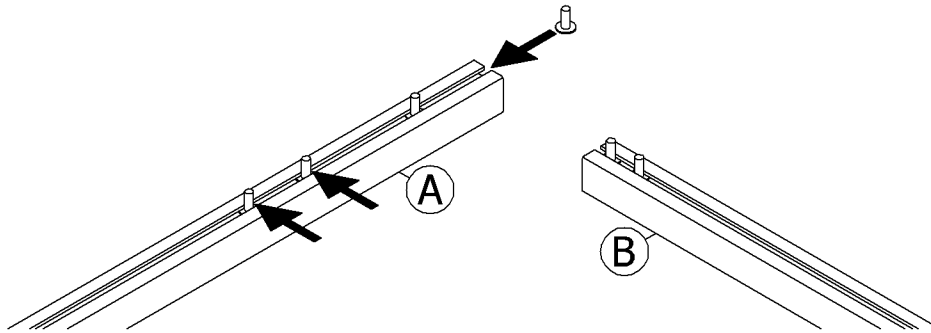
1. Lay out the framing members on a flat surface (see Figure 1-A). Depending on the size and configuration of your equipment screen, the quantities and dimensions of the framing will vary. This information is included in the "Parts List" that accompanies these instructions.

FIGURE 1-A



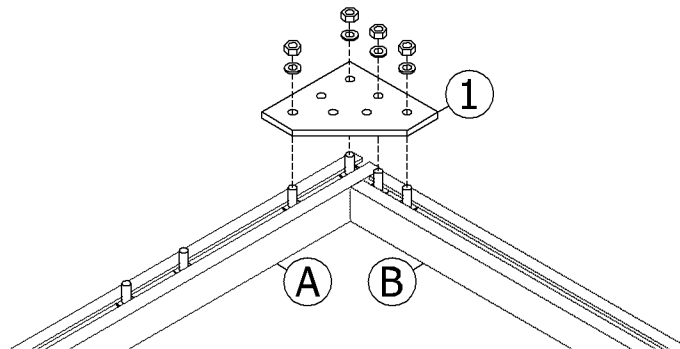
2. Insert 2 carriage bolts into the structural member "A". Insert 2 carriage bolts into structural member "B" (see Figure 2-A). Make sure to include 2 extra bolts into the channel "A" as shown (on one side only). These will be used for the attachment of cross member "C".

FIGURE 2-A



3. Push framing members A and B together and position the bolts so that the corner bracket will fit over them. Slide 90 degree corner bracket "1" over the bolts (see Figure 3-A). Apply one lock washer and nut to each bolt – hand tighten. Make sure the surfaces of each framing member are flush to the adjacent member. Use a carpenter's square to align the corner. Tighten the nuts with a ratchet or box end wrench.

FIGURE 3-A

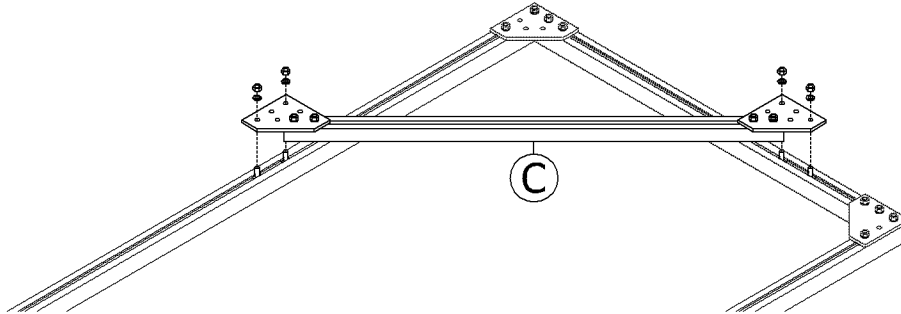


## Assemble Standoff Supports

Assembly Steps (continued):

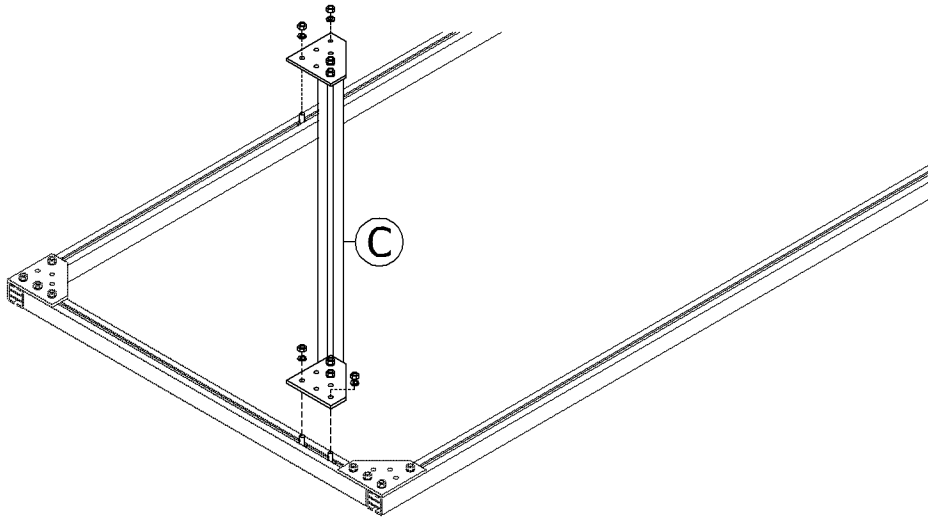
7. At the location of the upper cross brace, align the assembly "C" over the bolts in framing member "A" and "B" and apply one washer and nut to each bolt (2 per end). Framing member "C" should be at a 45 degree angle and touching both adjacent framing members after assembly (see Figure 7-A). Tighten all bolts with a ratchet or box end wrench.

FIGURE 7-A



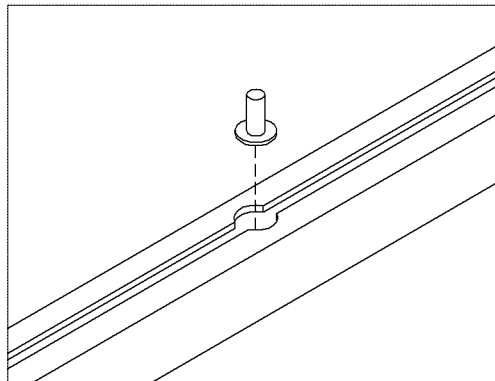
8. If your standoff support requires a lower cross brace, repeat step 6 for the bottom of the standoff support (see Figure 7-A).

FIGURE 8-A



**HINT:** If you need to insert bolts in a captivated channel, they can be added using a  $\frac{3}{4}$ " drill bit (See Figure Hint-1). Move 3"-4" away from where the bolt will be required. Drill a hole centered on the channel. Do not drill all the way through the structural member – the hole only needs to penetrate the upper legs of the channel. Insert a bolt through the hole and slide it to the required location.

FIGURE HINT-1

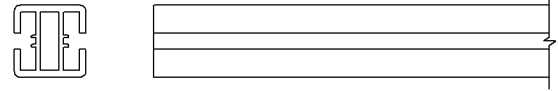


Mount the Standoff Supports to the Air Handler

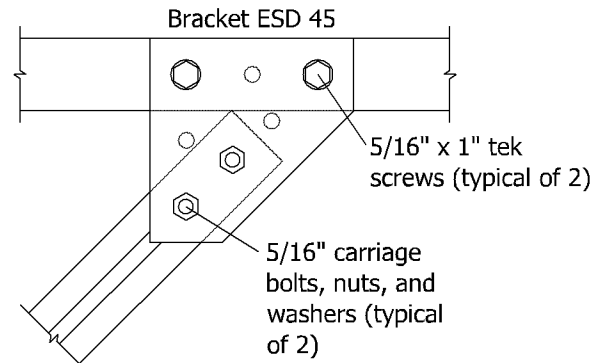
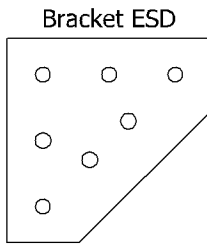
Parts list:

C- cross bracing structural member slotted (1.5" x 1.5" modular frame)

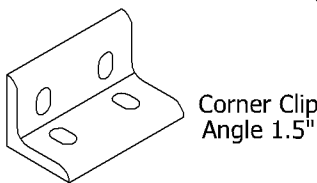
1.5 Structure



2- 45 degree corner bracket (Bracket ESD)



3 - corner clip angle 1.5"



5/16" carriage bolts, nuts, and lock washers

5/16" x 1" tek screws

Fasteners to air handling unit (not provided)

Assembly Steps at Corners:

1. Locate vertical structural framing inside the air handling unit (AHU). Most air handlers have framing at corners and at intervals along the length. Position standoff supports so fasteners mount through the air handling skin and into these framing members where possible. If a standoff support cannot be located at an AHU framing member, consider adding an internal framing member to the AHU at the location where a standoff support is required.
2. Drill holes through the "A" leg of the standoff support no greater than 6" from the ends and every 12" of height. Use a drill bit size that will create a tight clear hole for the fastener you have selected. Typical fasteners are 2" long #14 stainless steel Tek screws with a #3 bit (uses 1/4" drill bit).
3. Mount one standoff support to the air handler (see Figures 3-A and 3-B). The bolts and brackets of the standoff support must face away from the corner. As you mount more standoff supports, make sure they are at the same elevation by using a laser level or string for alignment.

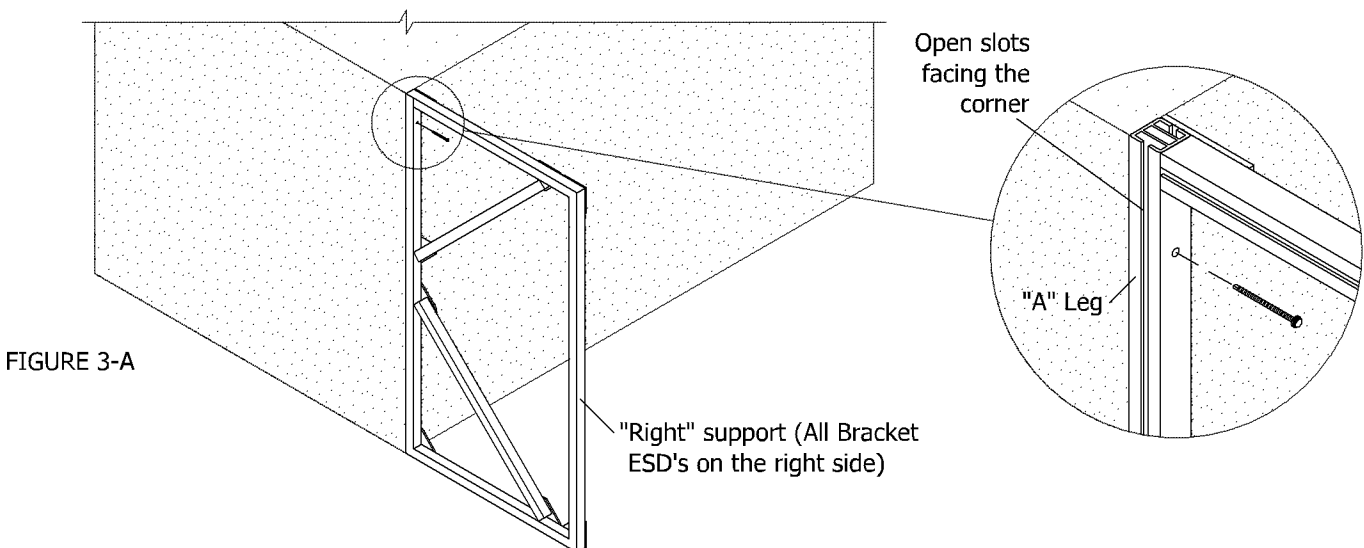


FIGURE 3-A

## Mount the Standoff Supports to the Air Handler

Assembly Steps at Corners (continued):

4. Mount the mating standoff support at the corner following the same procedure (see Figure 4-A). Bolts and brackets must face away from the corner. Each corner uses one "Left" and one "Right" support (see section "Standoff Support Configurations" on p. 2 for details).

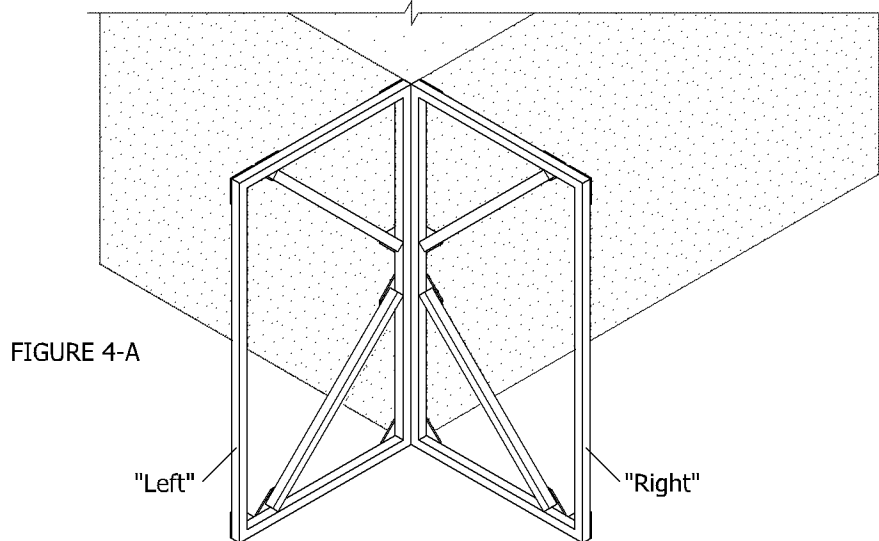


FIGURE 4-A

5. The top and bottom of each corner requires one racking brace (see Figure 5-A). Fit bracket "2" (45 degree cross bracket) to each end of framing member "C" with 2 carriage bolts, nuts and washers. Hand tighten the nuts.

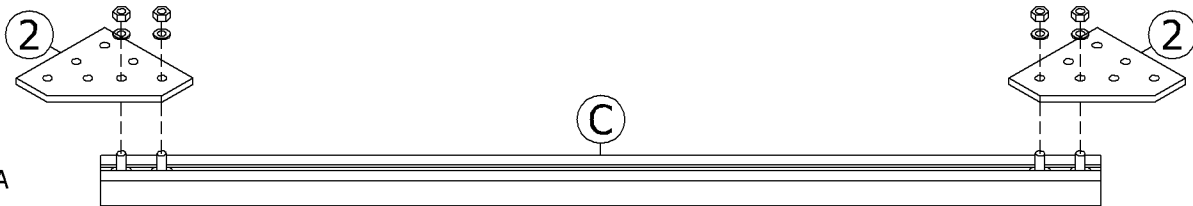


FIGURE 5-A

6. Use a carpenter's square to align the standoff supports at right angles to each other. Align the assembly "C" at a 45 degree angle over the framing members "B" and fasten each ESD Bracket with 2 each 5/16" x 1" tek screws (see Figure 6-A). Framing member "C" should be at a 45 degree angle and touching both adjacent framing members after assembly. Tighten all bolts with a ratchet or box end wrench. If access to the bottom of the framing is obstructed, cut 5" off the framing member "C" and mount it onto the top surface of the bottom framing member "B".

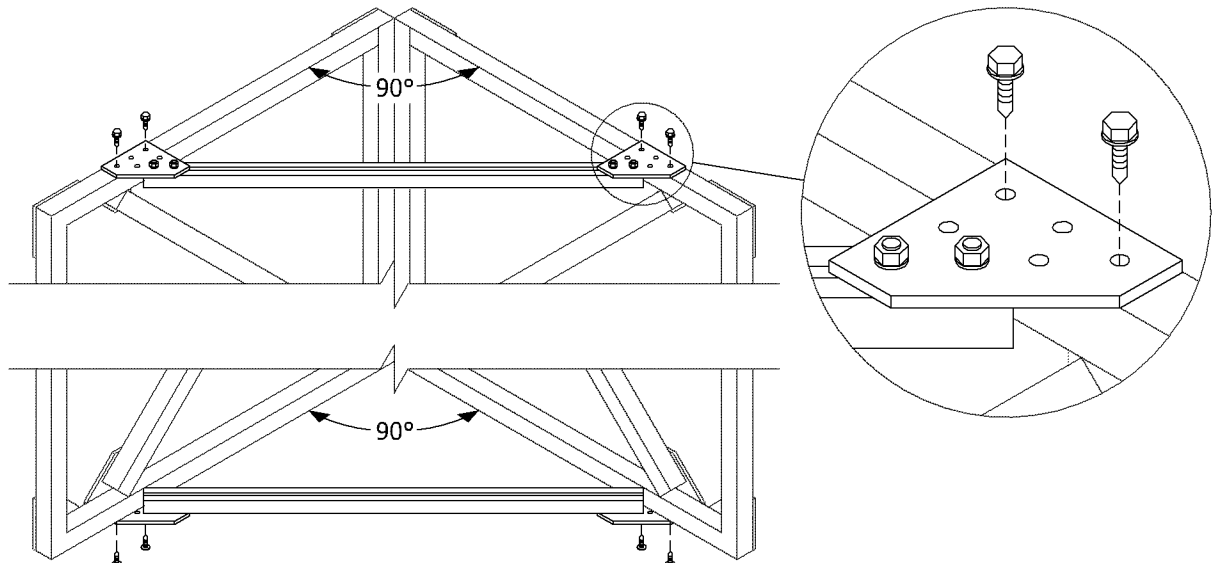


FIGURE 6-A

## Mount the Standoff Supports to the Air Handler

Assembly Steps at Corners (continued):

7. Each corner requires one corner clip angle 1.5 ("3") for every 18" of height. Place two carriage bolts through the holes in the corner clip angle (see Figure 7-A). Apply one washer and nut per bolt. Leave the nuts loose. Slide the heads of the carriage bolts into the slots of the standoff support. Locate one corner clip angle no farther than 6" from each end and every 18" of height. Tighten the nuts with a ratchet or box end wrench.

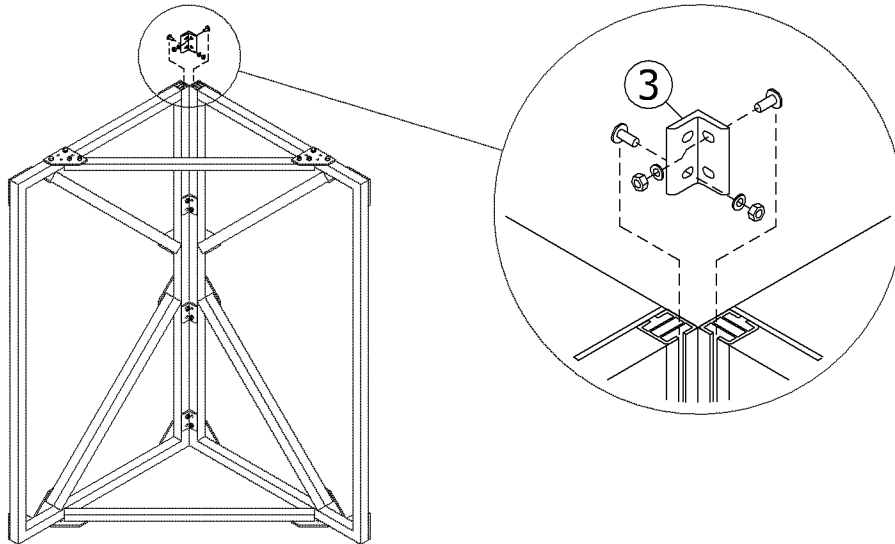


FIGURE 7-A

Assembly Steps at Ends:

1. Locate vertical structural framing inside the air handling unit (AHU). Most air handlers have framing at corners and at intervals along the length. Position standoff supports so fasteners mount through the air handling skin and into these framing members where possible. If a standoff support cannot be located at an AHU framing member, consider adding an internal framing member to the AHU at the location where a standoff support is required.

2. Drill holes through the "A" leg of the standoff support no farther than 6" from the ends and every 12" of height. Use a drill bit size that will create a tight clear hole for the fastener you have selected. Typical fasteners are 2" long #14 stainless steel Tek screws with a #3 tip. A tight clearance hole is 1/4".

3. Mount one standoff support to the air handler (see Figure 3-A). The bolts and brackets of the standoff support must face toward the end of the screen assembly. As you mount more standoff supports, make sure they are at the same elevation by using a laser level or string for alignment.

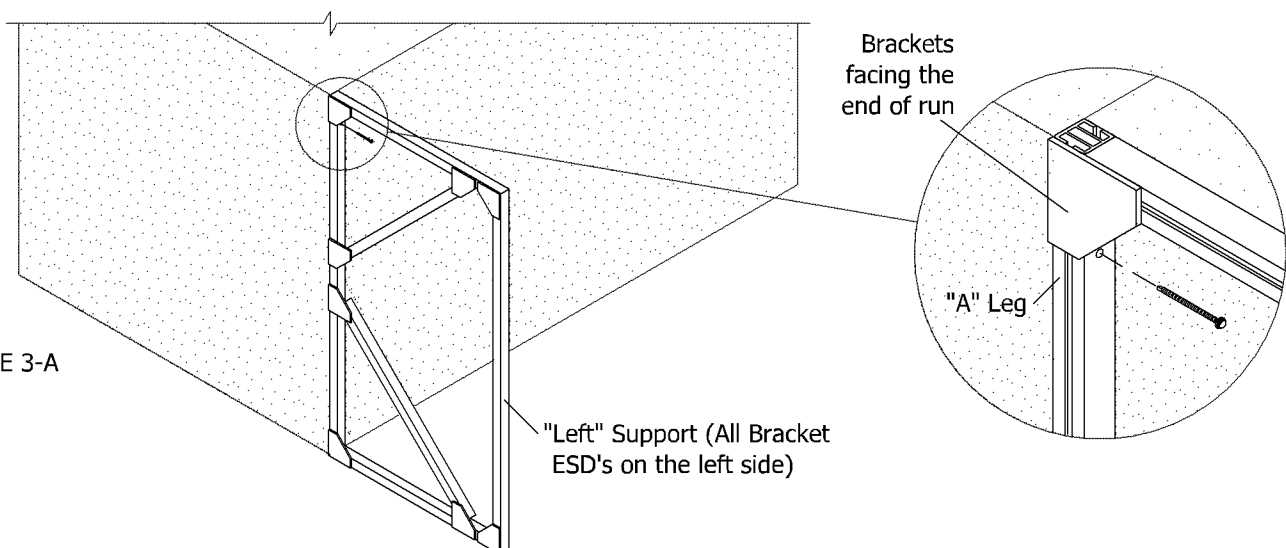


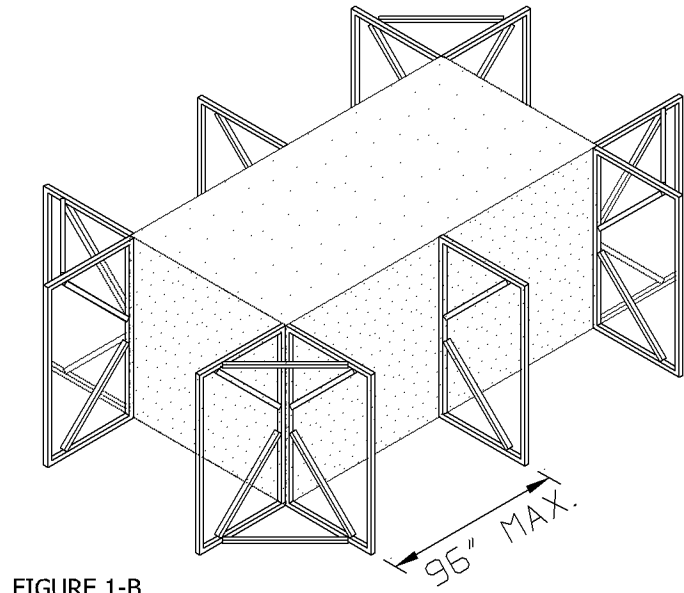
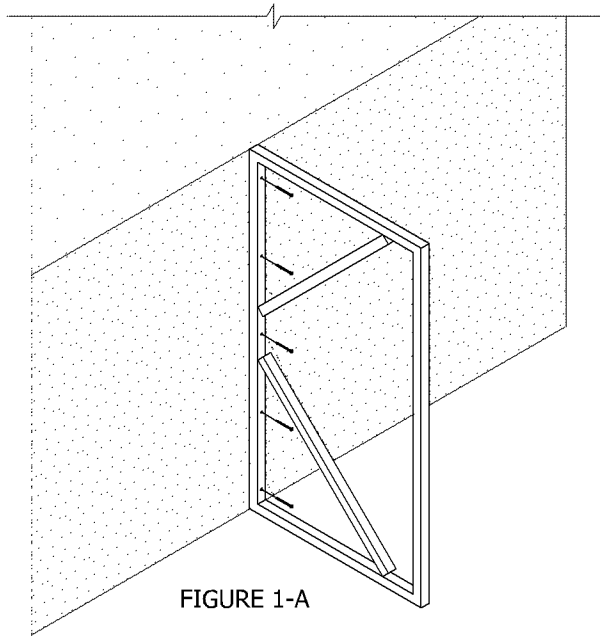
FIGURE 3-A



## Mount the Standoff Supports to the Air Handler

Assembly Steps at Intermediate Supports:

1. Mount any intermediate standoff supports using the same method as previously described (see Figure 1-A). Maximum horizontal distance between standoff supports is 96". Final layout for a 4-sided configuration should appear as shown in Figure 1-B.

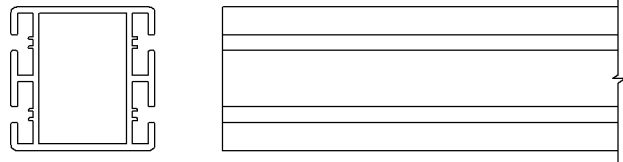


## Mount the Rails to the Standoff Supports

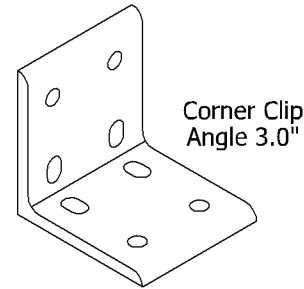
**Parts list:**

- S – Rail structural member (3" x 3" modular frame) - Length
- T - Rail structural member (3" x 3" modular frame) - Width

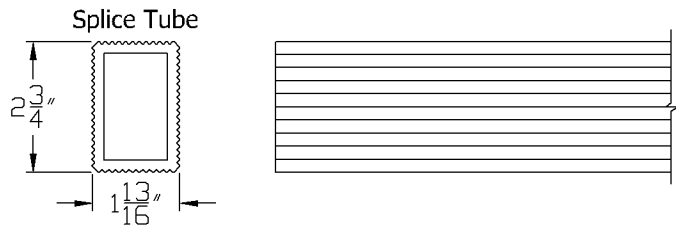
**3.0 Structure**



- 4 – Corner clip angle 3"



- 5 - Splice tube



- 5/16" carriage bolts, nuts, and lock washers

- 5/16" x 1" tek screws

**Assembly Steps:**

1. Attach corner clip angle "4" to the top and bottom end of each standoff support using 2 carriage bolts, nuts, and washers (see Figures 1-A and 1-B). Flush the corner clip angle to the top and bottom edge of the standoff support. Tighten nuts. NOTE: One set of corner clip angles "4" is required at each standoff support (see Figure 1-C).

FIGURE 1-A

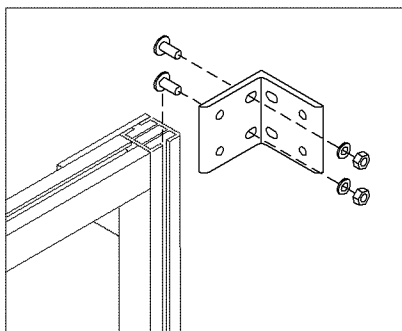


FIGURE 1-B

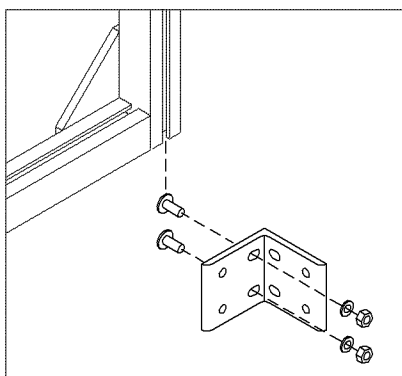
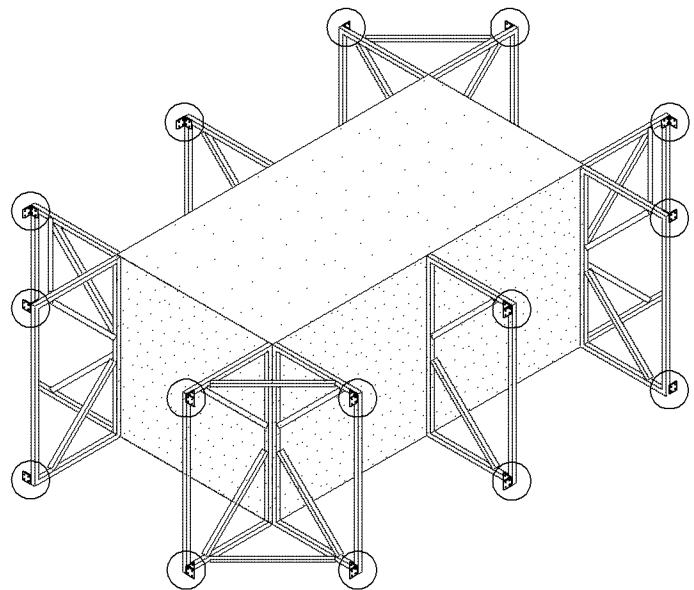


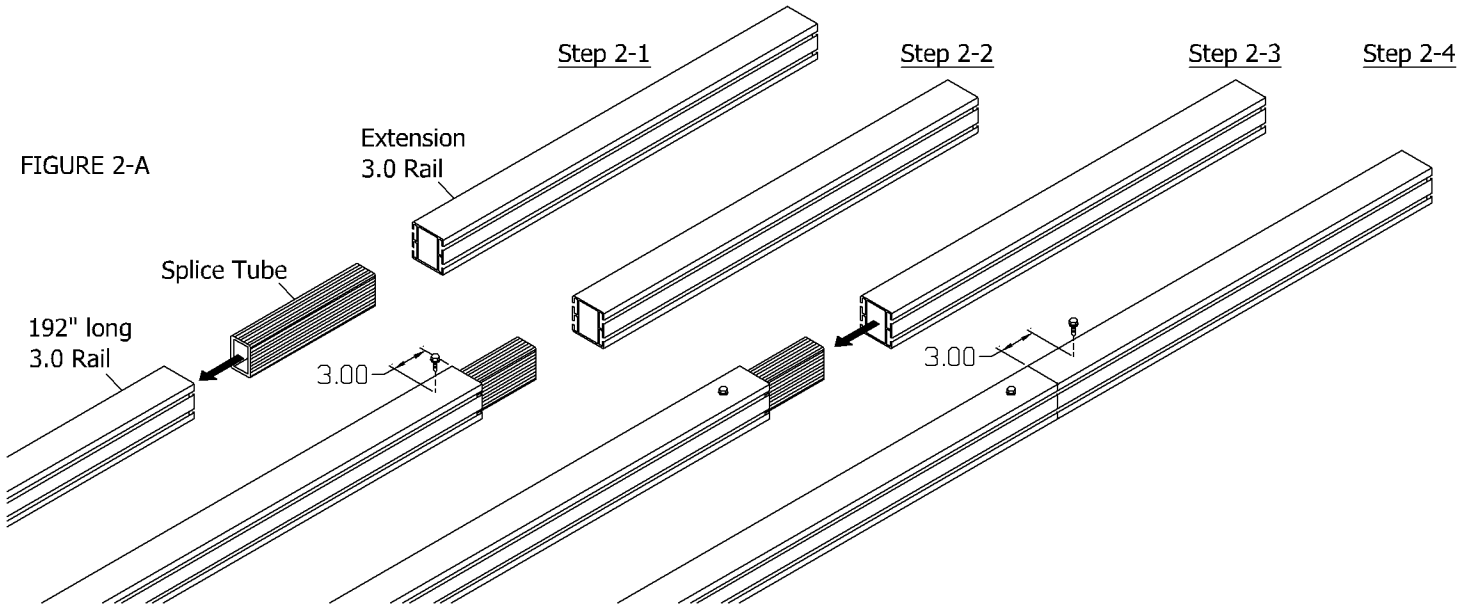
FIGURE 1-C



Mount the Rails to the Standoff Supports

Assembly Steps (continued):

2. If your rails are longer than 192", a rail splice will be necessary to achieve the overall dimensions required. The splice tube is inserted 6" into each rail and fastened with 2 each 5/16" x 1" long Tek Screws (see figure 2-A). If you do not have any rail splices, skip this step and proceed to Step #3.



3. Slide one carriage bolt per mounting point into each slot (on one side only) of the Rail "S". Each mounting point has one upper and one lower fastener (see Figure 3-B).

4. Lift the Rail "S" into place and align the bolts with the corner clip angles (see Figure 4-A). If the rails will end at a corner, then they must extend beyond the corner standoff support. This dimension is equal to the projection of the mating standoff support (see Figure 4-A). At any rails that will receive end caps "Y", the rails must extend beyond the standoff support 1.94" [1-15/16"] (see Figures 4-C and 4-D). Apply one lock washer and nut to each bolt and hand tighten. Do not tighten nuts with a wrench until all rails are mounted and aligned.

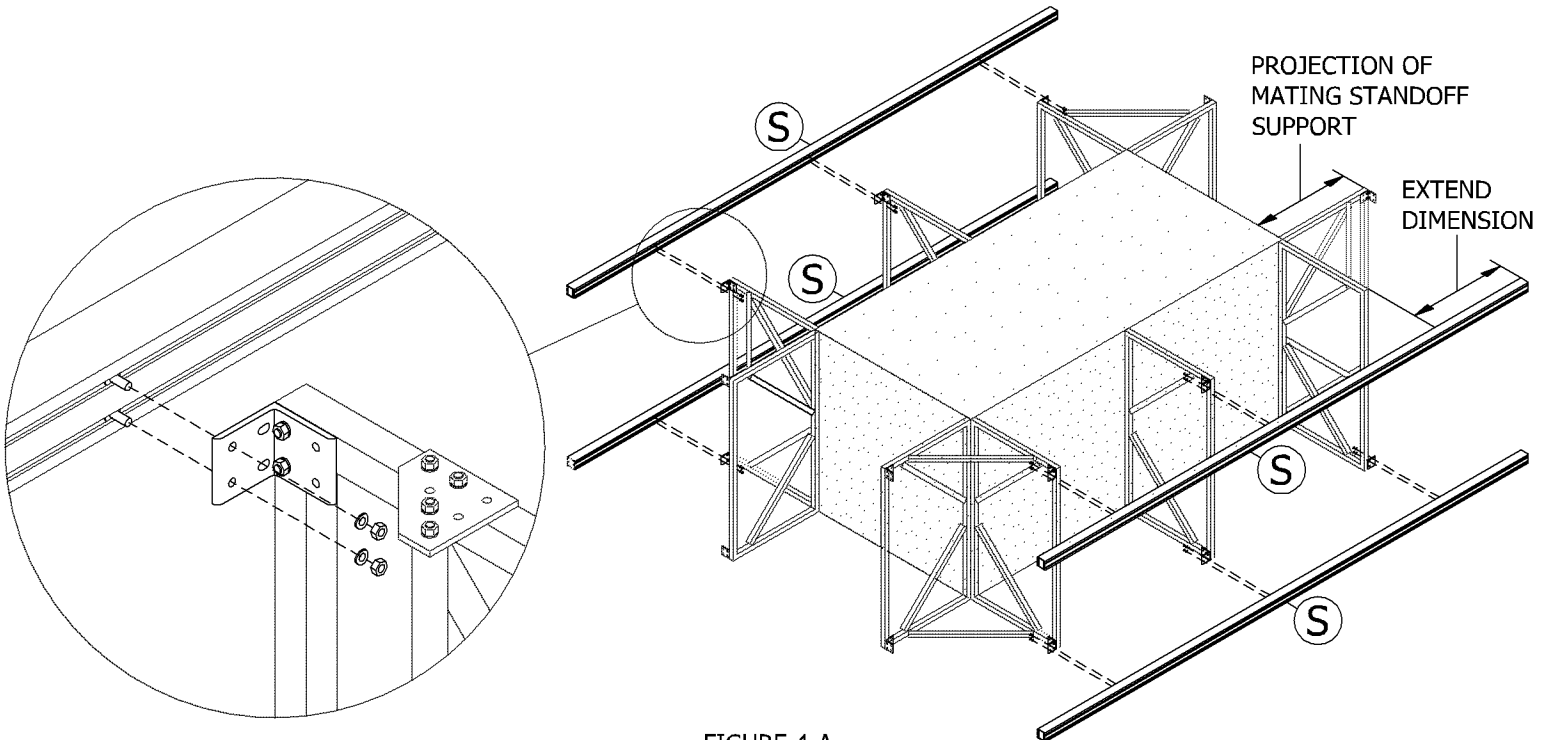


FIGURE 4-A

Mount the Rails to the Standoff Supports

Assembly Steps (continued):

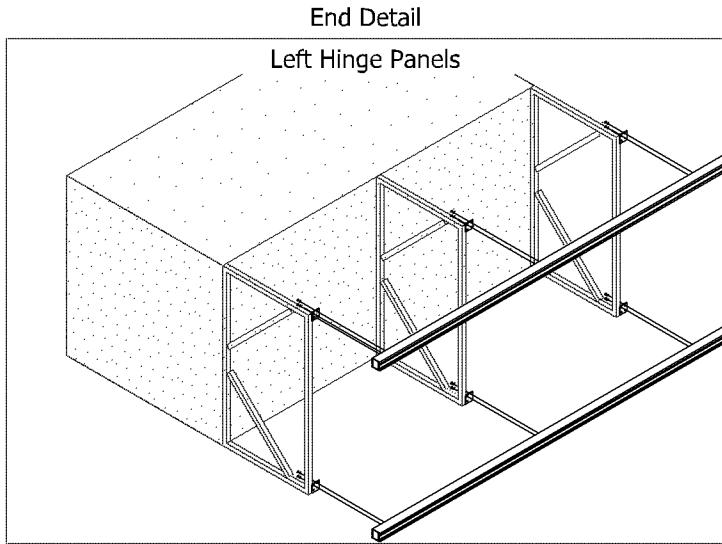


FIGURE 4-C

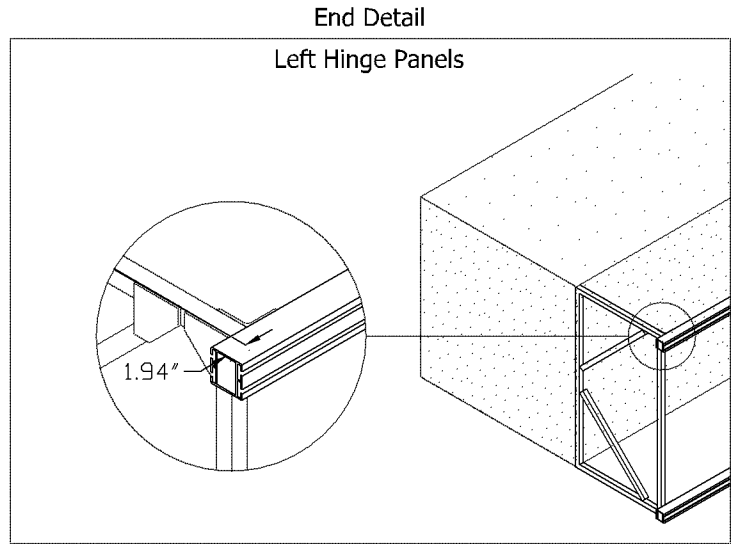
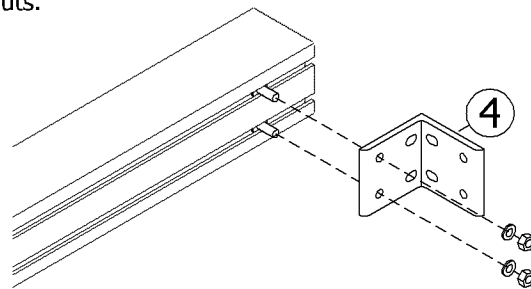


FIGURE 4-D

5. At any corners, mount corner angle clip "4" to the ends of the mounted Rails "S" (see Figure 5-A) with 3 carriage bolts, nuts, and washers as shown. Hand tighten the nuts.

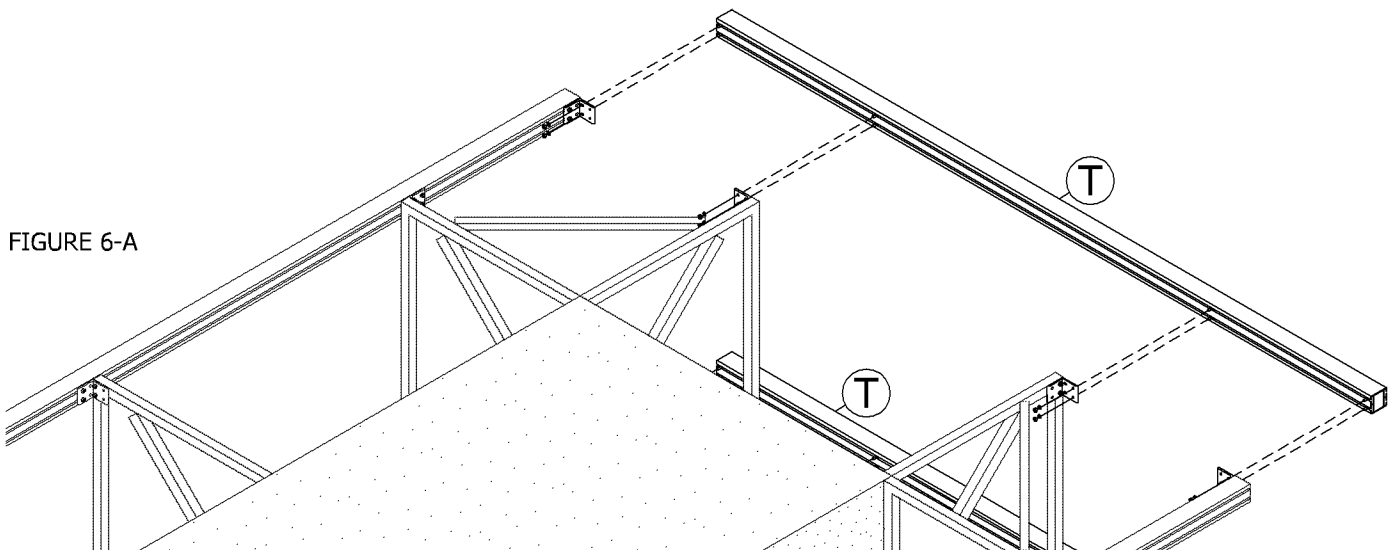
FIGURE 5-A



6. Slide one carriage bolt per mounting point into each slots of Rail "T" (an unmounted rail). Each mounting point has one upper and one lower fastener.

7. Lift rail "T" into place (see Figure 6-A). Align the carriage bolts with the corner clip angles on the standoff supports. Slide the carriage bolts through the holes in the corner clip angles "4" (mounted to standoff supports and rail "S"). Apply one washer and one nut to each carriage bolt. Hand tighten the nuts. Mount all remaining rail(s) using the same procedure.

FIGURE 6-A



## Mount the Rails to the Standoff Supports

Assembly Steps (continued):

8. At each corner, align the rails so that the tips of adjacent rails "S" and "T" are touching on the inside (see Figures 8-A and 8-B). Tighten the nuts at the corner angle clips with a ratchet or box end wrench.

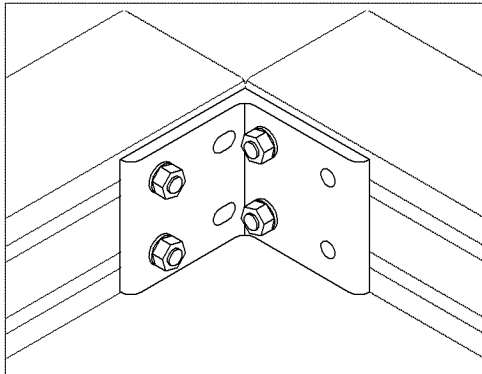


FIGURE 8-A  
(Inside view of corner)

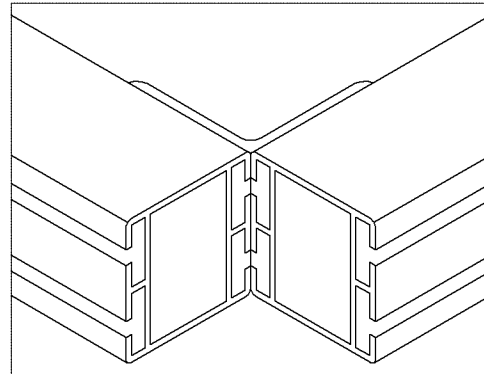


FIGURE 8-B  
(Outside view of corner)

9. Check the vertical alignment of the top and bottom rail to each corner. Use a plumb bob or carpenter's level and reposition rails until all corners are vertically aligned.

10. Tighten the nuts at each mounting point along the rails (see Figure 10-A) with a ratchet or box end wrench.

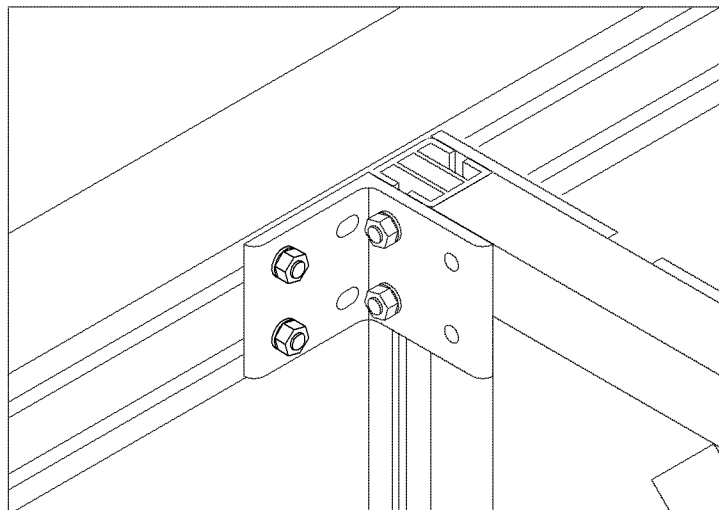


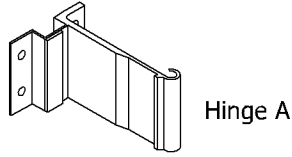
FIGURE 10-A

Mount Louver Panels to the Rails

Parts list:

Louver panels with partial hinges attached

6- hinge A (3" long)



9 - Latch

10 - hinge pin

11 - hinge stopper

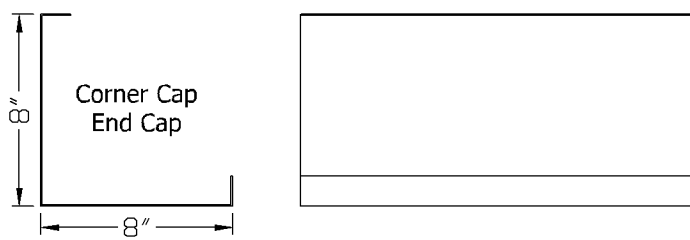
12 - hinge shim



Y - corner cap, end cap

5/16" carriage bolts, nuts, and lock washers

#10 x 3/4" tek screws



Assembly Steps at Hinges and End Brackets:

1. Determine the appropriate louver panels for one side of your screen. Louver panel sizes are called out on the submittal drawings that were prepared for your project.
2. Determine the hinging (Hinge Left or Hinge Right) for the run of louvers. If the louver panels are left hinge then start on the right exterior end of the rail. For right hinge panels, start on the left end of the rail. Insert one carriage bolt per panel into each slot in the rail (i.e. if you have 5 louver panels on a side, insert 5 carriage bolts in each slot). Push them down the rail for future use.
3. Insert one additional carriage bolt into each slot. Mount one additional Hinge A "6" over the carriage bolts.
4. If your starting point is at a corner (where a "Corner Cap" will be attached), align the groove on the rear of the Hinge A "6" to the end of the rail (see Figure 4-A and 4-B). Otherwise, proceed to step 5. Apply one lock washer and nut to each bolt. Tighten the nuts with a ratchet or box end wrench.

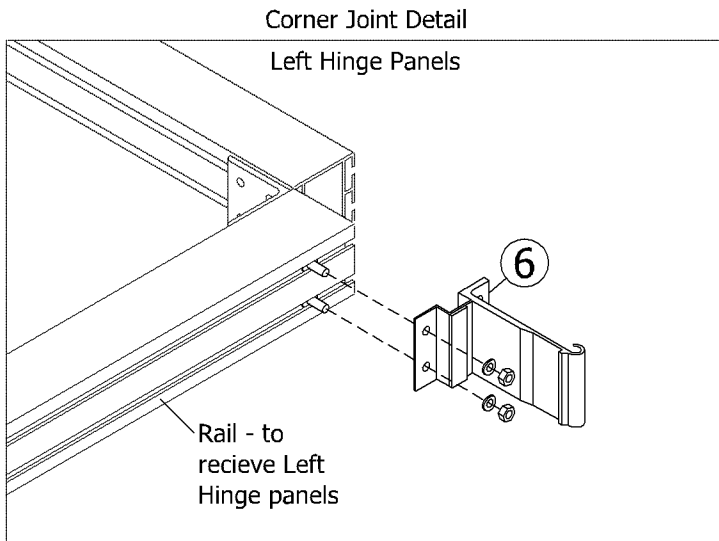


FIGURE 4-A

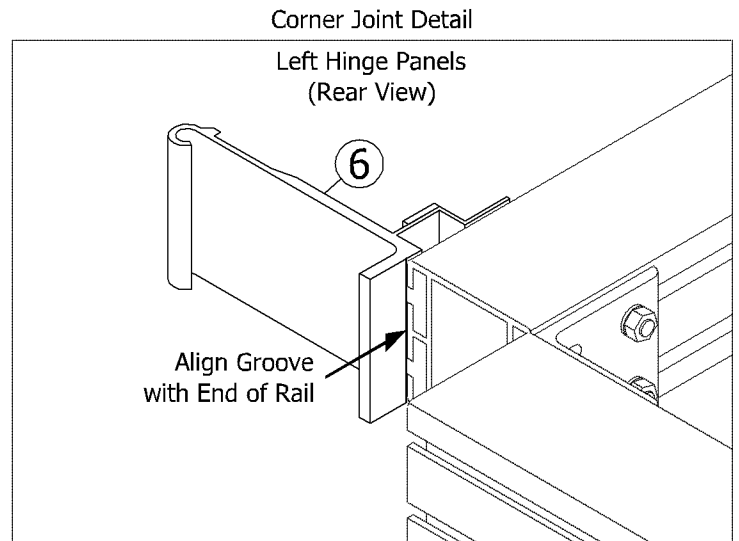


FIGURE 4-B

## Mount Louver Panels to the Rails

## Assembly Steps at Hinges and End Brackets (continued):

5. If the run of louvers starts at an end (where an "End Cap" will be located), align the edge of the Hinge A "6" at 6.94" [6-15/16"] from the end of the rail (see Figures 4-C and 4-D). Apply one lock washer and nut to each bolt. Tighten the nuts with a ratchet or box end wrench.

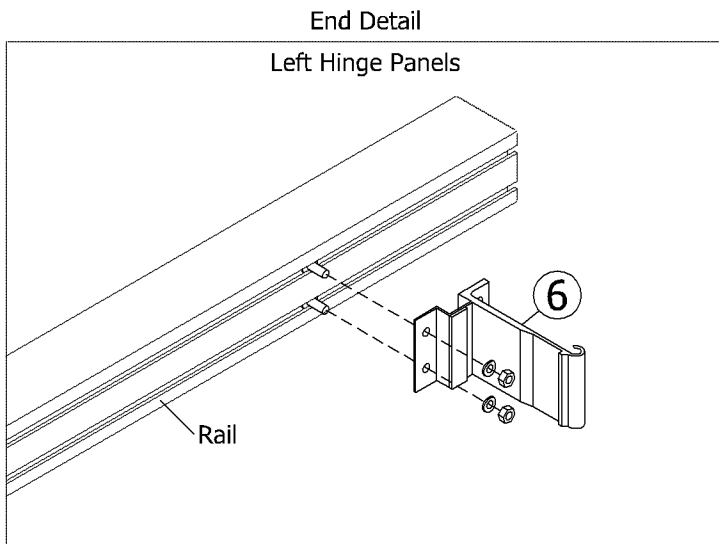


FIGURE 5-C

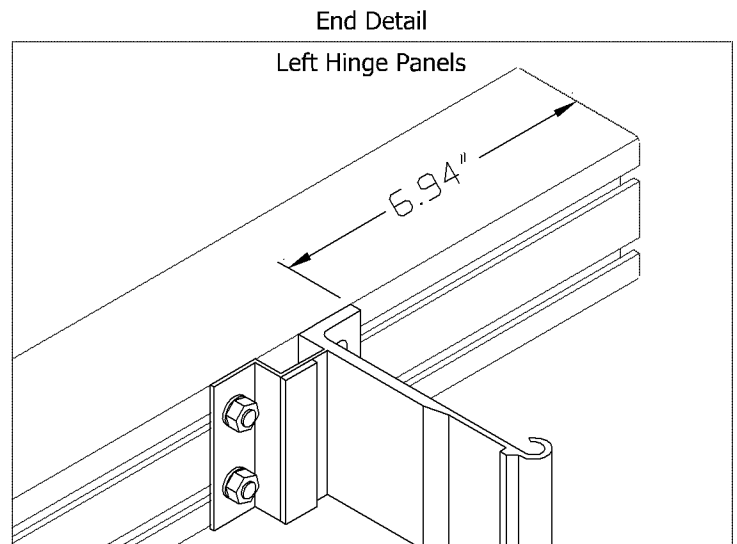


FIGURE 5-D

6. Repeat the same procedure for the upper and lower rail on the side. Use a plumb bob or carpenter's level to ensure that the brackets align vertically on the upper and lower rails. Loosen bolts and make adjustments as required.

7. Mount one Hinge A "6" to upper and lower rails. Utilize the nearest carriage bolts that were inserted during step 2 and apply one washer and nut to each bolt (see Figure 6-A). Leave nut loose enough to slide part Hinge A "6" along the rail. Determine the spacing required for each louver panel. Each spacing is 5/8" larger than the exact louver panel width. This spacing dimension is shown on the submittal drawings provided for the project (example: 45.00" x 5 spaces). Slide the part Hinge A "6" to the proper location (See Figure 6-B). Tighten the nuts with a ratchet or box end wrench.

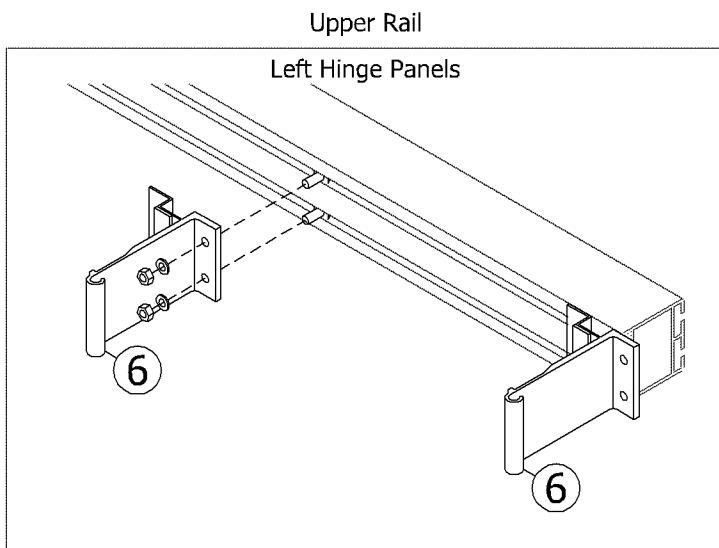


FIGURE 7-A

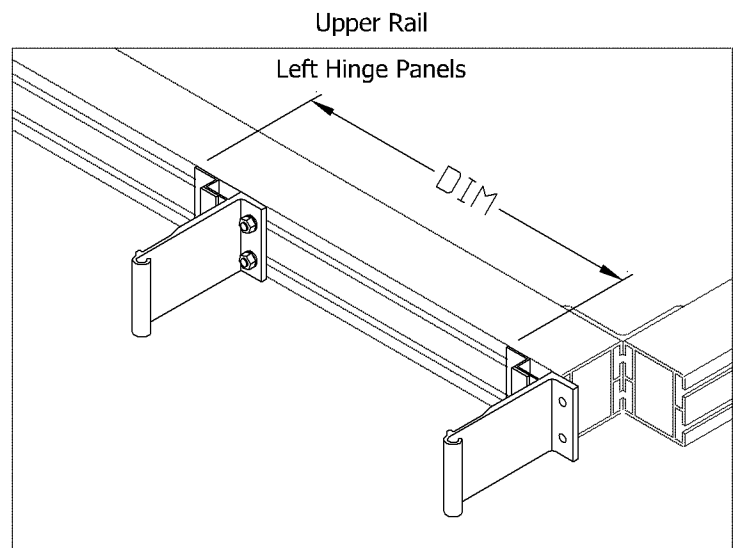


FIGURE 7-B

## Mount Louver Panels to the Rails

Assembly Steps at Hinges and End Brackets (continued):

8. Using the same spacing, repeat the attachment of hinges along the rail. If the end of the rail will join a corner, the last Hinge A "6" on a side should be flush with the end (see Figure 8-A). If the end of the rail will join an end cap, locate Hinge A "6" at 5.69" [5-11/16"] from the end of the rail (see Figure 8-B).

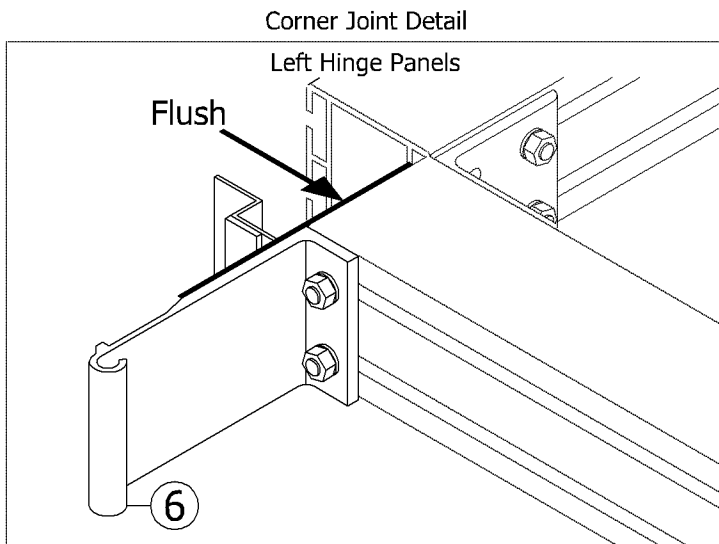


FIGURE 8-A

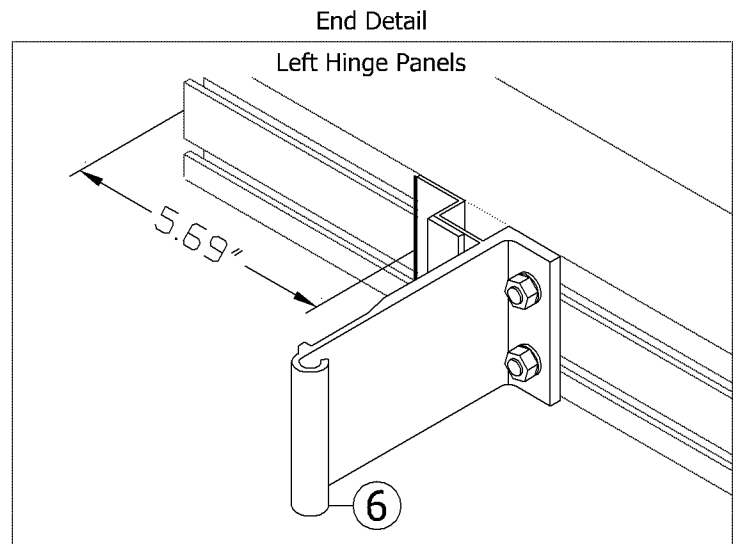


FIGURE 8-B

8. Repeat steps 1-8 for all sides of the screen.

Assembly Steps at Corner Caps:

1. Mount the corner caps "Y" (if applicable) to the hinges and end brackets (see Figure 1-A). Use a plumb bob or carpenter's level to ensure that all hinges and end brackets are aligned vertically. Loosen nuts and make any adjustments as necessary to create a square and level corner. Each part Hinge A "6" has a groove (vertical) for properly locating the tek screws. Use two #10 x 3/4" long tek screws to fasten the corner cap "Y" to each Hinge A "6".

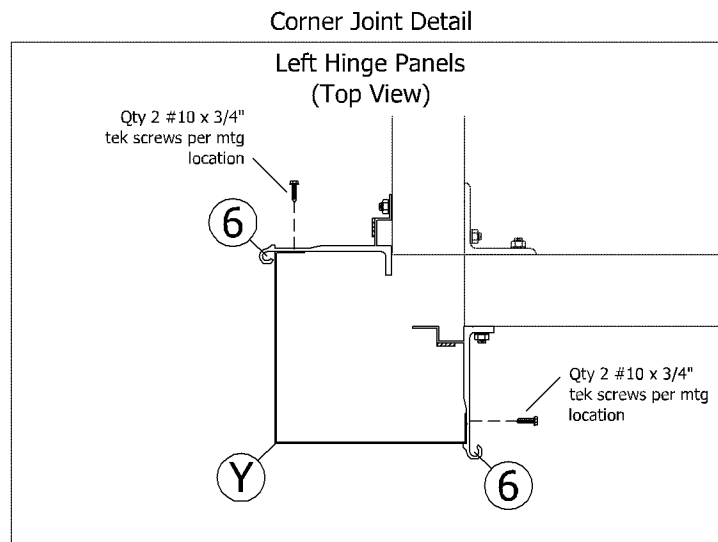


FIGURE 1-A

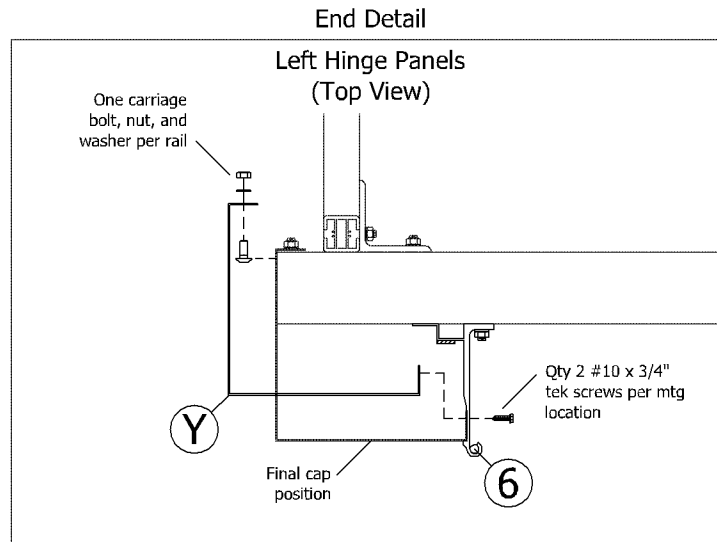
2. Repeat step 1 for all corner caps.



## Mount Louver Panels to the Rails

Assembly Steps at End Caps:

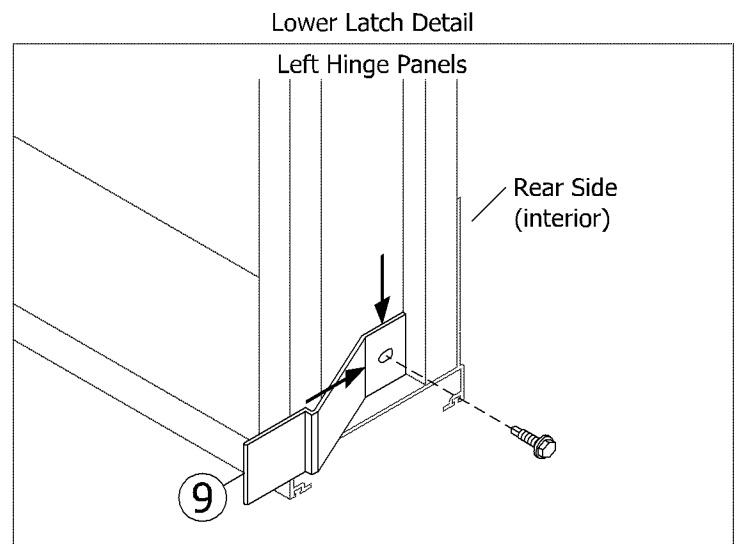
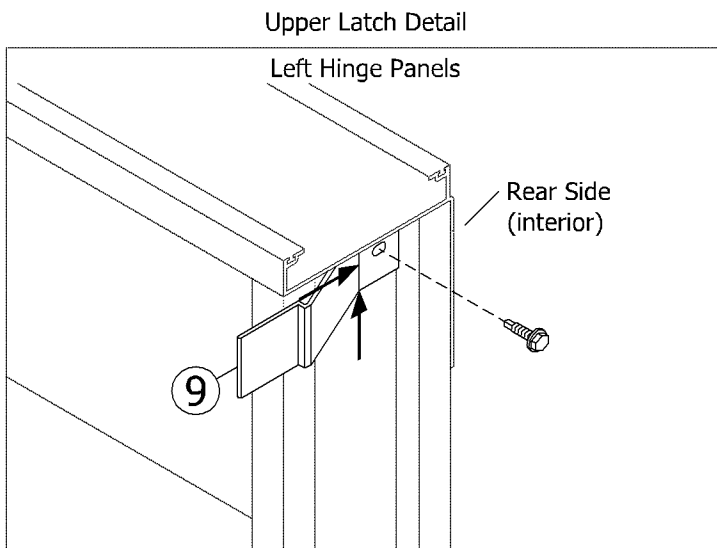
1. Mount the end caps "Y" (if applicable) to the Hinge A "6" (See Figure 1-A). Loosen nuts and make any adjustments as necessary to create a square and level cap. Insert one carriage bolt into the rear slot of each rail. Using the holes provided in the end cap, align the holes over the carriage bolts. The top of the cap should be flush with the top of the upper rail. Likewise with the bottom alignment. Apply one washer and nut to each bolt and finger tighten. Push the end cap against the end of the rail and against the adjacent Hinge A "6". Tighten the nuts with a ratchet or box end wrench. Each hinge has a groove (vertical) for properly locating the tek screws. Use two #10 x 3/4" long tek screws to fasten the end cap to each Hinge A "6".



2. Repeat step 1 for all end caps "Y".

Assembly Steps for Mounting Latches:

1. The louver panels require a Latch "9" at the top and bottom. Each latch is fastened with a #10 tek screw into the jamb at the top (see Figure 1-A) and bottom (see Figure 1-B) on the latch side of the panel (opposite the hinges). The Latch "9" protrudes beyond the face side of the louver as shown. Push the Latch "9" against the head and sill frames while fastening.



2. Repeat step 1 for all louver panels.

Mount Louver Panels to the Rails

Assembly Steps for Mounting Louver Panels:

1. Starting at the end of a side, mount one louver panel. Insert Hinge Pin "10" and one Hinge Stopper "11" into the lower Hinge A "6" (see Figure 1-A). Align the bottom hinge knuckle (attached to the louver) over the Hinge Pin "10". The louver panel will need to be tipped slightly to avoid interference with the upper hinge knuckle. Insert one part Hinge Stopper "11" into the bottom of the upper hinge (attached to the louver). Insert the part Hinge Pin "10" into the part Hinge A "6" at the upper hinge location (see Figure 1-B).

Lower Hinge Detail

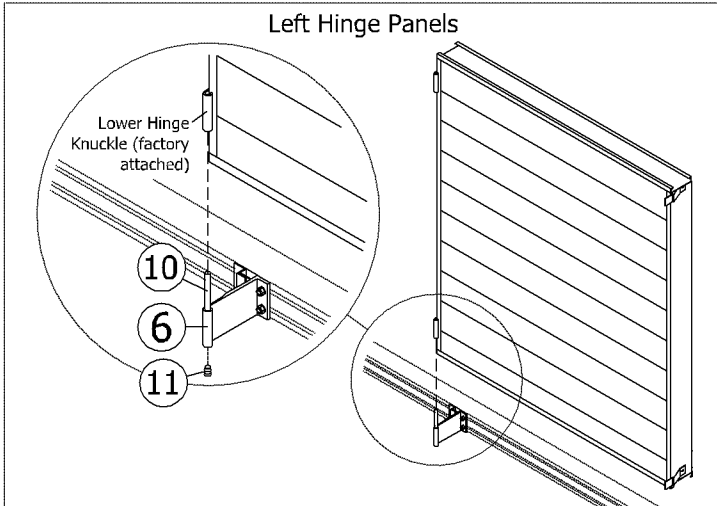


FIGURE 1-A

Upper Hinge Detail

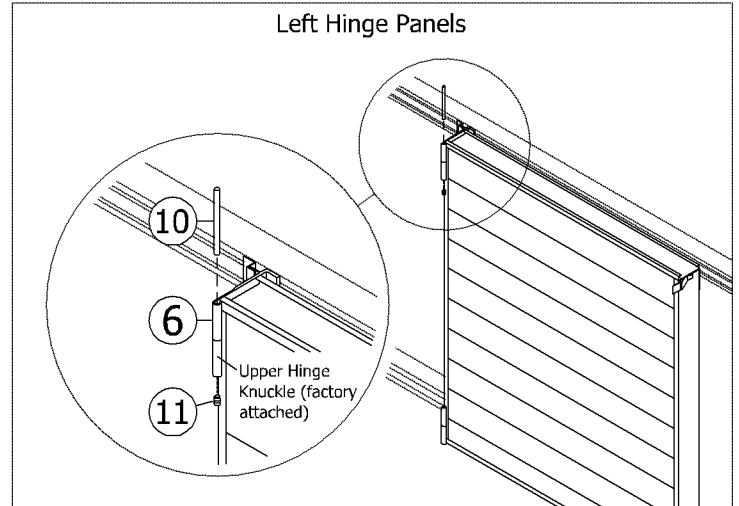


FIGURE 1-B

2. Open the louver panel to 180 degree swing. Peel the backing from one Hinge Shim "12". Apply the shim to part Hinge A "6" per figure 2-A and 2-B. Close the louver panel and inspect the latch side of the louver panel for alignment with the upper rail. If any alignment is required, loosen the bolts in the bottom hinge and move the hinge location slightly (left to lower the latch side, right to raise it).

Lower Shim Detail

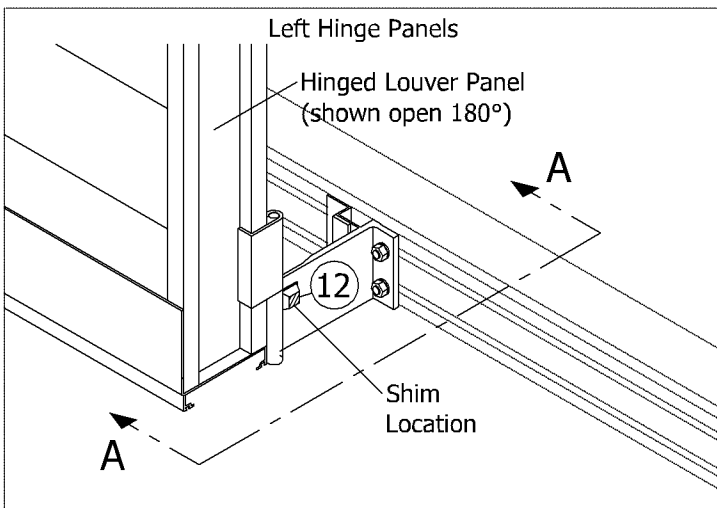


FIGURE 2-A

Lower Shim Section A-A

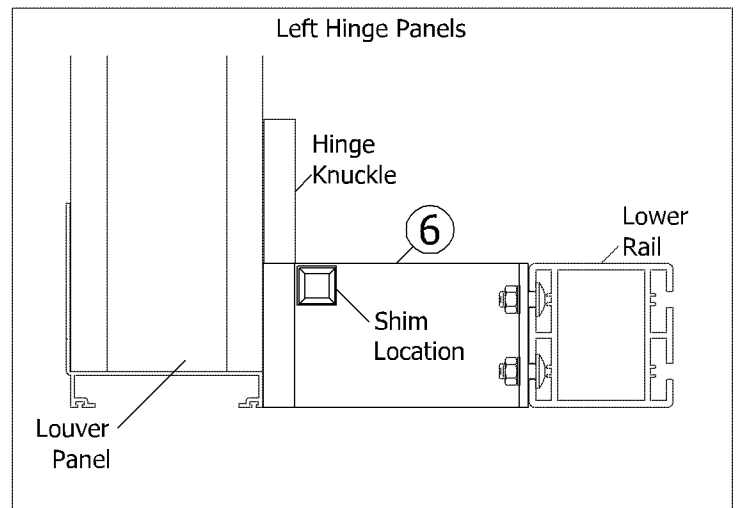


FIGURE 2-B

3. Repeat steps 1-2 for all louver panels. Maintain a dimension of 5/8" (0.625") between the jamb frames of adjacent louver panels. Make sure all louver panels are in proper alignment to engage the top and bottom latches. Make any adjustments as necessary to ensure proper operation.