METL-VISION[®] WINDOW SYSTEM FOR HORIZONTAL WALL TECHNICAL BULLETIN



PIONEERING INSULATED METAL PANEL TECHNOLOGY

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ΙΝΤ R O D U C T I O N

Metl-Span[®] has developed the Metl-Vision[®] window system to further complement the exceptional architectural aesthetics and function of Metl-Span's horizontal wall panels.

The Metl-Vision windows are specially designed to provide a fully integrated window system within the horizontal wall, and do so with great flexibility of window size, multiple lite configurations and window finish options.

Included within this technical bulletin is product information and suggested architectural details and installation details for the building designer and erector to use for the understanding and application of the Metl-Vision windows.

This technical bulletin is intended to be used in conjunction with the wall application and installation information in the Insulated Metal Wall Panel Horizontal Application Technical Bulletin which is available from Metl-Span.

The customer is responsible for selecting competent building designers and erectors, and must ensure that the window application is suitable for the specific building and is in accordance with good engineering and construction practices and all applicable building codes and regulations.

Metl-Span does not guarantee, and is not liable for the quality of the building design and erection, and is not responsible for window defects that may be attributed to improper design, erection or negligence by other parties.

Clarifications concerning the Metl-Vision windows should be directed to Metl-Span's Technical Services Department. Contact the Metl-Span office:

1720 Lakepointe Drive, Suite #101 TEL: (972) 221- 6656 FAX: (972) 436-7028 WEB: **metIspan.com**

WINDOW SYSTEM DESCRIPTION

WINDOW FRAME

•Frame Components - each window unit consists of a perimeter frame made of extruded aluminum head, sill and jamb members. For multiple lite windows, the individual lites are divided by extruded aluminum muntins.

•Frame Construction - to assure the rigidity of the window frame, the frame members are joined by flush butting and concealed shear blocks.

•Glazing Provisions - the frame members are designed with glazing pockets, gasket keepers and snap covers for the installation of standard 1" thick glazing material. The window frame is designed for the glazing to be installed from the interior.

•**Thermal Breaks** - the frame members are designed with integral elastomeric thermal breaks to minimize thermal conductance.

•Frame Seals - to assure weathertight performance, the window frames are designed with fully sealed joints, head and sill end dams and weep drainage provisions.

FRAME FINISH OPTIONS

•Anodized - clear, dark bronze or black color

- •Two Coat Painted custom color (primer & Kynar color coat)
- •Three Coat Painted custom color (primer, Kynar color coat & clear coat)
- •Mill Finish bare aluminum

WINDOW SIZE LIMITATIONS

•Window Height - because the window unit's head and sill are integrated into the horizontal wall panel joints, the window height must be in increments matching the wall panel widths. Standard wall panel widths are 24", 30" & 36" and custom widths are available between 24" & 36". Maximum window height is 20'; maximum lite opening is 6'. Greater heights will require factory approval.

•Window Width - the window unit's jambs may be located to coincide with a vertical wall panel joint, or may be located away from the vertical wall panel joints. When located away from a vertical joint, the minimum distance between the window jamb and the vertical joint is 12". The window unit's head and sill members may be spliced to provide windows wider than 20'.

•Load/Span Limitations - the maximum allowable window unit size and muntin spacing is determined by the load/span capability of the window support framing and the load/span capability of the muntins. For specific window frame design requirements, reference the Design Data section of this technical bulletin.

•Maximum Lite Size - within a maximum height limitation of 6', the maximum individual lite height and width is determined by the load/span and deflection capability of the glazing material. Refer to the glazing material manufacturer's specifications and instructions for the specific glazing design requirements.

WINDOW SYSTEM DESCRIPTION (cont.)

WINDOW TO WALL ASSEMBLY

•Erection Sequence - the assembled window frame is designed to be installed in sequence with the wall panel installation.

•Support Framing - the window assembly is designed to be supported by interior mounted support framing. The support framing design and material is not provided by Metl-Span. For support framing design requirements, reference the Design Data section of this technical bulletin.

•Window Projection - the window frame is 4" deep, and is designed to fit flush with the exterior face of the wall panels.

•Head & Sill Fit - the window frame is designed so the head and sill members interlock into the tongue & groove edges of the wall panels above and below the window.

•Jamb Fit (at vertical wall joint) - the window frame is designed for the continuation of the wall panel's vertical joint gasket between the window's jamb member and the end folds on the adjacent wall panels.

•Jamb Fit (away from vertical wall joint) - the window frame is designed for the application of a backer rod and joint sealant between the window's jamb member and the end folds on the adjacent wall panels.

WALL PANEL REQUIREMENTS

•Panel Type & Thickness - the window frame is designed for installation with 2" and 3" thick horizontal wall panels.

•Side Panels - rather than having to field cut the wall panels for the window opening, the window frames are designed for use with side panels that are factory cut and end folded. The minimum length of wall panels with end folds is 12".

•**Panel Joint Reveal** - The window frame is designed for installation with wall panels that have a horizontal joint reveal of 1/2".

Note: although panels with joint reveals greater than 1/2" may be used, such reveals will not match the 1/2" reveal between the window unit's head and the above window panel.

WINDOW PERFORMANCE

•Air Infiltration - multiple lite windows were tested in accordance with ASTM E283-99. At 6.24 psf air pressure (equivalent to 50 mph wind velocity), the measurable air infiltration rate was 0.05 cfm/ft².

•Water Infiltration - multiple lite windows were tested in accordance with ASTM E331-00. At 12.0 psf air pressure (equivalent to 69 mph wind velocity), there was no water leakage.

WINDOW SYSTEM DESCRIPTION (cont.)

•Uniform Load Deflection - multiple lite windows were tested in accordance with ASTM E330-02. At 30 psf positive & negative air pressure, the window assembly deflection did not exceed L/175. At 45 psf positive & negative air pressure, permanent set of the window assembly did not exceed 2%.

WINDOW ASSEMBLEY OPTIONS

•Factory Assembled - the window frame is factory assembled and shipped to the job site ready for field installation into the wall assembly.

•Factory Engineered - the window frame components are factory fabricated and shipped to the job site for field assembly prior to installation into the wall assembly.

•**Components Order** - the window frame components are shipped in stock lengths for field fabrication and field assembly prior to installation into the wall assembly.

•Glazing Components - the window units are field glazed. A glazing components package is available as an option with any of the above window frame options. The glazing components include the necessary setting blocks and chairs, foam backers and dams, glazing gaskets and tapes.

•Installation Drawings - submittal drawings and installation drawings will be available for the "Factory Assembled" and "Factory Engineered" window options.

•Assembly Instructions - a window assembly manual will be provided for the "Factory Engineered" and "Components Order" window options.

WINDOW DESIGN DATA

SUPPORT FRAMING

The window's perimeter frame members (head, sill and jambs) and the perimeter of the wall panel opening are supported by the window's support framing. The support framing design and material is not by Metl-Span.

When subjected to the project's design load, the window's support framing must be capable of supporting the window assembly without exceeding a deflection of L/175 or 3/4", whichever is less. Refer to the project's specifications and code requirements for the applicable safety factor.

The window support framing must provide a minimum 2" and 3" bearing width for the bearing and attachment of the window frame members and the wall panels.

Note: When a window jamb coincides with a vertical panel joint, and/or when the window intersects intermediate wall support members, the respective wall support members must be offset or set back 2 ¹/₄" to clear the window unit's 4" depth. To support the adjacent side panels and above and below window panels, these off-set or set back members must be built-up to provide wall panel support flanges at the wall plane above and below the window opening.

Window Muntins - on multiple lite windows, the horizontal and vertical muntins are not directly supported by the window's support framing. When subjected to the project's design wind load and the gravity load of the glazing, the deflection of the window muntins must not exceed L/175 or ³/₄", whichever is less.

The vertical muntins span between the window's head and sill. The horizontal muntins span between the window jambs and/or the vertical muntins. Vertical muntins must be capable of spanning the full window height without exceeding the allowable deflection. Horizontal muntins must be capable of spanning the allowable deflection.

The horizontal muntins must also be capable of supporting the weight of the glazing above the muntin without exceeding the allowable deflection.

WINDOW DESIGN DATA (cont.)

STRUCTURAL ANALYSIS

For the specific window applications, a structural analysis will be required to determine the maximum allowable muntin spans. Following are the window muntin section properties:

| Horizontal Muntin "I" factor - X: 2.9149 | Vertical Muntin "I" factor - X: 2.5313 |
|--|--|
| Y: 1.4691 | Y: 0.6745 |

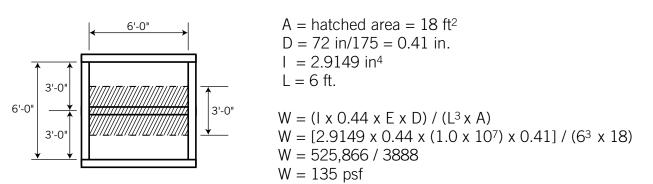
Note: The X values may be used for determining allowable horizontal and vertical muntin spans relative to wind loads. The Y values may be used for determining the allowable horizontal muntin span relative to gravity loads.

Following are example formulae and calculation for determining allowable muntin spans relative to wind loads.

- I "I" Factor X or Y (in⁴)
- W Wind Pressure (psf)

- $I = (0.44 \text{ x E x D}) / (W \text{ x } L^3 \text{ x A})$ $W = (I \text{ x } 0.44 \text{ x E x D}) / (L^3 \text{ x A})$
- essure (pst)
- A Tributary Area (ft²)
- E Modules of Elasticity (1.0 x 10⁷ psi)
- D Allowable Deflection (lesser of 3/4 in. or L/175 in.)
- L Muntin Span (ft.)

Example: Evaluate allowable wind pressure for horizontal muntin:



ARCHITECTURAL DETAILS

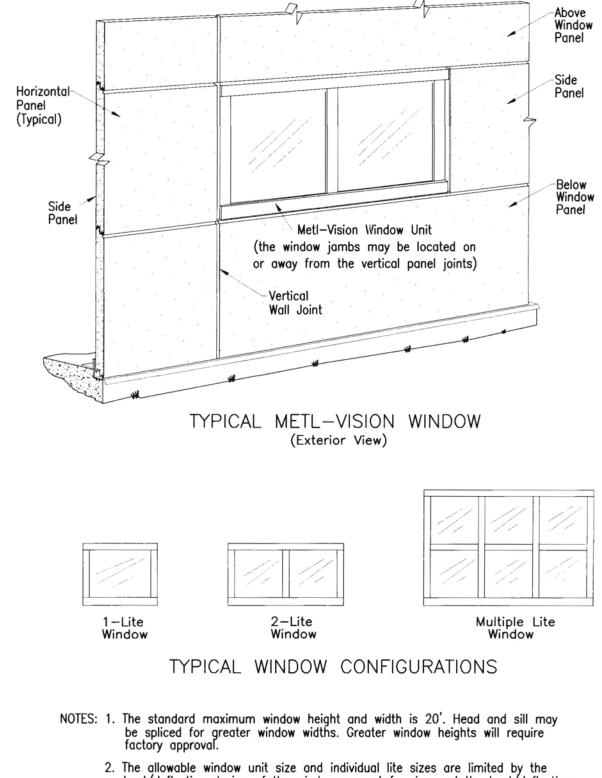
Following are suggested architectural details for the application of the Metl-Vision Window System.

These details are intended to be used in conjunction with the architectural details in the Insulated Metal Wall Panel Horizontal Application Technical Bulletin which is provided by Metl-Span.

In case of conflict between these details and the specific project's installation drawings, the installation drawings will take precedence.

ARCHITECTURAL DETAILS

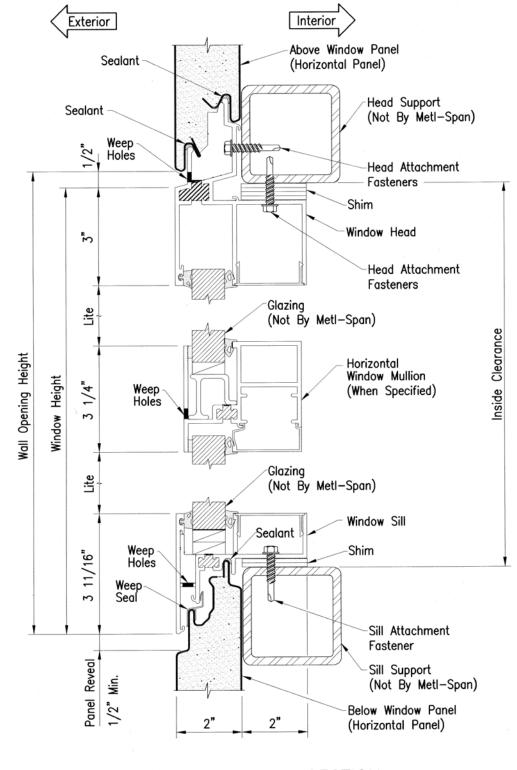
MSS081.501.1



2. The allowable window unit size and individual lite sizes are limited by the load/deflection design of the window support framing and the load/deflection limitations of the window muntins and glazing.

ARCHITECTURAL DETAILS

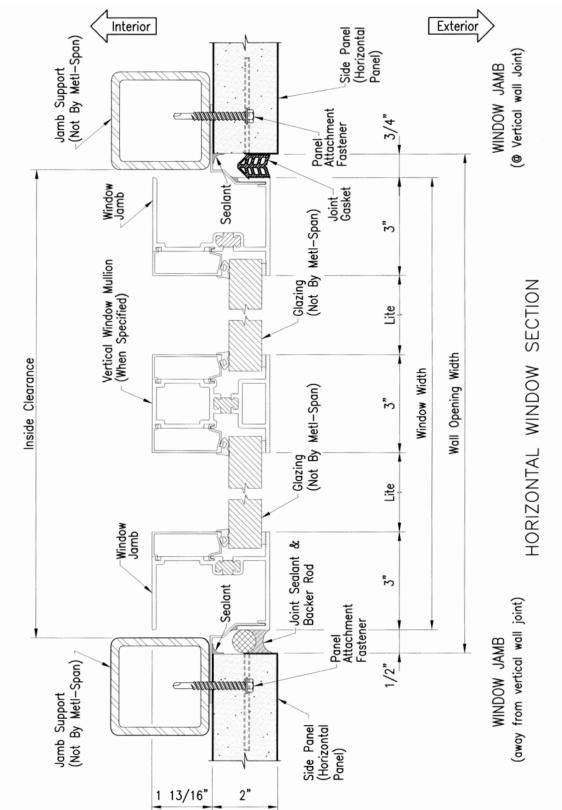
MSS081.502



VERTICAL WINDOW SECTION

ARCHITECTURAL DETAILS

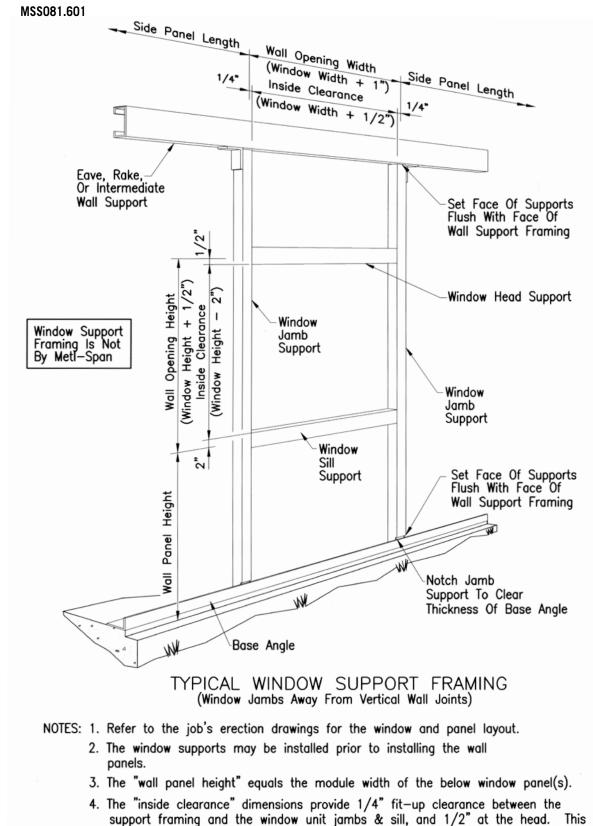
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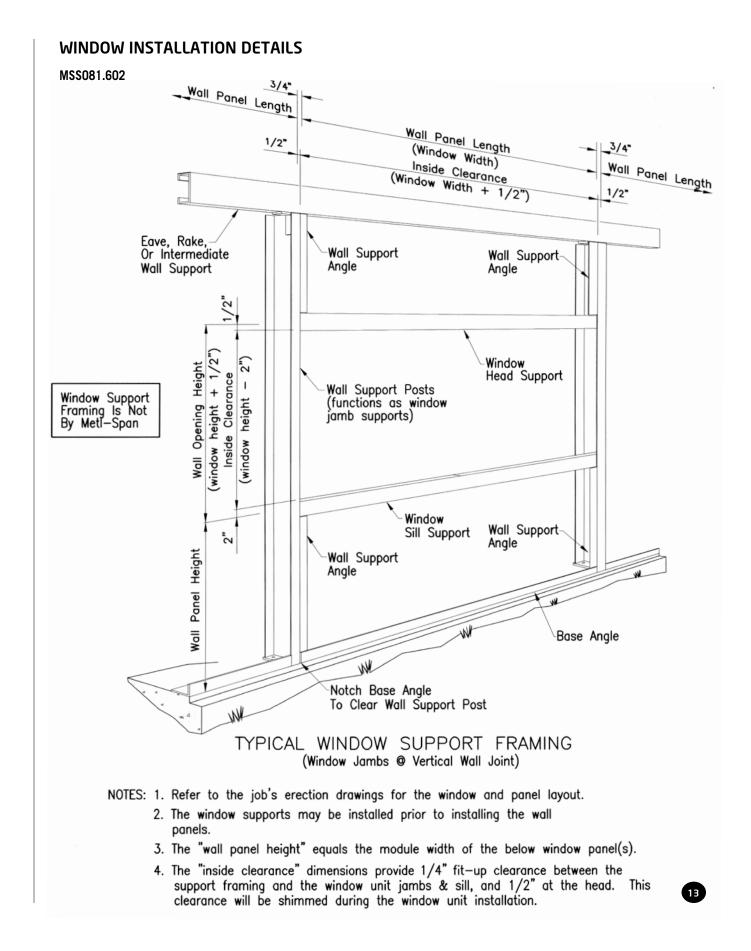


Following are suggested installation details and instructions for the application of the Metl-Vision Window System.

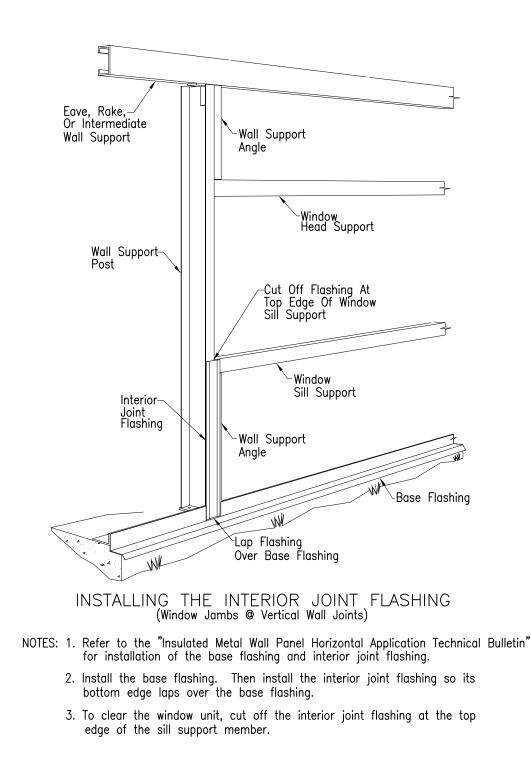
These details are intended to be used in conjunction with the project's installation drawings and the installation details and instructions in the Insulated Metal Wall Panel Horizontal Application Technical Bulletin which is provided by Metl-Span.

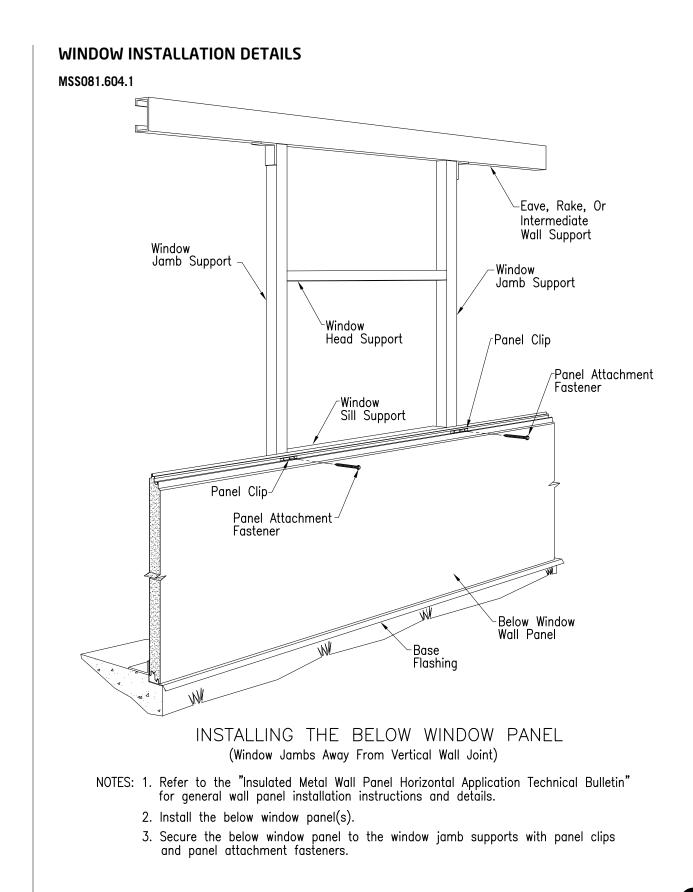
In case of conflict between these details and the project's installation drawings, the installation drawings will take precedence.



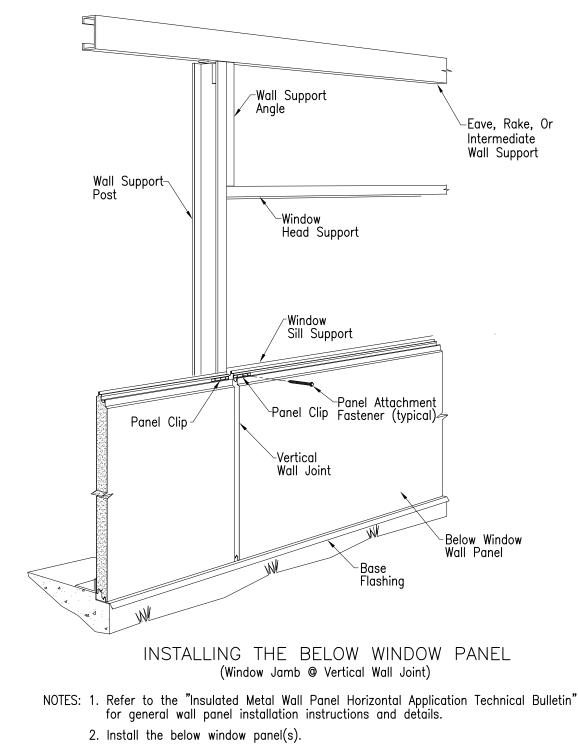


MSS081.620.1



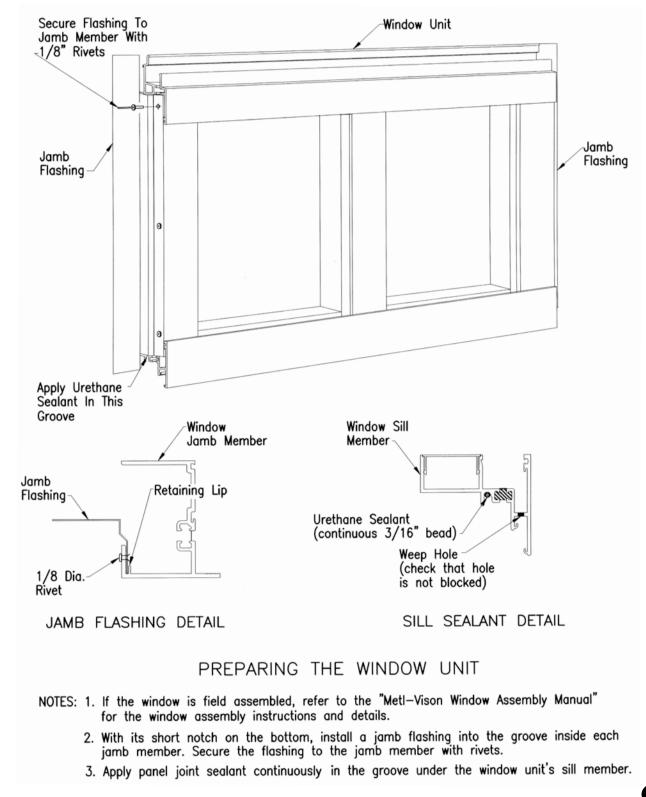


MSS081.605.1



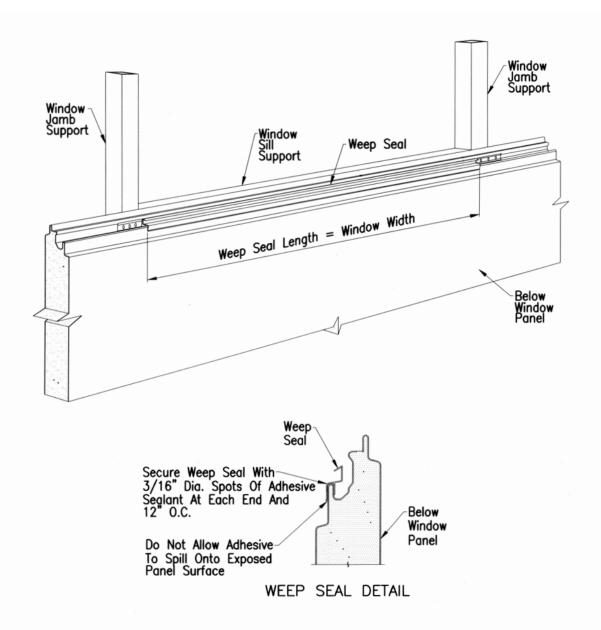
3. Secure the below window panel to the support framing with panel clips and panel attachment fasteners.

MSS081.606



MSS081.607

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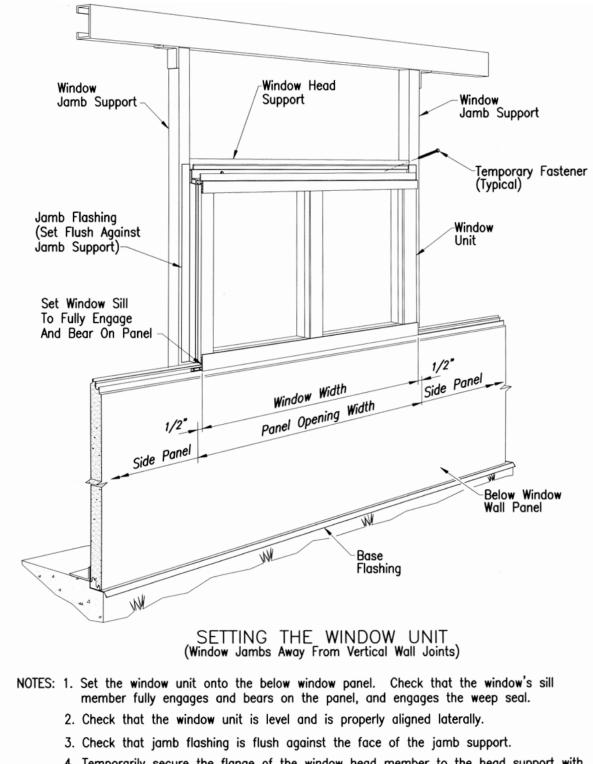


PREPARING THE BELOW WINDOW PANEL

NOTES: 1. Cut the weep seal to a length equal to the width of the window unit.

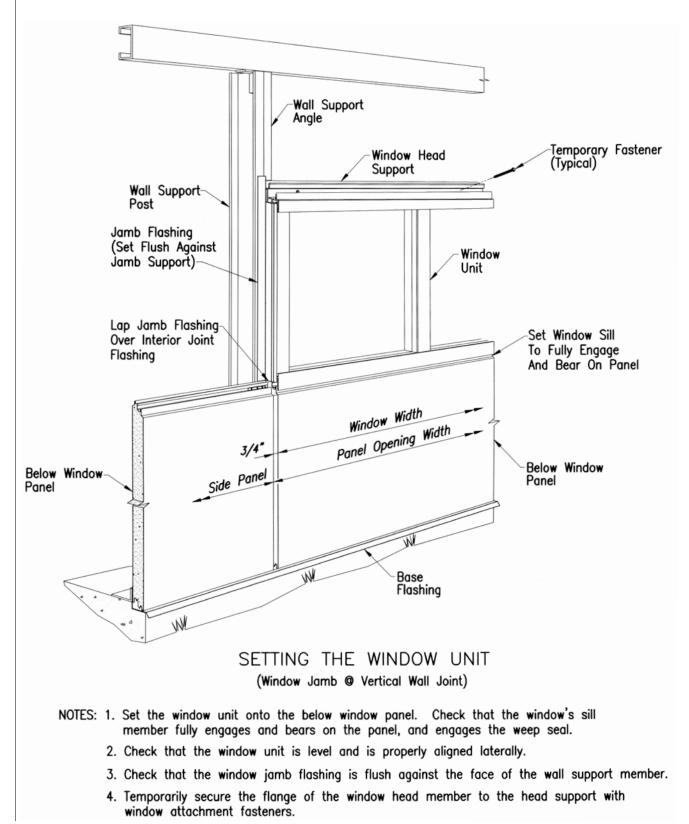
- 2. Apply spots of adhesive sealant in the weep seal's channel at each end and at 12" increments.
- 3. Install the weep seal onto the lip of the below window panel. Check that the weep seal is located to exactly match the window's installed position.

MSS081.608

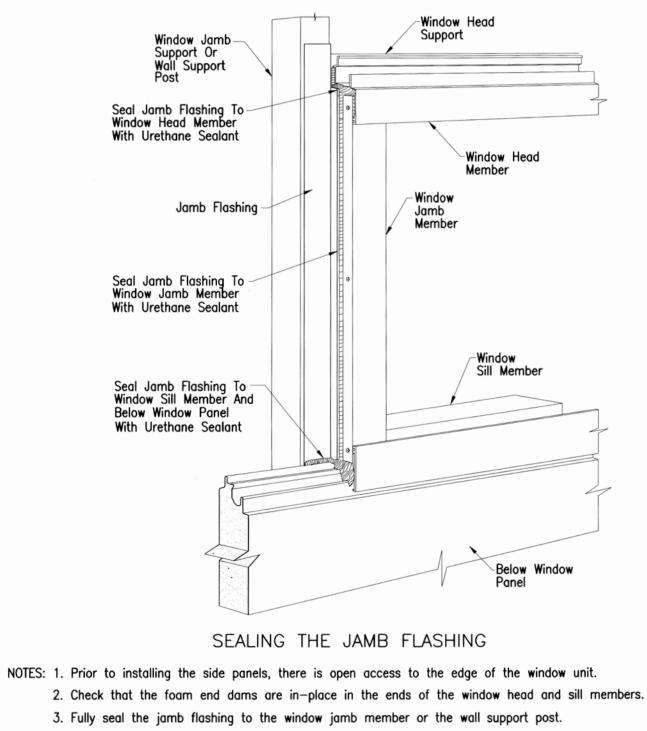


4. Temporarily secure the flange of the window head member to the head support with window attachment fasteners.

MSS081.609

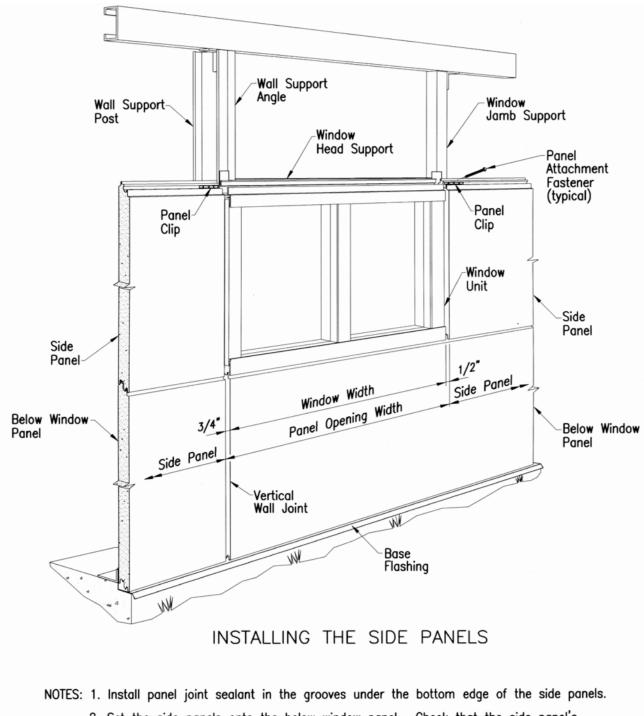


MSS081.610



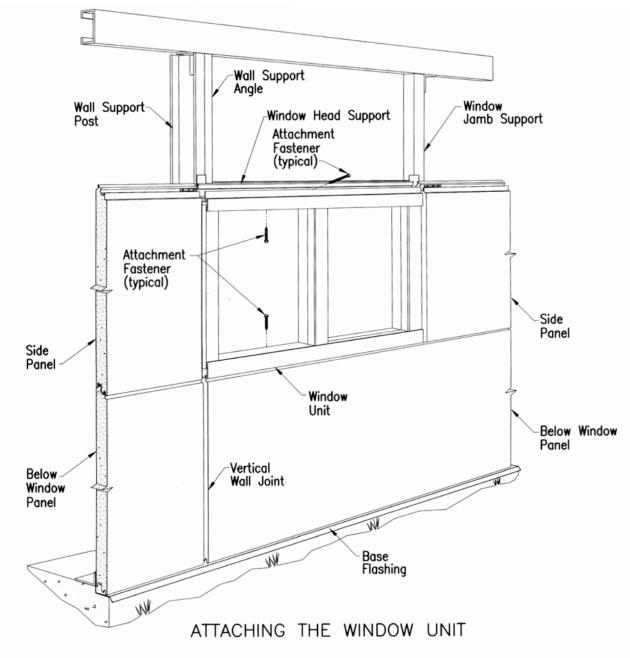
- 4. Fully seal the top end of the jamb flashing to the window head member.
- 5. Fully seal the bottom end of the jamb flashing to the window sill member and to the top edge of the below window panel.

MSS081.611



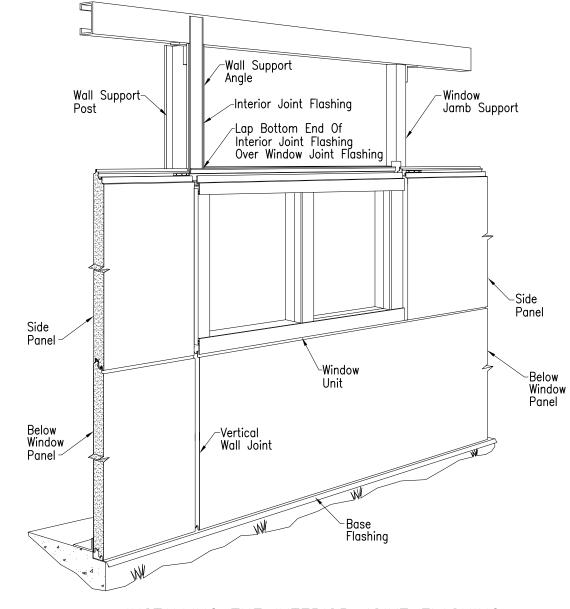
- 2. Set the side panels onto the below window panel. Check that the side panel's bottom edge fully engages and bears on the below window panel.
- 3. Check that the side panel ends are properly aligned laterally.
- Secure the side panels to the support framing with panel clips and panel attachment fasteners.

MSS081.612



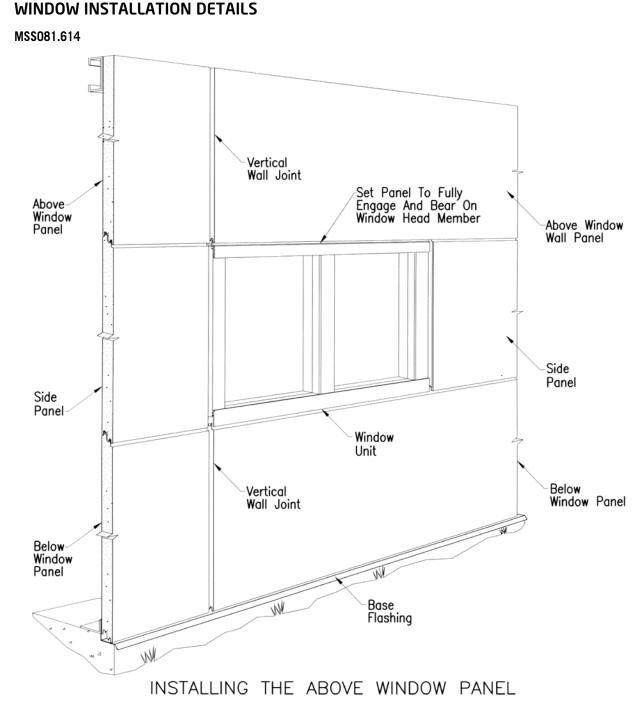
- NOTES: 1. Refer to the project's erection drawings for the specified window attachment fasteners and their required spacing.
 - 2. Check the window unit's lateral alignment between the side panels. If necessary remove the temporary fasteners and reposition the window.
 - 3. Secure the window's head flange to the head support with attachment fasteners.
 - 4. Shim the gaps between the window frame members and the window support framing.
 - 5. Remove the snap covers and secure the window head and sill members to the jamb and sill support members with attachment fasteners.

MSS081.613



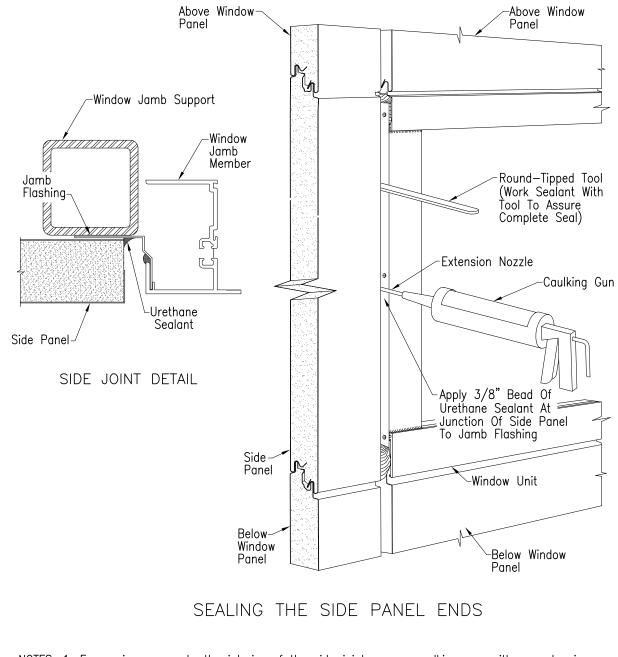
INSTALLING THE INTERIOR JOINT FLASHING

- NOTES: 1. Refer to the "Insulated Metal Wall Panel Horizontal Application Technical Bulletin" for installation of the interior joint flashing.
 - 2. Install the interior joint flashing so its bottom edge laps over the window jamb flashing.
 - 3. To clear the window unit, cut off the interior joint flashing at the bottom edge of the head support member.



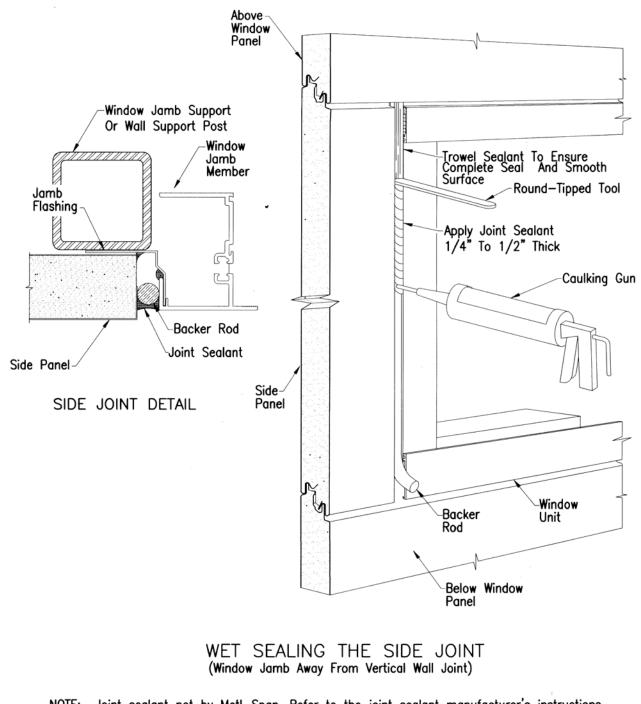
- NOTES: 1. Install panel joint sealant in the grooves under the bottom edge of the above window panel.
 - 2. Set the above window panel onto the side panels and window unit. Check that the panel's bottom edge fully engages and bears on the side panels and the window unit's head member.
 - 3. Check that the panel ends are properly aligned with the adjacent panels.
 - 4. Secure the above window panel to the wall support members with the specified panel clips and panel attachment fasteners.

MSS081.615.1



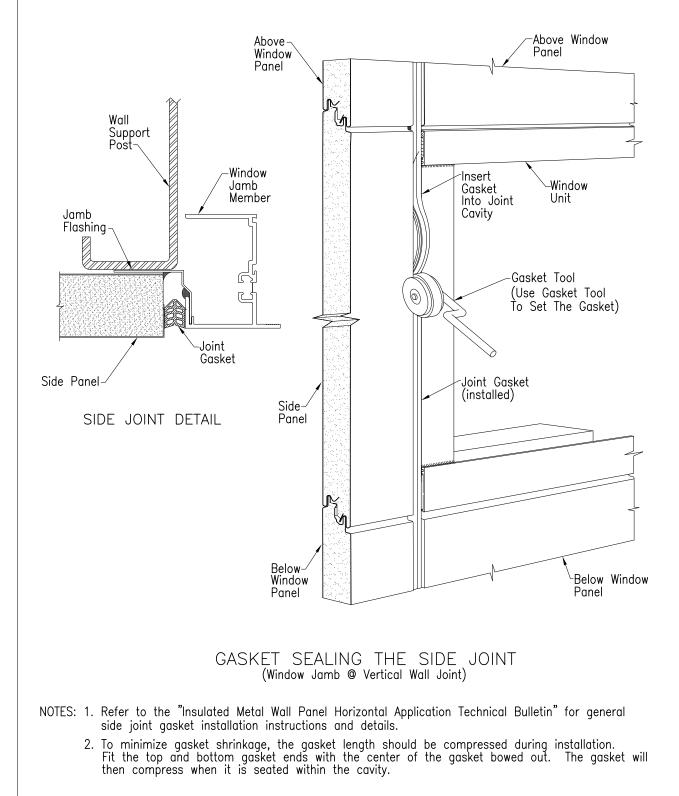
- NOTES: 1. For easier access to the interior of the side joint, use a caulking gun with an extension nozzle.
 - 2. Fully seal the interior edge of the side panel to the jamb flashing.
 - 3. Fully seal the top and bottom ends of the jamb flashing to the top edges of the above window panel and below window panel.
 - 4. Work the sealant with a round tip tool to ensure a complete seal.
 - 5. Refer to the "Insulated Metal Wall Panel Horizontal Application Technical Bulletin" for sealing instructions above and below the window.

MSS081.616

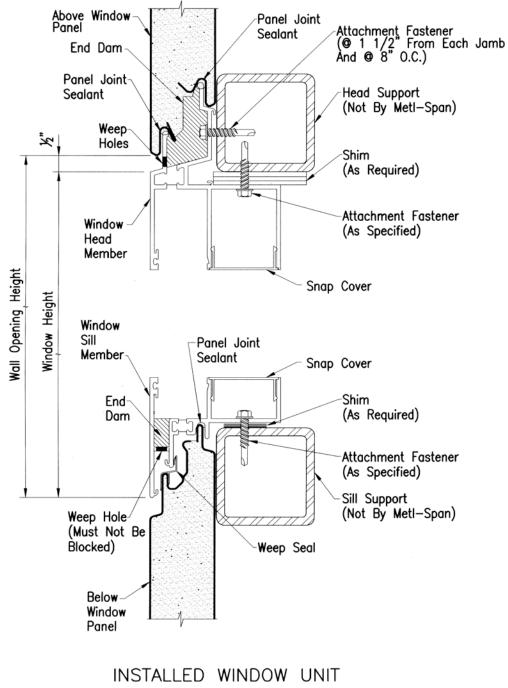


NOTE: Joint sealant not by Metl-Span. Refer to the joint sealant manufacturer's instructions for backer rod and sealant installation requirements.

MSS081.617.1

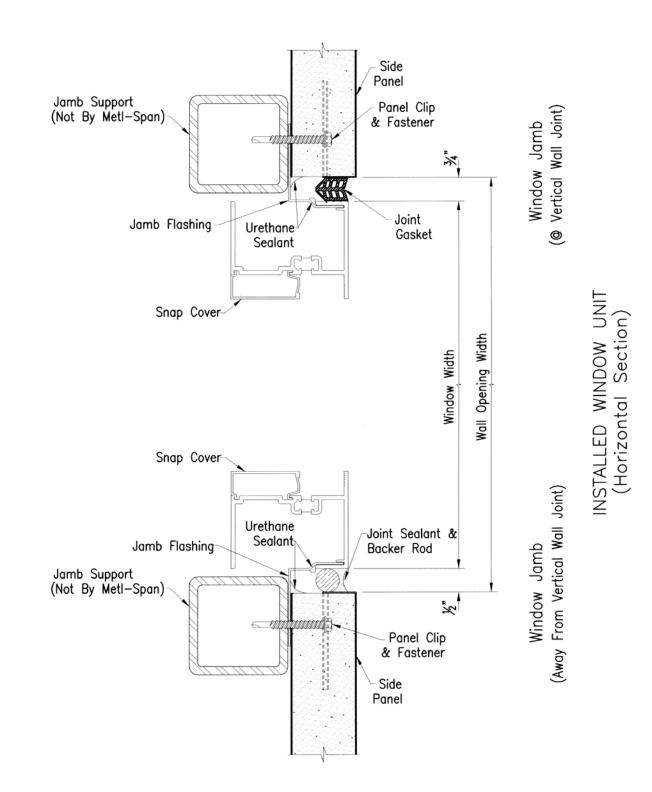


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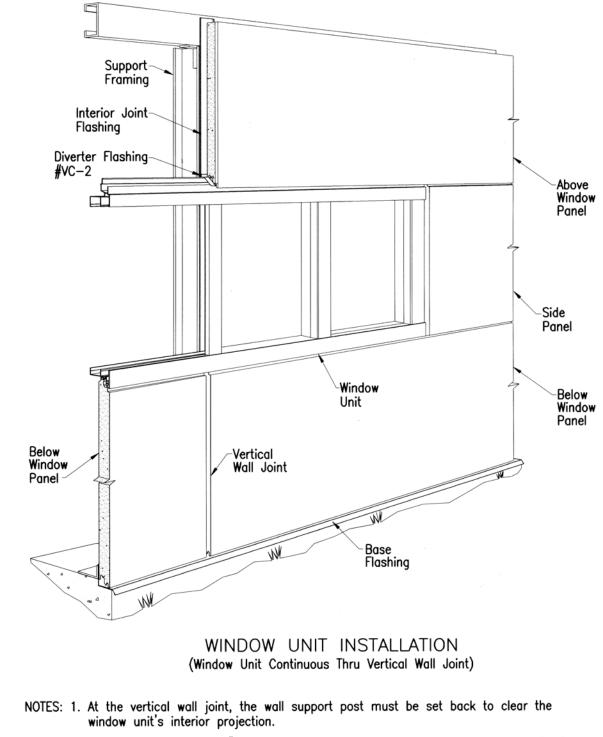


(Vertical Section)

MSS081.619



MSS081.623



- 2. Install diverter flashing #VC-2 into the interior joint flashing. Position the diverter flashing over the window head member to divert potential water in the wall joint to the outer surface of the head member.
- 3. Seal the diverter flashing to the foam core of the adjacent panels with urethane sealant. See panel installation details for additional information.

GLAZING INSTALLATION

Following are suggested installation instructions and details for the field application of glazing within the Metl-Vision window frames.

These instructions and details are intended to be used in conjunction with the project's specifications and installation drawings. In case of conflict between these details and the project's specifications and drawings, the project specifications and drawings will take precedence.

GLAZING INSTRUCTIONS

Prior to the glazing installation, the window frame and glass must be thoroughly cleaned and free of any contaminants or shavings in areas requiring glazing materials and sealant.

Reference the glazing details on the pages following these glazing instructions.

1. Apply ¹/s" x ³/s" pre-shimmed glazing tape to the exterior glazing leg at the vertical muntins and jambs. At horizontal muntins, apply glazing tape to upper and lower exterior glazing legs. At corners where vertical and horizontal glazing tapes meet, butt the tapes together to eliminate any gaps.

2. Pre-cut lengths of TREMCO sponge gasket #TR-538N and apply to glazing leg at head and sill.

3. At corners where gasket meets glazing tape, pull back gasket and apply "DOW 795" or equivalent sealant at corner and push gasket back into position. (This will form a seal where the two meet).

4. At sill, place two 3/8" setting blocks atop each other at 1/4 points. Assure that weep holes are not covered.

5. At horizontal muntins, place setting blocks on top of MW-1162 setting chairs at 1/4 points.

GLAZING INSTRUCTIONS (cont.)

6. When installing glass into one or two lite windows, the glass must be inserted at the head first, then leaned in on the bottom and set down onto the setting blocks. Be sure to use caution so that the gasket at the head is not displaced when the glass is slid past.

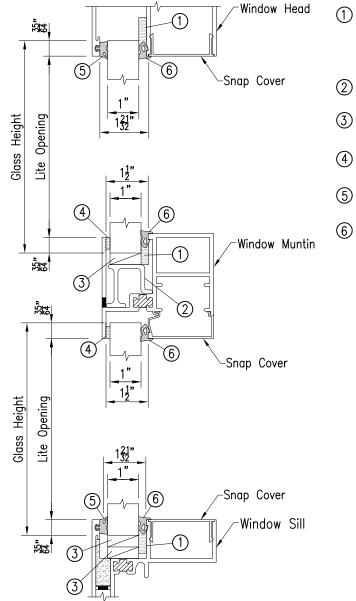
7. When installing glass into multiple lite windows, the upper lite glass must also be inserted at the head first, then leaned in on the bottom and set down onto the setting blocks/chairs on the horizontal muntin. In the lower lites, the glass must be inserted into the sill first and leaned into the horizontal muntin. Use caution not to hit the shear blocks holding the horizontal muntin into place; doing so may result in a broken glass.

8. Insert MW-1186 sponge air dams at the corners of each lite (four per lite) and seal into place with "DOW 795" or equivalent sealant. The air dams control airflow and are very critical in the performance of the windows.

9. Pre-cut and install ¹/₄" TREMCO wedge gasket #TR-643E for final glazing. Horizontal gaskets run through and must be installed first. Roll gaskets into glazing pockets, making sure that corners are mated tightly together. Alcohol may be sprayed on the gasket to ease its installation.

GLAZING INSTALLATION DETAILS

MSS081.621.1



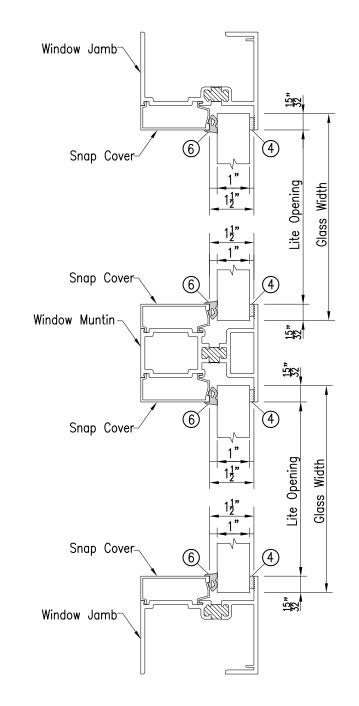
GLAZING LEGEND

- Before interior bead and gasket are installed, airdams MW-1186 (1" X 1"X 1/4") must be installed and sealed into place at all corners of the glass.
- (2) MW-1162 PVC setting block chair. (optional) (4" long)
- (3) Neoprene/EPDM setting or edge block. (80-90 durometer)
- (4) 1/8" X 3/8" butyl glazing tape. (pre shimmed)
- (5) Sponge gasket...TREMCO #TR-643E. (or equal)
- 6 Wedge gasket...TREMCO #TR-538N. (or equal)

GLAZING DETAILS (Vertical Section)

GLAZING INSTALLATION DETAILS

MSS081.622.1



GLAZING LEGEND

- (4) 1/8" X 3/8" butyl glazing tape. (pre shimmed)
- 6 Wedge gasket...TREMCO #TR-538N. (or equal)

GLAZING DETAILS (Horizontal Section)

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PIONEERING INSULATED METAL PANEL TECHNOLOGY



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