

MDSI  
Series 70  
Pressure Equalized  
Hook and Pin  
Installation Guidelines





















**METAL  
DESIGN  
SYSTEMS**

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**DESIGNED FOR  
A PERFECT FIT.**

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Metal Design Systems is pleased to offer an Installer's EDGE training course at our home office in Cedar Rapids, Iowa. This class is offered once a month free of charge to the installer. If you are interested in attending or would like more information, please contact MDSI via email at [tech@crmdsi.com](mailto:tech@crmdsi.com).

Part Number	Drawing	Description	Unit
7001		Mullion - Perimeter	Length
7002		Mullion - Intermediate	Length
7003-20		Splice Channel – cut to 6” in length (Combine 20 each 7003 & 7021 in each box)	Box of 20
7004-100		Anchor Channel 4”-5” cut to length	Box of 100
7005		Mid Span S Clip (Assembly part - Not a support material)	Length
7007-60		Anchor Channel 6.5”-7.5” cut to length	Box of 60
7009-50		Face Tie Back Support Bracket 4”-5”	Box of 50
7010-50		Wall Tie Back Support Bracket 4”-5”	Box of 50
7011-50		Face Tie Back Support Bracket 6.5”-7.5”	Box of 50
7012-50		Wall Tie Back Support Bracket 6.5”-7.5”	Box of 50
7014-100		Anchor Angle 4”-5” cut to length	Box of 100
7017-60		Anchor Angle 6.5”-7.5” cut to length	Box of 60
7018-100	<b>Bolt</b>	#10-24 x 1/2” hex machine head s.s. bolt	Bag of 100
7019-200	<b>Screw</b>	1/4-20 x 5/8” s.s. hex washer head	Bag of 200
7020-200	<b>Screw</b>	#12-14x1” T3 Self Drilling 18-8 Stainless Steel	Bag of 200
7021		Splice Sleeve – cut to 6” in length	Box with 7003
7022		Mullion Cap	Pc
7023		Furring Channel	Pc
7024		Slide Plate	Pc
7025-20		.080x7/8”x1-3/16”x6” Return Reinforcement Angle	Box of 20
7068-100		Bulb, Pin, & Bolt Assembly #10 x 24 x 1/2” hex machine head s.s. bolt	Box of 100

# Metal Design Systems, Inc.

## SERIES 70

### Installation Guidelines

#### Required Equipment:

##### Forklift:

Typically crates are shipped directly to the job site from our fabrication facility via LTL carrier. This means that the crates will arrive in an enclosed trailer which will require either a dock and a fork lift or an extended reach forklift in order to unload the crates. The average crate size is 4' x 10', but they can be up to 5' x 16'. Large shipments can be delivered on flat bed trucks if prior arrangements are made.

##### Man-lift/Scaffolding/Ladders:

The terrain, accessibility, quantity of work on each area, and height of work will typically determine the type of lift equipment required to complete each project. The preferred option will usually be an all terrain scissor lift because they offer a larger platform allowing for more work space and fewer moves.

##### Work Table:

You will need a work surface to prep the panels for installation, cut penetrations or make field modifications. The table should be large enough to safely support the largest panels on the project and be covered with a long pile carpet to protect the panels from damage. Some installers prefer to build tables on site using the crating materials. This is perfectly acceptable provided that they are constructed in a sturdy fashion.

##### Power Tools:

10" or 12" miter saw with 80 tooth non-ferrous metal cutting blade for cutting extrusions; jig saw with plywood cutting blade for cutting penetrations in panels; router with carbide tipped flat point V-bit; drill and various sized drill bits; screw gun with 5/16" hex head driver and #2 Phillips bit.

##### Hand Tools:

Pop-Rivet gun; rubber mallet; single-cut metal file; countersink bit; hole saw kit for penetrations; caulk gun; utility knife; single edge razor blades; tin snips; flat blade screw driver; tape measure; 4 foot level; torpedo level; (a laser or sight level can be

very helpful for layout depending upon the complexity of the project); chalk line; safety glasses work gloves and hearing protection.

##### Supplies:

Always have an ample supply of fasteners in various sizes; plastic horseshoe shims in 1/4", 1/8" and 1/16" thicknesses; silicone sealant in the appropriate color; waterproof tarps to cover the crates and shop rags.

##### Crew Size:

A crew size of three typically works best in most cases. This allows for two in the lift handling and installing the panels on the wall and one on the ground prepping panels, cutting and drilling extrusions, and for general ground support.

##### Unloading:

Prior to unloading the crates from the delivery truck, inspect the crates for damage.

**Note: Report any damage to the carrier and note the damage on the shipping tickets. The receiver must make all claims for damage through the carrier upon receipt. Metal Design Systems, Inc. is not responsible for any damage after the product leaves the factory.**

Unload the material one crate at a time, know and follow all safety rules. Use the proper equipment for the weight being unloaded. If unloading with an overhead crane, use a spreader bar and nylon slings, do not "choke" the crates. Do not attempt to lift the crates by hand, drag, drop or stack the crates.

##### Inspection and Inventory:

Shipping damage should be noted on the Bill of Lading and then reported to Metal Design Systems.

**Note: The customer is responsible for filing a claim for freight damage with the shipping company within 24 hours of receipt. Failure to do so may result in forfeiture of the right to receive corrective action.**

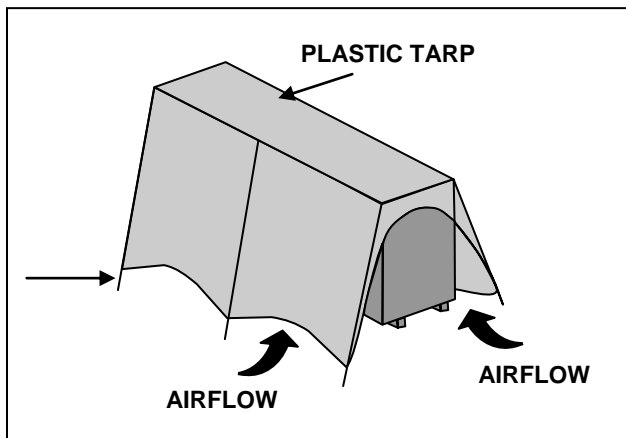
After verifying the condition of the product, inventory the panels and miscellaneous items and compare against the packing slip to ensure that all material is received.

**Note: Notify Metal Design Systems immediately if the quantities received do not match the packing list. Failure to do so may result in forfeiture of the right to receive corrective action.**

### **Storage:**

Store crates in a clean dry place. If the crates are to be stored outside, cover the crates to protect from the elements and ventilate to minimize heat build up. **(Figure 1)** At the end of each work day, place loose panels back into the open crates, secure the panels, and cover the crate.

Figure 1



### **Shake Out:**

Crate #1 will have a set of shop drawings revised to reflect field measurements and indicating panel part numbers and locations. Each crate will have a packing slip indicating the part numbers and quantities of the panels enclosed. At this time it may be beneficial to boldly write the contents of each crate on the outside for future reference. If possible, strategically place each crate in a location convenient to the final destination of its contents.

### **Handling Individual Panels:**

When removing panels from the crate, always take care to lift and clear other panels and sidewalls of the crate. **(Figure 2)** Never slide or drag panels out of its location. When carrying a panel, always carry it "on edge" and never flat. **(Figure 3)** Always be aware of your surroundings and take special care when handling panels that have intermediate routs or panels that have welded connections. Do not place the panels in any position that will cause the panel face or edges to come into contact with any

surface that will cause damage to the protective film or panel finish. The protective film is designed to prevent minor abrasions. Extreme care should still be taken to avoid dents and scratches.

Figure 2

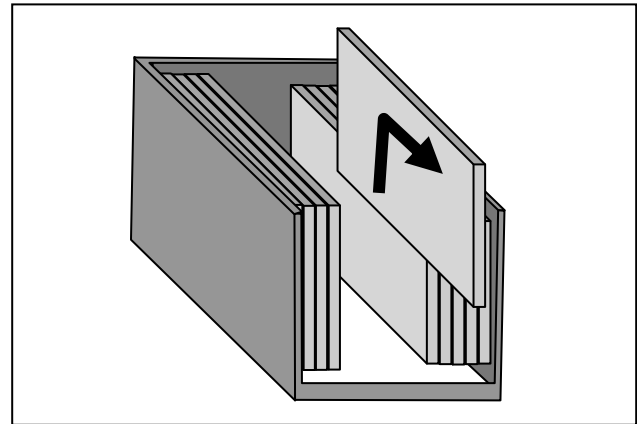
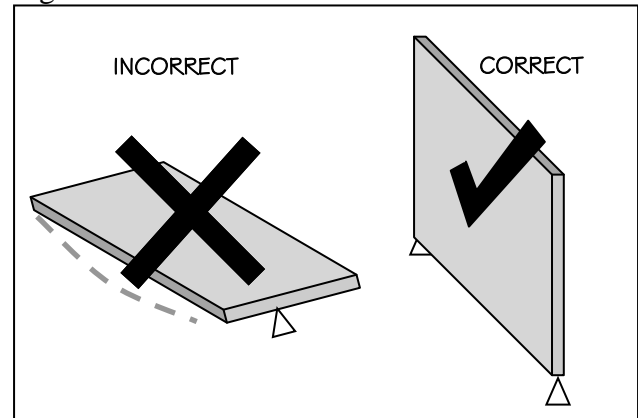


Figure 3



### **Substrate/Job Inspection:**

Inspect the area that is to receive the panels to ensure that all work is complete and satisfactory. All substrates, weather barriers, penetrations, doors, windows, and any other adjacent materials should be in place and cleaned prior to proceeding with panel installation.

**Note: Acid wash used for cleaning masonry will cause permanent damage to the panels.**

Ensure that all surfaces are plumb, level, square, true, dry and free from defects. Do not begin installation until all unsatisfactory conditions have been corrected.

### Installing Flashing & Weather Barrier:

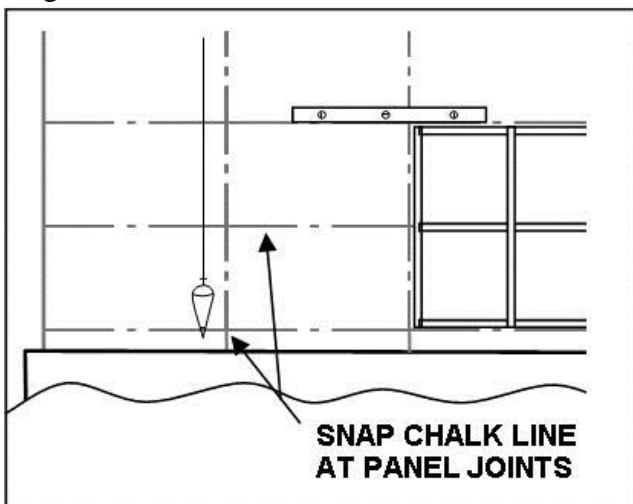
Install flashing using standard sheet metal practices and procedures, ensuring that all joints and seams are weather lapped and sealed. For the weather barrier, follow manufacture's written instructions for proper installation. Integrate weather barrier and flashing to allow proper drainage of any moisture that may enter or accumulate within the panel system. At this point the wall should be weather tight.

**Note:** This wall panel system is a "Rain Screen" system and is not designed with the intent to be weather tight. Therefore it requires an air and water barrier which shall be considered the primary weather seal. Water will come in contact with the weather barrier and it shall be installed in accordance with the manufacturers instructions to seal all seams, penetrations, fasteners and flashing integrated with the barrier to properly drain, evacuate and dry any moisture which may come in contact with it.

### Layout:

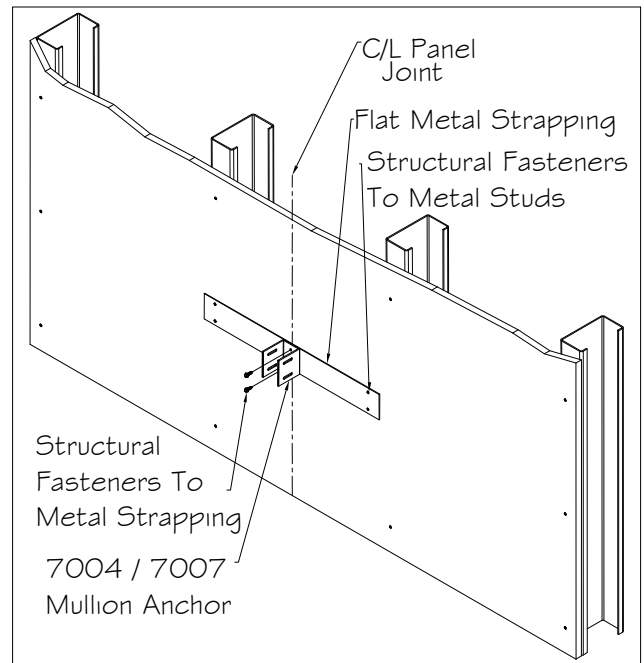
Reference the revised shop drawings and locate key components for panel system alignment (i.e. windows, doors, window mullions or other items that are critical to joint locations) and begin layout from these locations. Snap chalk lines at the center of each panel joint making sure that all lines are level and plumb. (Figure 4) This will help to control panel gain or loss over a long run. If the panel system is to be installed over a gypsum board substrate, locate all framing members to ensure that all fasteners engage a structurally sound member.

Figure 4



**Note:** If installing over gypsum board substrate, installer will likely be required to supply and install flat strapping or other horizontal framing members prior to installing series 70 sub frame system, as the anchor angles and anchor channels will not necessarily fall on studs. (Figure 5)

Figure 5



### Installing Sub-Frame System Metal Design Systems Series 70

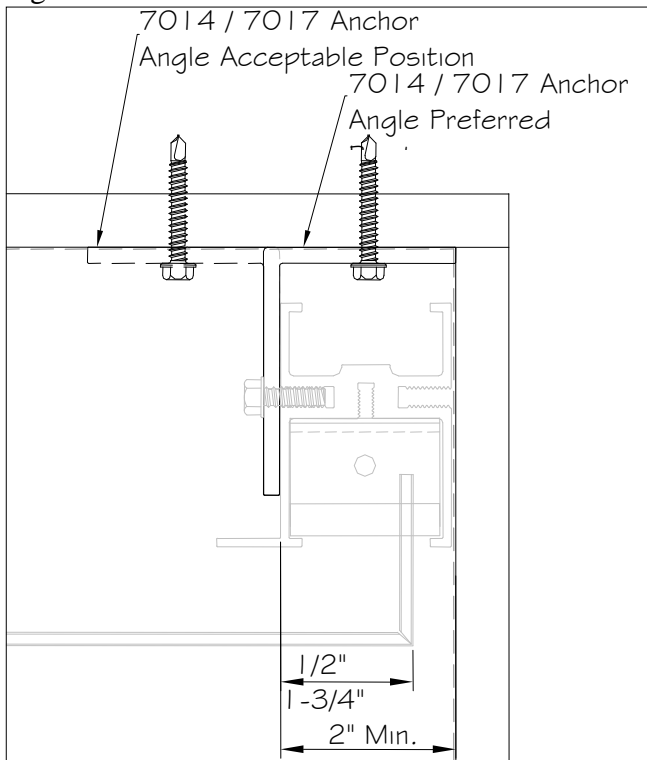
#### Setting up:

Locate work table and miter saw in a safe and convenient location relative to the installation area. Locate and unpack the crate with the sub-frame members, anchors and hardware.

#### Installing Anchor Angle PN 7014 (7017):

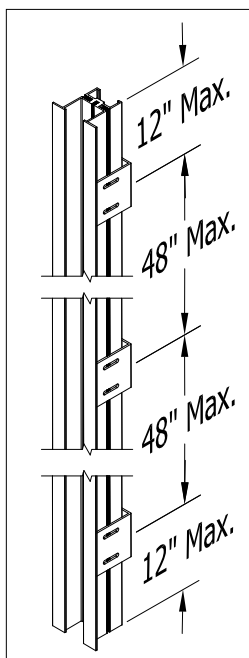
The anchor angles can be installed either with the angle returning behind the mullion or away from the mullion. The direction may be dictated by the position of the structural member that the anchor will be attached to. (Figure 6)

Figure 6



Position the anchor angles within the parameters shown in Figure 6. For vertical spacing, the anchor shall be placed within 12" of the end of every mullion and 48" max. on center (Figure 7), check for plumb, and fasten the angles to the wall using installer supplied screws. Metal Design Systems, Inc. recommends a minimum #12 stainless steel tek or wood screws (depending upon the substrate), minimum two per anchor.

Figure 7



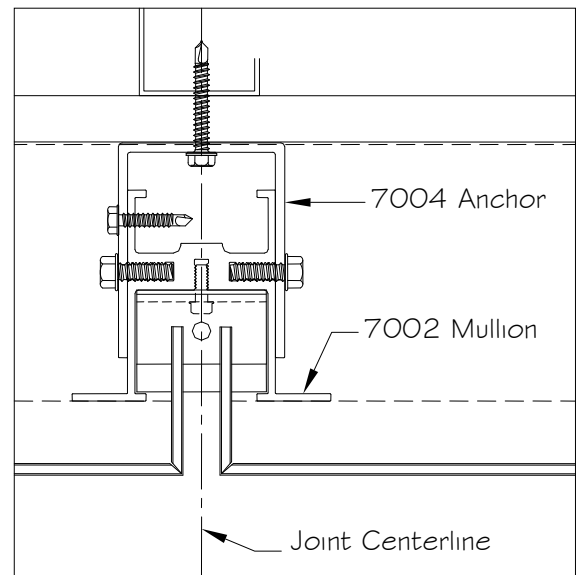
**Note: Check your project specific shop drawings. Fastener size, type and quantity as well as anchor size and spacing may differ from the minimums specified here.**

If system is applied directly over a gypsum board substrate, ensure that the fasteners are located and of sufficient length to properly engage a structural member. Wood screws require a minimum of 1" penetration into the wood and tek screws require a minimum of three full threads extending past the back side of the metal.

**Installing Anchor Channel PN 7004 (7007):**

When installing the anchors channel, center them directly in line with the vertical joint centerline. (Figure 8) Vertical spacing and position of the anchors shall be in accordance with the spacing described in Figure 7 or the project specific shop drawings. Angle Anchors may be used at intermediate joint locations but vertical spacing of the anchors shall be kept to a maximum spacing equal to 1/2 the distance of the anchor channels.

Figure 8



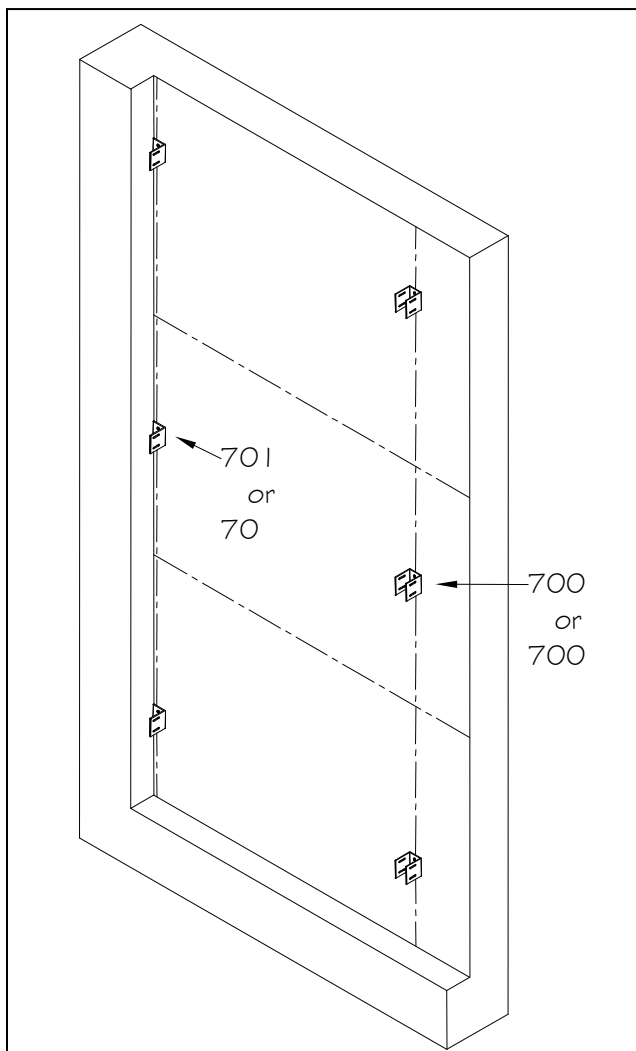
Fasten the anchors to the wall using installer supplied screws. Metal Design Systems, Inc. recommends a minimum #12, 300 series stainless steel self-tapping fasteners for applications into steel or aluminum and #12, 300 series stainless steel T17 point fasteners for wood substrates. The recommended maximum spacing is 16" on center. Please reference the project specific details for fastener type and spacing requirements. If the system is applied over a gypsum sheathing substrate, ensure that the fasteners are of sufficient

length to properly engage the structural framing members. Self-drilling/self-tapping fasteners require a minimum of 3 fully formed threads extending beyond the back of the metal, and wood screws require a minimum of 1" penetration.

**Note: When installing the anchors, ensure that they are directly in line with one another so that the mullions can be inserted into the anchors without difficulty.**

The Series 70 system should not require shims behind the anchors. There is a +/- 1/2" in and out adjustment built into the connection of the anchor to the mullion.

Figure 9

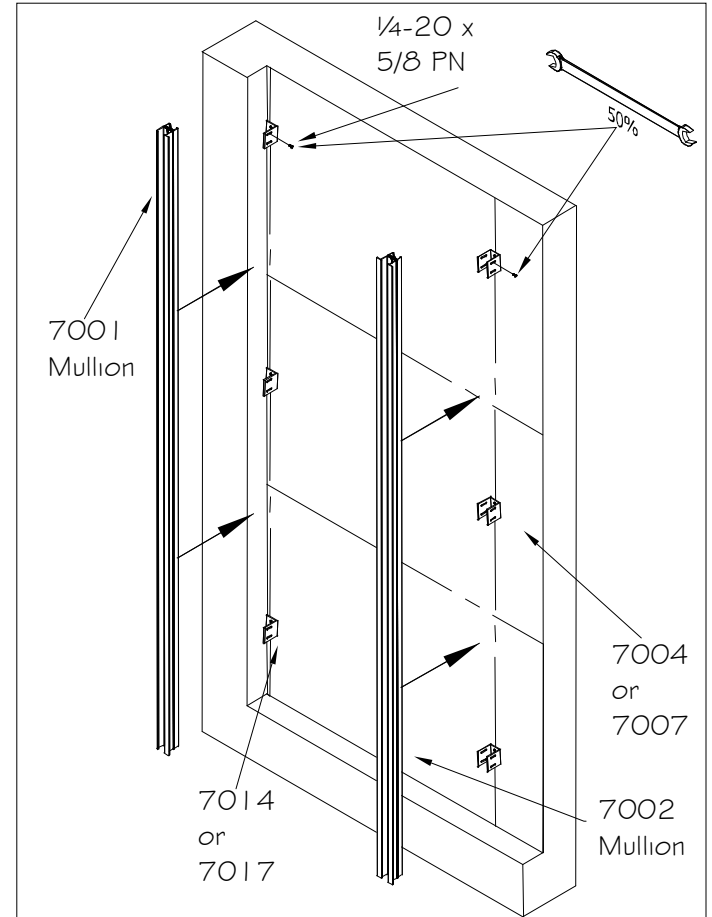


**Installing Mullions PN 7001 & 7002:**

Mullion extrusions will be shipped to the job site in stock lengths and must be field cut to the proper length for the application.

Install 7001 mullions on the left and right perimeter, and 7002 mullions on the intermediate vertical joints. When installing the perimeter 7001 mullion, the wider flange should be oriented toward the panel side. (Figure 10)

Figure 10



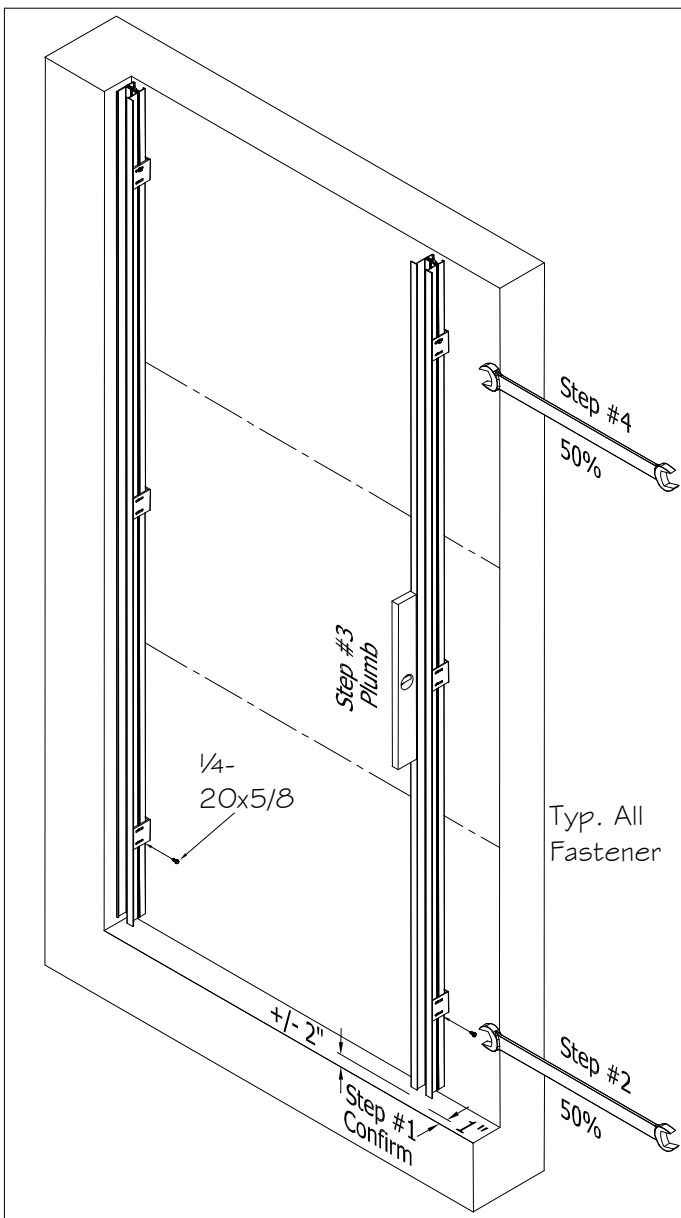
Align the mullion screw ports with the slots in the anchors and install one 1/4-20x5/8" hex washer head screw (7019) in the top slot of the anchor. Snug the screw with only enough force to hold the mullion in place temporarily with the bottom of the mullion approximately 2" above the sill flashing. (Figure 10 & 11) Adjust the bottom of the mullion in or out so that the face is in the correct plane with relation to the desired panel face plane.

**Note: The face of the mullion should be set exactly 1" inboard of the face of the panels.**

Install one 1/4-20x5/8" screw (7019) through the bottom slot and into the screw port on the side of the mullion. Tighten this fastener approximately 50% for now. (Figure 11)

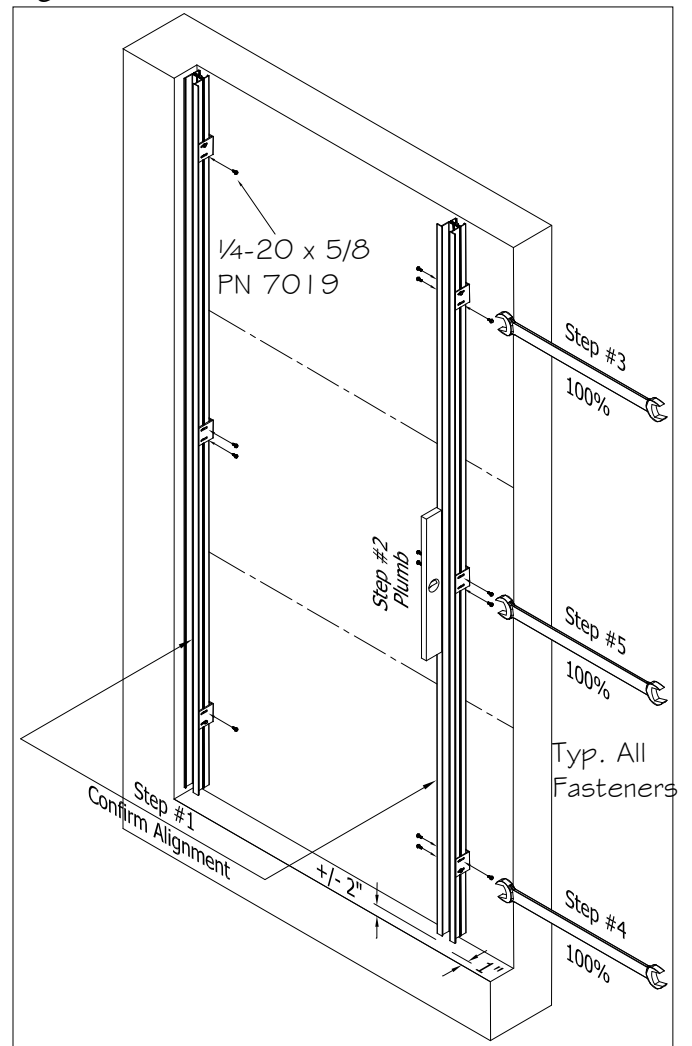
Move back to the top of the mullion and adjust the top screw so that channel is plumb and retighten at about 50% this time. Do this to each mullion.

Figure 11



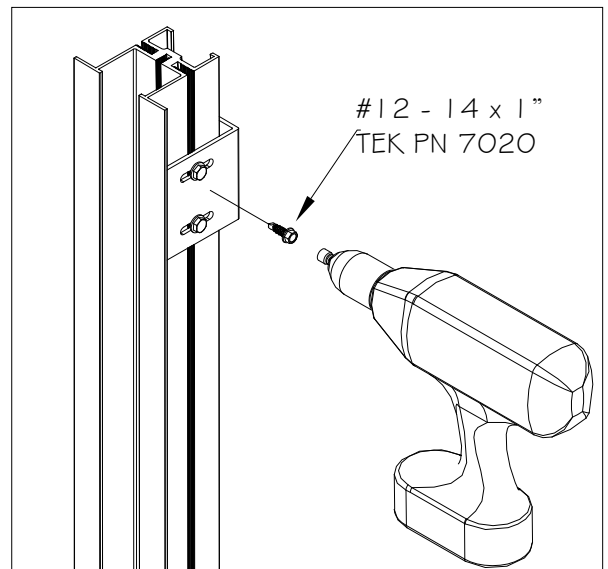
Confirm that the faces of all mullions are plumb and in plane with one another. Make adjustments to the top and bottom screws as necessary. Once satisfied with the positioning of all the mullions, tighten the screws and insert one 1/4-20x5/8" screw (7019) in each anchor slot and tighten. (Figure 12) Take care not to over tighten the fasteners and strip out the teeth in the screw ports.

Figure 12



Then drill one #12-14x1" tek screw (7020) through each anchor and into back portion of the mullion to prevent any future movement or loosening of the connection. (Figure 13)

Figure 13





**Note: In cases where multiple mullions will be stacked and spliced, it is important that the appropriate number of pins (7068) be pre-placed in the channel of each mullion prior to stacking each mullion. Slide the proper number of pins into the channel and temporarily secure the bottom pin with a #10-24x1/2" screw (7018) into the screw port near the bottom of the channel to keep the rest of the pins from falling out.**

**Note: When installing the mullions, ensure that a splice will not be located in a position where a pin will need to be placed.**

Use Splice Channel (7003) and Splice Sleeve (7021) to connect multiple sections of mullions in tall areas. **(Figures 14 and 15)**

Figure 14

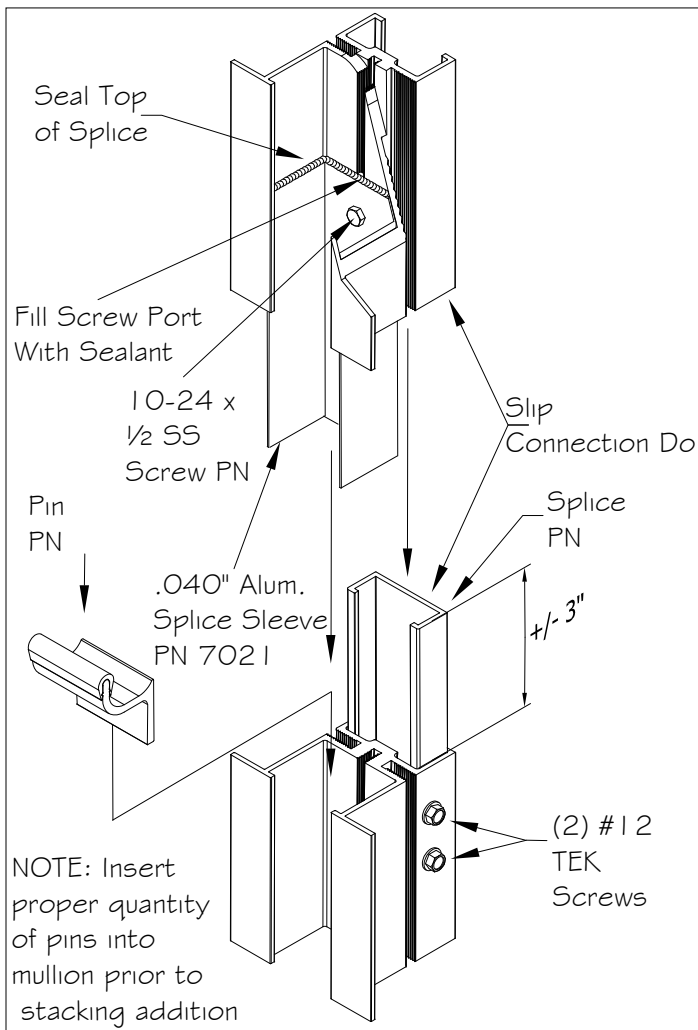
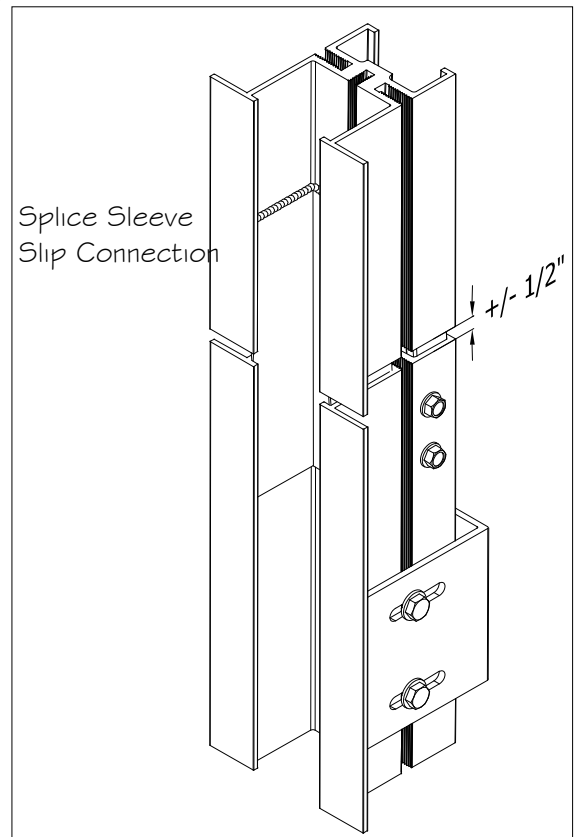
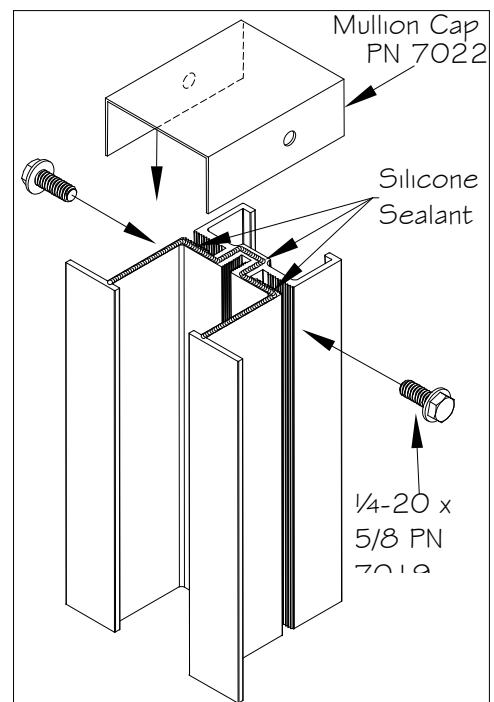


Figure 15



At the top of the vertical run, a Mullion Cap (7022) must be installed and sealed to prevent water from blowing over the top. Apply silicone sealant to the top of the mullion and fasten the cap into the side screw ports with 1/4-20x5/8" screws (7019). **(Figure 16)**

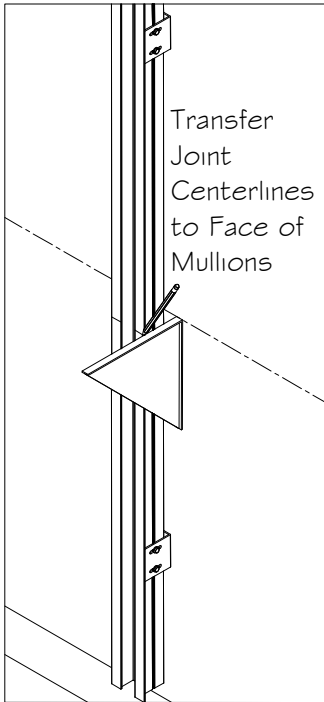
Figure 16



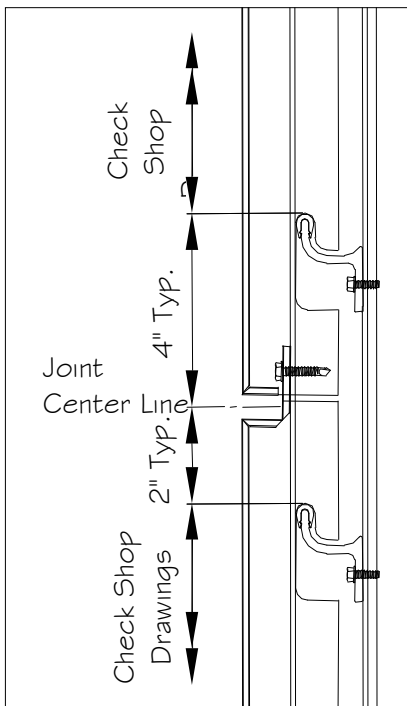
### Locating Pins PN 7068:

Start by transferring the horizontal joint lines onto the face of the mullions. **(Figure 17)**

Figure 17



The pins will be located off of these reference points. Pin placement is measured from the horizontal joint centerline to the top of the plastic bulb on the pin assembly (7068). Metal Design Systems' standard pin placement is 4" above and 2" below the joint centerline. **(Figure 18)**



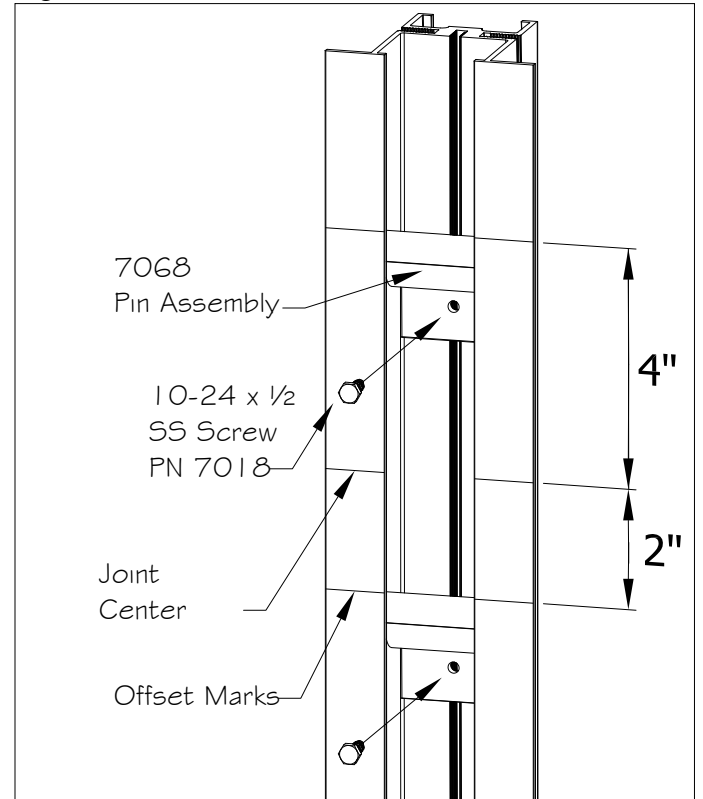
Intermediate pins will be required when the panels' vertical face dimension becomes greater than 30". Check your project specific shop drawings for hook and pin locations on each panel.

Mark the locations of the pin tops on the screw flange of the mullions.

Slide pins (7068) to align with the marks on the flange and secure each pin using #10-24x1/2" hex head SS screw (7018). **(Figure 19)**

Take care not to over torque the screws.

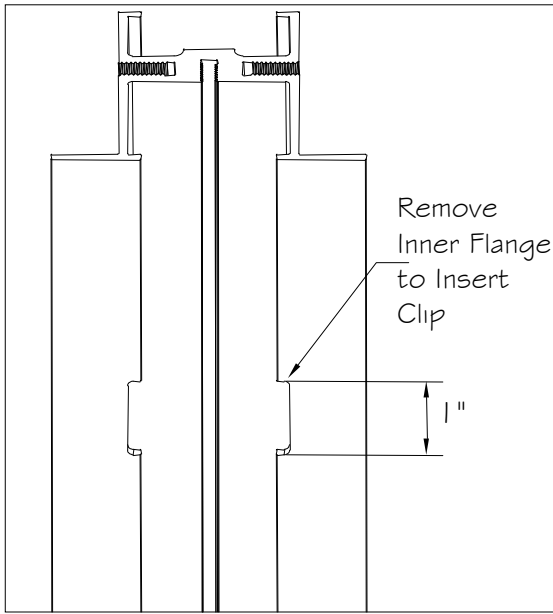
Figure 19



After the panels are installed, pin locations can be fine tuned through the open joints.

If pins (7068) need to be inserted after the mullions are installed, and they can not be slid into place from the top or bottom, remove the inner flange of the pin pocket. Use a router with a carbide tipped Formica trimming bit that has a bearing guide to make an access port to insert the pins. Remove approximately 1" from each side of the pocket. **(Figure 20)** Be sure that the access port is not located in a position that will coincide with the final pin placement. The pin must bear on the inner flange of the pocket to aid negative load resistance.

Figure 20

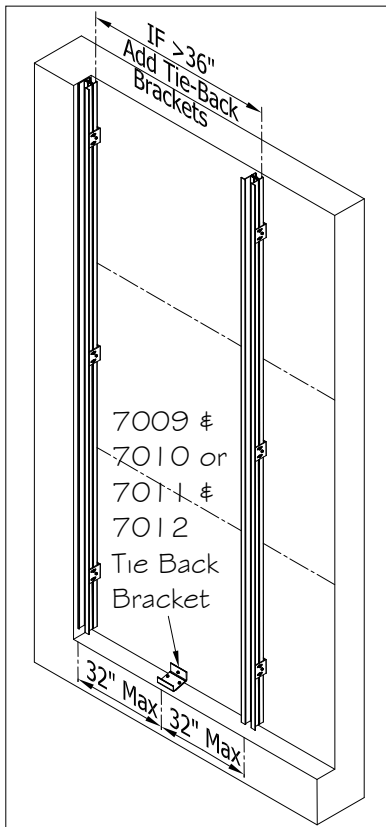


**Tie Back Brackets**

If the spacing between the mullions is greater than 36", Tie Back brackets will be required to support the horizontal joints. The brackets shall be placed a maximum of 32" on center. (Figure 21)

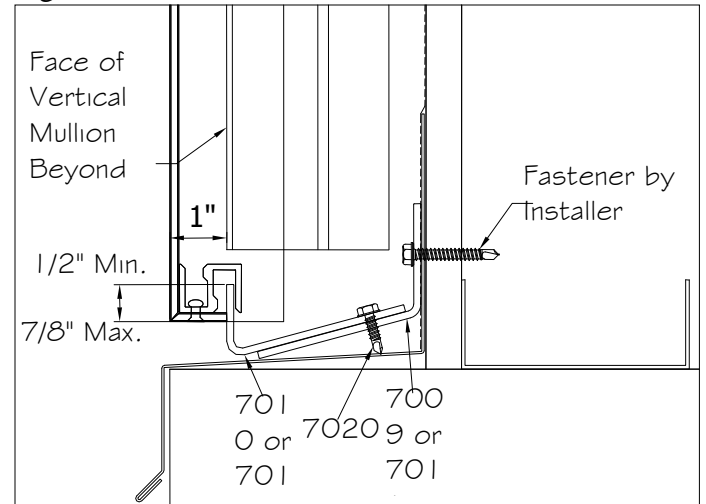
Brackets at the bottom of the wall must be set prior to installing the first panel. Brackets behind intermediate horizontal joints can be set as panel installation progresses.

Figure 21



Determine the offset dimension required for each bracket. The face of the bracket will be set flush with the face of the mullions. Place a straight edge across the mullions and measure the distance to the face of the substrate where the bracket will be placed. Fasten together the two bracket halves using two #12-14x1" tek screws (7020) so that the face of the bracket will be flush with the face of the mullions. Fasten the assembled bracket to the wall so that the top portion of the bracket that engages the bottom of the panel is set 1/2" - 7/8" above where you want the bottom of the panel to fall. (Figure 22)

Figure 22



**Installing Panels  
Metal Design Systems Series 70**

**Setting up:**

Locate work table and miter saw in a safe and convenient location relative to the installation area.

**Panel Prep:**

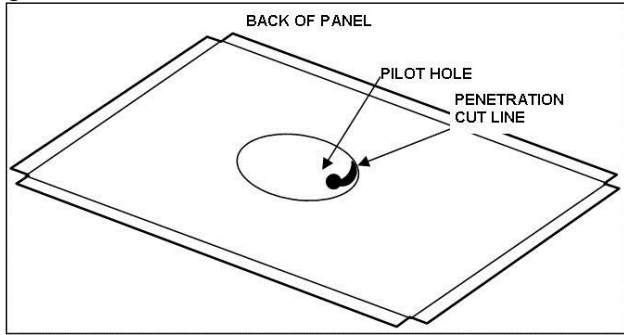
Remove panel from crate and inspect again for damage. If penetrations need to be cut in the panel it should be done so at this time.

**Cutting Penetrations:**

Verify location and size of penetration, remembering to allow for clearance of mullions and anchor extrusions. Mark penetration on the back of the panel and drill a pilot hole within the penetration, large enough for a jig saw blade. Cut the opening from the back side of the panel using a variable speed jig saw with a plywood cutting

blade. **(Figure 23)** Smooth the cut with a single cut metal file.

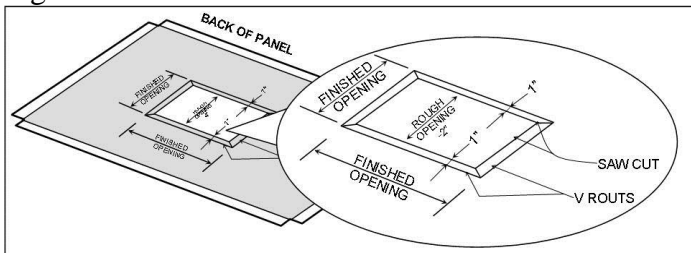
Figure 23



**Note: If the object penetrating the panel does not have a weatherproof escutcheon, you will need to caulk around the object penetrating. Therefore the panel will require a return leg around the opening to caulk to.**

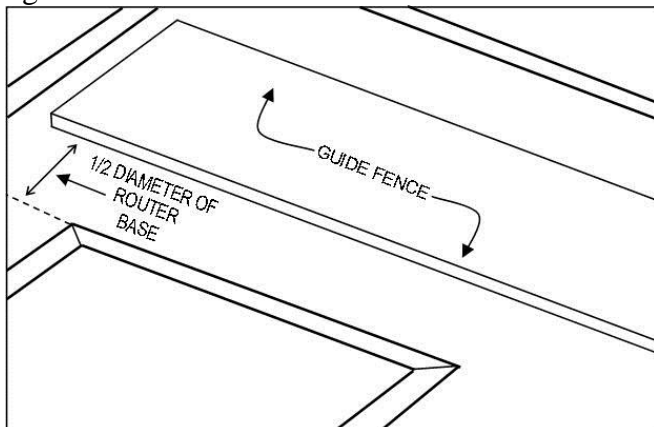
Cut opening in the same manner as above except that the opening should be 1" smaller than the object penetrating the panel. Using the router and the v-bit, rout grooves around the opening 1" away from the opening. **(Figure 24)**

Figure 24



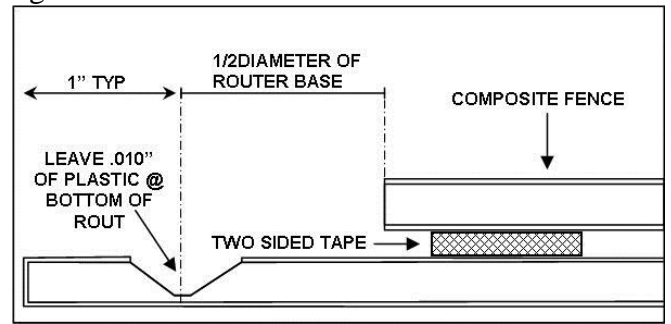
Use a fence to protect the good side of the panel and allow a clean straight rout. **(Figure 25)**

Figure 25



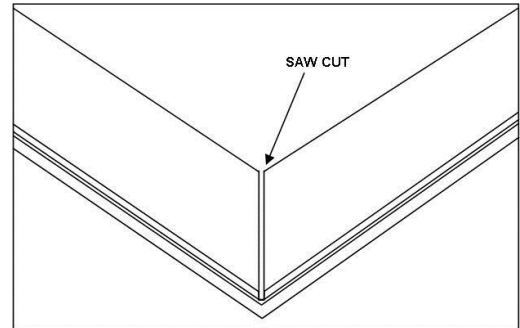
Two sided tape works well to temporarily secure the fence to the back of the panel. **(Figure 26)**

Figure 26



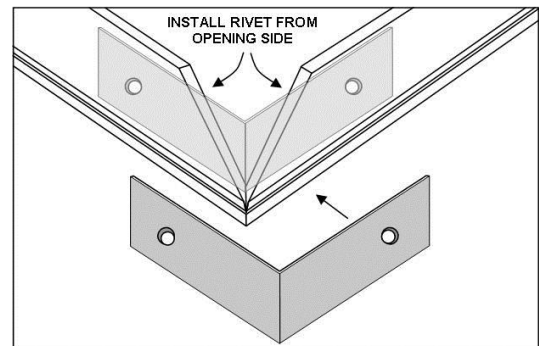
Saw cut the returns at the inside corners taking care not to cut past the v-rout. **(Figure 27)**

Figure 27



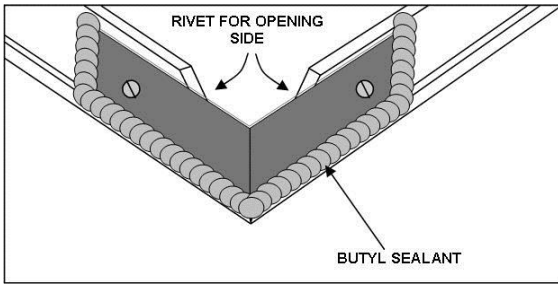
Back up the returns at the inside corners using a small piece of aluminum sheet bent to an angle. Pop-rivet or screw into place. **(Figure 28)**

Figure 28



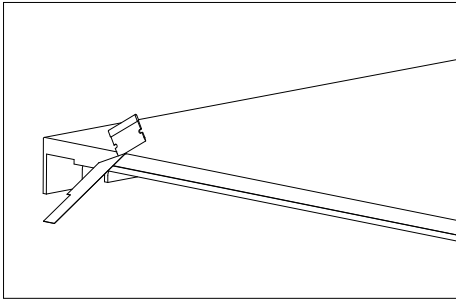
Back up the angle with butyl sealant. **(Figure 29)**

Figure 29



Place the panel on the work table and peel back the protective film from the panel return legs. Trim off the loose film using a single edge razor blade taking care not to scratch the panel finish. **(Figure 30)**

Figure 30



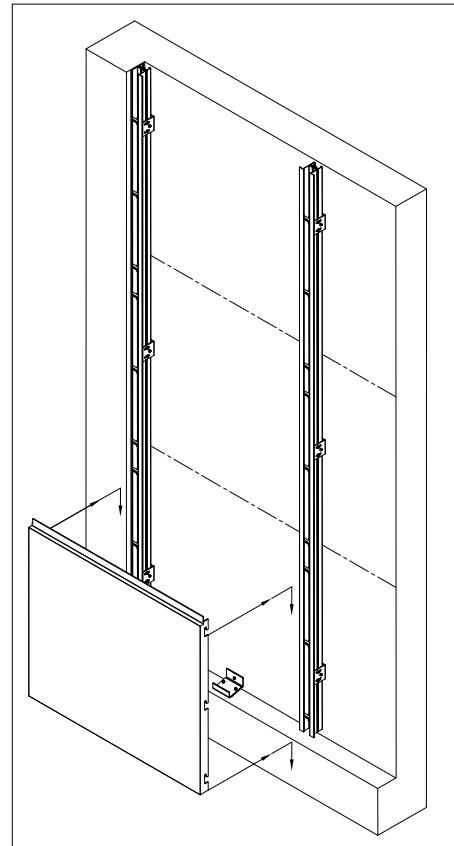
### Setting panels:

Begin with a panel on the bottom row of a wall.

Engage perimeter “hooks” (on the vertical return legs of the panel) onto the “pins” (7068) in the mullion. **(Figure 31)**

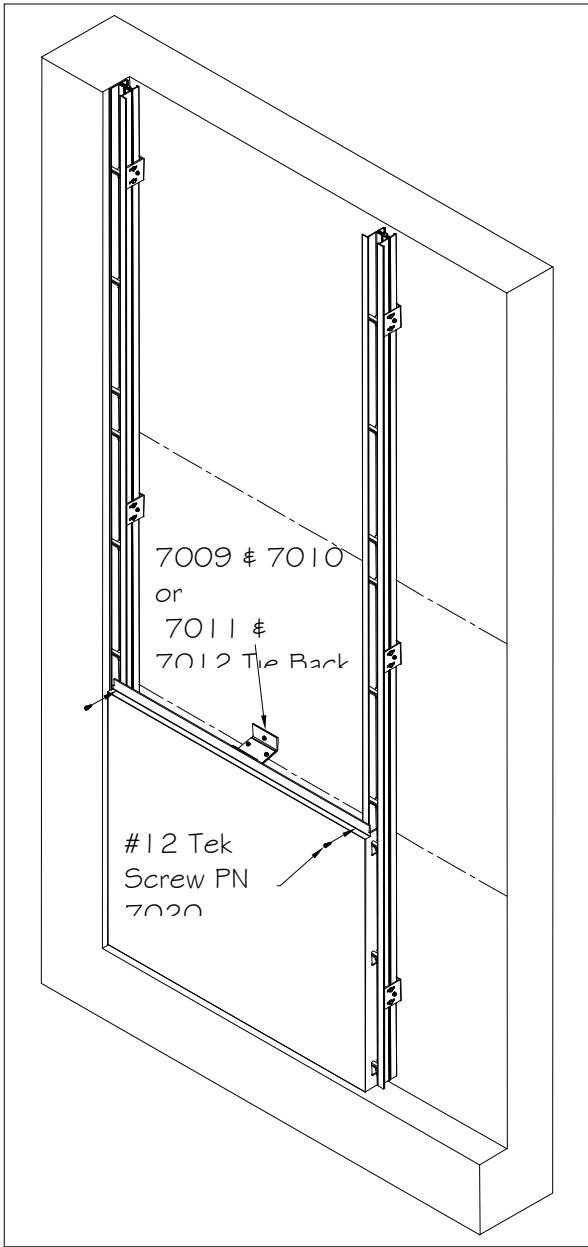
If intermediate Tie Back brackets are used, make sure the upturned leg of the bracket engages into the “S” shaped extrusion on the bottom of the panel. Adjust the height of each pin if needed to align with layout lines.

Figure 31



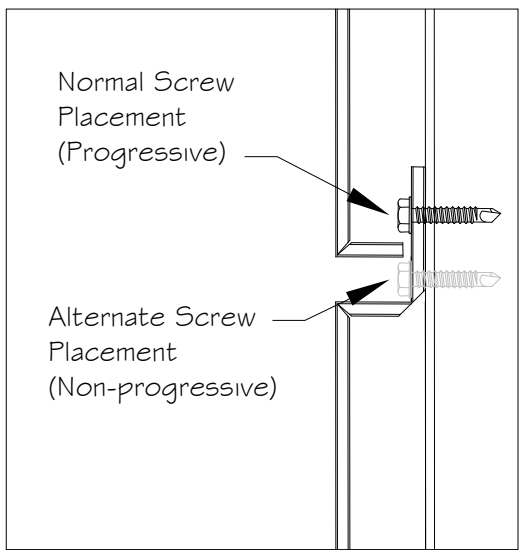
Ensure that panel is level, plumb and lined up with the layout lines and fasten with two #12-14x1” tek screws (7020) in the upper corners of the panel into the screw flanges of the mullion. **(Figure 32)**

Figure 32



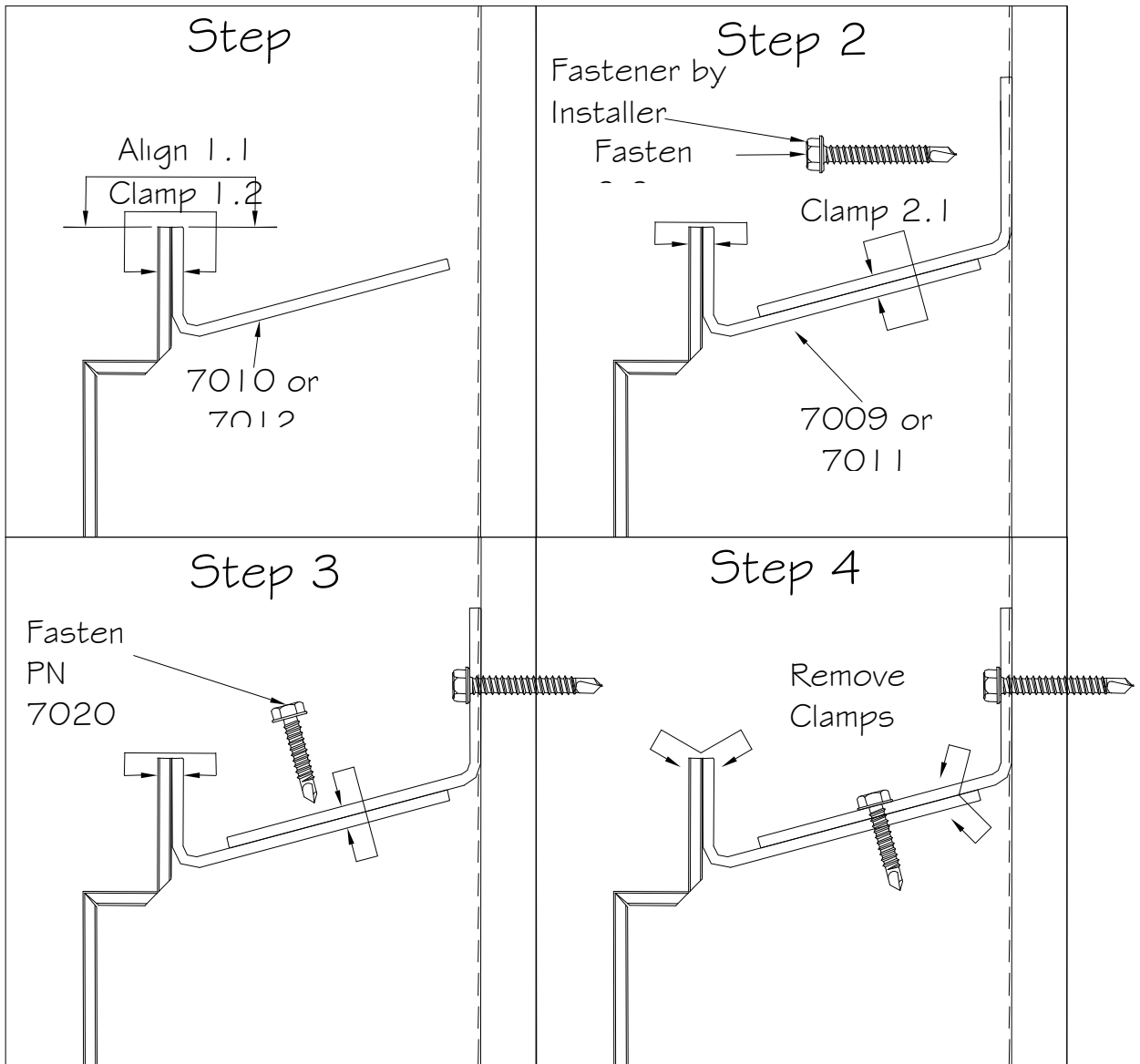
**Note: Series 70 can be installed as either a progressive or non-progressive system. Please determine which way your system should be installed. These instructions will work for either method; the only difference is the placement of the screws which hold the panels in place. To ease removal of panels at a later date, place the #12-14x1" fastening screws (7020) so that they will be left exposed in the horizontal joint. (Figure 33) Panel screws with colored heads may be provided for this purpose.**

Figure 33



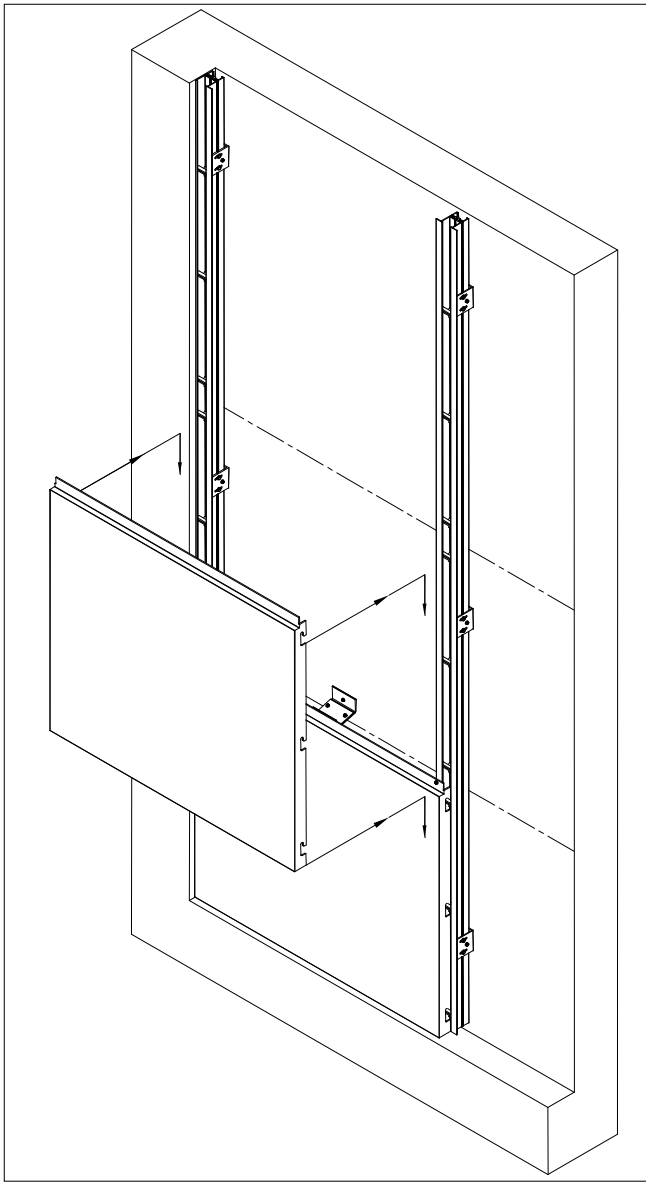
If the panels are wider than 36", Tie Back brackets will need to be installed prior to stacking the next panel. Locate the bracket in line with a structural member and clamp bracket half (7010 or 7012) to the upturned leg of the panel. Place bracket half (7009 or 7011) over the first half and slide it back tight to the substrate. Clamp the two halves together and fasten the back half to the substrate. Then fasten the two halves together with two #12-14x1" tek screws (7020) and remove the clamps. When the clamps are removed, ensure that the top of the bracket and the top of the panel are still in alignment. If not make adjustments so that they sit flush with one another without placing stress on the panel. (Figure 34)

Figure 34



Set next panel onto “pins” and shift into proper position. Again, making sure that the “S” extrusion engages over the lower panel and the Tie Back bracket. Adjust the panel and pins to align with the lower panel and layout lines. Secure it to the mullions when satisfied with the fit and location. Install Tie Back brackets if necessary and repeat the process until all panels are installed. **(Figure 35)**

Figure 35



**Note: Panels with film left exposed to UV for extended periods of time may become difficult to remove. Panels with film partially removed and left exposed to UV may become discolored.**

### **Cleaning Panels:**

In most cases, never use anything more than mild detergent and a soft cloth to clean the panels. Rinse with clean water immediately afterwards. See panel manufacturer's recommendations for proper cleaning methods.

### **Clean up:**

Keep work areas free of objects that could cause injury or damage to the panels. At the end of each work day, place all trash and debris into the appropriate containers for disposal.

**These guidelines are intended to convey the general sequences and procedures. Each application may vary and require specialized procedures. Refer to the project specific details for specialized instruction or contact Metal Design Systems, Inc. phone: 319-362-7454**

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The panels can be installed either by progressing horizontally or vertically. Continue this process until all panels are installed.

### **Removing Protective Film:**

The protective film should be removed immediately after final installation of the panel or at least at the end of each work day. Peel the film back against itself on the same plane as the panel face.

**Note: The film removal process may cause a static charge to build. To reduce the possibility of static shock, ground your self against the portion of the panel with the film removed.**