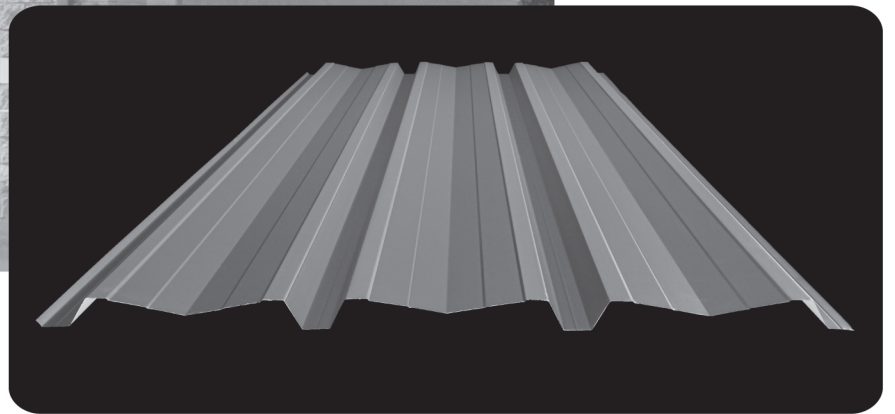


Shadowwall™ Wall System

Installation Guide



SHADOWALL™ SYSTEM INSTALLATION MANUAL

INTRODUCTION

This manual is furnished as a supplement to the other installation manual and drawings.

NOTE: Variations from the contents of the manual can occur because of specific customer requirements and subsequent engineering changes. Always refer to the Installation Drawings supplied with the shipment which will govern specific part and assembly arrangements and applicable installation details.

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SAFETY GUIDELINES

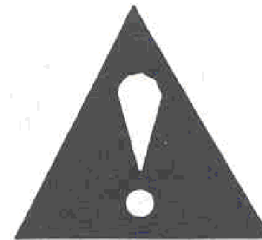
Safety

Safety must be a prime concern throughout the entire installation process. This manual contains safety information that is important for all workers to know and understand. It is not possible to present complete and comprehensive safety instructions in this manual. All local, state and OSHA safety regulations must be followed at all times. The installation contractor has the ultimate responsibility for the safety of workers and must comply with all applicable safety regulations.

The Occupational Safety and Health Act regulations applicable to the installation of this or any other building are identified as Part 1926, Safety and Health Regulations for Construction and are available from any government book store. These OSHA Regulations should be recognized as a job site requirement and must be fully complied with. Failure to do so may result in worker death or injury as well as substantial fines in the event of an OSHA inspection.

Recognize Safety Information

This is the safety-alert symbol. When you see this symbol in this manual, be alert to the potential for personal injury. Follow recommended precautions and safe practices.



Follow Safety Instructions and Warnings

Carefully read and follow all safety and warning messages in this manual and all applicable installation drawings.

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HANDLING PANELS

Full Crates: Unloading and Storage

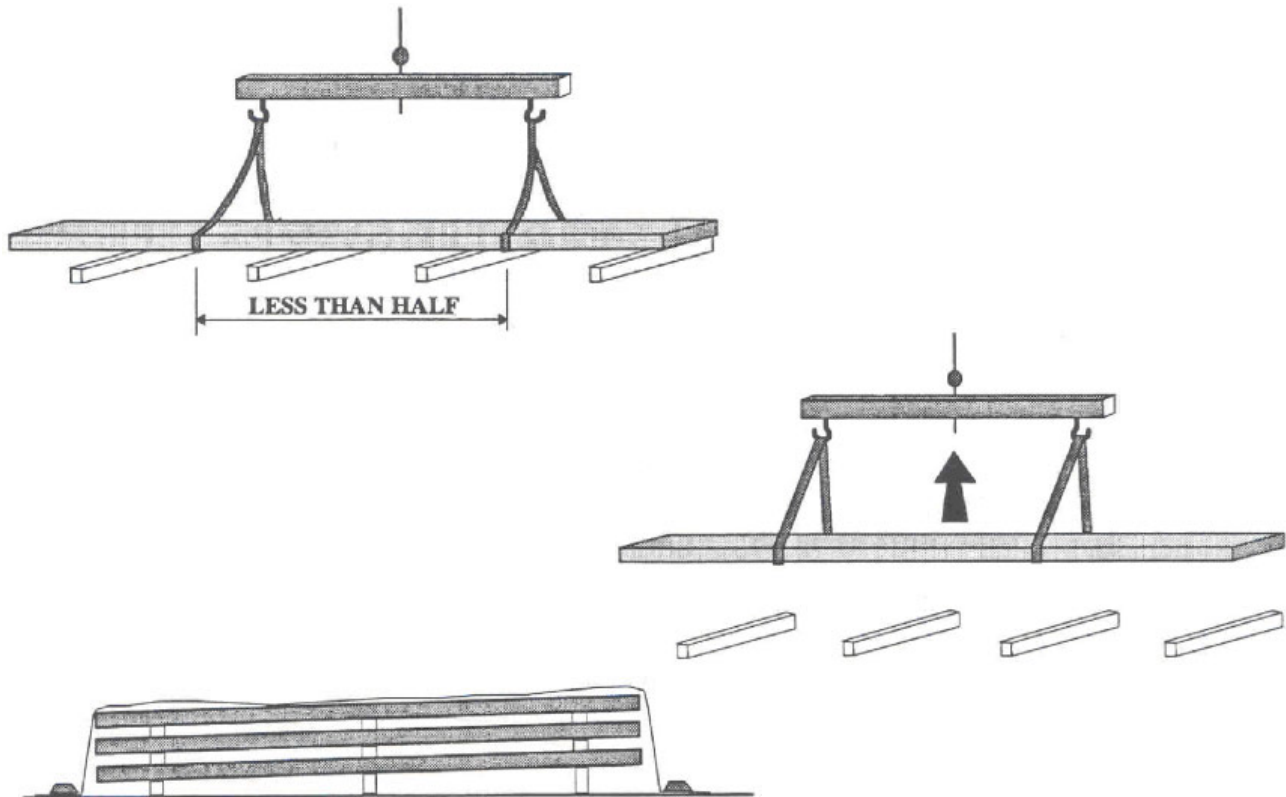
When unloading crates of panels upon arrival of shipment, it is important to rig the bundles properly for a safe lift.

Incorrect handling may break the panel crate, severely damaging panels beyond use.

When using a crane and wire rope sling, examine the wood crating to make sure the wood prevents the slings from damaging the panels. Nylon slings are necessary when handling crates that have been opened or no longer have the wood crating for protection. The distances between the slings should be slightly less than half the length of the panel.

With 40 foot panels, the slings should be a little less than 20 feet apart, which will allow the bundle to arch slightly as the lift is made. The use of spreader bar is preferred.

When using a forklift for unloading, spread the forks and make a test lift at the center of the crate. If upward bow is not excessive, carefully lift. If the crates are too long or the fork cannot be used under the crate safely, use a spreader bar and slings from the forks. Normal crates of 32 panels will weigh approximately 4000 lbs. maximum. When unloading and storing at jobsite, always place dunnage under the crate, open crate ends, cover, and slope for drainage of water from rain or snow.



Single Panel

To prevent bucking of the panel when hand carrying a single panel, two workmen should grip the corrugation edge on the same side of the panel and lift in unison, distributing the weight, allowing the panel to hang sideways. Longer panels may require another workman in the middle.



CAUTION: Always wear gloves when handling panels.

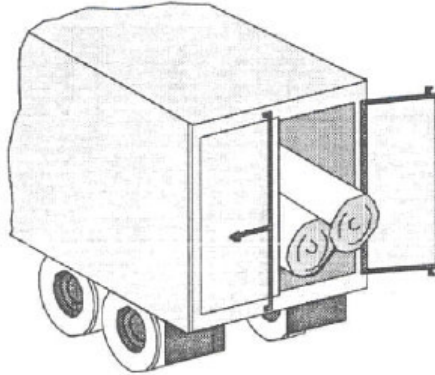
WARNING: Carrying wall panels on windy days is extremely hazardous. Panels may act like a sail throwing you off balance and causing you to fall. Blown panels may also hit and injure other workers. Keep loose panels secured to prevent wind damage.

HANDLING MATERIAL

Insulation Storage

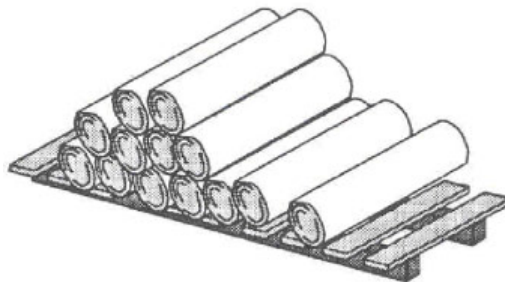
Inspect the insulation upon arrival at the jobsite to insure that it is exact as ordered. If the insulation is defective, it should not be installed and the supplier should be contacted immediately.

Insulation must be stored in a dry protected area. A storage trailer provides very good protection.



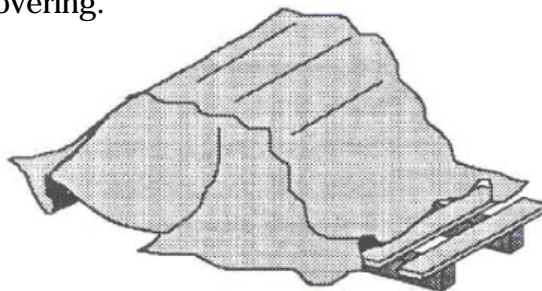
If a dry protection area is not available at the site, the insulation should be placed at the end of the building where the roof panels will first be applied. This will provide protection for the insulation material until the building is completed.

Elevate all packages above the ground or slab to prevent possible contact with surface water. Facings utilizing Kraft paper are especially susceptible to moisture. All facings are fragile and subject to impact damage. Care in handling must be exercised. Do not allow the rolls of insulation to be thrown off the shipping vehicle, kicked, or placed in contact with sharp objects during storage.



Plastic bags used for wrapping should have holes in each end to ventilate the insulation. Do not remove plastic bags until insulation is needed.

Packages can be left uncovered during the day, weather permitting, but should be protected at night with a tarp or other covering.



On large projects, the insulation can be supplied in phases as construction progresses. The longer the insulation is in storage, the more likely it will be damaged or stolen.

Hardware, Fastener and Sealant Storage

All building material used for the wall installation should be checked, separated, and stored in a dry protected area so that they are not damaged, stolen, or lost before use.

Do not store heavy materials on boxes of sealant as this will damage the sealant beyond use.

Trims and Flashing

Check these parts for damage and store in a protected area. The trim parts may be covered with a strippable film, to eliminate transit scratching. If the parts are exposed to the weather while in storage, remove the film. Sun exposure turns the film brittle, and becomes difficult to remove.

Strategically place materials so they are near the area of intended use to eliminate unnecessary handling.

TOOLS AND RELATED MATERIALS

Installation procedures shown in this manual will require the following tools and materials:

- Hole Finder tool- fabricated or purchased from Dynamic Fastener Service.
- Electric Impact Wrench- 1/2" drive with 3/8" magnetic socket.
- Electric drill 3/8" heavy duty with 1/8", 3/16", and 5/16" drill bits.
- Electric screwgun with 3/8" and 5/16" hex sockets.
- Torx® head adapters for 1/2" impact with T-45 Torx tip.
- Torx head adapters for screwgun with T-30 Torx tip.
- Open barrel caulking gun (1/10 gal. tube).
- Self-drilling screws (#12 x 1" and #14 x 3/4")
- Torx head fasteners (T-30 x 3/4", T-30 x 1 1/4", T-45 x 7/8", T-45 x 1 1/2", and T-45 x 2")
- Aligning punches, tapered 1/8" to 3/8" x 9" long-sharpened.
- Steel banding equipment or rope.
- Nylon slings 4" wide 10' & 12' long or 1/2" cable, 10' & 14' long, eyes both ends.
- Utility Knife.
- Double faced insulation tape or adhesive.
- Insulation stapler and staples.
- Lock-grip pliers.
- Blind rivet setting tool.
- Power Shear (double cut shear).
- Nibbler or reciprocating saw.
- Hacksaw.
- Aviation style snips- right and left.
- Steel tape measure.
- Chalk line.
- Tarps or plastic sheeting.
- Gloves.
- Hand lines.
- Appropriate safety equipment and materials.

Dynamic Fastener

www.dynamicfastener.com

(800) 821-5448 -Voice; (800) 844-1199 -Fax

All other tools are the normal tools required for the installation of pre-engineered buildings.

Torx® is a registered trademark of the Camcar division of Textron, Inc.



FASTENERS

Description

The shipping manifest will list the use location of the wall fasteners. The use location may also be shown on the wall panel layout drawing. The code and description of the fasteners listed in this manual are:

- 097361 T-45 Torx Scrubolt™ (7/8")
- 097362 T-45 Torx long Scrubolt (1-1/2")
- 097363 T-45 Torx long Scrubolt (2")
- 097365 T-30 Torx standard point, self-drilling screw
- 097364 T-30 Torx mini point, self-drilling screw
- 097124 Blind rivet
- 096884 Blind rivet

Panel Fasteners And Tools

Before starting paneling, be sure that proper tools, in good repair, are on hand. An inefficient drill motor, dull drill bit, lack of tools, inadequate power source or other equipment deficiencies slows down the entire crew. The cost of lost time can easily become greater than the cost of providing adequate, well maintained equipment.

Several fastener options are available for the application of the Shadowall system panels. The proper location for each is shown on the installation drawings. The shipping manifest accompanying the building is used to determine the actual fasteners furnished.

Panel-to-Panel and Sidelap Fasteners

Type: Self-drilling screw

Required tool: Electric screwgun with T-30 Torx tips

NOTE: Use depth locating or torque control electric screwgun for driving self-drilling screws. High RPM (200-2500 RPM) drivers are necessary to attain optimum speeds. High tool amperage (4 to 7 amps) is required to achieve the proper torque for secure fastening.

Panel-to-Structural

Type: Self-drilling screw

Required tool: Electric screwgun with T-30 Torx tips

Type: Scrubolt

Required tool: 1/2" drive impact wrench with T-45 Torx tips

NOTE: The Scrubolt fastener is used only for panel-to-structural connection and is specifically designed to engage in the factory-punched secondary structural.

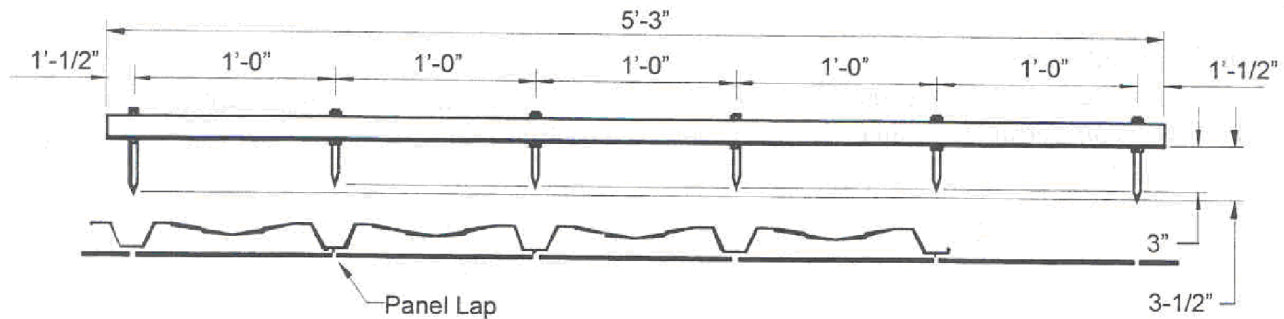
Fastener Installation

Although the selection of specialized fasteners is important, their correct application holds the key to a weather-tight, structurally sound construction project. The following fastener installation procedures should be read and understood by all installation personnel.

Do not overdrive fasteners! When possible, use drivers with torque control set to function properly for the combination of fastener size, hole size and material thickness.



Hole Finder



Shadowwall™ Hole Finder

For locating the factory punched holes in intermediate girts, through the panels, use a "hole finder". This tool may be fabricated from locally available materials such as a 2 X 2 with spikes driven through or as detailed as steel tubing with spring loaded, hardened steel punches. The "hole finder" can also be purchased from Dynamic Fastener (800) 821-5448.

The two outside punches are guide punches and should be tapered so they will set deep enough into the girt holes for the inside punches to contact the panel. The four inside punches have sharpened points for marking the panel.

The hole finder should not be used to punch holes! A hammer blow on the inside punches will mark the panel, in line with the factory punched holes in the girt. Be sure the hole finder is located in the corrugations. Remove the hole finder, enlarge and align the hole with the girt with an aligning punch, and install the Scrubolt fastener.

For current information regarding pricing and availability of the Shadowwall wall system "hole finder" tool and other hand and electric powered tools refer to the Construction/Equipment/Miscellaneous section of the Builder Administration Library in the Butler Advantage® computer pricing system.

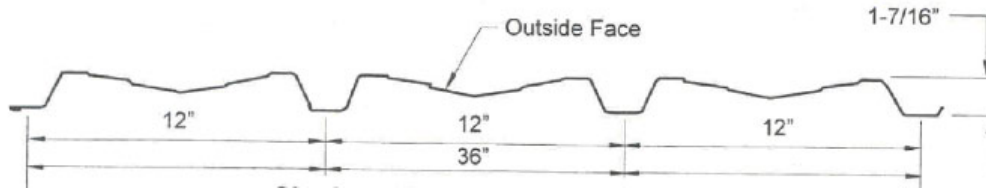
IMPORTANT NOTES:

- Be sure to properly align girts with eave members and base angles before using the holefinder to mark panels.
- Always install panel-to-structural fasteners before installing panel-to-panel fasteners.
- All drill shavings need to be removed from the panel.

GENERAL INFORMATION

Wall Panel Dimensions

The wall panel provides a width coverage of 36" and is available in 1/8" increments from 3'-0" to 40'-0". The panel is formed with four major corrugations and a "V" shape between each of the major ones. Each panel is factory produced with a fastener groove.



Shadowall™ Panel Cross Section

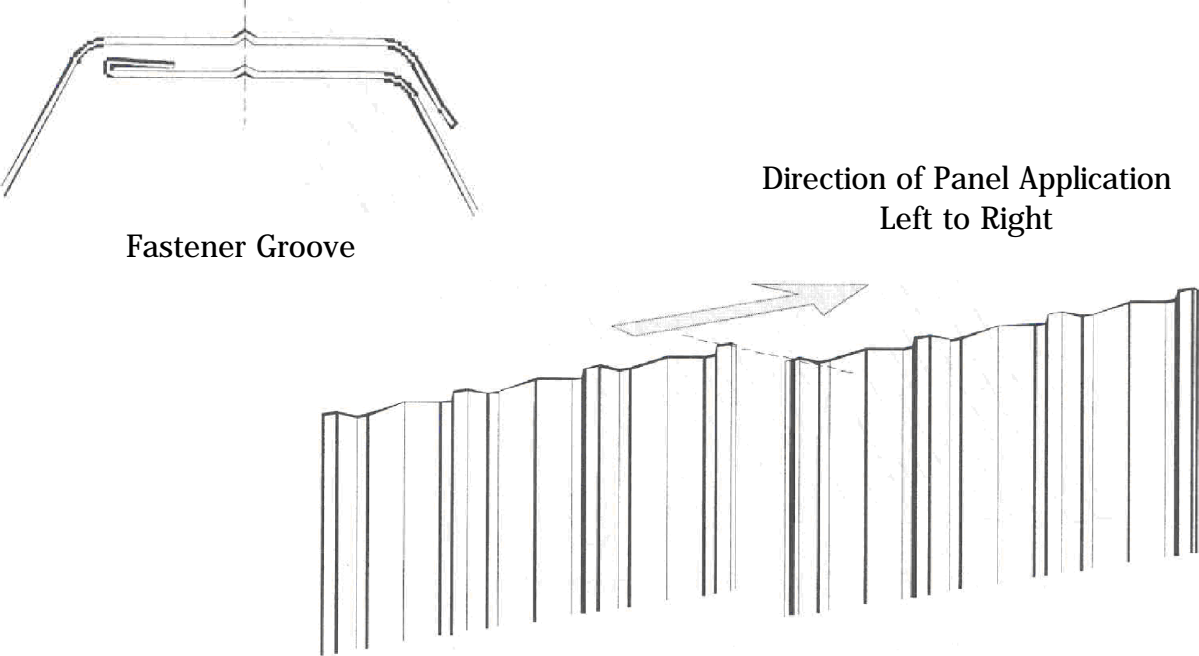
Panel Usage

The panels are manufactured from 24 or 26 gauge standard material with a design yield of 50 KSI. Panels can be lapped to construct heights greater than 40'-0".

- Shadowall wall system uses the standard primary and secondary structural systems.
- Factory punched panels are punched at the top and bottom for alignment to attach to the factory punched eave struts, base angles, and gable angles.
- Panel-to-girt connections are field punched or field drilled holes in the panel.
- When Butler Lite*Panl translucent wall panels are required, the panels will be in a separate carton or another crate marked "miscellaneous".
- Verify the Butler Lite*Panl unit's location shown in the wall paneling layout drawing and make adjustment to the owner drawing as required.
- Panels are available in several combinations of punched or unpunched panels with punched or unpunched secondary structurals. Installation procedures will vary with the options selected.

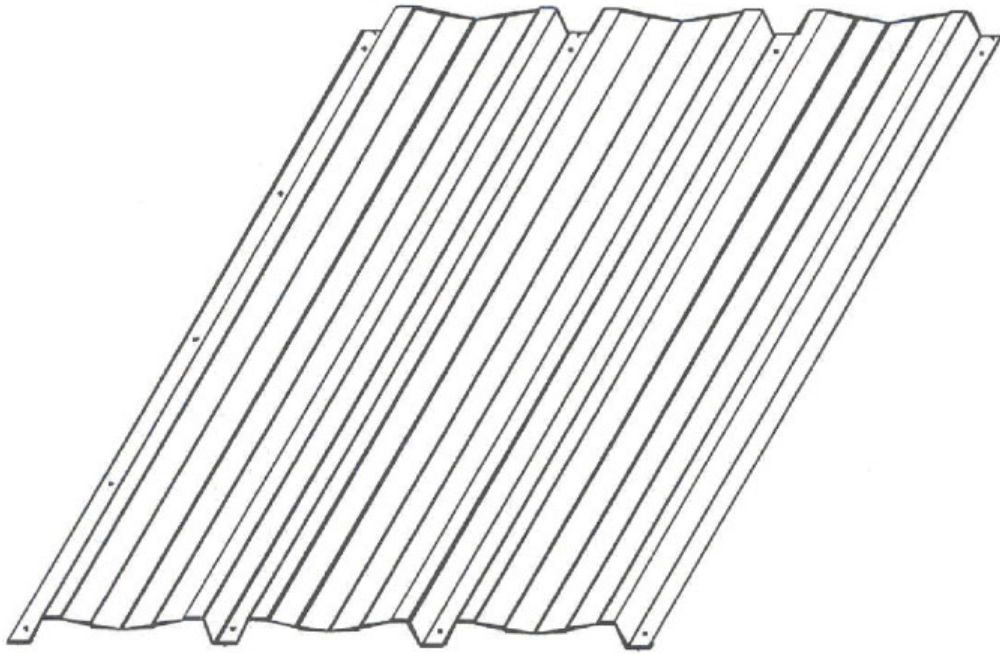
PANEL INSTALLATION

Direction of Wall Panel Installation



The non-symmetrical shape of the Shadowwall system panel requires that careful attention be given to the direction of the panel installation. Wall panels are installed from left to right. This will automatically place the hem edge on top. If it is necessary to install from right to left, you must 'tuck' the lip edge under the hem edge.

Panel-Drilling Panels



Pre-Drilled Panel for Punched Structural

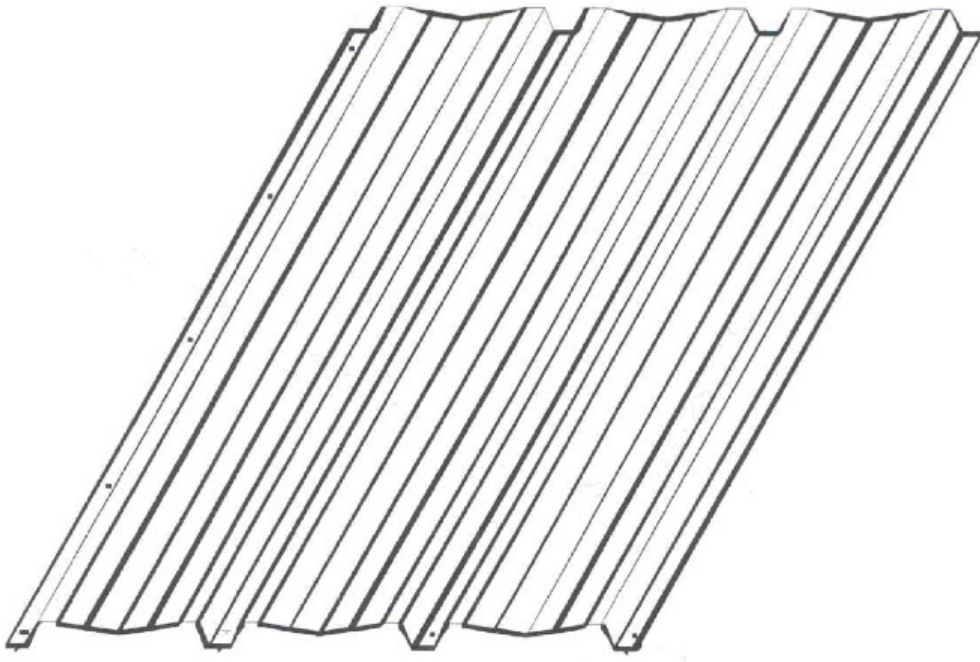
Unpunched wall panels that are used on punched structurals should be pre-drilled for alignment purposes. The panels should be drilled at both ends for panel-to-structural fastening. Refer to the planographs for the spacing requirements of the sidelap fasteners.

Drilling

For drilling, use a 3/8 heavy duty, high speed drill motor. A 1/8" or 3/16" sharp bit should be used with sufficient pressure to obtain good cutting action.

Material to be drilled should be tightly nested or in contact with one another. This is important to assure drilling accuracy. If the material is separated and the drill is not perpendicular to the material, the result will be fit-up problems.

NOTE: All drill shavings need to be removed from the panel.



Pre-Drilled Panel for Unpunched Structural

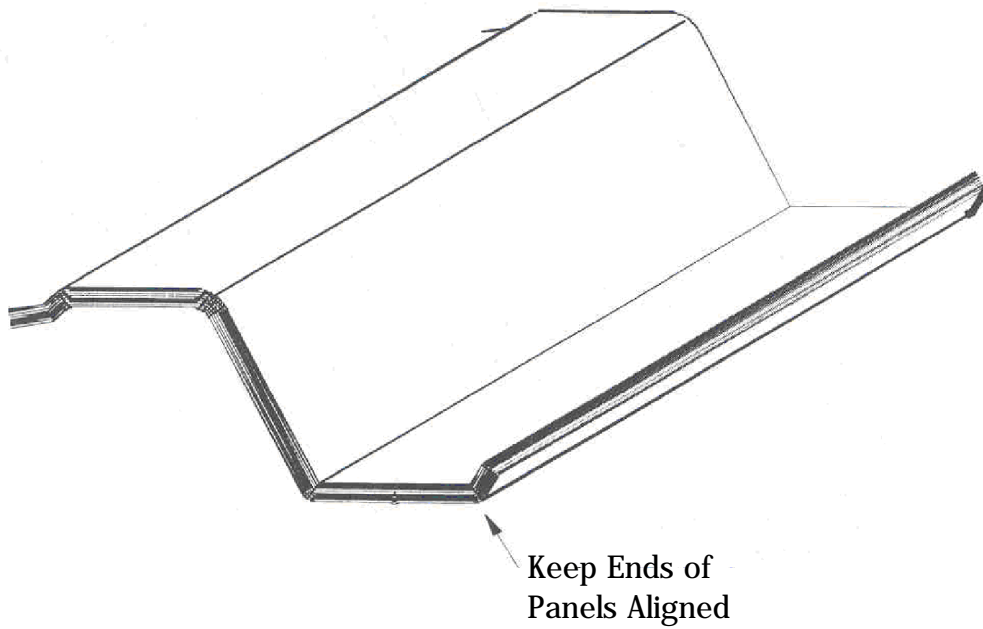
Unpunched wall panels that are used on unpunched structurals should be pre-drilled along the one edge of corrugation only for the alignment of the sidelap fasteners. Refer to the planographs for the spacing requirements of the sidelap fasteners. It is recommended to pre-drill holes for the base closure.

Drilling

For drilling, use a 3/8 heavy duty, high speed drill motor. A 1/8" or 3/16" sharp bit should be used with sufficient pressure to obtain good cutting action.

Material to be drilled should be tightly nested or in contact with one another. This is important to assure drilling accuracy. If the material is separated and the drill is not perpendicular to the material, the result will be fit-up problems.

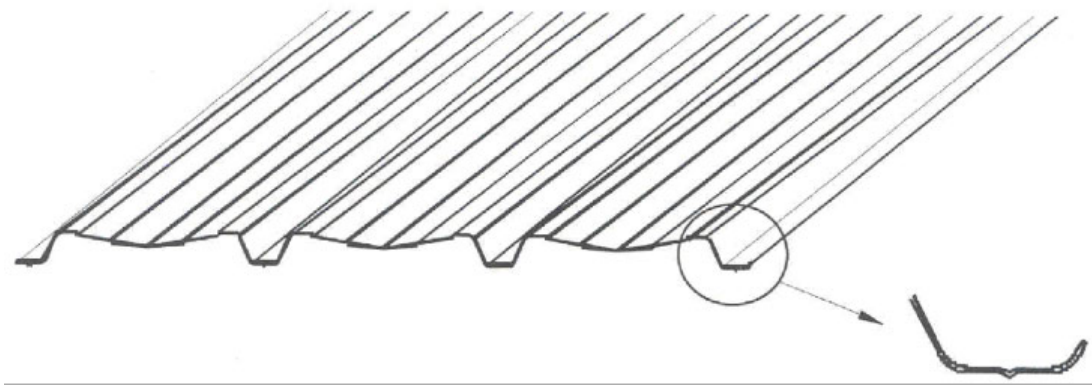
NOTE: All drill shavings need to be removed from the panel.



Position of Panels for Stack Drilling

Panels are normally stack drilled, 6 to 8 panels at a time. Do not drill more than 8 panels due to alignment of hemmed edge! Panels should be stacked so the bottom end is in near perfect alignment. When re-stacking panels do not slide panels from the bundle to avoid scratching the finished surface.

NOTE: Refer to instalation drawing for the hole location information. Measure all the holes from the same end of the panel.



Determining Bottom Edge of Panel

The panel end condition holes are laid out on a panel to prepare a drilling template. Paneling installation drawings will show the specific hole location dimensional information.

Determine the distance the bottom set of holes are from the end of the panel. This becomes the 'gauge' end of the panel and all other dimensions should be taken from this end or line of holes.

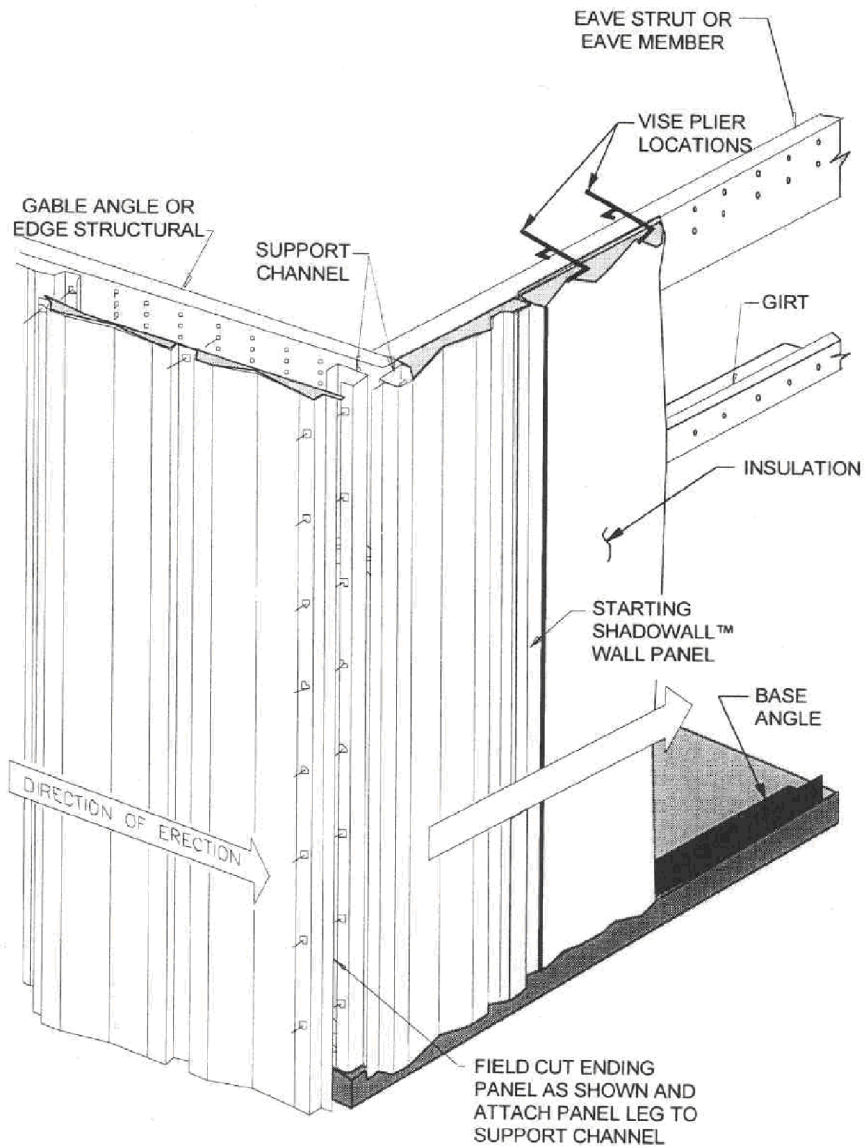
Holes are located in the center of each corrugation. Hole location dimensions are shown on the paneling installation drawings. To assure drilling accuracy, center punch the hole locations before drilling. Panel-to-panel sidelap holes should be marked on the template panel in a similar manner. Uniform location of fasteners is assured and the probability of the underneath corrugation in a wall panel lap rolling away from the drill is reduced. Sidelap holes are pre-drilled on only the overlapping corrugation (the corrugation without the lip).

Fasteners

Panel fasteners are dependent upon the thickness of blanket insulation required. (Refer to the planographs). The standard fasteners are located in each corrugation at the secondary structurals and at a maximum of 2'-6" on centers between structurals on intermediate sidelap fastening.

Secondary Structurals

It is easier to install the wall panels before the roof panels due to the handling of the insulation. Paneling the wall first eliminates roof traffic distortion of the eave struts.



Wall Panel Installation

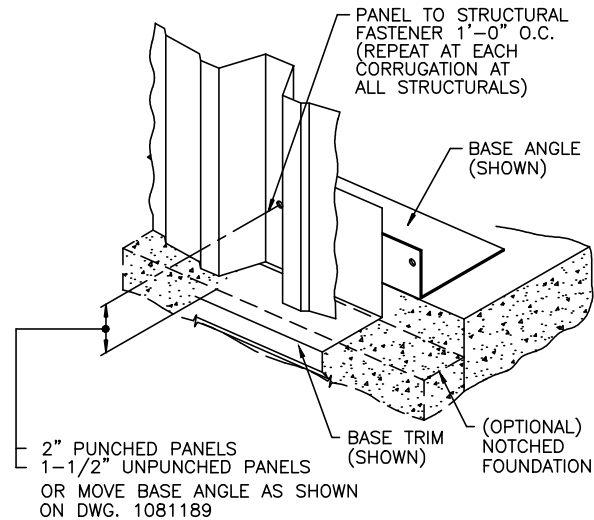
The general practice is to install the Shadowwall wall panels and insulation at the same time, working from left to right. Procedures will vary with the insulation method selected and with the wall base condition option selected. Wall structurals should be aligned in the horizontal position before starting paneling.

Base Conditions

There are five different base conditions available with the Shadowall wall system. Before paneling, determine which condition(s) exist(s).

Metal Closure

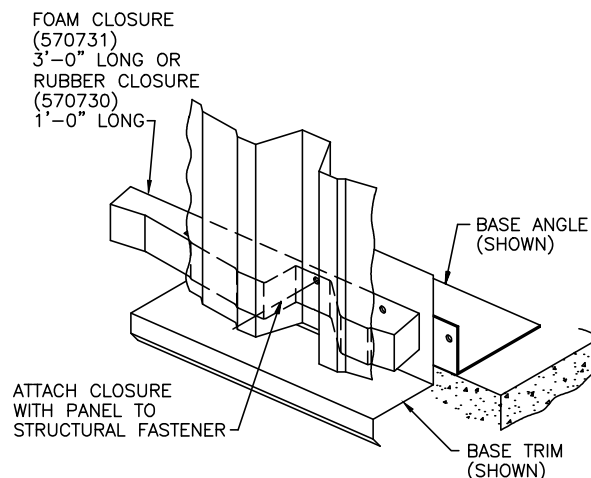
This closure is intended as a vermin closure only and is not effective where a "light-tight" condition is required or where control of air movement is required. This closure may also act as an insulation retainer.



Metal Base Closure Installation

Foam Closure

A foam closure creates a better barrier against light transmission and air movement.



Foam Closure Installation

INSULATION

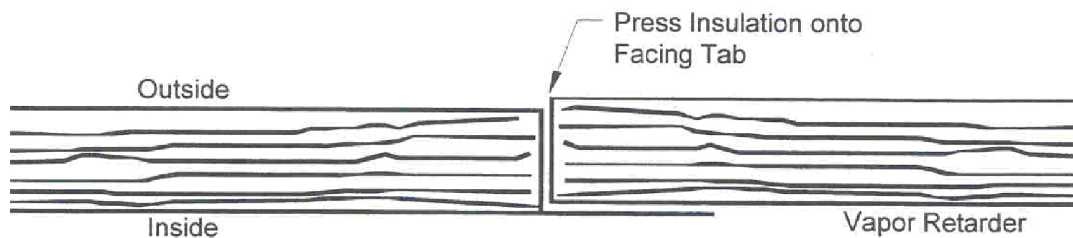
The majority of buildings are insulated. The most common type of insulation used is 3 ft. wide or wider fiberglass blanket in various thickness with a vapor retarder of vinyl, aluminum foil, or a combination of both. Prior to beginning insulating, review the roll lengths furnished. Wall insulation is normally furnished in rolls which are multiples of the wall height and are to be field cut to the required length.

Vapor Retarder

It is essential that the insulation facing provide a continuous membrane to prevent airborne moisture from condensing within the insulation. All insulation joints must be sealed and any facing damage repaired promptly.

Sealing Tabs

The fiberglass insulation facing is available with either a 6" tab on one side or two 3" tabs, one on each side. The tabs may be plain or with factory applied adhesives.



Single Tab Blanket Insulation

The single tab insulation with the factory applied adhesive is protected by a release paper. After the insulation is in place, pull the release paper from the tab and the other facing simultaneously. Use the other hand to press the tab into good contact with the facing and smooth the joint. If the insulation does not have factory applied adhesive, apply adhesive to the tab and press the tab into good contact with the facing and smooth the joint.

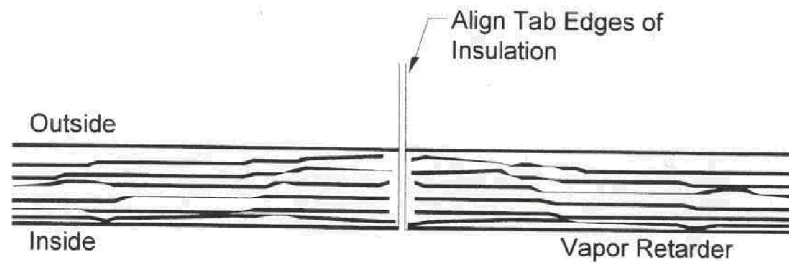


Figure 1

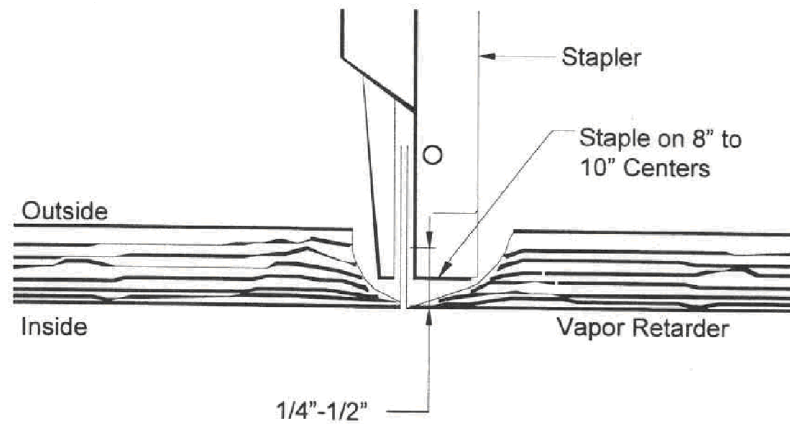


Figure 2

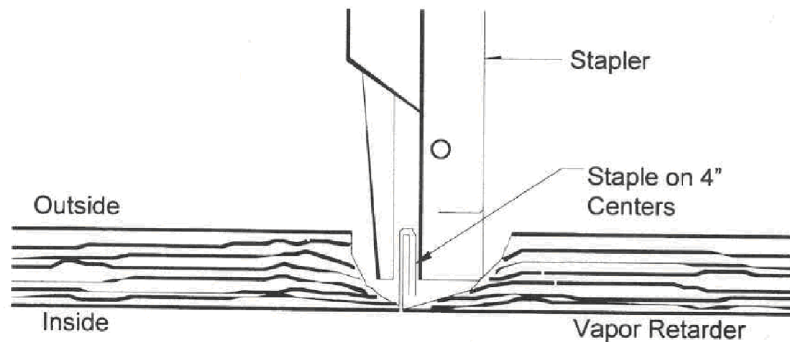
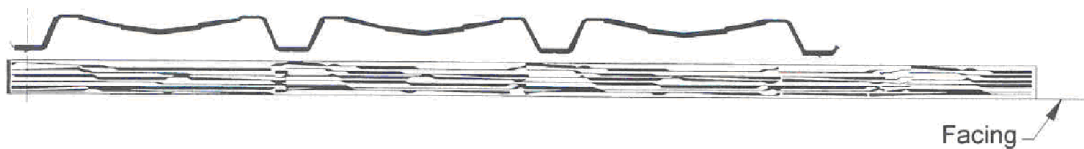


Figure 3

Double Tab Blanket Insulation

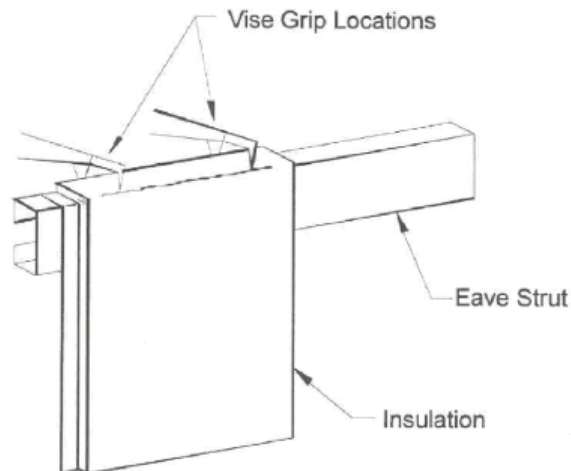
The double, plan 3" tabs are sealed together at the joints by folding and stapling. Stapling is done from the outside as the insulation is applied. Pull the adjoining facing tabs outward at the joint and align the top edges of the two tabs making sure the insulation has no gaps. (Figure 1) Staple the two tabs together approximately 1/4" to 1/2" measuring from the vapor retarder on 8" to 10" centers. (Figure 2) Fold the tab over and staple on 4" centers. (Figure 3)

Installation



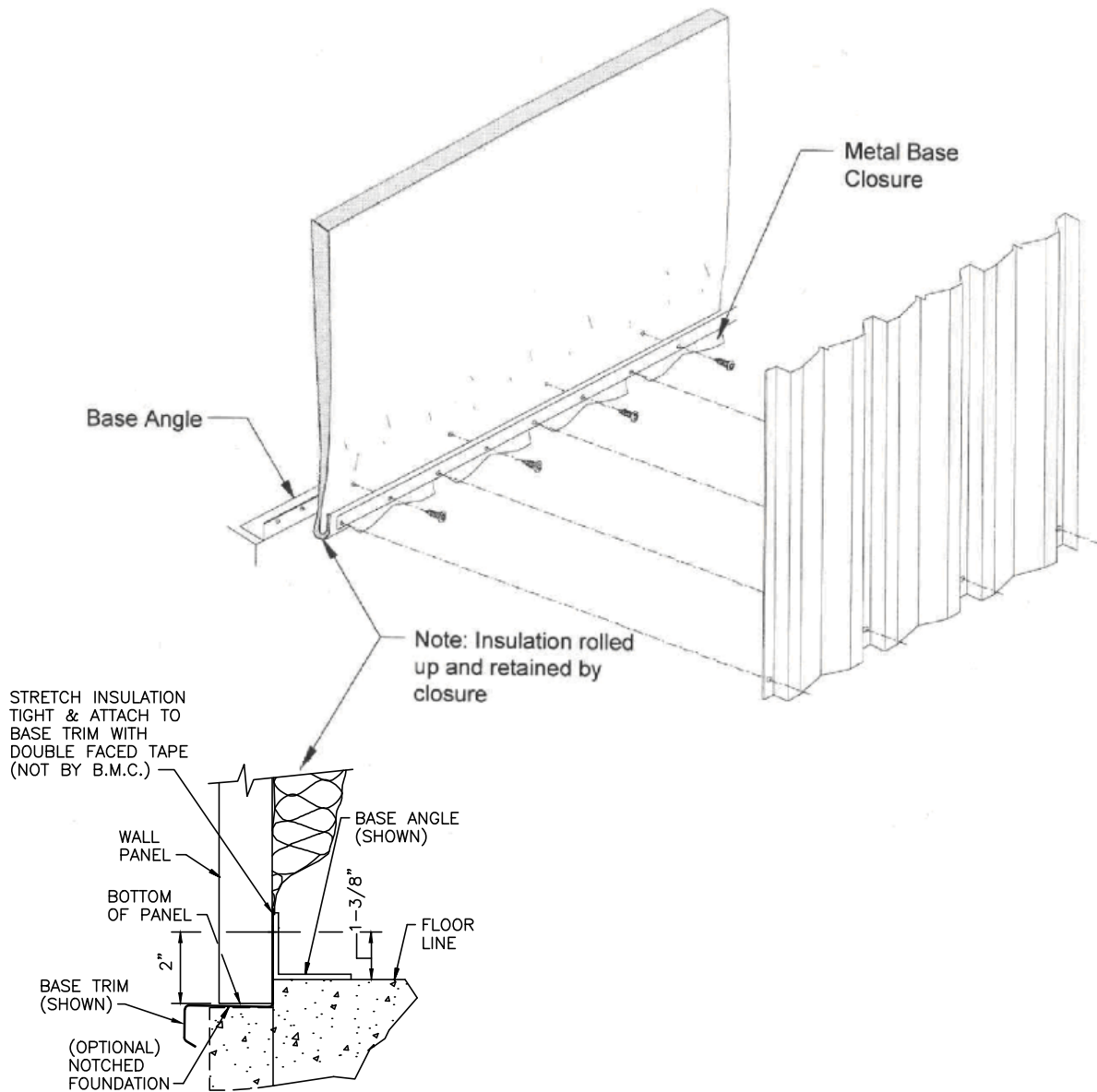
4' Starter Roll of Insulation

Using a 4' wide starter roll offsets the panel and insulation joints. Then continue insulation with the 3' or 6' wide rolls. This keeps the insulation joints 1' ahead of the panel edge.



Temporary Attachment Method

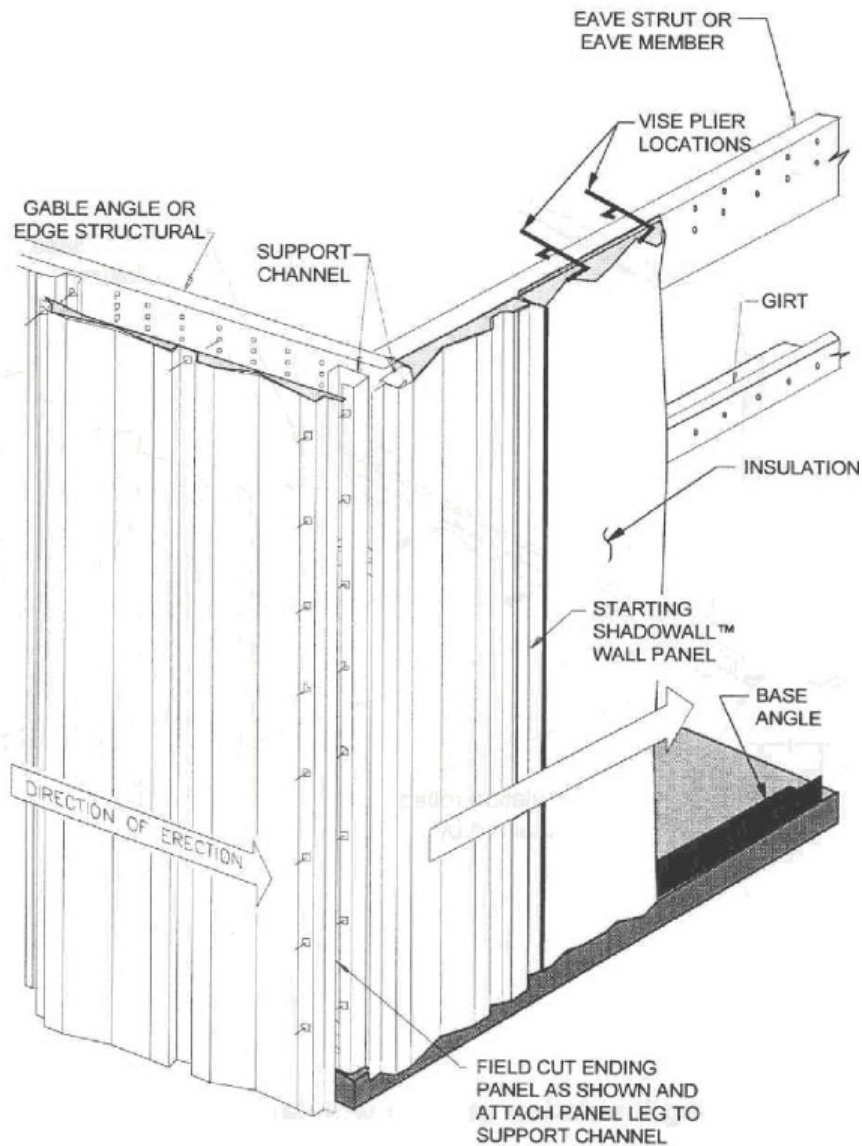
The insulation is retained by installing the base angle, pulling the insulation at the top, and attaching the insulation temporarily to the top of the eave strut. A pair of vise grip pliers or adhesive can be used to hold the insulation in place. It is recommended to trim the insulation around the base angle to prevent wicking.



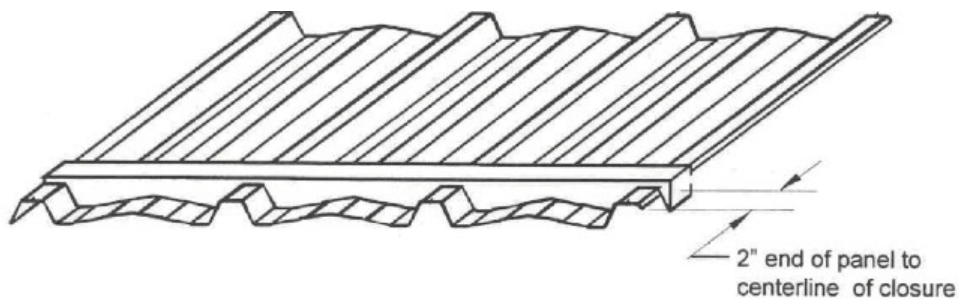
Retaining Insulation at Base with Metal Closure

If the base metal flashing is to be used, it can also be used to retain the insulation. Use the panel fasteners through the base flashing 6" from the corrugation locations.

INSTALLATION



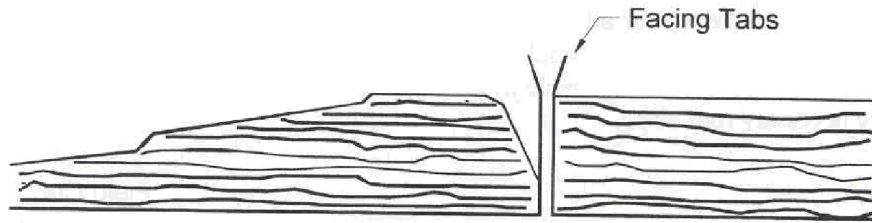
Apply the first panel over the insulation and install the top and bottom panel-to-structural fasteners. If vise grip pliers were used as a temporary attachment, remove them and trim the insulation at the top and bottom. If the base flashing is not used, it is necessary to hold the insulation until the panel is in place.



Foam Closure Installation

If the optional foam closure is used, remove release paper and attach closure to the panel as illustrated.



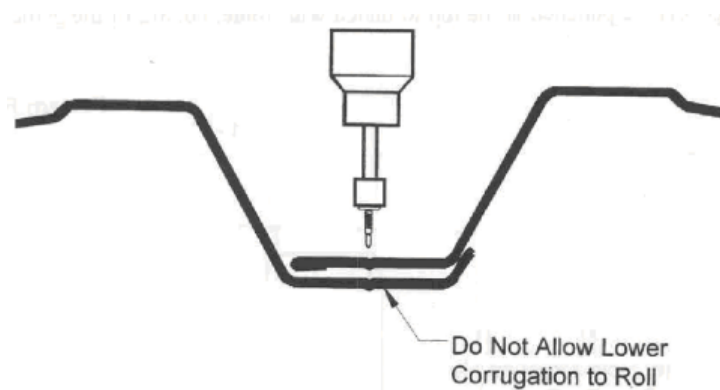


Butting Adjacent Insulation Blankets

Succeeding rows of insulation are attached to the eave strut in the same manner as the first. The insulation blankets are positioned so the insulation butts together. Facing tabs should be sealed according to the insulation installation.

Sidelap

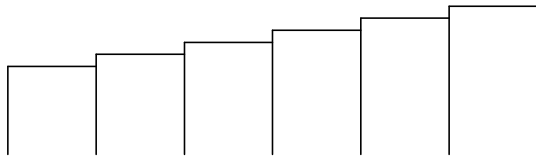
Panel-to-girt and panel-to-panel fastening can be done as the paneling progresses. When installing the sidelap fastener, do not permit the screwgun pressure to push the bottom panel before the fastener penetrates or the resulting hole will not be in the center of the corrugation and an unsightly sidelap can occur.



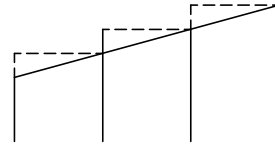
Sidelap Fastener Installation

ENDWALL PANELS

Endwall panels are square cut at the top for all roof panels with a slope less than or equal to 1:12, panel lengths are stepped each 3ft. of width of building. The void in the wall panel created by the step is covered by the gable trim. For greater than or equal to 1 1/2:12 roof slope buildings, it is necessary to cut the top of each panel to match the necessary roof slope.



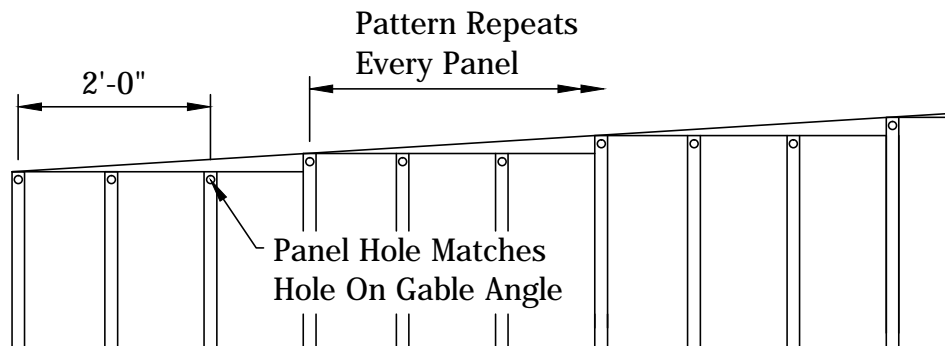
1/2:12 Roof Slope



Greater Than or Equal to
1 1/2:12 Roof Slope

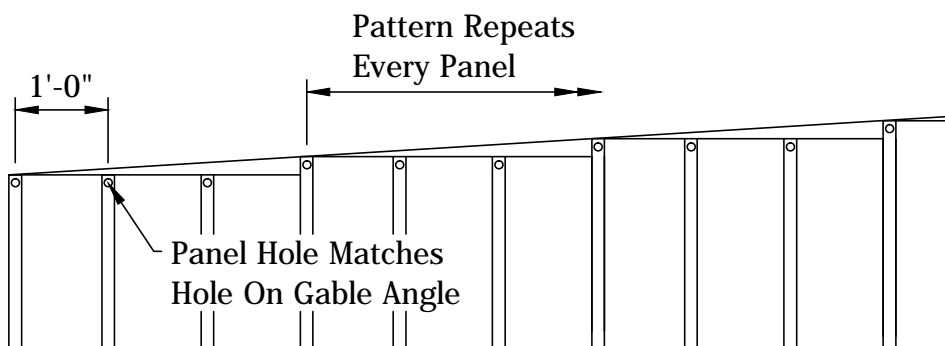
Endwall Panel Variations

Factory punched endwall panels are punched at the top to match with some, not all, of the gable angle holes. Fastening is required on 12" centers.



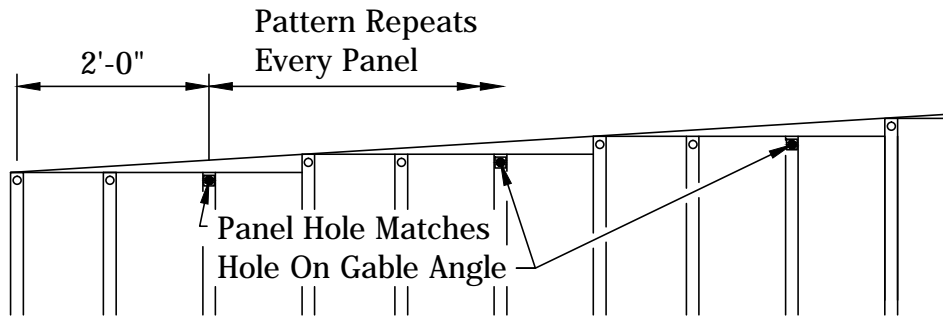
Panel Punching Matching with Gable Angle
1/4:12 Roof Slope

For 1/4:12 slope roof system, only one hole in each panel matches with a hole in the gable angle. Other fasteners are field installed through the panel.



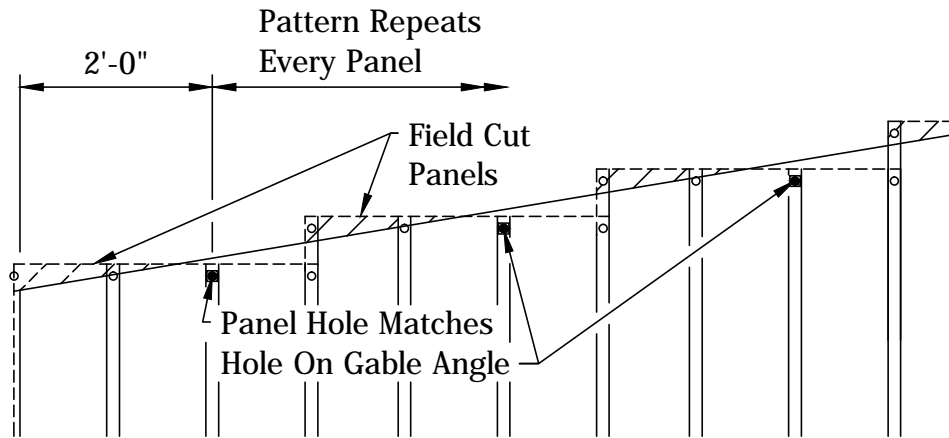
Panel Punching Matching with Gable Angle
1/2:12 Roof Slope

For 1/2:12 slope roof system, only one hole in each panel matches with a hole in the gable angle. Other fasteners are field installed through the panel.



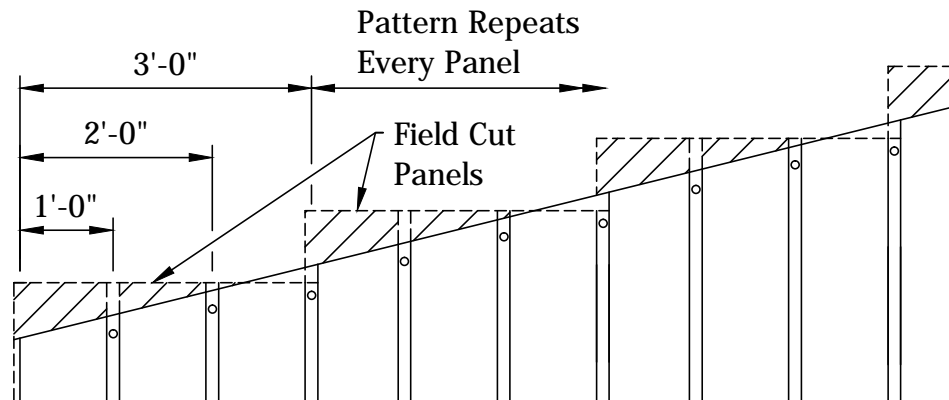
Panel Punching Matching with Gable Angle
1:12 Roof Slope

For 1:12 slope roof buildings one hole in each panel matches holes in the gable angle. Other fasteners are field installed through the panel.



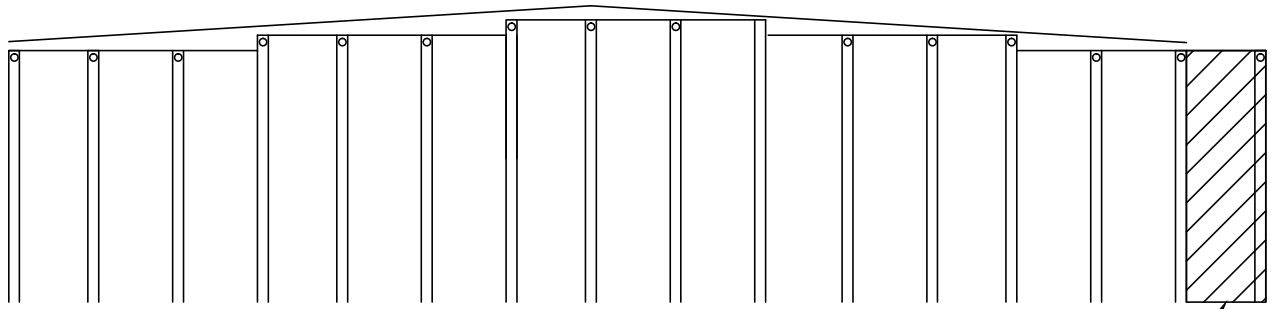
Panel Punching Matching with Gable Angle
2:12 Roof Slope

For 2:12 slope roof buildings one hole in each panel matches holes in the gable angle. Other fasteners are field installed through the panel.



Panel Punching Matching with Gable Angle
4:12 Roof Slope

For 4:12 slope roof buildings no holes in wall panel match holes in the gable angle. All fasteners are field located and installed through the panel.

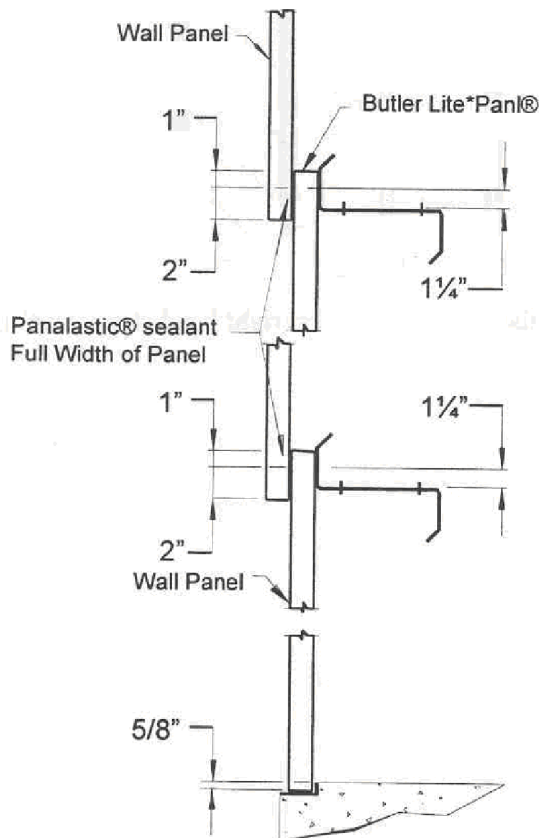


Field Cut

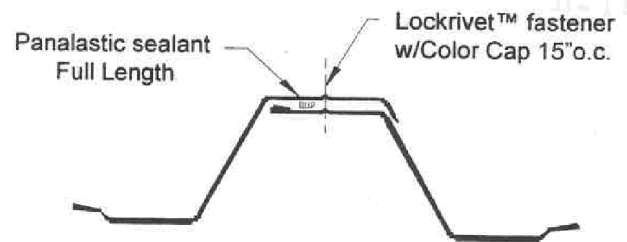
Wall panel direction is left to right. Unless the building is divisible by three feet, field cutting will be required at the right hand corner of wall.

Butler Lite*Panl® Translucent Wall Panel

The installation of a Butler Lite*Panl® translucent unit is similar to the installation of the Shadowwall wall system panel.



Butler Lite*Panl®
Between Wall Panel

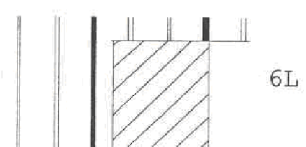
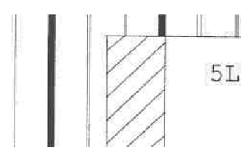
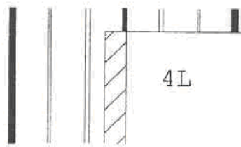
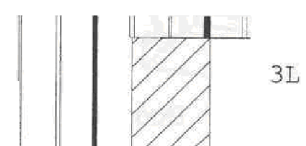
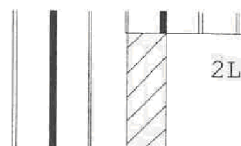
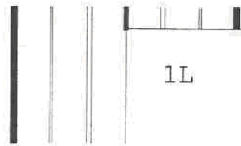


Sidelap Fastener

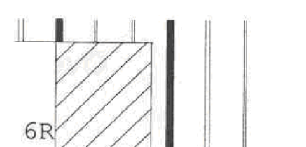
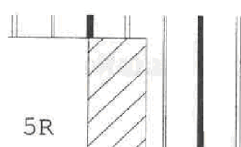
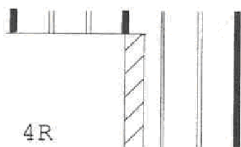
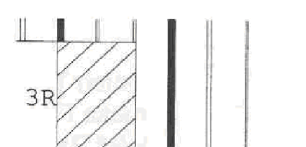
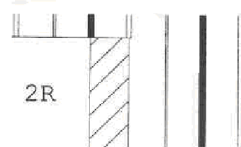
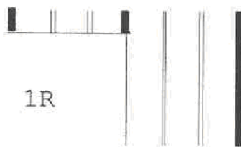
- When Butler Lite*Panl units are required, the panels will be in a separate carton or crate.
- Verify the Butler Lite*Panl unit's locations shown in the wall paneling layout drawing and make adjustments to the owner drawing as required.
- All splices must be located at a joint.
- The direction of installation is in the same direction as Shadow wall panel.

Overhead or Slide Doors

The paneling arrangement around an overhead or slide door is determined by the relative position of the left and right hand edge of the door to a panel sidelap position. Any of the following combinations depicted below are possible. Wall panels at the edge of the door opening must be field cut to clear the door opening and slit to provide for installation of a drip gutter above the door. Panels above the door are constructed by notching the panels beside the door and field cutting short panels between the notched panels.



Left Hand Door

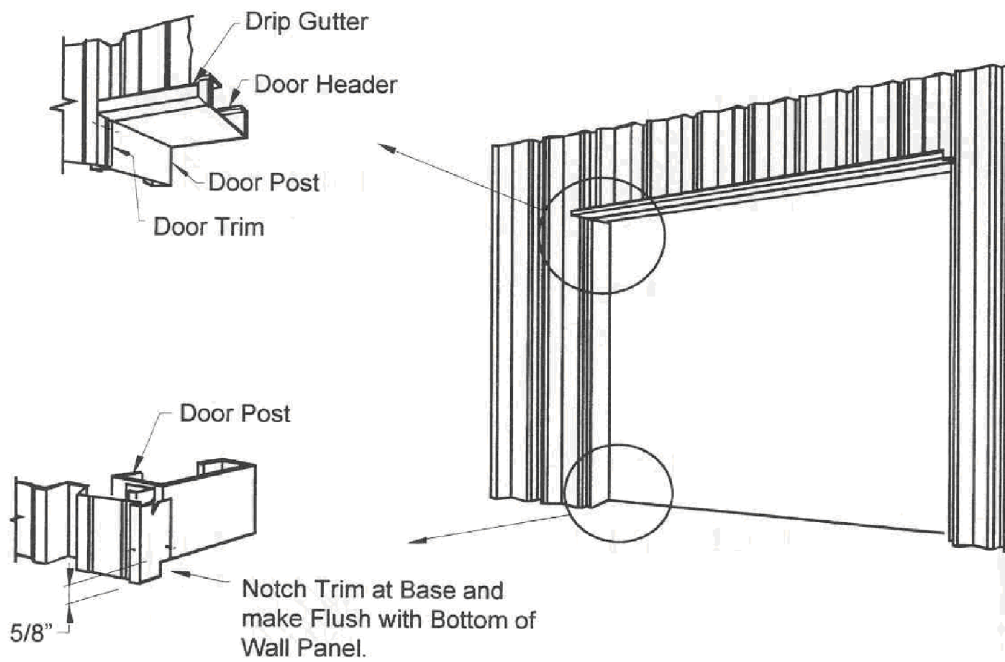


Right Hand Door

Door Paneling Arrangements-Overhead or Slide Door

NOTE: Shaded Area Indicates a Sidelap Hatched Area Indicates Area to be Field Cut

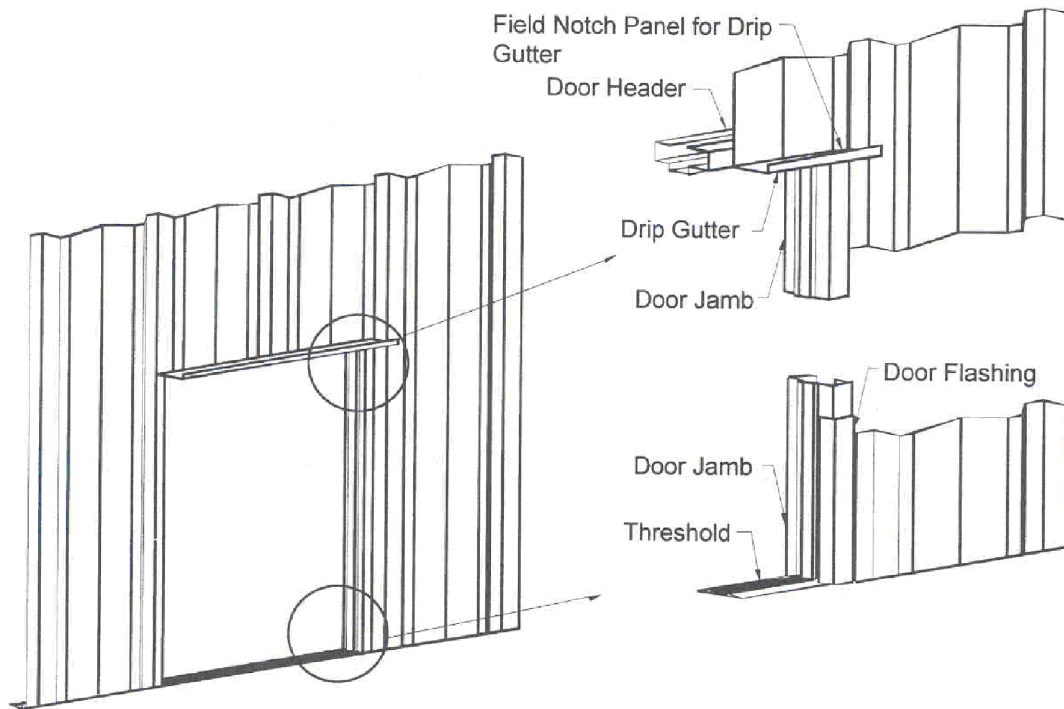
Door structurals must be properly located and the paneling arrangements determined before cutting the panels. Extra panels are not furnished and improper panel arrangements or errors in cutting will result in part shortages. Drip gutters above the door and door post flashings are installed as part of the paneling operations. Door post supports are supplied for off-modularity conditions.



Overhead or Slide Door Installation

Personnel Doors

All panel openings for personnel doors are field cut. Doors should be located so the center line of the door is also the center line between the two corrugations. The 3'-0" and 6'-0" doors are installed with a trim piece. The 3'-8" door is installed over the edge of the corrugation. The hollow metal door framing is usually installed before the panel opening is cut. The cutting can then be matched to the in-place frame making it possible to compensate for minor variations in door locations, plumb of wall etc. Panels are field notched at each top corner for the door to receive the drip gutter.

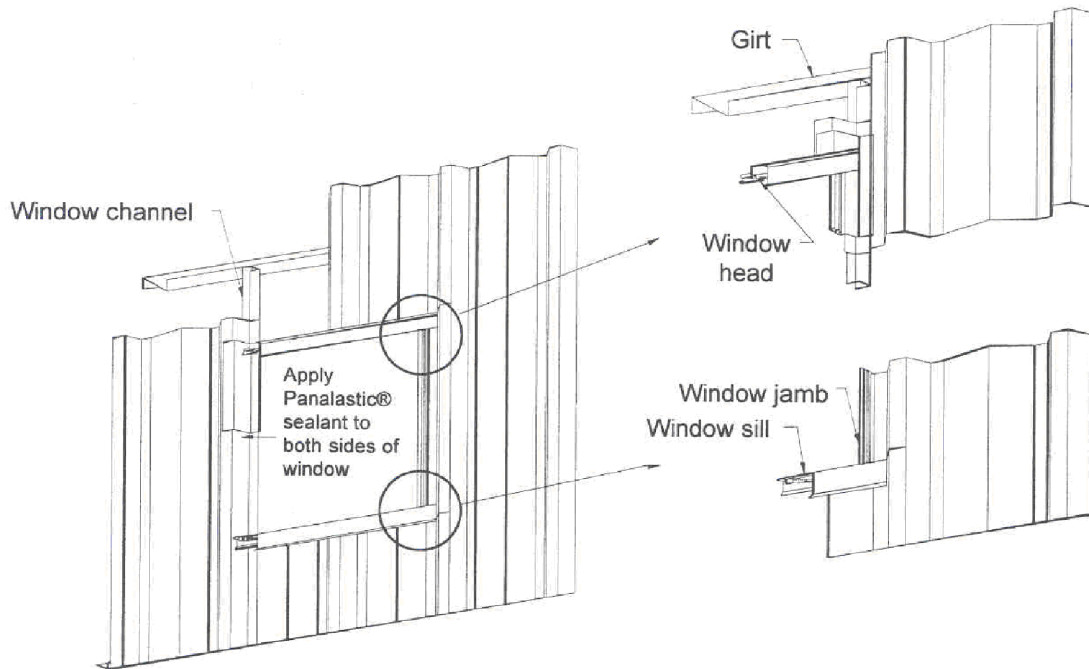


Personnel Door Installation Details

Windows

Windows are field installed on 1'-0" modules. When the required window locations is not on a 1'-0" module, it is necessary to adjust the panels beside the window to keep from notching or backlapping. If notching or backlapping is necessary, be sure you have sufficient panels. Extra panels are not furnished for these adjustments unless specifically ordered with the building.

Panel above and below windows are field cut from full length wall panels. Cutting schedules are shown on the window installation drawings. Dimensions on the drawings are based on the top of the window in line with the personnel doors.



Window Installation Details

Insulation is stretched over the wall structurals in the normal manner. Window support channels are then attached to the wall structurals through the insulation.

NOTE: Window support channels should be installed as the wall paneling progresses.



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