

CF INSULATED METAL  
WALL PANEL  
**INSTALLATION GUIDE**



PIONEERING INSULATED METAL PANEL TECHNOLOGY

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## INTRODUCTION

Metl-Span®'s CF wall panel is the construction industry's premier factory insulated panel for architectural, commercial, industrial and cold storage applications. The CF wall panel utilizes Metl-Span's pioneering composite panel technology to provide the most advanced thermal, structural and weather resistant performance of any panel available today.

When installing the wall panels, you are assured that the panels have been computer designed and precision fabricated to meet the specified panel design requirements and provide for efficient field installation. However, the final in-place performance of the panels is critically dependent upon the complete and accurate installation.

This installation guide provides technical information and suggested installation procedures to help you understand and successfully install your wall panels.

This guide is intended to be used in conjunction with the project's installation drawings. The installation drawings should identify the applicable wall conditions, specify the components and specify the required arrangement of the components.

This guide will help you lay out the wall assembly and establish the installation sequence. The guide's details demonstrate suggested panel handling and installation procedures and point out conditions requiring special emphasis or caution.

*Caution:* The information in this guide is based on the application of standard CF wall panels for typical building conditions. Specific building design and construction conditions may require variations from the information in this guide.

In case of conflict between this guide and the project's installation drawings, the installation drawings will govern.

Clarification concerning the installation of wall panels should be directed to the Metl-Span Technical Services Dept. Contact the Metl-Span office:

1720 Lakepointe Drive, Suite #101  
Lewisville, Texas 75057  
TEL: (972) 221-6656  
FAX: (972) 436-7028  
WEB: [metlspan.com](http://metlspan.com)

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## CUSTOMER'S RESPONSIBILITY

For the following information, the term “customer” refers to the project’s owner and/or his representatives, such as the project’s architect, design engineer and general contractor.

Concerning the application of CF wall panels for a specific project, the customer is responsible for ensuring the following:

- The wall panels are suitable for the purpose which they are to be used.
- The project’s structural framing is properly designed and in satisfactory condition to accept the erection and design loads imposed by the wall panels, and is properly designed for the applicable service considerations, such as expansion/contraction and vibration, etc.
- The application of exterior and/or interior panel joint seals and perimeter seals are properly specified for the project’s moisture and vapor control requirements.
- The selection of a competent installer who is qualified and experienced in the proper installation of composite panels and related construction.
- The customer must ensure that the installer takes time to study and understand the project’s installation drawings and adapts or modifies the information in this installation guide as necessary to meet the project’s specific requirements.
- The wall panels and related components are installed in compliance with the applicable codes, regulations, and good engineering and construction practices, and in accordance with the project’s installation drawings and the applicable portions of this installation guide.

## DISCLAIMERS

Metl-Span® does not guarantee and is not liable for the quality of installation. Metl-Span is not responsible for defects that may be attributed to improper installation or the negligence of other parties.

Unless specified in writing, Metl-Span makes no expressed or implied warranties pertaining to the fitness of the wall panels or its components for any particular purpose by the owner, and shall not be responsible for any indirect or consequential damages, such as to building contents, nor for any further loss of any kind to the owner or contractor.

Unless specified in writing, Metl-Span does not warrant any product or material as meeting the ordinances, laws or regulations of any particular state or local municipality, and Metl-Span is not responsible for conformance by the owner or contractor to such ordinances, laws or regulations.

## SAFE INSTALLATION

The owner is responsible to provide a safe job site and safe working conditions. The owner and installer are responsible for the safe execution of the wall panel installation.

In the USA, the Occupational Safety and Health Act (OSHA) governs regulations with the objective of protecting workers from injury or accident. “Part 1926, Safety and Health Regulations for Construction” are applicable to the wall installation.

In Canada, Occupational Safety and Health (OSH) regulation is under the jurisdiction of the local provinces and territories. Federal employees and Crown agencies may be subject to federal OSH jurisdiction.

The OSHA and OSH regulations should be recognized as job site requirements and fully complied with. Safe installation practices may be further defined and made mandatory by state or local ordinances.

The information in this installation guide is not intended to prescribe comprehensive safety procedures. If the installer cannot safely install the wall panels in accordance with the suggested procedures in this guide, it is the responsibility of the installer to determine appropriate alternate installation procedures.

## INSTALLATION DRAWINGS

Depending upon the project’s contract conditions, the installation drawings for the wall panel installation may or may not be provided by Metl-Span®. In either case, it is the owner’s responsibility to ensure that comprehensive and complete installation drawings are provided to the installer.

It must be verified that the installation drawings are the latest issue with the latest revisions and additions.

The latest issue of the installation drawings must be readily available at the job site during the preparation, installation and inspection of the wall support framing, wall panels, flashing and other related construction.

The installation drawings must be reviewed for differences with the actual job conditions. Any differences must be resolved with the customer before proceeding with the installation of the panels.

The installation drawings must be reviewed for differences with this installation guide. Adapt or modify the information in this guide in accordance with the project conditions as specified on the installation drawings.

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## APPLICATION OPTIONS

The CF panel is suitable for a broad range of application options. Not all of these options are specifically covered within this installation guide. Following are brief descriptions of these options and reference to the primary source of installation instructions for each option.

*Important:* Always refer to the project's installation drawings to confirm the specified panel applications and any specific installation requirements which may vary from the information in this installation guide.

**Exterior Walls** - the installation of CF panels for the typical construction of exterior walls is shown in this installation guide.

**Interior Walls (Partitions)** - the installation of CF panels for the construction of interior walls or partitions is similar to the installation of exterior walls as shown in this guide, with exception of the base framing and flashing which may vary from the details in this guide. Refer to the project's installation drawings for the specific requirements.

*Caution:* Because of the interference of interior overhead construction, the installation of interior walls may require different panel handling and lifting procedures than shown in this installation guide.

**Vertical Panels** - the wall panels may be specified to be vertically oriented. Vertical oriented wall panels are set standing up on one end and joined side by side to construct the wall. The vertical panels are attached to horizontal framing members.

The information in this installation guide shows how panels are installed in a vertical orientation.

**Horizontal Panels** - the wall panels may be specified to be horizontally oriented. Horizontal oriented wall panels are set on their side and stacked on top of one another to construct the wall. The panel ends are aligned to form vertical end joints. The horizontal panels are attached to vertical framing members.

For information concerning how wall panels are installed in a horizontal orientation, refer to the Metl-<sup>®</sup>Span technical bulletin, titled "CF Insulated Metal Wall Panel Horizontal Application."

**Architectural Type Panels** - for architectural wall applications, the panels may be specified with a flat (no profile) or slightly profiled exterior face. The installation of Architectural Type wall panels is the same as the installation of exterior walls as shown in the guide, with the exception that the wall framing tolerances and panel handling requirements are more critical to avoid visible distortion of the panel face.

For the specific requirements, refer to the section in this guide, titled 'Architectural Type Panels - Special Considerations' on page 9.

## APPLICATION OPTIONS (cont.)

**Parapet Walls** - the installation of panels which are extended to provide a parapet is similar to the installation of exterior walls as shown in this installation guide, with the exception that different head framing and flashing may be required. Refer to the project's installation drawings for the specific requirements.

**Facades** - the installation of panels to construct a facade is similar to the installation of exterior walls as shown in this installation guide, with the exception that different framing and flashing may be required. Refer to the project's installation drawings for the specific requirements.

**Cold Storage** - the installation of panels for cold storage applications is similar to the installation of panels for non-cold storage applications, with the exception that different perimeter flashing assemblies may be required for more critical vapor control and insulation continuity.

The information in this guide shows the installation of typical flashing assemblies for both cold storage and non-cold storage applications. In this guide, specific cold storage details are sub-titled "Cold Storage" and specific non-cold storage details are sub-titled "C&I" (commercial and industrial).

**Wall Flashing Options** - the trim and flashing for wall panel applications may be specified as sheet metal or aluminum extrusions. This guide shows the installation of typical sheet metal flashing. For information concerning the installation of aluminum extrusions refer to the Metl-Span® publication titled "Extrusions & Applications."

**Ceiling, Soffit & Roof** - the panels may be used in the horizontal position for the construction of ceilings, soffit and roofs.

For ceiling and soffit applications the panels are assembled side by side and are typically supported by direct attachment to overhead framing members or suspended by attachment to an overhead hanger rod and cross channel framing system which is not provided by Metl-Span.

For roof applications, CF panels may be used to provide the decking and insulation function, but must be covered by an appropriate bonding board and roofing membrane which are not provided by Metl-Span. For roof applications, the panels are supported by roof framing members below.

*Note:* If the panels are specified as CFR roof panels refer to the Metl-Span installation guide titled "CFR Insulated Metal Roof Panel."

For ceiling, soffit or roof applications the CF panels will require different framing, panel attachment and flashing than shown in this guide. Refer to the project's installation drawings for the specific requirements.

*Caution:* Because of the horizontal position of the panels and support framing, the installation of panels for ceiling, soffit or roof construction will require different panel handling and lifting procedures than shown in this installation guide.

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## PROPER EQUIPMENT

Before receiving the materials and before starting the panel installation, the panel installer must ensure that the proper equipment and tools are on hand.

Unloading the panel bundles will require a suitable fork lift or crane. The equipment must be capable of handling the weight and multiple point pick-up requirements of the panel bundles and be capable of the job site's travel requirements. For specific unloading requirements, reference the 'Unloading Panel Bundles' detail in this guide on pages 24 and 25.

Handling and setting the individual panels will require suitable lifting equipment. The lifting equipment must be capable of carrying the panel's weight without damage to the panel and must be capable of the job site's travel and reach requirements. For specific handling requirements, reference the 'Lifting and Setting Panels' details in this guide on pages 36 and 37.

In all cases, reference the equipment manufacturer's instructions to ensure that the equipment is of sufficient capacity for the panel's weight and length and to ensure the proper and safe operation of the equipment.

## WET WEATHER PROTECTION

The materials are carefully inspected and crated before leaving the plant. The material is accepted by the transportation company as being complete and in satisfactory condition. It is the transportation company's responsibility to deliver the shipment intact and in satisfactory condition. It is the consignee's responsibility to inspect the shipment for damage and shortages when it is delivered.

Conducting a material inventory at the time of delivery is essential. By conducting the inventory, the installer is able to identify any material shortage or damage and minimize later erection delays caused by the need to reorder the missing or damaged materials.

It is most important that any shortages or damage of the delivered materials be noted and clearly marked on the bill of lading before signature of acceptance. Claims for shortages or damaged material cannot be made against the freight carrier unless they are noted on the bill of lading or otherwise for hidden damage in accordance with U.S. Department of Transportation regulations.

In the case of packaged components (such as fasteners, clips and sealants, etc.), the quantities are marked on their container and should be checked against the bill of materials. Metl-Span® must be notified of any concealed shortages or damage within 15 days of delivery.

Upon acceptance of the shipment, the customer or his representative is responsible for proper handling, storage and security of the wall materials. Metl-Span is not liable for damage or loss of materials at the job site.

## VERIFYING THE STRUCTURE

Before starting the panel installation, it must be verified by the project's Engineer of Record that the structure is designed to accommodate the wall panels and their connections and accept the erection and design loads imposed by the wall panels.

It must be verified that the structure is complete with all structural connections and bracing in place and secured. And it must be verified that the necessary wall framing members are in place and secured.

## FRAMING ALIGNMENT

**General** - before starting the panel installation, the wall framing must be checked for straightness and alignment, and must be checked to verify that the wall panels can be installed without interference.

The wall bearing surfaces of the wall framing members are intended to be aligned to the specified plane of the wall's interior surface. This plane is referred to as the "steel line".

The proper alignment of the wall framing members to the specified steel line is necessary to ensure the proper fit-up of the overall construction, and the alignment between adjacent framing members is most critical to the panel installation efficiency and panel performance.

**Panel Deflection (Bow)** - on a wall with intermediate framing members, a misalignment between adjacent framing members will cause deflection (bending) of the panels as they are connected to the misaligned members. This will cause installation difficulty when attempting to join a straight panel to the deflected installed panel. The deflected panels are also subjected to bending stress which may cause panel face rippling or buckling when combined with the normal conditions of thermal stress and wind stress, etc.

On exterior walls the alignment of the wall framing members must not cause the wall panel to bow inward towards the building interior (or cold side). On interior walls and partitions the alignment of the wall framing members must not cause the panel to bow inward towards the cold side.

This means the intermediate framing members must never be aligned inwards of the vertical plane between the base member and the head member. And in the case of multiple intermediate framing members, any intermediate member must not be aligned inward of the adjacent members.

## FRAMING ALIGNMENT (cont.)

**Alignment Tolerances** - in most cases, the general wall framing alignment tolerance is L/300 maximum deviation from the plane of the specified “steel line”. This would apply as the alignment tolerance for the base and head framing members.

Intermediate framing members alignment tolerances are more critical, as specified below:

- 0 to 1/4” outward of the actual wall framing plane for members at 10’ or greater spacing
- 0 to 1/8” outward of the actual wall framing plane for members at 5’ to 10’ spacing
- 0 to 1/16” outward of the actual wall framing plane for members at less than 5’ spacing

In all cases, the alignment of the framing members must be checked at the member’s mid-span location as well as at its connection to the columns.

For additional wall framing alignment information, refer to the ‘Checking Framing Alignment’ detail in this guide on page 33. And always refer to the project’s installation drawings or design specifications for any specific framing alignment requirements.

*Caution:* Wall framing alignment error and interference must be corrected before panel installation can begin. Metl-Span® is not responsible for difficult panel joint assembly and panel face rippling or buckling caused by misaligned wall framing.

Framing modifications or additions required to correct framing misalignment must be designed by the project’s Engineer of Record and cannot be provided by Metl-Span®.

## ARCHITECTURAL TYPE PANELS-SPECIAL CONSIDERATIONS

All panels require proper handling and installation. However because the exterior faces of Architectural Type panels do not have substantial stiffening ribs or striations, the panels are more susceptible to visible surface distortions.

Before installing the Architectural Type panels, the installer must check that all wall framing members are precisely located and aligned within the specified tolerance. The framing alignment must be checked at the columns and at the mid-span of the horizontal framing members. All misalignments must be corrected before the panels are installed.

The installer must ensure that the panels are properly protected and are handled and installed with extreme care to prevent bending the panel, distorting the panel edges or any other cause of panel face distortion.

To prevent bending stress, the panels must be uniformly supported during handling and installation. And the panel edges and corners must be cushioned against concentrated bearing stress during installation.

## PANEL JOINTS

The proper fit-up of the wall panel joints is most critical to the performance and appearance of the wall.

**Ship Lap** - the edges of the panels have an offset (ship lap) configuration which allows the panels to be attached to the wall framing members with clips concealed within the panel joints. The clips are set on the panel's clip shelf which is an extension of the panel's exterior face. In this manner the panel's exterior face (as well as the interior face) are mechanically secured to the wall framing members.

**Tongue-and-Groove** - the edges of the panel's exterior and interior metal faces are formed into a tongue-and-groove configuration to provide a positive interlock between joining panels. This double tongue-and-groove joint provides structural continuity between the adjacent panels and provides protected cavities for the joint sealants.

**Fit-up Tolerance** - to ensure the structural integrity of the adjoining panels and effectiveness of the panel joint sealants, every panel joint must be fully engaged.

When the panel joints are fully engaged, the actual panel coverage width (modularity) may vary between  $-1/16''$  to  $+ 1/8''$  due to normal fabrication and field tolerances. Joint-to-joint dimensions should be checked frequently during installation to insure proper modularity.

The joint gap is the visible vertical space between the edges of the exterior faces on the adjacent panels. When panels are fully engaged, the width of the joint gap is normally  $1/16''$  to  $1/8''$ .

**Joint Interference** - if the panel joint gap cannot be closed tighter than  $3/16''$ , the panel should be checked for a cause of interference along the panel edges and the top and bottom corners.

*Note:* If the panel joints cannot be closed tighter than a  $5/16''$  joint gap, a bent tongue or crushed groove along the panel edge would be a suspected cause.

**Plumbing the Panels** - to maintain a uniform panel coverage and appearance, it is most important that each panel is set to plumb (vertically aligned), and the panel joints are uniformly engaged along the full length of the joint (within the specified coverage width and joint gap tolerances).

**Inspecting the Panel Joint** - as each panel is installed, the installer at the top of the wall can look down at the top end of the panel joint to check its condition. Before the next panel is installed, the installer must confirm that the tongue-and-groove joints are fully interlocked and check that the tongue satisfactorily engages the sealant in the groove.

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## VAPOR SEAL CONSIDERATIONS

**General** - because of the greater thermal efficiency of walls constructed with CF panels, there is a potentially greater vapor pressure differential (vapor drive) between the exterior and the interior side of the wall. The greater vapor drive requires more critical attention to the function and application of the weather and vapor seals to prevent the infiltration of water vapor into the wall assembly and into the interior of the building or room.

If water vapor is allowed to infiltrate and remain within the panel joints, the condensation and resulting accumulation of moisture will reduce the panel's thermal insulating efficiency and may cause corrosive and structural damage to the panel. Water vapor infiltration through the panel joints and flashing assemblies into the building interior can cause serious water damage and safety liabilities.

Depending upon the project's climatic and operating conditions, differential vapor pressure may try to drive water vapor through the panel joints and perimeter assemblies from the exterior or from the interior.

**C & I Applications** - for commercial and industrial buildings, where vapor pressure differentials are normally caused by cold exterior temperatures and heated interiors, the weather/vapor seal of the panel joints are typically specified at the interior side (warm side) of the wall and the wall panel joints are designed to be self-draining to the exterior.

**Cold Storage (Freezer) Applications** - for freezer buildings or rooms where the vapor pressure differentials are normally caused by below freezing interior temperatures and warmer exterior temperatures, the weather/vapor seals are typically specified at the exterior side (warm side) of the wall.

By not sealing the interior side of the panel joints and flashing assemblies, it is intended that any moisture in the wall construction will be drawn into the room and removed by condensation on the refrigeration coils. This minimizes the potential for damage caused by the freezing of moisture within the panel joints and flashing assemblies.

**Cold Storage (Cooler) Applications** - for cooler buildings or rooms where the interior temperature is above freezing and vapor pressure differentials are caused by reversible conditions of either warmer or colder exterior temperatures, the vapor seals may be specified at both exterior and interior sides of the wall.

**Design Responsibility** - the building's designer is responsible for understanding the project's climatic and operating conditions, and to specify the appropriate vapor seal requirements as necessary for proper vapor control.

Before starting the wall installation, verify that the building designer has specified the vapor seal requirements on the installation drawings or the project's specifications.

**Installer Qualifications** - because of the critical requirements of the weather and vapor seals, the installer must understand the principles of vapor drive and water migration and must understand the requirements for the effective moisture and vapor control.

## SEALANT APPLICATION

It is the installer's responsibility to ensure that the specified sealants are used and are in good condition and are applied in the proper manner. Always reference the sealant manufacturer's instructions for specific storage and use requirements.

**Sealant Pigtailed** - pigtailed are short beads of sealant which are applied to the panel edge to serve as a bridge between the sealant within the panel's tongue-and-groove joint and the perimeter flashing sealant on the surface of the panel. Pigtailed are also used as a bridge between the perimeter flashing sealants and the flashing splice sealants.

*Caution:* Because the pigtailed are installed in concealed areas of the panel joint and flashing assemblies, they are easily forgotten. Omission of the pigtailed will cause critical leaks in the wall's weather and vapor seals. Always verify the pigtailed are in place as each panel is being installed.

**Temperature Effects** - temperature extremes must be considered during installation of the panels due to the sensitivity of sealants. Refer to the sealant manufacturer's instructions for the specified application temperature range.

At cold temperatures the sealant stiffens and may be difficult to apply with a loss of adhesion and compressibility. During cold weather the sealant should be stored in a heated room or chest so it will be warm enough to use effectively.

At hot temperatures the sealant may become too soft for practical handling. During hot weather the sealant cartons should be stored in a cool and shaded area, and sealant rolls and tubes in use should be kept shaded until actually being used.

**Contamination** - to ensure proper adhesion and sealing, the sealant must have complete contact with the adjoining surfaces. Contaminants such as water, oil, dirt and dust will prevent proper contact. Immediately before applying the sealant, the panel and flashing surfaces must be dry and thoroughly cleaned of all contaminants.

Panel joints containing factory-applied sealant, should be examined prior to installation. Any sealants that have become contaminated with dirt or debris must be removed and be replaced with new field applied sealant.

During humid weather condensation or light mist can accumulate on the panel, flashing and sealant surfaces and may not even be noticed. It is important that the panel and flashing surfaces are wiped dry immediately before installation. A single wiping cloth will soon get saturated and become useless. A sufficient supply of dry wiping cloths must be made available during panel installation.

*Caution:* When the installation requires fitting of the panel (such as at openings or transitions to other construction materials, etc), always complete the fitting and test fit the panel before installing the joint sealant.

**Panel Joint Sealant** - during panel installation, always check that the joint sealant and pigtailed sealants are properly applied before engaging the panel joint.

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## VAPOR BARRIER MEMBRANE

On freezer buildings the application of vapor barrier membranes may be specified to provide an effective exterior vapor seal at the difficult to seal eave/rake and wall corner conditions. The installation details in this guide for cold storage flashing show typical vapor barrier membrane applications.

The flexibility of the membrane allows it to be closely fitted and sealed to the respective panel surfaces. And the typically longer available lengths allow the membrane to be applied with minimum splices. If the building has a membrane roof, the vapor barrier membrane for the eave and rake may be an extension of the roof membrane.

The selection and procurement of the appropriate membrane material and splicing adhesive/sealant is the responsibility of the building designer and installer. The vapor barrier membrane is not provided by Metl-Span®.

## FILLER INSULATION

To maintain the building's thermal efficiency across the cavities at the wall corners, wall to roof transitions and wall transitions to other construction, filler insulation must be installed within the cavities.

Failure to fill the cavities with insulation can result in reduced thermal efficiency as well as moisture and ice damage within the wall construction and frost and condensation problems in the building interior.

The filler insulation must be installed in a manner that maintains thermal efficiency across cavities where expansion/contraction is expected.

For C&I (non-cold storage) applications, fiberglass insulation is typically specified as the filler insulation. Fiberglass batt insulation is field cut to size and stuffed within the respective cavities.

For cold storage applications, because of the greater exterior/interior temperature differentials, a more thermally efficient field applied foam is typically specified as the filler insulation.

The selection and procurement of the appropriate filler insulation material is the responsibility of the building designer and installer. The filler insulation is not provided by Metl-Span®.

*Note:* Although field foam may be applied to completely fill the respective cavities, field foam should not be expected to function as the actual weather/vapor seal.

Panel and flashing surfaces must be protected from foam overspray.

## THERMAL BREAKS

For cold storage buildings, thermal breaks may be specified on the interior panel faces at wall corners, transitions and base conditions to minimize thermal conductance between the exterior and interior of the wall.

The thermal breaks consist of shallow saw cuts along the specified edges of the panel's interior face. Refer to the 'Cutting Panels' detail on page 43 of this guide for suggested thermal break cutting procedures. The thermal break must be located so as not to impact the structural integrity of the panel.

## FASTENER INSTALLATION

The connections of the panels to the wall framing members is a most critical factor of the wall's load resistance performance and may be equally critical to the wall's weathertight performance. It is the installer's responsibility to ensure that the specified fasteners are used and are installed in the proper manner and at the specified spacing. Reference the project's installation drawings for the specified fasteners and spacing.

**Fastening Methods** - the method of panel attachment is dependent upon the project's specific requirements.

For typical applications the panels are attached to the framing members with clips and screws concealed within the panel joint.

In some cases the project's design loads will require backside attachment of the panels to the framing members in addition to the clips. The backside attachment consists of installing rivets through the flange of the structural member into the interior face of the panel at a specified spacing between the panel joints.

At wall corners, framed openings and wall terminations, the edges of the panels are attached to the framing member with thru-panel screws.

Reference the respective connections details on pages 38-41 of this guide for specific fastening method information.

**Fastener Types** - the fastener type is determined by the material of the wall framing members and the project's environment and operating conditions.

For most applications with steel wall framing members, self-drilling or self-tapping screws are used for the clip attachment and thru-panel attachments. Other type fasteners may be specified when attaching the panels to other framing member materials.

Fab-Lok® or Bulb-tite® rivets are most commonly used for the backside attachments of the panels.

## FASTENER INSTALLATION (cont.)

Self-drilling screws with sealing washers and/or 1/8" rivets are typically used for attaching the flashing to the wall panels.

*Caution:* Corrosion resistant fasteners must be used in corrosive environments.

**Pilot Holes** - self-tapping screws will require pilot holes. Providing the correct size pilot hole is most critical to the fastener's structural performance. See the following chart for the proper drill bit size required for the specific framing member thickness.

THICKNESS OF STEEL	SIZE OF DRILL	TYPE OF SCREW
18 GAGE	3/16" DRILL	B, BP, AB, A
16 GAGE	#9 DRILL	B, BP, AB, A
14 GAGE	#9 DRILL	B, BP, AB, A
12 GAGE	#3 DRILL	B, BP
11 GAGE	#2 DRILL	B, BP
OVER 11 GAGE THRU 3/8"	#1 DRILL	B, BP
OVER 3/8" THICKNESS	.234 DRILL	B, BP

**Screw Guns** - use industrial quality screw guns with torque control clutch for driving self-drilling and self-tapping screws. Guns with variable speed (0 to 2000 rpm) and high amperage (5 to 7 AMP) are recommended to achieve the proper drilling speed and proper torque for secure fastening.

**Sockets & Bits** - use only the best industrial quality sockets or bits, and ensure that worn sockets are immediately discarded. Cheap sockets and bits from the local home improvement store typically fit poorly and rapidly become too worn for effective use. Such poorly fitting, worn sockets can severely reduce installation efficiency because of wobble and stripping of the screw heads.

**Installing Screws** - always refer to the fastener manufacturer's instructions for specific installation requirements.

Before starting a screw, the materials to be joined must be pressed firmly together to ensure that there are no gaps between the materials.

Most self-drilling screws require 20 pounds of pressure to maintain the drilling action and to start the thread cutting action. Applying such pressure before starting the screw gun will usually prevent tip walking or wandering. If too little pressure is applied, the drill point may not cut into the metal and the spinning will cause the point to heat up and become dull. If the pressure is too heavy, the far side material may be deflected away causing a stand-off condition or the drill tip may break or split.

*Caution:* Do not overdrive screws. Overdriving the screws causes screw strip-out, sealing washer damage and depression (dimpling) of the panel or flashing surface.

## FASTENER INSTALLATION (cont.)

Before starting the wall installation, preset and test the screw gun's clutch for the proper torque setting for each specific combination of fastener size and material thickness (and hole size for self-tapping screws).

Screws must always be installed perpendicular to the surface of the material being secured. A tilted screw causes eccentric bearing under the screw's head, which may result in break off of the screw heads. Tilted screws can also cause lateral drifting between the materials being secured.

**Panel Clip Attachment** - the panel clip attachment screws must be driven until the panel face is secure against the framing member, but must not be overdriven to cause excessive crushing of the foam core and distortion of the metal panel edge. Distorting the panel edge will cause difficult panel joint assembly and may cause visible rippling of the panel's exterior face and excessive joint gaps.

The recommended procedure is to drive the panel clip screws until the foam core under the clip is only slightly compressed (1/16" maximum). The compression of the foam core during installation of the clip screws can be readily observed at the exposed panel edge.

When attaching the panel clips with two self-drilling screws, stacking and screw tip breakage may occur if the screw threads engage the panel face material before the drill tip completes drilling through the framing member.

The recommended procedure is to drive the top screw until its drill tip fully drills through the framing member. Then back out the top screw until its threads clear the inside face of the wall panel. Fully drive the bottom screw and then fully drive the top screw.

**Sealing Washers** - exposed screws for flashing attachments are provided with sealing washers. For the proper seating of the sealing washers, the flashing surface must be clean and drill shavings must be removed from under the washer before seating the fastener. The fastener must be installed perpendicular to the panel or flashing surface so that the washer can seat level without warping or cupping.

The fastener should be tightened to uniformly compress the washer, but not so tight that the washer splits or rolls out from under the metal backer, and not so tight that the panel face or flashing is dimpled. The recommended procedure is to tighten the fastener until the sealing washer just starts to visually bulge from under the metal backer.

**Oversize Screws** - as a good erection practice, whenever possible the panel installers should carry approved oversized screws. Upon stripping or breaking a screw, the screw must be immediately removed and replaced with the appropriate oversized screw.

*Caution:* Do not defer replacing a stripped or broken screw to be remembered and fixed later. The majority of such screws will be forgotten until a problem is reported.

## FIELD CUTTING

**Cutting Panels** - the panels are easily cut with circular saws or reciprocating saws using proper metal cutting blades. If the saw cannot cut through the entire panel thickness, or if shears or nibblers are used, cut each panel face and use a knife or handsaw to cut through the remaining core.

Be sure to properly support the panel during the cutting operation to prevent separation of the face from the core or buckling of the panel. When necessary pad the saw's shoe plate and guides so they do not scuff or scratch the exposed panel surfaces.

*Caution:* When cutting panels, always wear protective eye shields, gloves and long sleeve clothing to protect the eyes and skin from the saw chips and saw dust.

**Abrasive Saw Problems** - abrasive saws (circular saws with friction disks) are not recommended for cutting panels or flashing. Abrasive saws create high heat which may burn away the protective cladding from the panel edges causing the edge to rust. Abrasive sawing also emits fine, hot steel and abrasion particles which may be blown onto panel and flashing surfaces where they can cause staining and rusting of those surfaces.

**Cutting Flashing** - it is recommended that flashing be cut with good quality sheet metal shears to provide a clean, undamaged cut.

When field cutting through complex shapes, it is usually easier to cut out a 1" wide strip using the left and right hand shears. The 1" cut out provides the clearance to make smooth cuts and the clearance to work the shears around tight corners.

**Layout and Marking** - when marking the panels and flashing for cutting, avoid marking the panels in a manner which will leave visible marks or stains on the exposed surfaces. Use chalk or washable felt tip markers.

*Note:* Whenever possible, fit flashing splices so the factory cut edge is exposed and the field cut edge is covered.

## PREVENTING CORROSION

**Surface Damage** - damaged panel and flashing surfaces are subject to corrosion and may void the material warranties. Ensure that the panels and flashing are not being subjected to abusive conditions or contact with abrasive materials or residue.

**Wet Conditions** - ensure that the panels and flashing are not being subjected to long term wet conditions such as standing water, steam, spray or dripping water, wet debris, wet insulation or other moisture holding materials.

**Corrosive Materials** - ensure that the panels and flashing are not subjected to direct contact or runoff from corrosive materials such as copper or iron pipes and flashing, uncured cement, treated lumber, anti-icing chemicals, strong solvents or other corrosive materials.

## APPEARANCE AND SURFACE DAMAGE

The embossed and premium painted finish of the panel faces provides an exceptionally attractive appearance. It is most important that the panel surfaces are protected from damage during handling and installation.

**Impact and Abrasion** - because of their weight, the panels have considerable inertia which causes them to be susceptible to impact damage. Do not allow the panels to be struck by other construction, materials or equipment while moving the panels.

Always cushion the panel surfaces from direct contact with temporary supports or lifting slings and clamps etc. Because of the panel's weight, even resting on a sharp edge or irregular object can cause creasing or denting of the panel face. Do not slide the panels across rough or abrasive surfaces.

**Bending & Crushing** - to prevent bending or crushing damage, ensure that the panels are uniformly supported at adequate spacing. Do not handle the panels in a manner that can cause buckling of the faces, or separation of the faces from the core. Refer to the 'Panel Handling and Lifting' details on pages 35-37 of this guide for additional information.

**Surface Contamination** - be careful not to drip or smear sealant onto the exposed panel surfaces. Check that the panel joints do not have excessive sealant which spills onto the exposed panel surfaces after the joints are engaged.

To prevent oil and rust stains on the finished wall surfaces, thoroughly clean the panels of dirt, grease, saw chips, grinding dust etc. before setting the panels in place.

Do not saw cut or torch cut materials in areas where the residue and sparks can be blown onto the bundled or installed wall panel surfaces. Do not paint, solvent wash or do other operations in areas where the overspray and residue can be blown onto the panel surfaces.

**Joint Spacing** - uniform joint spacing and plumb panels are critical to the appearance of the finished wall. Ensure that each joint is uniformly engaged and each panel is plumb.

**Oil Canning** - oil canning of flat surfaces is a normal condition of metal faced panels and is not cause for rejection. However rippling and wrinkling caused by improper handling or misalignment and deflection of the wall framing members can result in objectionable appearance and must be avoided.

## UNSPECIFIED MATERIALS

Use of wrong materials may cause installation and performance problems and may void the material warranties. All installed materials, especially sealants and fasteners, must be those which are specified on the project's installation drawings.

Metl-Span® cannot be responsible for the performance of materials which are not provided, specified or approved by Metl-Span.

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## PANEL REPLACEMENT

Whenever a panel is damaged during installation, the panel installation should be stopped and disposition of the damaged panel resolved. Do not continue with the installation of the damaged panel and risk having to replace the panel after the wall is finished, which can be difficult and costly.

Whenever possible set the damaged panel aside to be used where the damaged area is cut out for door or corner panel conditions, or to be used where the appearance of the damage area is concealed or otherwise not objectionable.

*Caution:* As much as possible, avoid having to replace the panels. The panels are fabricated on a per order basis. A special run of replacement panels may require considerable lead time and specific face materials and colors may not be readily available.

## INSPECTION DURING INSTALLATION

During the wall panel installation, it is critical that all areas of the wall assembly are frequently inspected to ensure that the panels and flashing are being installed in the proper manner and in accordance with the project's installation drawings and the applicable portions of this installation guide.

Failure to install the wall assembly correctly will result in wall performance problems which may require costly corrective work, material replacement, and performance and damage claims, etc. Incorrect installation may also void the material warranties and any applicable performance warranties.

## INSTALLATION DETAILS

The following section of this guide contains details which provide instructions and graphic illustrations of the suggested procedures for the preparation of the wall framing and the receiving, handling and installation of the wall panels and associated flashing.

The details are arranged in the order of the typical wall installation sequence. Where there are differences between Cold Storage and C&I (non-cold storage) applications, separate details for both conditions are provided.

The details are generic, showing typical wall framing and flashing conditions. Because of the many variations of applications and construction conditions, these generic details may vary from the project's actual conditions. Always reference the project's installation drawings for the specified requirements. If there are differences between the installation drawings and these installation guide details, the installation drawings will govern.

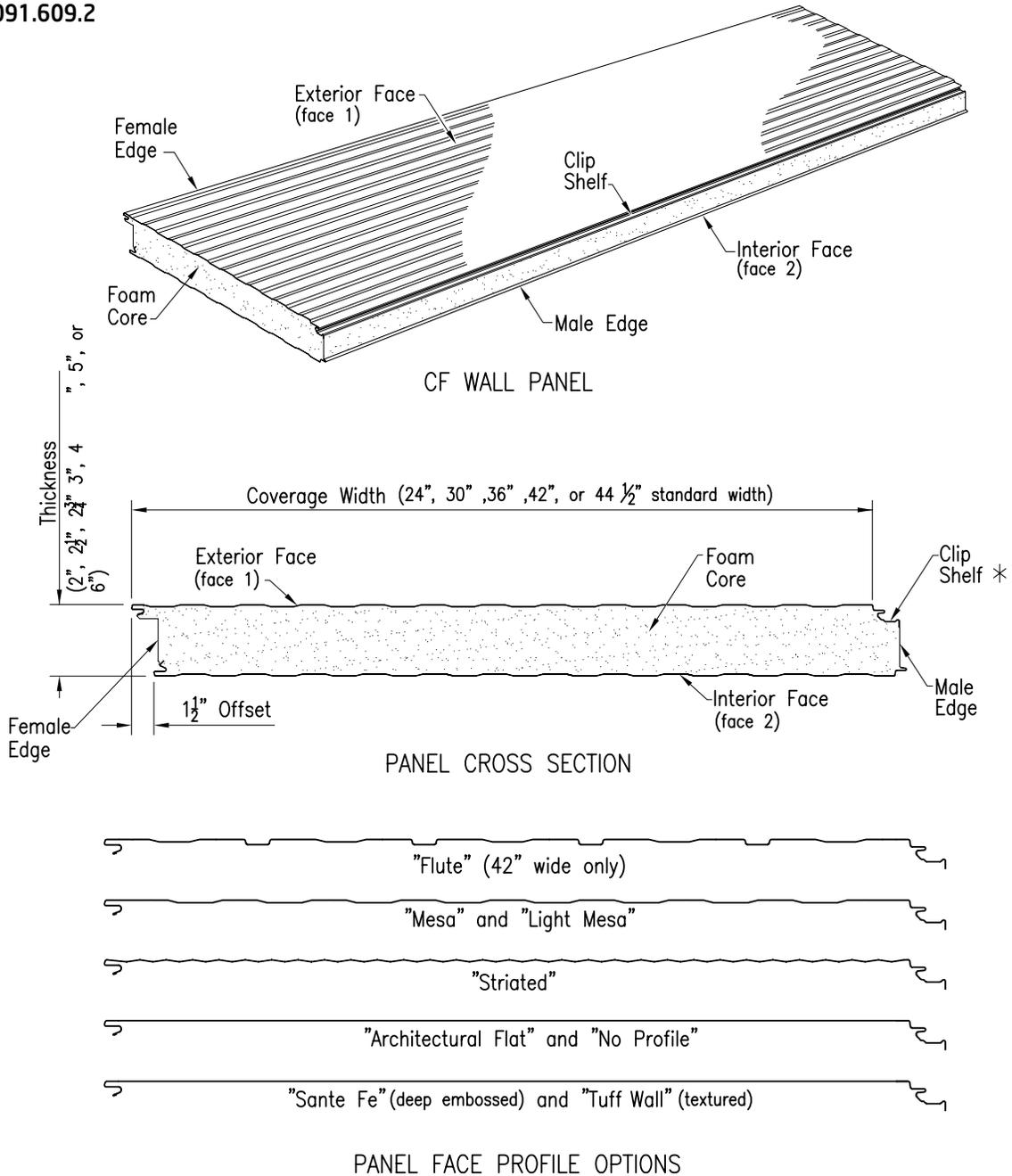
Before starting the panel installation, it is important to study the project's installation drawings to determine the project's specified conditions. Select the installation details in this guide which are applicable to the project's conditions, then adapt or modify the details as necessary for the project's requirements.

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## PANEL DESCRIPTION

MSS091.609.2

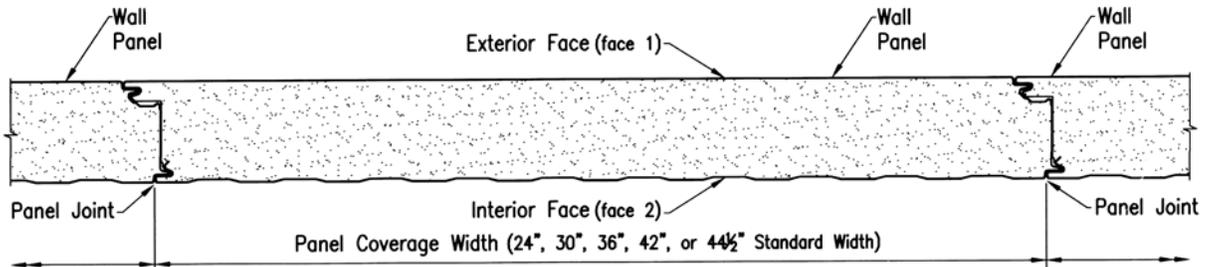


### Panel Variations:

1. There may be several panel variations specified on the project and all profiles are not available for both faces. Always refer to the installation drawings for panel placement and face orientations.
2. Flute profile panels are available with optional joint reveal widths.
- \*3. The 44 1/2" width panel is referenced as CF45. This panel does not have a metal clip shelf and is used only for interior partitions.
4. 2-3/4" thickness available in NV plant only.

## PANEL JOINT DESCRIPTION

MSS091.610



WALL ASSEMBLY PLAN VIEW

**Joint Assembly** – the edges of adjacent panels are joined together by tongue-and-groove engagement of the steel faces and ship lap joining of the foam core.

**Panel Module** – when panel joints are fully engaged, the actual coverage width may vary – 1/16" to + 1/8" due to panel tolerances and field tolerances.

**Direction of Installation** – the panels can be installed in either direction (left to right or right to left). Refer to the installation drawings for the specified direction of installation.

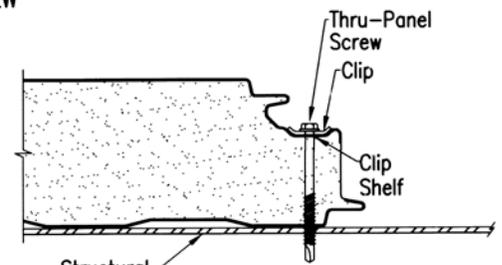
If installation drawings are not provided, the direction of installation is determined by job site and erection requirements.

**Clip Shelf** – the panel is typically attached to the wall framing members with clips. The clips are set in the panel's clip shelf. The clips are then secured by screws driven through the factory holes in the clip, through the panel and into the framing member.

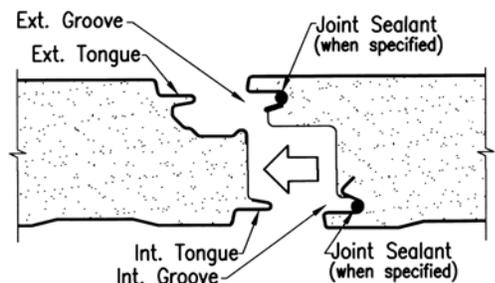
*Note: The 44-1/2" width panel does not have a clip shelf. This panel is used only for interior walls or partitions.*

**Joint Sealant** – the application of the joint sealant is dependent upon the project's weather seal and vapor seal requirements. Refer to the project's installation drawings for the specified joint sealant locations.

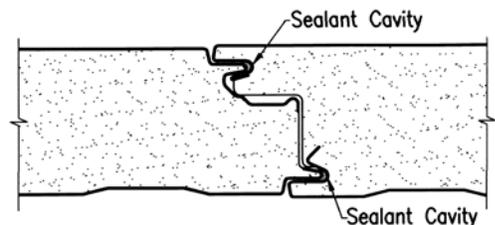
**Sealant Cavities** – when the joint is fully engaged, sealant cavities are left within the tongue-and-groove joints. The cavities help ensure a functioning thickness of the sealant within the joint and minimize extruding of sealant out of the joints onto the panel face.



CLIP & FASTENER ASSEMBLY



JOINT SEALANT APPLICATION



ASSEMBLED SIDE JOINT

## PANEL BUNDLE STAGING

MSS091.611

**Panel Bundles** – the wall panels are shipped in stretch wrapped bundles. Each bundle consists of a single stack of panels in the flat position.

**Bundle Identification** – a bundling report is provided with each shipment of panels. The report identifies each bundle with a number, and identifies the panels within the bundle with a panel I.D. code.

**Installation Drawings** – the installation drawings will specify where the panels are located on the building. If Metl-Span® is providing the project's installation drawings, the drawings will specify the panels with the same code that is shown on the bundling panel I.D. report.

**Bundle Staging** – using the bundling report to identify the panels within the bundles, the bundles can be pre-positioned around the building in the order that the panels are to be used.

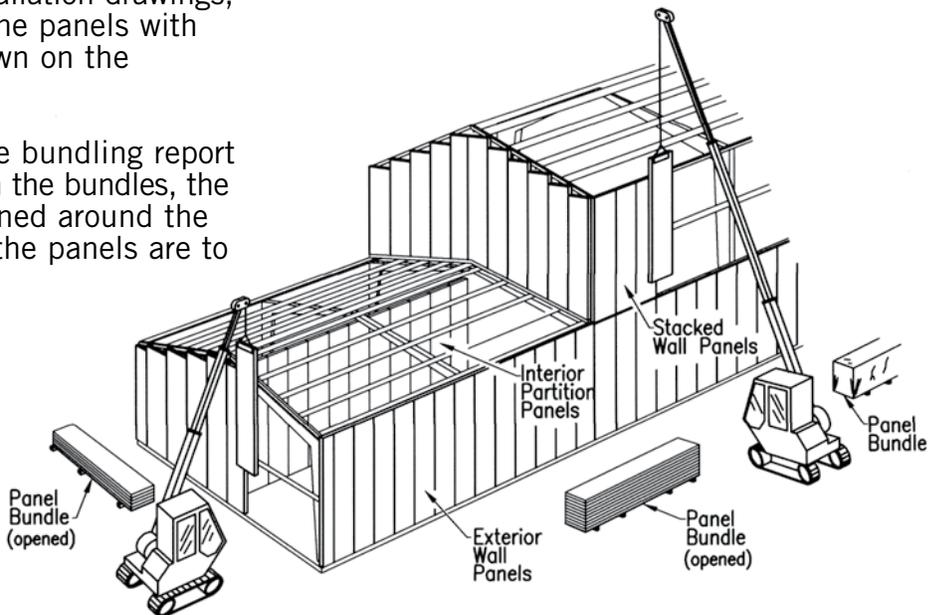
Bundle I.D.      Panel Length  
Panel Thickness

Bundle Report

Bundle #	Total Qty.				
3	11				
Item #	Item Desc.	Qty. in Bundle	Gauge	Thk.	Length
1	W-A1	11	U	3"	27'-3"
Face 1- Brick Red S. Polyester 26 gauge G-90 steel			Face 2- Igloo White Poly. 26 gauge G-90 steel		

Panel Description      Panel I.D.      Qty. Of Panels

READING THE BUNDLING REPORT



TYPICAL PANEL INSTALLATIONS

### Panel Installation Sequence:

**Exterior Wall Panels** – plan the installation sequence so the bundles can be staged near their installed locations and provide ready access and clearance for the lifting equipment. Plan the installation sequence so each wall can be started at one corner and finished at the opposite corner without interruption.

**Stacked Wall Panels** – plan the panel installation sequence so installation of the bottom course of panels can be completed and the area cleared before starting the top course of panels. This will allow for ready access and staging of the top course panel bundles and set-up of the lifting equipment.

**Interior Partition Panels** – to allow access for inside staging of the partition panel bundles and access for the lifting equipment, a portion of the exterior walls may have to be left open until after installation of the partition panels is completed.

## UNLOADING AND MOVING PANEL BUNDLES

MSS091.612

**Contractor's Responsibility** – before the materials arrive, it is the contractor's responsibility to determine how the trucks will be unloaded and where the material will be staged at the job site.

The contractor must determine what personnel, equipment and job site conditions are required to safely unload and move the material. Refer to the unloading instructions provided with the shipment for any specific requirements.

**Bundle Weights** – the weight of each bundle is listed on the Bill of Lading. The maximum bundle weight is 5,000 lb. Verify that the lifting equipment, rigging and any supporting structure can safely handle the bundle weight.

*Caution: Do not attempt to lift stacked bundles. Lift only one bundle at a time.*

**Unloading By Forklift** – the panel bundles are shipped on flat bed trailers which allow side unloading by forklifts. The bundles have built-in bearing pads which raise the bundle to allow insertion of the forklift blades.

Spread the forklift blades as far as possible and ensure that the blades support the full width of the bundle. Check that the blade tips do not damage the bundles on the opposite side of the trailer.

Provide padding or blocking on the forklift masts to prevent damage to the panel edges within the bundle.

Use care when moving the bundles. Excessive bouncing and flexing will damage the panels.

**Shorter Bundles** – shorter bundles can be lifted and moved with a single forklift.

Before lifting the bundle, check that the forklift blades are level and centered under the weight of the bundle.

**Longer Bundles** – longer bundles may require two forklifts.

If two forklifts are required, the lift points will be marked on the side of the bundle by the factory. At each lift point, position a forklift so its blades straddle the lift point mark.

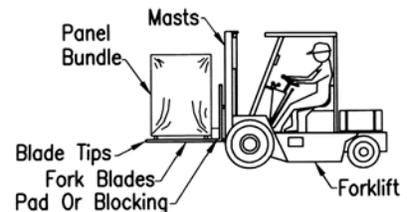
Before lifting the bundle, check that the two forklifts are level with each other and ensure that their operation can be accurately coordinated.

**Guidelines for bundles requiring two forklifts:**

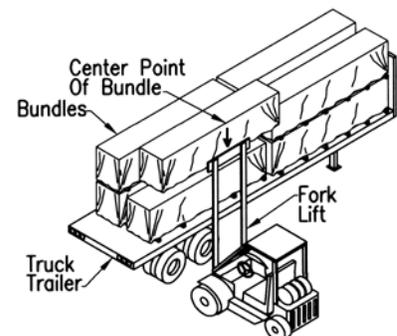
Panels 2", 2-<sup>1</sup>/<sub>2</sub>" & 2-<sup>3</sup>/<sub>4</sub>" thick – 36' or longer

Panels 3" thick – 40' or longer

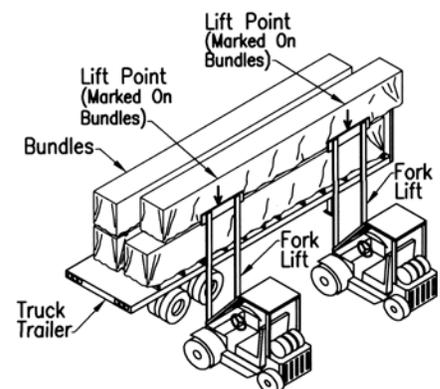
Panels 4" to 6" thick – 48' or longer



UNLOADING WITH FORKLIFT



ONE POINT FORK LIFT



TWO POINT FORK LIFT

## UNLOADING AND MOVING PANEL BUNDLES (cont.)

MSS091.613

**Unloading By Crane** – the panel bundles are shipped on flat bed trailers which allow overhead unloading by a crane with spreader beam and lifting slings. The bundles have built-in bearing pads which raise the bundle to allow insertions of lifting slings under the bundle.

The lifting slings must be 6" min. width straps. Do not use cables as slings. At each sling, use 2" x 12" anti-pinch boards on the top and bottom of the bundle to prevent the straps from crushing the edges of the panels. Cut the boards 4" longer than the overall width of the bundle. On the sides of the bundle, insert 2" thick foam blocks between the strap and the bundle.

Following are suggested rigging for various bundle weight and length conditions. Always test the lifting equipment and rigging in a safe area before starting the unloading.

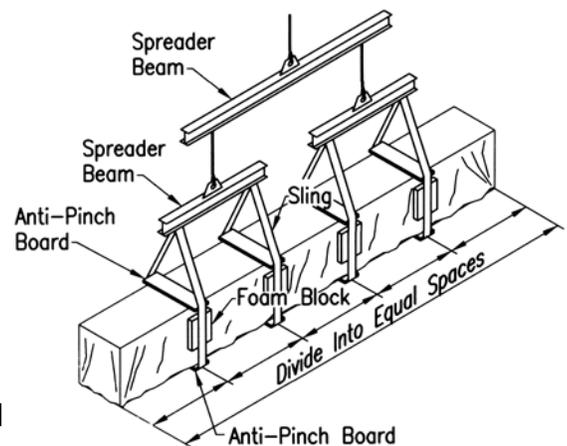
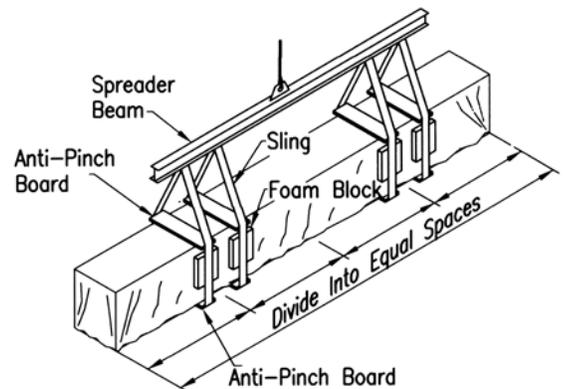
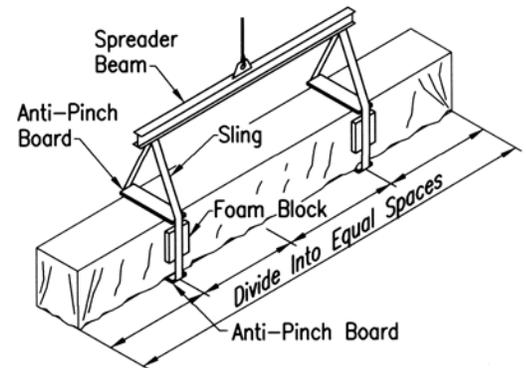
*Caution: Too few lift points or excessive lift point spacing can cause bending and crushing damage to the panel.*

*Do not attempt to lift stacked bundles. Lift only one bundle at a time.*

**Bundles under 4,000 lbs and under 44' length** - bundles less than 4,000 lbs weight and less than 44' length, may be lifted with a single spreader beam and two slings. The slings are to be positioned at quarter points from each end of the bundle.

**Bundles over 4,000 lbs and under 44' length** - bundles of 4,000 lbs or more weight and less than 44' length, may be lifted with a single spreader beam and four slings. Double sets of slings are to be positioned at quarter points from each end of the bundle.

**Bundles over 4,000 lbs and/or over 44' length** - bundles of 4,000 lbs or more weight and/or 44' or more length, may be lifted with ganged spreader beams and four slings. The slings are to be positioned at equal spaces along the length of the bundle.



## JOB SITE PROTECTION OF PANELS

MSS091.620

**Panel Bundles** – the wall panels are shipped in stretch wrapped bundles. Each bundle consists of a single stack of panels in the flat position.

The panel bundles must be protected against impact damage, water exposure and chemical contamination. If necessary, the bundles must be stored under cover until immediately before installation.

**Bundle Blocking** – always set the bundles on blocking to prevent panel bending and to raise the bundle above standing water, snow and mud. Position the blocking under each of the bundle's bearing pads.

**Bundle Drainage** – shim the blocking as necessary for a level support and graduate the blocking thickness so the bundle will be at a slight pitch to ensure water drainage between the panels.

**Bundle Ventilation** – to provide for ventilation and evaporation of moisture within the bundles, slit the wrapping at intervals along each side at the bottom of the bundles.

**Temporary Cover** – in opened bundles the remaining panels must be protected from water exposure, chemical contamination, construction residue and over-spray etc.

When left overnight or during wet weather, opened bundles must be moved to a covered area or the bundle must be covered with a tied down tarp to protect the exposed panels.

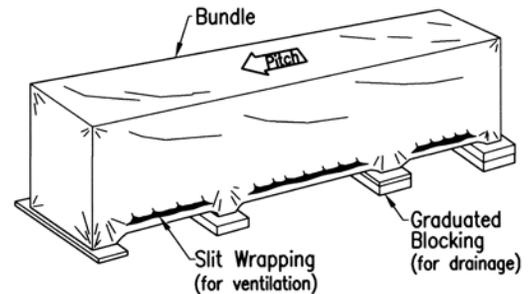
*Caution: Attempting to move the bundle after the shrink wrap has been opened or removed may result in damaged panels.*

**Temporary Tie-Down** – when left overnight or during severe weather, opened bundles must be secured with banding or snug straps to prevent wind movement of the panels.

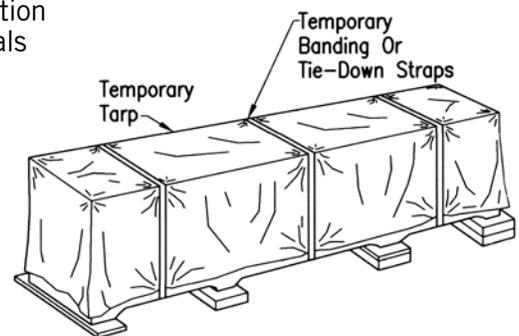
*Caution: Over tightening the banding or straps can damage the panel edges. Do not over tighten and provide protective padding under the banding at the bundle corners.*

**Thermal Bow** – when one face of the panel is warmed, such as by exposure to sun radiation, the panel will bow towards the warm side. Bowing may cause difficulty in engaging the panel joint during installation.

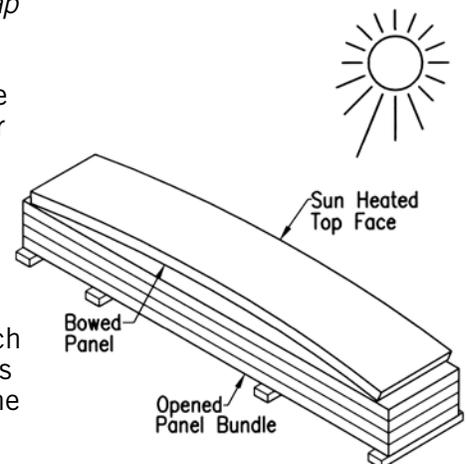
The top panel on the bundle is typically exposed to sun radiation prior to its installation. To prevent the panel's thermal bow, set the entire bundle under shade or set the next panel under shade to cool down before it is installed, or turn the panel over to allow equal warming of the opposite face.



BLOCKING AND VENTING THE BUNDLES



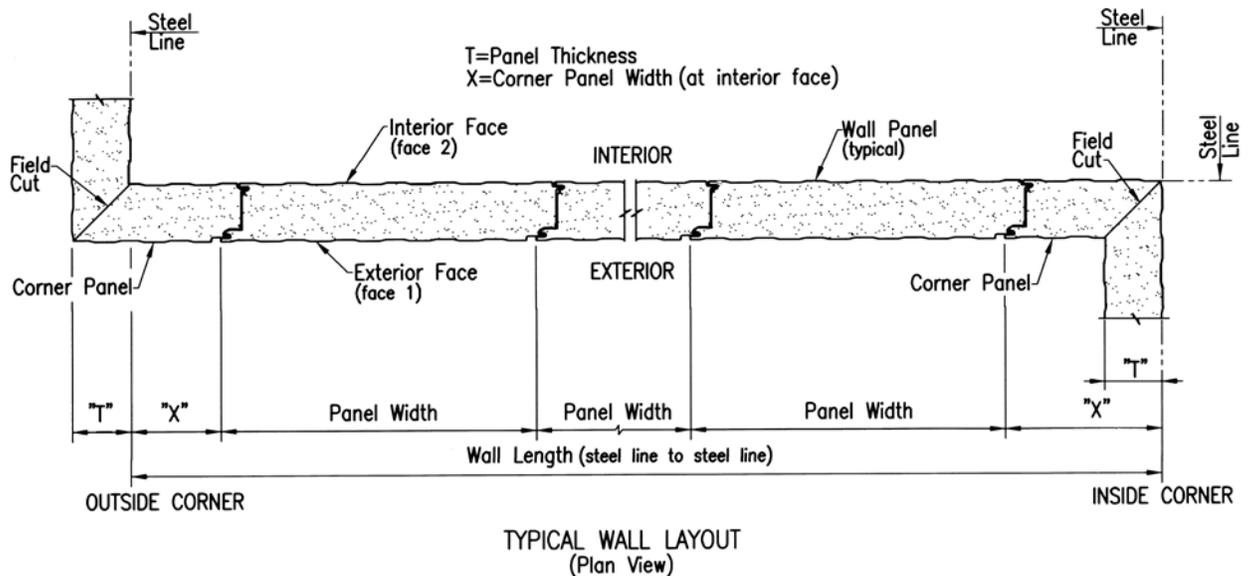
OPENED PANEL BUNDLE



THERMAL BOWING

## PREPARE WALL PANEL LAYOUT

MSS091.617



**Wall Panel Layout** – before starting the wall panel installation, it is recommended that a wall panel layout be prepared to assist in determining the cutting dimensions for the corner panels and to ensure the wall panels are correctly positioned for the actual building conditions.

*Caution: If the installation drawings provide specific wall panel layouts, those layouts must be used. However it is critical to conduct field measurements of the actual building conditions and adjust the layout accordingly.*

**Field Measurements** – because of field tolerances and potential error, the wall panel layout must be based on the actual measured conditions of the wall framing members. These field measurements should always be made to the respective wall bearing surfaces of the framing member. For normal building conditions, the wall panel layout can be based on field measurements at the base of the wall.

**Field Cut Corner Panel** – for most wall conditions, the corner panels are field cut to provide symmetrical corner panel widths at each end of the wall. The corners may be assembled with mitered cut or lapped panels. Refer to the 'Corner Panel Variations' detail on page 28 for the typical corner conditions.

**Calculate Corner Panel Width** – to determine the width of the corner panels, divide the wall length (steel line to steel line) by the panel width (24", 30", 36", 42" or 44.5"). Then divide the remainder by 2. If the resulting dimension is less than 1/2 the panel width, add the panel width to the remainder and then divide by 2.

The resulting dimension will be the width of the corner panel's interior face (dimension X).

For mitered corner conditions, the width of the corner panel's exterior face must be increased by a dimension equal to the panel thickness (dimension T).

For square cut corner conditions, the overall width of the run-by panel must be increased by a dimension equal to the panel thickness (dimension T).

*Caution: The above calculations can be used to determine the starting and finishing corner panel widths. However to allow for panel installation tolerances, it is recommended that the width of the finishing corner panel be determined by measurement of the remaining space after the other panels have been installed.*

## CORNER PANEL VARIATIONS

MSS091.626

**Corner Variations** – there are several variations of wall corner assemblies that can be used with wall panels. Refer to the installation drawings for the specified corner assembly.

**Beveled Corner** – on a beveled corner assembly, the edges of the opposing panels are cut at a 45° bevel and butt joined at the corner.

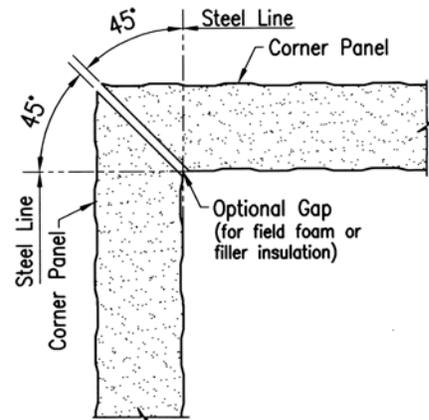
This type corner is most effective in reducing thermal transfer through the corner assembly. For cold storage applications, the beveled corner eliminates the need of a thermal break cut on the interior face of the corner panel.

**Lapped Corner** – on a lapped corner assembly, the edges of the opposing panels are square cut. One panel (the by-pass panel) extends past the end of the other panel to form the lap joint.

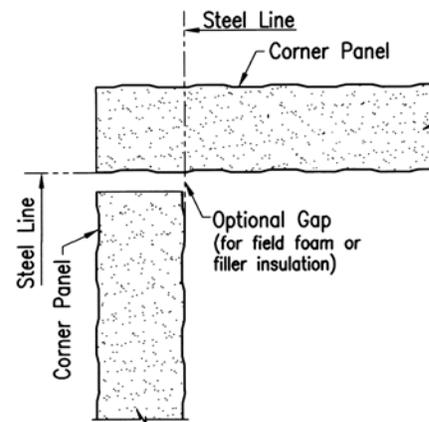
This type corner eliminates the need to bevel cut the corner panel edges. For cold storage applications, a thermal break cut may be required on the interior face of the overlapping panel.

**Interlocking Corner** – this type corner assembly may be used when one of the corner panels can be used at its full (uncut) width. The cut panel laps and interlocks over the female edge of the uncut panel.

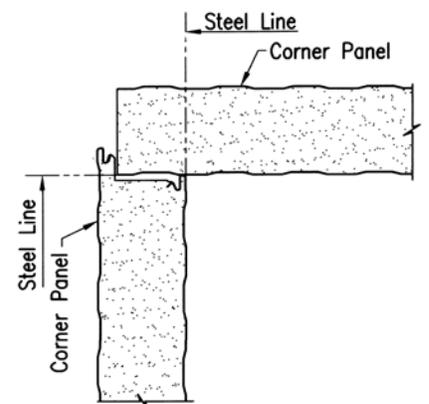
This type corner eliminates the need to cut one of the corner panels to width. For cold storage applications, a thermal break cut may be required on the interior face of the overlapping panel.



MITERED CORNER



LAPPED CORNER



INTERLOCKING CORNER

## C & I BASE ASSEMBLY—ON FOUNDATION

MSS091.622.1

**C & I Assemblies** – the following details show the typical base framing and flashing assemblies for non-cold storage building applications.

**On-Foundation Base Assembly** – this type of base assembly is used when the bottom end of the wall panels are set on the foundation.

The base flashing provides water shed to the exterior. The optional foundation notch minimizes water seepage onto the building's floor.

**Base Assembly Alignment** – before starting the base assembly installation, check that the foundation surfaces are level, straight and aligned to the intended steel line.

**Base Assembly Attachment** – use the appropriate concrete fasteners to secure the base flashing to the foundation. Check that the concrete fasteners are solidly in place.

**Base Sealant** – to seal the junction between the base flashing and the foundation, the standard sealant is a field applied butyl tape.

Check that the base sealant is installed continuously and is uniformly compressed between the base angle and the foundation. At voids or depressions in the foundation, use extra layers of sill sealant as necessary.

*Caution: The base sealant must be positioned so the concrete fasteners penetrate the center of the sealant.*

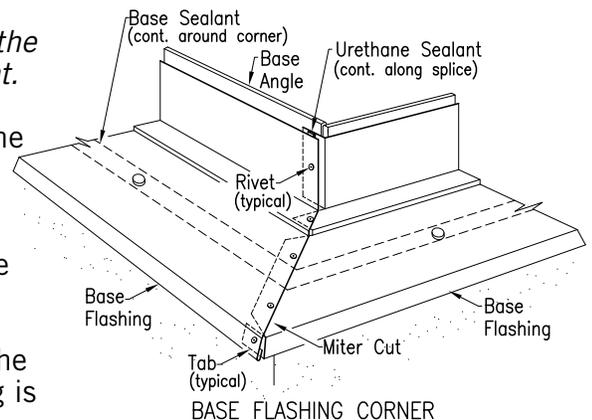
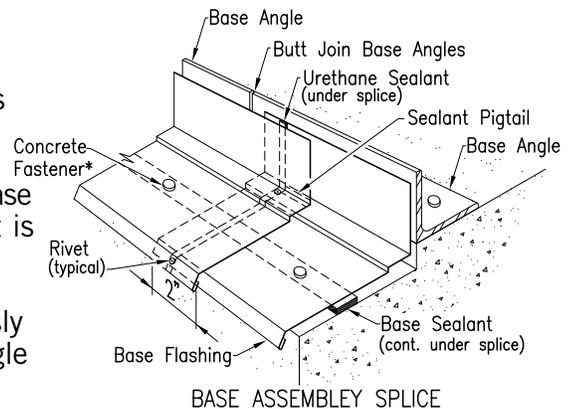
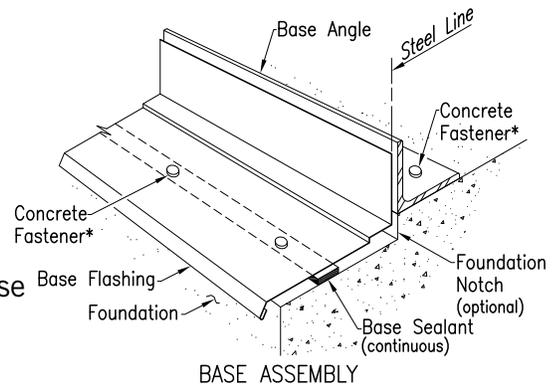
**Base Flashing Splices** – to provide continuity of the base flashing along the wall, the base flashing sections are lap spliced together.

Lap the flashing ends 2". Apply sealant within the lap and secure the lap with 1/8" rivets as shown.

**Base Flashing Corners** – to provide continuity of the base flashing around the corner, the base flashing is field mitered and lap spliced at the corner.

Cut the end of one flashing section at a 45° bevel. Cut the end of the opposite flashing section with tabs that will lap under the end of the beveled cut flashing. Apply sealant between the flashing ends and secure the corner assembly with 1/8" rivets as shown.

\*These Materials Are Not Provided By Metl-Span



## C&I BASE ASSEMBLY—OFF FOUNDATION

MSS091.623.1

**Off-Foundation Base Assembly** – this type of base assembly is used when the bottom of the wall panels overhang the edge of the foundation.

The base flashing provides water shed to the exterior. The base flashing is an assembly of a top flashing and underside flashing and may have an optional integral support angle to resist sag.

*Caution: The base assembly must be temporarily blocked to support the weight of the wall panels until the panels are securely fastened to the base angle.*

**Base Assembly Alignment** – before starting the base assembly installation, check that the foundation surfaces are level, straight and aligned to the intended steel line.

**Base Assembly Attachment** – use the appropriate concrete fasteners to secure the base flashing to the foundation. Check that the concrete fasteners are solidly in place.

**Base Sealant** – to seal the junction between the base flashing and the foundation, the standard sealant is a field applied butyl tape.

Check that the base sealant is installed continuously and is uniformly compressed between the base flashing and the face of the foundation. At voids or depressions on the foundation, use extra layers of sill sealant as necessary.

*Caution: The base sealant must be positioned so the concrete fasteners penetrate the center of the sealant.*

**Base Flashing Splices** – to provide continuity of the base flashing along the wall, the base flashing sections are spliced together.

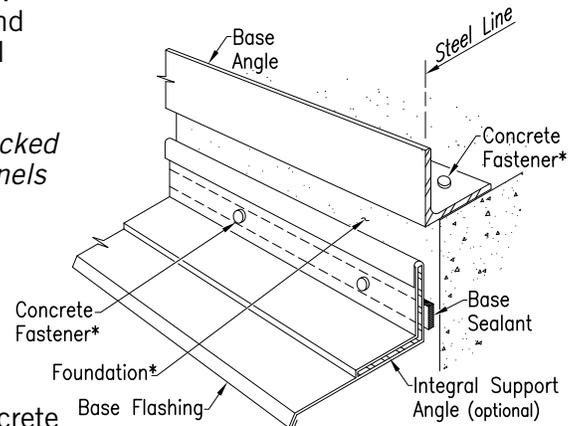
Lap the base flashing end 2". Apply sealant within the lap and secure the lap with 1/8" rivets as shown.

On base flashing with integral support angle, the support angle and underside flashing are butt joined and the top flashing is extended at one end for lap splicing.

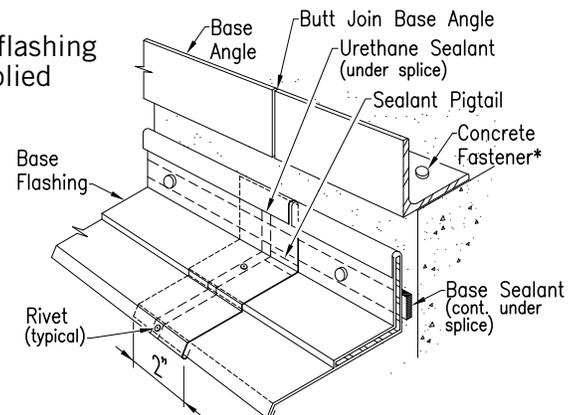
**Base Flashing Corners** – to provide continuity of the base flashing around the corner, the base flashing is field mitered and lap spliced at the corner.

Cut the end of one flashing section at a 45° bevel. Cut the end of the opposite flashing section with tabs that will lap under the end of the beveled cut flashing. Apply sealant between the flashing ends and secure the corner assembly with 1/8" rivets as shown.

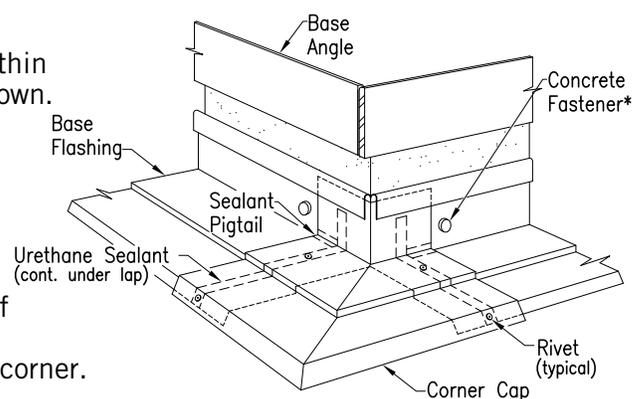
\*These Materials Are Not Provided By Metl-Span



OFF FOUNDATION BASE ASSEMBLY



BASE ASSEMBLY SPLICE



BASE ASSEMBLY CORNER

## COLD STORAGE BASE ASSEMBLY—BASE CHANNEL

MSS091.624.1

**Cold Storage Base Assemblies** – the following details show typical base assemblies for cold storage applications.

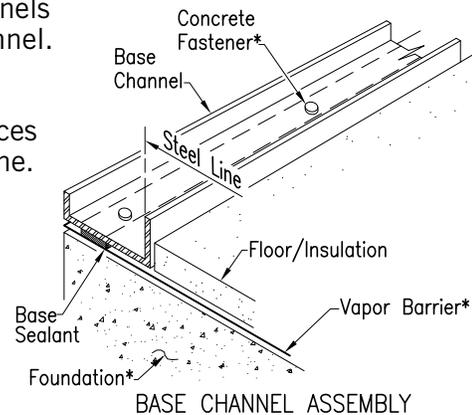
\*These Materials Are Not Provided By Metl-Span

**Base Assembly with Base Channel** – this type of base assembly is used when the bottom end of the wall panels are set on the foundation and retained within a channel.

**Base Assembly Alignment** – before starting the base assembly installation, check that the foundation surfaces are level, straight and aligned to the intended steel line.

**Vapor Barrier** – if the floor construction specifies a vapor barrier membrane, the membrane is typically extended under the base channel and is sealed to the base channel with the base sealant.

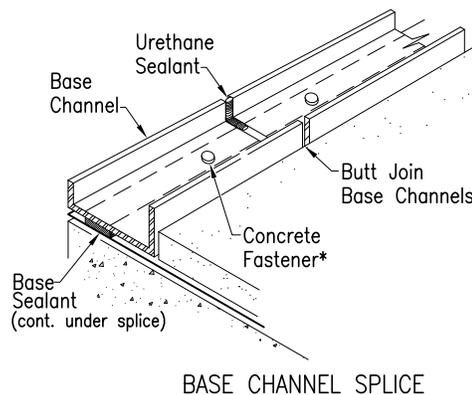
*Caution: Take care not to tear or disrupt the vapor barrier during the installation of the base channel.*



**Base Sealant** – to seal the junction between the base channel and the foundation (or vapor barrier) the standard sealant is a field applied butyl tape.

Check that the base sealant is continuous and uniformly compressed between the base channel and the foundation, and is continuous under the base channel splice joints and corner joints.

**Base Channel Attachment** – use the appropriate concrete fasteners to secure the base channel to the foundation. Check that the concrete fasteners are solidly in place and at the specified spacing.

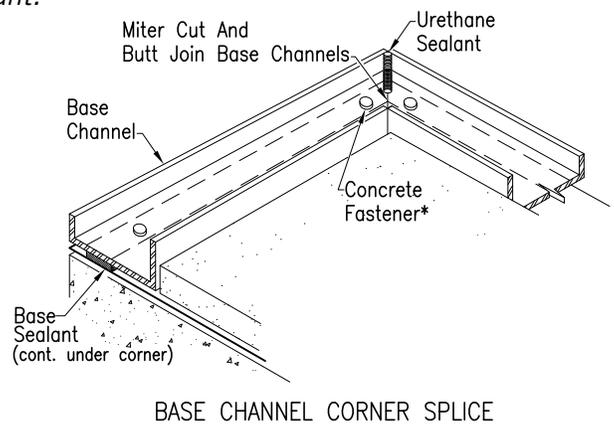


*Caution: The base sealant must be positioned so the concrete fasteners penetrate the center of the sealant.*

**Base Assembly Splices and Corner** – to provide continuity of the base assembly along the wall, the base channels are butt joined together.

To provide continuity of the base assembly around the corners, the base channels are miter cut and butt joined together at the corner.

The outer portion of the butt joints are sealed with a bead of urethane sealant. The sealant is applied along the inside of the channel's outer flange and extended across the channel's web to marry with the base sealant.



# COLD STORAGE BASE ASSEMBLY—BASE ANGLE

MSS091.625.1

**Base Assembly with Base Angle** – this type of base assembly is used when the bottom end of the wall panels are set on the foundation and connected to a base angle.

**Base Assembly Alignment** – before starting the base assembly installation, check that the foundation surfaces are level, straight and aligned to the intended steel line.

**Vapor Barrier** – if the floor construction specifies a vapor barrier membrane, the membrane is typically extended under the base angle and is sealed to the base angle with the base sealant.

*Caution: Take care not to tear or disrupt the vapor barrier during the installation of the base angle.*

**Base Sealant** – to seal the junction between the base assembly and the foundation (or vapor barrier) the standard sealant is a field applied butyl tape.

Check that the base sealant is continuous and uniformly compressed between the base angle and the foundation, and is continuous under the base angle splice joints and corner joints.

**Base Angle Attachment** – use the appropriate concrete fasteners to secure the base angle to the foundation. Check that the concrete fasteners are solidly in place and at the specified spacing.

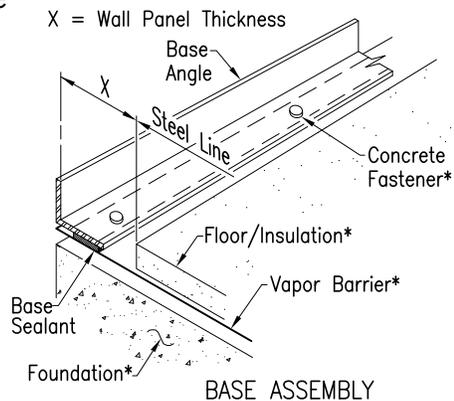
*Caution: The base sealant must be positioned so the concrete fasteners penetrate the center of the sealant.*

**Base Angle Splices & Corner** – to provide continuity of the base angle along the wall, the base angles are butt joined together.

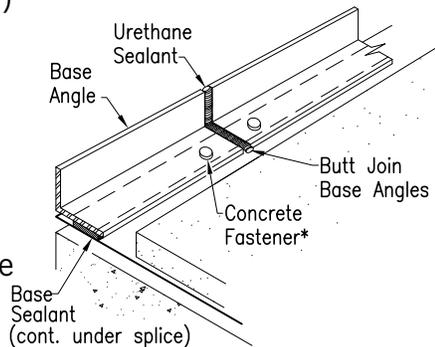
To provide continuity of the base angles around the corner, the base angles are miter cut and butt joined together at the corner.

Seal the outer portion of the base angle butt joints with a bead of urethane sealant. Apply the sealant into the butt joint along the inside of the angle's outer flange and extend the sealant along the angle's bottom flange to marry with the base sealant.

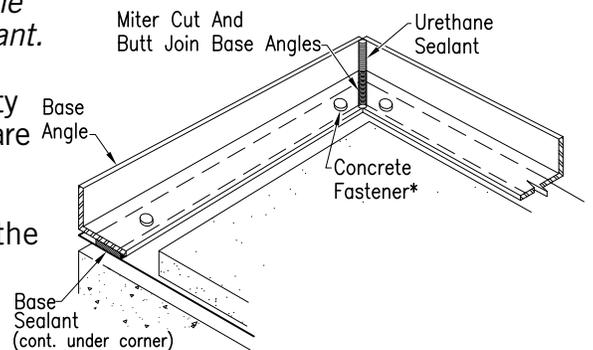
\* These Materials Are Not Provided By Metl-Span



BASE ASSEMBLY



BASE ANGLE SPLICE



BASE ANGLE CORNER SPLICE

# CHECKING FRAMING ALIGNMENT

MSS091.618

**Steel Line** – the nominal wall plane is usually specified as the vertical plane of the wall’s interior surface, and is typically referred to as the “Steel Line”.

Refer to the project’s installation drawings to determine the specified locations of the wall steel lines.

**Checking Alignment** – before starting the panel installation, check that the panel bearing surfaces of the wall framing are correctly aligned to the vertical plane of the specified steel line.

Use field measurements to confirm the alignment of the wall framing members. Check the alignment at mid-span as well as at the columns.

*Caution: Improper alignment of the framing members can cause difficult panel installation and can cause rippling or buckling of the panel faces. Misalignment of the wall framing must be corrected before starting the wall panel erection.*

**Base Alignment** – check that the condition of the foundation, or build-up of structural and flashing materials, does not cause the bottom of the panels to be offset from the steel line.

**Intermediate Structural Alignment** – if the alignment of the intermediate framing members causes the wall panel to bow inward, the exterior panel face will be subjected to compression stresses which can cause rippling or buckling.

Check and correct the position of the intermediate framing members as necessary to ensure that they are not misaligned inward of the nominal plane of the wall framing.

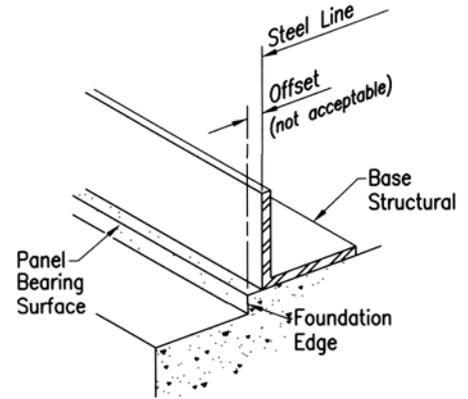
**Alignment Tolerances** – the general intermediate framing member alignment tolerance is +1/4”, -0” outside of steel line.

For framing members at closer than 10’ spacing, the alignment tolerance is +1/8”, -0” outside of steel line.

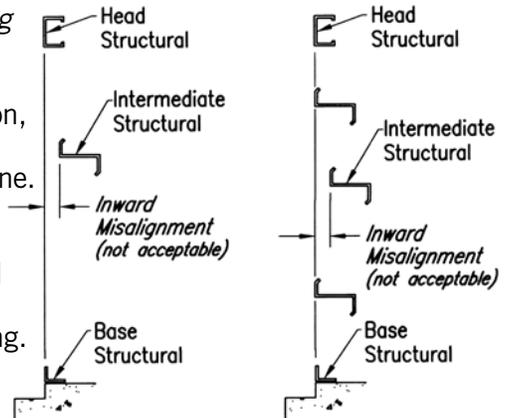
For framing members at closer than 5’ spacing, the alignment tolerance is +1/16”, -0” outside of steel line.

*Caution: For specific applications, other tolerances may be required. Refer to the project’s installation drawings for specific framing alignment requirements.*

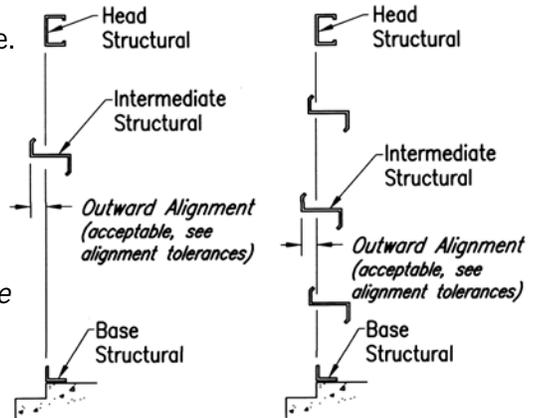
If the intermediate structural members are not aligned as shown as “acceptable alignment,” shimming may be allowed depending on fastening pattern and inward wind pressures. Please consult the Technical Services Department for allowable options.



MISALIGNMENT AT FOUNDATION



UNACCEPTABLE ALIGNMENT



ACCEPTABLE ALIGNMENT

# INTERIOR FLASHING & PERIMETER SEALANTS

**MSS091.627.1**

**Interior Flashing** – before starting the wall panel installation, the interior flashing must be in place.

*Note: For some applications interior flashing may be omitted. Refer to the project's installation drawings for the specified interior flashing and its installation.*

**Base Assembly** – depending upon the specified base condition, a base flashing may be required or the base structural may function as the base flashing.

**Head Flashing** – depending upon the specified head condition, an interior head flashing may be required or the head structural may function as the head flashing.

*Caution: When the head structural functions as the head flashing, joint gaps and holes in the structural must be sealed by covering with a suitable flashing material provided by the contractor.*

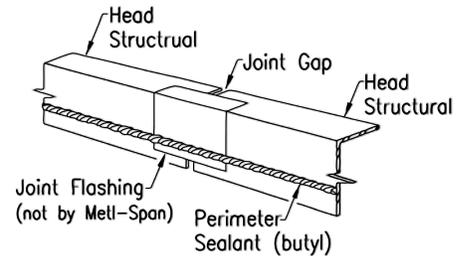
**Vertical Flashing** – at the wall corners and transitions to other wall construction etc., interior vertical flashing may be required.

**Interior Vapor Seal (Perimeter Sealant)** – the interior vapor seal consists of a sealant applied along the interior flashing to provide a continuous seal between the wall panels and adjacent construction (such as the foundation, roof and other walls).

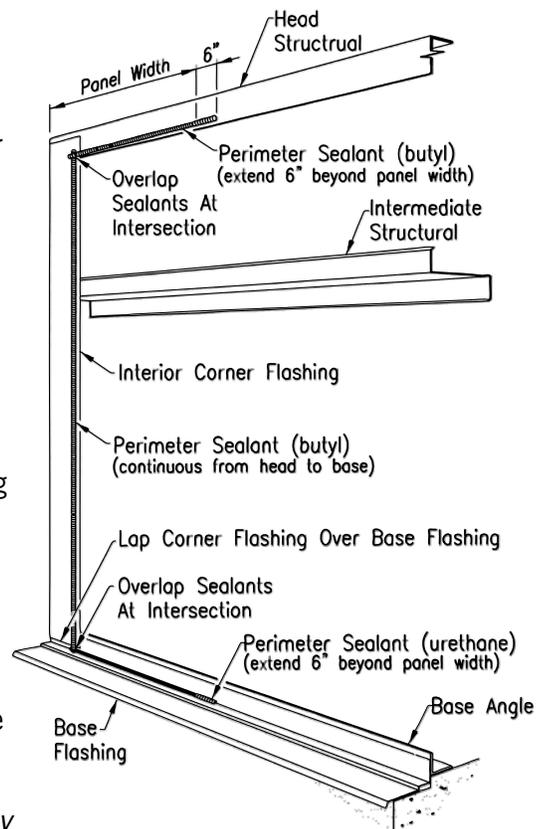
*Note: For some applications the interior vapor seal may be omitted. Refer to the project's installation drawings for the specified vapor sealant application.*

The standard interior vapor sealant is a gun grade butyl or urethane. Refer to the sealant manufacturer's instructions for specific requirements.

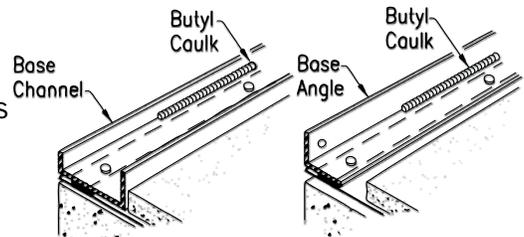
*Caution: To prevent disruption, contamination or premature setting of the sealant, do not apply the sealant until immediately before installing the wall panels. Apply the perimeter sealant progressively, only as much as needed for each panel.*



SEALING STRUCTURAL JOINTS



FLASHING & SEALANT ASSEMBLY



BASE CHANNEL      BASE ANGLE  
COLD STORAGE BASE SEALANT

## MANUAL HANDLING AND SETTING PANELS

MSS091.621

**Contractor's Responsibility** – improper handling of the panels can be hazardous to the workers and can cause damage to the panels and adjacent materials.

It is recommended that the panels always be handled with appropriate lifting equipment. However when it is necessary to manually handle panels, it is the contractor's responsibility to provide adequate manpower to safely lift and carry the panels.

*Caution: Do not attempt to tilt up panels that are longer or heavier than the capability of the available manpower.*

**Manually Handling Panels** – lift the panels by a sufficient number of workers equally spaced along each edge of the panel, and lifting together so the panel does not sag or twist.

**Face Separation** – do not lift the panel by the edges of the topside face. This will cause the panel's face to separate from the core. The workers must lift only on the bottom face of the panel.

**Blocking** – when the panels must be set on the ground, provide sufficient blocking so the panel is uniformly supported and is cushioned against face damage.

**Turning Panels** – when the panels must be turned over or tilted on its edge, roll the panel only onto its male edge and place cushioning material under the edge to prevent crushing and finish damage.

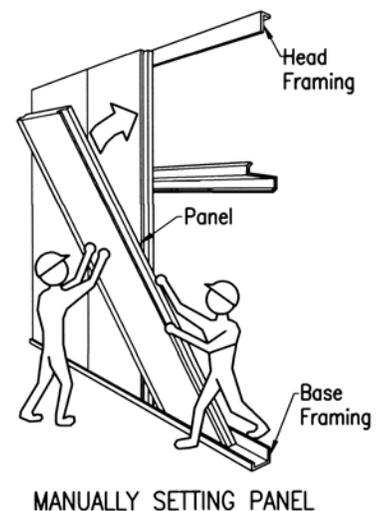
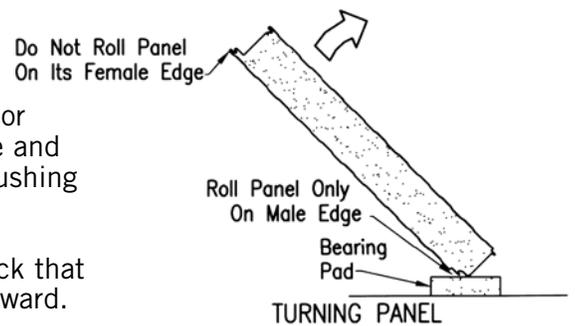
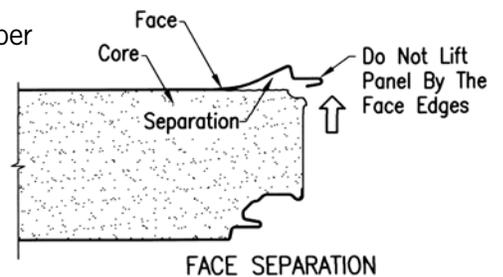
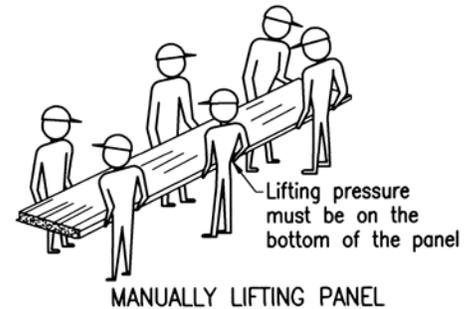
**Setting the Panel** – to manually set the panel, first check that the panel is ready to lift with its interior face turned upward. If not, the panel must be turned over.

Lift the panel with a sufficient number of workers along each side and carry the panel to the building with its bottom end towards the building.

Set the bottom end of the panel on the base and ensure that its edge is at least 1" clear of the edge of the previously installed panel.

*Caution: Use extreme care that the worker's fingers and feet are clear of the bottom end of the panel when the panel is being set.*

Pivoting the panel on its bottom end, tilt the panel upward into place against the support framing. Refer to the following panel installation details for further instructions on setting the panel and engaging the panel side joint.



## LIFTING AND SETTING PANELS WITH END LIFT

MSS091.614

**Contractor's Responsibility** – improper handling of the panels can be hazardous to the workers and can cause damage to the panels and adjacent materials. It is the contractor's responsibility to ensure a safe and secure method of lifting and setting the panels.

**End Lifting** – when using the end lift method, clamp or hook devices are fitted to the top of the panel. The top end of the panel is then lifted to the vertical position and carried by its top end to its position on the structure.

**Panel Length Limitations** – before attempting to lift panels by the flat end lift method, confirm that the panels can be lifted without excessive panel bending. Longer panels may require the edge lifting method to prevent panel bending damage.

*Caution: Do not allow excessive panel bending. The bending stress may buckle the panel, or weaken the panel so buckling occurs later when the installed panels are exposed to exterior/interior temperature differentials.*

**Equipment Requirements** – verify that the lifting equipment is of sufficient capacity for the panel weight and length and is of sufficient mobility and reach for the construction conditions.

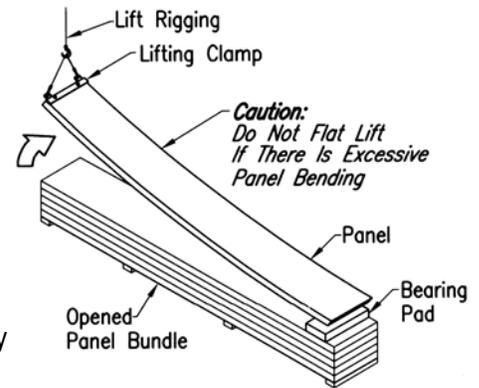
Verify that the clamping or hook device is of suitable design and condition to safely lift the panel's weight without a failure of the lifting connection or damage to the panel.

*Caution: While the lifting devices may safely lift a panel under static conditions, wind forces and inertia forces caused by jerky boom operation and bouncy transit across rough terrain may exceed the lift's capacity or cause panel bending or face separation damage.*

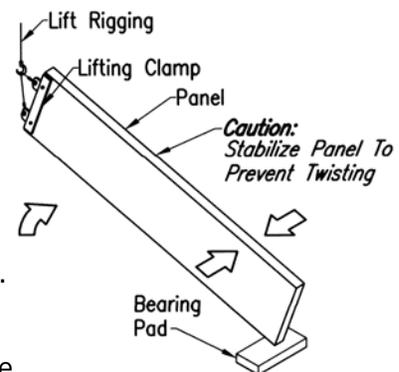
**Bearing Pads** – provide a bearing pad (such as soft wood or rigid foam) to cushion the panel's bottom edge from crushing damage as the panel is being lifted to the vertical position.

When lifting the panel directly from the panel bundle, check that the bearing pad is positioned to prevent crushing and scuffing damage to the panels still in the bundle.

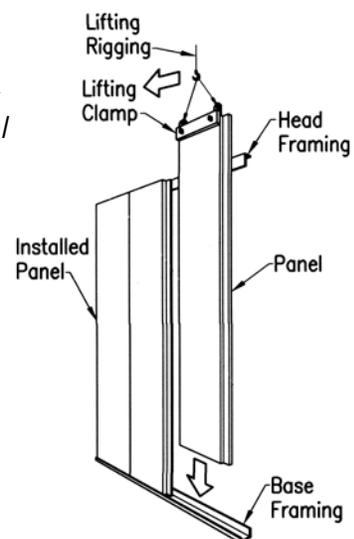
*Note: After the panel is set on the foundation, the clamp or hook devices must be removed from the panel to allow the top of the panel to set against the head structural.*



FLAT LIFTING PANELS



EDGE LIFTING PANEL



SETTING PANELS WITH END LIFT

# LIFTING AND SETTING PANELS WITH VACUUM LIFT

MSS091.615

**Contractor's Responsibility** – improper handling of the panels can be hazardous to the workers and can cause damage to the panels and adjacent materials. It is the contractor's responsibility to ensure a safe and secure method of lifting and setting the panels.

**Vacuum Lifting** – modern vacuum lift equipment provides a convenient and safe method of lifting and setting the panels.

When using vacuum lift equipment, there are no drilled holes or clamps to damage the panel, and there is no equipment on the inside surface of the panel to foul the support framing during installation.

With a proper sized vacuum unit, the multiple vacuum heads provide uniformly spaced pick-up points to minimize bending of the panel as it is lifted from the bundle and carried into position.

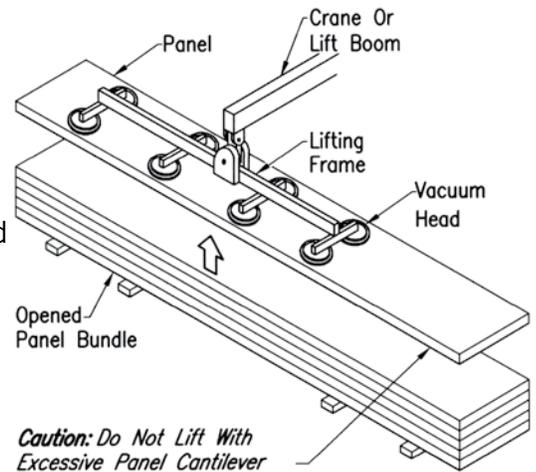
**Equipment Requirements** – verify that the lifting equipment is of sufficient capacity for the panel weight and length and is of sufficient mobility and reach for the construction conditions.

*Important: The panel's weight limits the panel span between vacuum heads and cantilevered end spans that can be lifted without panel bending or face separation damage. Verify that there are a sufficient number of vacuum heads and the lifting frame is of sufficient length for the panel's weight and length. See the weight chart at the end of this manual for calculating panel weights.*

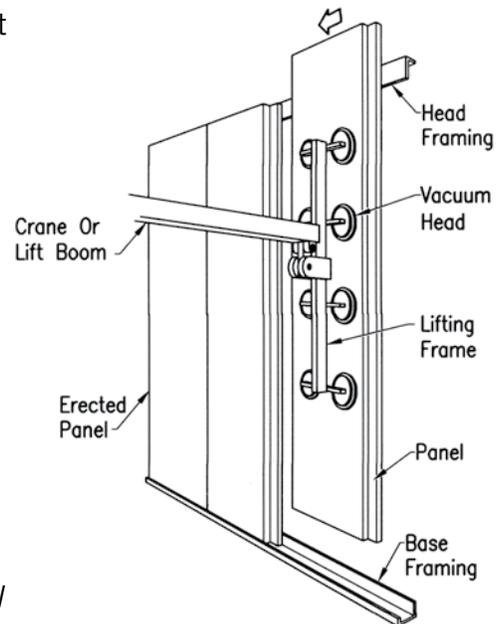
Verify that the vacuum heads (vacuum cups) are of suitable design and condition to safely lift the profiled and embossed surfaces of the panels. Specific vacuum heads will be required for flute profile panels.

*Caution: While the vacuum heads may safely lift a panel under static conditions, wind forces and inertia forces caused by jerky boom operation and bouncy transit across rough terrain may exceed the lift's capacity or cause panel bending or face separation damage.*

**Panel Orientation** - the panels may have to be turned over for proper panel face orientation to the vacuum heads.



LIFTING PANELS WITH VACUUM LIFT



SETTING PANELS WITH VACUUM LIFT

# PANEL CONNECTIONS TO BASE FRAMING

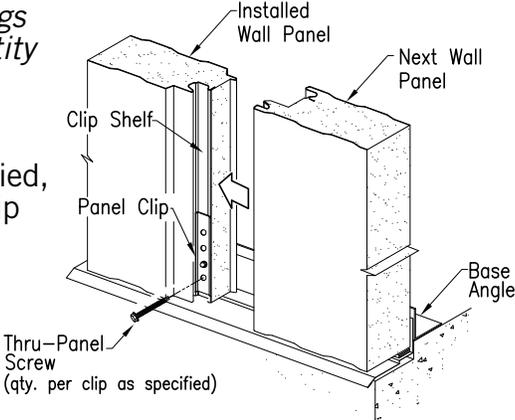
MSS091.628.1

**Panel Connections at Base** – these details show typical methods of attaching the wall panels to the base framing.

*Important: Refer to the project's installation drawings for the specified fastener type and spacing or quantity per clip.*

**Panel Clip Connections** – when a base angle is specified, the wall panel is attached to the base angle with a clip concealed within the panel's side joint.

The clip is nested in the clip shelf extension of the installed panel's exterior face. As specified, one or two self-drilling or self-tapping screws are installed through the factory holes in the clip, through the panel and into the base angle. The joint engagement of the next panel covers the clip and screws.

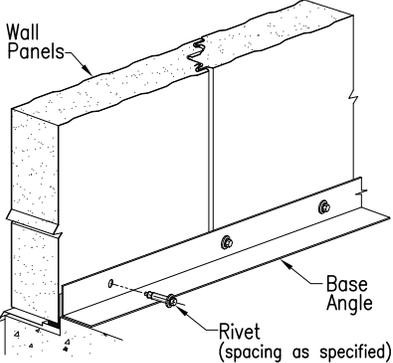


PANEL CLIP CONNECTION @ BASE ANGLE

If self-tapping screws are used, pre-drill the panel and base angle using the factory punched holes in the clip as the guide. Refer to the "Fasteners" section on pages 14-16 for recommended drill sizes.

**Backside Rivet Connection** – depending upon the design loads imposed on the wall panels, rivets may be required in addition to the panel clip connections.

Fab-Lok® or Bulb-tite® type rivets are typically specified. At the specified spacing, the rivets are installed through the base angle's flange and into the interior face of the panel.

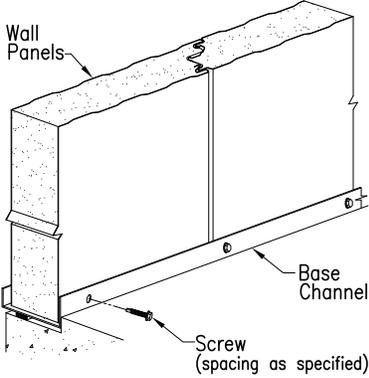


RIVET CONNECTION @ BASE ANGLE  
(Back Side Connection-When Specified)

The rivet installation requires pre-drilling 5/16" diameter holes through the flange of the base angle and the interior face of the panel.

**Backside Screw Connection** – when a base channel is specified, self-drilling screws are typically specified as the backside fasteners.

The screws are installed at 12" spacing through the interior flange of the base channel and into the interior face of the wall panel.



SCREW CONNECTION @ BASE CHANNEL

# PANEL CONNECTIONS TO INTERMEDIATE FRAMING

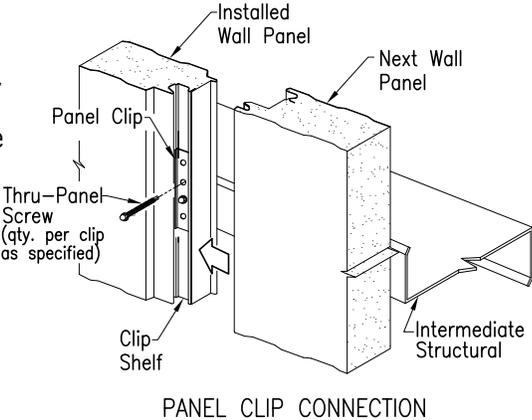
MSS091.629.1

**Panel Connections at Intermediate Framing** – these details show typical methods of attaching the wall panels to the intermediate structural members.

*Important: Refer to the project's installation drawings for the specified fastener type and spacing or quantity per clip.*

**Panel Clip Connection** – the wall panel is attached to the intermediate structural members with clips concealed within the panel's side joint.

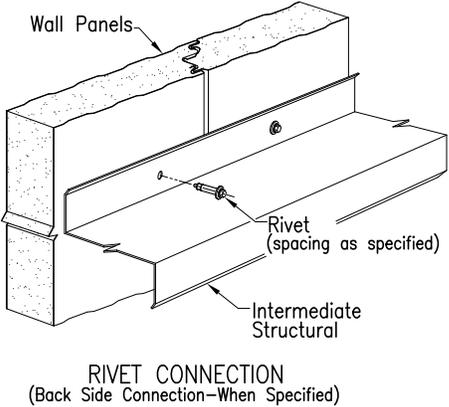
The clip is nested in the clip shelf extension of the installed panel's exterior face. As specified, one or two self-drilling or self-tapping screws are installed through the clip, through the panel and into the flange of the structural. The joint engagement of the next panel covers the clip and screws.



If self-tapping screws are used, pre-drill the panel and intermediate framing member using the factory punched holes in the clip as the guide. Refer to the "Fasteners" section in this installation guide for the recommended drill sizes.

**Back Side Rivet Connection** – depending upon the design loads imposed on the wall panels, back side connections with rivets may be required in addition to the panel clip connections.

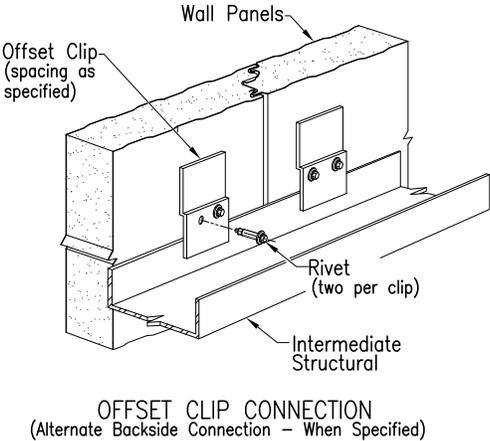
Fab-Lok® or Bulb-tite® type rivets are typically specified. The rivets are installed through the flange of the intermediate structural and into the interior face of the panel at the specified spacing.



The rivet installation requires pre-drilling 5/16" diameter holes through the flange of the structural member and the interior face of the panel.

**Back Side Clip Connection** – for intermediate structural members with thick flanges (such as hot rolled sections), offset clip connections may be specified.

The offset clip is lapped over the flange of the structural member and is connected to the interior face of the panel with two FabLok type rivets.



The rivet installation requires pre-drilling 5/16" diameter holes through the interior face of the panel. Use the factory holes in the clip as a guide for drilling the holes.

*Caution: The offset clips must be installed with the factory holes oriented to the structural member's flange as shown.*

## PANEL CONNECTIONS TO HEAD FRAMING

MSS091.630.2

**Panel Connections at Head** – these details show typical methods of attaching the wall panels to the head structurals.

*Important: Refer to the project's installation drawings for the specified fastener type and spacing or quantity per clip.*

**Panel Clip Connection** – the wall panel is attached to the head structural member with a clip concealed within the panel's side joint.

The clip is nested in the clip shelf extension of the installed panel's exterior face. As specified, one or two self-drilling or self-tapping screws are installed through the factory holes in the clip, through the panel and into the head structural. The joint engagement of the next panel covers the clip and screws.

If self-tapping screws are used, pre-drill the panel and head structural using the factory punched holes in the clip as the guide. Refer to the "Fasteners" section on pages 14-16 for the recommended drill sizes.

**Back Side Rivet Connection** – depending upon the design loads imposed on the wall panels, back side connections with rivets may be required in addition to the panel clip connections.

Fab-Lok<sup>®</sup> or Bulb-tite<sup>®</sup> type rivets are typically specified. The rivets are installed through the flange of the head structural and into the interior face of the panel at the specified spacing.

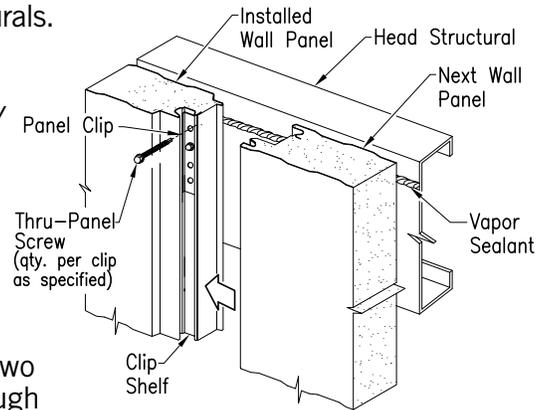
The rivet installation requires pre-drilling 5/16" diameter holes through the flange of the structural and the interior face of the panel.

**Thru-Panel Fastener Connection** – for some applications, thru-panel fasteners may be specified instead of back fastening.

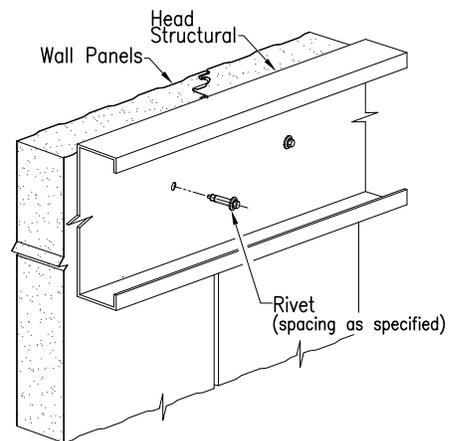
The thru-panel fasteners may be specified as self-drilling or self-tapping screws with elastomeric sealing washers.

Install the screws at the specified spacing, through the panel and into the head structural.

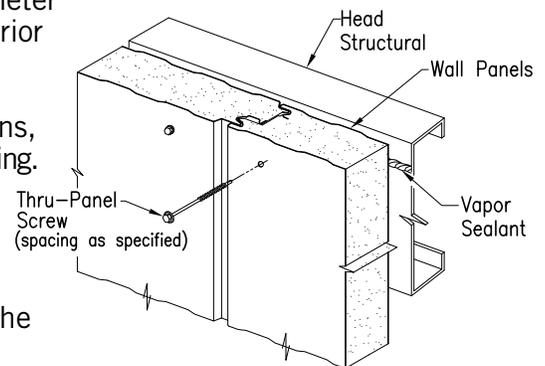
If the self-tapping screws are specified, the panel and head structural must be pre-drilled. Refer to the "Fasteners" section on pages 14-16 for the recommended drill sizes.



PANEL CLIP CONNECTION



RIVET CONNECTION  
(Back Side Connection—When Specified)



THRU-PANEL CONNECTION

## PANEL CONNECTIONS AT CORNER AND FRAMED OPENING

MSS091.631

**Panel Connections at Corners & Framed Openings** - these details show the typical method of attaching the wall panels at the wall corners and edges of framed openings with thru-panel fasteners.

Thru-panel fasteners may be specified as self-drilling or self tapping screws with elastomeric sealing washers.

*Important: Refer to the project's installation drawings for the specified fastener type and spacing.*

**Panel Attachment at Corner** - at the base, head and intermediate structurals, install a thru-panel screw through the panel and into the structural.

Install the thru-panel screws at 1" from the corner steel line, to ensure that the screw heads will be covered by the corner trim.

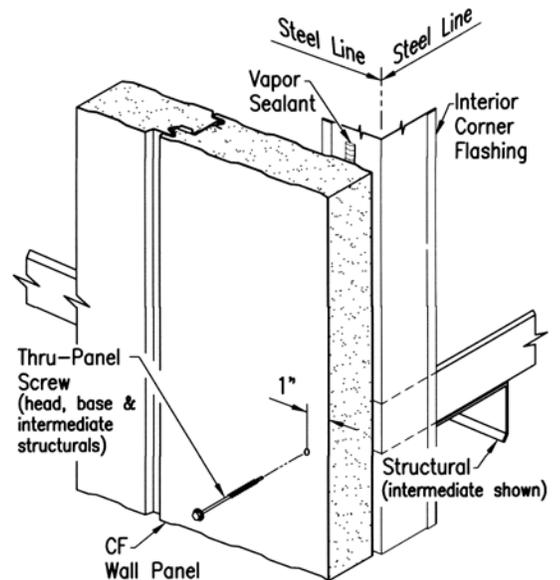
**Panel Attachment at Framed Opening** - at the edges of framed openings, install thru-panel screws through the panel and into the jamb structural.

Install the screws at 3" from the base and head of the panel and at the specified spacing between.

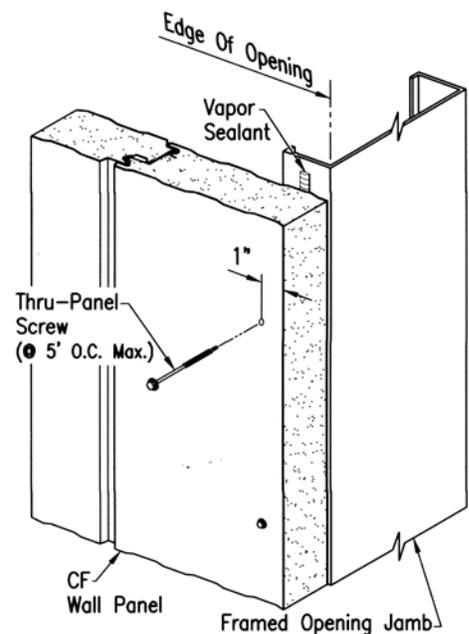
Locate the screws at 1" from the edge of the opening to ensure that the screw heads will be covered by the jamb trim.

*Caution: Do not crush the panel edge by overdriving the screws. Overdriving the screws will cause dimpling and rippling of the panel face. Drive the screws only tight enough to ensure the panel is tight against the structural.*

The panels are attached to the framed opening's head structural in the same manner as the attachment to an intermediate framing structural.



PANEL CONNECTION AT CORNER



PANEL CONNECTION AT JAMB

## PANEL JOINT SEALANTS

MSS091.616

**Joint Sealant Requirements** – depending upon the project's requirements, sealants may be required in the panel joints on either or both the interior and exterior sides of the wall. On some projects, different wall areas may have different sealant requirements.

The panels may be delivered with the sealant factory applied, or the sealant may require field installation.

*Important: Refer to the installation drawings or project specifications for the specified sealant and locations.*

**Field Installation of Sealant** – apply the panel joint sealant into the specified interior and/or exterior metal groove on the panel's female edge. The sealant must be applied continuously and as close as possible to the bottom of the groove.

The suggested sealant bead size is 3/16" to 1/4". Adjust the sealant bead size to ensure there is complete and continuous contact of the sealant with the tongue of the adjacent panel after the joint is assembled, but not so much that sealant is extruded onto the panel face.

**Sealant Pigtails** – it is critical to ensure continuity of the sealants at the intersections between the panel joints and the perimeter flashing assemblies.

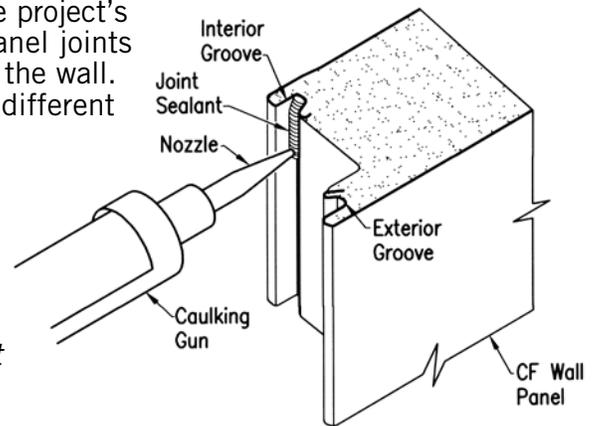
After each panel is installed, apply sealant pigtails around the panel's interior edge to provide a sealant bridge between the panel's joint sealant and the interior perimeter sealants.

At the panel's exterior face, determine where the exterior perimeter sealants will be located. Apply sealant pigtails along the panel edge to provide a sealant bridge between the panel's joint sealant and exterior perimeter sealants.

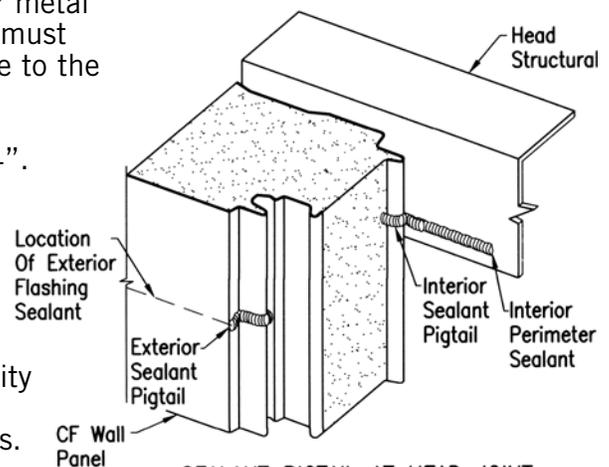
**Joint Assembly** – slide the panel joint together in a smooth motion to help ensure the uniform dispersion of the sealant within the joint cavity.

Do not assemble the panel joint in a manner that causes the joint to engage and then disengage. This may cause the sealant to be drawn out of the cavity, leaving the joint unsealed.

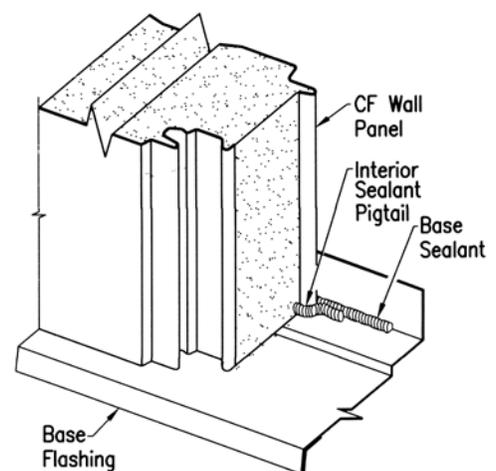
*Caution: If the joint is assembled and then disassembled the sealant must be checked and any displaced sealant must be replaced.*



FIELD APPLIED JOINT SEALANT



SEALANT PIGTAIL AT HEAD JOINT



SEALANT PIGTAIL AT BASE

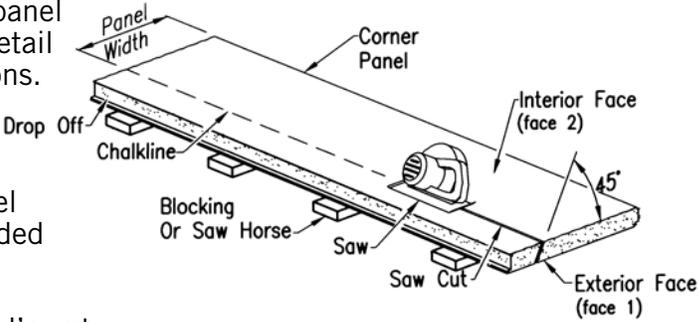
# CUTTING PANELS

MSS091.639

**Corner Type** – refer to the installation drawings for the type of corner condition (mitered or lapped).

**Corner Panel Width** – determine the corner panel width. Refer to the ‘Prepare Panel Layout’ detail on page 27 for corner panel width calculations.

**Corner Panel Layout** – lay the panel on appropriate blocking or saw horses with the interior face (face 2) turned up and the panel edges correctly oriented to the panel’s intended position on the building.

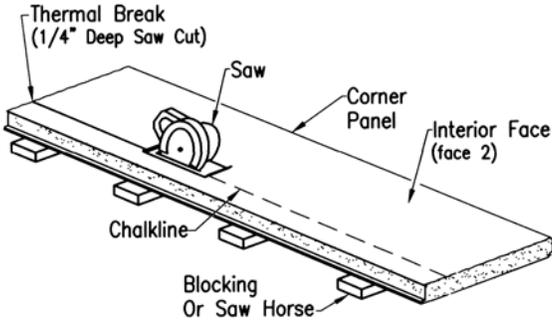


CUTTING THE CORNER PANEL (Mitered Corner Panel Shown)

On the panel’s interior face, lay out the panel’s cut width. Mark the cut line with a chalk line.

*Caution: Be sure to allow for the extra panel width required for the bevel or lapped corner conditions.*

**Cutting the Corner Panel** – set the saw blade angle for the required square cut or miter cut and cut the panel along the chalk line.



THERMAL BREAK AT CORNER (For Cold Storage)

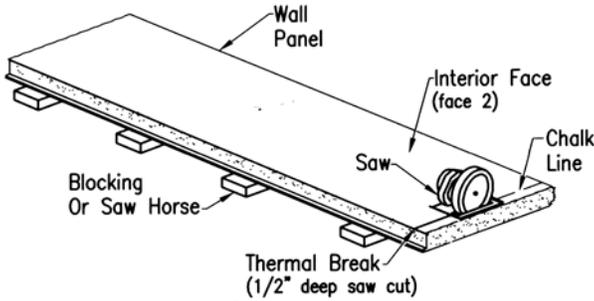
Refer to the ‘Field Cutting’ section on page 17 of this guide for panel cutting requirements.

**Thermal Break** – for cold storage applications, a thermal break cut may be required along the vertical edge of the corner panel, and a thermal break cut may be required along the bottom edge of all the panels.

Refer to the project’s installations drawings for specific thermal break requirements and locations.

**Thermal Break Layout** – lay out the thermal break location on the panel’s interior face, and mark the cut line with a chalk line.

**Cutting the Thermal Breaks** – set the saw for a 1/2” cut depth and saw the cut along the chalk line mark.



THERMAL BREAK AT BASE (For Cold Storage)

Extreme care must be taken when handling the panel after the thermal break is created as the end of the panel is weakened.

Refer to the ‘Field Cutting’ section on page 17 of this guide for panel cutting requirements.

# CORNER PANEL INSTALLATION

MSS091.632

**Corner Panel Installation** - these details show the typical installation of the corner wall panels.

*Note: The details show the installation of the corner panel at the start of the wall assembly. The corner panel installation at the finish of the wall assembly is similar.*

*The installation of wall termination panels is the same as the corner panels.*

**Interior Vapor Sealants** – check that the interior vapor sealants are in place at the base, corner and head.

*Caution: During the panel installation, check that the vapor sealant is not displaced. Apply new sealant as necessary.*

**Panel Orientation** – check that the panel faces and edges are correctly oriented for installation.

**Setting the Panel** – set the bottom end of the panel on the base assembly and push the panel into place against the framing members.

**Aligning the Panel** – check that the cut panel edge is correctly aligned with the corner steel lines and check the plumb of the panel.

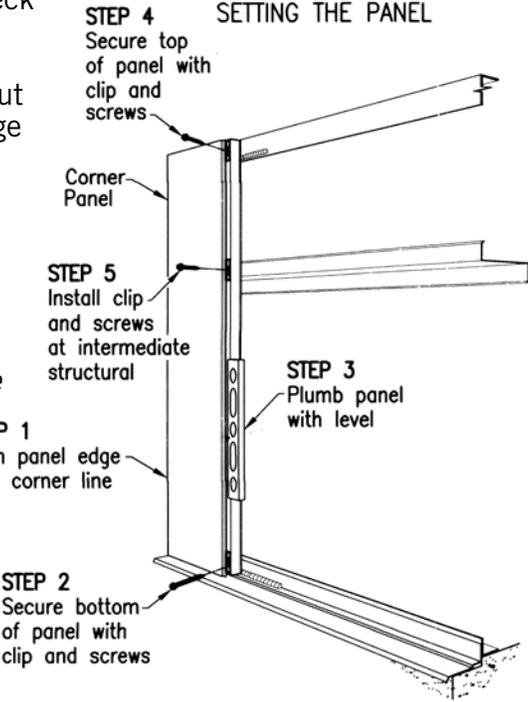
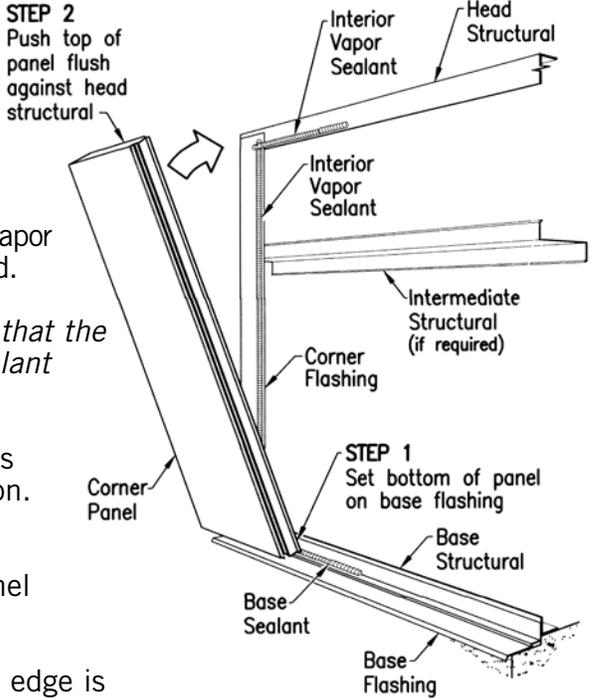
To check plumb, use a 6” level set against the uncut edge of the panel. Set the level along the metal edge of the panel’s exterior face.

**Attaching the Panel** – while holding the panel aligned and plumb, fasten the panel to the base, head and intermediate structurals with the panel clips and fasteners.

*Caution: Before attaching the panel to an intermediate structural, check for any misalignment between the panel and the structural.*

*If there is a gap between the panel and structural, do not stress the panel by fastening it to the misaligned structural. The structural must first be repositioned to eliminate the misalignment.*

At the corner, fasten the edge of the panel to the base, head and intermediate structurals with the specified thru-panel fasteners. Check that the fasteners are located where their heads will be covered by the corner trim.



PLUMBING AND FASTENING THE PANEL

## INTERMEDIATE PANEL INSTALLATION

MSS091.633

**Intermediate Panel Installation** – these details show the typical installation of the intermediate wall panels.

**Perimeter Sealants** – check that the interior vapor sealants are in place at the base and head.

*Caution: During the panel installation check that the vapor sealant is not displaced. Apply new sealant as necessary.*

**Joint Sealant** - field apply the panel joint sealant or confirm the factory applied sealant is in place. Install the pigtail sealants on the edge of the previously installed panel.

**Panel Orientation** – check that the panel faces and edges are correctly oriented for installation on the wall framing.

**Setting the Panel** – set the bottom end of the panel on the base assembly.

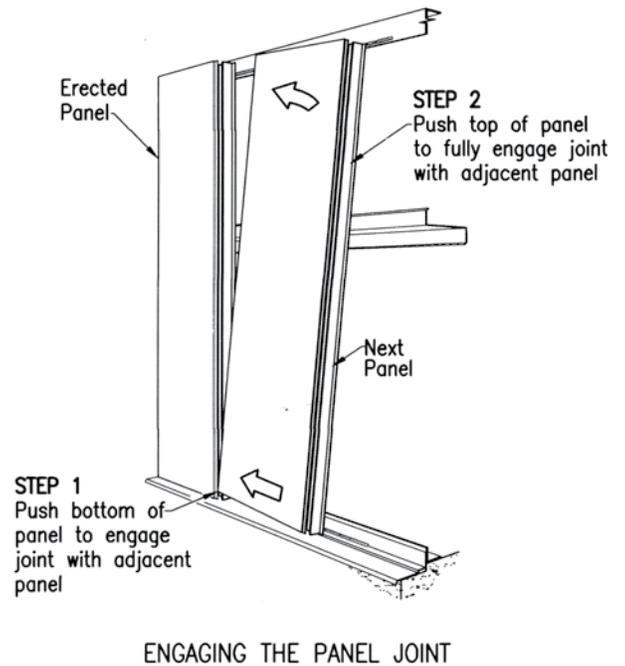
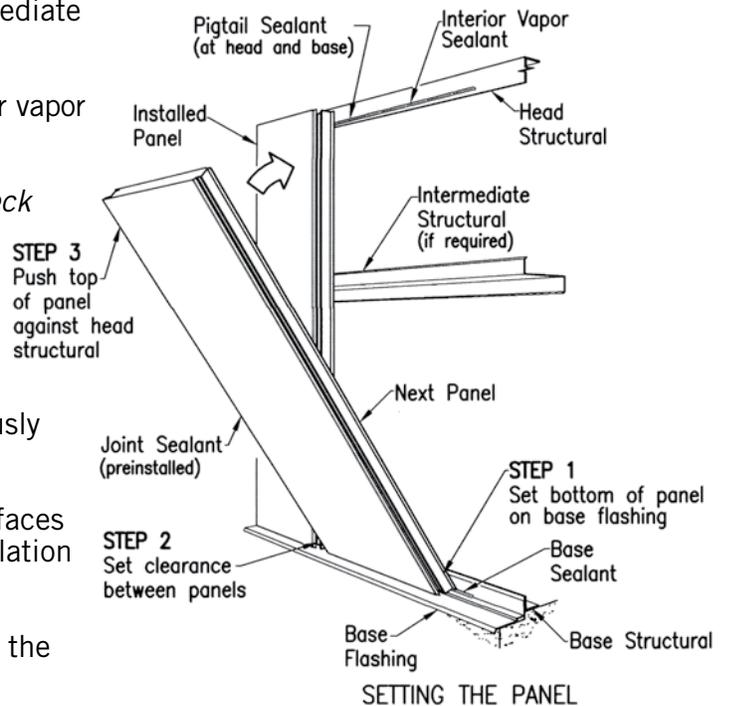
Position the panel so its edge will clear the edge of the previous installed panel when tilting the panel into place.

**Joining the Panels** – align the edge of the panel with the previous installed panel, then push the panel towards the previous panel to engage the tongue-and-groove joint.

One method of joining the panels is to first push the bottom edge of the panel into full engagement with the previous installed panel. Then let the panel's weight help rock the top of the panel into engagement with the previous panel.

Continue pushing the panels together until the tongue-and-groove joint is fully engaged and uniform along the full length of the joint.

Refer to the 'Panel Joints' section on page 10 of this guide for additional joint engagement considerations and tolerances.



## INTERMEDIATE PANEL INSTALLATION (cont.)

MSS091.634

**Plumb the Panel** – to check that the panel is plumb, use a 6” level set against the exposed edge of the panel. Set the level along the metal edge of the panel’s exterior face.

*Caution: After the panel is plumbed, check that the panel joint has remained fully engaged and on the required module.*

*If the panels are stacked, the panel joints must be aligned between the lower and upper tiers.*

**Attaching the Panel** – while holding the panel aligned and plumb, fasten the panel to the base, head and intermediate structurals with panel clips and fasteners.

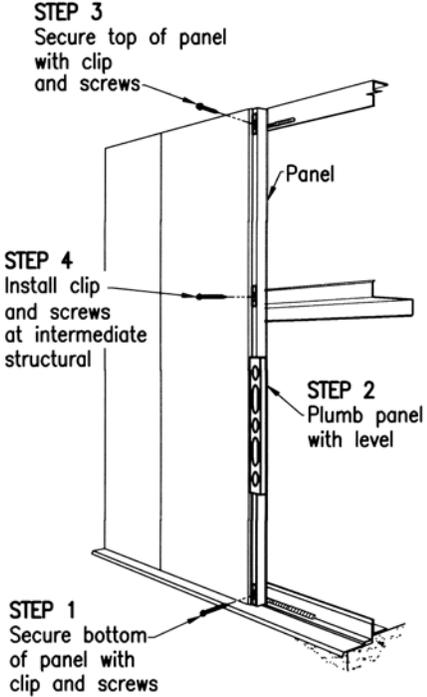
*Caution: Before attaching the panel to an intermediate structural, check for any misalignment between the panel and the structural.*

*If there is a gap between the panel and structural, do not stress the panel by fastening it to the misaligned structural. The structural must first be repositioned to eliminate the misalignment.*

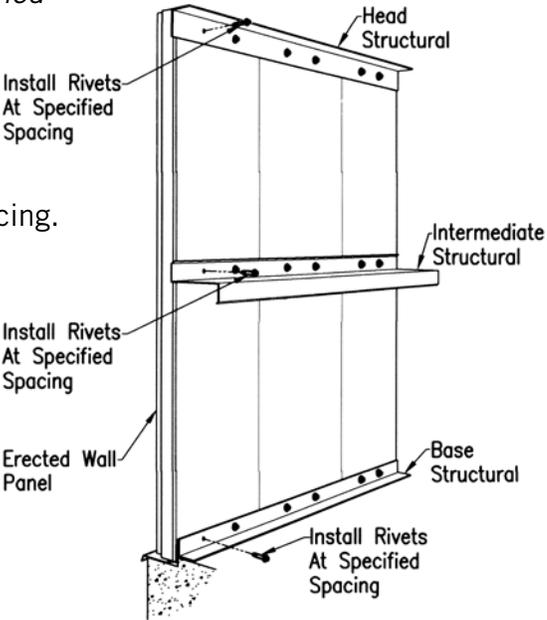
**Back Side Attachment** – refer to the installation drawings for the specified back side fastener spacing.

Pre-drill and install the rivets through the base, head and intermediate structurals and into the interior face of the panel at the specified spacing.

*Note: At this time also install the back side fasteners on the corner panels.*



PLUMBING AND FASTENING THE PANEL



BACK SIDE FASTENING

## CHECKING THE INSTALLED PANEL

MSS091.647.1

**Check the Installed Panel** – after each panel is installed, check to verify it is in acceptable condition before installing the next panel.

*Caution: Make all corrections before the next panel is installed. Trying to correct or replace a panel after the wall is completed can be difficult and costly.*

**Panels** – check the following on each panel:

- Check that the faces are not rippled due to misaligned wall framing members.
- Check that the panel faces were not dented, scratched or otherwise damaged during installation.
- Inspect the full length of the exposed panel edge to ensure it is undamaged and clear of obstructions.

**Connections** – check the following at each connection:

- Check that specified fasteners are installed.
- Check that there are no gaps between the panel and structural such as caused by obstructions or loose fasteners.
- Check that the panel clip fasteners are not overdriven causing more than 1/16" crushing of the panel edge.

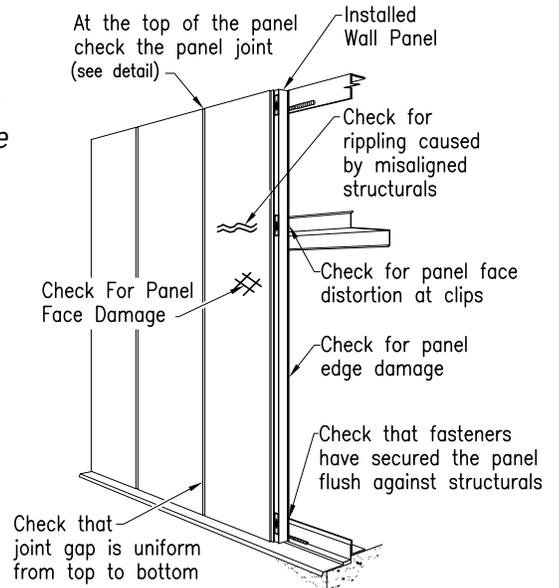
**Panel Joint** – check the following on each panel joint:

- Check that metal tongue-and-groove joints are fully engaged.
- Check that the tongue is fully embedded in the sealant within the tongue-and-groove joint.
- Check that the full length of the joint is plumb with a uniform joint gap. Normal exterior joint gap width is 1/16" to 1/8".

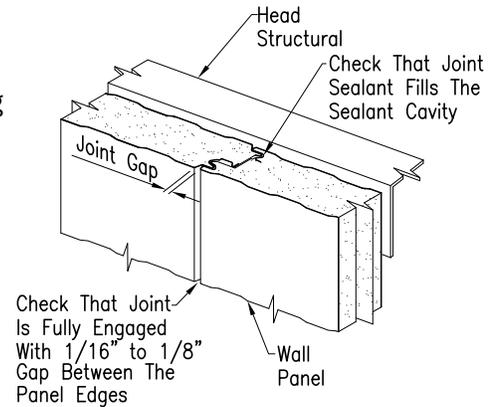
*Note: On flute profile panels with a joint reveal, the joint gap will have to be inspected on the interior face.*

The condition of the tongue-and-groove joints and joint sealant can be readily inspected by viewing the joint from above the top of the panels during installation.

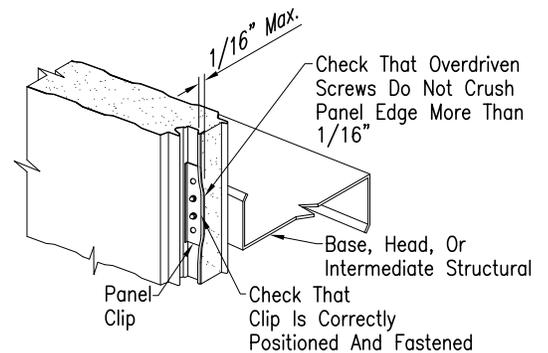
Refer to the 'Panel Joints' section on page 10 of this guide for additional joint requirements and tolerances.



CHECKING THE INSTALLED PANEL



CHECKING THE PANEL JOINT



CHECKING THE PANEL CLIP

## C & I— EXTERIOR CORNER TRIM

MSS091.635

**C & I Corner Assembly** – these details show the typical corner assembly for non-cold storage applications. For cold storage applications, refer to the appropriate cold storage details in this guide.

**Interior Corner Flashing** – normally the interior corner flashing and interior vapor sealants are in place before installing the wall panels. If not in place, install the interior corner flashing and sealant at this time.

**Filler Insulation** – the filler insulation is provided by the contractor. Fit the filler insulation into the cavity between the opposing corner panels.

**Corner Trim Alignment** – temporarily set and align the corner trim into position on the wall panels. Mark the position of the corner trim's outer edges on the panel face at the base and head of the panel.

Extend a chalk line between the marks to provide for alignment of the trim during its installation.

**Tape Sealant** – apply tape sealant continuously along the interior surface of the corner trim's outer flanges. Set the edge of the tape sealant at 1/4" from the trim's edge.

**Corner Trim Installation** – if the corner trim requires splices, set the bottom corner trim section first.

Set the bottom end of the corner trim flush on the base flashing. Set the edges of the corner trim along the chalk lines.

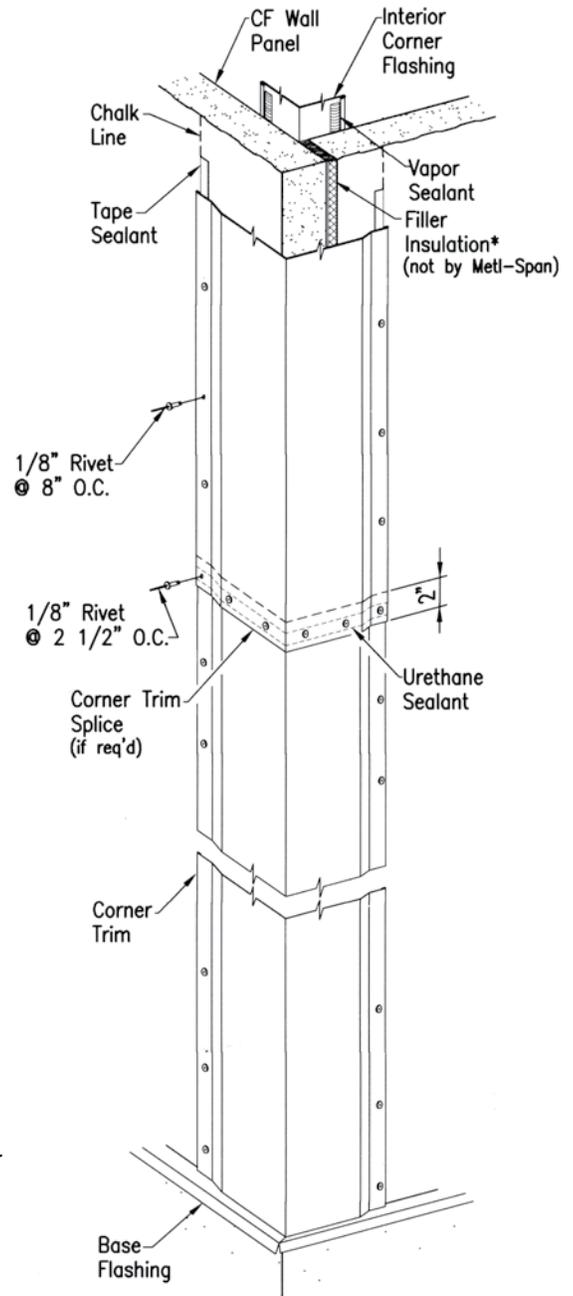
Fasten the corner trim to the wall panels with 1/8" rivets. Position the rivets along the center of the corner trim's outer flanges and at 8" spacing, starting 3" from the base.

**Corner Trim Splices** – lap the end of the upper corner trim section 2" over the end of the installed section.

Apply urethane sealant in the lap and fasten the lap with 1/8" rivets at the center of the outer flanges and at 2-1/2" spacing.

**Cut Top of Corner Trim** – cut off any excess corner trim flush with the top of the wall panels.

\*These Materials Are Not Provided By Metl-Span



WALL CORNER ASSEMBLY  
(Offset Corner Trim Shown)

## C & I— EAVE/RAKE FLASHING

MSS091.638

**C&I Eave and Rake Flashing** – these details show the typical eave and rake assembly for non-cold storage applications.

**Filler Insulation** – the filler insulation is provided by the contractor. Fit the filler insulation into the cavity between the wall panels and the roof assembly.

**Eave/Rake Flashing Alignment** – temporarily set and align the eave/rake flashing into position on the wall panels. Mark the position of the flashing's lower edge on the panel face at each corner and at intermediate locations along the wall.

Extend a chalk line between the marks to provide for alignment of the eave/rake flashing during its installation.

**Flute Closure** – if the wall panels have a flute profile, install the adhesive backed flute closure strips onto the wall panel at 1/4" above the chalk line.

**Tape Sealant** – apply the tape sealant continuously along the interior surface of the eave/rake flashing's bottom flange. Set the edge of the tape sealant at 1/4" from the flashing's bottom edge.

**Eave/Rake Flashing Installation** – align the bottom edge of the eave/rake flashing flush along the chalk line.

Fasten the flashing to the wall panels with wall screws. Position the screws along the center of the flashing's bottom flange and at 8" spacing.

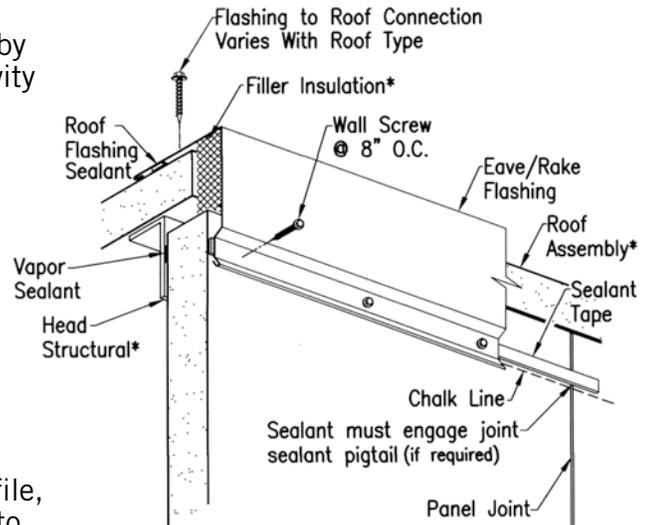
*Caution: If the wall panel has a mesa or flute profile, locate the screws to fall on the high mesa.*

**Connection to Roof Assembly** – plumb and square the face of the eave/rake flashing.

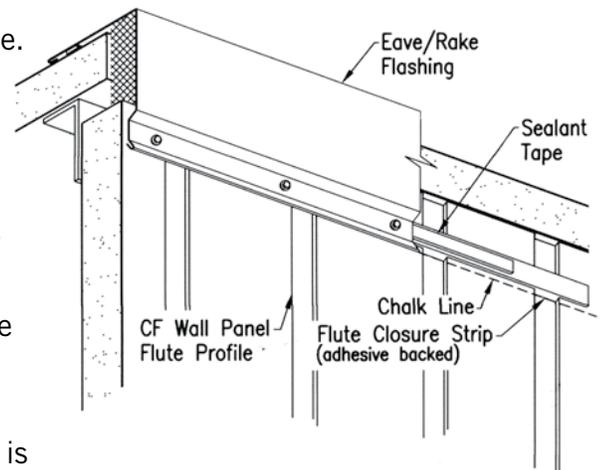
If the assembly has end caps, temporarily set an end cap in position to ensure the end cap will fit when it is installed later.

Refer to the installation drawings for the specified sealant and fasteners for attaching the top flange of the eave/rake flashing to the roof assembly.

\*These Materials Are Not Provided By Metl-Span



EAVE/RAKE FLASHING ASSEMBLY



FLUTE CLOSURE ASSEMBLY  
(For Flute Profile Panel Only)

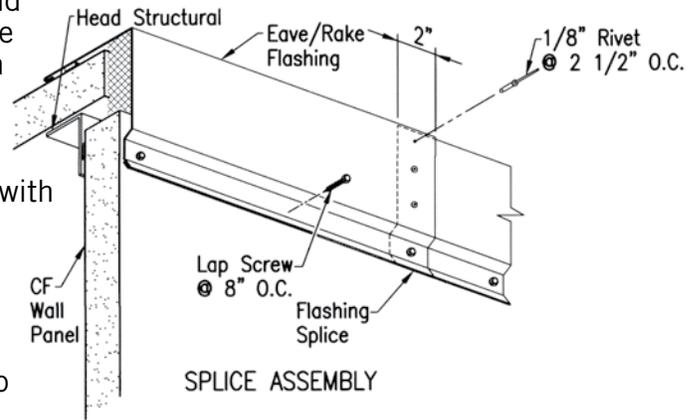
## C & I— EAVE/RAKE FLASHING (cont.)

MSS091.636

**Flashing End Alignment** – at the starting end of the eave/rake flashing assembly, align the factory cut end of the flashing section flush with the outer edge of the corner trim.

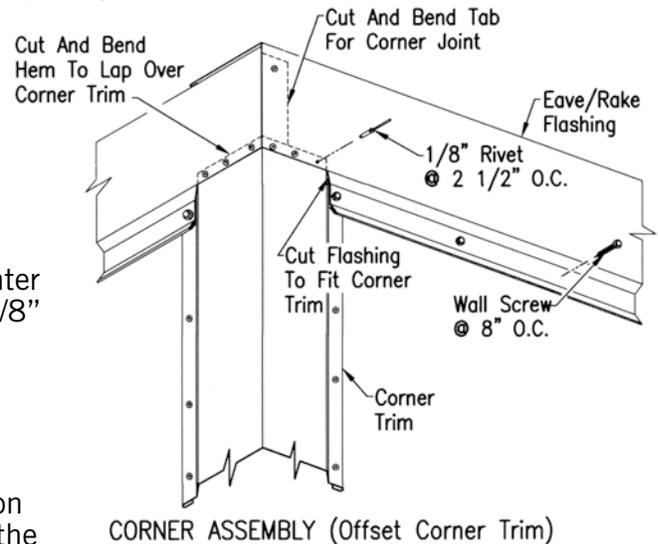
At the finish end of the eave/rake flashing assembly, cut off the excess flashing flush with the outer edge of the corner trim.

Orient the eave/rake flashing sections so field cut ends are always overlapped by a factory cut end at the splices and corners. And as much as possible, align the splices so the lap edge is away from normal viewing.



**Splice Assembly** – lap the end of the next eave/rake flashing section 2" over the end of the installed section.

Apply urethane sealant within the lap and fasten the lap with a wall screw at the center of the flashing's bottom flange and with 1/8" rivets at 2-1/2" spacing.

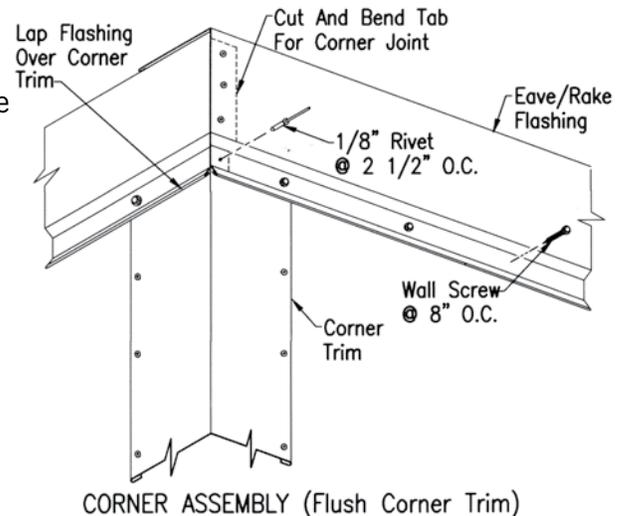


**Corner Assembly** – notch and bend a tab on the end of the finish flashing section. Fit the tab to lap under the end of the opposing starting flashing section.

If the corner assembly has offset corner trim, notch and hem the bottom edge of the eave/rake flashing sections to fit over the corner trim.

If the corner assembly has a flush corner trim, fit the eave/rake flashing flush over the corner trim.

Apply urethane sealant within the laps and fasten the laps with 1/8" rivets at 2-1/2" O.C.



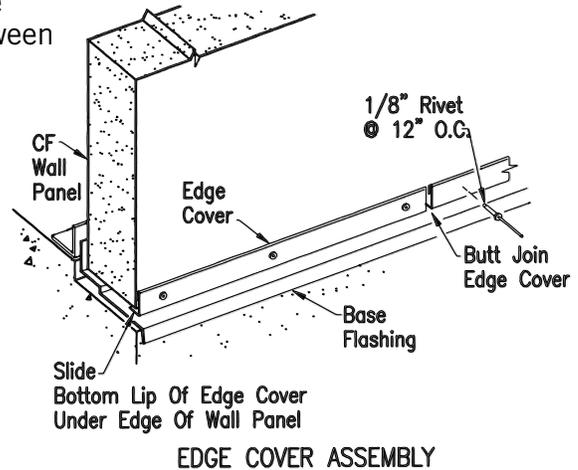
## C & I— EDGE COVERS

MSS091.637.1

**C & I Edge Cover** – for the typical non-cold storage applications, an edge cover is installed along the bottom edge of the wall panel to cover gaps between the panel ends and the base flashing.

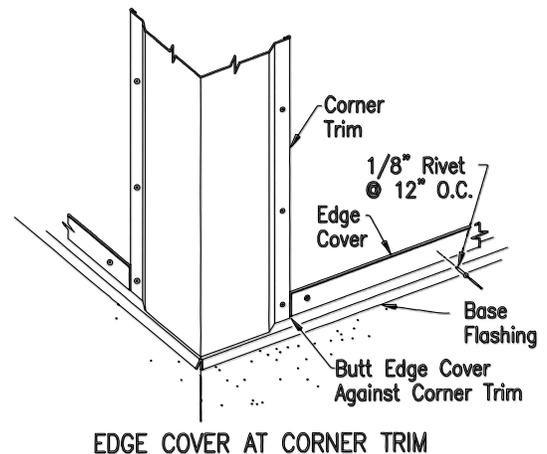
*Note: Edge Covers are also used above framed openings to cover gaps between the panel ends and the head flashing. Refer to the framed opening flashing details.*

**Edge Cover Splices** - at the edge cover splices, butt join the ends of the edge cover sections.



**Edge Cover Bottom Alignment** - to provide for drainage, hold the bottom edge off the surface of the base flashing.

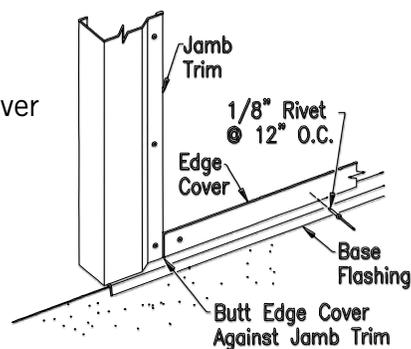
Use shims to set the space between the bottom edge of the edge cover and surface of the base flashing at a uniform 1/16" to 1/8".



**Edge Cover End Alignment** – at the wall's vertical flashing and trim, field cut the end of the edge cover sections to fit.

**Corners** - at the wall corners, butt the end of the edge cover section flush against the outer edge of the corner trim.

**Framed Openings** - at the edge of framed openings, butt the end of the edge cover section flush against the outer edge of the jamb trim.



## COLD STORAGE— EXTERIOR VAPOR BARRIER

MSS091.640

**Cold Storage Exterior Vapor Barrier** – on cold storage applications, a vapor barrier membrane may be specified for a more effective vapor seal of the perimeter flashing assemblies.

*Important: The vapor barrier membrane is provided by the contractor. Refer to the installation drawings or project specifications for specific requirements.*

**Vapor Barrier Alignment** – at the corners temporarily set and align the corner trim into position on the wall panels. Mark the position of the corner trim's outer edges on the panel face at the base and head of the panel.

At the eaves and rakes, temporarily set and align the eave or rake flashing into position along the edge of the roof. Mark the position of the flashing's bottom edge on the wall panels at each corner and at intermediate locations along the wall.

Extend chalk lines between the marks to provide for alignment of the vapor barrier during its installation.

**Tape Sealant** – at the wall corners, apply the tape sealant continuously along the wall panel surface at 1/4" from the chalk line. Extend the tape sealant from the bottom edge of the wall panels to above the chalk line along the eave/rake.

At the eaves and rakes, apply the tape sealant continuously along the wall panel surface at 1/4" above the chalk line. Continue the sealant around the corners and lap the wall corner tape sealants.

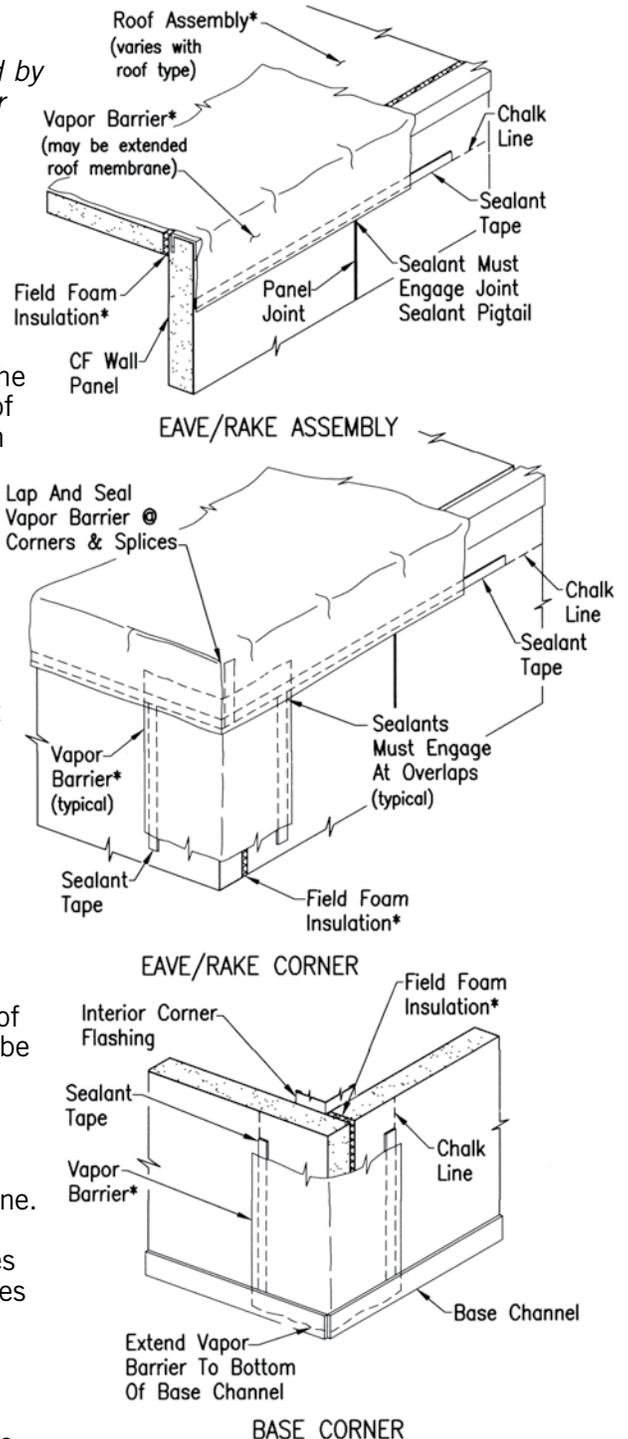
Refer to the installation drawings for the specific requirements for sealing the membrane into the roof assembly. In some cases, the roof membrane may be extended to form the eave/rake membrane.

**Vapor Barrier Membrane** – install the corner membranes first, and then install the eave/rake membranes to lap over the top of the corner membrane.

Cut the membranes to fit flush with the outer edges of the tape sealants, and uniformly adhere the edges of the membrane to the tape sealant.

Lap and seal the membrane at the corners and splices. Refer to the membrane manufacturer's instructions for the recommended adhesive/sealants.

\* These Materials Are Not Provided By Metl-Span



## COLD STORAGE—BASE FLASHING

MSS091.644.2

**Cold Storage Base Trim** – for typical cold storage applications, a base trim covers the bottom edge of the wall panels and the exterior flange of the base channel or angle.

\*These Materials Are Not Provided By Metl-Span

These details show the base trim installed on a base channel. The base trim installation on a base angle is similar.

**Aligning the Base Trim** – align the center flat of the base trim over the exterior flange of the base channel.

Use a level or string line to set the base trim level.

**Base Trim Attachment** - attach the base trim to the flange of the base channel with the specified wall screws located in the center of the flashing flat and at 12" spacing.

Set the screw spacing so a screw will be located at each base trim splice.

**Base Trim Splice** – lap the ends of the base trim sections 2". Apply urethane sealant within the lap and fasten the lap with a wall screw and 1/8" rivets at the locations shown.

**Base Trim Corner** – cut the end of one base trim section at a 45° bevel. Cut and bend the end of the opposite base trim section to provide tabs for a lap at the corner.

Apply urethane sealant within the lap and fasten the lap with 1/8" rivets at the locations shown.

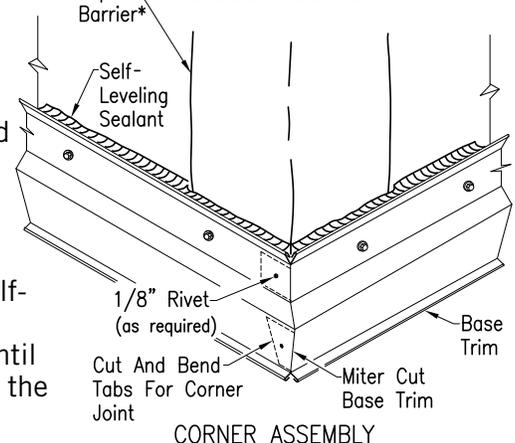
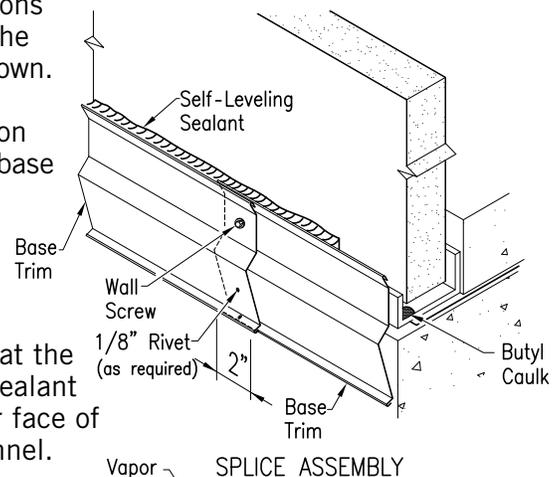
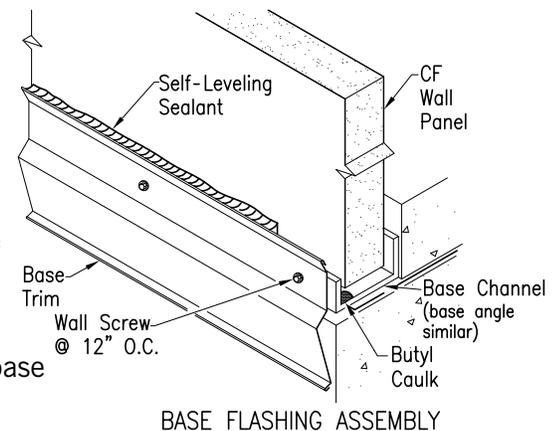
**Self-leveling Sealant** – the exterior weather/vapor seal at the bottom of the wall is provided by a dual self-leveling sealant application poured into the cavity between the exterior face of the wall panel and the exterior flange of the base channel.

Two different self-leveling sealants are supplied for the application after the base trim assembly (including splices and corners) is fully assembled. Apply the self-leveling urethane sealant to fill the gap between the panel face and vertical leg of the channel.

Allow 24 hours cure time before next step.

The top lip of the base trim forms a pocket where the self-leveling elastomeric sealant is applied over the urethane sealant. For the last pouring, completely fill the cavity until the elastomeric sealant is flush and level with the top of the base trim along the full length of the wall.

Refer to the caulking manufacturer's instructions for specific application and curing requirements.



## COLD STORAGE—EXTERIOR CORNER TRIM

MSS091.641

**Cold Storage Corner Assembly** – these details show the typical corner assembly for cold storage applications.

\*These Materials Are Not Provided By Metl-Span

**Interior Corner Flashing** – if interior flashing is specified, it must be in-place before installing the wall panels.

**Filler Insulation** – for cold storage applications a field applied foam insulation is typically used to fill the cavities between the opposing corner panels.

*Important: The filler insulation is provided by the contractor. Refer to the project specifications for specific requirements.*

*Caution: During the application of field applied foam insulation, exposed panel and flashing surfaces must be protected from foam overspray or drippage.*

**Corner Trim Installation** – if the corner trim requires splices, set the bottom corner trim section first.

Set the corner trim in position over the vapor barrier membrane, and set the trim's bottom end completely down into the base channel. If an offset corner trim is used, notch the end of the corner trim to fit into the base trim.

Align the outer edges of the corner trim with the chalk marks.

Fasten the corner trim to the wall panels with wall screws. Position the screws along the center of the corner trim's outer flanges and at 8" spacing, starting 3" from the base.

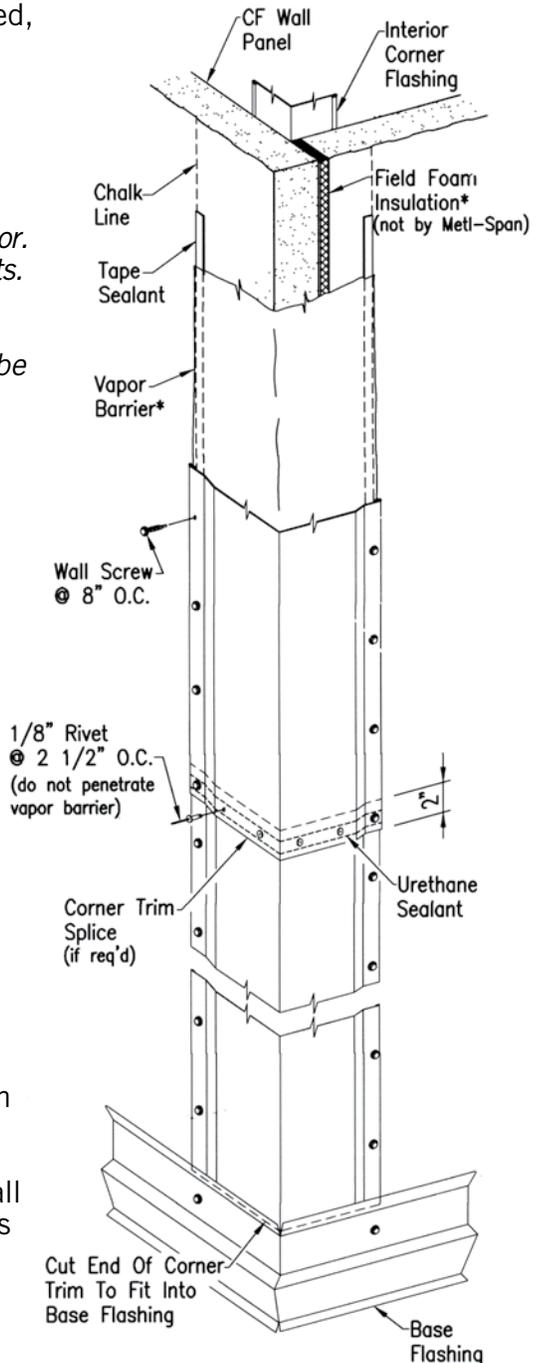
Check that the screws penetrate the center of the tape sealant.

**Splice Assembly** – lap the end of the upper corner trim section 2" over the end of the installed section.

Apply urethane in the lap and fasten the lap with a wall screw at the center of the outer flanges and 1/8" rivets across the splice at 2-1/2" spacing.

*Caution: Do not damage or displace the membrane when installing the corner trim. Do not puncture the membrane when drilling holes for the splice rivets.*

Cut off any excess corner trim flush with the top of the wall panels.



WALL CORNER ASSEMBLY

## COLD STORAGE—EAVE/RAKE DETAILS

MSS091.642

**Cold Storage - Eave/ Rake Alternate Details** – these details show some of the alternate eave and rake conditions for cold storage applications.

**Cap Channel** - a cap channel may be specified to provide support and attachment for the edge of the roof assembly.

When a cap channel is specified, saw cut a continuous notch in the foam core at the top of the wall panels flush along the inside face.

Set the back flange of the cap channel in the notch and attach the front flange to the wall panels with the specified low profile screws at 8" spacing.

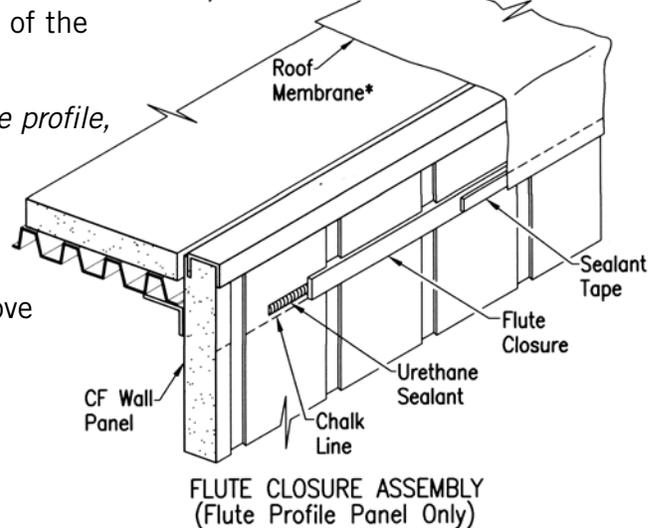
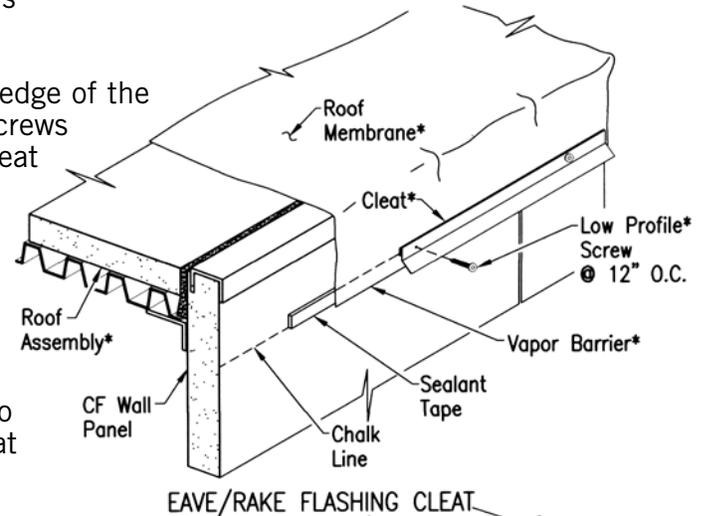
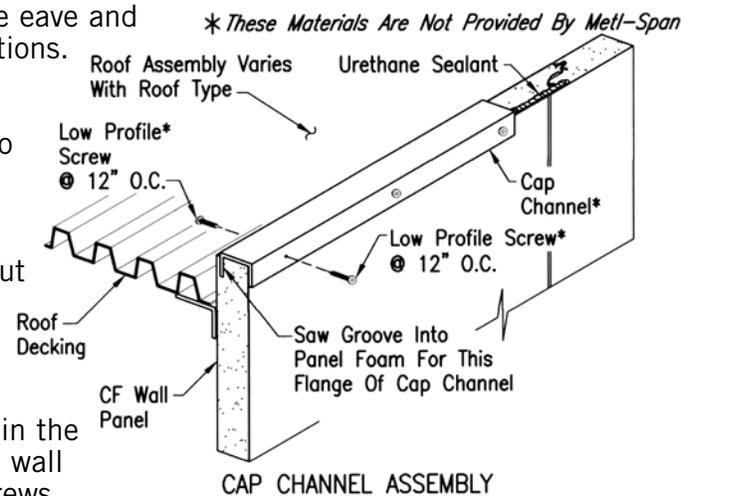
**Flashing Attachment to Wall** - the bottom edge of the eave/rake flashing may be attached with screws (as shown on the C&I details), or with a cleat (as shown on these cold storage details). Refer to the installation drawings for the specific flashing attachment requirements.

**Cleat Installation** - when a cleat is specified for attaching the eave/rake flashing, set the bottom edge of the cleat along the chalk line and attach the cleat to the wall panels with the specified screws at 8" spacing.

Check that the screws penetrate the center of the tape sealant.

*Caution: If the wall panel has a mesa or flute profile, locate the screws to fall on the high mesa.*

**Flute Closure** - if the wall panels are flute profile, apply urethane sealant along the back side and ends of the flute closure strips. Install the closure strips at 1/4" above the chalk line.



## COLD STORAGE—EAVE/RAKE FLASHING

MSS091.643

**Cold Storage - Eave/Rake Flashing** - these details show the typical eave and rake flashing assembly for cold storage applications.

**Eave/Rake Flashing Alignment** - on each wall, align the ends of the flashing assembly flush with the outer edge of the corner trim.

Orient the eave/rake flashing sections so field cut ends are always overlapped by a factory cut end at the splices and corners. And as much as possible, align the splices so the lap edge is away from normal viewing.

**Eave/Rake Flashing Installation** - if a cleat attachment is used, set the flashing over the vapor barrier membranes. Hook the hem at the bottom edge of the eave/rake flashing over the bottom edge of the cleat.

If a screw attachment is used, set the flashing over the membrane and align its bottom edge with the chalk mark. Fasten the flashing to the wall panels with the specified wall screws. Position the screws along the center of the flashing's bottom flange and at 8" spacing.

**Attachment to Roof** - refer to the installation drawings for the specified eave/rake flashing to roof connection.

Install the specified sealant along the top edge of the roof assembly.

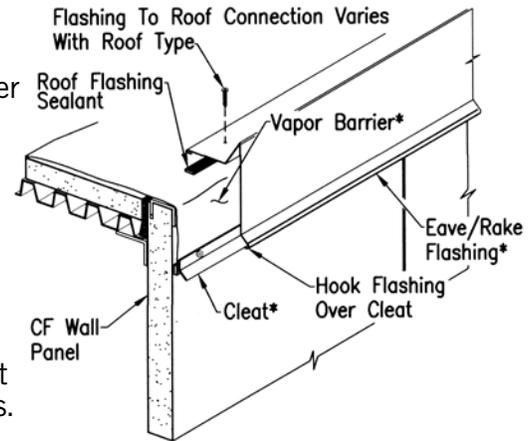
Square and plumb the face of the eave/rake flashing and attach its top flange to the roof assembly with the specified fasteners.

**Splice Assembly** - lap the ends of the flashing sections 2". Apply urethane sealant in the lap and fasten the lap with 1/8" rivets at 2-1/2" spacing.

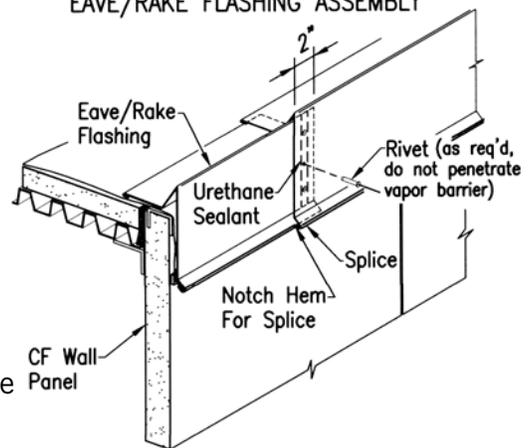
**Corner Assembly** - at the corner, cut and bend the end of one flashing section to lap under the factory cut end of the opposing flashing section. Apply urethane sealant in the lap and fasten the lap with 1/8" rivets at 2-1/2" spacing.

*Caution: Do not damage or displace the membrane when installing the flashing. Do not puncture the membrane when drilling holes for the splice and corner rivets.*

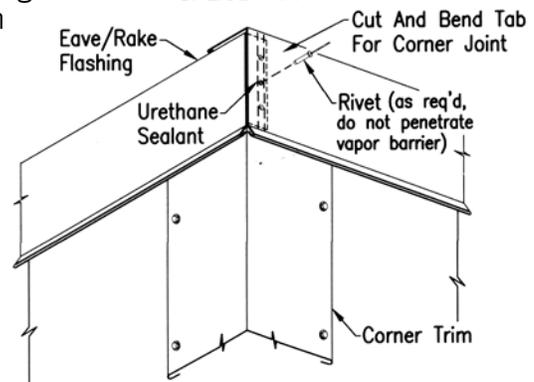
\*These Materials Are Not Provided By Metl-Span



EAVE/RAKE FLASHING ASSEMBLY



SPLICE ASSEMBLY



EAVE/RAKE CORNER ASSEMBLY

## C&I— FRAMED OPENING FLASHING

MSS091.645.2

**Framed Opening Flashing** - these details show a typical flashing assembly for framed openings.

\*These Materials Are Not Provided By Metl-Span

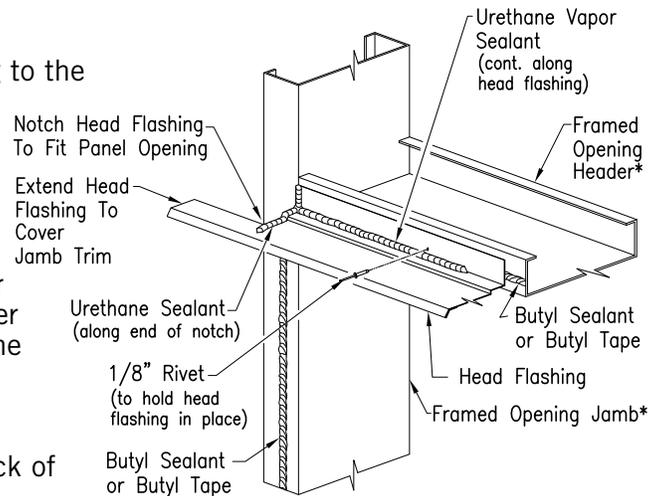
**Interior Vapor Sealant** - before installing the wall panels, apply the interior vapor sealant on header and jamb flanges around the perimeter of the opening.

**Head Flashing Preparation** - cut the head flashing to the length required to cover the top ends of the jamb trim on both sides of the framed opening.

Notch the ends of the head flashing to fit the edge of the panel opening as shown.

**Head Flashing Installation** - Apply butyl sealant or butyl sealant tape to the outside face of the header frame. Set the head flashing in position. Attach the flashing to the header with 1/8" rivets to hold the flashing in place.

Apply urethane sealant continuously along the back of the head flashing. Apply 1/2" diameter beads of urethane sealant across the end of the notches as shown.



HEAD FLASHING INSTALLATION

After the wall panels are in place, at each end of the head flashing, apply urethane sealant to seal the gap between the wall panel and the edge of the head flashing's notch. Apply butyl sealant or butyl sealant tape to jamb support face.

Check that this sealant engages the sealant at the end of the notch.

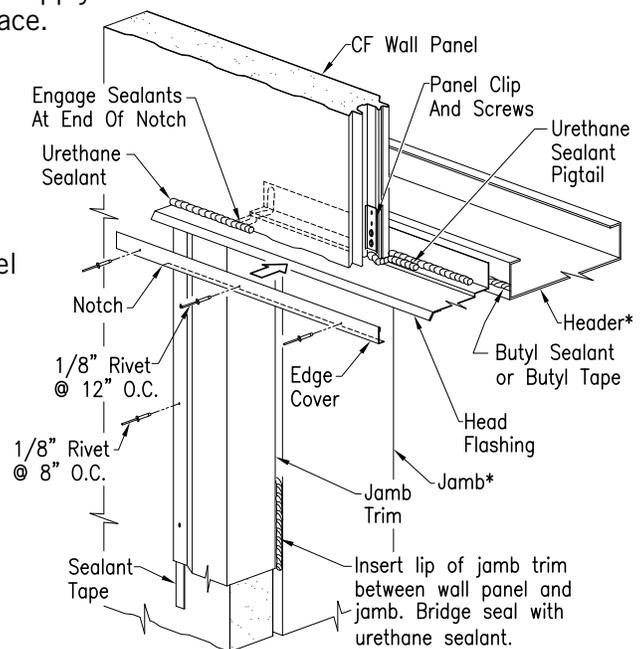
**Edge Cover** - at each end of the edge cover, notch the trim's bottom flange to fit the panel opening.

Install the edge cover and attach it to the wall panel with 1/8" rivets spaced 3" from each end and 12" O.C. between.

**Jamb Trim** - apply tape sealant along the interior surface of the jamb trim's outer flange. Position the sealant 1/4" from the trim's outer edge.

Fit the jamb trim over the edge of the wall panel and insert the interior lip of the jamb trim between the jamb structural and the panel.

Align and plumb the outer edge of the jamb trim. Attach the trim to the wall panel with 1/8" rivets spaced 3" from the base and at 8" O.C. Apply a "bridge" seal of urethane between the jamb trim and the jamb support as well as between the head flashing and the header support.



WALL PANEL & JAMB TRIM INSTALLATION

## C&I— STACK JOINT ASSEMBLY

MSS091.646.2

**C&I Stack Joint** - these details show the typical stack joint assembly for non-cold storage applications.

The stack joints are required when the building's height requires two or more tiers of wall panels.

**Combination Base/Head Assembly** - the stack joint functions as the head assembly for the lower tier panels, and the base assembly for the upper tier panels.

The stack joint assembly and the panel base and head connections are installed in a similar manner as the typical base and head assemblies.

*Important: Refer to the previous details in this guide for the general installation of the wall panels. Refer to the previous non-cold storage details for the general installation of flashing assembly.*

**Structural Considerations** - before attempting to install the wall panels, the acceptable condition of the stack joint structural members must be verified.

*Caution: Verify that the stack joint structural members are designed to accommodate the erection and design loads imposed by the lower and upper tier wall panels.*

Check that the stack joint structural members are at the proper elevation to match the panel heights.

Check that the stack joint structural members have sufficient flange width for attaching the lower and upper tier panels.

**Setting Upper Tier Panels** - the vertical positioning of the upper tier panels is critical for proper fit-up of the stack joint assembly and the panel performance.

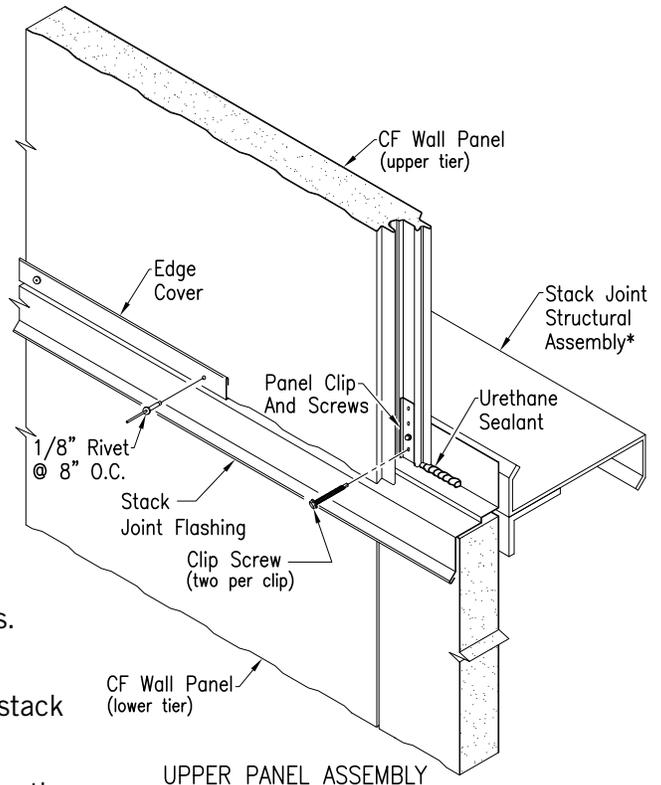
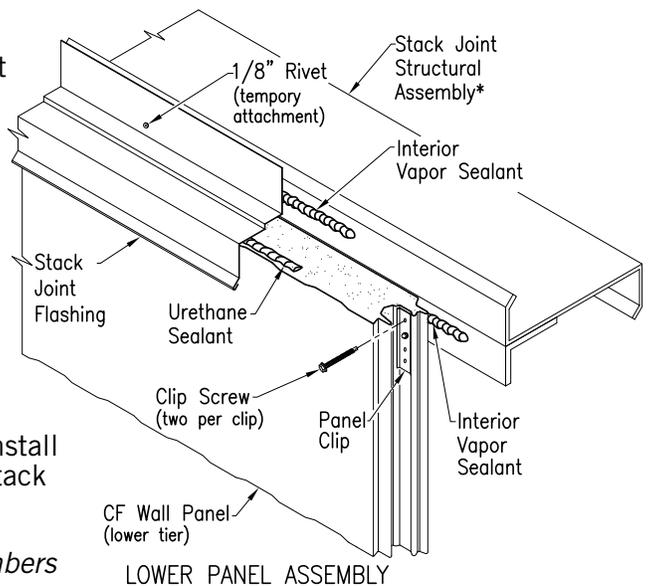
*Caution: During the installation of the upper tier panels do not allow the panels to crush the stack joint flashing and the top of the lower tier panels.*

The panel lifting equipment must be capable of holding the upper tier panels in place while the panels are being attached to the structural members.

Set the upper tier panels so the gap between the bottom edge of the panel and the surface of the stack joint flashing does not exceed 1/2".

**Panel Joint Alignment** - for acceptable appearance the side joints of the upper tier panel must be plumbed and aligned with the side joints of the lower tier panels.

\*These Materials Are Not Provided By Metl-Span



## COLD STORAGE — STACK JOINT ASSEMBLY

MSS091.648.1

**Cold Storage Stack Joint** - these details show the typical stack joint assembly for cold storage applications. The stack joints are required when the building's height requires two or more tiers of wall panels.

**Combination Base/Head Assembly** - the stack joint functions as the head connection for the lower tier wall panels, and the base connection for the upper tier panels.

*Important: Refer to the previous details in this guide for the general installation of the wall panels.*

**Flashing Installation** - the installation of the field foam, vapor barrier and stack joint flashing and pourable caulk is similar to the cold storage base and head flashing installations.

*Important: Refer to the previous cold storage details in this guide for the general installation of the vapor barrier, flashing and pourable caulk.*

**Structural Considerations** - before attempting to install the wall panels, the acceptable condition of the stack joint structural members must be verified.

Check that the stack joint structural members are at the proper elevation to match the panel heights. Check that the stack joint structural members have sufficient flange width for attaching the lower and upper tier panels.

*Caution: Verify that the stack joint structural members are designed to accommodate the erection and design loads imposed by the lower and upper tier wall panels.*

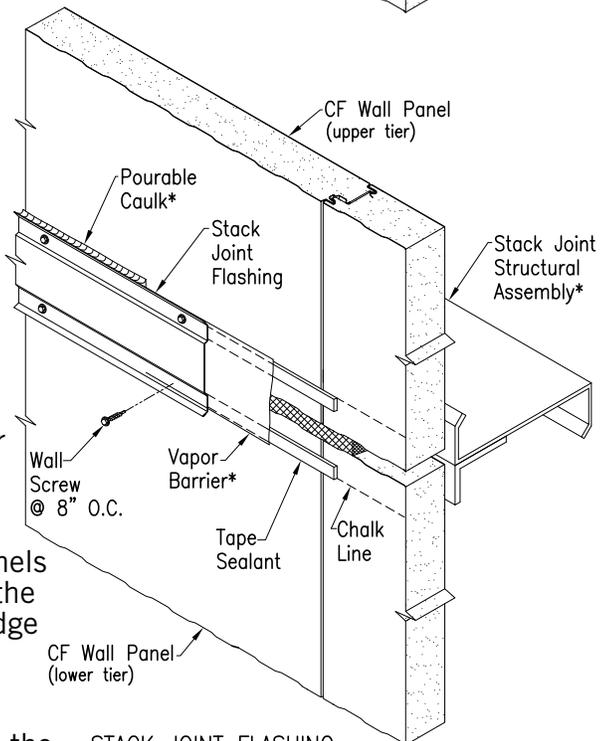
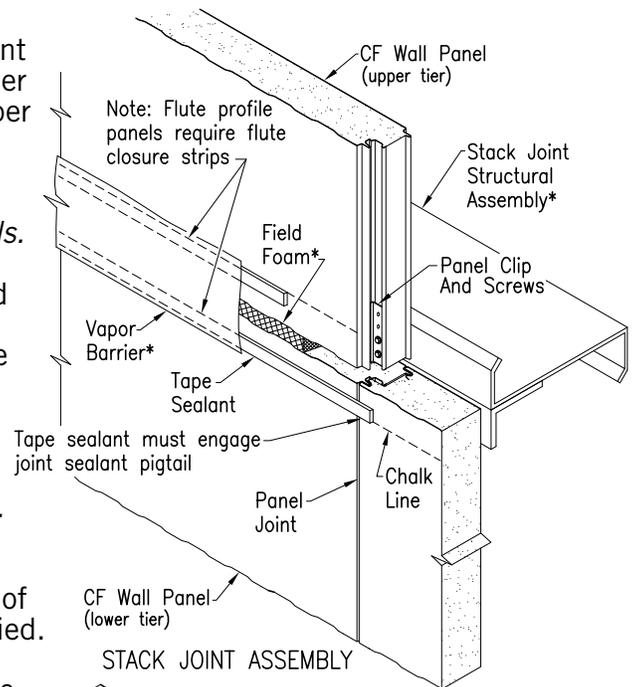
**Setting Upper Tier Panels** - the vertical positioning of the upper tier panels is critical for proper fit-up of the stack joint assembly and the panel performance.

*Caution: During their installation, do not allow the upper tier panels to crush the top of the lower tier panels.*

The panel lifting equipment must be capable of holding the upper tier panels in place while the panels are being attached to the structural members. Set the upper tier panels so the gap between the bottom edge of the panel and the surface of the base flashing does not exceed 1".

**Panel Joint Alignment** - for acceptable appearance, the side joints of the upper tier panel must be plumb and aligned with the side joints of the lower tier panels.

\*These Materials Are Not Provided By Metl-Span



## PENETRATION FLASHING

MSS091.649.1

**General** – the following details show typical methods of flashing penetrations through the wall panels. These details show the penetrating object (penetrant) as a round pipe or duct; details for other shaped penetrants are similar.

**Structural Considerations** – before installing the penetration and flashing, confirm that the structural support for the wall panels and penetrants are properly designed and provided in accordance with the following considerations.

**Penetrant Support** – the wall panels are not designed to support the weight of the penetrants. The penetrant must be independently supported and must not be allowed to bear directly on the edge of the wall panel cut-out.

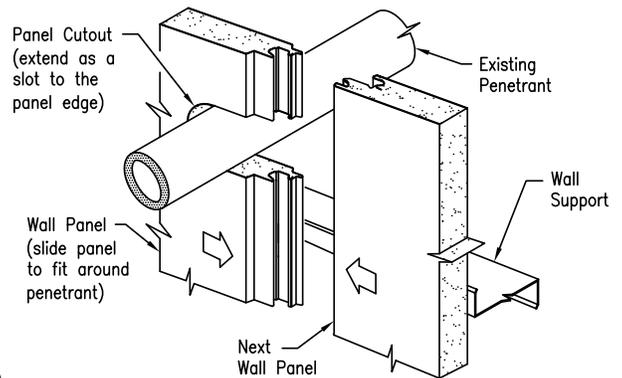
**Wall Panel Support** – to minimize the damaging effects of wall panel deflections upon the penetration flashing and seals (such as caused by wind and thermal stress), and to minimize the panel weakening effect of large panel openings and cutouts extending through the panel edge, the penetration must be located close to a wall support member, or an additional wall support must be provided at the penetration.

### Wall Panel Cutout – (existing penetrant)

If the wall panels are being installed around an existing penetrant, the penetration opening in the wall panel will have to be pre-cut before installing the panel.

Extend the cutout to the nearest panel edge to form a slot that will allow the panel to be slid laterally into place around the penetrant.

As much as possible, locate the panel joint as close as possible to the penetrant to minimize the width of the cutout slot.

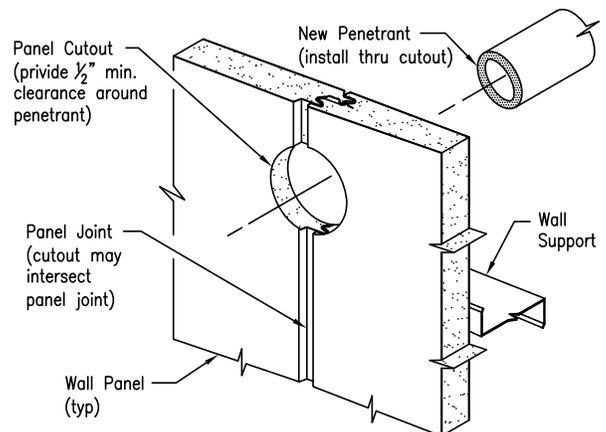


PANEL CUTOUT (existing penetrant, new wall)

**Wall Panel Cutout – (new penetrant)** If the penetrant is to be installed after the wall panels are installed, the penetration opening may be cut in the installed wall panel.

It is acceptable for the penetration opening to intersect wall panel joints.

*Caution: the penetrant must not be allowed to bear on the edge of the wall panel cutout. Cut the opening in the wall panel so there will be a 1/2" (min.) clearance completely around the penetrant.*



PANEL CUTOUT (new penetrant, existing wall)

## PENETRATION FLASHING (cont.)

MSS091.653

**Weather Seal** – if the penetration is through an exterior wall with vertical wall panel joints, it is best to avoid locating the penetration where it will intersect a wall panel joint and be subject to water draining from the panel joint into the penetration cavity.

Shown are weather seal details when intersecting a panel joint cannot be avoided.

### Existing Penetrant - New Wall

If a new wall is installed around an existing penetrant, sealant must be applied to the exterior tongue & groove of the wall panel joint to prevent water entering the panel joint.

Sealant pigtail seals must also be applied to interface with the perimeter sealant of the penetration cover plates.

Refer to the “Panel Joint Sealants” section for installation of the panel joint sealant and the pigtail sealants.

### New Penetrant - Existing Wall

If the penetrant is installed through an existing wall, either the existing wall must have been installed with the exterior joint sealant, or an exterior grade sealant must now be applied along the exterior fillet of the panel joint for the full height of the wall.

**Vapor Seals** – depending upon the building’s vapor control requirements, either the exterior or interior side of the wall panel joints may have joint sealant to function as the vapor barrier.

### Existing Penetrant - New Wall

On an exterior wall with the vapor barrier on the exterior side of the wall, the weather seal described above also functions as the vapor seal.

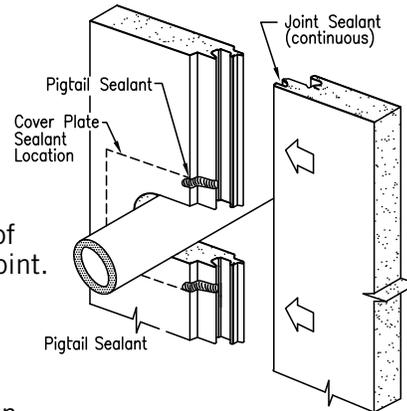
For interior walls and for exterior walls with the vapor barrier on the interior side of the wall, install the pigtail sealants to interface with the cover plate sealant in the same manner as described above for the weather seal.

### New Penetrant - Existing Wall

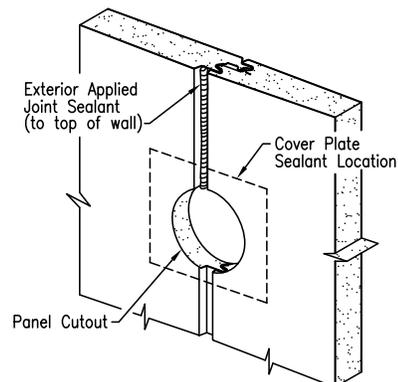
To prevent water vapor entering the penetration cavity on the vapor barrier side of the wall, pigtail sealants must be applied on the panel joint to interface with the perimeter sealant of the penetration cover plates.

Apply the pigtail sealant to seal off the tongue-and-groove joint cavities at the top and bottom edges of the panel cutout.

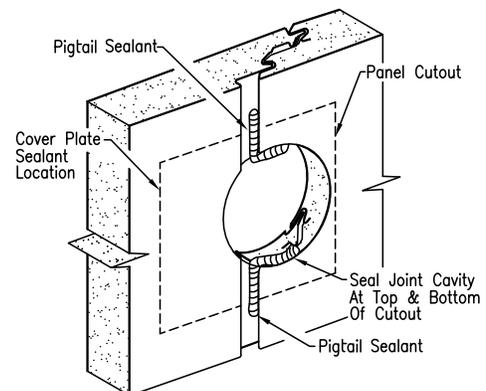
Extend the pigtail sealant along the exterior fillet of the panel joint to interface with the cover plate sealant.



WEATHER & VAPOR SEAL (Existing Penetrant, New Wall)



WEATHER SEAL (New Penetrant, Existing Wall)



VAPOR SEAL (New Penetrant, Existing Wall)

## PENETRATION FLASHING (cont.)

MSS091.650

**Cavity Insulation** – fill the cavity between the wall panel cutout and penetrant with filler insulation. If fiberglass or mineral fiber is used, pack the cavity before installing the cover plates.

If field foam is used, pre-install the cover plates on one side of the wall to help retain the foam during application. Apply masking to panel face surfaces which may be subject to foam spillage.

*Caution: Heated penetrants must be properly insulated to protect wall panel and flashing from temperatures exceeding 180° F.*

**Fabricate Cover Plates** – fabricate cover plates from sheet metal matching the wall panel faces.

Lay out the cover plates as two halves to fit around the penetrant and lap 2” where they join.

Lay out the cover plates to extend 2” (min.) beyond the perimeter of the opening. Cut out the center opening in the cover plates to tightly fit the penetrant with 1/8” (max.) clearance.

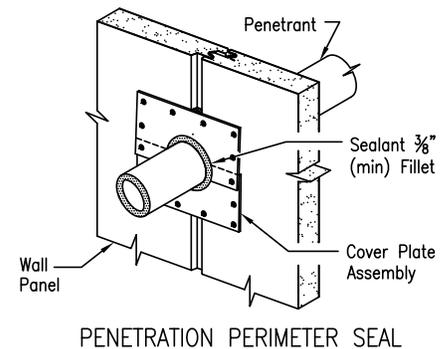
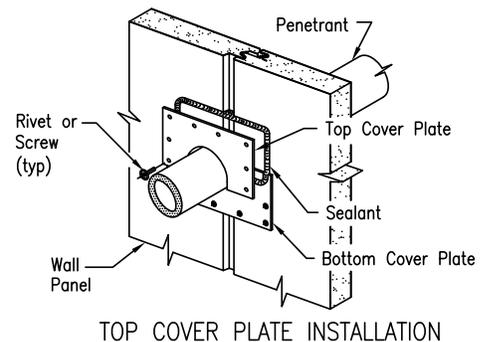
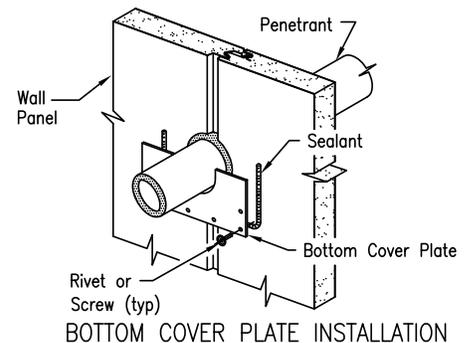
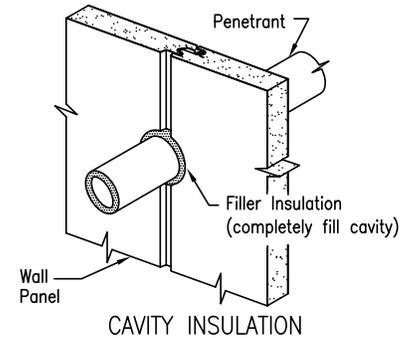
**Cover Plate Installation** – apply a continuous bead of urethane sealant between the perimeter of the bottom cover plate and the wall panel.

Position the cover plate to fit against the penetrant. Fasten the cover plate to the wall panel with rivets or trim screws at 3” (max.) spacing. Do not fasten the bottom cover plate in the area where the two cover plate halves will lap.

Apply a continuous bead of sealant between the top cover plate and the wall panel. And apply sealant across the cover plate lap area.

Position the top cover plate half to fit against the penetrant and lap the bottom cover plate. Fasten the top cover plate (including the lap area) to the wall panel.

**Penetrant Seal** – apply a continuous 3/8” (min.) fillet of urethane caulk around the interface between the penetrant and the cover plates.



## ROOF STRUCTURAL FLASHING

MSS091.651

**General** – the following details show typical methods of flashing roof structural penetrations through the wall panels. These details show the structural as an I-beam, details for other shaped structural members are similar.

**Wall Panel Cutout** – to allow the wall panels to be installed around the existing structural members, the panel openings for the structural penetrations will have to be precut.

If the panel opening does not intersect a panel joint, the opening is cut from the top edge of the panel. The panel is then tilted and slid upward to fit around the structural.

Provide sufficient cutout clearance to allow the panel to be slid laterally for joint engagement.

If the penetration opening intersects a wall joint, the opening is cut from the edge of each panel. The panels may then be slid laterally into position, or tilted and slid up to fit around the structural.

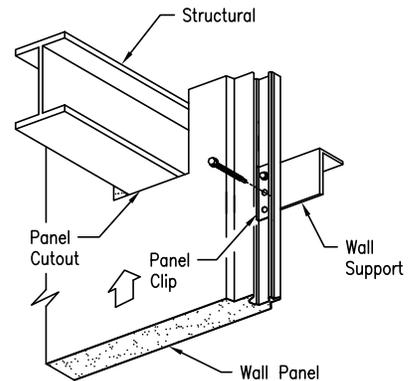
*Caution: The penetrant must not be allowed to bear on the edge of the wall panel cutout. Cut the opening in the wall panel so there will be a 1/2" (min.) clearance completely around the penetrant.*

**Weather & Vapor Seal** – On the weather side and/or vapor barrier side of the wall, install pigtail sealant into the panel joint to interface with the penetration's cover plate sealant.

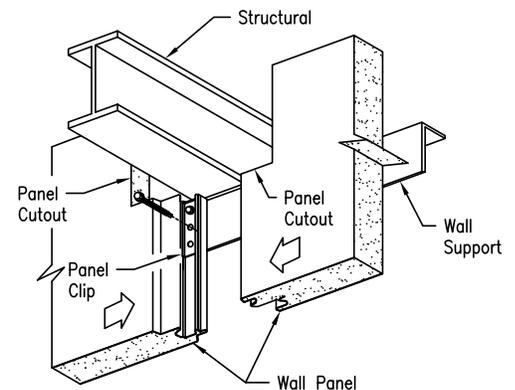
Refer to the "Panel Joints Sealants" section for installation of the panel joint sealant and pigtail sealants.

**Cavity Insulation** – fill the cavity between the wall panel cutout and structural with filler insulation. If fiberglass or mineral fiber is used, pack the cavity before installing the cover plates.

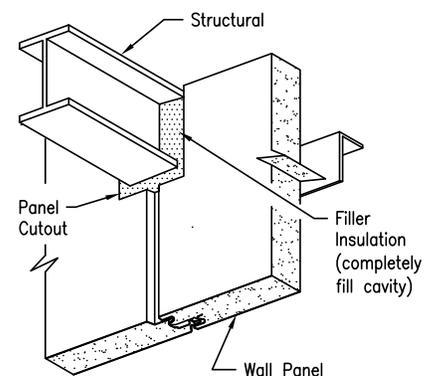
If field foam is used, pre-install the cover plates on one side of the wall to help retain the foam during application. Apply masking to panel face surfaces which may be subject to foam spillage.



PANEL CUTOUT (at center of panel)



PANEL CUTOUT (at panel joint)

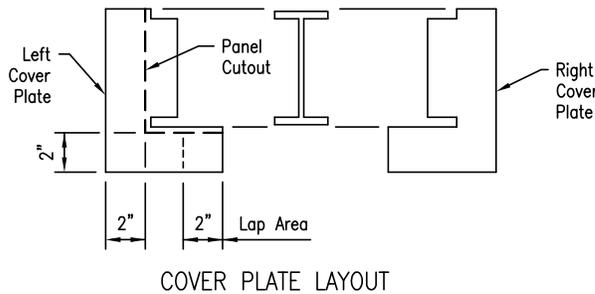


CAVITY INSULATION

## ROOF STRUCTURAL FLASHING (cont.)

MSS091.652

**Fabricate Cover Plates** – fabricate cover plates from sheet metal matching the wall panel faces. Lay out the cover plates as two halves to fit around the structural and lap 2" where they join. Lay out the cover plates to extend 2" (min.) beyond the perimeter of the panel opening. Cut out the opening in the center of the cover plates to tightly fit the structural with 1/8" (max.) clearance.



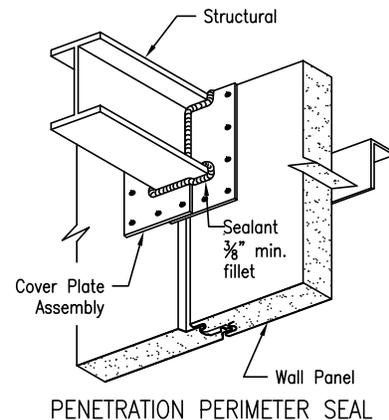
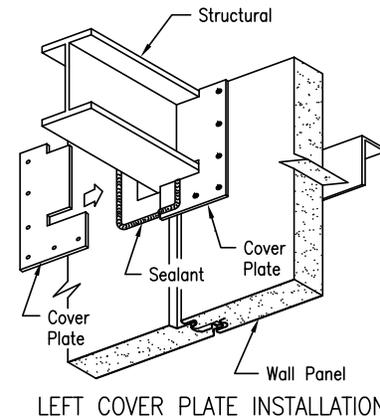
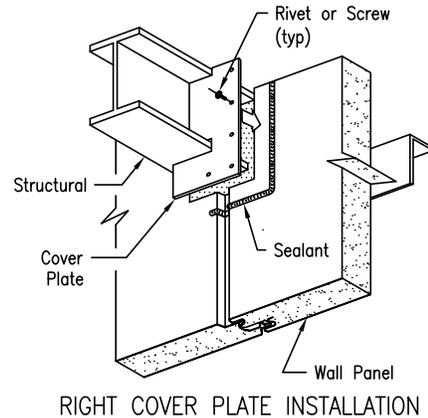
**Cover Plate Installation** – apply a continuous bead of urethane sealant between the perimeter of one of the cover plate halves and the wall panel.

Position the cover plate half to fit tightly against the structural. Fasten the cover plate to the wall panel with rivets or trim screws at 3" (max.) spacing. Do not fasten the cover plate in the area where the two cover plate halves will lap.

Apply a continuous bead of sealant between the second cover plate half and the wall panel. Apply sealant across the cover plate lap area.

Position the second cover plate half to fit tightly against the structural and lap the other cover plate half. Fasten the second cover plate (including the lap area) to the wall panel.

**Structural to Cover Plate Seal** – apply a continuous 3/8" (min.) fillet of urethane caulk around the interface between the structural and the cover plate.



## METL-SPAN<sup>®</sup>, URETHANE INSULATED METAL PANELS--WEIGHT IN PSF

Thickness	Panel Type	Facing Gage (Face 1/Face2)								
		26/26	24/26	22/26	26/24	24/24	22/24	26/22	24/22	22/22
2"	CF-45	2.10	2.32	2.58	2.32	2.54	2.80	2.58	2.80	3.06
	CF-42	2.14	2.35	2.65	2.35	2.58	2.86	2.61	2.84	3.12
	CF-36	2.15	2.36	2.66	2.37	2.60	2.88	2.62	2.86	3.14
	CF-30	2.18	2.42	2.71	2.40	2.64	2.93	2.64	2.91	3.20
	CF-24	2.23	2.49	2.79	2.46	2.72	3.02	2.70	2.99	3.29
2.5"	CF-45	2.20	2.42	2.68	2.42	2.64	2.90	2.68	2.90	3.16
	CF-42	2.24	2.45	2.75	2.45	2.68	2.96	2.71	2.94	3.22
	CF-36	2.26	2.46	2.76	2.47	2.70	2.98	2.72	2.96	3.24
	CF-30	2.28	2.52	2.81	2.50	2.74	3.03	2.74	3.01	3.30
	CF-24	2.33	2.59	2.89	2.56	2.82	3.12	2.80	3.09	3.39
2.75"	CF-45	2.26	2.48	2.73	2.48	2.68	2.92	2.73	2.92	3.19
	CF-42	2.30	2.51	2.80	2.51	2.72	2.98	2.76	3.02	3.25
	CF-36	2.32	2.52	2.81	2.53	2.74	3.00	2.77	3.04	3.27
	CF-30	2.34	2.58	2.86	2.56	2.78	3.05	2.78	3.09	3.33
	CF-24	2.39	2.65	2.93	2.63	2.86	3.14	2.84	3.17	3.42
3"	CF-45	2.31	2.53	2.79	2.53	2.75	3.01	2.79	3.01	3.27
	CF-42	2.35	2.56	2.86	2.56	2.79	3.07	2.82	3.05	3.33
	CF-36	2.37	2.57	2.87	2.58	2.81	3.09	2.83	3.07	3.35
	CF-30	2.39	2.63	2.92	2.61	2.85	3.14	2.85	3.12	3.41
	CF-24	2.44	2.70	3.00	2.67	2.93	3.23	2.91	3.20	3.50
4"	CF-45	2.51	2.73	2.99	2.73	2.95	3.21	2.99	3.21	3.47
	CF-42	2.55	2.76	3.06	2.76	2.99	3.27	3.02	3.25	3.53
	CF-36	2.57	2.77	3.07	2.78	3.01	3.29	3.03	3.27	3.55
	CF-30	2.59	2.83	3.12	2.81	3.05	3.34	3.05	3.32	3.61
	CF-24	2.64	2.90	3.20	2.87	3.13	3.43	3.11	3.40	3.70
5"	CF-45	2.72	2.94	3.20	2.94	3.16	3.42	3.20	3.42	3.68
	CF-42	2.76	2.97	3.27	2.97	3.20	3.48	3.23	3.46	3.74
	CF-36	2.78	2.98	3.28	2.99	3.22	3.50	3.24	3.48	3.76
	CF-30	2.80	3.04	3.33	3.02	3.26	3.55	3.26	3.53	3.82
	CF-24	2.85	3.11	3.41	3.08	3.34	3.64	3.32	3.61	3.91
6"	CF-45	2.93	3.15	3.41	3.15	3.37	3.63	3.41	3.63	3.89
	CF-42	2.97	3.18	3.46	3.18	3.41	3.69	3.44	3.67	3.95
	CF-36	2.99	3.19	3.49	3.20	3.43	3.71	3.45	3.69	3.97
	CF-30	3.01	3.25	3.54	3.23	3.47	3.76	3.47	3.74	4.03
	CF-24	3.06	3.32	3.62	3.39	3.55	3.85	3.53	3.82	4.12

The above numbers are based on a core density of 2.50 pcf.

The weight of the different panel facings are as follows:  
 26 gage: .7752 psf, 24 gage: .9792 psf, 22 gage: 1.224 psf



PIONEERING INSULATED  
METAL PANEL TECHNOLOGY

1720 Lakepointe Drive, Suite #101

Lewisville, Texas 75057

**Toll-free: 877.585.9969**

Tel: 972.221.6656

Fax: 972.420.9382

Web: [metlspan.com](http://metlspan.com)

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