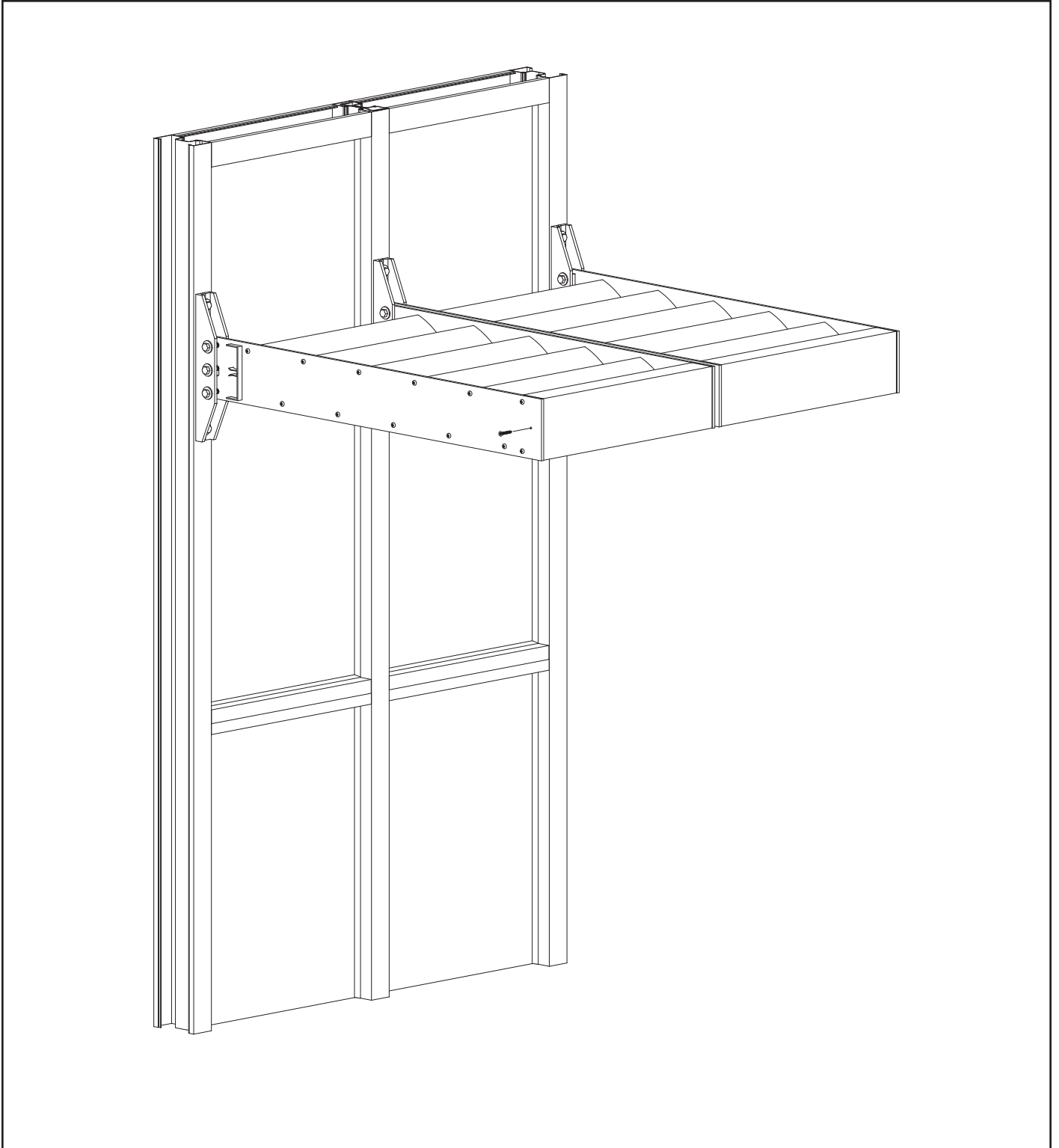


**ThermaShade® Sunshade System for Storefront
Exposed Anchor**



Installation Manual



Prior to fabrication and installation of the YKK AP ThermaShade® system, an engineering review **MUST** be completed. A qualified engineer must review the “combined load” information for the project to ensure proper selection of curtain wall and ThermaShade members.

Please maintain an executed copy of the document in your project file.

A blank copy of the document is contained in the ThermaShade price book and design manual section.








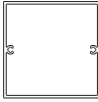


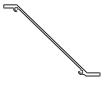
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Installation Notes

1. Do not drop, roll or drag boxes of aluminum framing. Move and stack boxes with proper support to prevent distortion. If fork lifts are used, be especially careful about striking the boxes when lifting or moving.
2. Store in a dry, out of the way area. If rain exposure, condensation or any water contact is likely, then all packaging material should be removed. Wet packaging materials will discolor and may stain aluminum finishes and paints.
3. All materials should be checked for quality and quantity upon receipt, YKK AP must be notified immediately of any discrepancies in shipment. Check to make sure that you have the required shims, sealants, supplies and tools necessary for the installation.
4. Carefully check the openings and surrounding conditions that will receive your material. Remember, if the construction is not per the construction documents, it is your responsibility to notify the general contractor in writing. Any discrepancies must be brought to the general contractor's attention before you proceed with the installation.
5. Gather your shop drawings, materials, packing list, and this installation manual. Carefully review parts, location, the sequence it goes therein, when you glaze it and how you seal it. Installation instructions are of a general nature and may not cover every condition you will encounter. The shop drawings and/or installation manuals were prepared specifically for the product.
6. Any material substitutions must be of equal or greater quality.
7. Make certain that material samples have been sent for compatibility testing for all manufacturer's sealants involved. Make certain sealants have been installed in strict accordance with the manufacturer's recommendations and specifications, including cleaning and priming all parts.
8. Remember to isolate, in an approved manner, all aluminum from uncured masonry or other incompatible materials.
9. System-to-structure fasteners are not supplied by YKK AP. Fasteners called out on shop drawings are to indicate minimum sizes for design loading.
10. If any questions arise concerning YKK AP products or their installation, contact YKK AP for clarification before proceeding.
11. YKK AP storefront and/or curtain wall framing is typically completed before drywall, flooring and other products which may still be in process. Take the extra time to wrap and protect the work produced.
12. Cutting tolerances are plus zero, minus one thirty second unless otherwise noted.
13. Check our website, www.ykkap.com, for the latest installation manual update prior to commencing work.

STOCK LENGTHS

 <p>3-1/2" Round Louver or Fascia</p>	<p>E9-3705</p>	 <p>Wedge 6" x 1-3/4" Fascia Only</p>	<p>E9-3711</p>
 <p>3" Round Louver or Fascia</p>	<p>E9-3706</p>	 <p>2-1/4" Round Louver Only</p>	<p>E9-3712</p>
 <p>3" Winged Louver Only</p>	<p>E9-3707</p>	 <p>3-5/8" Airfoil Louver Only</p>	<p>E9-3713</p>
 <p>6" Open Airfoil Louver Only</p>	<p>E9-3708</p>	 <p>Square 3-1/2" x 3-1/2" Louver or Fascia</p>	<p>E9-3714</p>
 <p>6" Airfoil Louver Only</p>	<p>E9-3709</p>	 <p>Rectangular 2-1/4" x 5" Fascia Only</p>	<p>E9-3715</p>
 <p>Angle 5-3/4" x 4-1/4" Louver Only</p>	<p>E9-3710</p>		

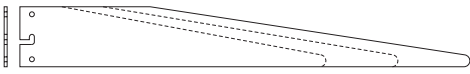
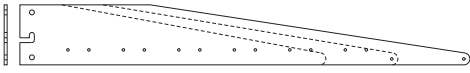
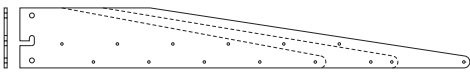

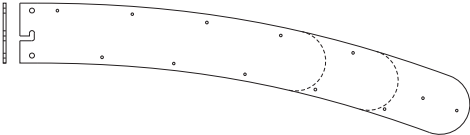
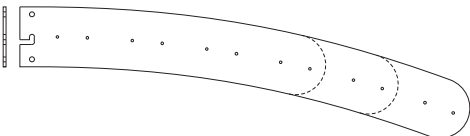
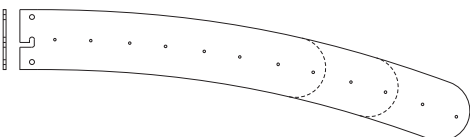
STANDARD OUTRIGGERS

Example:
E1-3720-0200 (Common)

	<p>Square End Bay Outrigger Use for End Bay Condition Only</p>	<p>24" E1-3720-0200 30" E1-3720-0206 36" E1-3720-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3705 & E9-3714</p>	<p>24" E1-3721-0200 30" E1-3721-0206 36" E1-3721-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3705, E9-3706, E9-3707 & E9-3714</p>	<p>24" E1-3722-0200 30" E1-3722-0206 36" E1-3722-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3705, E9-3708, E9-3709, E9-3710 & E9-3714</p>	<p>24" E1-3723-0200 30" E1-3723-0206 36" E1-3723-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3705, E9-3714 & E9-3715</p>	<p>24" E1-3724-0200 30" E1-3724-0206 36" E1-3724-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3706, E9-3707 & E9-3715</p>	<p>24" E1-3725-0200 30" E1-3725-0206 36" E1-3725-0300</p>
	<p>Square Intermediate Outrigger Use with E9-3708, E9-3709, E9-3710 & E9-3715</p>	<p>24" E1-3726-0200 30" E1-3726-0206 36" E1-3726-0300</p>
	<p>Rounded End Bay Outrigger Use for End Bay Condition Only</p>	<p>24" E1-3740-0200 30" E1-3740-0206 36" E1-3740-0300</p>
	<p>Rounded Intermediate Outrigger Use with E9-3705 & E9-3714</p>	<p>24" E1-3741-0200 30" E1-3741-0206 36" E1-3741-0300</p>
	<p>Rounded Intermediate Outrigger Use with E9-3705, E9-3706 & E9-3707</p>	<p>24" E1-3742-0200 30" E1-3742-0206 36" E1-3742-0300</p>
	<p>Rounded Intermediate Outrigger Use with E9-3705, E9-3708, E9-3709 & E9-3710</p>	<p>24" E1-3743-0200 30" E1-3743-0206 36" E1-3743-0300</p>
	<p>Rounded Intermediate Outrigger Use with E9-3706 & E9-3707</p>	<p>24" E1-3744-0200 30" E1-3744-0206 36" E1-3744-0300</p>

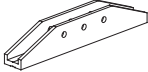
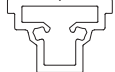
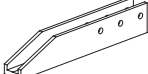






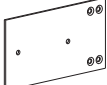

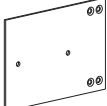

STANDARD OUTRIGGERS

Example:
E1-3760-0200 (Common)









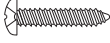


	<p>Wedge End Bay Outrigger Use for End Bay Condition Only</p>	<p>24" E1-3760-0200 30" E1-3760-0206 36" E1-3760-0300</p>
	<p>Wedge Intermediate Outrigger Use with E9-3711 & E9-3712</p>	<p>24" E1-3761-0200 30" E1-3761-0206 36" E1-3761-0300</p>
	<p>Wedge Intermediate Outrigger Use with E9-3711 & E9-3713</p>	<p>24" E1-3762-0200 30" E1-3762-0206 36" E1-3762-0300</p>
	<p>Curved End Bay Outrigger Use for End Bay Condition Only</p>	<p>24" E1-3780-0200 30" E1-3780-0206 36" E1-3780-0300</p>
	<p>Curved Intermediate Outrigger Use with E9-3705, E9-3708 & E9-3709</p>	<p>24" E1-3781-0200 30" E1-3781-0206 36" E1-3781-0300</p>
	<p>Curved Intermediate Outrigger Use with E9-3705</p>	<p>24" E1-3782-0200 30" E1-3782-0206 36" E1-3782-0300</p>
	<p>Curved Intermediate Outrigger Use with E9-3706 & E9-3707</p>	<p>24" E1-3783-0200 30" E1-3783-0206 36" E1-3783-0300</p>

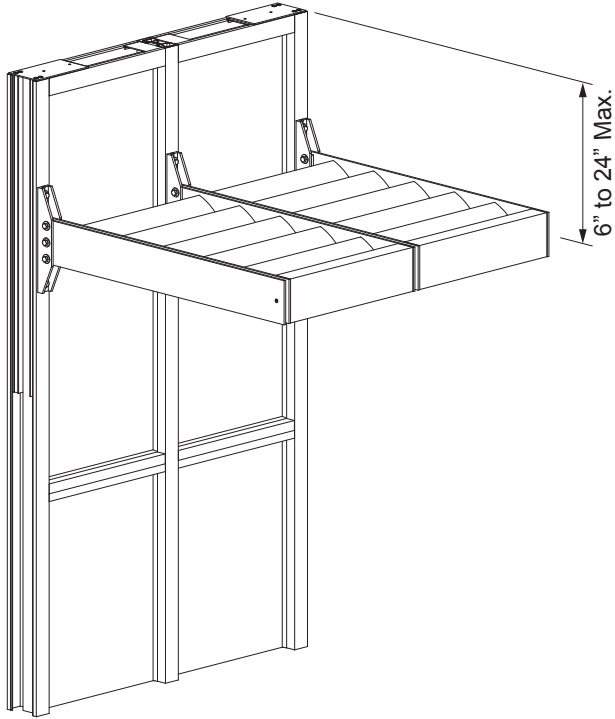
Actual lengths are 1-1/2" longer than nominal.

ACCESSORIES

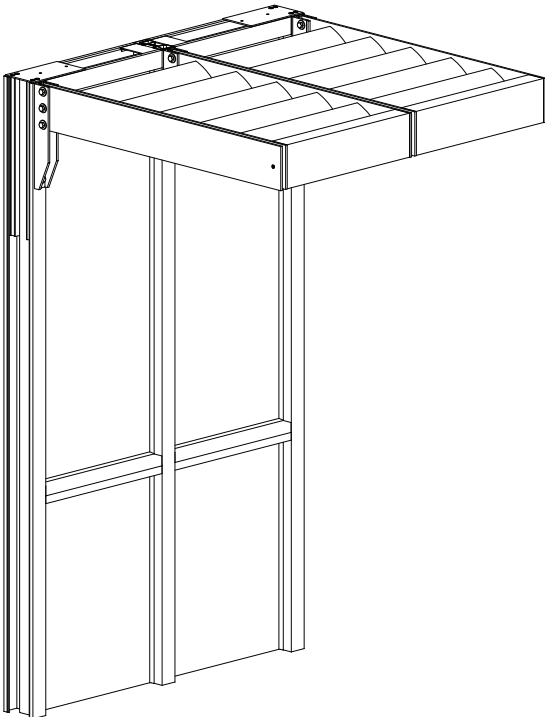
	<p>“Type A” Exposed Bolt Anchor Use with E9-1013, E9-1075, BE9-2553, BE9-2555, E9-0654, and BE9-0684</p>	<p>E1-3930</p>		<p>Mullion Reinforcement Sleeve 36” Long, for YES 45 XT Use with E1-3872</p> <p>E1-3846</p>
	<p>“Type B” Exposed Bolt Anchor Use with E9-1013, E9-1075, BE9-2553 and BE9-2555, Used at Head</p>	<p>E1-3936</p>		<p>Mullion Reinforcement Sleeve 18” Long, ,for YES 45 XT, Use with E1-3873 and E1-3874</p> <p>E1-3845</p>
	<p>Outrigger Spacer Use with Intermediate Outriggers</p>	<p>E1-3934</p>		<p>Steel Bar 18” Long Use with E1-3873 and E1-3874</p> <p>E1-3857</p>
	<p>Outrigger Spacer Use with Jamb Outriggers</p>	<p>E1-3935</p>		<p>Steel Bar 24” Long Use with E1-3872</p> <p>E1-3858</p>
	<p>1/2” Aluminum Spacer (1) Per Pair of Outriggers</p>	<p>E1-3549</p>		<p>Anchor Plate for YES 45 FI, TU, & XT</p> <p>E1-3859</p>
	<p>Mullion Reinforcement Sleeve 36” Long Use with E1-3872</p>	<p>E1-3848</p>		<p>Anchor Plate for YES 60 FI, TU, & XT</p> <p>E1-3799</p>
	<p>Mullion Reinforcement Sleeve 18” Long, Use with E1-3873 and E1-3874</p>	<p>E1-3849</p>		

FASTENERS

 <p>3/8" x 2" Bolt Stainless Steel, For Attachment of Outrigger to Anchor Clip Three per Anchor Clip</p>	<p>HM-3832 -SS</p>	 <p>3/8" x 1-1/4" Bolt, Stainless Steel For Attachment of Anchor Clip to YES 45 FI/TU Mullion</p>	<p>HM-3820 -SS</p>
 <p>3/8" Jamb Nut Stainless Steel, For Attachment of Outrigger to Anchor Clip</p>	<p>JM-3800 -SS</p>	 <p>3/8" x 1-1/4" Bolt, Stainless Steel, For Attachment of Anchor Clip to YES 45 FI/TU Mullion</p>	<p>FM-3820 -SS</p>
 <p>3/8" Flat Washer, Stainless Steel, For Attachment of Outrigger to Anchor Clip</p>	<p>WW-3800 -SS</p>	 <p>3/8" x 1" Bolt, Stainless Steel For Attachment of Anchor Clip to YHS 50 FI/TU Mullion</p>	<p>HM-3816 -SS</p>
 <p>3/8" Lock Washer, Stainless Steel, For Attachment of Outrigger to Anchor Clip</p>	<p>WS-3800 -SS</p>	 <p>3/8" x 1" Bolt, Stainless Steel For Attachment of Anchor Clip to YHS 50 FI/TU Mullion</p>	<p>FM-3816 -SS</p>
 <p>#10 x 1" PHSMS Type AB Stainless Steel, For Attachment of Louvers/Fascia to Outrigger</p>	<p>PC-1016 -SS</p>	 <p>#14 x 1" FHPSMS, Zinc Plated Steel, For Attachment of Anchor Plate to Mullion</p>	<p>FC-1416</p>
 <p>#10 x 1" FHSMS-SS Type AB, Stainless Steel, For Attachment of End Bay Outriggers</p>	<p>FC-1016 -SS</p>		

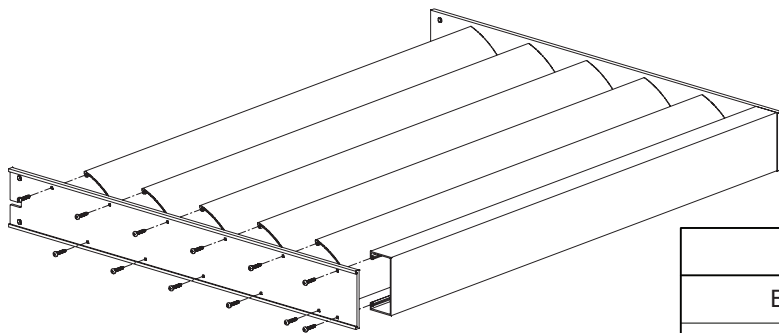
THERMASHADE LOCATION OPTIONS**TYPE A**

- Outrigger and mullion anchor are located below the head.
- Requires standard "Type A" mullion anchors and covers.
- Can utilize Luminance[®] light shelf system.
- Horizontal can align with C of outrigger.

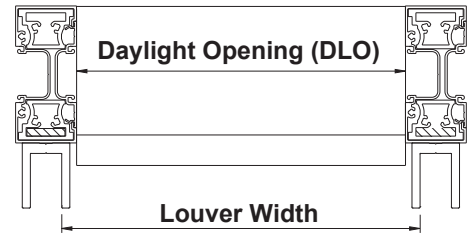
**TYPE B**

- Outrigger and mullion anchor are located at the extreme head location, requiring "Type B" anchor and covers.

THERMASHADE ASSEMBLY FABRICATION



Detail 1



Bay Type	Louver Width	
	YES 45/60 FI/TU/XT*	YHS 50 FI/TU
Common / Intermediate	D.L.O. + 1"	D.L.O. + 1-1/2"
Common / Jamb (Single Outrigger)	D.L.O. + 1-3/4"	D.L.O. + 2-1/4"
Common / Jamb (Double Outrigger)	D.L.O. + 1"	D.L.O. + 1-1/2"
Punched Opening (Single Outrigger)	D.L.O. + 2-1/4"	D.L.O. + 3"
Punched Opening (Double Outrigger)	D.L.O. + 1"	D.L.O. + 1-1/2"

STEP 1 FABRICATION OF THERMASHADE ASSEMBLIES

For proper anchoring of the outrigger at Type A locations: The top of the outrigger must be a minimum of 3-1/2" to a maximum of 21-1/2" below the top of the head member.

For proper anchoring of the outrigger at Type B locations: The top of the outrigger must be 1/16" below the top of the head member.

Louver and Fascia Fabrication

-Cut louvers and fascia in accordance to the Louver Width Chart on **Detail 1**.

* **Note:** For 2-1/4" wide YES 45 or YES 60 mullions, add 1/8" cut length at each mullion used.

Refer to approved shop drawings for louver lengths for non-standard mullion widths.

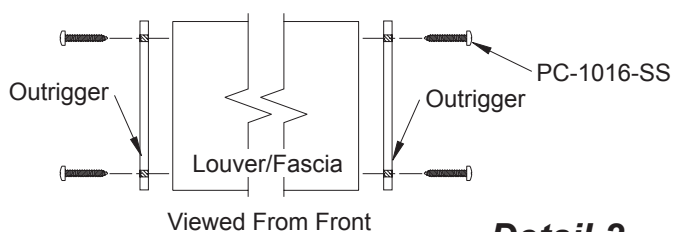
If louvers and fascia are to be fabricated from field measurements, correct louver and fascia cut length can be determined by measuring from the inside right leg of the anchor clip to the inside left leg of the adjacent anchor clip (this is the proper louver width).

See **Detail 1**.

-Assemble the ThermaShade by fastening two (2) outriggers to the cut louvers and fascia.

See **Detail 2**.

See **Detail 2** for proper alignment of extruded outriggers.

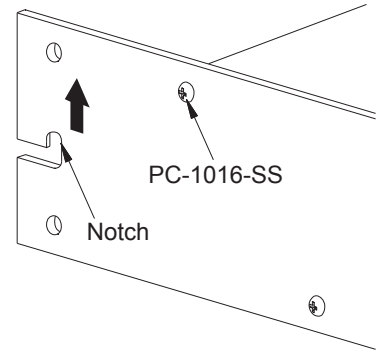


Detail 2

THERMASHADE ASSEMBLY FABRICATION

STEP 2 INTERMEDIATE OUTRIGGER ASSEMBLY

- Attach louvers to the outriggers with PC-1016-SS screws by aligning pre-drilled holes in the outrigger with the screw splines of the louver.
- Ensure that the notch at the center of the outrigger points upward to prevent attaching the outriggers upside down. Do not tighten screws completely until all louvers and fascia are attached, then tighten all fasteners.



Detail 3

See **Detail 3**.

STEP 3 VERTICAL MULLION FABRICATION

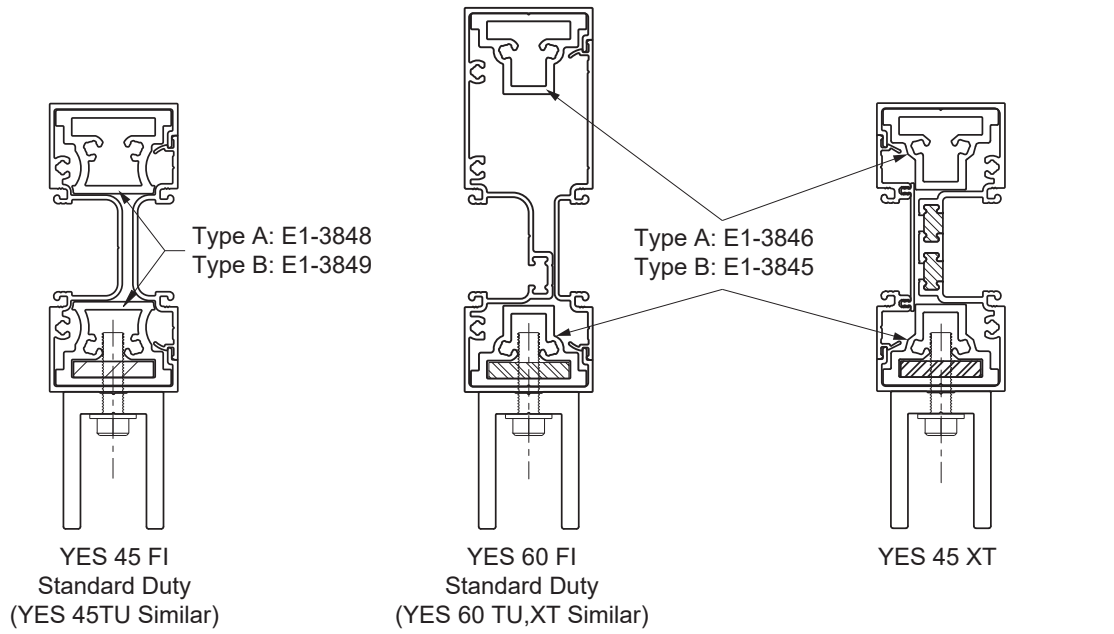
Vertical span and spacing with ThermaShade should be evaluated by a P.E., or consult YKK AP.

- For Standard Duty YES 45/60 FI/TU/XT, drill 0.406 diameter clear holes into the vertical mullions as shown in **Detail 5** on **Page 10**.
- For YHS 50 FI/TU & Heavy Duty YES 45/60 **Type A** locations (and if no steel bar is required), drill and tap 0.3125" holes into the vertical mullions as shown in **Detail 6A** on **Page 11**. If steel is required, drill 0.406" diameter clear holes into the vertical mullions.
- For YHS 50 FI/TU & Heavy Duty YES 45/60 **Type B** locations (and if no steel bar is required), drill and tap 0.3125" holes into into the vertical mullions as shown in **Detail 6B** on **Page 11**. If steel is required, drill 0.406" diameter clear holes into the vertical mullions.

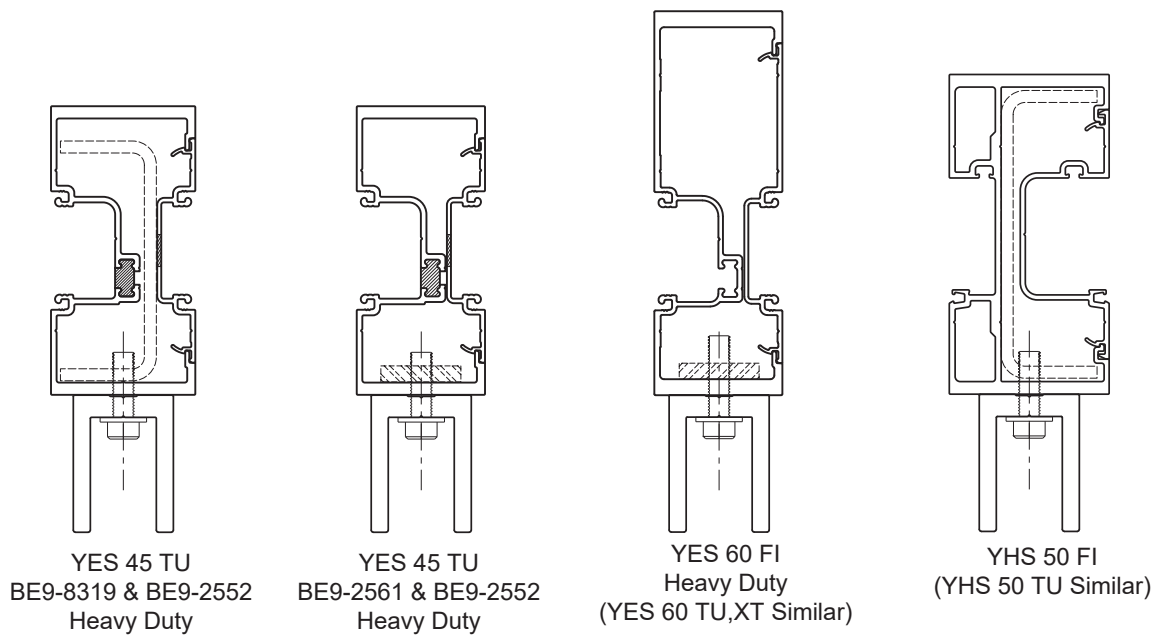
See **Detail 4** on **Page 9** for mullion options.

THERMASHADE ASSEMBLY FABRICATION

STEP 3 (cont'd)



Detail 4

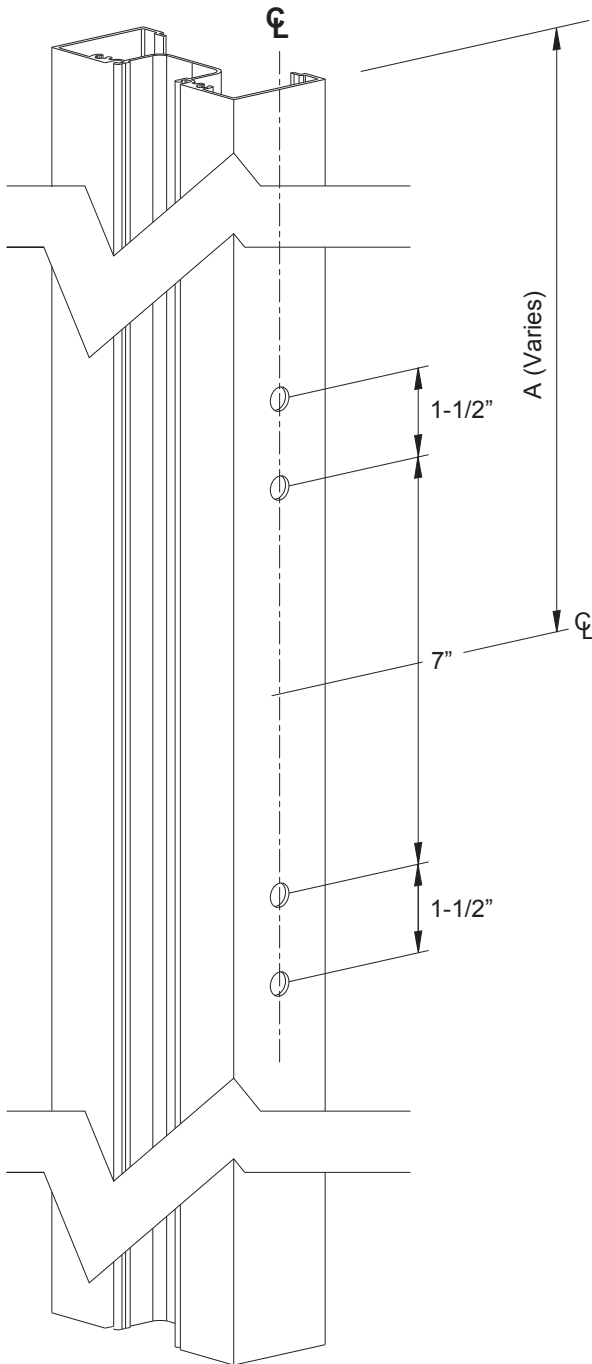


**STANDARD DUTY YES 45/60 FI/TU/XT VERTICAL
MULLION FABRICATION**

YES 45 FI Shown, YES 45 TU/XT, YES 60 FI/TU/XT Similar

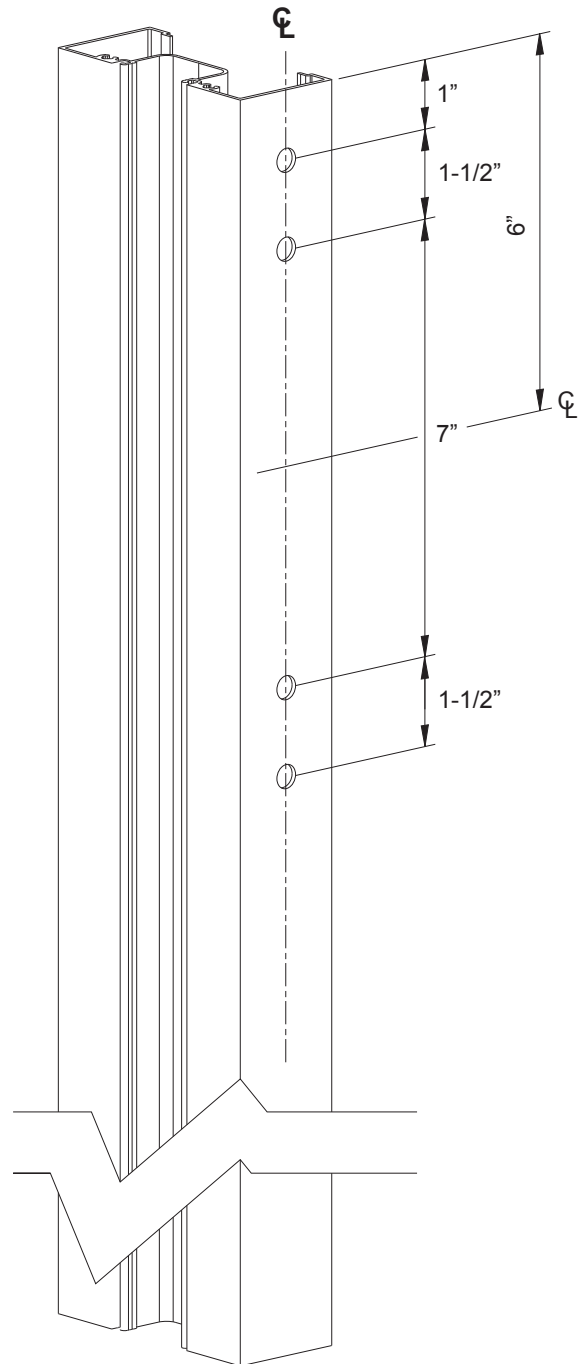
STEP 3 (cont'd)

TYPE A



Detail 5A

TYPE B



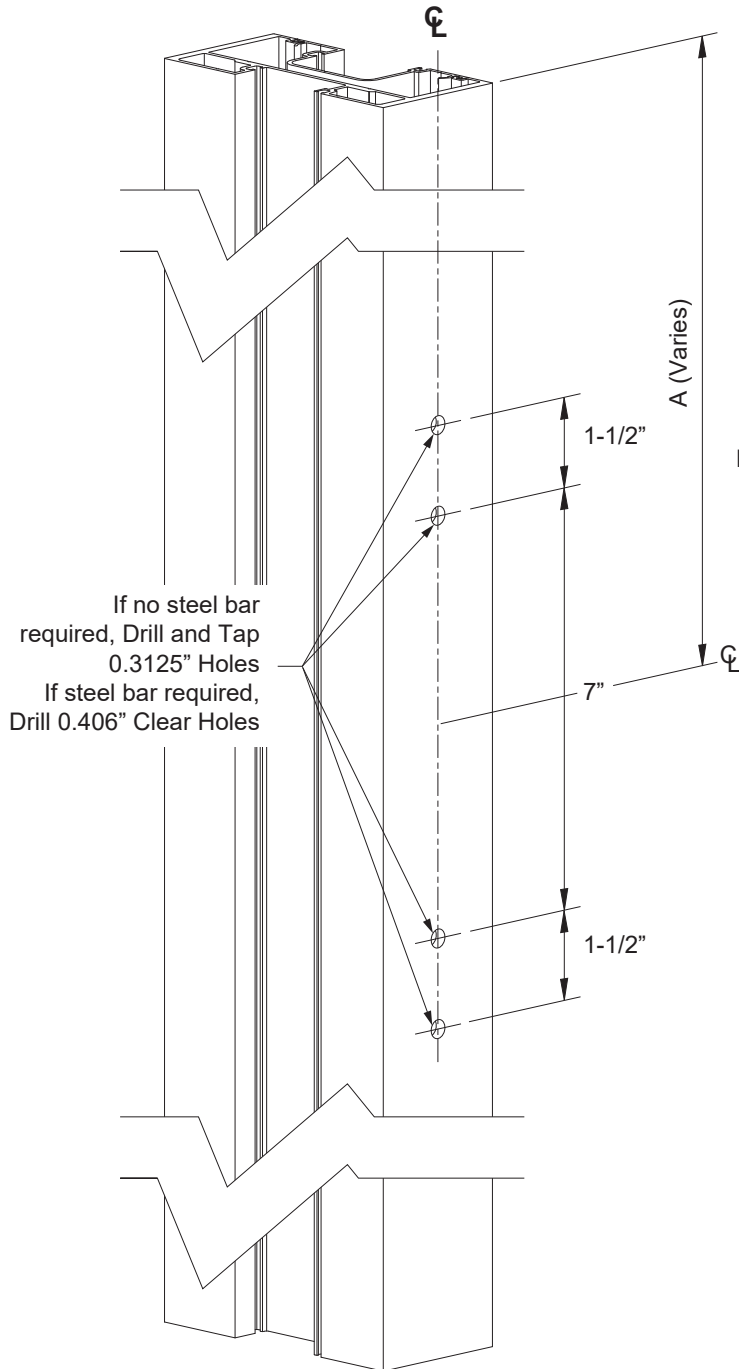
Detail 5B

YHS 50 FI/TU & HEAVY DUTY YES 45/60 VERTICAL MULLION FABRICATION

YHS 50 FI Shown, Others Similar

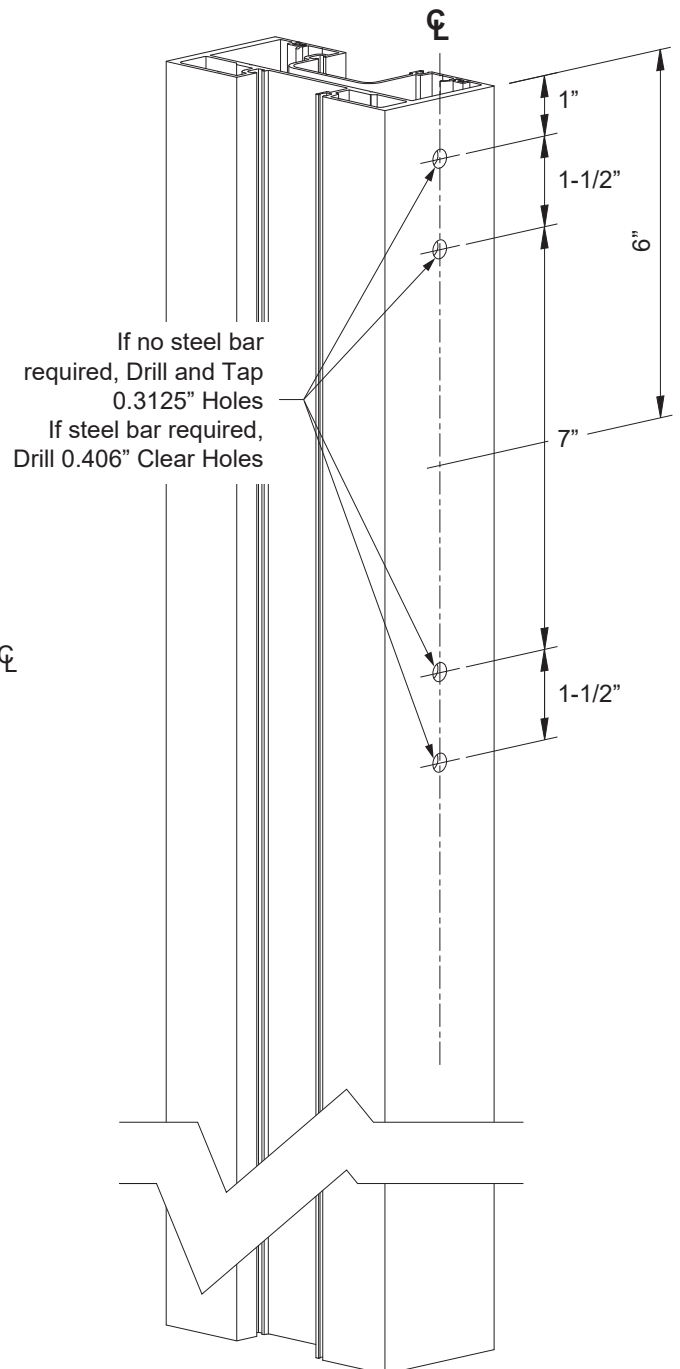
STEP 3 (cont'd)

TYPE A



Detail 6A

TYPE B



Detail 6B

FABRICATE STEEL BAR E1-3858 and MULLION REINFORCEMENT E1-3848

STEP 4

The ThermaShade for Storefront Type A application is for Outrigger & Anchor \varnothing locations that are located 6" to 24" from the top of the storefront vertical mullion.

For applications where the Outrigger & Anchor \varnothing 's are located 6"-12" from the top of the mullion, the 36" Mullion reinforcement Sleeve and the 24" long steel reinforcement sleeve will need to be cut. Refer to **Figure 1** for the length of the cut.

Figure 1

A = Reference Dimension from the top of mullion to \varnothing of outrigger & anchor.

B= Length of steel

C= Length of Mullion Reinforcement Sleeve (remove material from the top).

$$B = 12" + A$$

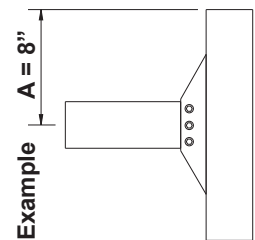
$$C = 12" + A$$

Example:

$$A = 8"$$

$$B = 12" + 8" = 20"$$

$$C = 12" + 8" = 20"$$



For applications where the Outrigger & Anchor \varnothing 's are located 12"-24" from the top of the mullion, ONLY the 36" Mullion reinforcement Sleeve will need to be cut.

Refer to **Figure 2** for the length of the cut.

Figure 2

A = Reference Dimension from the top of mullion to \varnothing of outrigger & anchor.

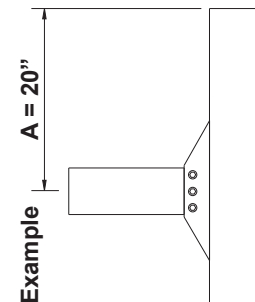
C= Length of Mullion Reinforcement Sleeve (remove material from the top).

$$C = 12" + A$$

Example:

$$A = 20"$$

$$C = 12" + 20" = 32"$$



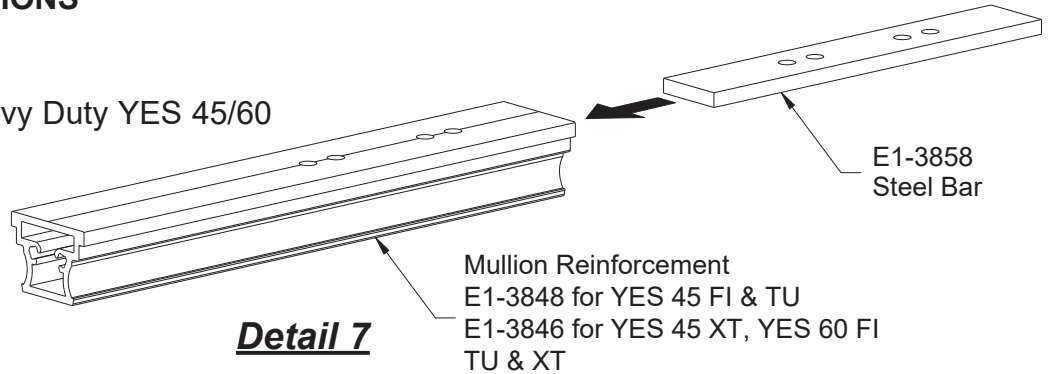
The ThermaShade for Storefront "Type B" application is for Outriggers located at the extreme top of the storefront vertical mullion. No additional fabrication is required.

ANCHOR SYSTEM ASSEMBLIES

STEP 5 ANCHOR PLATE ASSEMBLY FOR “TYPE A” CONDITIONS

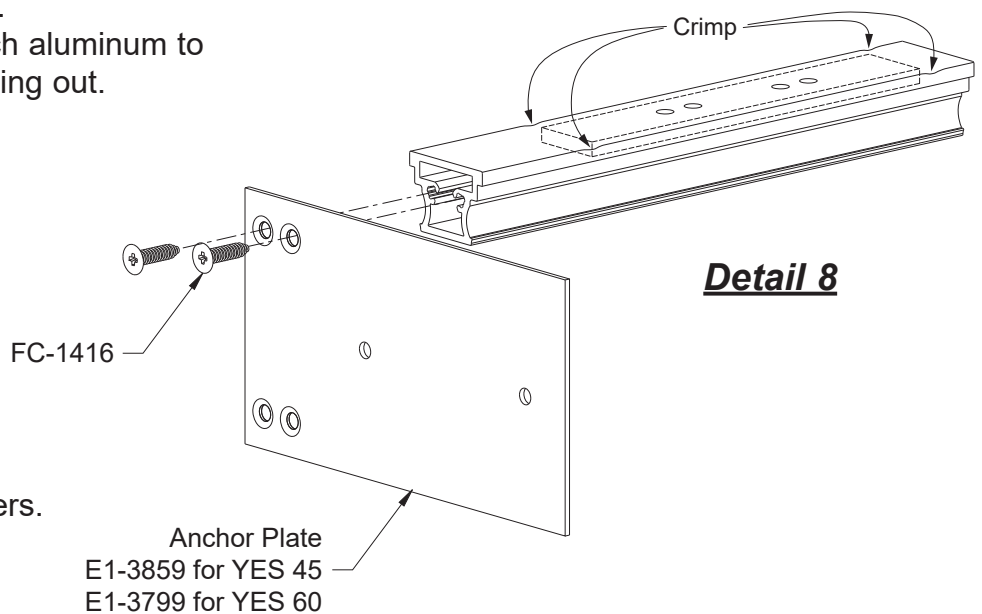
Note:

For YHS 50 FI/TU & Heavy Duty YES 45/60 applications, skip to **Step 6B on Page 16.**



- Slide the E1-3858 steel reinforcement bar into the mullion reinforcement.
- Align holes and crimp or punch aluminum to prevent the steel bar from sliding out.

See **Detail 7.**



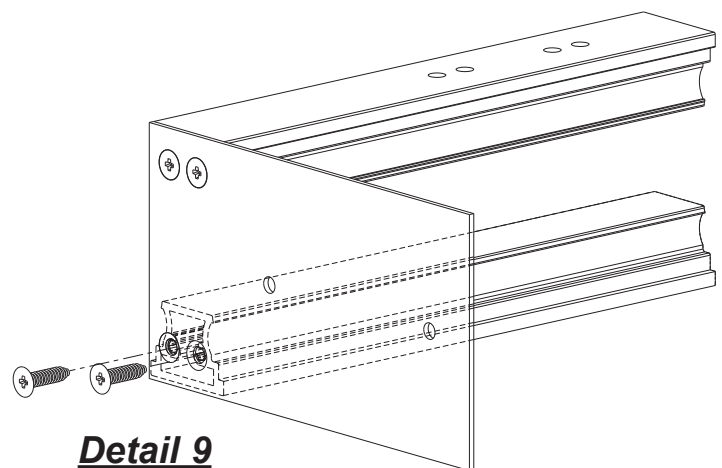
- Attach the anchor plate to the mullion reinforcement sleeve using (2) two FC-1416 fasteners.

See **Detail 8.**

- Attach the second mullion reinforcement sleeve to the E1-3859 anchor plate using (2) two FC-1416 fasteners.

See **Detail 9.**

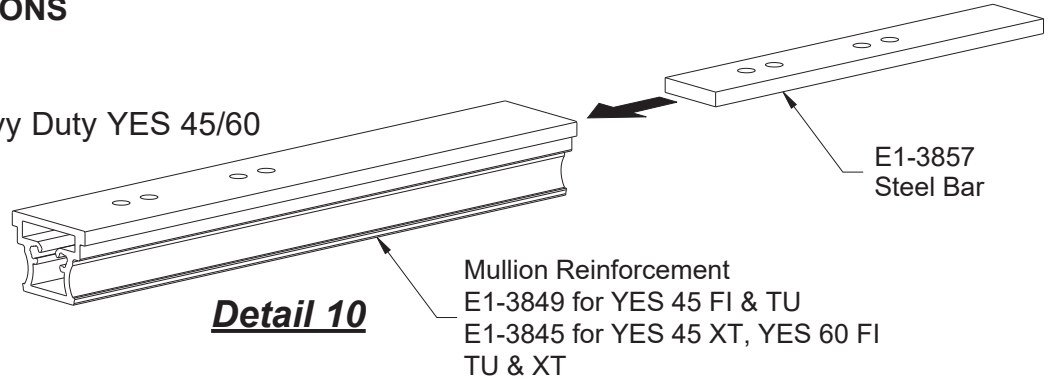
For “Type B” conditions, see Step 5 on Page 14.



ANCHOR SYSTEM ASSEMBLIES

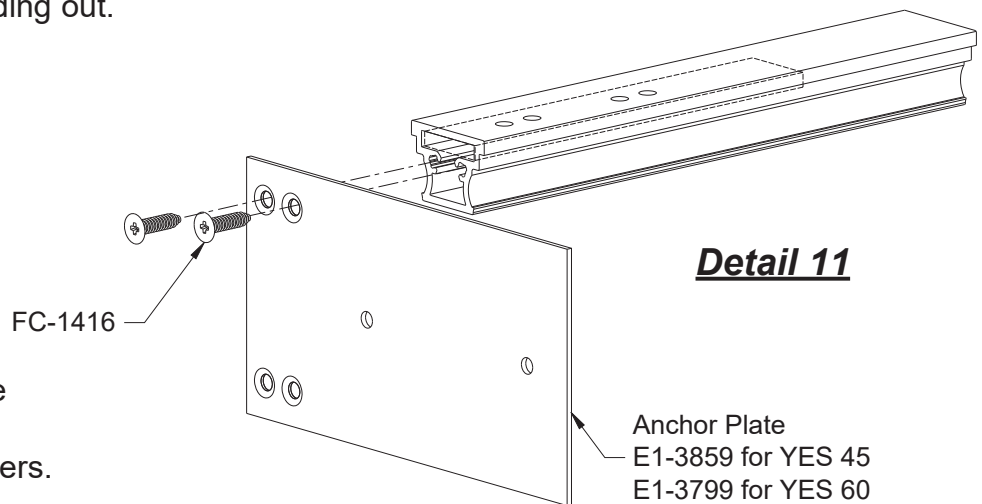
**STEP 5
ANCHOR PLATE ASSEMBLY
FOR “TYPE B” CONDITIONS**

Note:
For YHS 50 FI/TU & Heavy Duty YES 45/60 applications, skip to **Step 6B** on **Page 16**.



- Slide the E1-3857 steel bar into the mullion reinforcement.
- Align holes and crimp or punch aluminum to prevent the steel bar from sliding out.

See **Detail 10**.

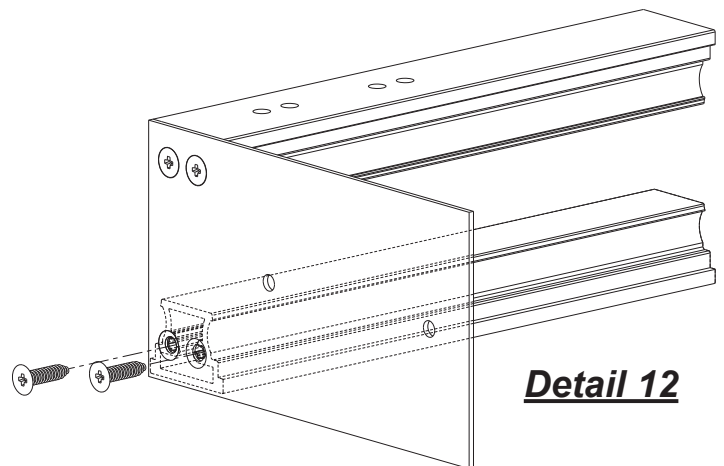


- Attach the anchor plate to the mullion reinforcement sleeve using (2) two FC-1416 fasteners.

See **Detail 11**.

- Attach the second mullion reinforcement sleeve to the E1-3859 anchor plate using (2) two FC-1416 fasteners.

See **Detail 12**.

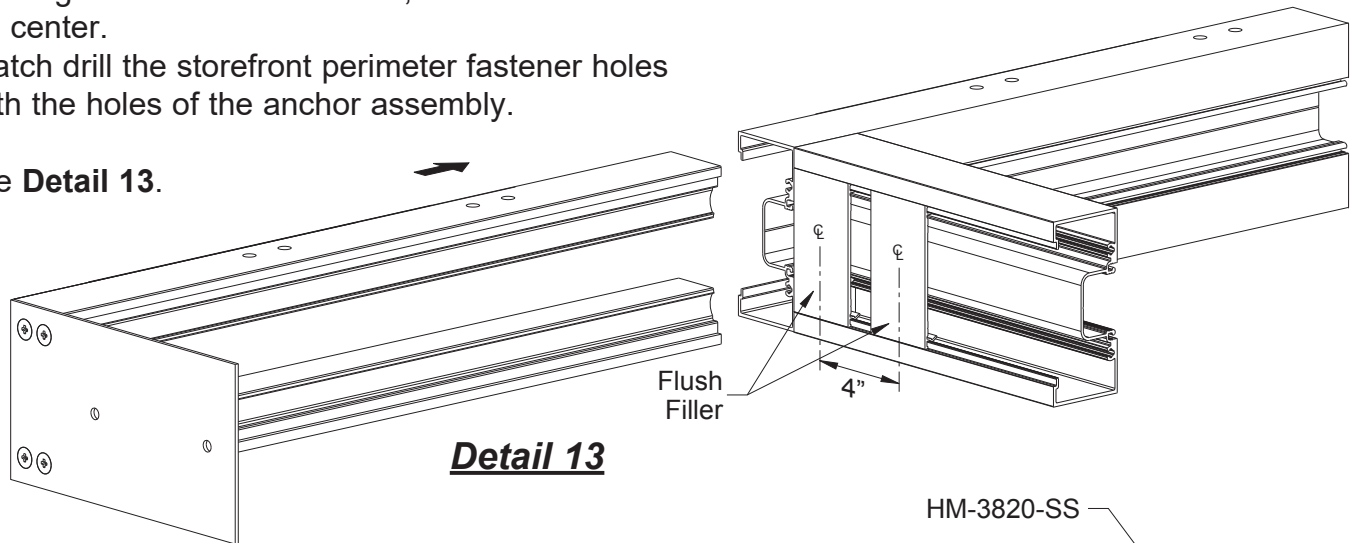


ANCHOR SYSTEM ATTACHMENT

STEP 5 (Cont'd) ANCHOR PLATE ASSEMBLY

- Prior to installing the anchor assembly, attach (2) two flush fillers to the head horizontal. Locate the first flush filler against the edge of the vertical mullion, and the second flush filler 4" on center.
- Match drill the storefront perimeter fastener holes with the holes of the anchor assembly.

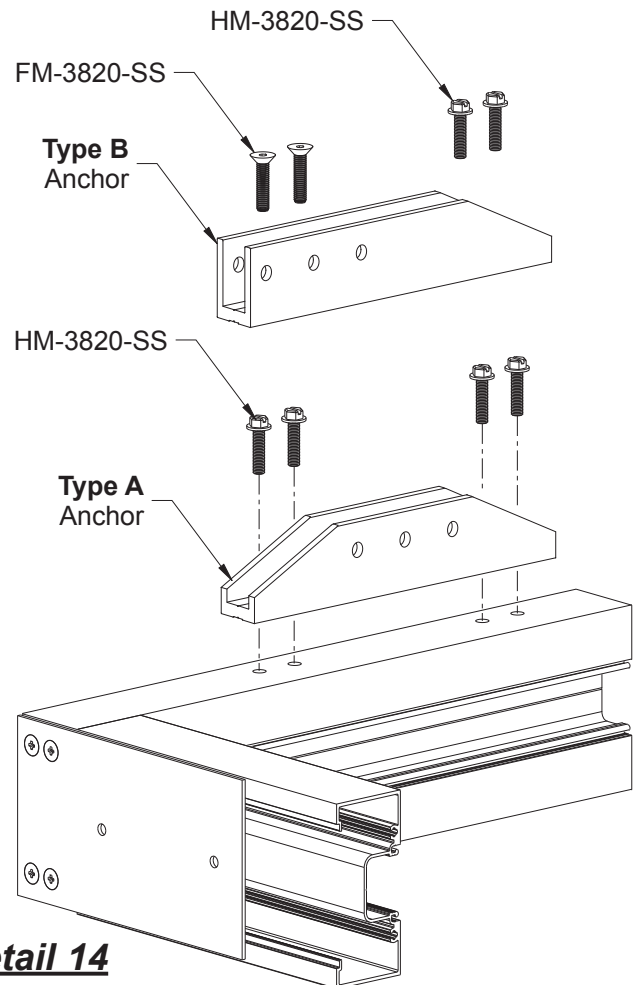
See **Detail 13**.



STEP 6A ATTACH ANCHOR CLIP TO VERTICAL MULLION (FOR STANDARD DUTY YES 45/60 FI/TU/XT APPLICATIONS)

- Insert the first HM-3820-SS bolt into the slotted hole of the anchor clip.
- Before completely tightening the first bolt, adjust the anchor clip up or down in the slotted hole as needed until the clip is in the exact location required. After thoroughly checking the vertical alignment, snug the bolt until the anchor clip meets the mullion.
- Install the bolts into the remaining hole locations, beginning with the top bolt and working down. Tighten the bolts until the bolt head and the extrusion fit together tightly. DO NOT over-tighten.

See **Detail 14**.



ANCHOR SYSTEM ATTACHMENT

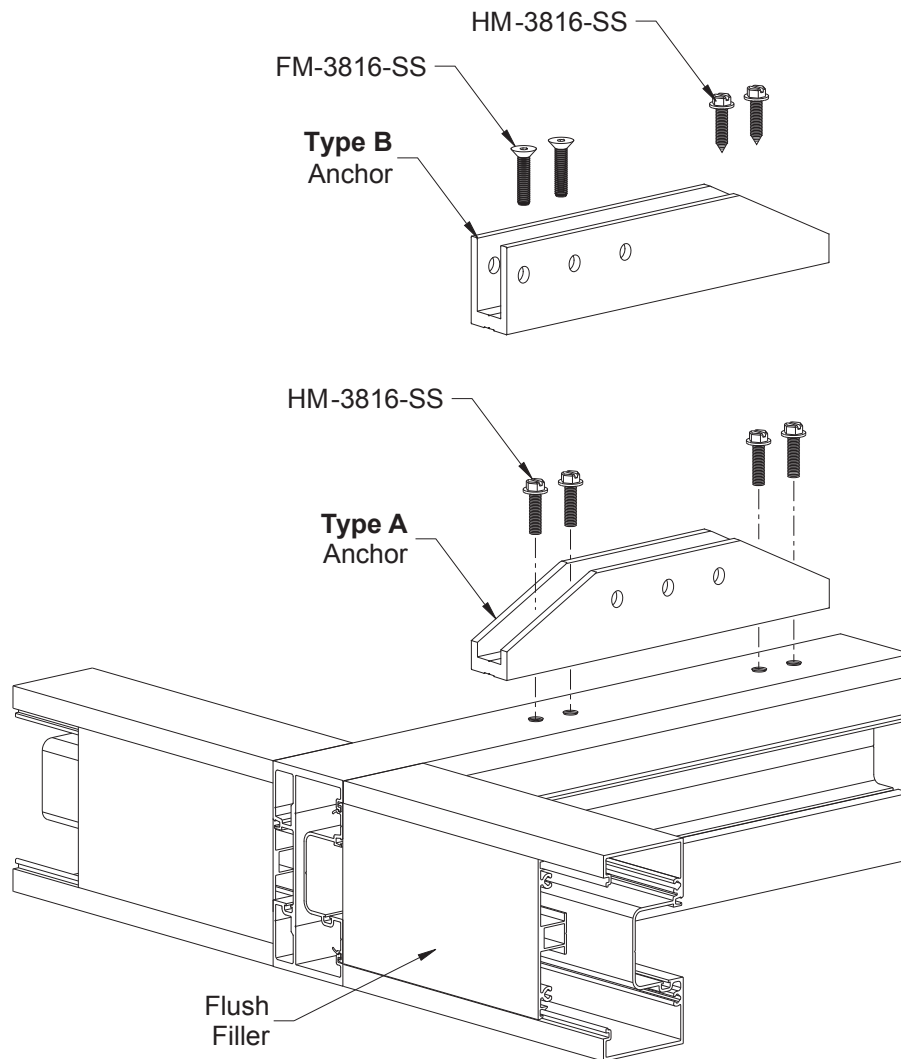
STEP 6B

ATTACH ANCHOR CLIP TO VERTICAL MULLION

(FOR YHS 50 FI/TU & HEAVY DUTY YES 45/60 APPLICATIONS)

- Insert the first HM-3816-SS bolt into the slotted hole of the anchor clip.
- Before completely tightening the first lag bolt, adjust the anchor clip up or down in the slotted hole as needed until the clip is in the exact location required. After thoroughly checking the vertical alignment, bolt until the anchor clip meets the mullion.
- Install the bolts into the remaining hole locations, beginning with the top bolt and working down. Tighten the lag bolts until the lag screw head and the extrusion fit together tightly. DO NOT over-tighten.

See **Detail 15**.



Detail 15

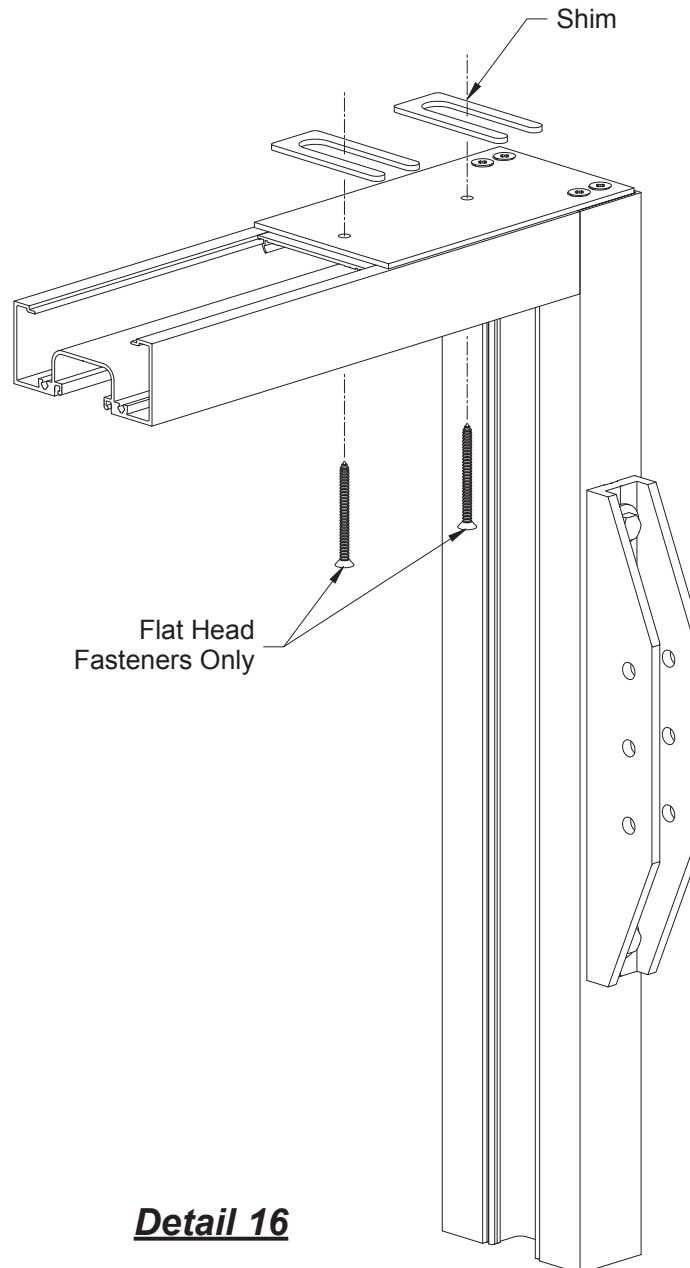
ANCHOR SYSTEM ATTACHMENT

STEP 7 STOREFRONT INSTALLATION (TYPICAL)

-Anchor storefront as shown in the storefront installation instructions and according to approved shop drawings and P.E. calculations.

For the 3/8" caulk joint at the head, be sure to include a 1/4" hard shim at each anchor plate fastener.

See **Detail 16**.

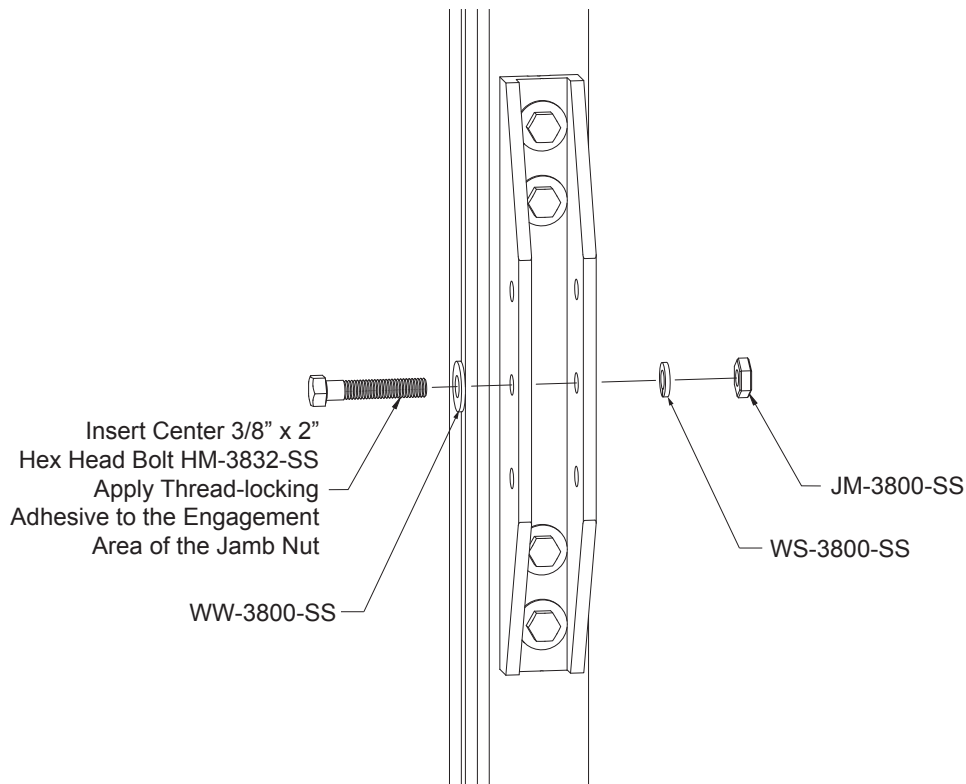


INSTALL THERMASHADE ASSEMBLIES**STEP 8****ANCHOR CLIP PREPARATION**

- Apply a Loctite thread locking compound to the HM-3832-SS 3/8" x 2" bolt.
- Align JM-3800-SS nut and WS-3800-SS lock washer over the center hole, then insert the middle through bolt with a WW-3800-SS washer and tighten until the threads of the bolt are flush with the outside edge of the nut. This center bolt will be used to temporarily hang the ThermaShade assemblies during the installation process.

See **Details 17**.

Glazing should be done prior to hanging ThermaShade assemblies.



Detail 17

INSTALL THERMASHADE ASSEMBLIES

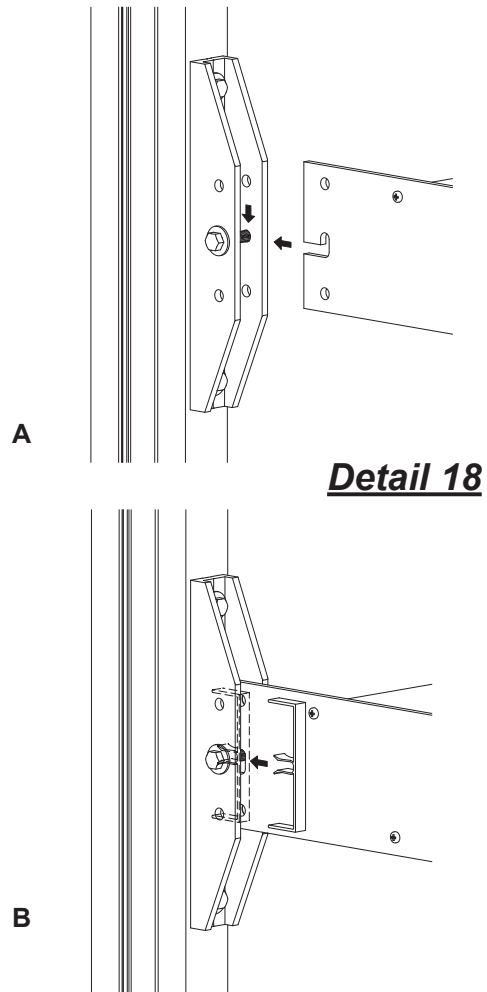
STEP 8 (Cont'd)

INSTALL THERMASHADE ASSEMBLIES

- Position the assembly to align the outrigger hook slots with the middle through bolts. Slide the assembly over the through bolts until the hooks engage and the assembly hangs from the through bolts. See **Detail 18 A**.
- After the outrigger assemblies have been placed in this position, snap the spacer onto the bolt. See **Detail 18 B**.
- Continue to hang remaining ThermaShade assemblies onto the anchor clips in the same manner, making sure to snap the spacers into position for each unit.
- The remaining two anchor clip bolts can be inserted at any time during the installation sequence after two adjacent assemblies have been hung and aligned.

Note: The E1-3934 spacer may be placed into position before the adjacent ThermaShade assembly is hung in place. Then insert two (2) 3/8" x 2" HM-3832-SS bolts.

See **Detail 18**.



INSTALL THERMASHADE ASSEMBLIES

STEP 8 (Cont'd)

INSTALL THERMASHADE ASSEMBLIES

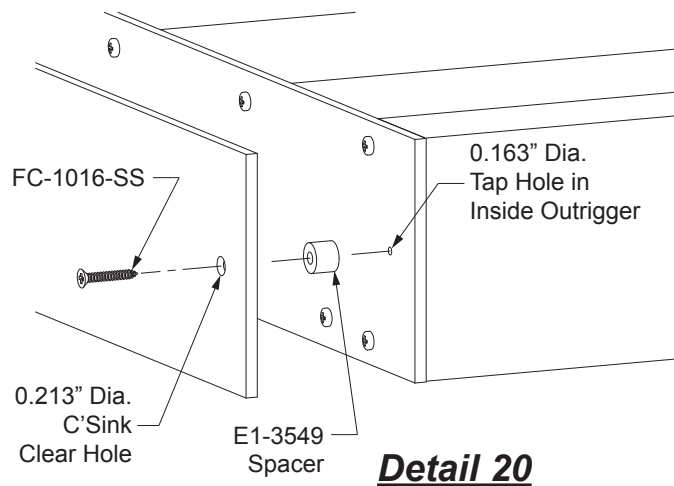
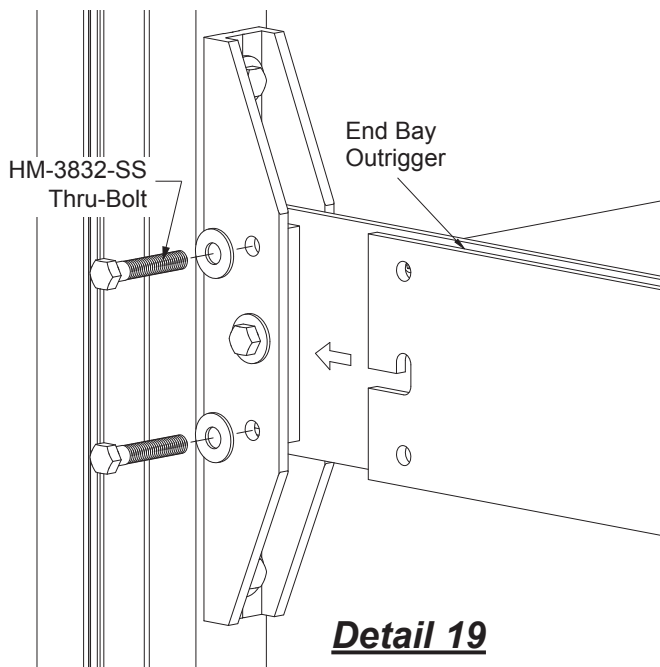
- Repeat above instructions for the remaining ThermaShade assemblies.
- After the assemblies are aligned, tighten all anchor clip thru-bolts.

INSTALLATION OF END BAY OUTRIGGERS (OPTIONAL)

End bay outriggers have three attachment holes to align with the anchor clip. End bay outriggers are used to “cap off” the end bay assembly.

- To complete the end bay assemblies, hang the end bay outrigger onto the outermost anchor clip.
- Insert the remaining two thru-bolts.

See **Detail 19**.



- Install the E1-3549 tube spacer at best hidden location between the intermediate outrigger and the end bay outrigger.
- Locate and drill a 0.213" diameter countersunk clear hole in the end bay outrigger.
- Locate, drill and tap a 0.161" diameter hole for a #10 screw at the same location in the adjoining intermediate outrigger.
- Fasten the E1-3549 spacer between the end bay outrigger and the intermediate outrigger using one FC-1016-SS fastener.

See **Detail 20**.

REGLAZING INSTRUCTIONS

REGLAZING STOREFRONT WHERE APPLICABLE

ThermaShade assemblies must be removed to allow access to glass for reglazing. The adjacent assemblies must also be removed on both sides of the replaced glass to allow for setting. For example, three ThermaShade assemblies must be removed for one piece of glass, four removed for two, etc.

- Carefully remove the snap on face covers above the outriggers on both sides of the broken glass area to expose the three through bolts.
- Loosen and remove the top and bottom bolts. Loosen the center bolt until finger-tight.
- At this point the outrigger can be lifted 3/8" and pulled away from the glass.

Note: After the glass has been replaced, follow the standard installation instructions for replacing the ThermaShade assemblies that had to be removed.



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