

MDSI Exposed Fastener Rainscreen

Equitone

Installation Guidelines



**METAL
DESIGN
SYSTEMS**

**DESIGNED FOR
A PERFECT FIT.**

Metal Design Systems is pleased to offer an Installer's EDGE training course at our home office in Anamosa, 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 sales@crmdsi.com

Metal Design Systems, Inc.

Equitone Exposed Fastener (EF) 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.

Power Tools:

A 10" or 12" miter saw with 80 tooth non-ferrous metal cutting blade for cutting extrusions; drills and various sized drill and hex bits; drill centering tool for 11mm holes with 4.1mm drill bit; and rivet gun with flexible nosepiece.

Hand Tools:

Caulk gun; 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; clamps; ledger boards; 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.

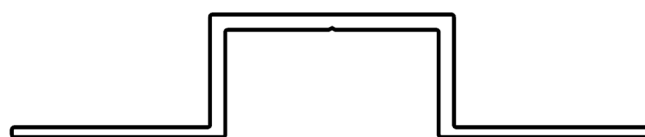
Fasteners:

Metal Design Systems, Inc. recommends a minimum size #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.

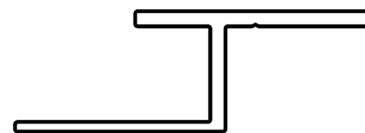
Crew Size:

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.

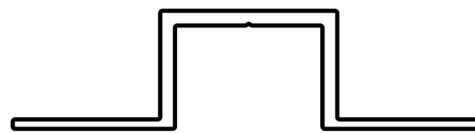
Available Equitone EF Extrusion Profiles:



4-1314-00 Hat Extrusion



4-1315-00 "Z" Extrusion



4-1316-00 Narrow Hat Extrusion

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.

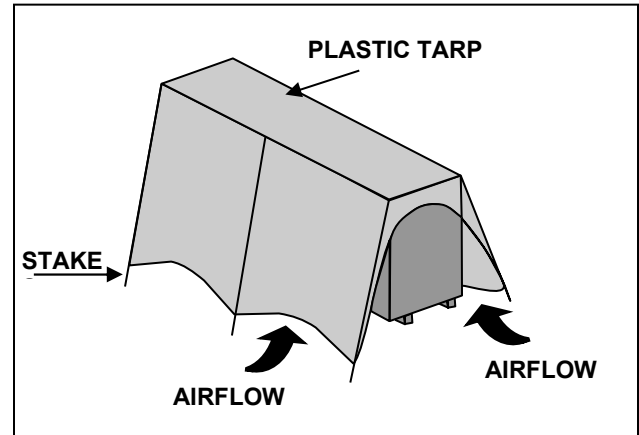
After verifying the condition of the product, take time to inventory the panels and miscellaneous items and compare those counts against the packing slip to ensure that all items are accounted for.

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:

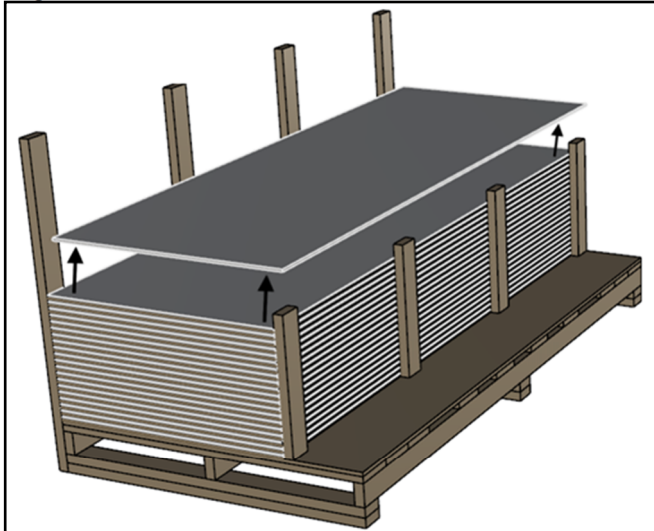
Refer to the shipment packing lists to find which crate has a set of shop drawings revised to reflect field measurements. These drawings will also indicate the panel part numbers and locations. Each crate will have a packing slip indicating the part numbers and quantities of the panels enclosed. It may be beneficial to boldly write the contents of each crate on the outside for future reference. If possible strategically place each crate in a convenient access location on site based on the final installed destinations of its contents.

Handling Individual Panels:

When removing panels from the crate always carefully lift the panel clear of any obstructions or other panels in the crate (Figure 2). Never slide, drag, or push panels out of their stored locations. When carrying a panel always carry it “on edge” and never flat (Figures 2 and 3). Carrying it flat may cause the panels to bow, crack, or break. Always be aware of your surroundings. Do not place the panels in any position that will cause the panel face or edges to come into contact with an object or surface that will cause damage to the panel finish. Extreme care should be taken while handling to avoid chipping the edges and/or scratching the faces.

The panels should never be allowed to sit unsupported in a bowed or twisted position. Incorrect storage may cause permanent deformation of the panel (Figure 4).

Figure 2



Lift panels directly up off of stack, then rotate up on edge before beginning to move it.

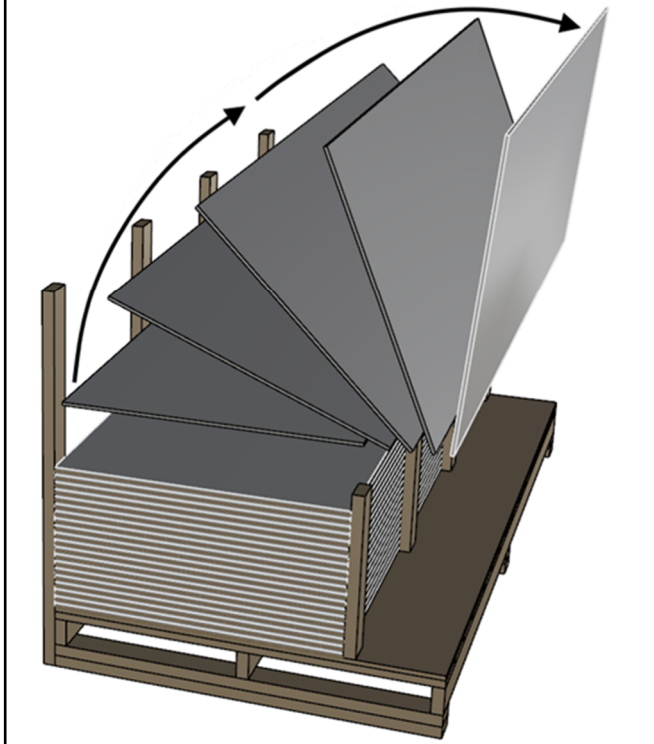


Figure 3

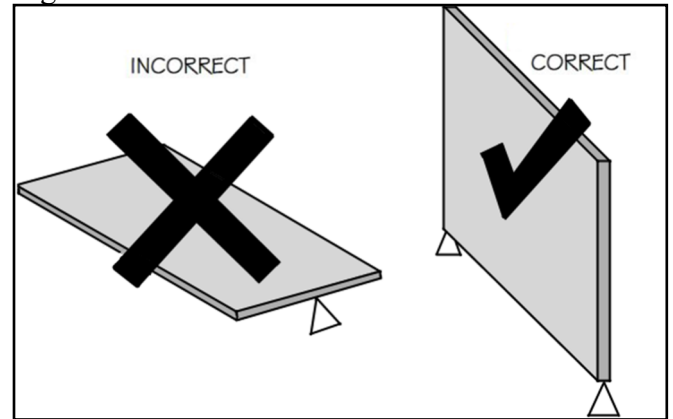
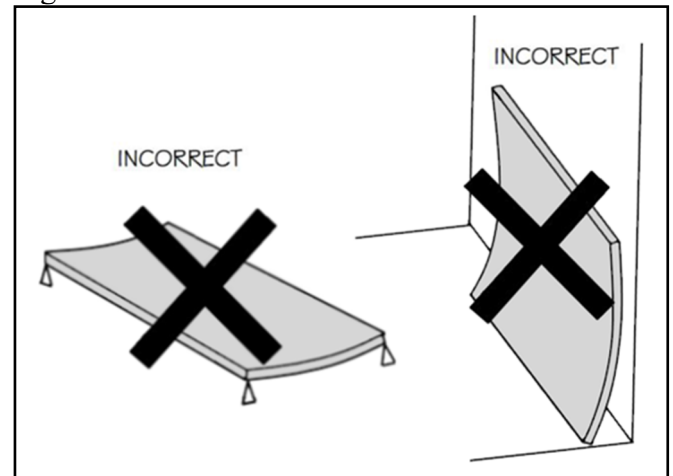


Figure 4



Substrate/Job Inspection:

Inspect the area that is to receive the panels to ensure that all required work is complete and satisfactory. All substrates, weather barriers, penetrations, doors, windows, and any other adjacent materials should be in place, sealed, 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 finished plumb, level, square, true, dry, and free from defects. Do not begin installation until all unsatisfactory conditions have been corrected.

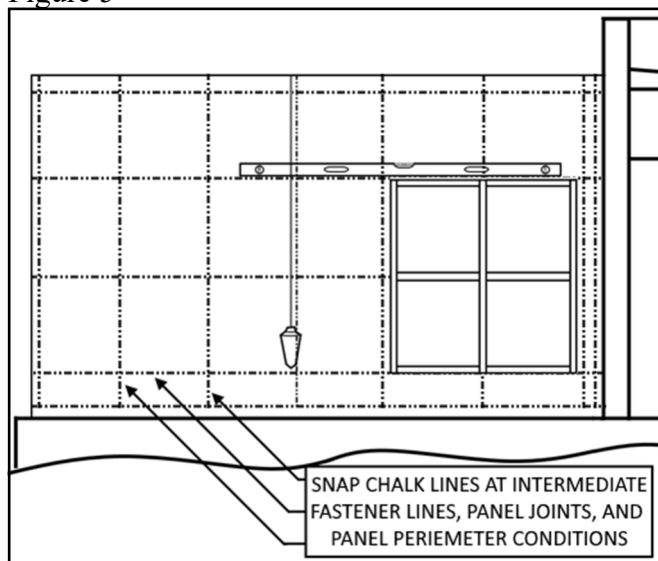
Flashing & Weather Barrier:

Equitone EF is a drained and back ventilated rainscreen cladding system. The wall panels shield the weather resistive barrier (WRB) from the majority of moisture while the ventilated panel joints and the upper and lower venting gaps allow the cavity space to dry. The system is not intended to be the primary weather barrier, therefore the WRB must be properly installed, flashed, sealed and terminated at all conditions according to the manufactures instruction prior to installation of the wall panels system. All fastener penetrations through the WRB must be treated according to the WRB manufactures written instructions. Failure to do so could result in moisture infiltration.

Layout:

Reference an up to date set of shop drawings and locate key components for panel system alignment (i.e. windows, mullions, doors, or other items that are critical to joint locations) and begin layout from these locations. Snap layout chalk lines at each edge-of-panel termination condition (**Figure 8**), then where each “Z” extrusion will be placed (**Figure 8 and Figure 9**), and at the center of each vertical and horizontal panel joint making sure that all lines are level and plumb (**Figure 5**). This will help to control unintended gain or loss in the panel layout over any long runs.

Figure 5

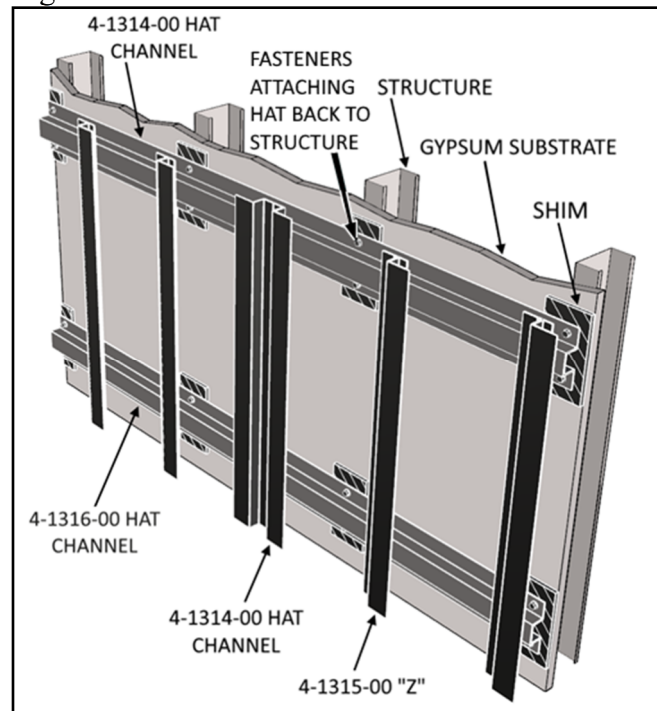


It may be helpful to snap two lines for the horizontal joints with one set 3/16” above the joint

centerline, and the other set 3/16” below it to represent the edge of the panels on either side of the joint. See “Setting Extrusions” for more info.

If the panel system is to be installed over a gypsum board substrate, locate all framing members to ensure that all system fasteners engage a structurally sound member that can bear the load of the system components. If this is not possible, the installer will likely be required to supply and install hat channels or other horizontal framing members prior to installing aluminum Equitone sub-frame system, as the “Z” and hat extrusions will not necessarily fall on studs (**Figure 6**).

Figure 6



Installing Panels:

Setting up:

Locate a work table and miter saw in a safe and convenient location relative to the installation area. Then find the “Z” and hat extrusions provided for the project.

No extrusion can have more than one stop-point rivet attached to it. Additionally on each panel no single row of fasteners (running parallel with the direction of the extrusions on the wall) can be fastened to two separate extrusions. As such, note that as part of the layout phase of the installing the

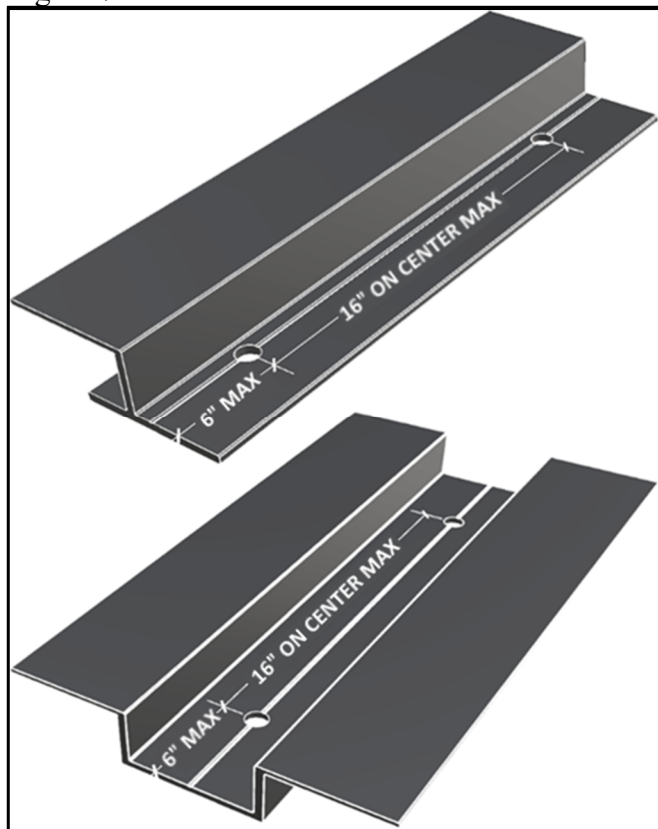
extrusions must be cut as noted in “**Setting Extrusions**” below so that when necessary they end approximately 1” above or below each horizontal joint.

Additionally see **Figures 24, 25, and 26** and their related notes on page 11.

Extrusion Prep:

Cut the extrusions to length and drill clear holes in the “Z” and hat extrusions, located in the “witness groove” starting at a maximum of 6” from the ends and are then usually spaced out at 16” on center max from there (**Figure 7**). The extrusions must be installed on the wall with 3/4” gaps (min.) in between them to allow for cycles of expansion and contraction.

Figure 7



Reference the shop drawings for extrusion layout information, as well as to confirm any project-specific fastener type requirements and spacing.

Setting Extrusions:

The “Z” extrusions at perimeter conditions will be set with the back inner-flange centered on the panel holes and the back outer-flange offset 2” in

from that centerline (+/- 1/4”) (**Figure 8**). The “Z” extrusions for intermediate holes will be set using the same methods as the perimeter “Z” but it can be oriented left or right as needed (**Figure 9**).

The hat extrusions at vertical intermediate panel joints will be set with their witness groove centered on the vertical joint locations (**Figure 10**).

Figure 8

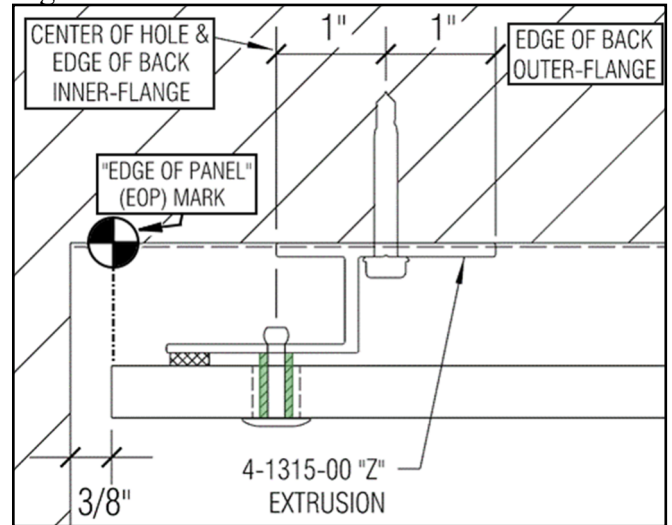


Figure 9

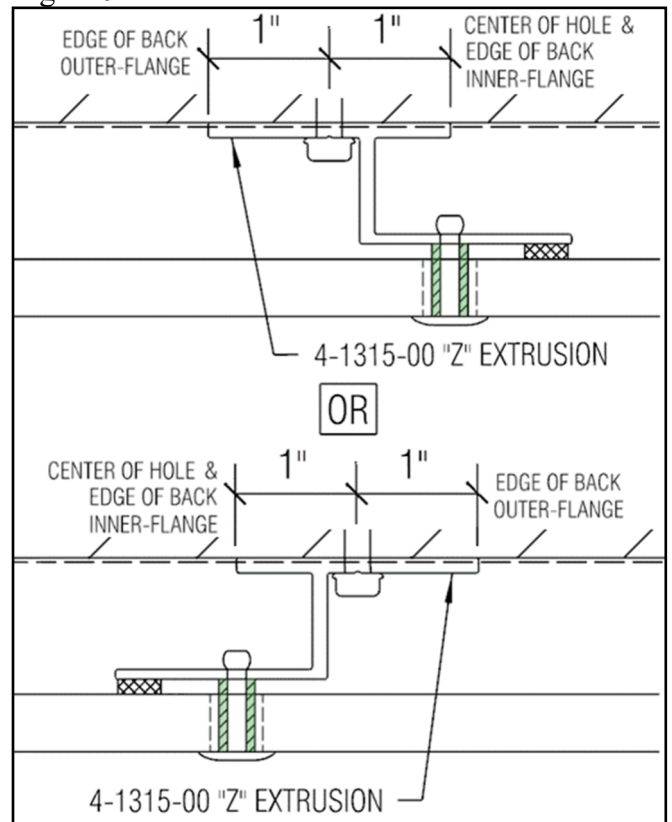
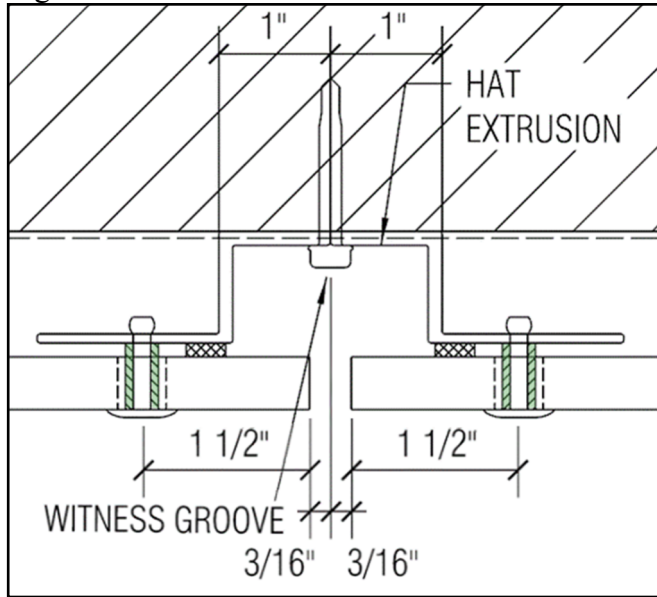
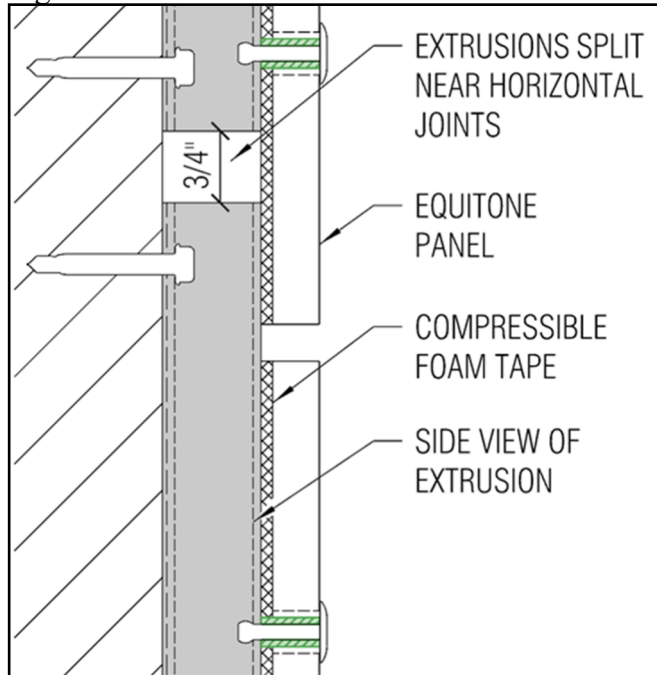


Figure 10



Plan carefully when working through the extrusion layout so that the $\frac{3}{4}$ " gaps set between the extrusions always fall approx. 1" above or below each horizontal joint. (Figure 11).

Figure 11

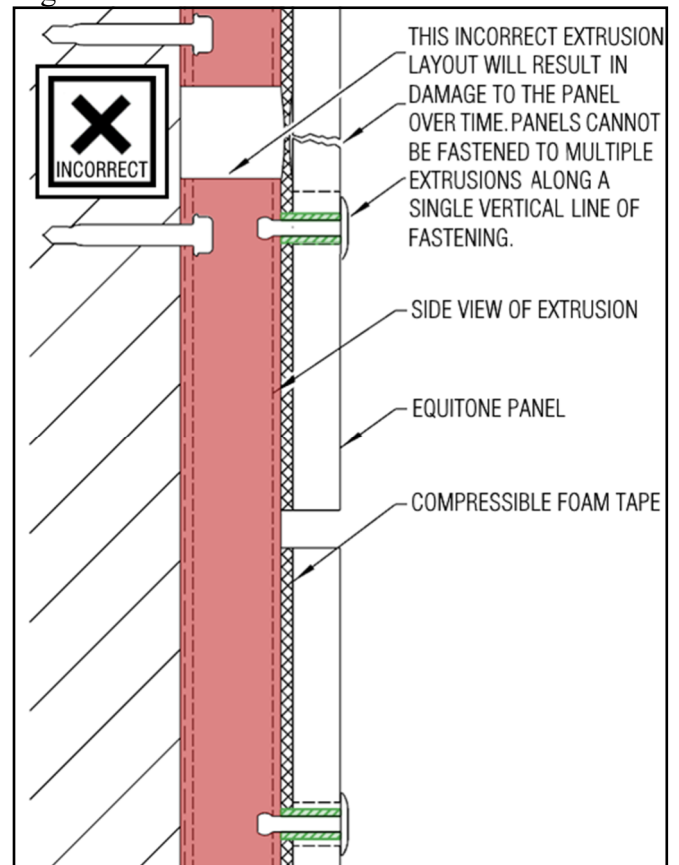


To avoid damage to the panels these gaps must be close enough to the joint that an extrusion for one panel does not carry so far past the panel's edge that it reaches the first row of fasteners for the next panel.

Different amounts of expansion or contraction acting on the extrusions working against the panel's opposite expansion or contraction may cause the panel to bow, crack, or split (Figure 12). The aluminum extrusions will expand and contract in response to temperature changes while the panels will do so in response to relative humidity levels.

(Timber battens for UNI-screw installs should be gapped a minimum of a $\frac{1}{4}$ " between boards. The same rule for where to place the splits applies.)

Figure 12

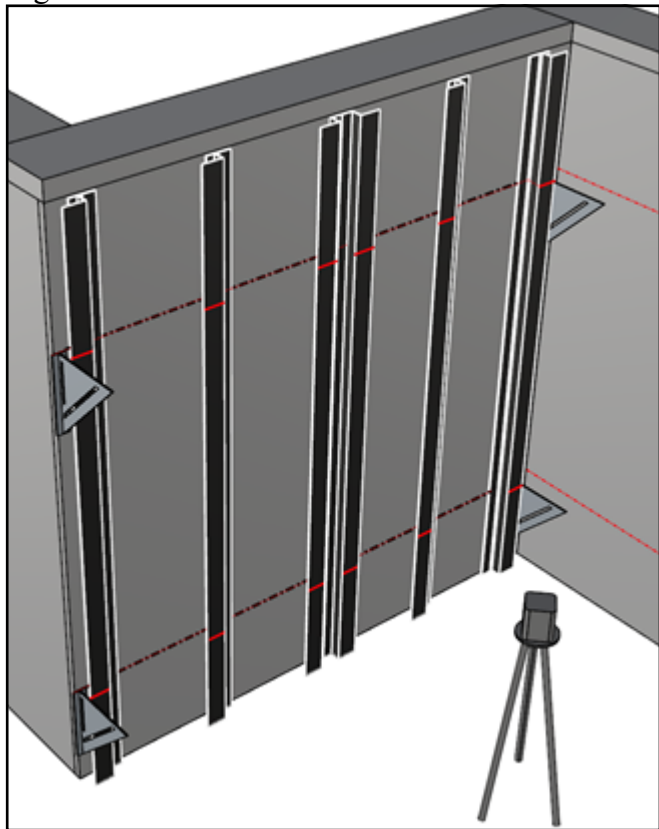


Before installing the "Z" and hat extrusions check through the project drawings for the termination condition details used in the area being worked on for any special offsets that may be required and to determine if additional flashing or ventilation material needs to be installed first.

Following the established vertical chalk lines fasten the extrusions to the wall using the fasteners and spacings noted in the project shop drawings.

After installing the extrusions, it may be helpful to transfer the horizontal joint line markings (or their 3/16" edge-of-panel offsets) (**Figure 17**) to the face of the extrusions using a chalk line and either a square or a laser level (**Figure 13**).

Figure 13



Compressible foam tape will need to be applied to the extrusions prior to installing the panels. This can be applied in continuous runs from top to bottom while bridging between individual extrusions as needed, but unless an optional metal horizontal joint filler piece has been included in the design of the project the tape will need to be trimmed out at each horizontal joint before installation is complete. The tape should be applied to clean surfaces in dry conditions.

On "Z" extrusions the tape should set flush with the outer edge of the flange (**Figure 14**). On hat extrusions the two runs should be set flush with the inner edges (**Figure 15**).

Figure 14

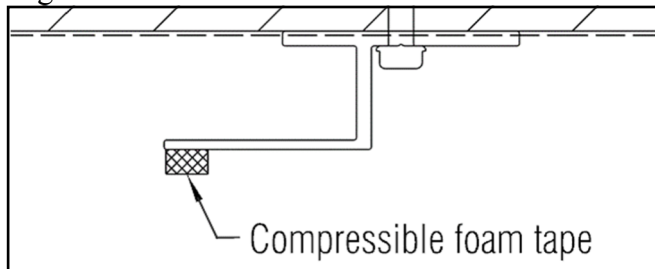
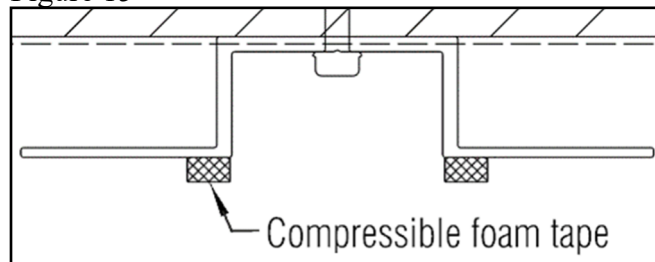


Figure 15



Installation of the panels will be done from top to bottom as this is best practice to protect the panels. To begin, take a ledger board, metal angle, or rectangular metal tube and clamp or temporarily fasten it to the extrusions 3/16" above the highest horizontal joint centerline mark (**Figure 16 and 17**). Before proceeding verify that the ledger is secured in place completely level from left to right.

Also test the ledger to ensure it will support the weight of the panels that will be set on it.

Panel Prep:

Referencing the packing lists and the shop drawings, find the first panel needed, remove it from its crate and inspect it for damage.

Setting Panels:

Lift the panel up into place (taking care to handle it as noted on page 3) and gently set it on the ledger board to protect the bottom edge and corners from being chipped or scratched. Next align the panel with the edge of panel (EOP) mark at the perimeter condition and verify the opposite end is offset 3/16" from the centerline witness groove of the hat extrusion (**Figure 18 or 19**). Once aligned, hold or clamp the panel in place.

Figure 16

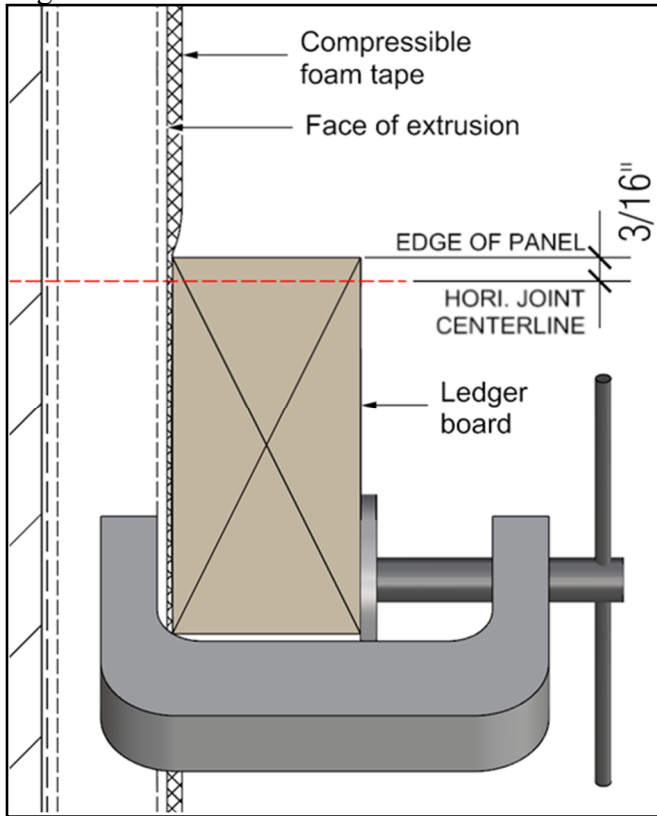
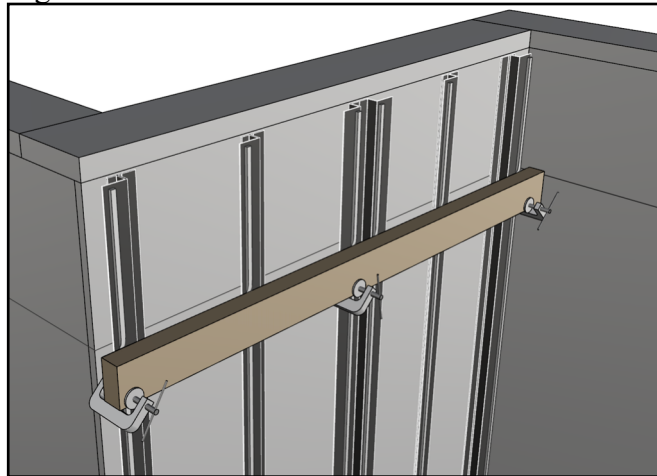


Figure 17



Never use a screw to temporarily hold a panel in place on the wall during installation or to permanently fix a portion of a panel to the metal subframe.

If the project uses [linea] material for its panels, the lines of the material must be milled with the milling tool on a solid work surface that fully supports the panel before the panel is set in place for installation onto the wall.

Figure 18

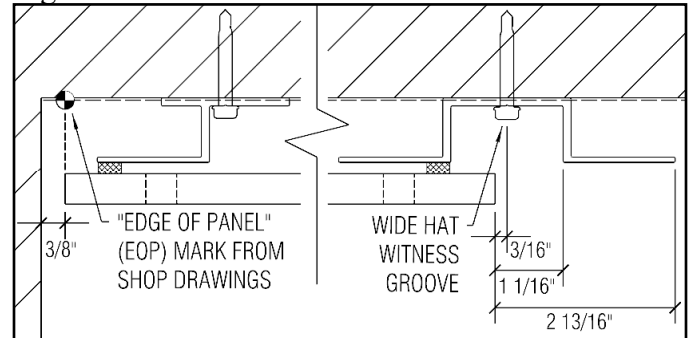
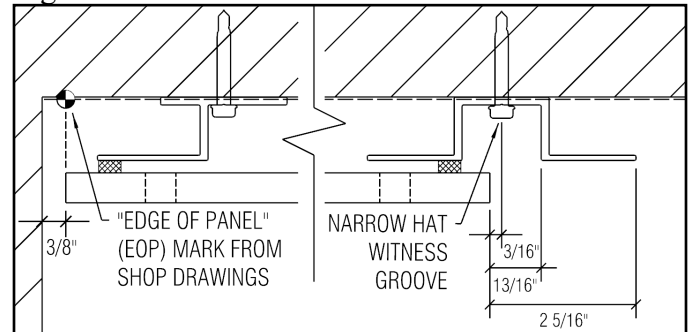


Figure 19

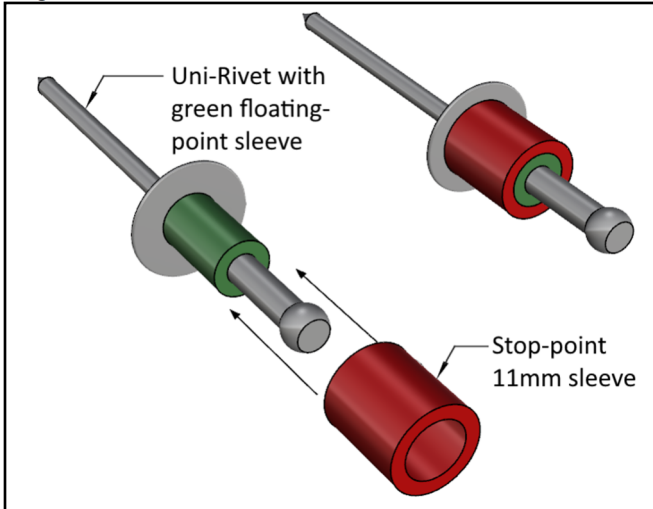


Uni-Rivet Installation:

With the panel in place, the next step will be to fix the stop-points of the panel to the extrusions. Each panel is required to have two stop-points. These are the supportive fixings that will bear the weight of the panel and around which the panel will move along with natural expansion and contraction cycles.

As all pre-drilled holes in the panels are 11mm in diameter, the stop-points are made into stop-points on each panel by taking a red 11mm stop-point sleeve and sliding it over the existing green gliding-point sleeve on the Uni-Rivets (Figure 20).

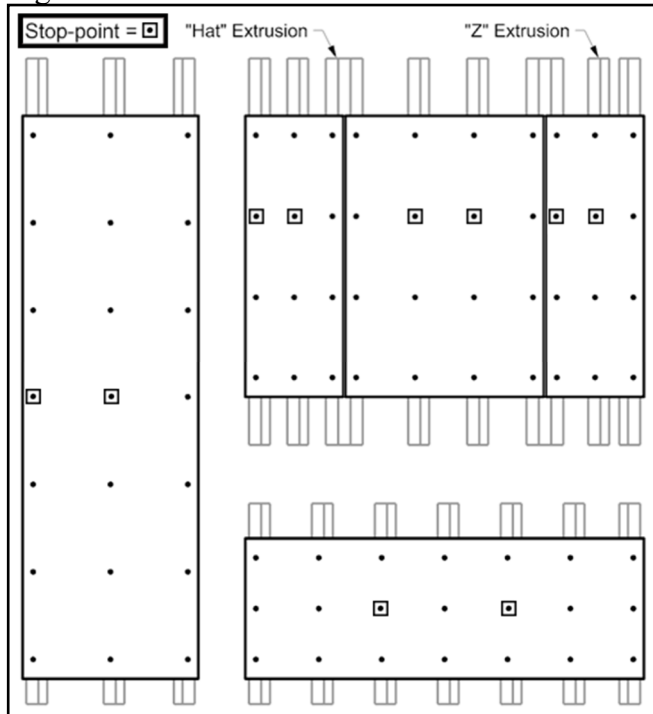
Figure 20



If the shop drawings do not specify the locations of the stop-point holes of the panels, it is critical that several rules are followed when determining where to place the stop-points during install:

The two stop-points of a panel should be set as close to the center of the panel as possible, both vertically and horizontally (Figure 21).

Figure 21



If there is no true center row of holes, choose the higher of the two middle rows for the stop-points (Figure 21, top right).

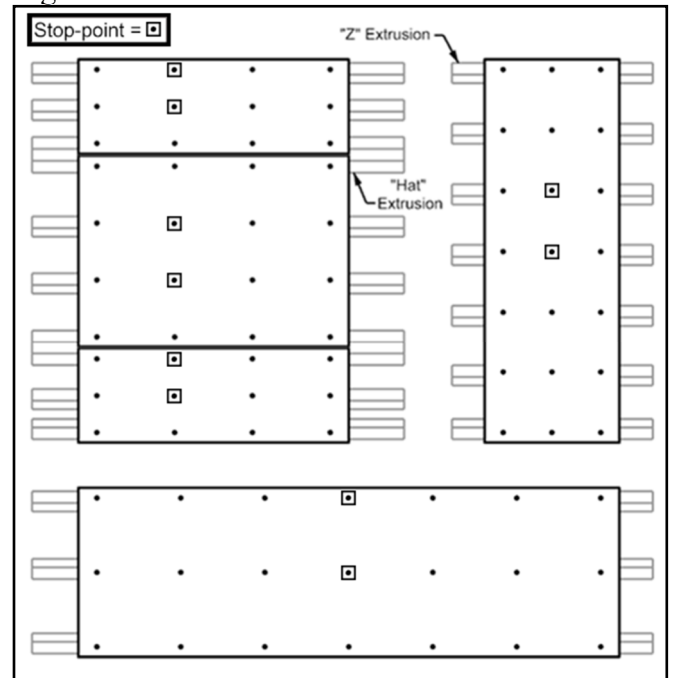
If the extrusions for the project are run vertically, the stop-points need to be aligned horizontally across from each other (Figure 21).

If the stop-points are being set into a row of holes that is an odd number across, one stop-point should be in the center hole and the other should be the next hole over (either to the left or right). Whichever offset direction is used must be used consistently with every panel on that elevation (Figure 21, top right, side panels).

However, long panels oriented horizontally on vertical extrusions may have their stop-points spaced out with one hole between them if there are an odd number of horizontal holes greater than 3 (Figure 21, bottom right). If there are exactly 3 holes or the number of holes is even the holes should be adjacent to each other.

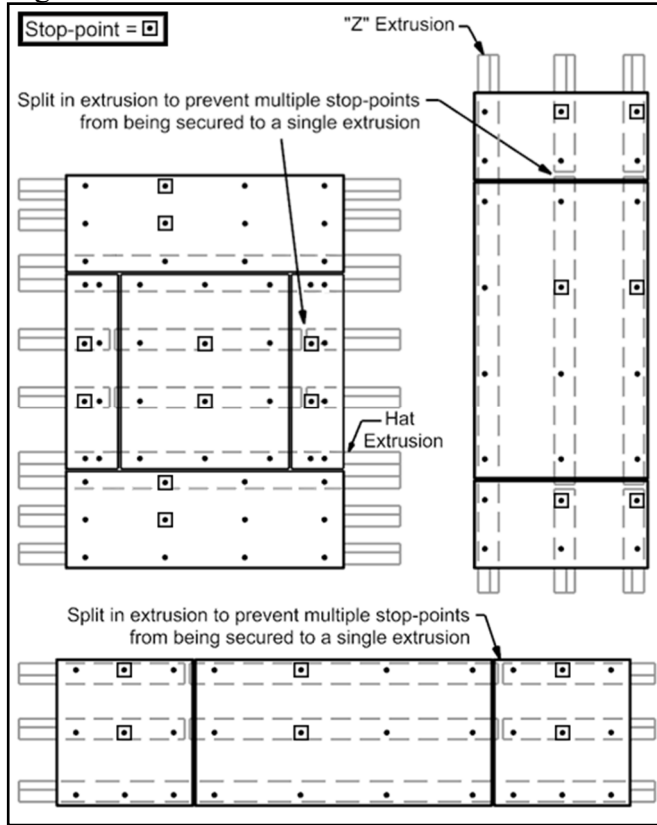
If the extrusions for a project are run horizontally (non-typical), the stop-points should be aligned in the same vertical row of holes (Figure 22). For panels without a centered vertical row, set both the stop-points immediately left or right of the center of the panel (note both must be offset in the same direction). All panels on an elevation must also use the same offset direction. (Figure 22, top left).

Figure 22



Two stop-points should never be set in the same extrusion. This applies both to two stop-points of a single panel, as well as two stop-points of two adjacent panels. It may be necessary to have additional splits in the extrusion layout in order to achieve this (Figure 23).

Figure 23



If a panel and an adjacent panel both have only two rows of holes available for the stop points, the intermediate joint must use two separate "Z" extrusions instead of one hat extrusion in order to avoid fixing two stop-points to a single extrusion (Figure 24 and Figure 25).

Figure 24

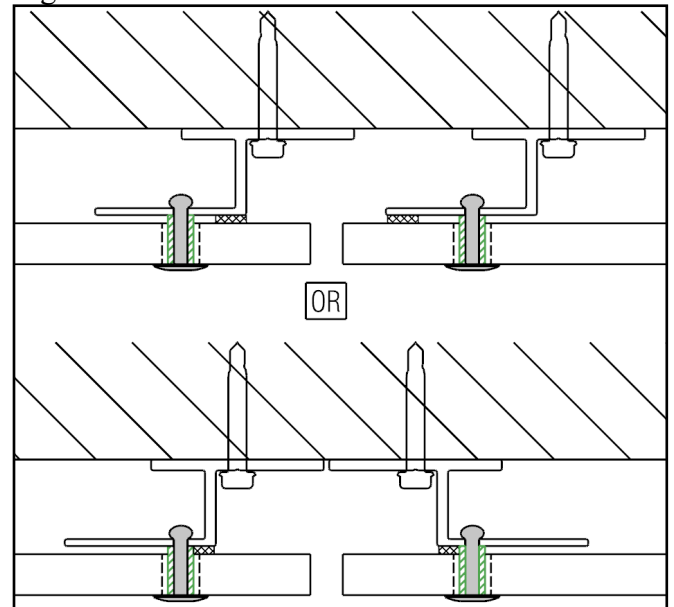
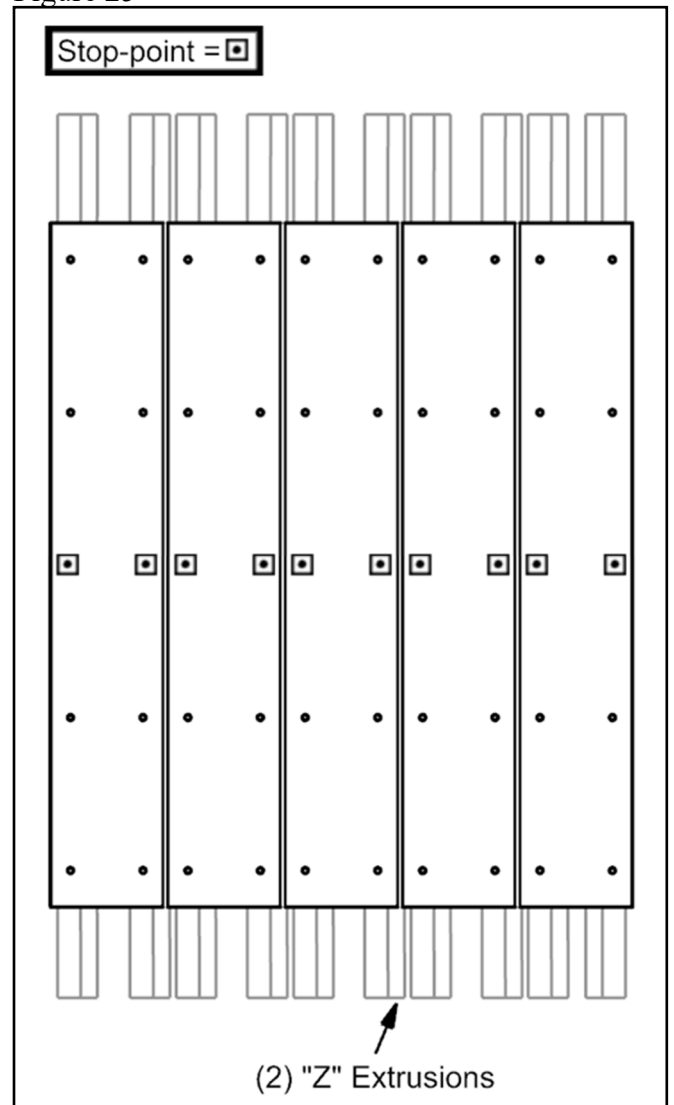


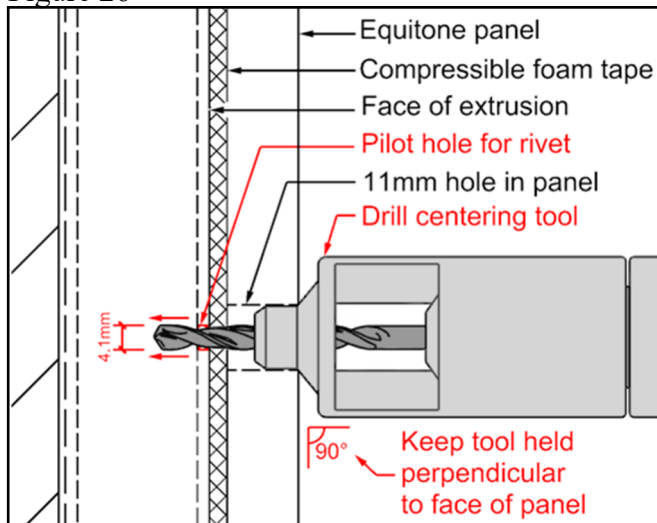
Figure 25



Installation of each panel must begin with the stop-point holes so the eventual centers of the gliding-point holes are based on it.

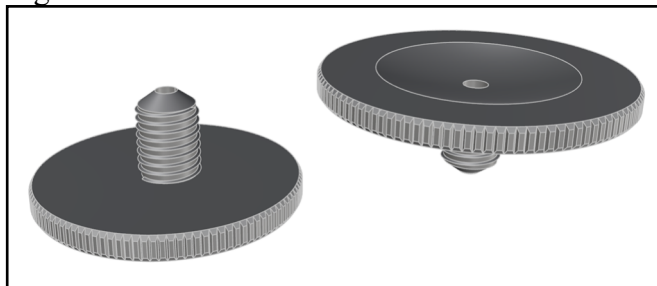
With the aligned panel held or clamped securely in place to ensure it does not move before being riveted, take a drill and drill centering tool with a 4.1mm drill bit and pre-drill the extrusion in the exact center of the first stop-point hole while keeping the tool held perpendicular to the face of the panel (**Figure 26**). Clear the hole of debris.

Figure 26



Then take a riveting tool with flexible nosepiece (**Figure 27**) to secure the first stop-point hole using a pre-finished Uni-Rivet with a red 11mm stop-point sleeve. Then repeat these steps for the second stop-point hole. Always drill and rivet one stop-point at a time.

Figure 27



The flexible nosepiece helps keep the rivet square with the face of the panel while the rivet is being pressed into place and compressing the foam. It can also help protect the panel and rivet from damage.

The depth of the panel system off the wall is set when the back of the green and red sleeves of the rivet bottom out while pressed against the face of the extrusion (**Figure 28** and **Figure 29**). The sleeves are designed to be 2.25mm deeper than the thickness of the panel. Do not rely solely on the pulling force of the riveter to compress the foam.

Figure 28

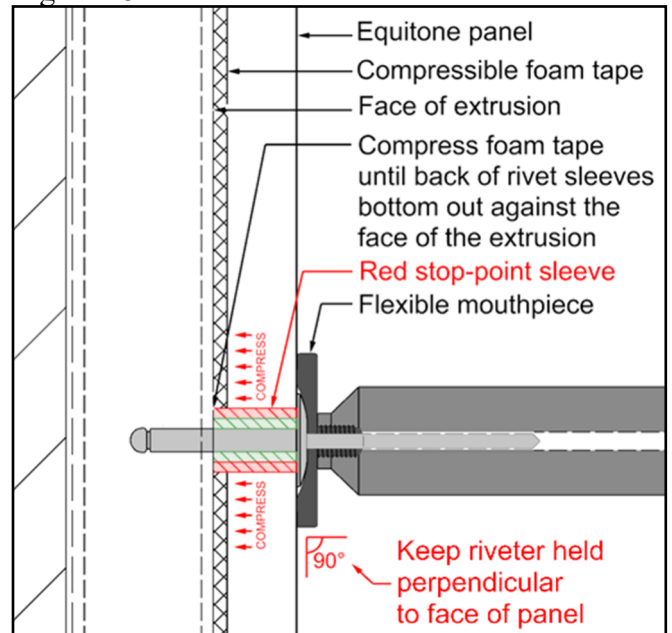
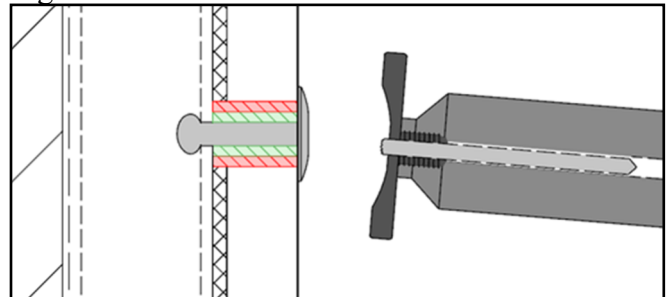


Figure 29

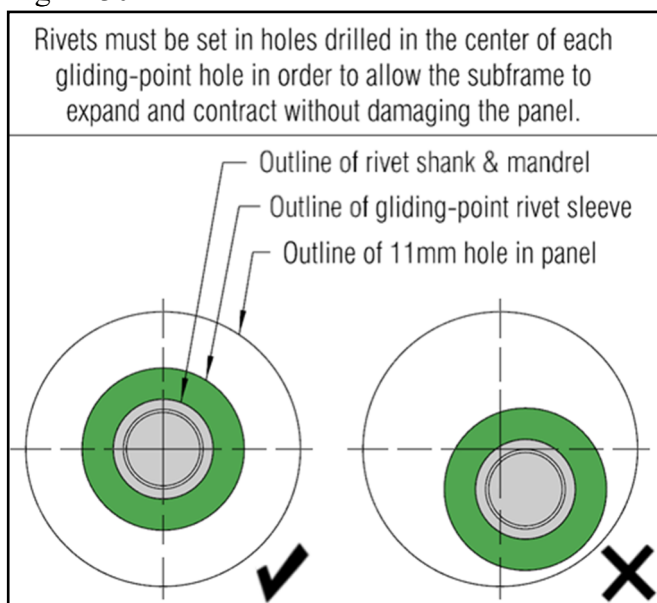


With the panel's stop-points set, unclamp the panel (if clamped in place) but continue to hold and support the panel up against the metal extrusions to prevent damage to it at the stop-point rivet locations. Then take the drill and drill centering tool with a 4.1mm drill bit and pre-drill the extrusions in the exact centers of all remaining 11mm holes in the panel. These will be the gliding-point holes that will allow the panel to move as needed around its stop-points during expansion and contraction cycles and protect the panel from cracking or breaking.

The gliding-points are made gliding-points by using a Uni-Rivet as-is with just the pre-installed green sleeve on the Uni-Rivets set in the center of each remaining 11mm hole of the panel.

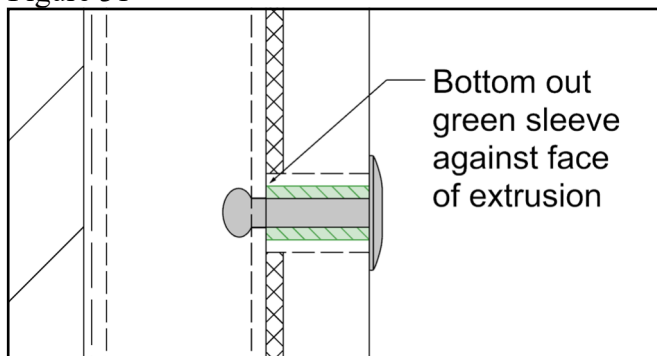
To avoid the panels being damaged over time it is critical that a centering tool be used when pre-drilling the extrusions so that the centers of the 4.1mm holes in the extrusions match the centers of the 11mm holes in the panels. The gliding point hole rivets should never make contact with the edge of a hole cut in the panel (Figure 30).

Figure 30



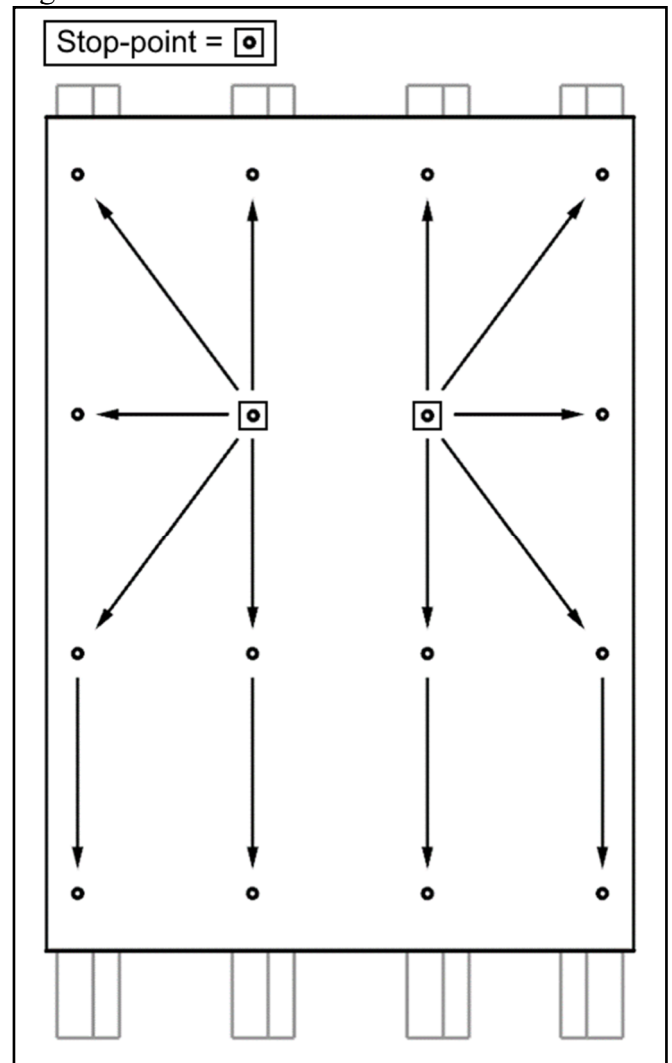
With the holes in the extrusions pre-drilled, clear the holes of any debris. Then take the riveting tool with the flexible nosepiece and install a Uni-rivet with a green sleeve on the rivet shank into each hole, making sure to compress the foam and bottom out the sleeves against the face of the extrusions (Figure 31).

Figure 31



When installing the gliding-point rivets start at the holes nearest the stop-point holes and work outward from there to ensure a flat installation of the panel (Figure 32)

Figure 32

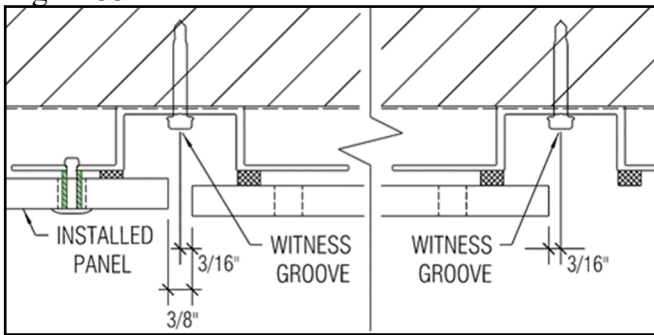


Any dust, dirt, oil and other debris that ends up on exposed panel face surfaces or edges during the install process should be immediately removed before the next panel is installed. Take extra care in cleaning if a panel was field cut around an obstruction as the dust from the panel material combined with water, sweat, or oil can harden on the surface of the panel and permanently mar the panel finish.

Reference Equitone’s comprehensive application guide before beginning installation and have items on hand as needed.

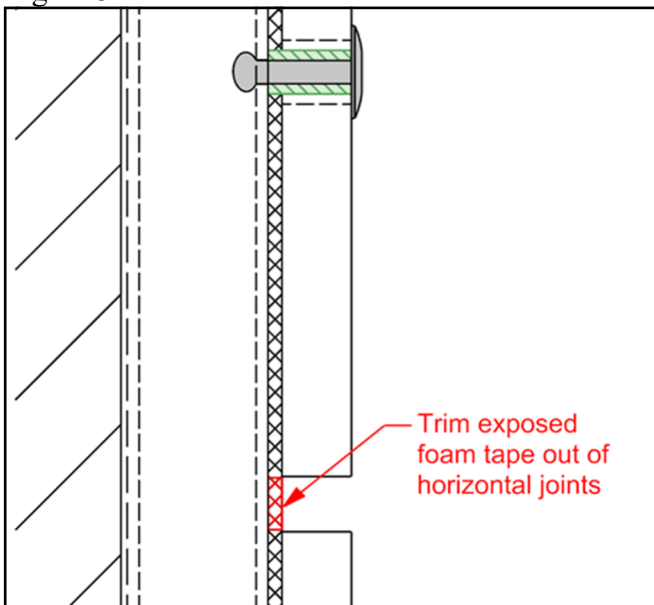
With the first panel fully installed, the next panel can now be located, checked for damage, brought up into place, set on the ledger board, and offset 3/8" (10mm) from the adjacent, installed panel (**Figure 33**). These 3/8" joints are required to allow for expansion of the panels and can be consistently held with shims or other spacers during install, but they must be able to be removed without damaging the edges or finish of the panels once the panels are installed.

Figure 33



As installation proceeds down row by row, if the compressible foam tape has been applied in continuous runs from top to bottom it will be necessary to trim out any portions of it that are left visible and exposed running through the horizontal joints (**Figure 34**).

Figure 34



In protecting the panels during install as well as from other trades working in the area, tape should never be directly adhered to a panel surface as the adhesive can permanently stain the panels or damage the coating. Equitone instead recommends the use of corflute sheets clipped or fastened to the sub-framing such that the sheets hang approx. 1/4" in front of the panel surface as best practice.

Installation Progression:

When the current course of panels has been installed or the end of the ledger board has been reached, the ledger board can be unclamped or unfastened and moved down or over and set up for the next course of panels. Panel installation can then continue as above.

If the heights of the current row of panels are staggered along the bottom edge, the adjacent, taller panels can be skipped over temporarily while the current course of panels is installed true with each other using the same leveled ledger board placement.

Measure and hold the spaces for each skipped panel by including both the panel face size and the spacing for any vertical joints when setting the next panel. See **Figures 35 - 38**.

Figure 35

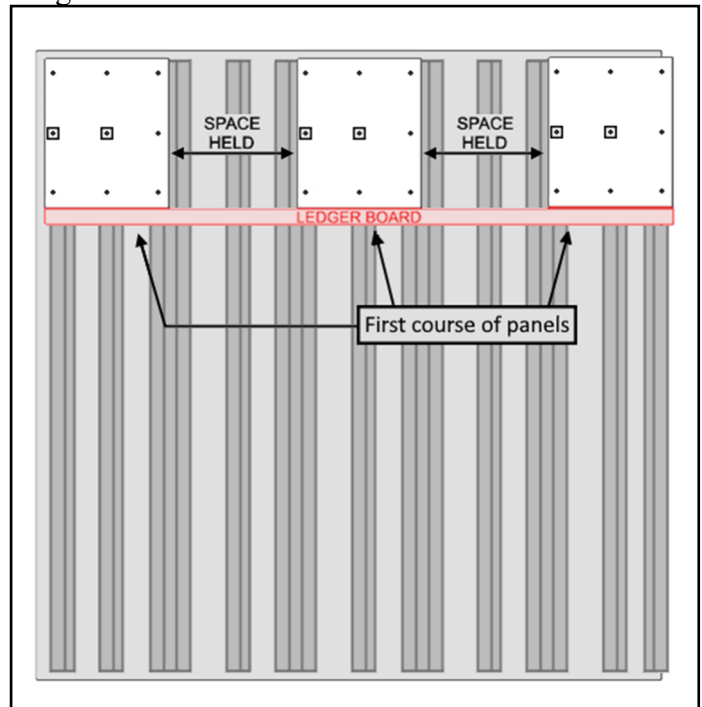


Figure 36

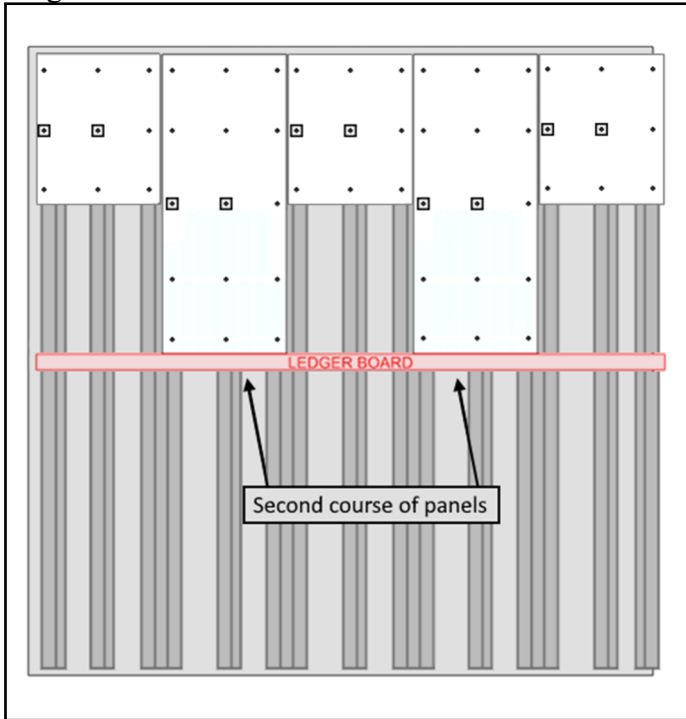
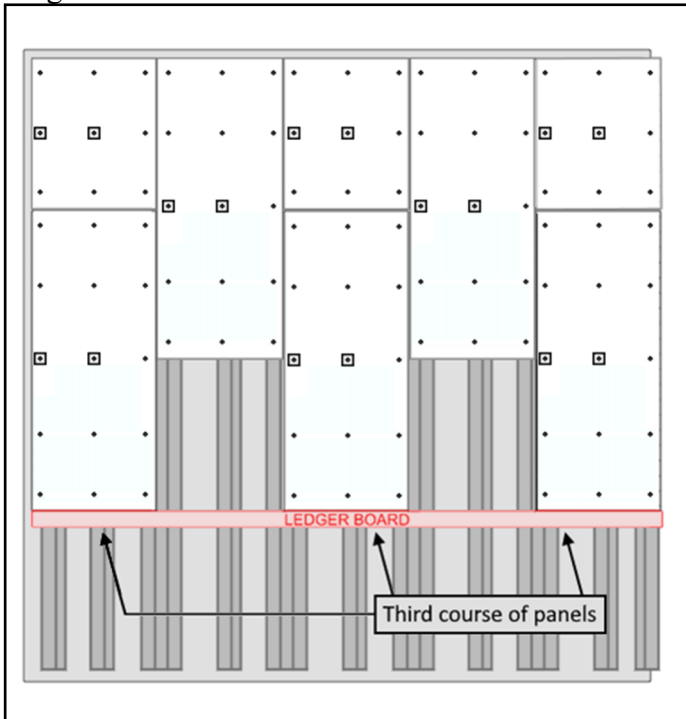
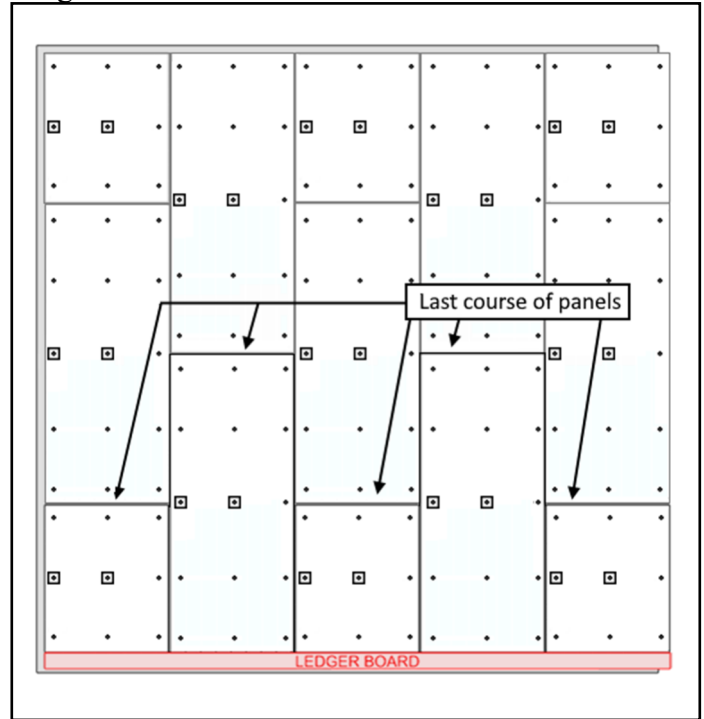


Figure 37



Since in most cases the extrusions will not extend below the bottom edge of the bottom panels, if the ledger board is needed for installing the last course of panels a different method of securing the ledger board will have to be used depending on the onsite conditions.

Figure 38



Special Conditions:

Please consider that not all conditions can be covered within these general installation guidelines. Please reference the project specific shop drawings for special details and instruction for conditions not covered. For additional instruction or clarification, please contact your MDSI Project Manager.

Cleaning Panels:

Please refer to the Equitone documentation available online or at request for proper material handling and cleaning procedures.

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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