

Features

- Trifab® VersaGlaze® 450 is 4-1/2" (114.3) deep with a 1-3/4" (44.5) sight line
- Front, Center, Back or Multi-Plane glass applications
- Flush glazed from either the inside or outside
- Screw Spline, Shear Block, Stick or Continuous Head and Sill fabrication
- SSG / Weatherseal option
- 1/8" (3.2), 1/4" (6.4), or 3/8" (9.5) infill options
- Permanodic® anodized finishes option
- Painted finishes in standard and custom choices

Optional Features

- Profit\$Maker® Plus die sets available

Product Applications

- Storefront, Ribbon Window or Punched Openings
- Single-span
- Integrated entrance framing allowing Kawneer standard entrances or other specialty entrances to be incorporated
- Kawneer windows or GLASSvent® Windows for Storefront Framing are easily incorporated

For specific product applications,
consult your Kawneer representative.

Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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PICTORIAL VIEWS 5-10

CENTER 11

FRONT 22

BACK 37

MULTI-PLANE 45

CHARTS (WINDLOAD, DEADLOAD, END REACTION & THERMAL) 53-72

Metric (SI) conversion figures are included throughout these details for reference. Numbers in parentheses () are millimeters unless otherwise noted.

The following metric (SI) units are found in these details:

- m – meter
- cm – centimeter
- mm – millimeter
- s – second
- Pa – pascal
- MPa – megapascal

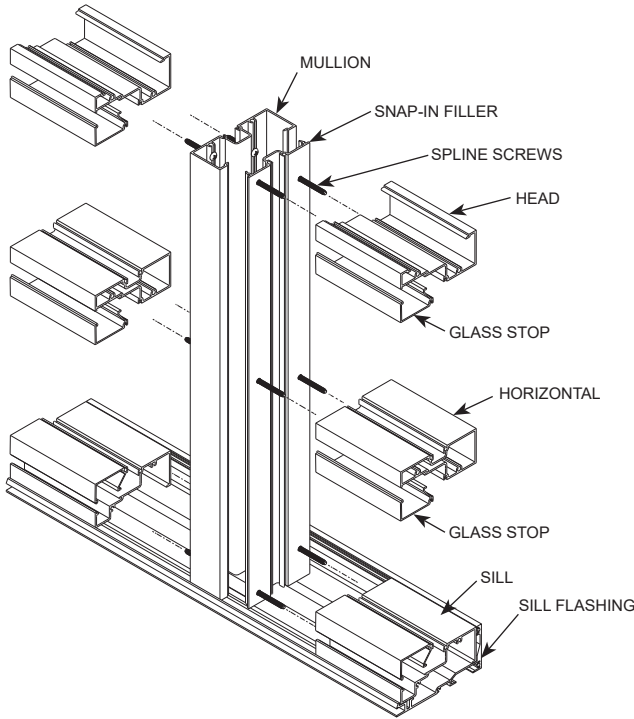
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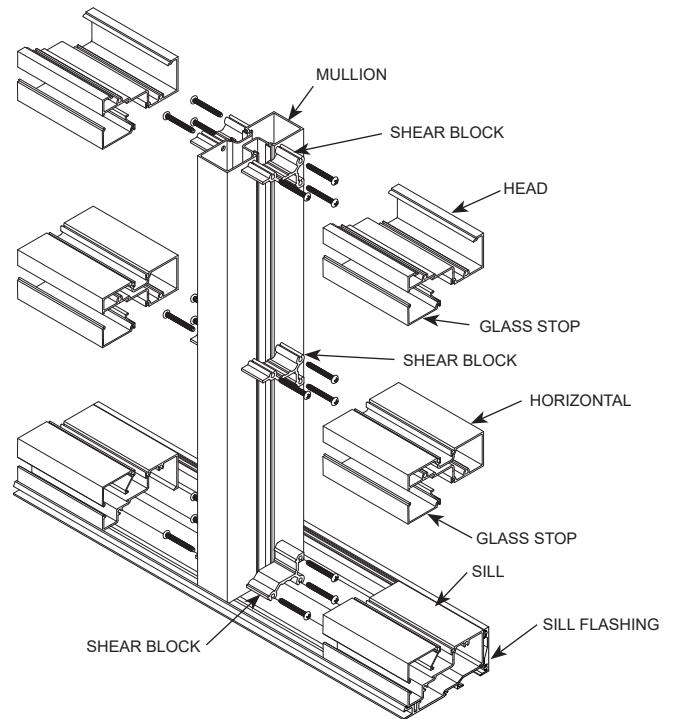
The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The individual units are then snapped together to form a complete frame.

SCREW SPLINE ASSEMBLY

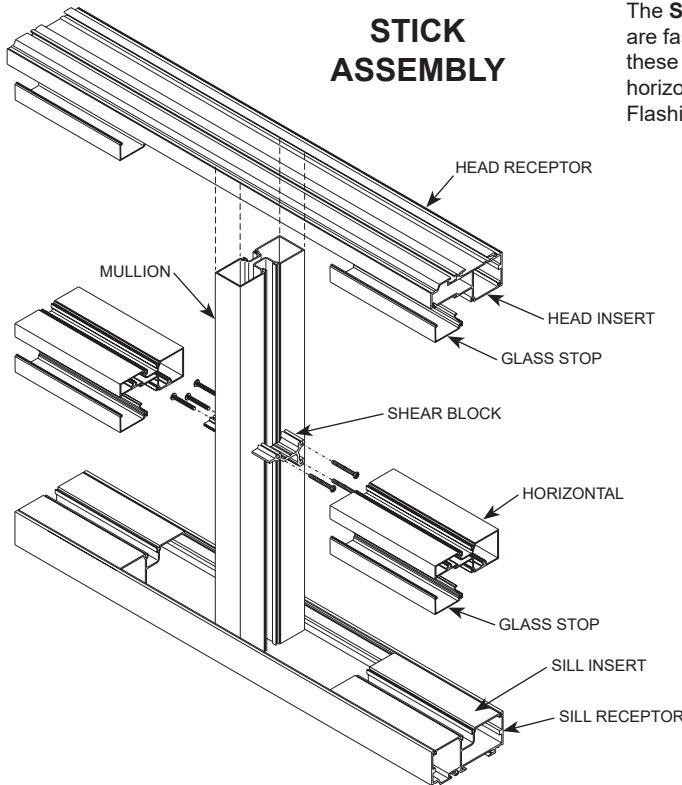


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

NOTE:

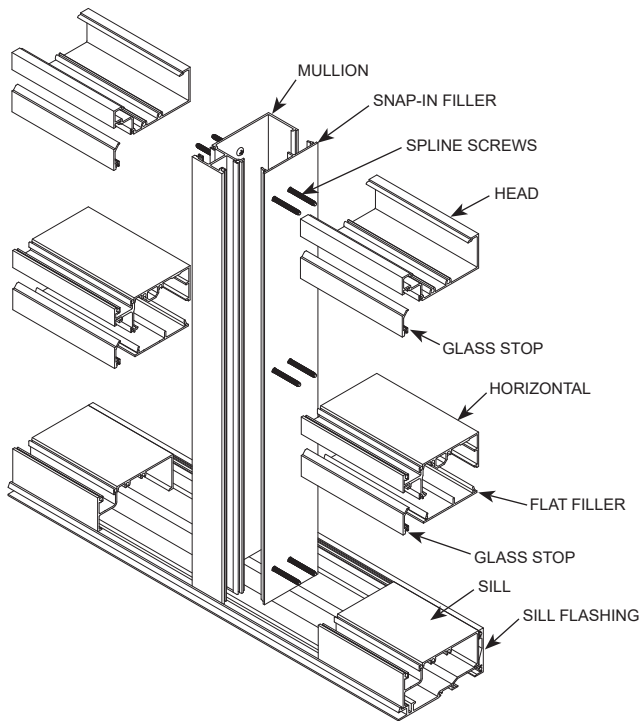
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 14)

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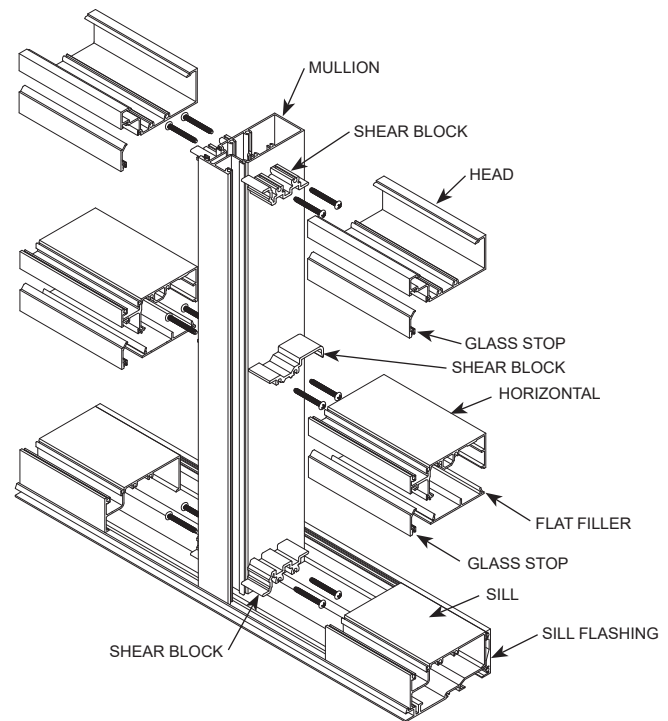
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SCREW SPLINE ASSEMBLY

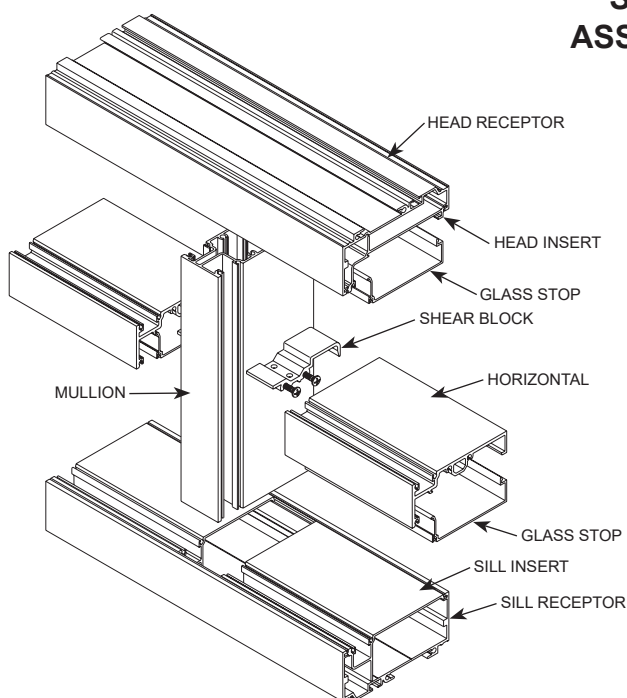


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SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



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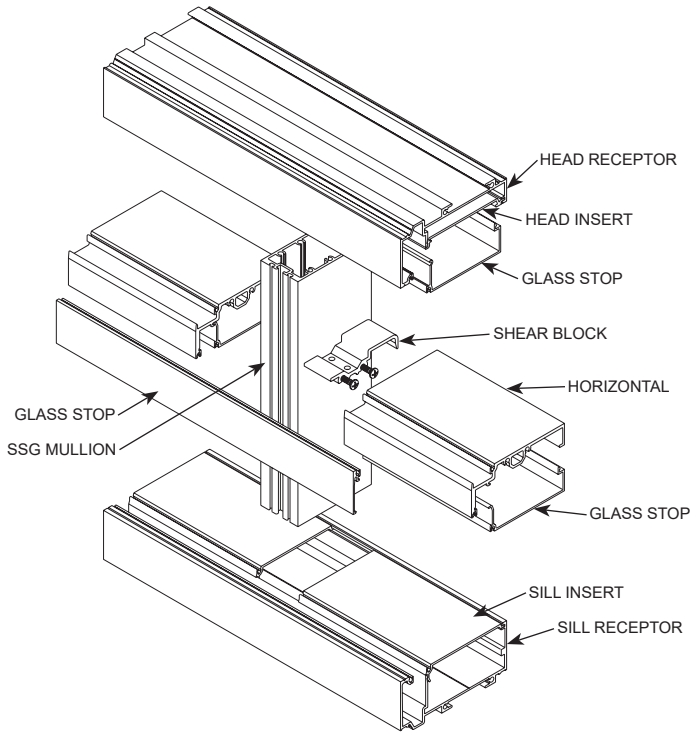
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 31)

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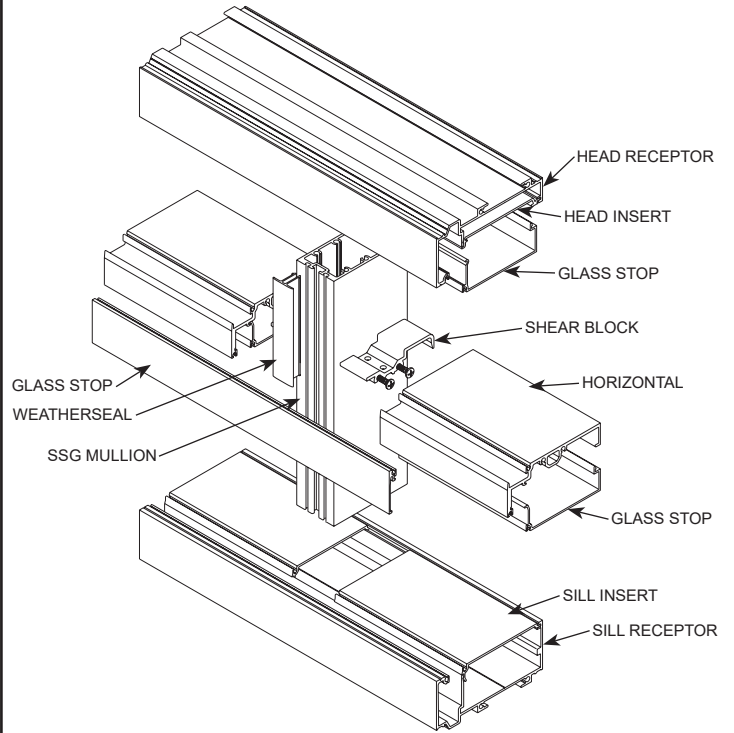
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STICK ASSEMBLY (SSG)



STICK ASSEMBLY (WEATHERSEAL)



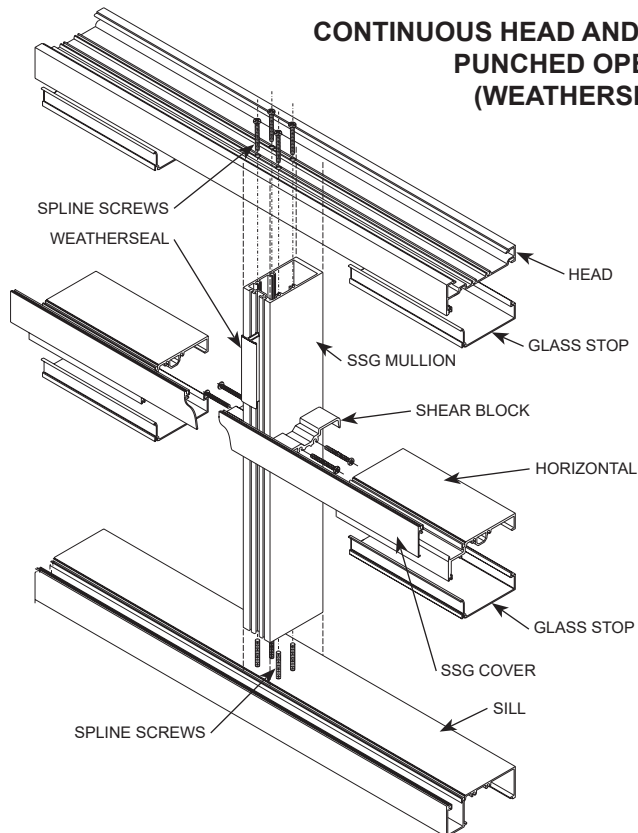
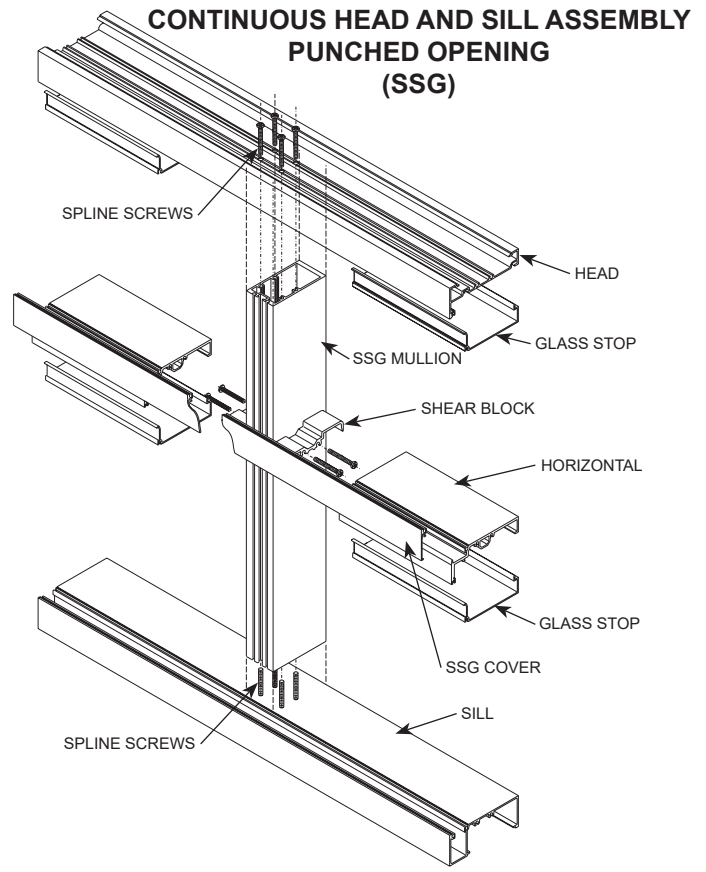
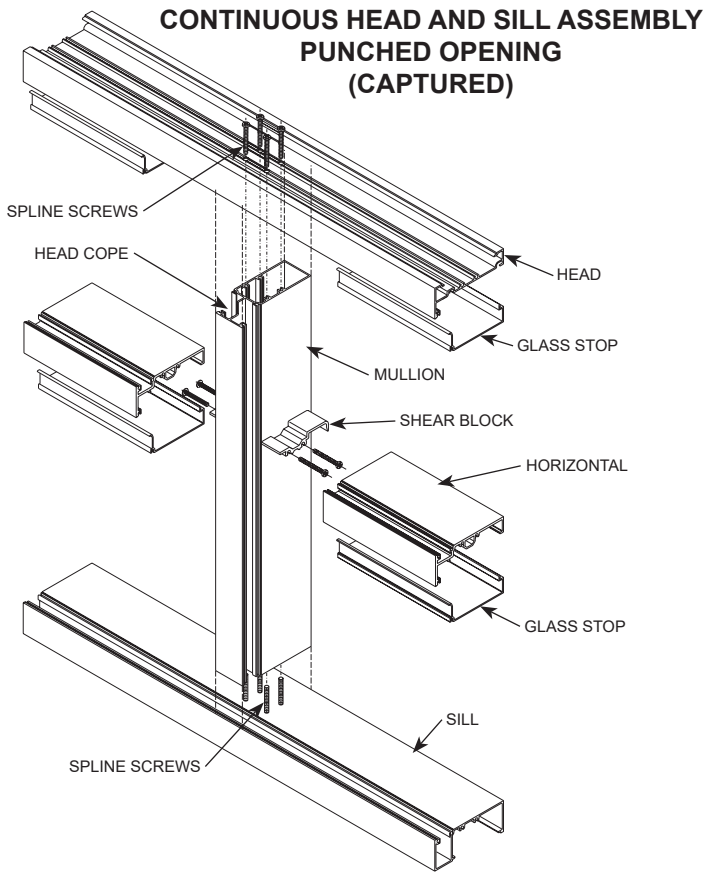
NOTE:

If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 31)

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The **CONTINUOUS HEAD AND SILL** punched opening fabrication allows a frame to be pre-assembled and installed as a single unit. Screws are driven through the back of the head and sill members into splines extruded in the vertical framing members. Intermediate horizontals are attached to the verticals with shear blocks.



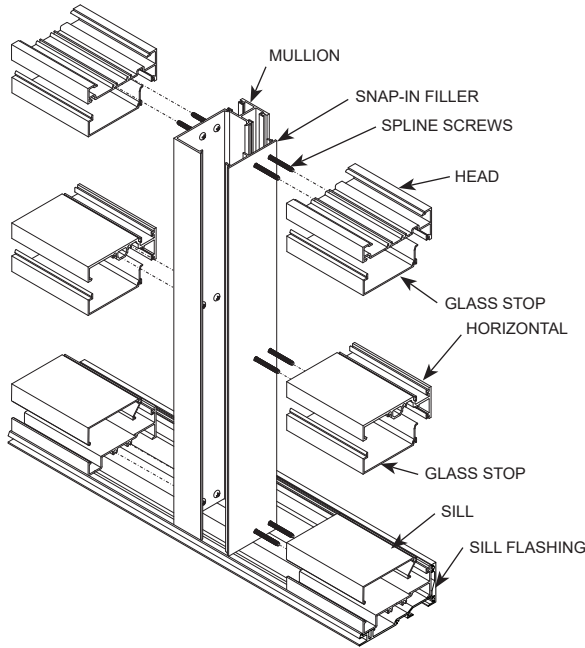
The **Punched Opening** fabrication allows a frame to be pre-punched and installed as a single unit. screws are driven through the back of the head and sill members into splines extruded in the vertical framing members. Intermediate horizontals are attached to the verticals with shear blocks.

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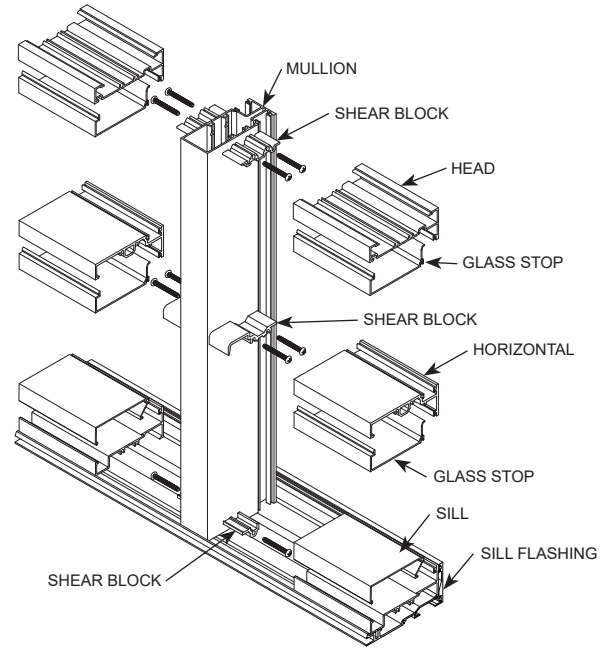
THE SPLIT VERTICAL IN THE SCREW SPLINE SYSTEM ALLOWS A FRAME TO BE INSTALLED FROM UNITIZED ASSEMBLIES. SCREWS ARE DRIVEN THROUGH THE BACK OF THE VERTICALS INTO SPLINES EXTRUDED IN THE HORIZONTAL FRAMING MEMBERS. THE INDIVIDUAL UNITS ARE THEN SNAPPED TOGETHER TO FORM A COMPLETED FRAME.

SCREW SPLINE ASSEMBLY

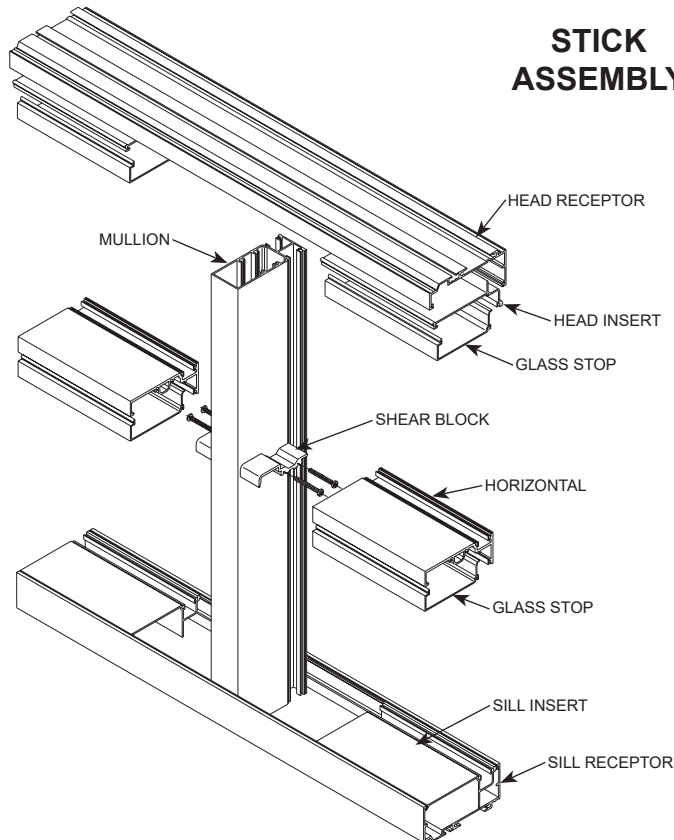


THE SHEAR BLOCK SYSTEM OF FABRICATION ALLOWS A FRAME TO BE PRE-ASSEMBLED AND INSTALLED AS A SINGLE UNIT. HORIZONTALS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS.

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

NOTE:

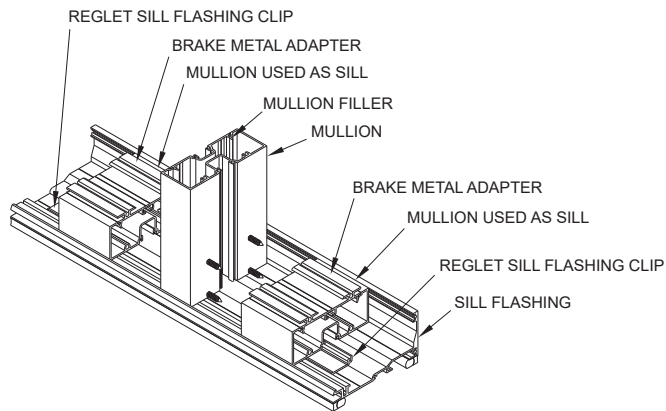
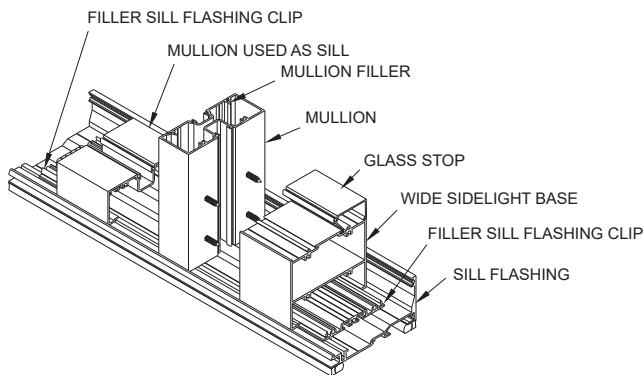
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 41)

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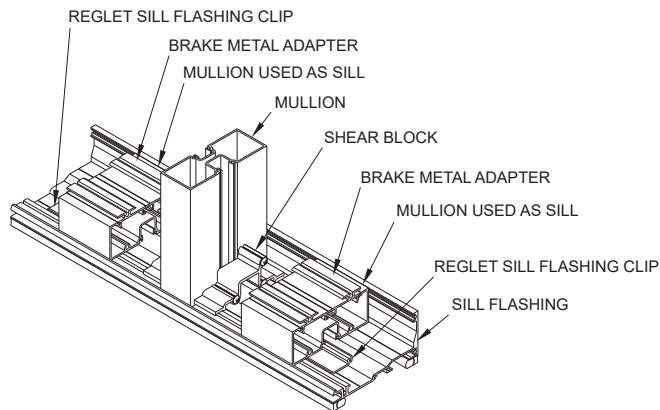
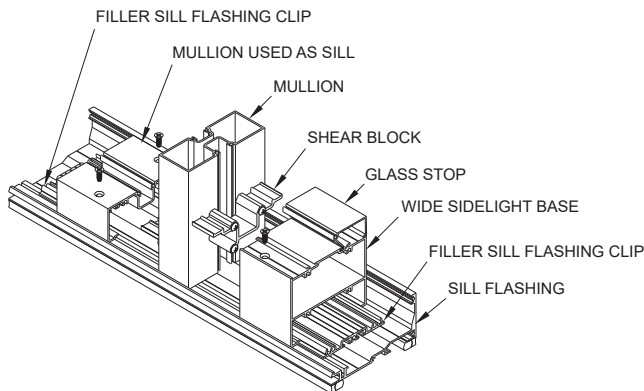
SCREW SPLINE ASSEMBLY

The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.



SHEAR BLOCK ASSEMBLY

The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.



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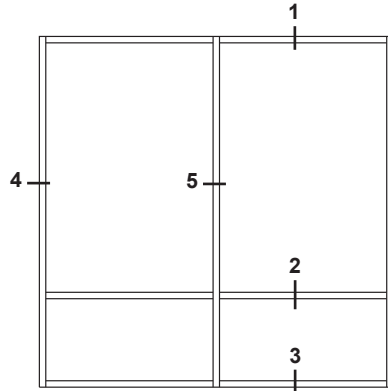
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GLASSvent® WINDOW for STOREFRONT FRAMING20

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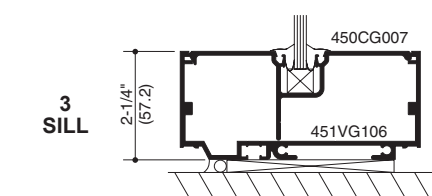
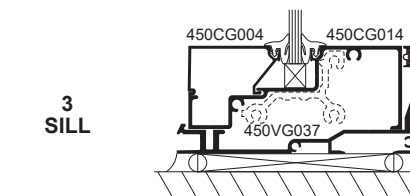
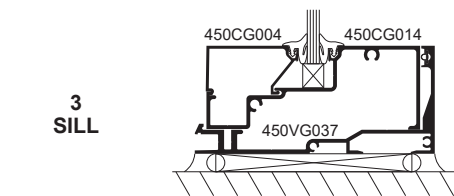
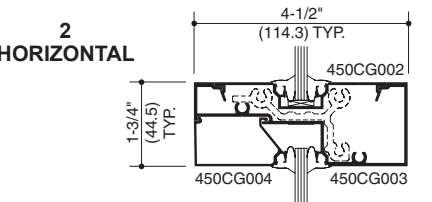
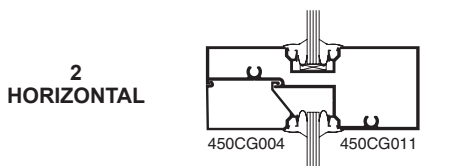
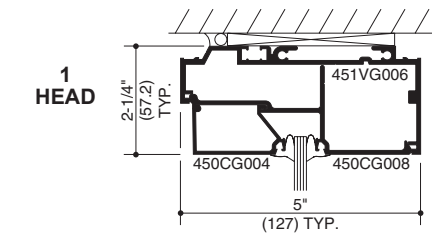
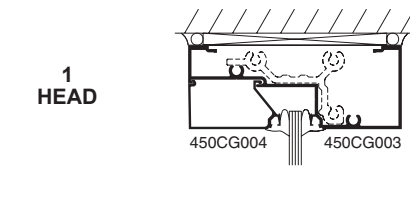
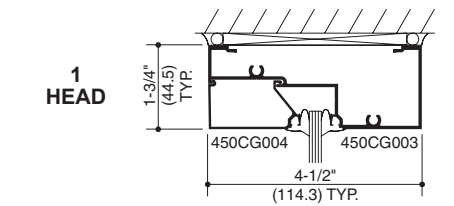
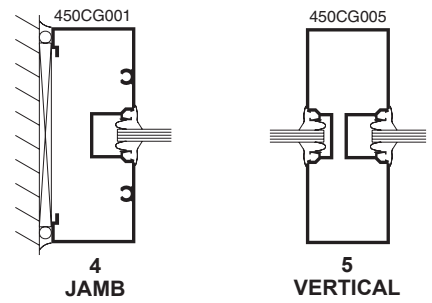
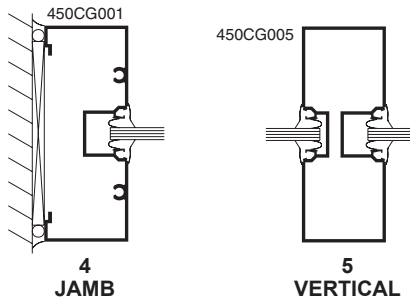
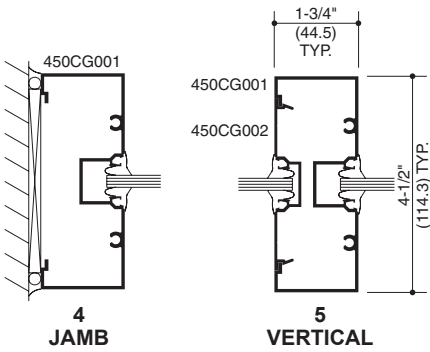


ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

SHEAR BLOCK

STICK



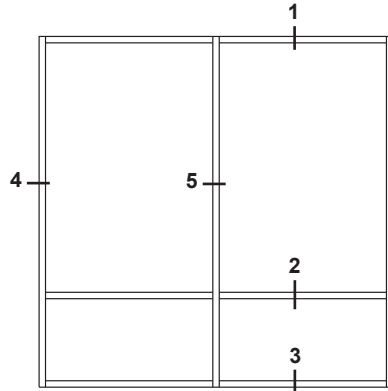
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

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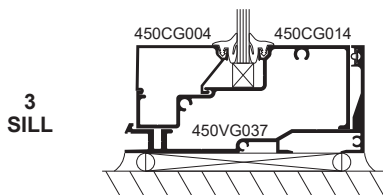
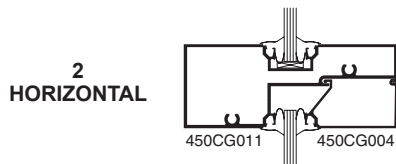
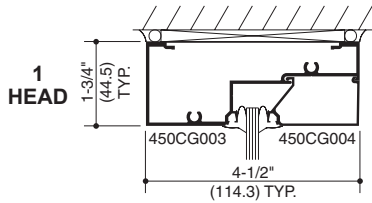
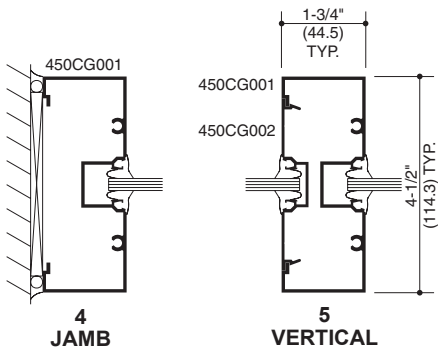
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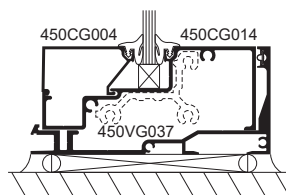
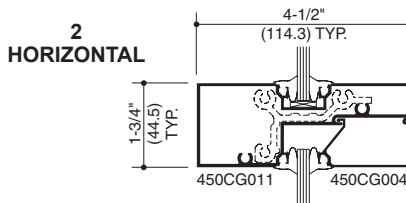
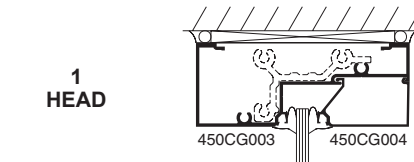
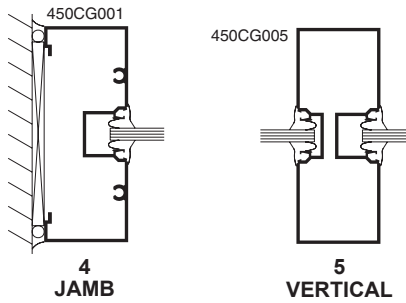
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SCREW SPLINE



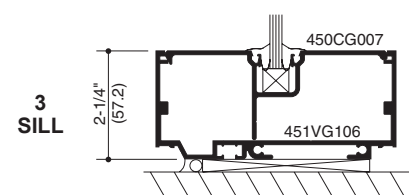
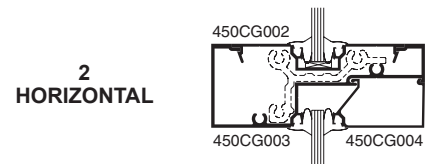
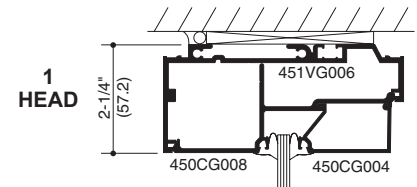
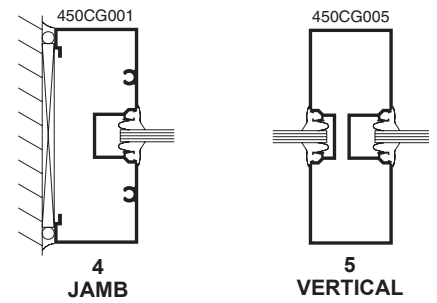
* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



* HP Sill Flashing shown with optional gasket.

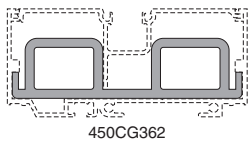
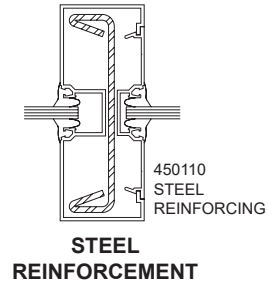
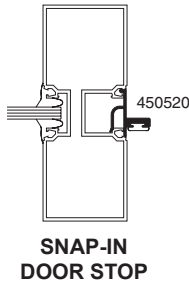
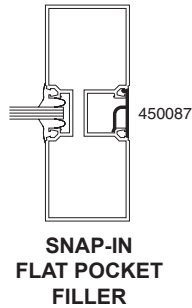
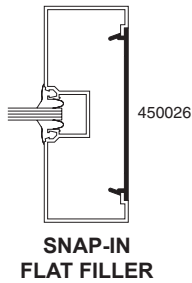
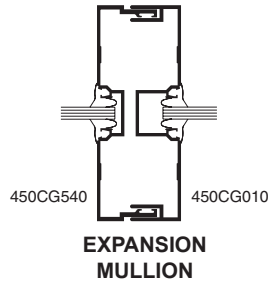
STICK



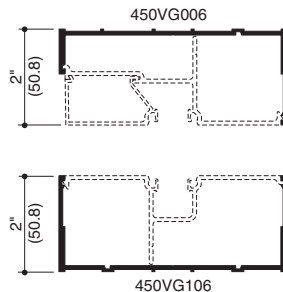
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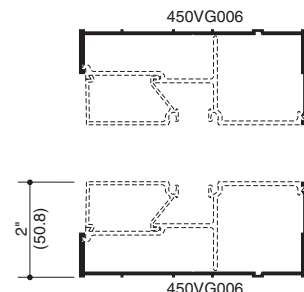
Additional information and CAD details are available at www.kawneer.com



MULLION ANCHOR



OPTIONAL LIGHTWEIGHT CAN RECEPTORS (Stick System)



OPTIONAL UNEQUAL LEG CAN RECEPTORS (Stick System)

NOTE:

If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional Mullion Anchors must be used.

NOTE:

Mullion Anchor not used with Lightweight Receptor.

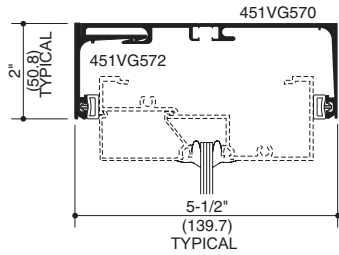
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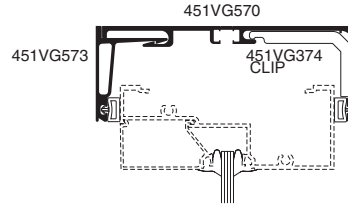
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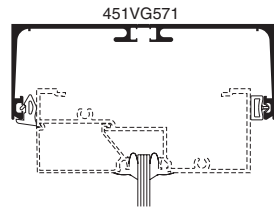
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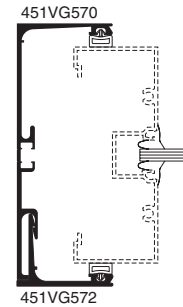
**STANDARD HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



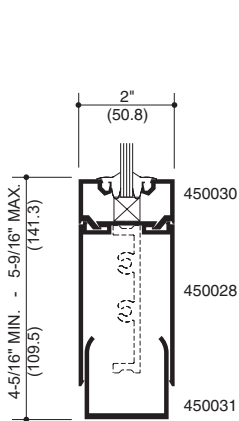
**HEAVY WEIGHT
HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



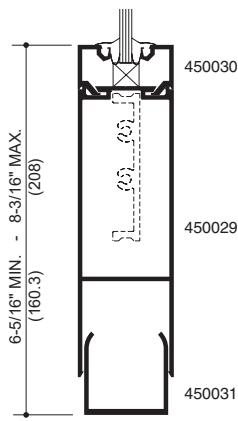
**ONE PIECE
HEAD
COMPENSATING RECEPTOR**



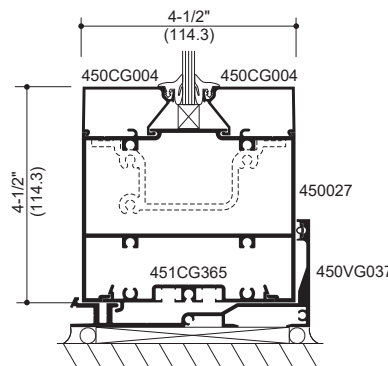
**JAMB
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



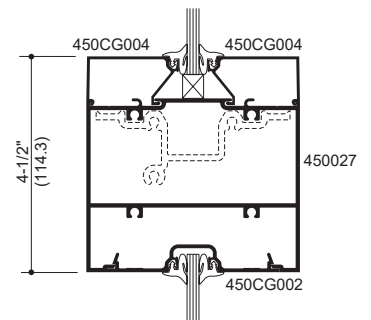
**NARROW
SIDELITE BASE**



**NARROW
SIDELITE BASE**



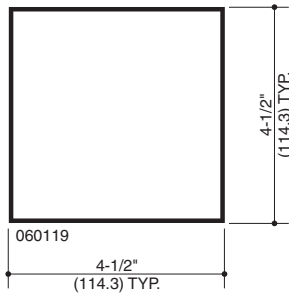
SIDELITE BASE



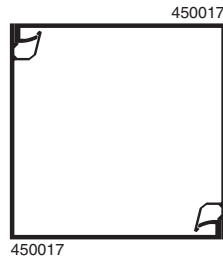
**4-1/2" x 4-1/2" (114.3 x 114.3)
HORIZONTAL**

NOTE: SIDELITE BASES SHOWN ARE FOR USE WITH SCREW SPLINE AND SHEAR BLOCK SYSTEMS ONLY.

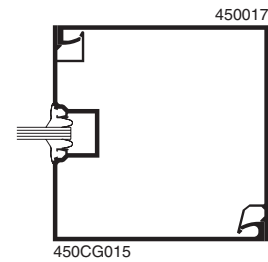
Additional information and CAD details are available at www.kawneer.com



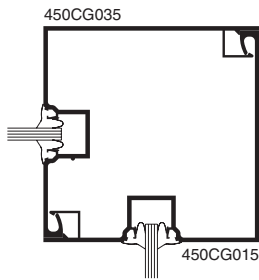
4-1/2" x 4-1/2" (114.3 x 114.3) TUBE



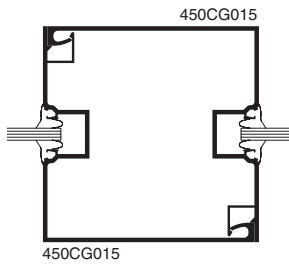
TWO PIECE NO POCKET CORNER



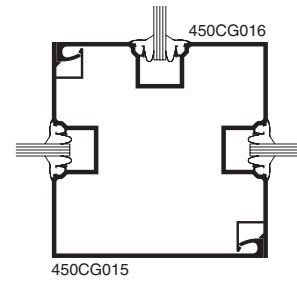
ONE POCKET CORNER



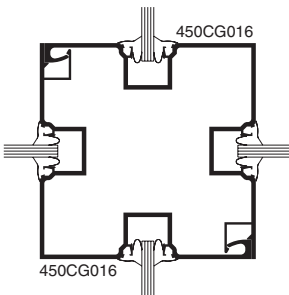
TWO POCKET 90° CORNER



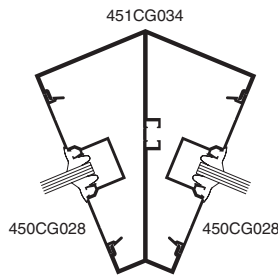
TWO POCKET VERTICAL POST



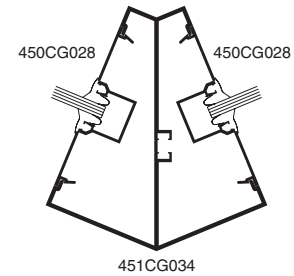
THREE POCKET 90° CORNER



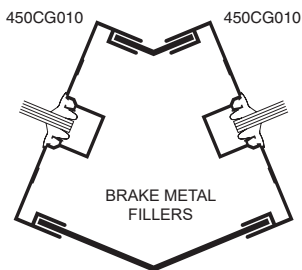
FOUR POCKET 90° CORNER



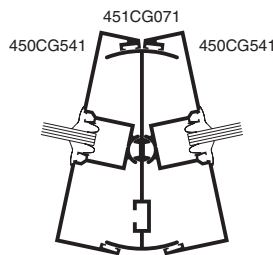
135° INSIDE CORNER



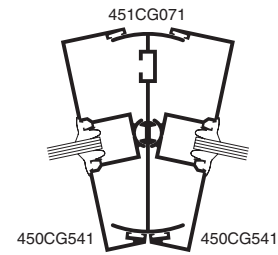
135° OUTSIDE CORNER



VARIABLE DEGREE BRAKE METAL CORNER



155° TO 180° PIVOT MULLION (OUTSIDE CORNER)

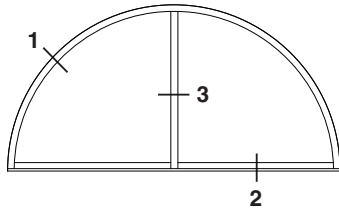


155° TO 180° PIVOT MULLION (INSIDE CORNER)

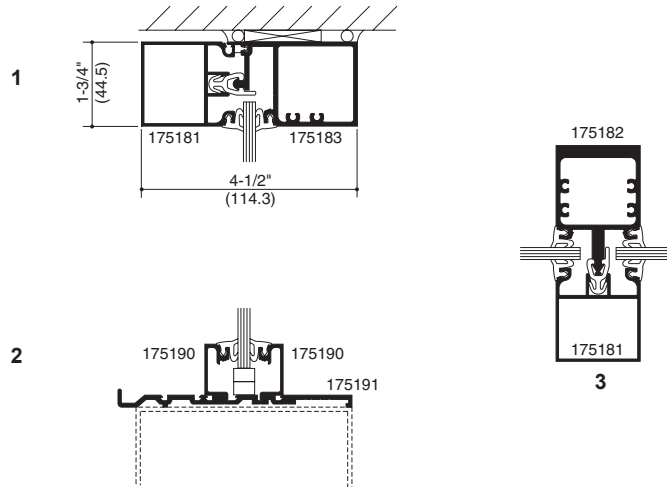
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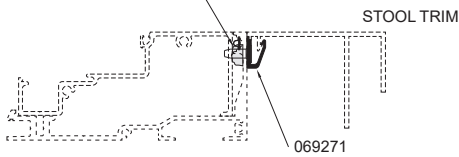
Additional information and CAD details are available at www.kawneer.com



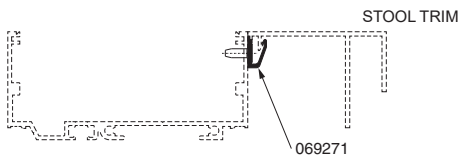
CURVING DETAILS
(Center Plane Only)



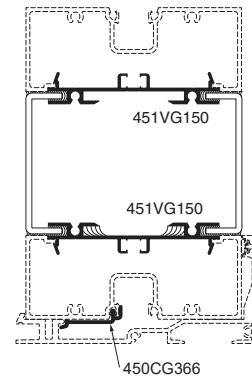
Seal over Stool Trim fasteners to prevent water infiltration.



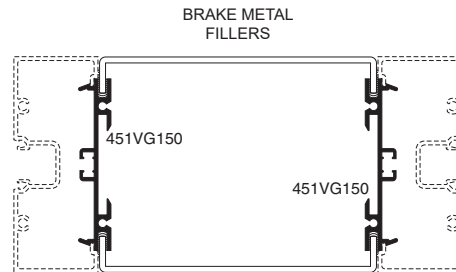
STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING



STOOL TRIM CLIP FOR STICK/CONTINUOUS HEAD AND SILL FABRICATION



BRAKE METAL ADAPTOR AT HORIZONTAL



BRAKE METAL ADAPTOR AT VERTICAL

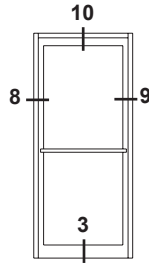
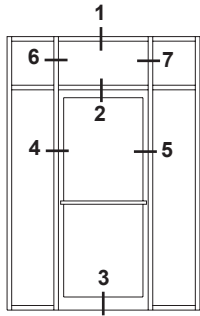
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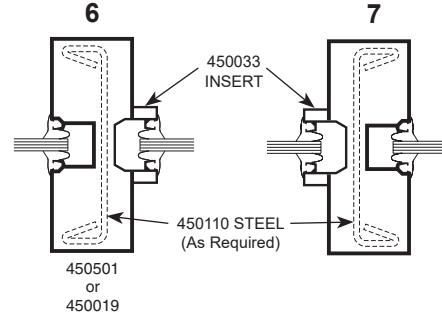
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TRIFAB® VERSAGLAZE® 450 FRAMING INCORPORATING KAWNEER "190" DOORS.

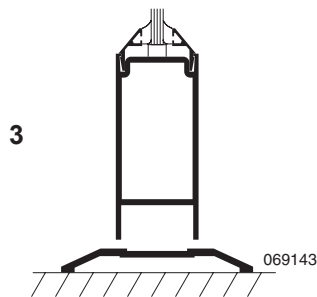
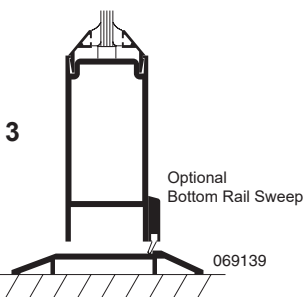
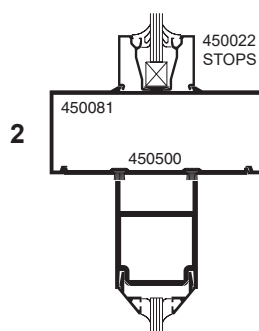
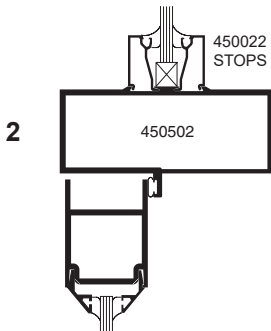
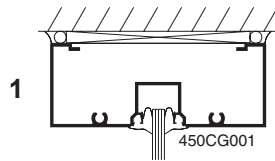
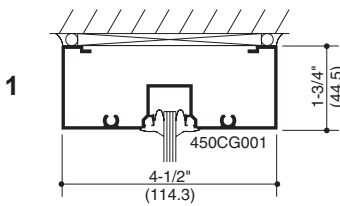
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



ELEVATIONS ARE NUMBER KEYED TO DETAILS

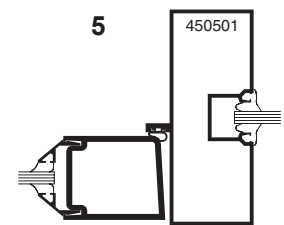
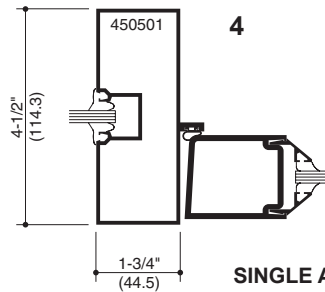
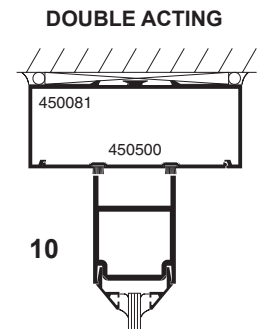
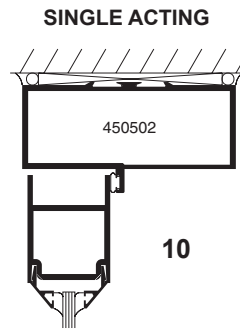


Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

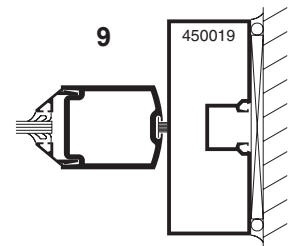
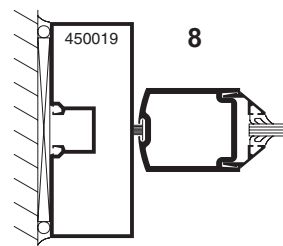


SINGLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR WITH TRANSOM



SINGLE ACTING DOOR



DOUBLE ACTING DOOR

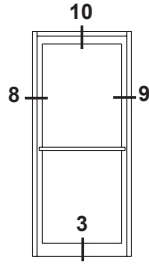
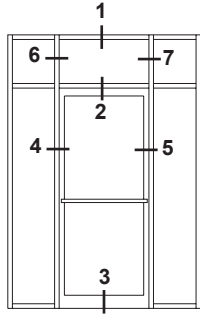
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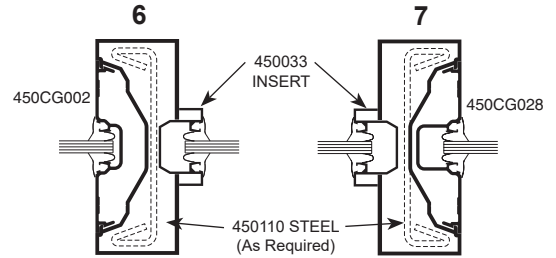
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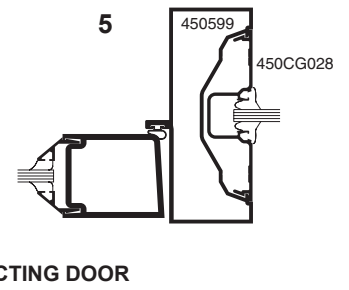
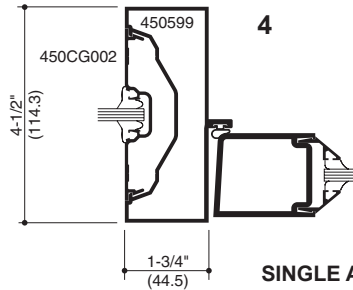
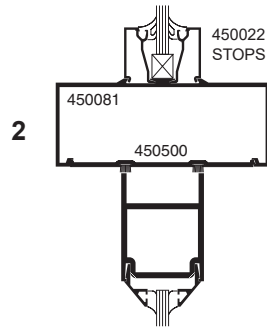
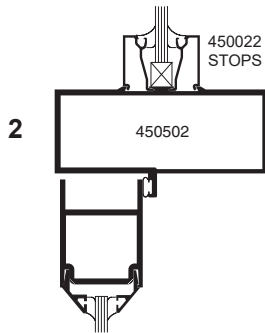
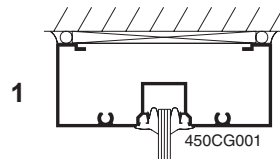
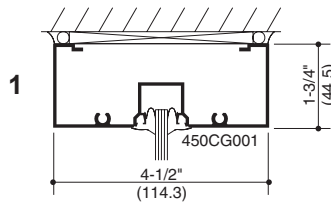
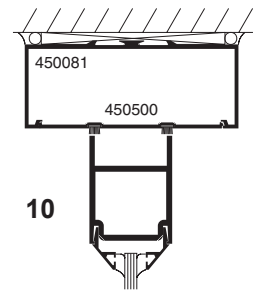
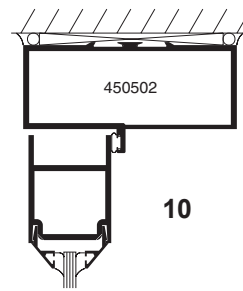
ELEVATIONS ARE NUMBER KEYED TO DETAILS



Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

SINGLE ACTING

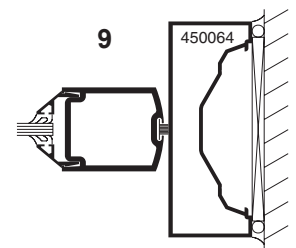
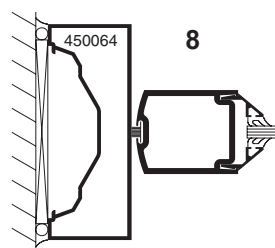
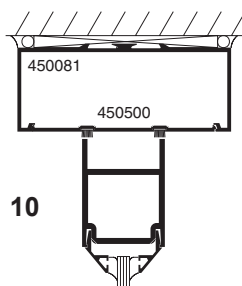
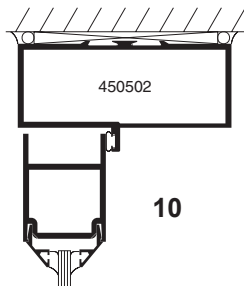
DOUBLE ACTING



SINGLE ACTING DOOR

SINGLE ACTING

DOUBLE ACTING



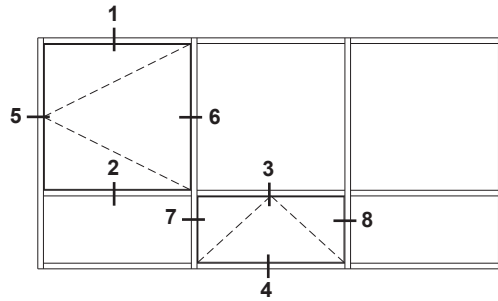
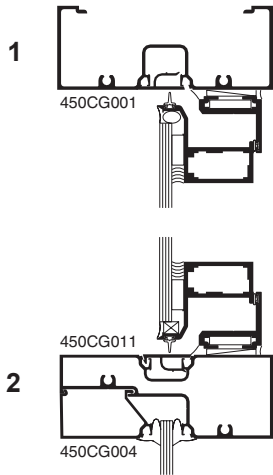
DOUBLE ACTING DOOR

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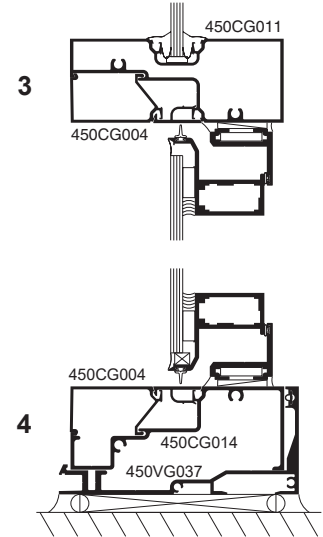
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**OUTSWING CASEMENT
VERTICAL SECTION SHOWN**

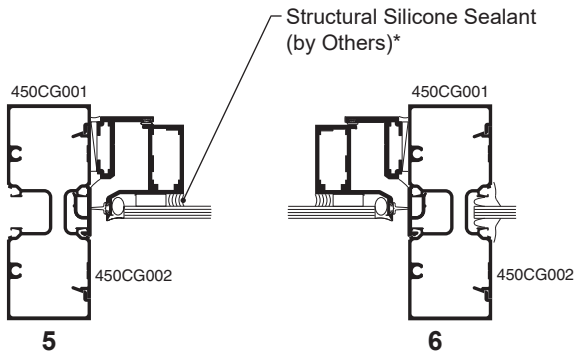


ELEVATION IS NUMBER KEYED TO DETAILS

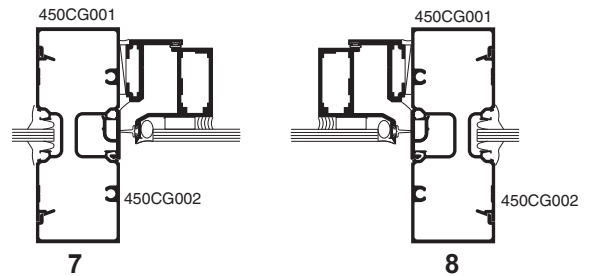
**PROJECT-OUT
VERTICAL SECTION SHOWN**



**OUTSWING CASEMENT
HORIZONTAL SECTION SHOWN**



**PROJECT-OUT
HORIZONTAL SECTION SHOWN**



* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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BASIC FRAMING DETAILS 24-30

MISCELLANEOUS FRAMING.....31,32

CORNERS.....33

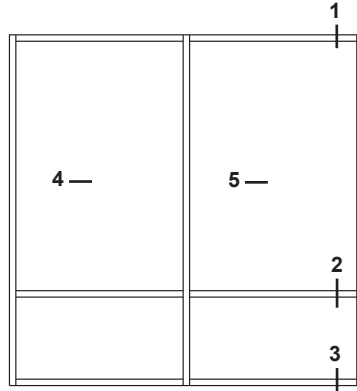
ENTRANCE FRAMING.....34

GLASSvent® WINDOW for STOREFRONT FRAMING35

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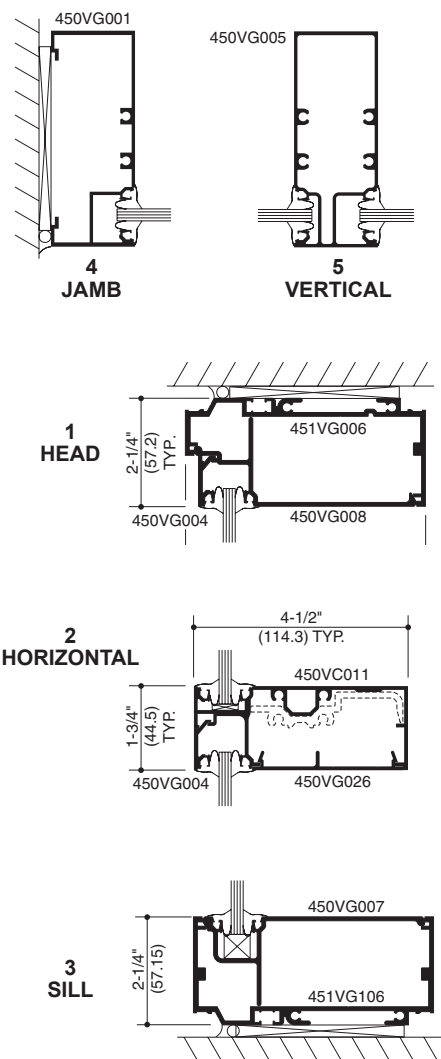
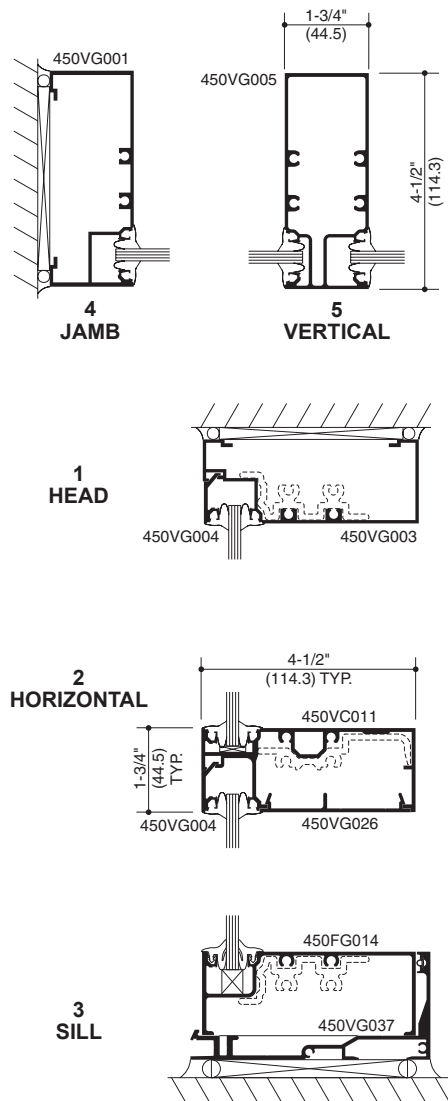
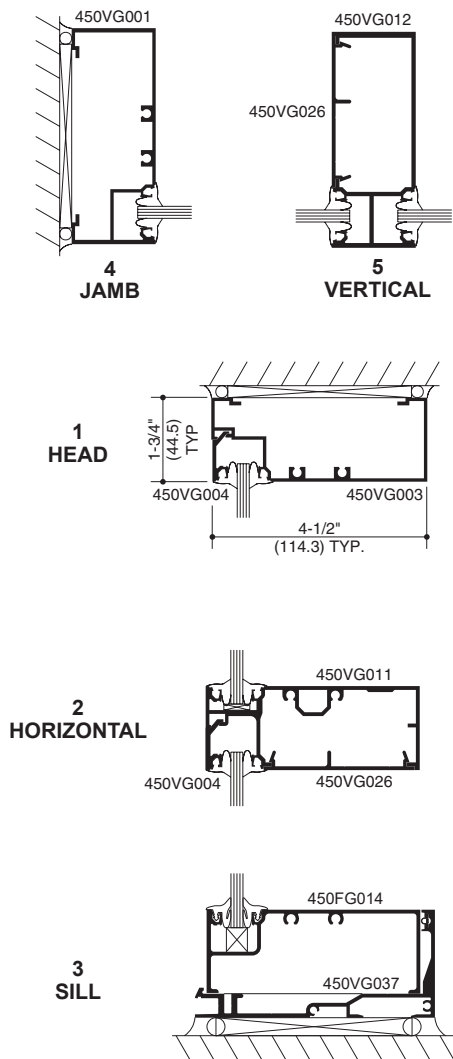


ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

SHEAR BLOCK

STICK



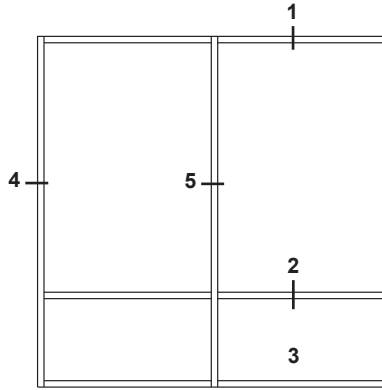
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

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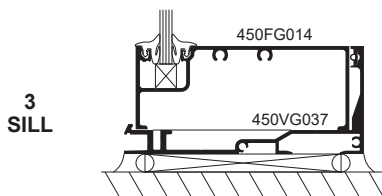
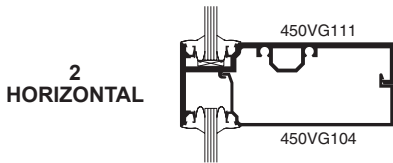
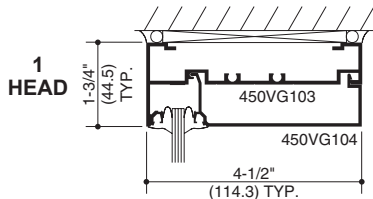
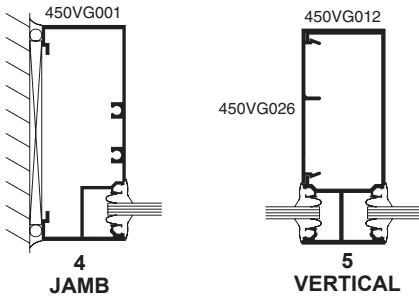
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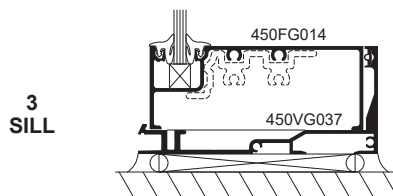
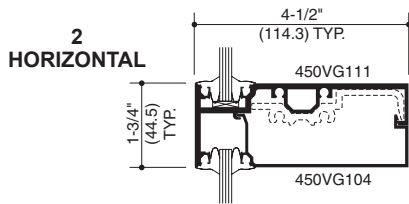
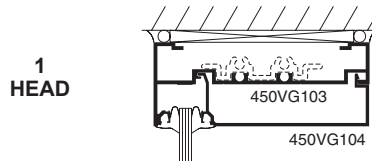
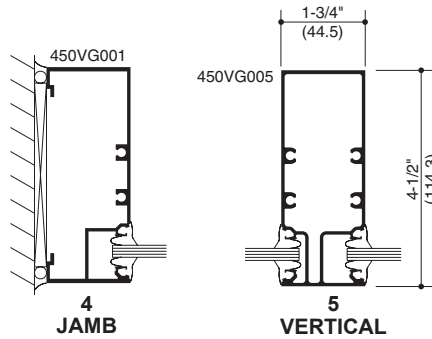
ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE



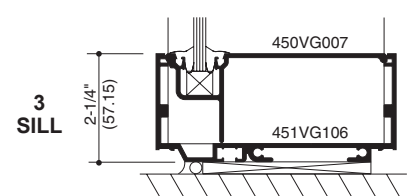
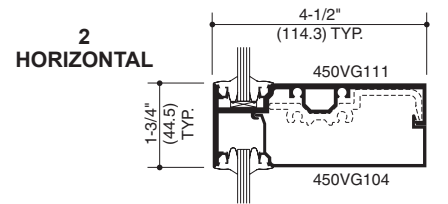
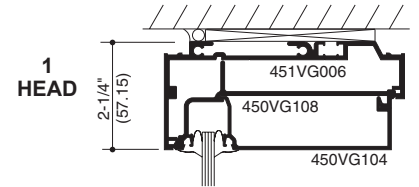
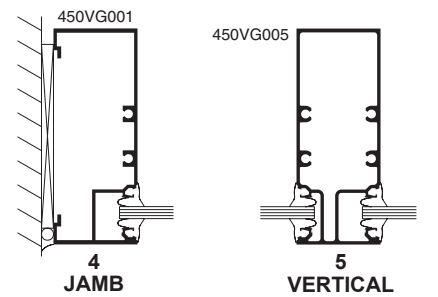
* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



* HP Sill Flashing shown with optional gasket.

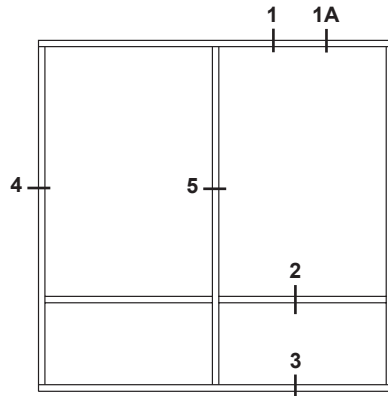
STICK



Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

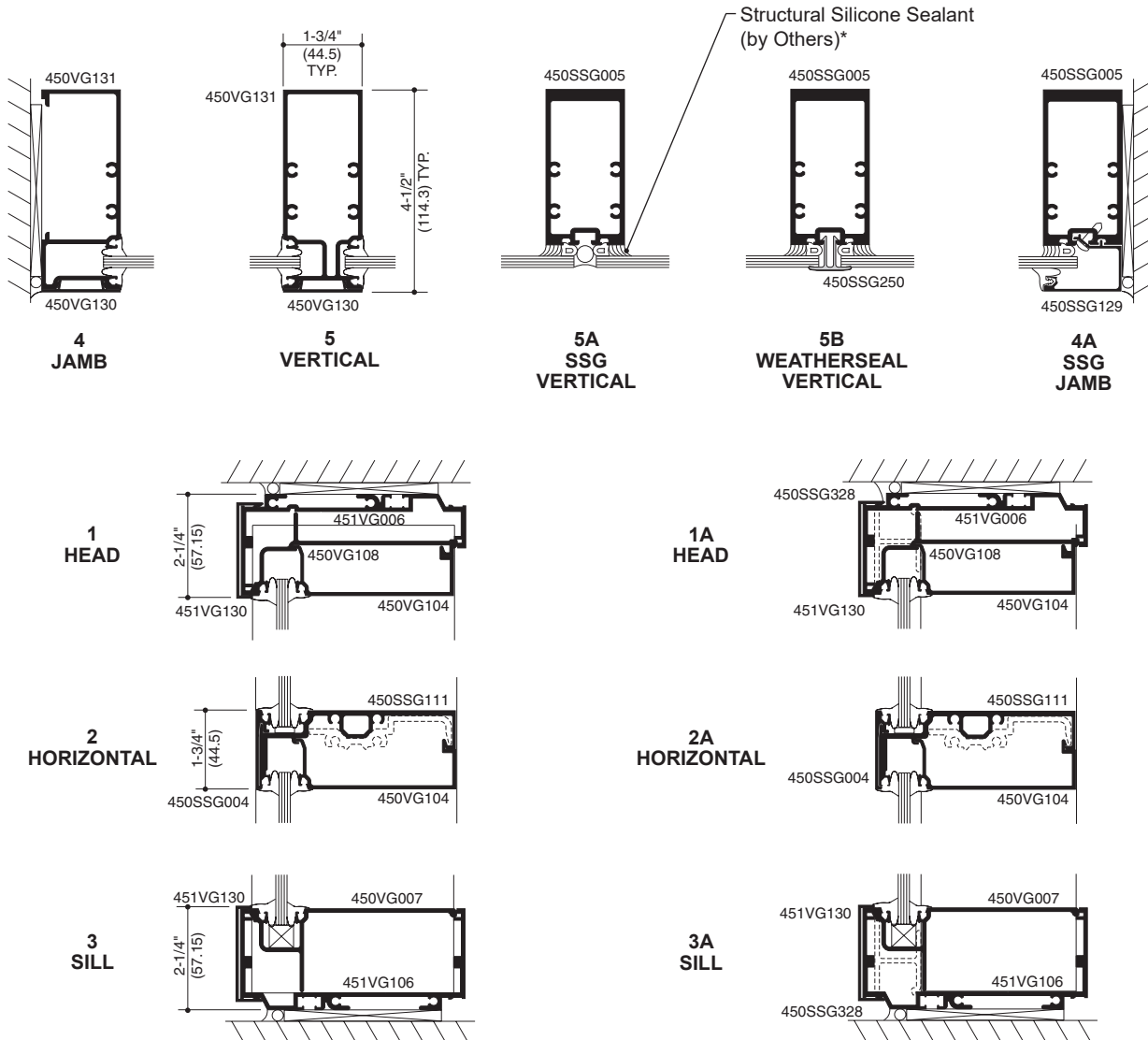
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Additional information and CAD details are available at www.kawneer.com



ELEVATION IS NUMBER KEYED TO DETAILS

**STICK SYSTEM (INSIDE GLAZED)
TWO COLOR OPTION
STANDARD RECEPTOR with SSG ADAPTOR**

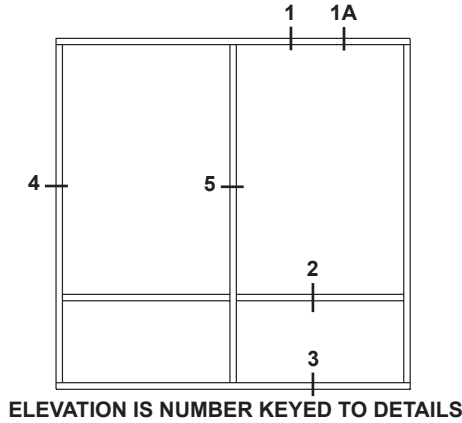


* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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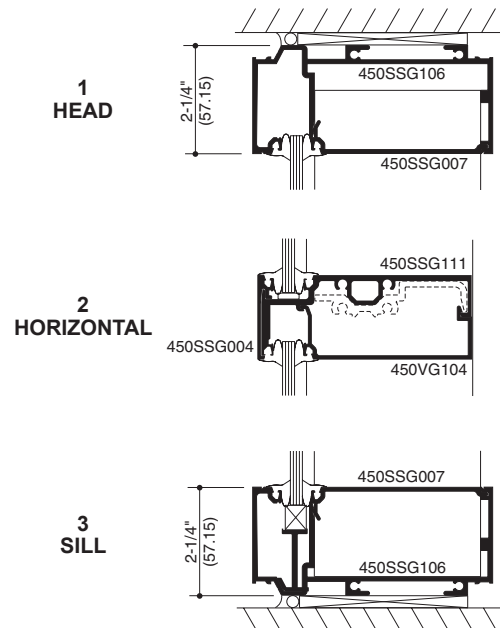
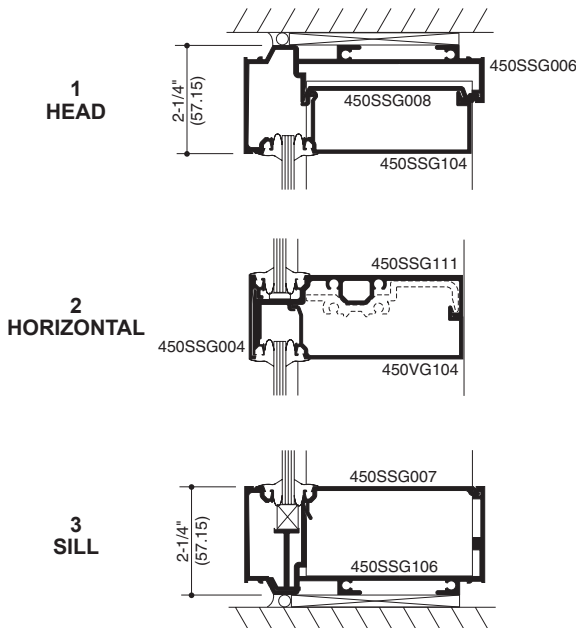
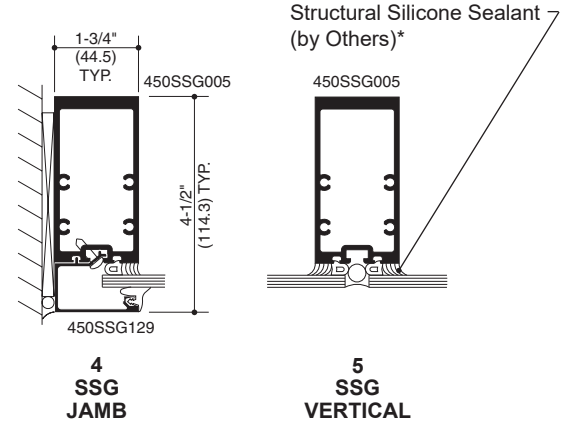
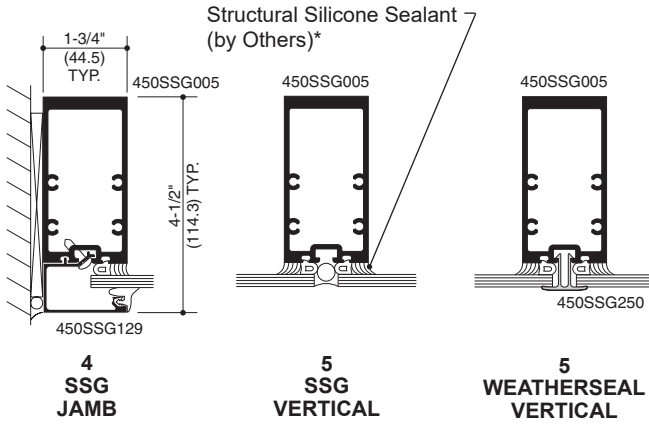
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STICK SYSTEM (INSIDE GLAZED) SSG RECEPTOR

STICK SYSTEM (OUTSIDE GLAZED) SSG RECEPTOR

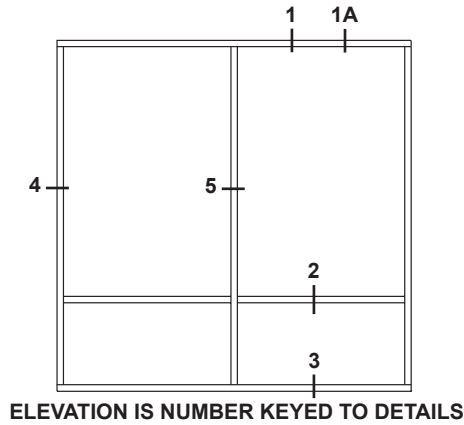


* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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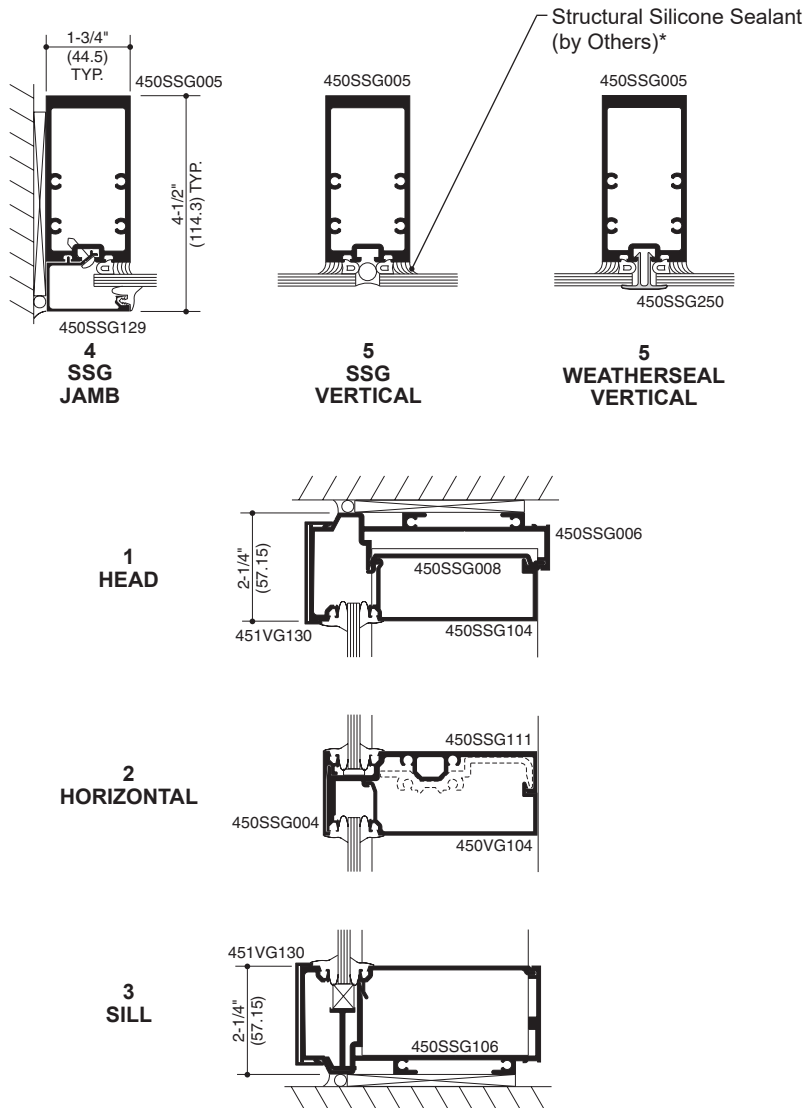
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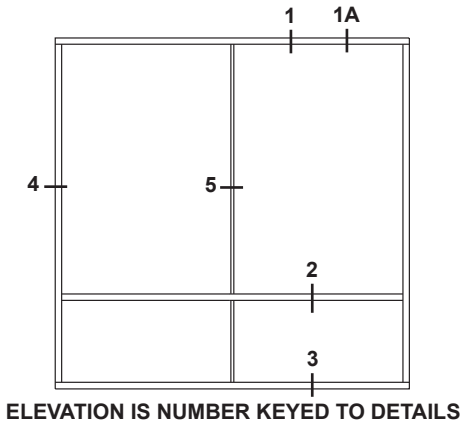
ELEVATION IS NUMBER KEYED TO DETAILS

**STICK SYSTEM (INSIDE GLAZED)
SSG RECEPTOR
TWO COLOR OPTION**



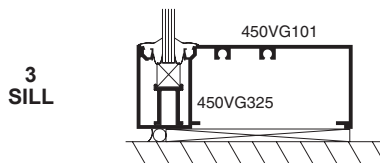
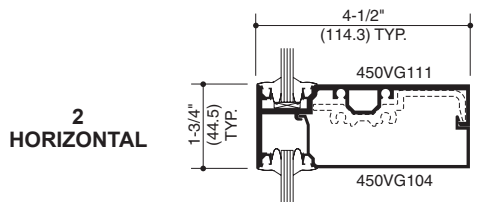
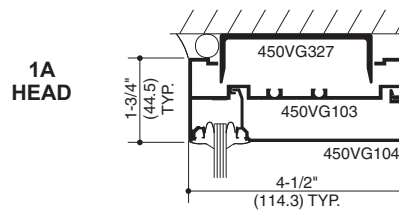
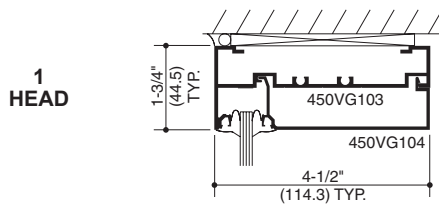
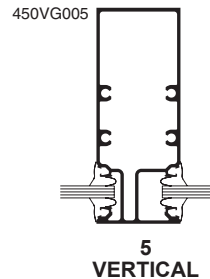
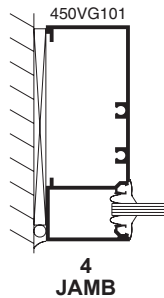
* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

Additional information and CAD details are available at www.kawneer.com



CONTINUOUS HEAD AND SILL
MULTI-LITE PUNCHED OPENINGS
(20 FEET MAXIMUM UNIT WIDTH)

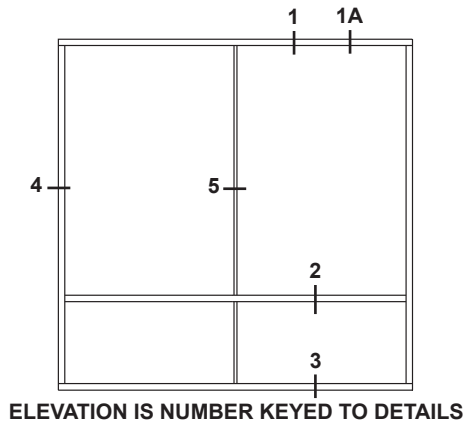
CONTINUOUS HEAD AND SILL (INSIDE GLAZED)
PUNCHED OPENING



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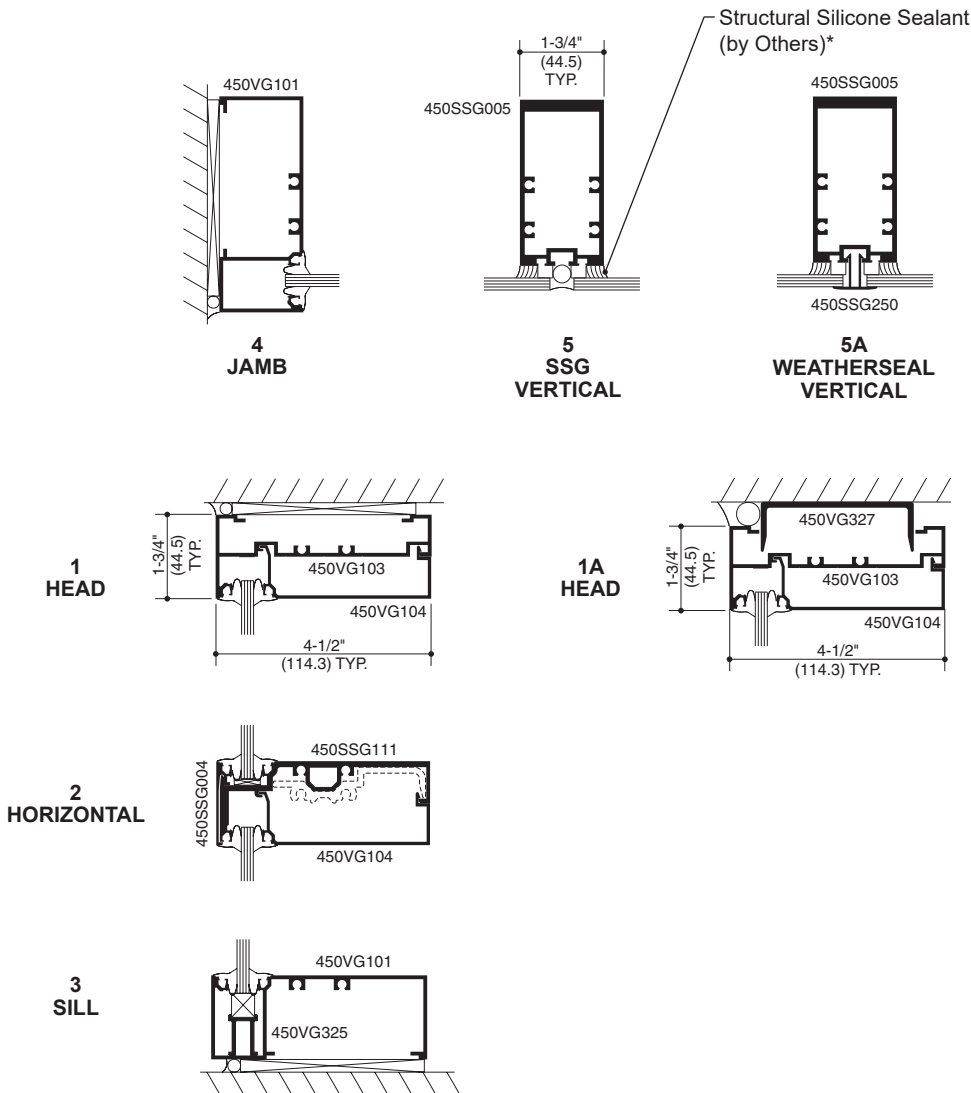
Additional information and CAD details are available at www.kawneer.com



**CONTINUOUS HEAD AND SILL
MULTI-LITE PUNCHED OPENINGS
(20 FEET MAXIMUM UNIT WIDTH)**

**CONTINUOUS HEAD AND SILL (INSIDE GLAZED)
SSG \ WEATHERSEAL**

PUNCHED OPENING

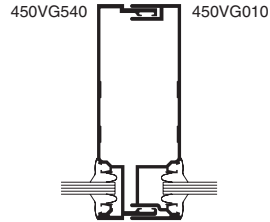


* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

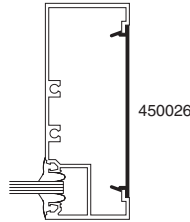
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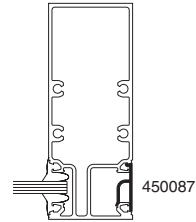
Additional information and CAD details are available at www.kawneer.com



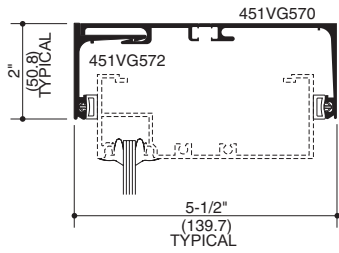
**EXPANSION
MULLION**



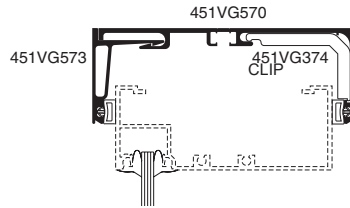
**SNAP-IN
FLAT FILLER**



**SNAP-IN FLAT
POCKET FILLER**



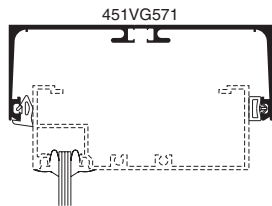
**STANDARD HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



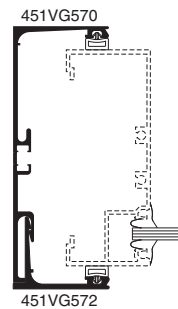
**HEAVY WEIGHT
HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**

NOTE:

If the end reaction of the mullion [mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two] is more than 500 lbs., the optional Mullion Anchors must be used.



**ONE PIECE
HEAD
COMPENSATING RECEPTOR**

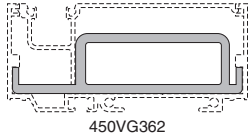


**JAMB
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**

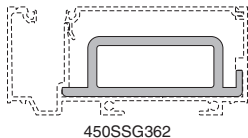
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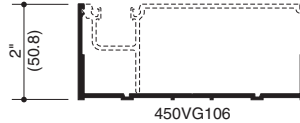
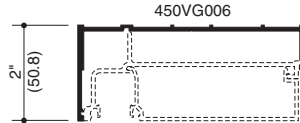
Additional information and CAD details are available at www.kawneer.com



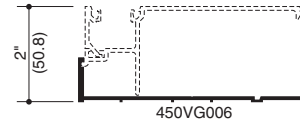
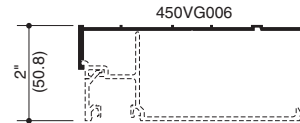
MULLION ANCHOR



SSG MULLION ANCHOR



**OPTIONAL LIGHTWEIGHT
CAN RECEPTORS
(Stick System)**



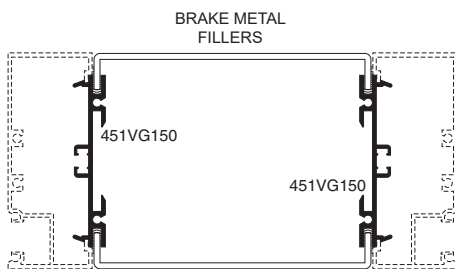
**OPTIONAL UNEQUAL LEG
CAN RECEPTORS
(Stick System)**

NOTE:

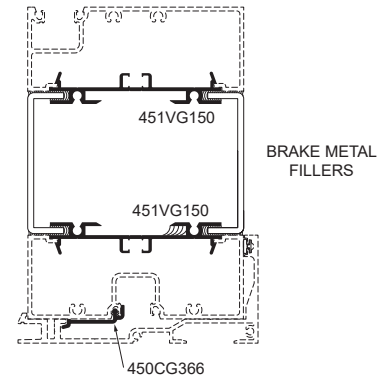
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional Mullion Anchors must be used.

NOTE:

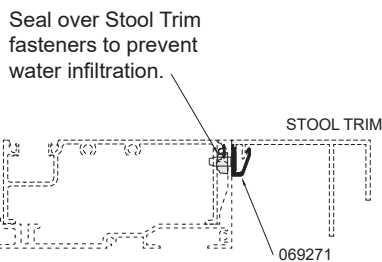
Mullion Anchor not used with Lightweight Receptor.



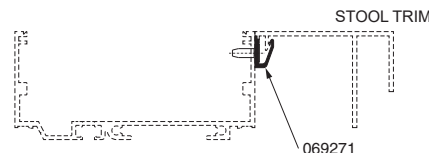
**BRAKE METAL ADAPTOR
AT VERTICAL**



**BRAKE METAL ADAPTOR
AT HORIZONTAL**



**STOOL TRIM CLIP
WITH HIGH PERFORMANCE
FLASHING**



**STOOL TRIM CLIP
FOR STICK/CONTINUOUS HEAD
AND SILL FABRICATION**

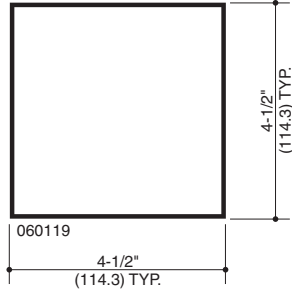
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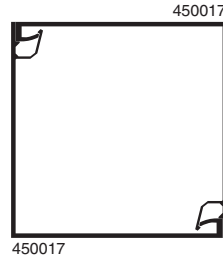
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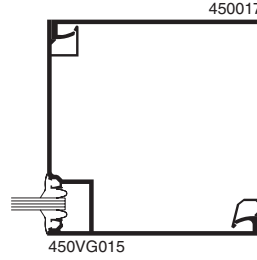
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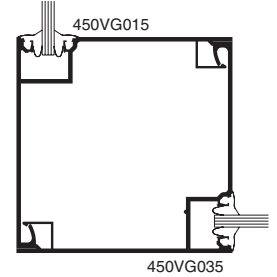
4-1/2" x 4-1/2" (114.3 x 114.3) TUBE



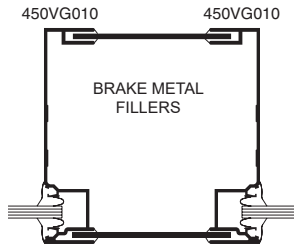
TWO PIECE NO POCKET CORNER



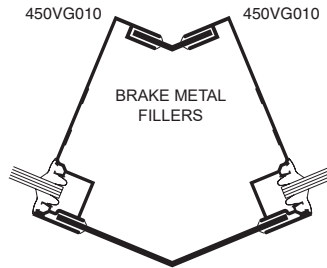
ONE POCKET CORNER



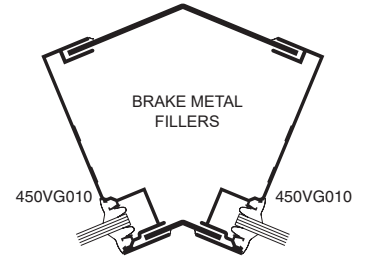
TWO POCKET 90° CORNER



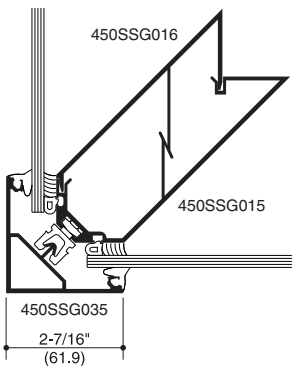
TWO POCKET BRAKE METAL POST



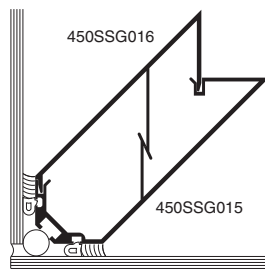
VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER



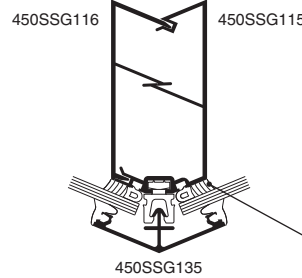
VARIABLE DEGREE BRAKE METAL INSIDE CORNER



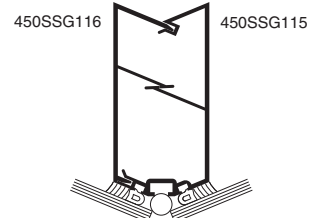
90° CORNER



90° SSG CORNER



135° CORNER



135° SSG CORNER

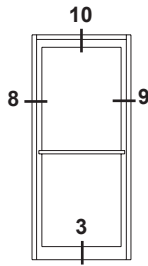
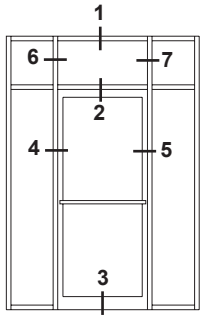
Structural Silicone Sealant (by Others)*

* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

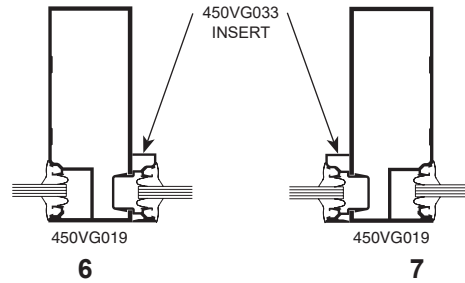
Additional information and CAD details are available at www.kawneer.com

TRIFAB® VERSAGLAZE® 450 FRAMING INCORPORATING KAWNEER "190" DOORS.

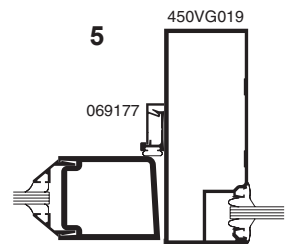
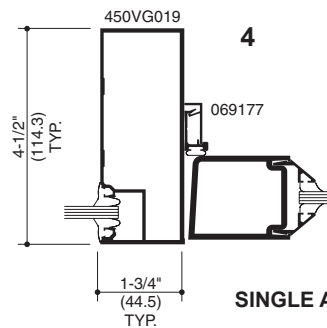
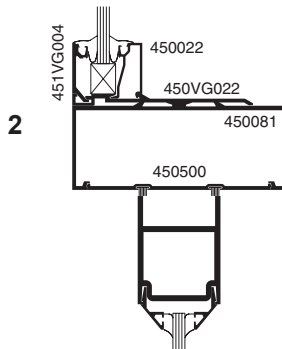
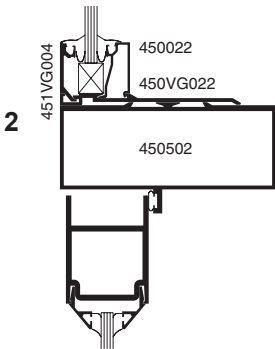
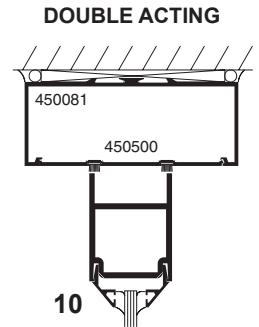
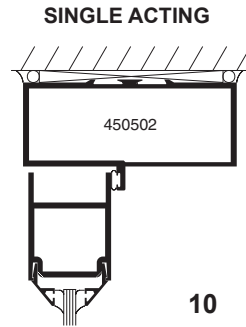
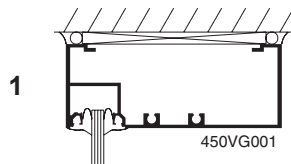
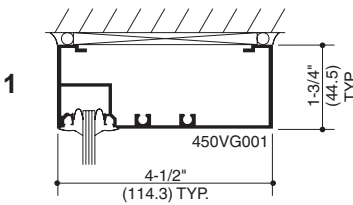
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



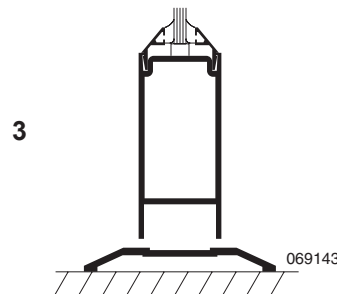
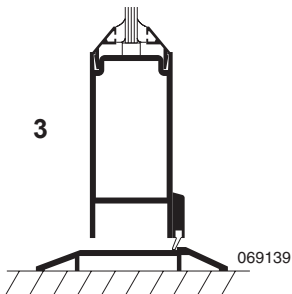
ELEVATIONS ARE NUMBER KEYED TO DETAILS



Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert.

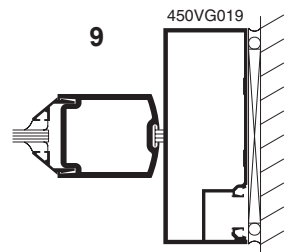
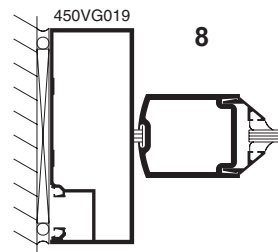


SINGLE ACTING DOOR



SINGLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR WITH TRANSOM



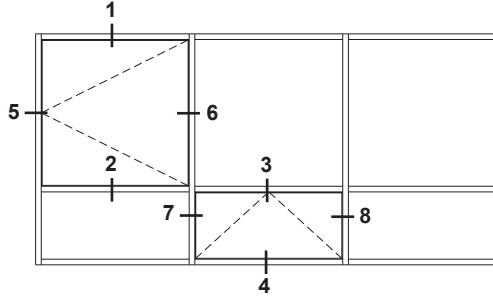
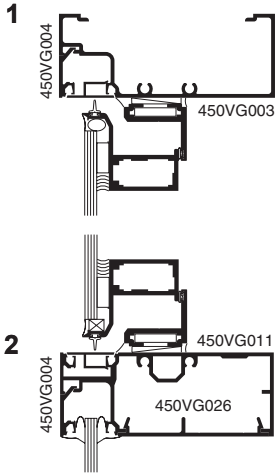
DOUBLE ACTING DOOR

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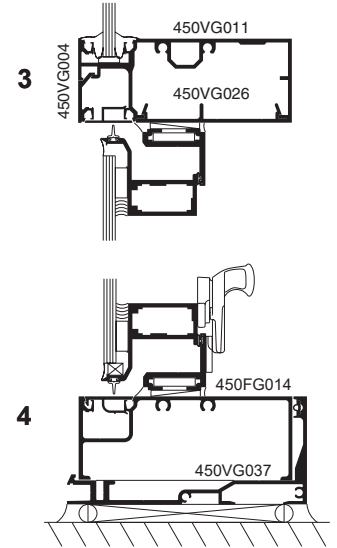
Additional information and CAD details are available at www.kawneer.com

**OUTSWING CASEMENT
VERTICAL SECTION SHOWN**

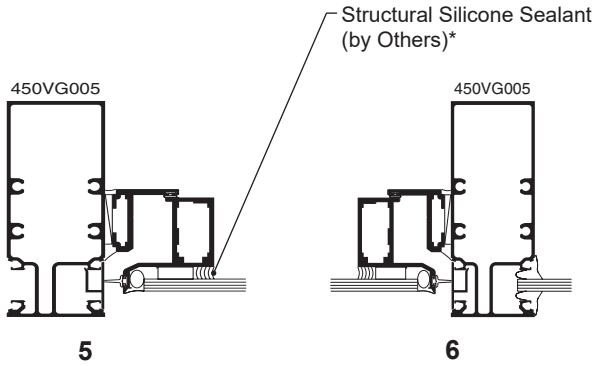


ELEVATION IS NUMBER KEYED TO DETAILS

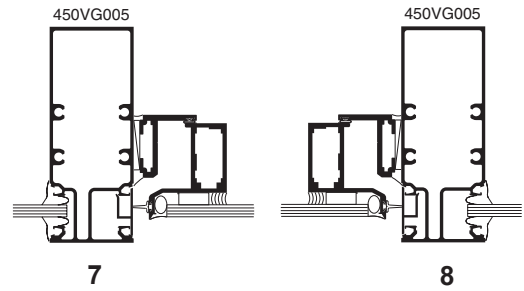
**PROJECT-OUT
VERTICAL SECTION SHOWN**



**OUTSWING CASEMENT
HORIZONTAL SECTION SHOWN**



**PROJECT-OUT
HORIZONTAL SECTION SHOWN**



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BASIC FRAMING DETAILS38,39

MISCELLANEOUS FRAMING.....40,41

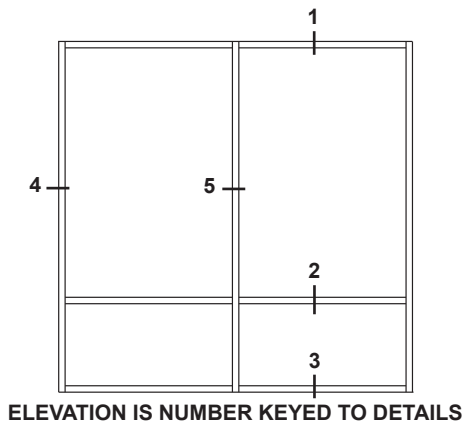
CORNERS.....42

ENTRANCE FRAMING.....43

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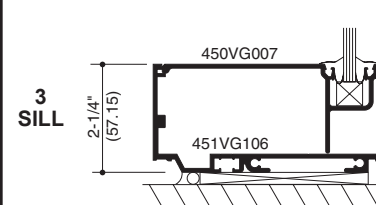
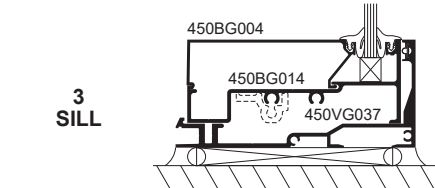
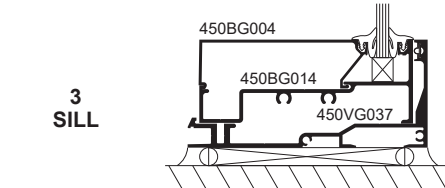
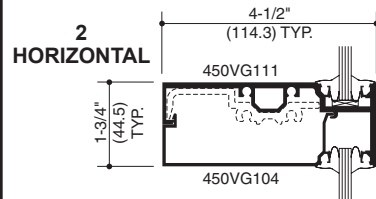
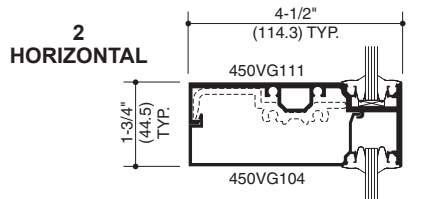
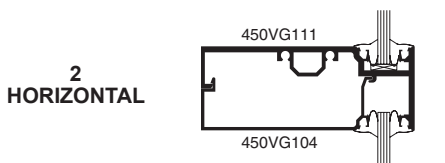
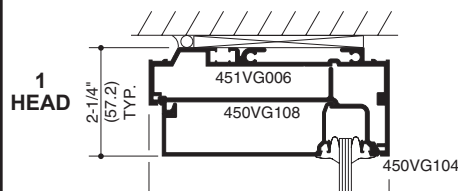
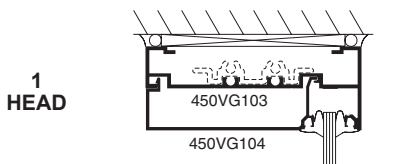
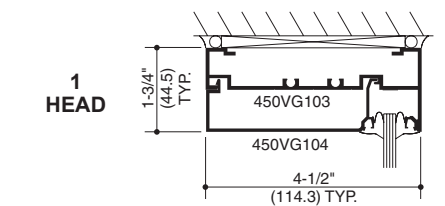
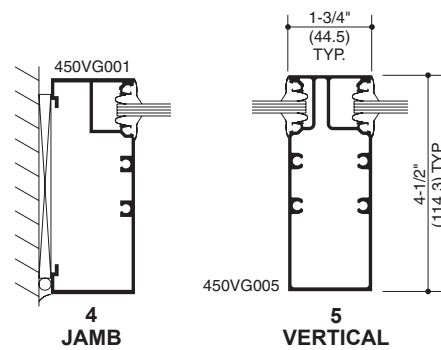
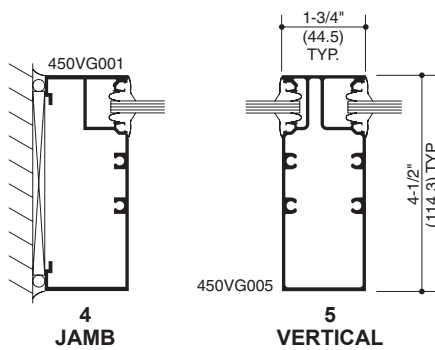
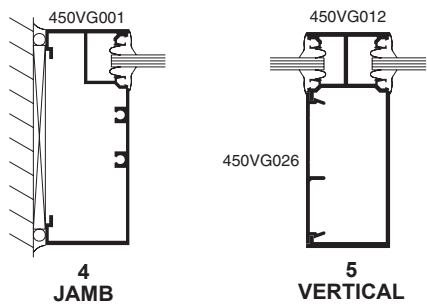


ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

SHEAR BLOCK

STICK



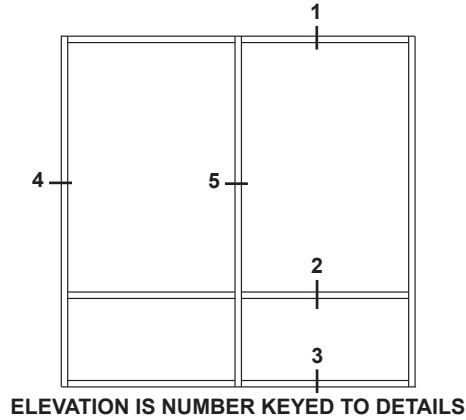
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

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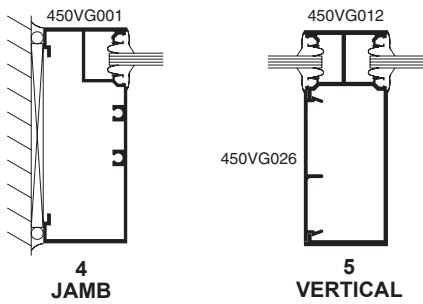
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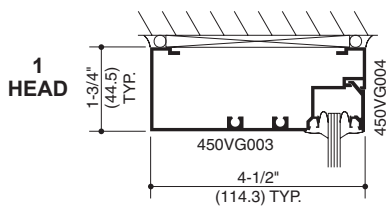
ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE



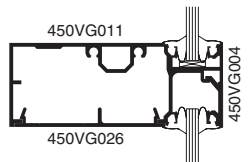
4 JAMB

5 VERTICAL

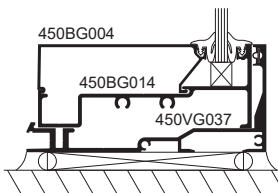


1 HEAD

2 HORIZONTAL

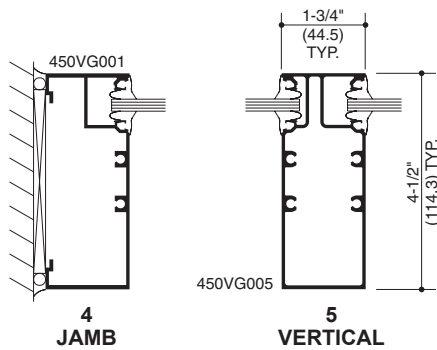


3 SILL



* HP Sill Flashing shown with optional gasket.

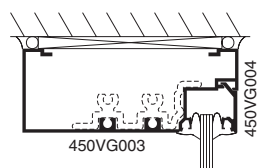
SHEAR BLOCK



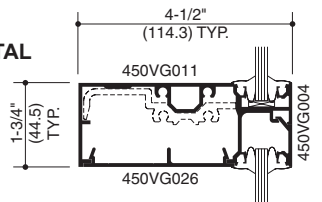
4 JAMB

5 VERTICAL

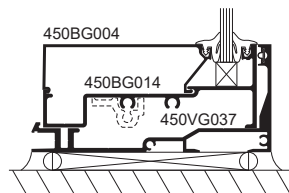
1 HEAD



2 HORIZONTAL

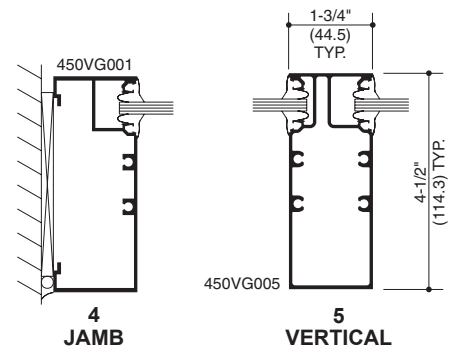


3 SILL



* HP Sill Flashing shown with optional gasket.

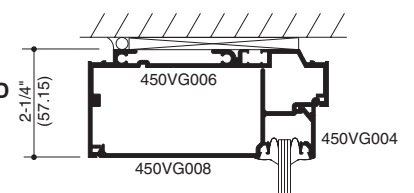
STICK



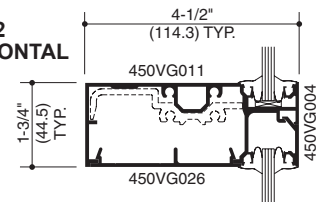
4 JAMB

5 VERTICAL

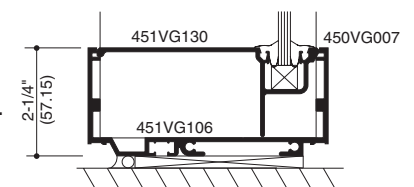
1 HEAD



2 HORIZONTAL



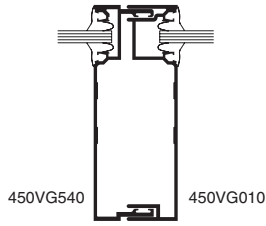
3 SILL



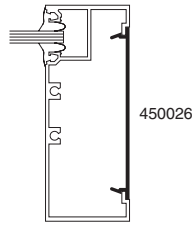
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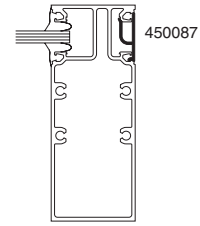
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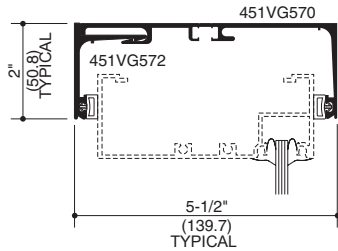
EXPANSION MULLION



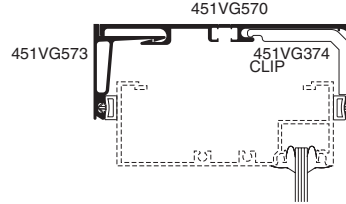
FLAT FILLER



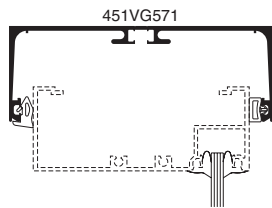
**SNAP-IN
FLAT FILLER**



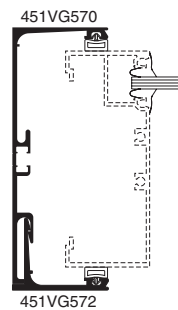
**STANDARD HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



**HEAVY WEIGHT
HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



**ONE PIECE
HEAD
COMPENSATING RECEPTOR**

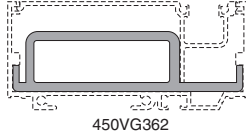


**JAMB
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**

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450VG362

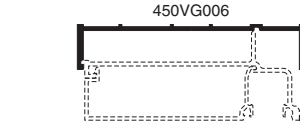
MULLION ANCHOR

NOTE:

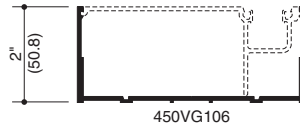
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional Mullion Anchors must be used.

NOTE:

Mullion Anchor not used with Lightweight Receptor.

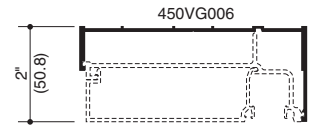


450VG006

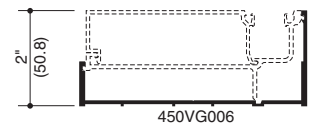


450VG106

OPTIONAL LIGHTWEIGHT CAN RECEPTORS

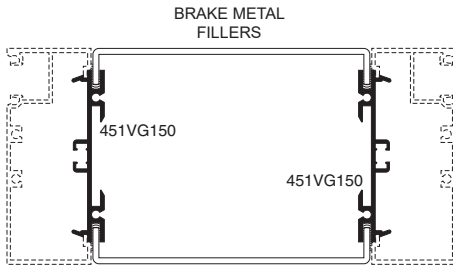


450VG006

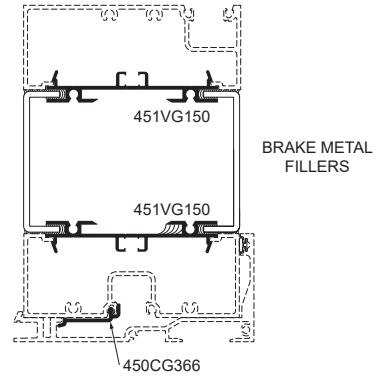


450VG006

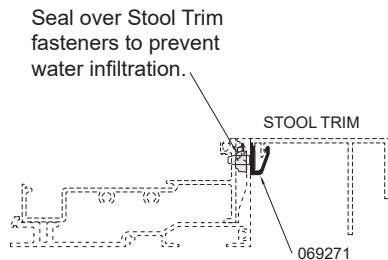
OPTIONAL UNEQUAL LEG CAN RECEPTORS (Stick System)



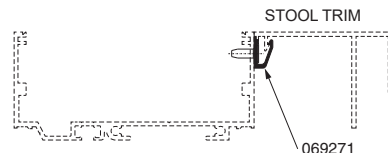
BRAKE METAL ADAPTOR AT VERTICAL



BRAKE METAL ADAPTOR AT HORIZONTAL



STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING

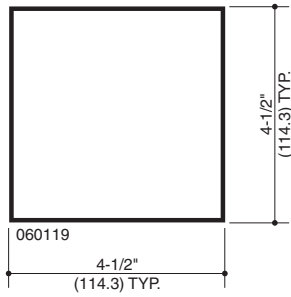


STOOL TRIM CLIP FOR STICK ASSEMBLY

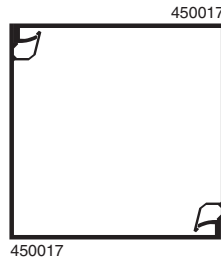
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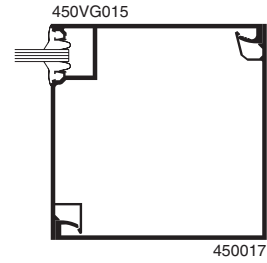
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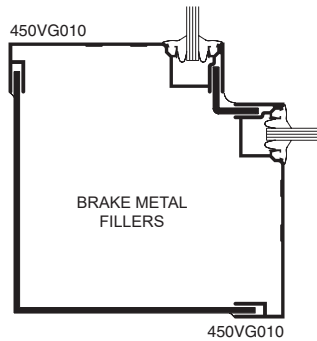
4-1/2" x 4-1/2" (114.3 x 114.3) TUBE



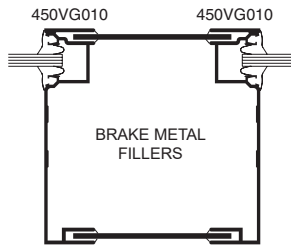
TWO PIECE NO POCKET CORNER



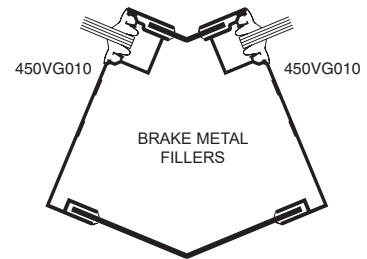
ONE POCKET CORNER



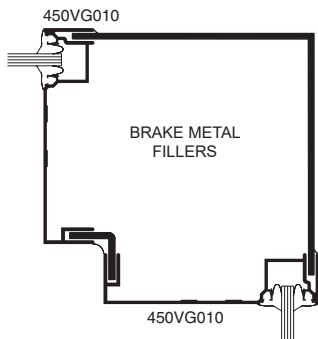
90° OUTSIDE BRAKE METAL CORNER



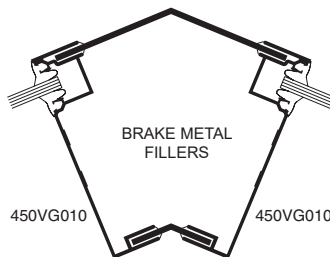
TWO POCKET BRAKE METAL POST



VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER



90° INSIDE BRAKE METAL CORNER



VARIABLE DEGREE BRAKE METAL INSIDE CORNER

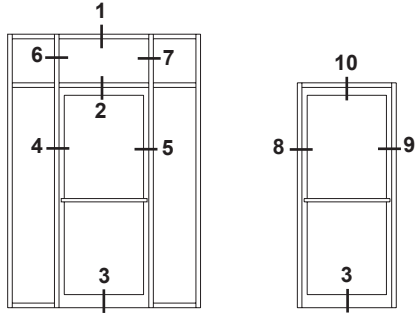
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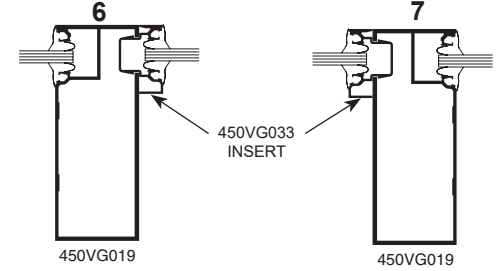
Additional information and CAD details are available at www.kawneer.com

TRIFAB® VERSAGLAZE® 450 FRAMING INCORPORATING KAWNEER "190" DOORS.

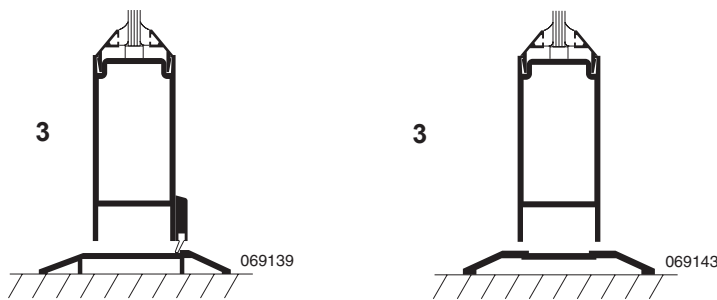
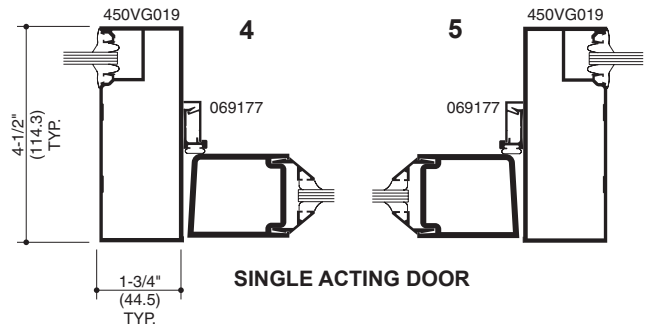
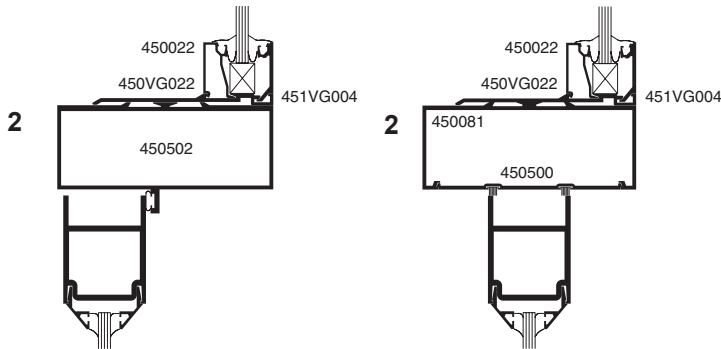
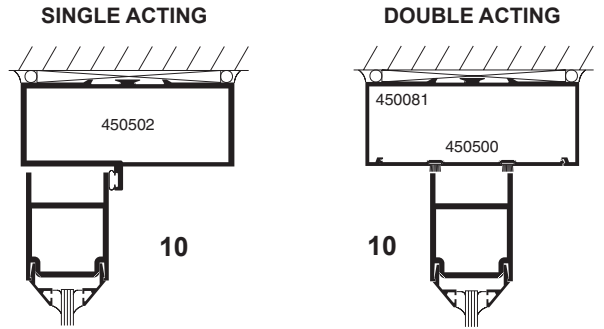
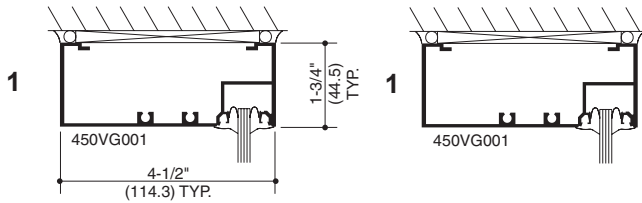
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



ELEVATIONS ARE NUMBER KEYED TO DETAILS



Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert.



SINGLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR

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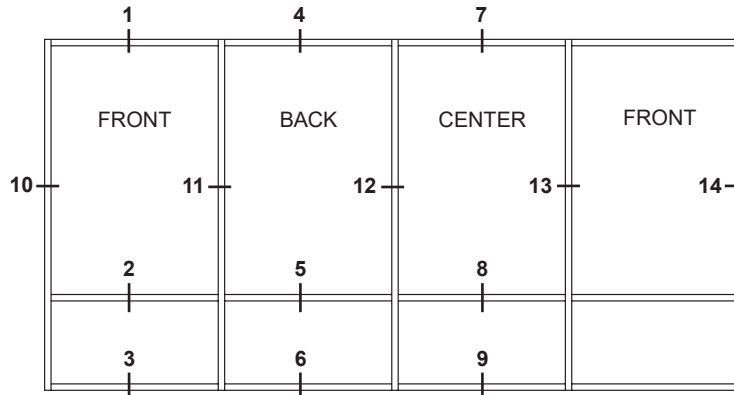
BASIC FRAMING DETAILS 46-51
(See appropriate Center, Front or Back Section
for Miscellaneous Details.)

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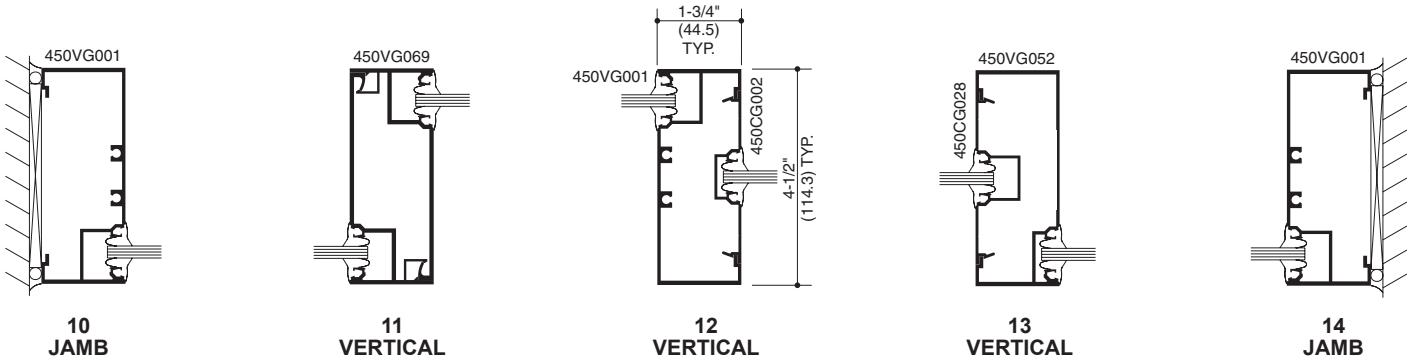
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SCREW SPLINE ASSEMBLY

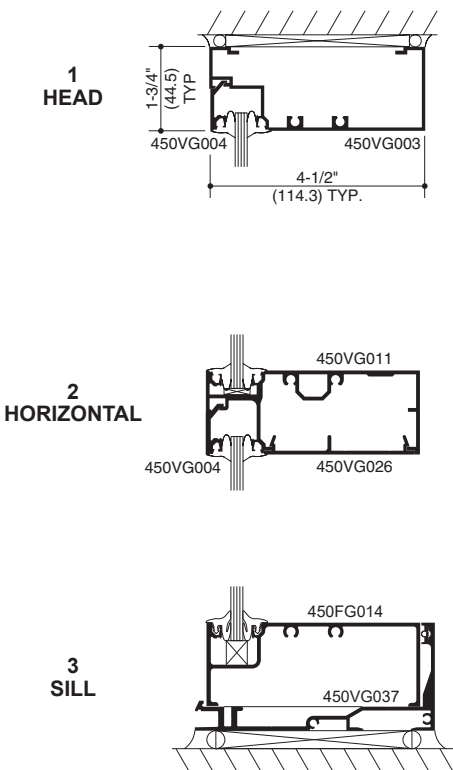


ELEVATION IS NUMBER KEYED TO DETAILS



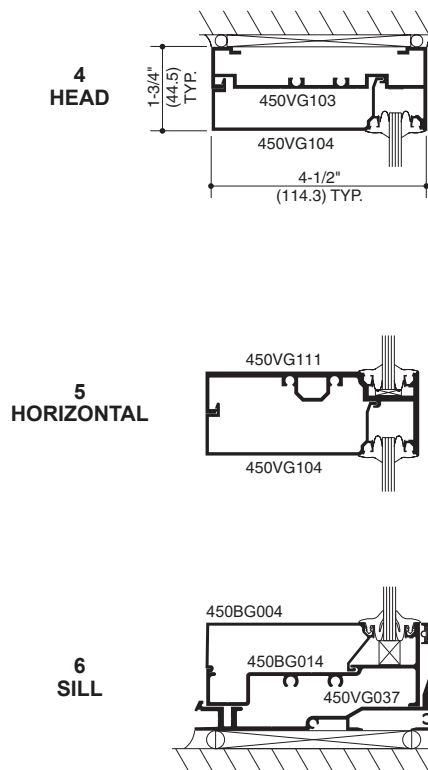
FRONT

See Pages 23 thru 35 for all FRONT details.



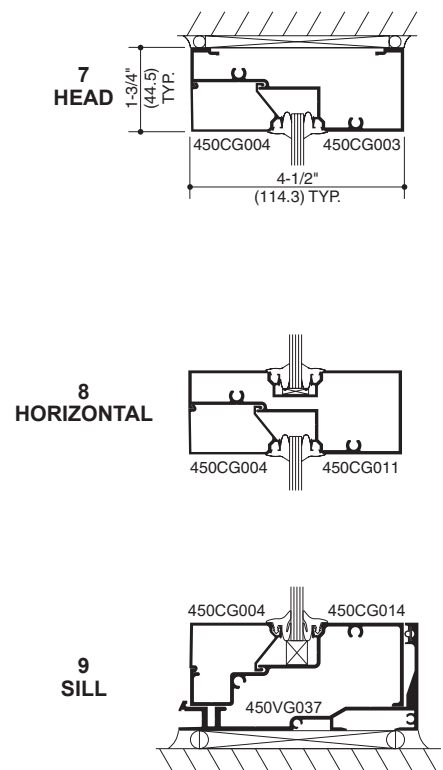
BACK

See Pages 38 thru 43 for all BACK details.



CENTER

See Pages 12 thru 21 for all CENTER details.

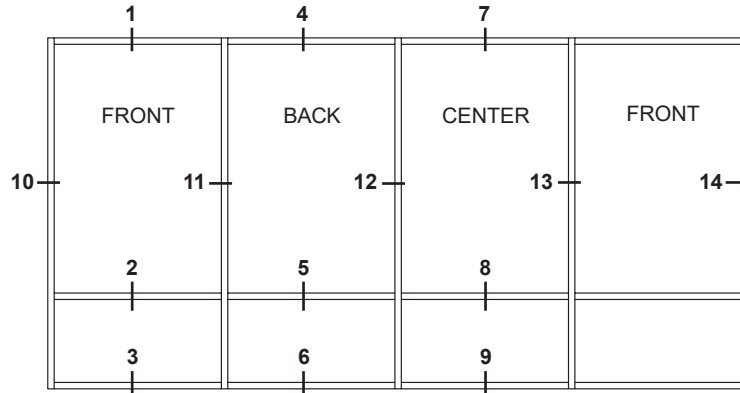


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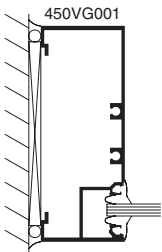
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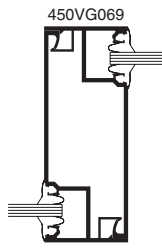
SCREW SPLINE ASSEMBLY



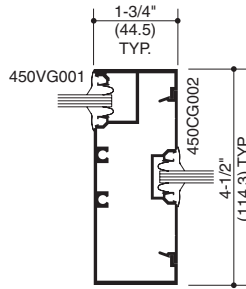
ELEVATION IS NUMBER KEYED TO DETAILS



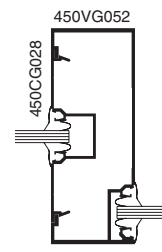
10 JAMB



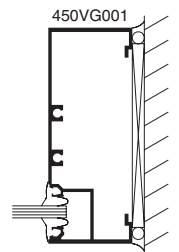
11 VERTICAL



12 VERTICAL



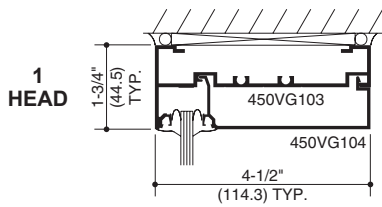
13 VERTICAL



14 JAMB

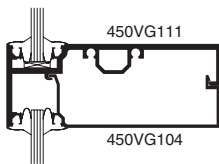
FRONT

See Pages 23 thru 35 for all FRONT details.

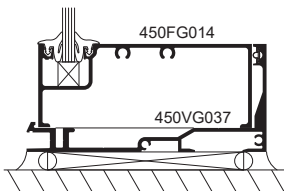


1 HEAD

2 HORIZONTAL

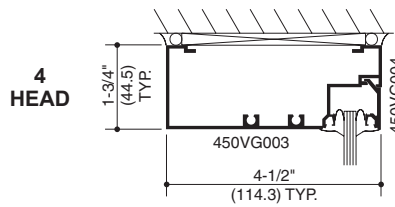


3 SILL



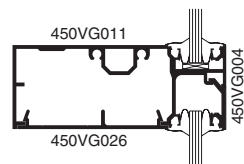
BACK

See Pages 38 thru 43 for all BACK details.

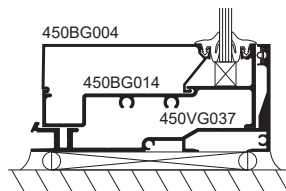


4 HEAD

5 HORIZONTAL

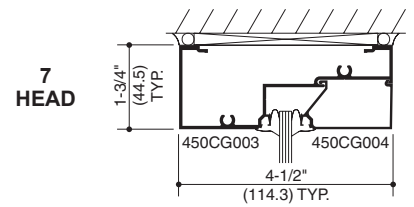


6 SILL



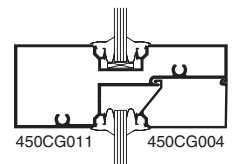
CENTER

See Pages 12 thru 21 for all CENTER details.

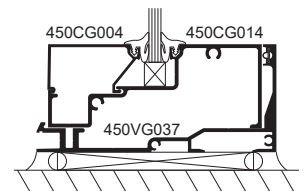


7 HEAD

8 HORIZONTAL



9 SILL

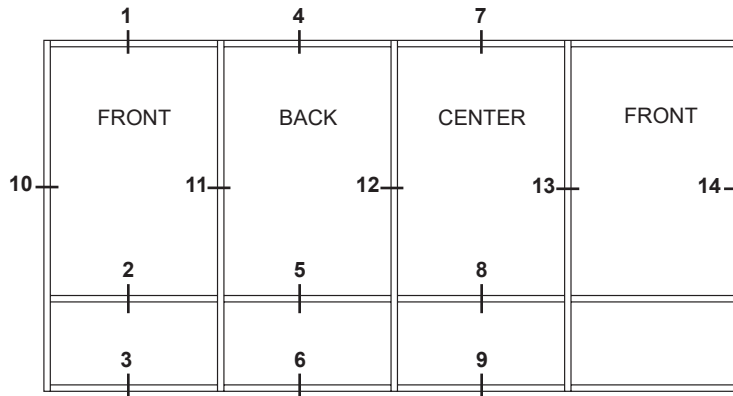


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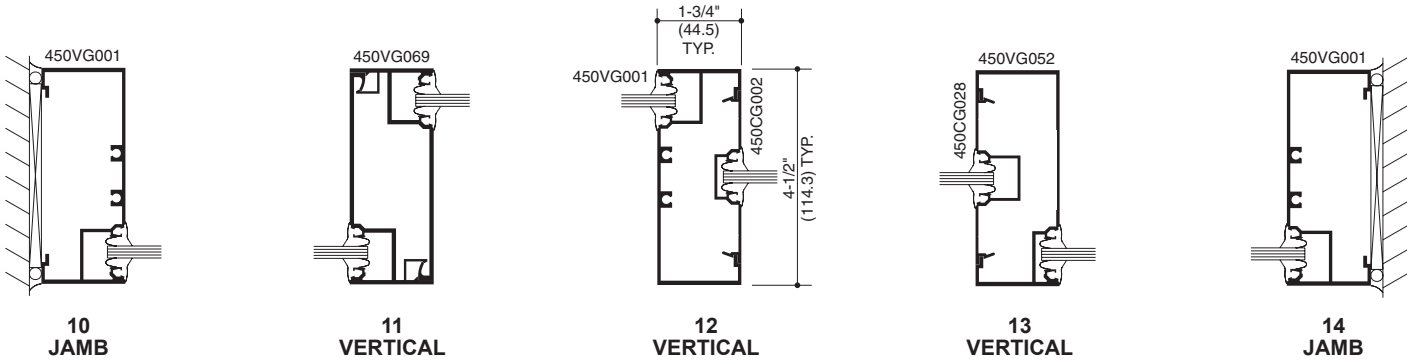
Additional information and CAD details are available at www.kawneer.com

SHEAR BLOCK ASSEMBLY



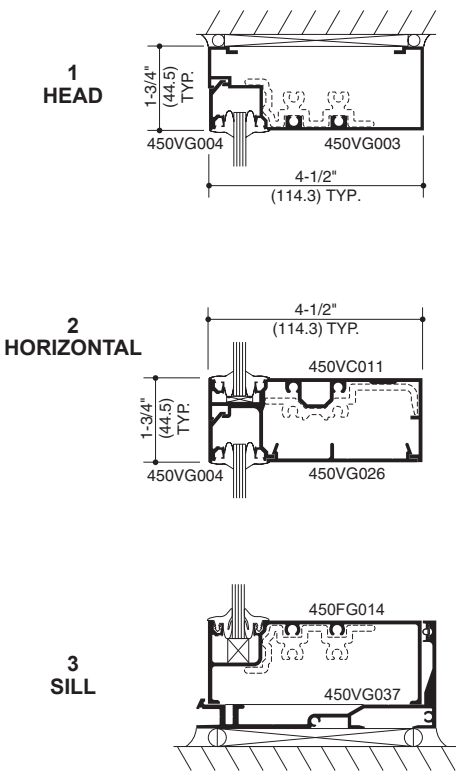
ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece.



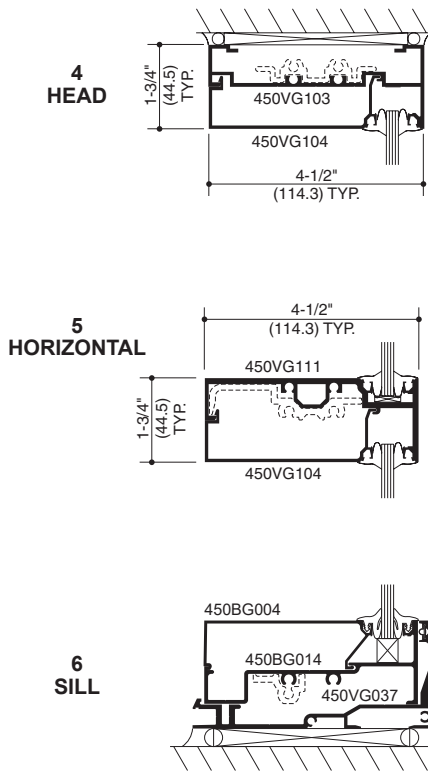
FRONT

See Pages 23 thru 35 for all FRONT details.



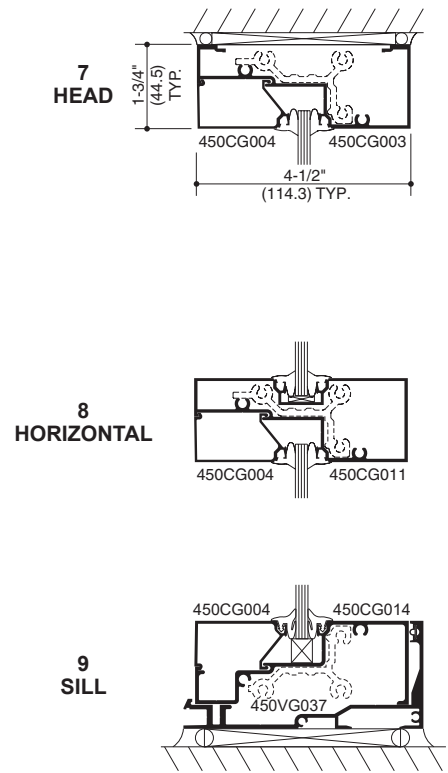
BACK

See Pages 38 thru 43 for all BACK details.



CENTER

See Pages 12 thru 21 for all CENTER details.

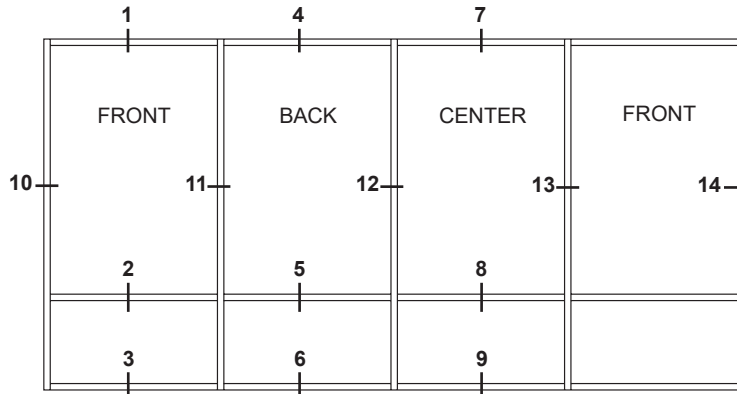


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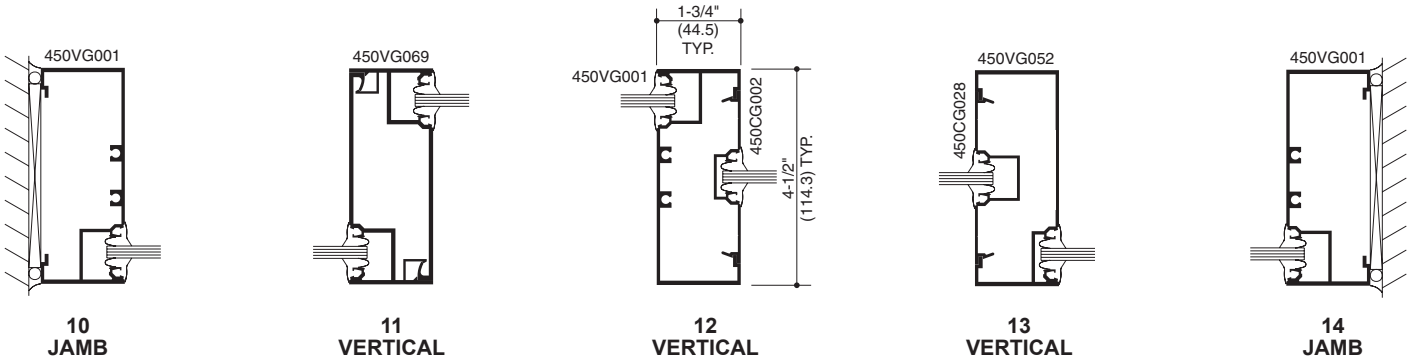
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SHEAR BLOCK ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece

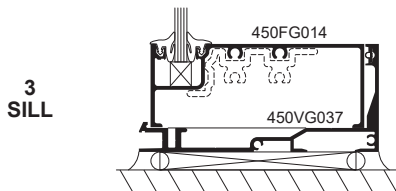
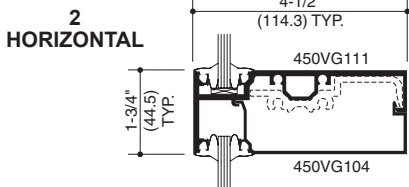
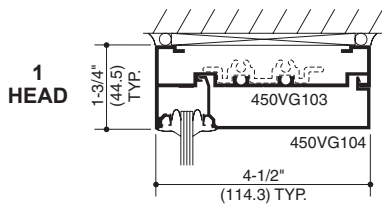


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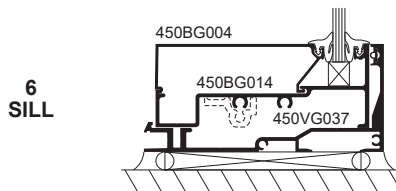
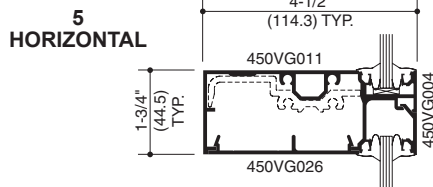
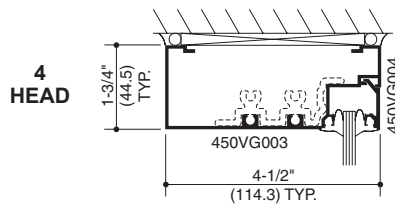
FRONT

See Pages 23 thru 35 for all FRONT details.



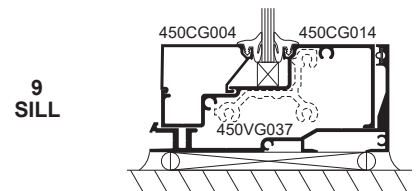
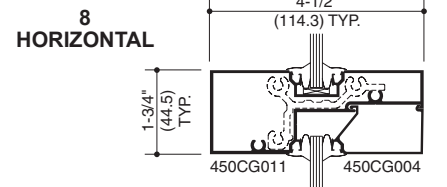
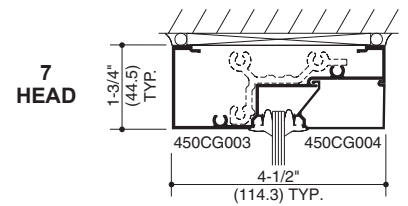
BACK

See Pages 38 thru 43 for all BACK details.



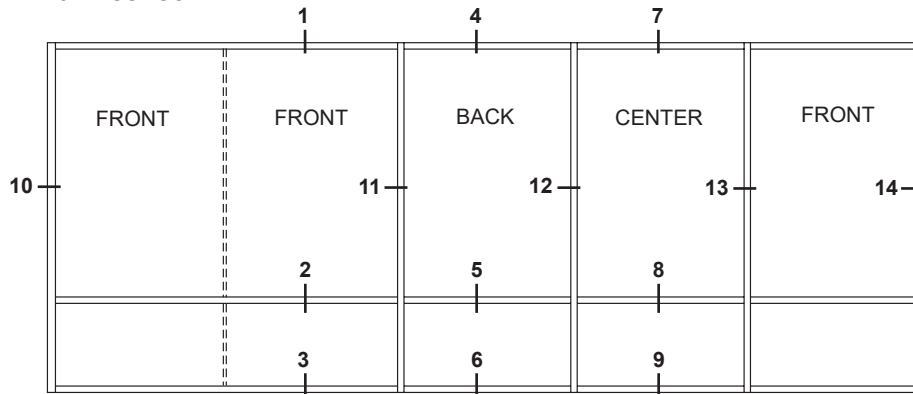
CENTER

See Pages 12 thru 21 for all CENTER details.



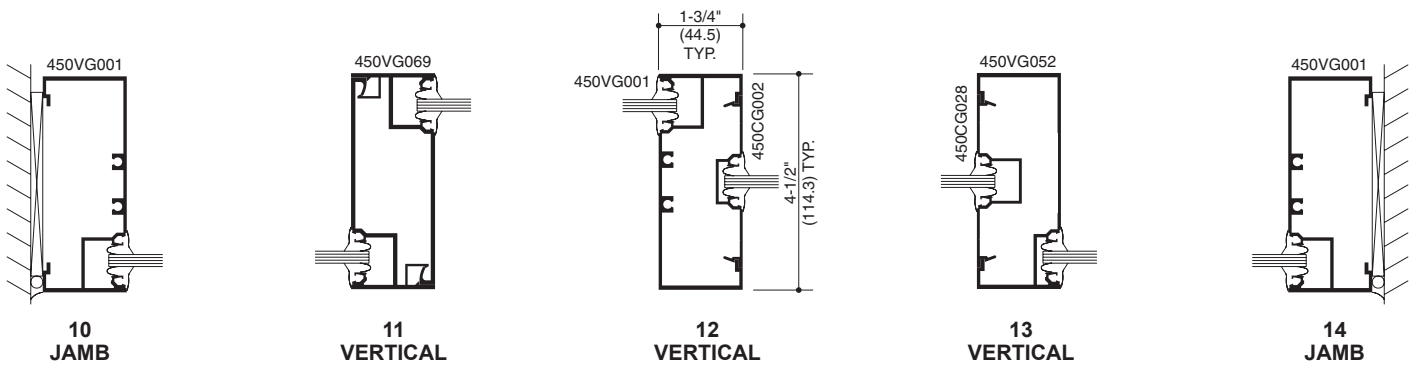
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STICK ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece.



FRONT

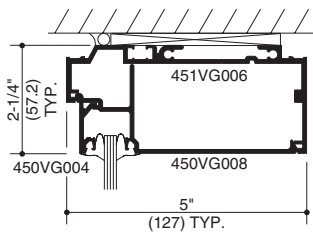
See Pages 23 thru 35 for all FRONT details.

BACK

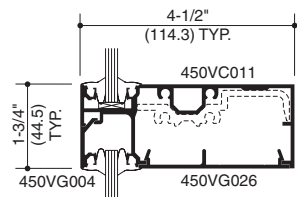
See Pages 38 thru 43 for all BACK details.

CENTER

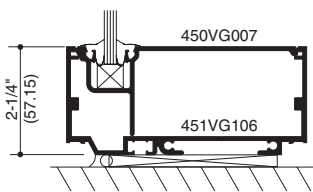
See Pages 12 thru 21 for all CENTER details.



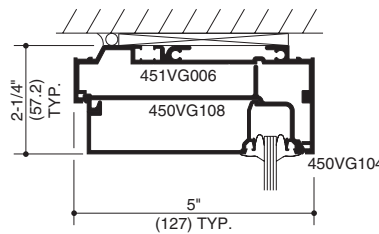
1 HEAD



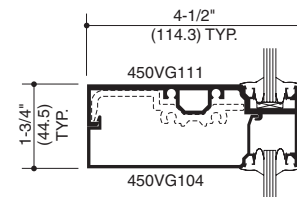
2 HORIZONTAL



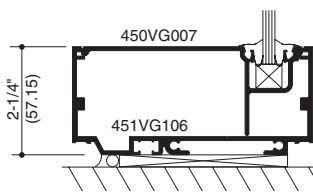
3 SILL



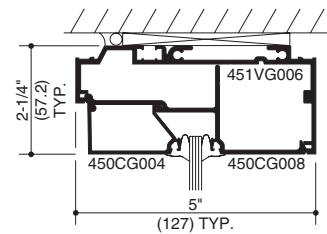
4 HEAD



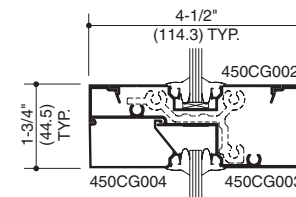
5 HORIZONTAL



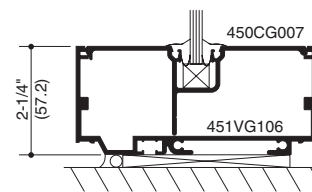
6 SILL



7 HEAD



8 HORIZONTAL



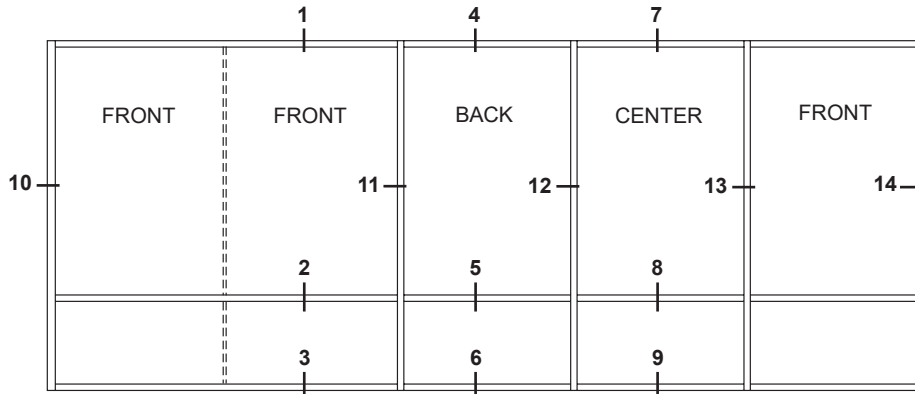
9 SILL

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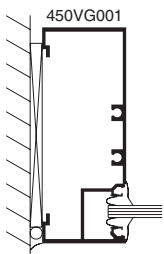
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STICK ASSEMBLY

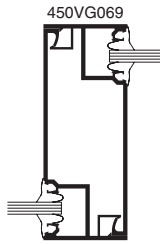


ELEVATION IS NUMBER KEYED TO DETAILS

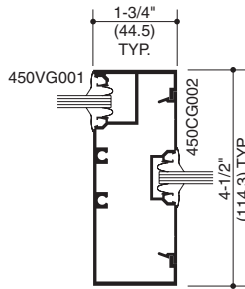
Note: Transition verticals are required to be two piece



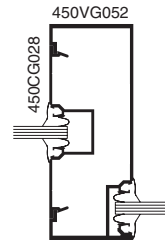
10 JAMB



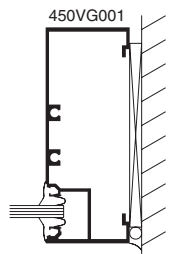
11 VERTICAL



12 VERTICAL



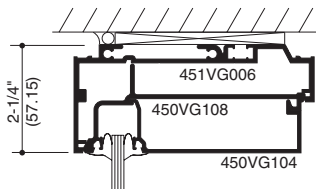
13 VERTICAL



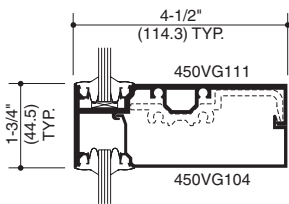
14 JAMB

FRONT

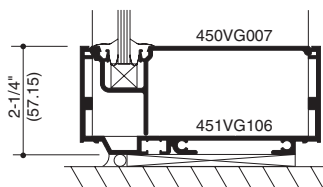
See Pages 23 thru 35 for all FRONT details.



1 HEAD



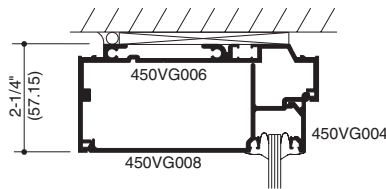
2 HORIZONTAL



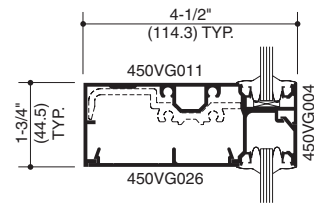
3 SILL

BACK

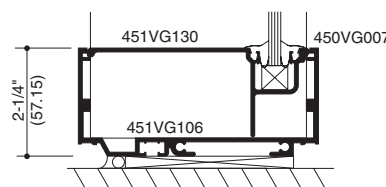
See Pages 38 thru 43 for all BACK details.



4 HEAD



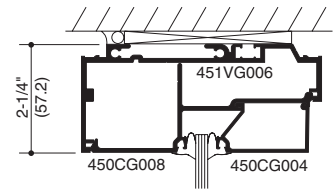
5 HORIZONTAL



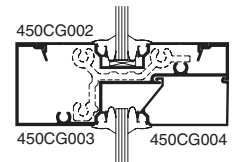
6 SILL

CENTER

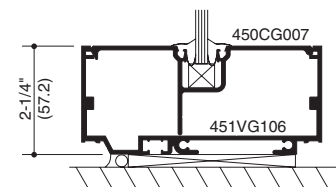
See Pages 12 thru 21 for all CENTER details.



7 HEAD



8 HORIZONTAL



9 SILL

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WINDLOAD CHARTS

CENTER 55-57

FRONT or BACK58,59

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ENTRANCE FRAMING 63-65

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END REACTION CHARTS68

THERMAL CHARTS69,72

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WIND LOAD CHARTS

Mullions are designed for deflection limitations in accordance with AAMA TIR-A11 of L/175 up to 13' 6" and L/240 +1/4" above 13' 6". These curves are for mullions WITH HORIZONTALS and are based on engineering calculations for stress and deflection. Allowable wind load stress for ALUMINUM 15,152 psi (104MPa), STEEL 30,000 psi (207MPa). Charted curves, in all cases are for the limiting value. Wind load charts contained herein are based upon nominal wind load utilized in allowable stress design. A conversion from Load Resistance Factor Design (LRFD) is provided. To convert ultimate wind loads to nominal loads, multiply ultimate wind loads by a factor of 0.6 per ASCE/SEI 7. A 4/3 increase in allowable stress has not been used to develop these curves. For special situations not covered by these curves, contact your Kawneer representative for additional information.

If the end reaction of the mullion [mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two] is more than 500 lbs., the optional Mullion Anchors must be used. Consult Application Engineering. (*Mullion Anchor not used with Lightweight Receptor.*)

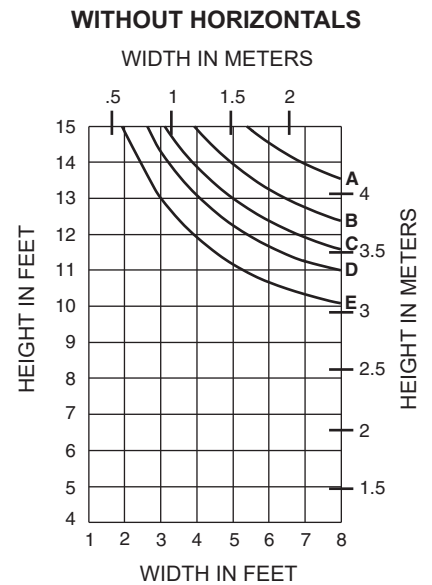
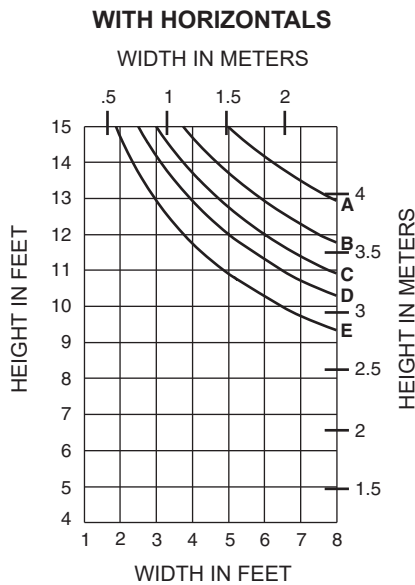
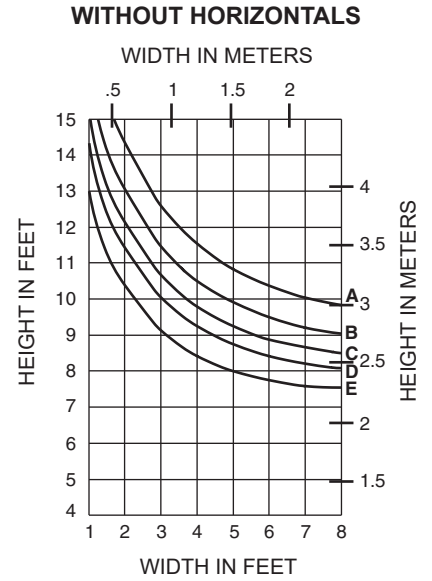
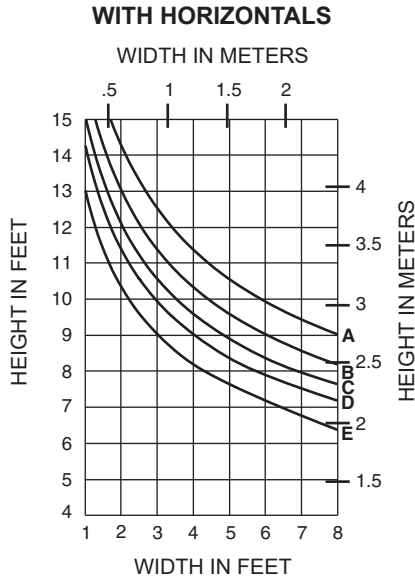
DEADLOAD CHARTS

Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1/4" (6.4) thick glass supported on two setting blocks at the loading points shown.

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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

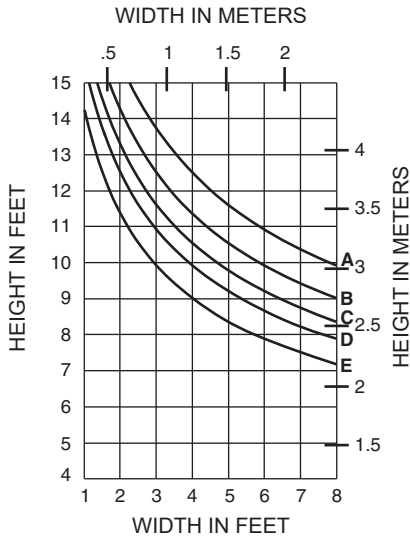


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D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

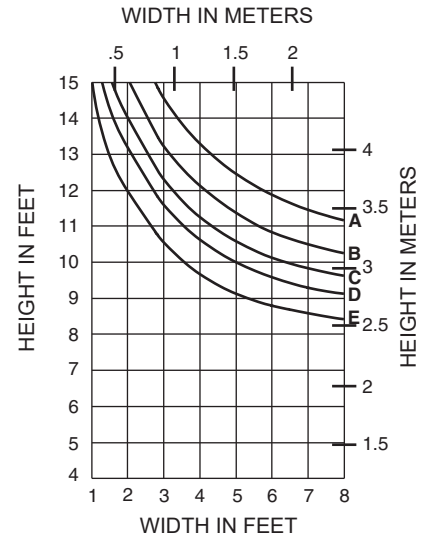
WITH HORIZONTALS



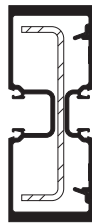
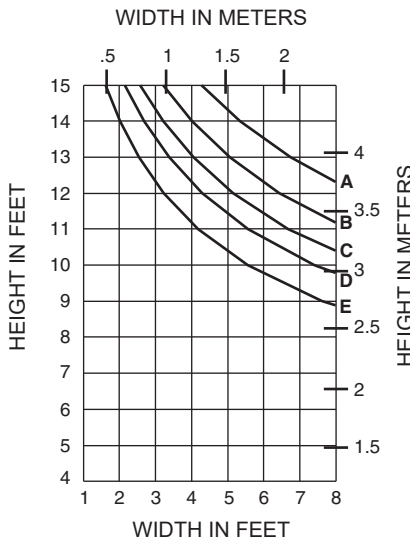
**450CG013
450CG002**

$I = 4.481 (186.51 \times 10^4)$
 $S = 1.991 (32.63 \times 10^3)$

WITHOUT HORIZONTALS



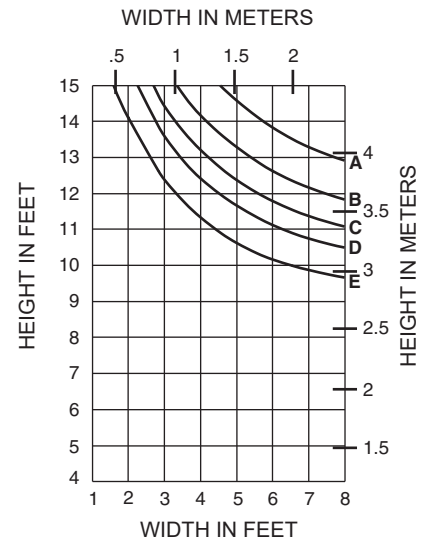
WITH HORIZONTALS



**450CG013
450CG002
with 400110 STEEL**

$I_A = 4.481 (186.51 \times 10^4)$
 $S_A = 1.991 (32.63 \times 10^3)$
 $I_S = 0.970 (40.37 \times 10^4)$
 $S_S = 0.535 (8.76 \times 10^3)$

WITHOUT HORIZONTALS

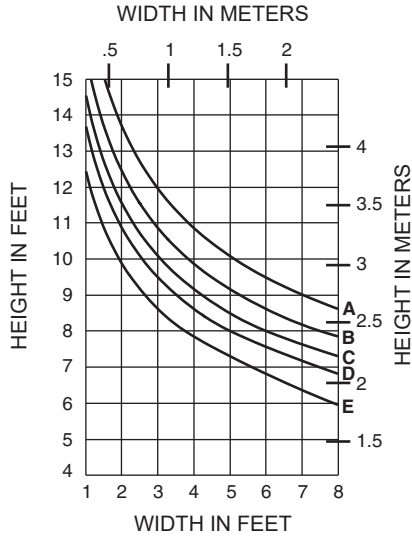


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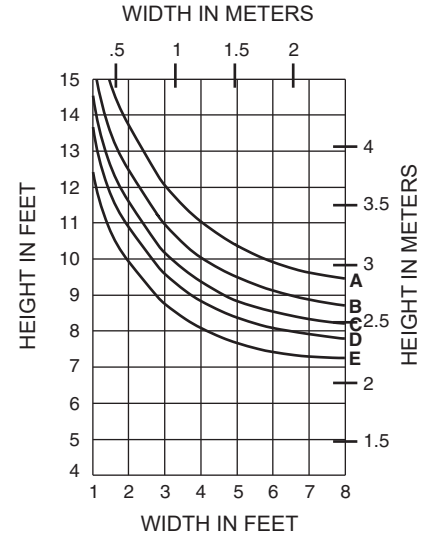
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C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

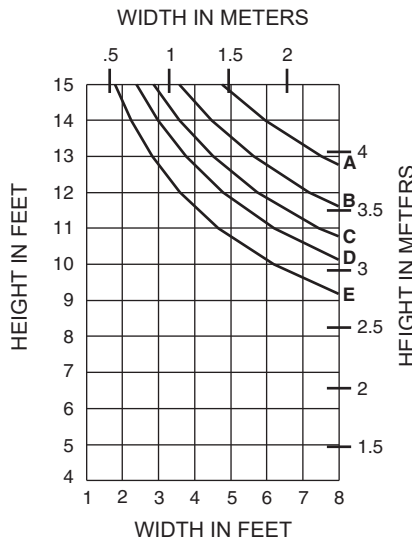
WITH HORIZONTALS



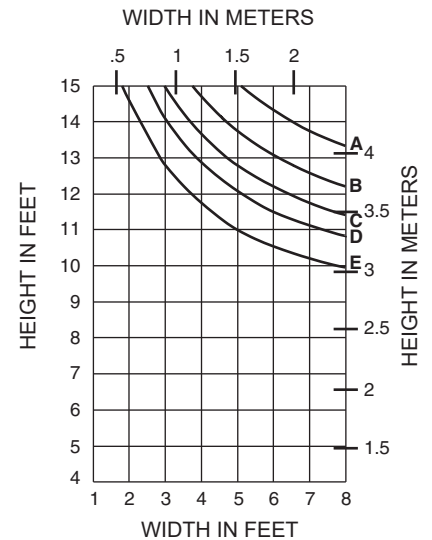
WITHOUT HORIZONTALS



WITH HORIZONTALS



WITHOUT HORIZONTALS

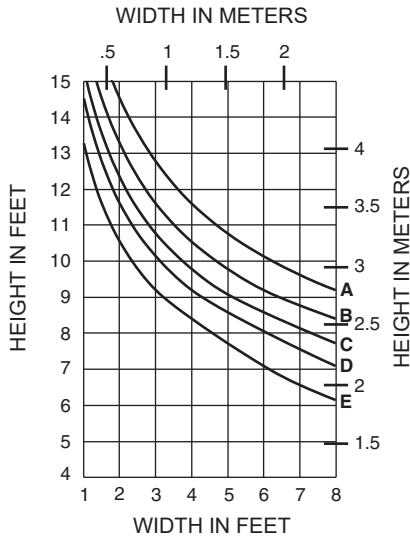


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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

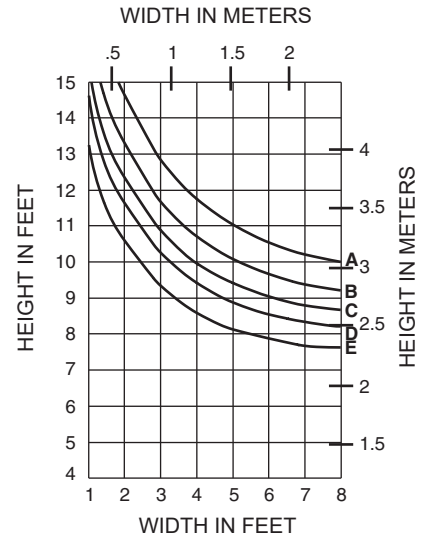
WITH HORIZONTALS



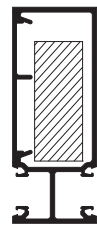
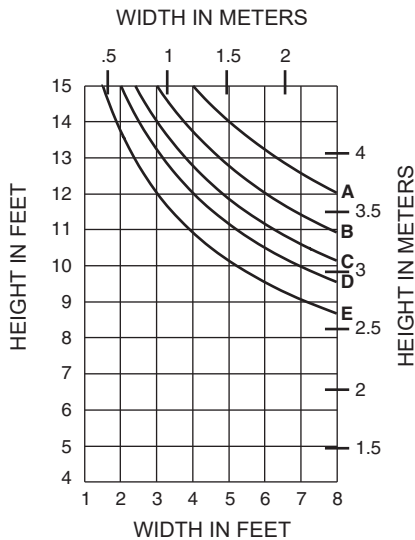
450VG012
450VG026

$I = 3.074 (127.95 \times 10^4)$
 $S = 1.192 (19.53 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



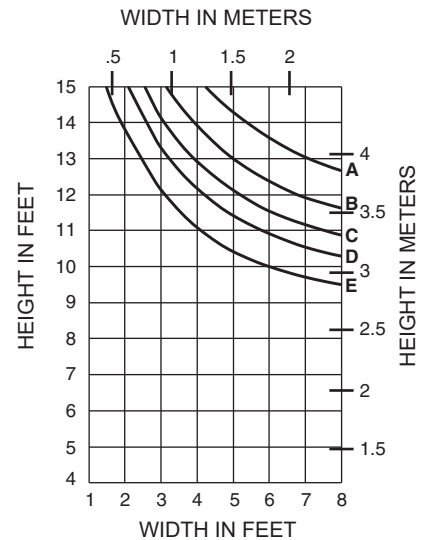
450VG012
450VG026

with 1" x 2-1/2" STEEL BAR

$I_A = 3.074 (127.95 \times 10^4)$
 $S_A = 1.192 (19.53 \times 10^3)$

$I_S = 1.302 (54.19 \times 10^4)$
 $S_S = 1.042 (17.08 \times 10^3)$

WITHOUT HORIZONTALS



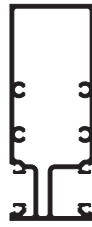
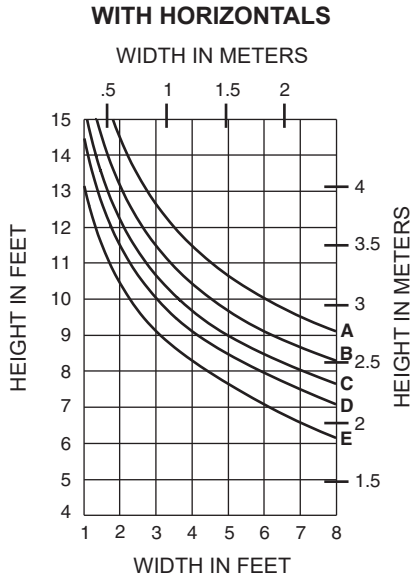
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

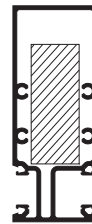
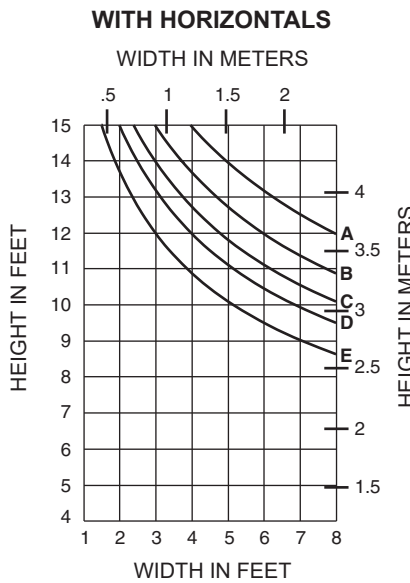
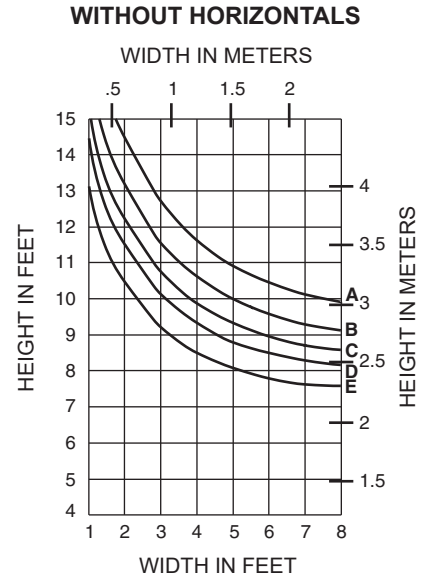
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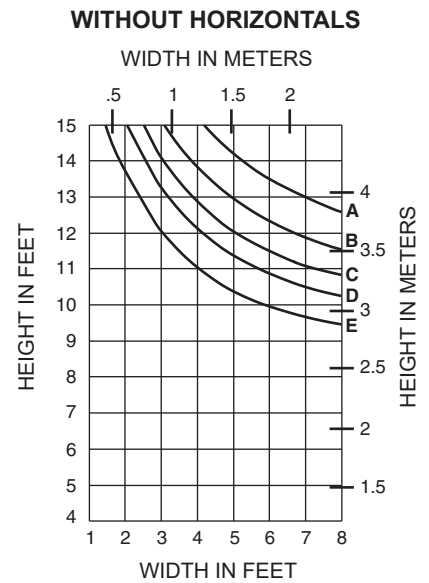
450VG005

$I = 2.978 (123.95 \times 10^4)$
 $S = 1.192 (19.53 \times 10^3)$



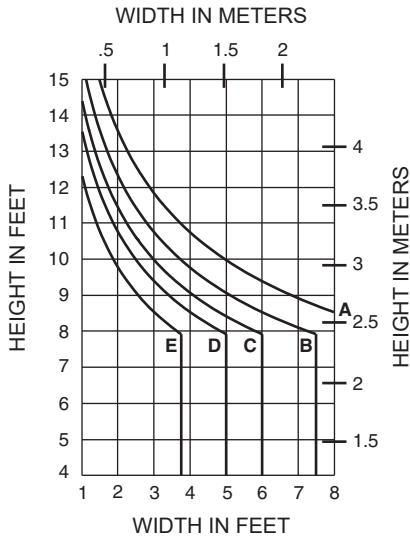
450VG005
with 1" x 2-1/2" STEEL BAR

$I_A = 2.978 (123.95 \times 10^4)$
 $S_A = 1.192 (19.53 \times 10^3)$
 $I_S = 1.302 (54.19 \times 10^4)$
 $S_S = 1.042 (17.08 \times 10^3)$



	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

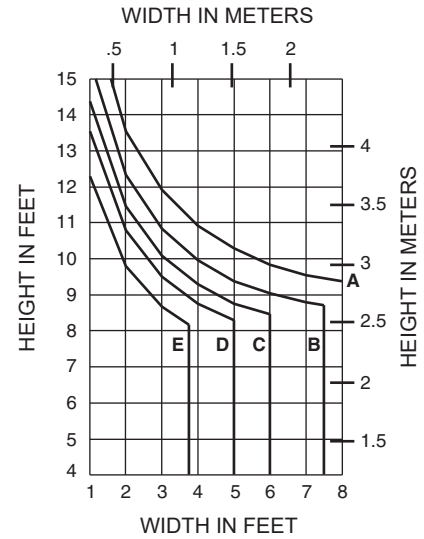
WITH HORIZONTALS



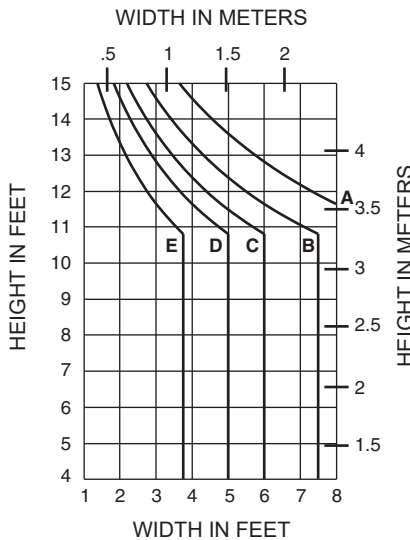
450SSG005

$I = 2.445 (101.76 \times 10^4)$
 $S = 1.352 (22.15 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS

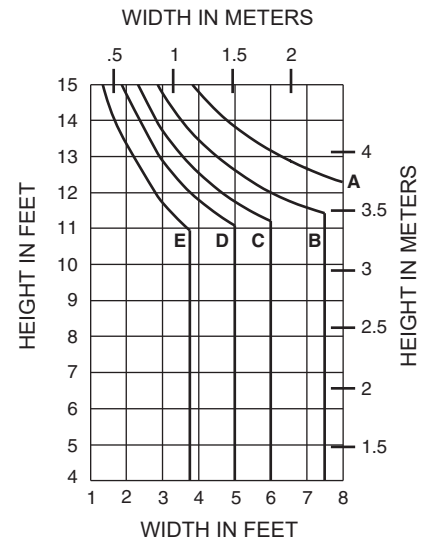


450SSG005

with 1" x 2-1/2" STEEL BAR

$I_A = 2.445 (101.76 \times 10^4)$
 $S_A = 1.352 (22.15 \times 10^3)$
 $I_S = 1.302 (54.19 \times 10^4)$
 $S_S = 1.042 (17.08 \times 10^3)$

WITHOUT HORIZONTALS



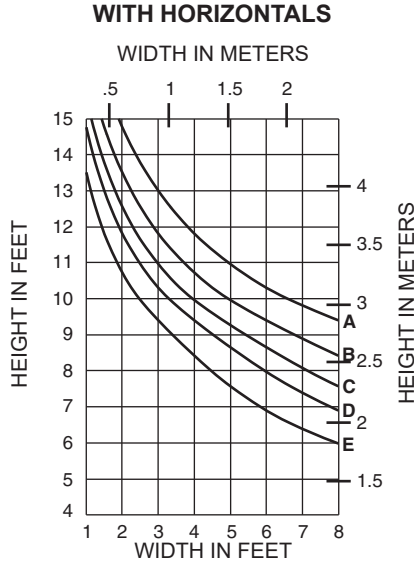
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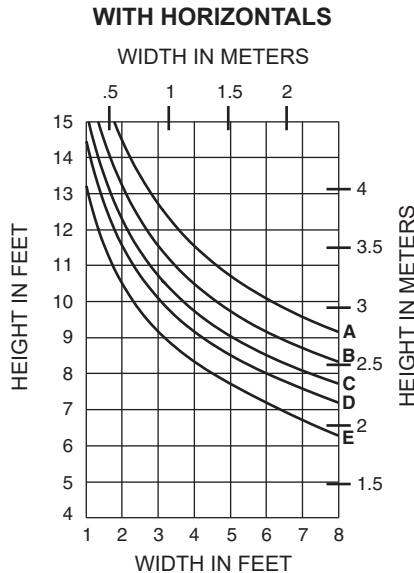
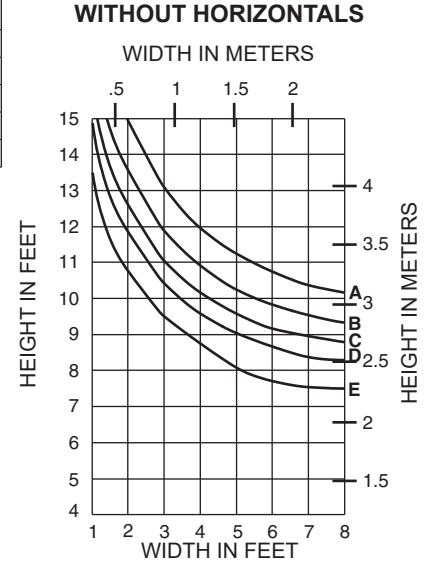
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



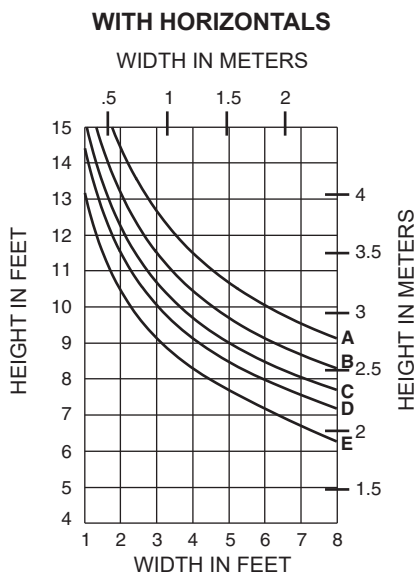
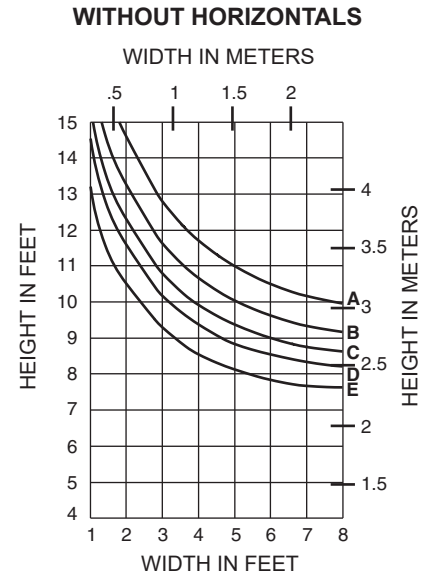
450VG069
450VG069

I = 3.246 (135.10 x 10⁴)
S = 1.132 (18.55 x 10³)



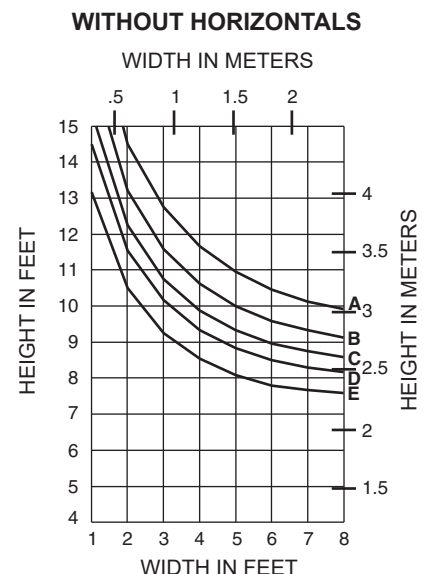
450VG001
450CG002

I = 3.031 (126.15 x 10⁴)
S = 1.239 (23.30 x 10³)

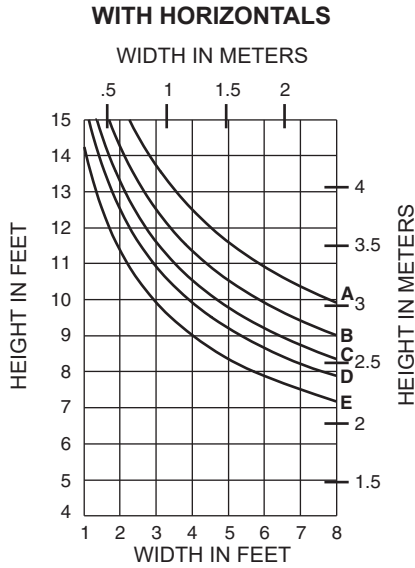


450VG052
450CG028

I = 2.998 (124.79 x 10⁴)
S = 1.235 (20.24 x 10³)

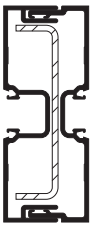
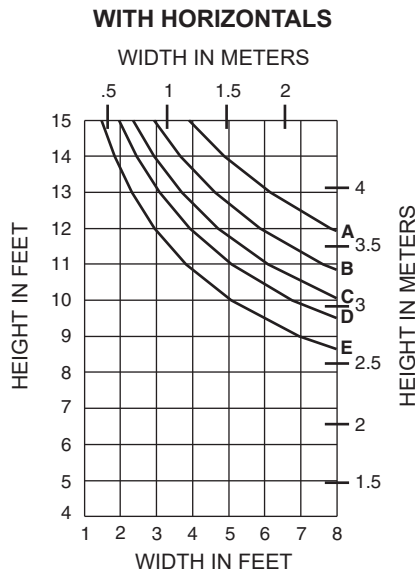
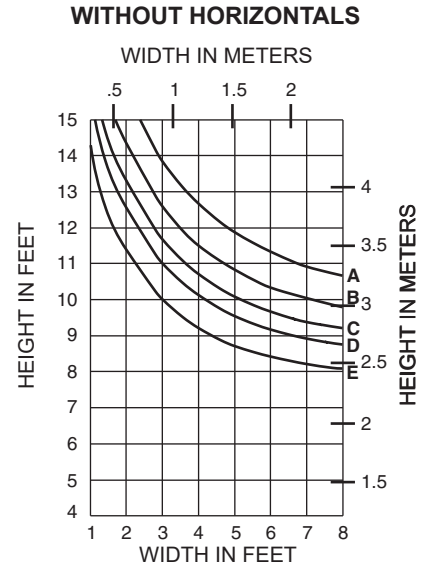


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



450CG540
450CG010

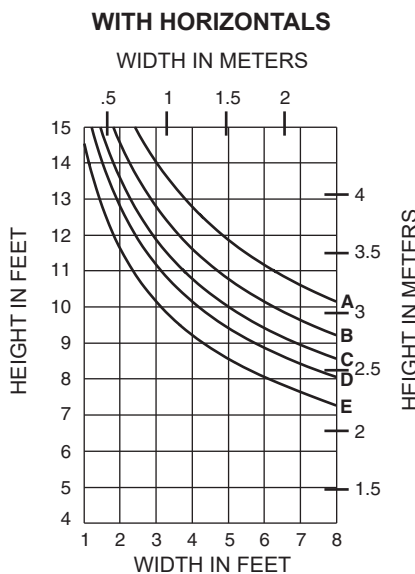
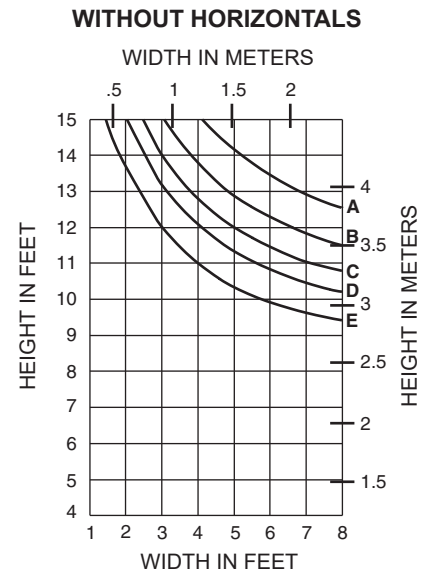
$I = 3.846 (160.08 \times 10^4)$
 $S = 1.710 (28.02 \times 10^3)$



450CG540
450CG010
WITH 400110 STEEL

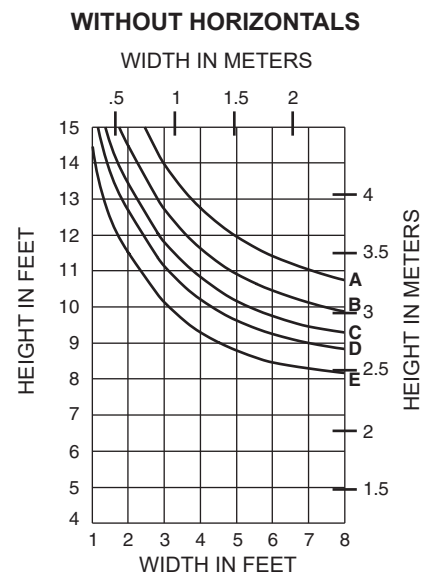
$I = 3.846 (160.08 \times 10^4)$
 $S = 1.710 (28.02 \times 10^3)$

$I_s = 0.970 (40.37 \times 10^4)$
 $S_s = 0.535 (8.76 \times 10^3)$



450VG540
450VG010

$I = 4.117 (171.36 \times 10^4)$
 $S = 1.704 (27.92 \times 10^3)$

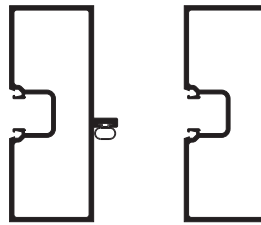
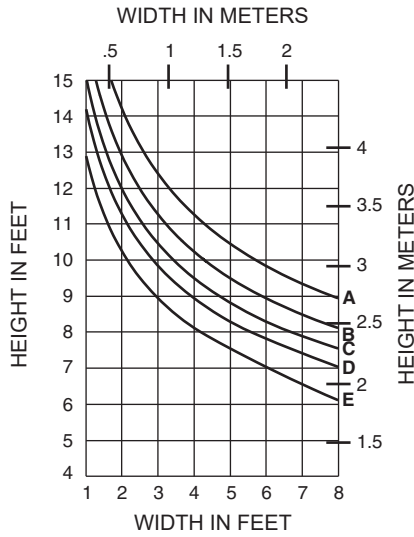


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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

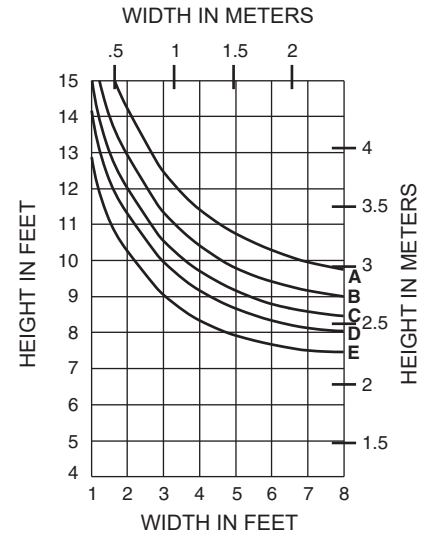
WITH HORIZONTALS



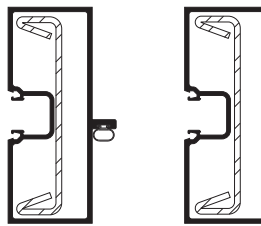
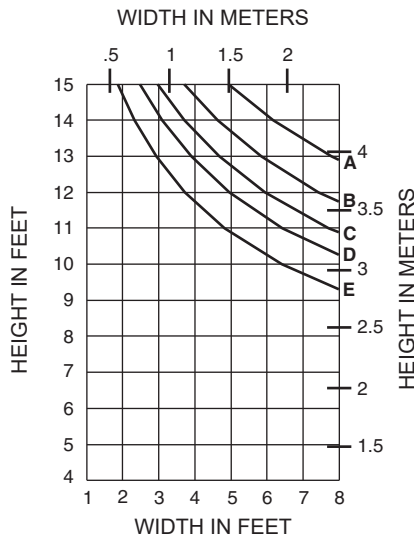
450501 450019

$I = 2.813 (117.08 \times 10^4)$
 $S = 1.250 (20.48 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS

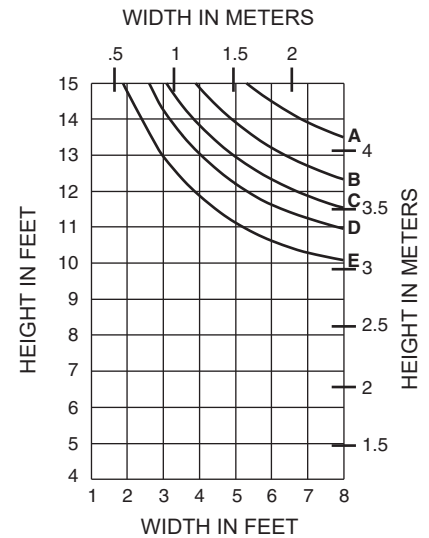


450501 450019

WITH 450110 STEEL

$I_A = 2.813 (117.08 \times 10^4)$
 $S_A = 1.250 (20.48 \times 10^3)$
 $I_S = 1.935 (80.57 \times 10^4)$
 $S_S = 0.938 (15.37 \times 10^3)$

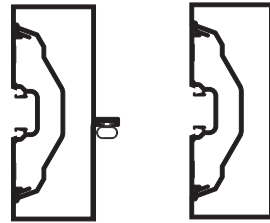
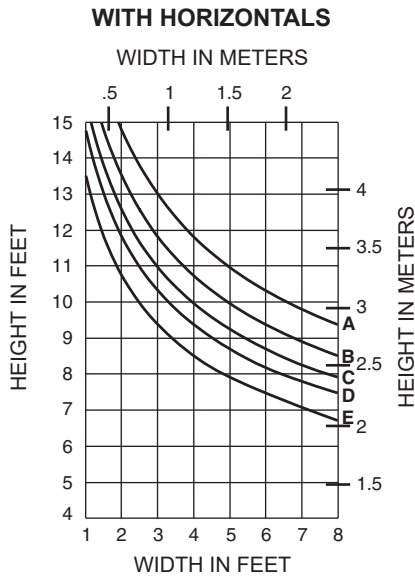
WITHOUT HORIZONTALS



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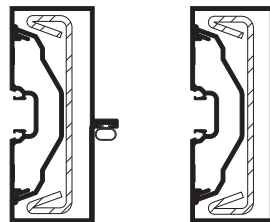
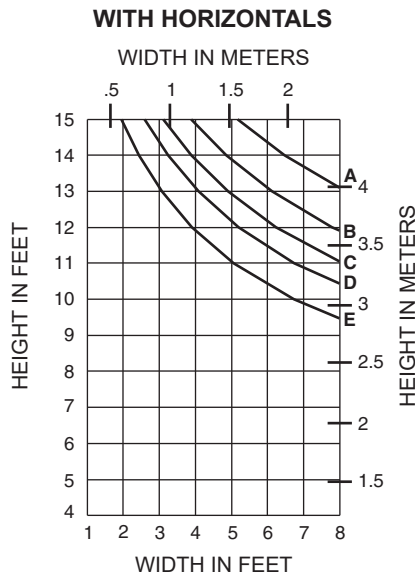
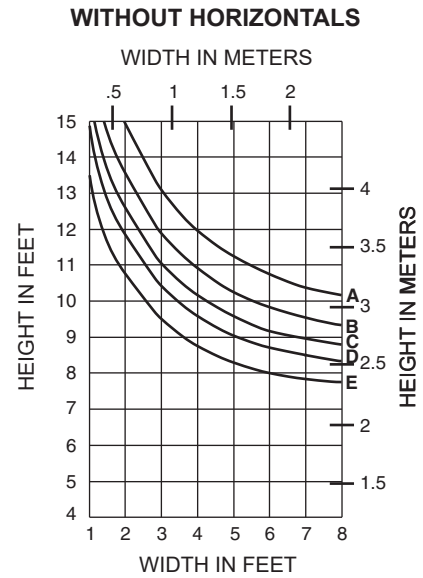
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



450599
450CG002

450064
450CG002

$I = 3.226 (134.28 \times 10^4)$
 $S = 1.467 (24.04 \times 10^3)$



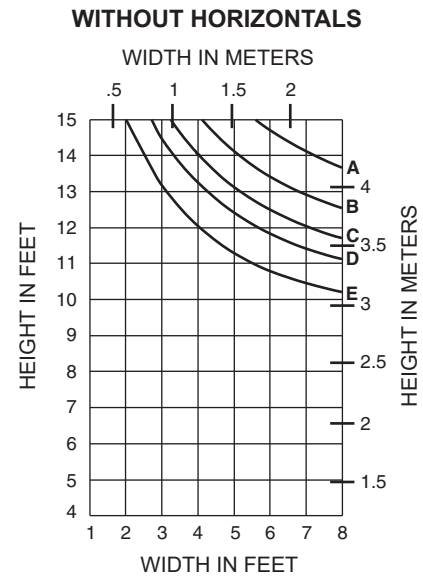
450599
450CG002

450064
450CG002

WITH 450110 STEEL

$I_A = 3.226 (134.28 \times 10^4)$
 $S_A = 1.467 (24.04 \times 10^3)$

$I_S = 1.935 (80.57 \times 10^4)$
 $S_S = 0.938 (15.37 \times 10^3)$

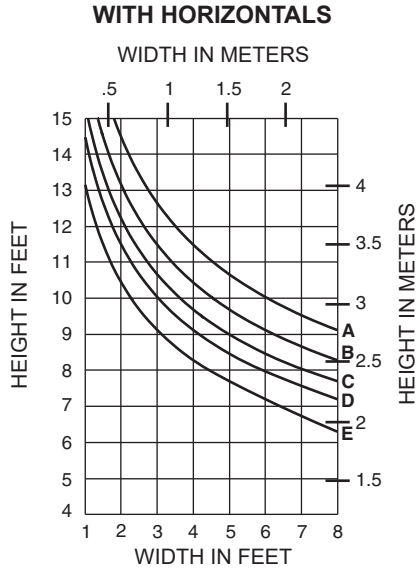


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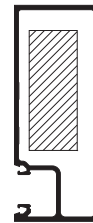
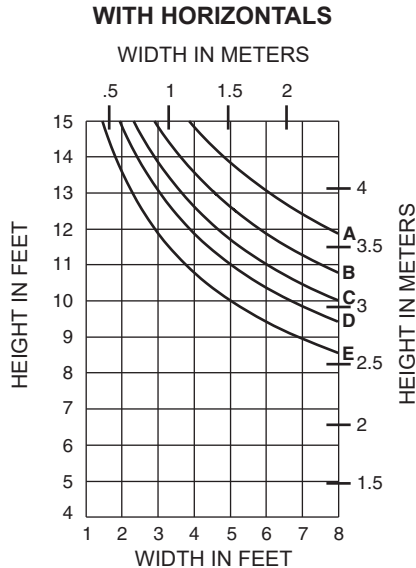
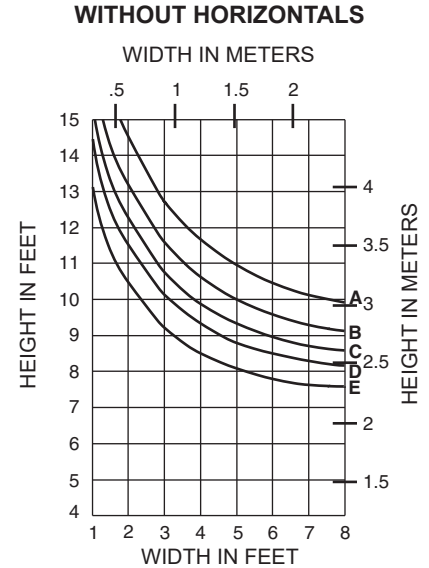
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



450VG019

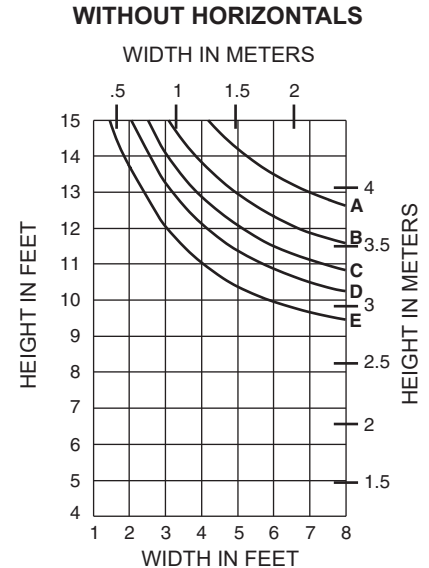
$I = 2.985 (124.24 \times 10^4)$
 $S = 1.244 (20.38 \times 10^3)$



450VG019

WITH 1" x 2-1/2" STEEL BAR

$I_A = 2.985 (124.24 \times 10^4)$
 $S_A = 1.244 (20.38 \times 10^3)$
 $I_S = 1.302 (54.19 \times 10^4)$
 $S_S = 1.042 (17.08 \times 10^3)$

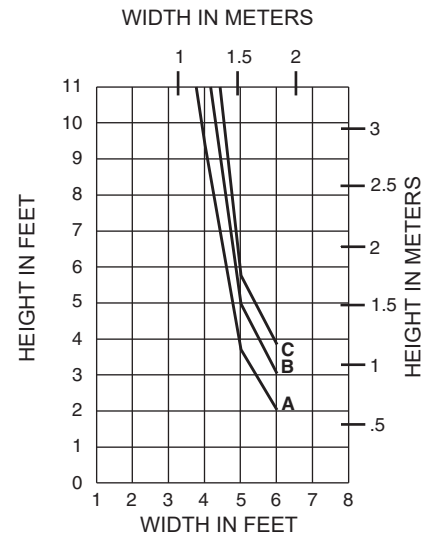
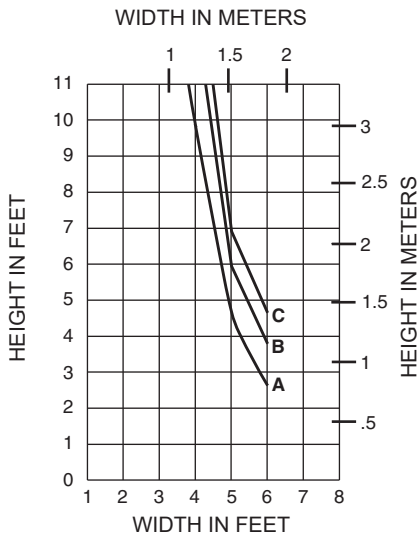
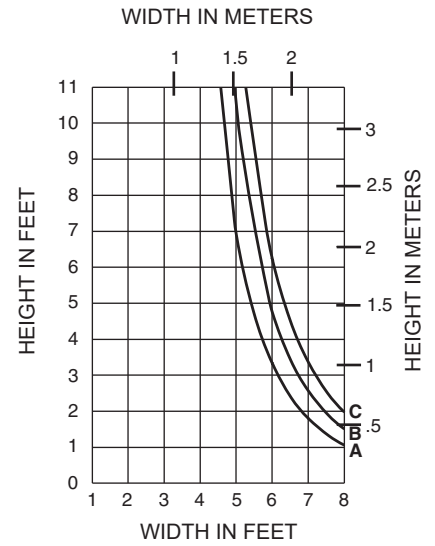
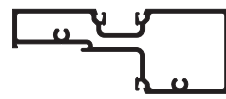
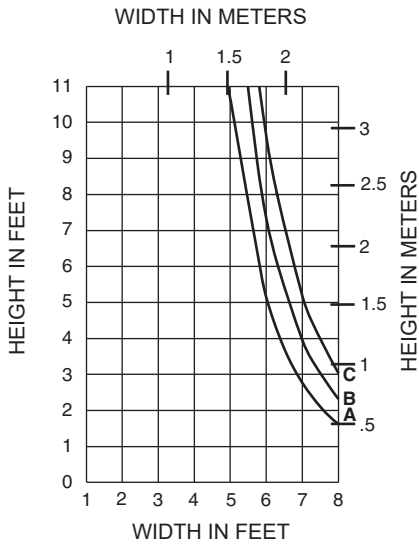


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Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1/4" (6.4) thick glass supported on two setting blocks at the loading points shown.

- A = (1/4 POINT LOADING)
- B = (1/6 POINT LOADING)
- C = (1/8 POINT LOADING)

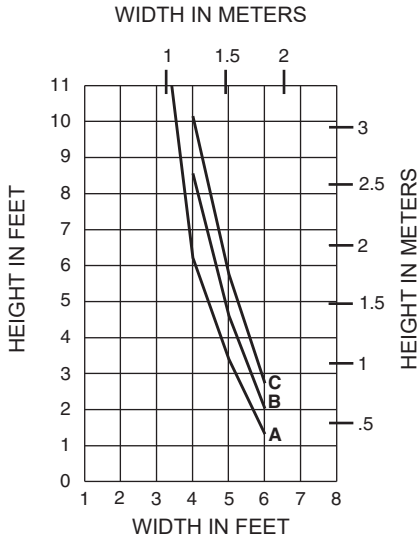


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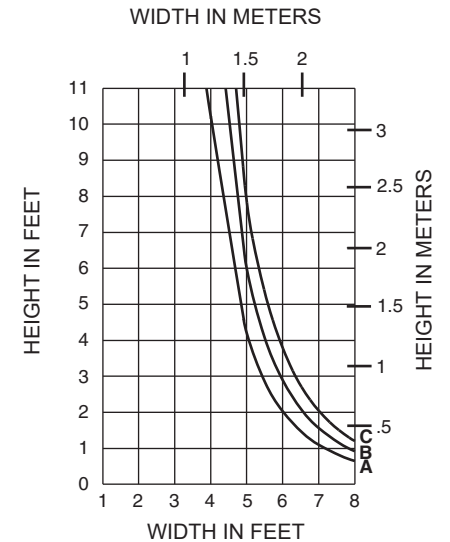
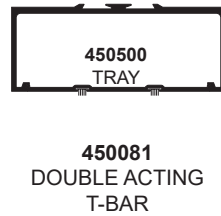
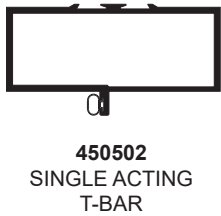
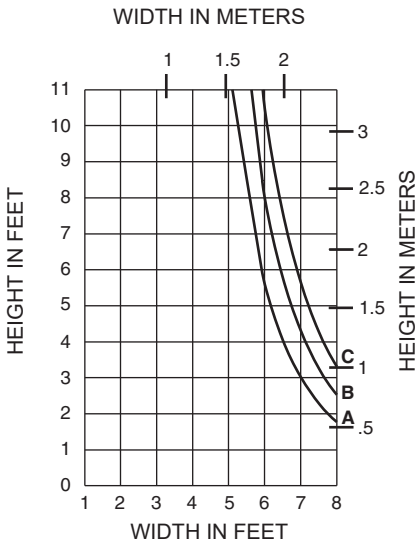
- A = (1/4 POINT LOADING)
- B = (1/6 POINT LOADING)
- C = (1/8 POINT LOADING)



DEADLOADS ON ENTRANCE TRANSOM BARS

Height limitations for transom glass over a doorway are based upon a 1/16" (1.6) maximum allowable deflection at the center of a transom bar. The accompanying charts are calculated for 1/4" (6.4) thick glass supported on two setting blocks placed at the loading points shown.

- A = (1/4 POINT LOADING)
- B = (1/6 POINT LOADING)
- C = (1/8 POINT LOADING)



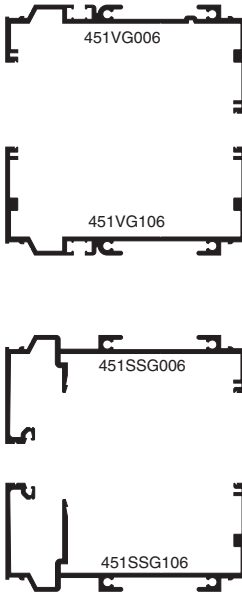
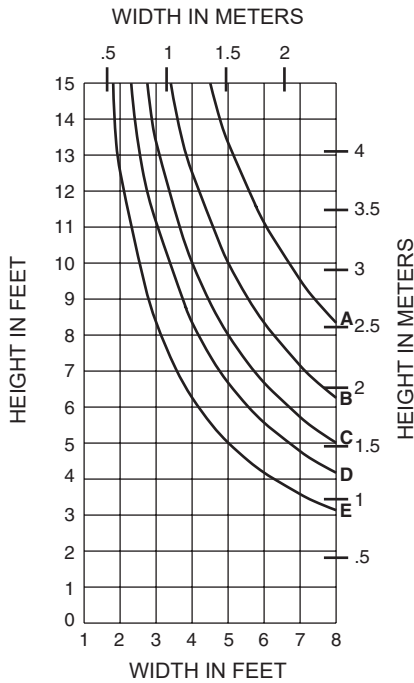
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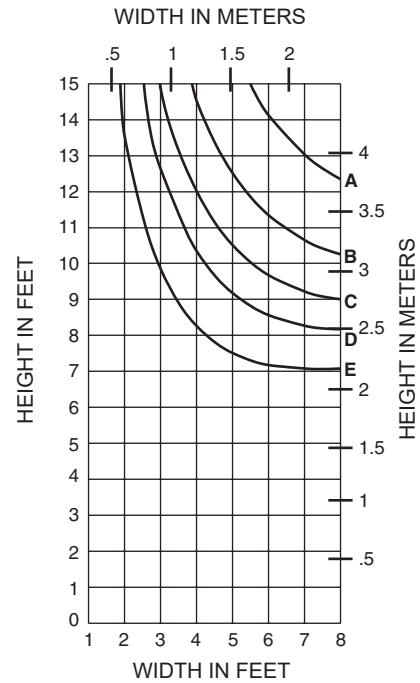
For each application, end reactions MUST be checked. These charts are used to verify that the end reactions at the head and sill receptors are 500 lbs. (2224N) or less and will meet the specified windload.

- A = 15 PSF (720 Pa)
- B = 20 PSF (960 Pa)
- C = 25 PSF (1200 Pa)
- D = 30 PSF (1440 Pa)
- E = 40 PSF (1920 Pa)

WITH HORIZONTALS



WITHOUT HORIZONTALS

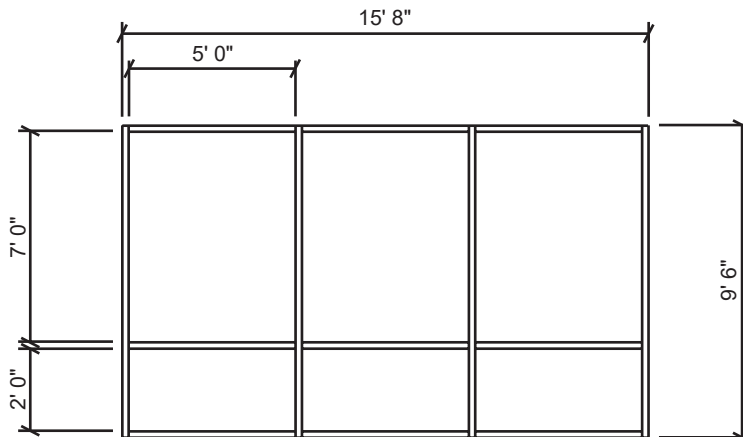


500lbs. Max. End Reaction

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Generic Project Specific U-factor Example Calculation
 (Percent of Glass will vary on specific products depending on sitelines)



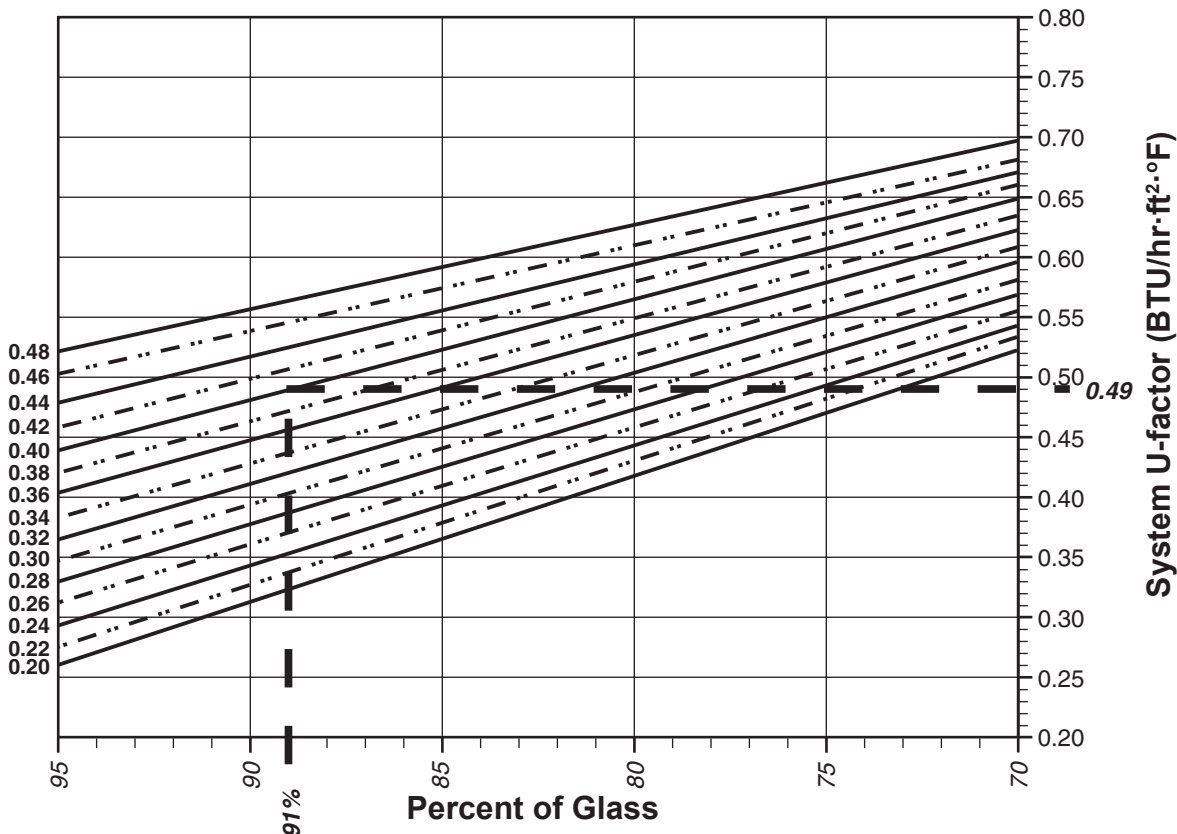
Example Glass U-factor = 0.42 Btu/hr·ft²·°F

Total Daylight Opening = 3(5' x 7') + 3(5' x 2') = 135ft²

Total Projected Area = (Total Daylight Opening + Total Area of Framing System)
 = 15' 8" x 9' 6" = 148.83ft²

Percent of Glass = (Total Daylight Opening ÷ Total Projected Area)
 = (135 ÷ 148.83)100 = 91%

System U-factor vs Percent of Glass Area



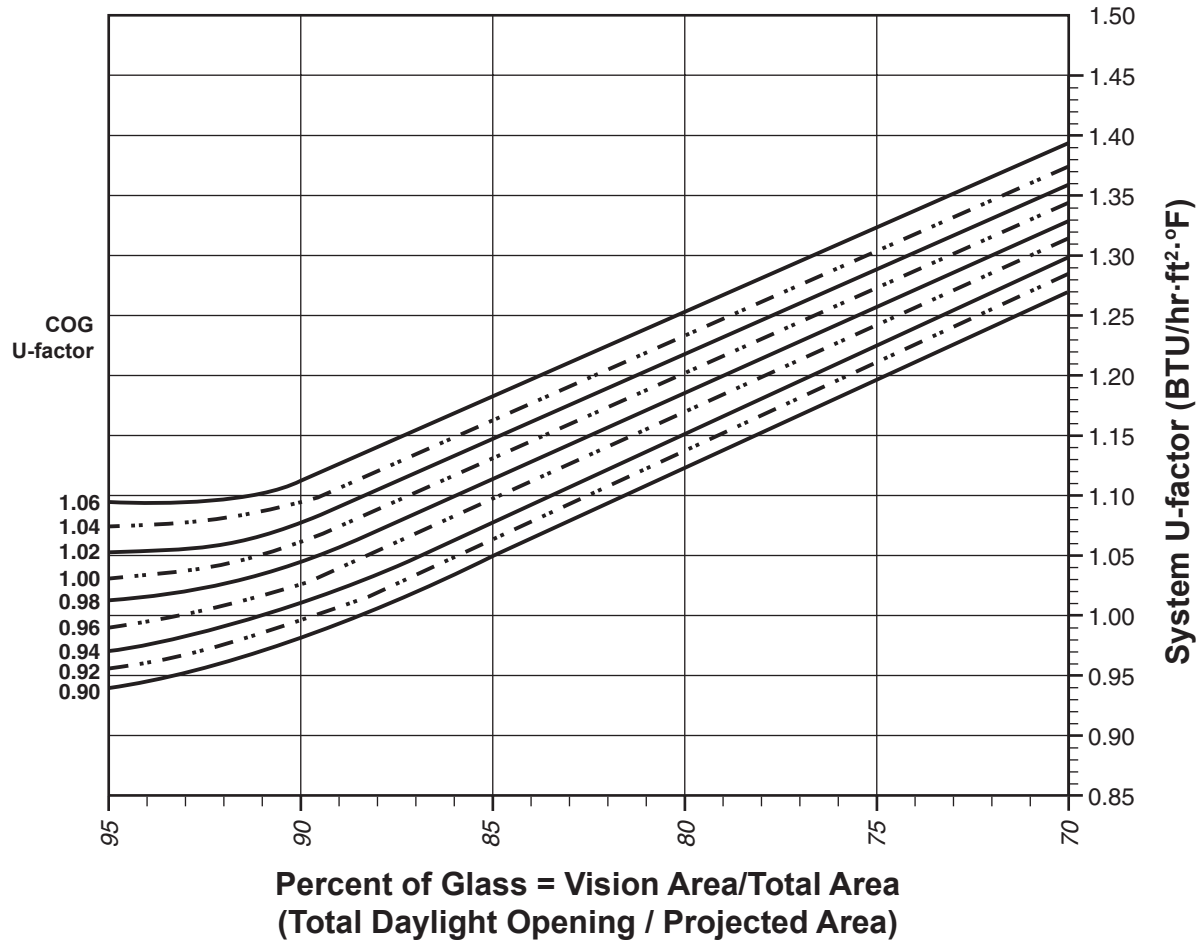
Based on 91% glass and Center of Glass (COG) U-factor of 0.42
System U-factor is equal to 0.49 Btu/hr·ft²·°F

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System U-factor vs Percent of Glass Area



Notes for System U-Factor, SHGC and VT charts:

For glass values that are not listed, linear interpolation is permitted.

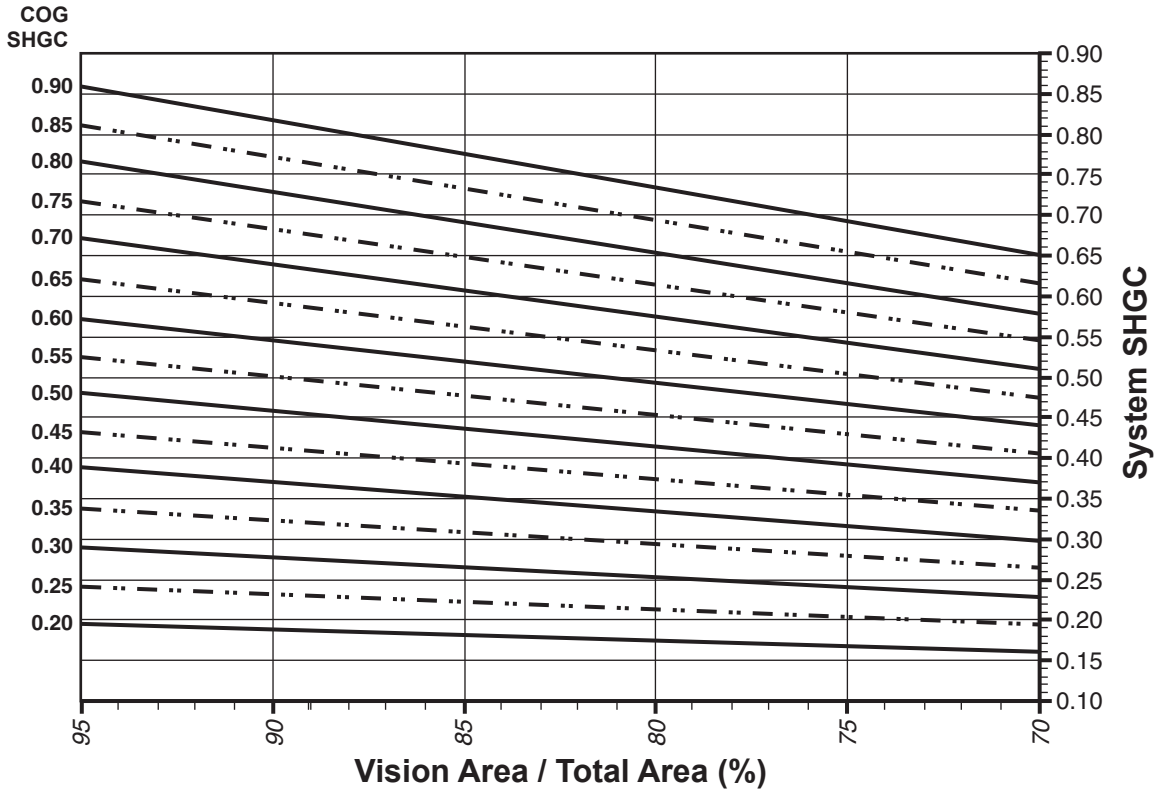
Glass properties are based on center of glass values and are obtained from your glass supplier.

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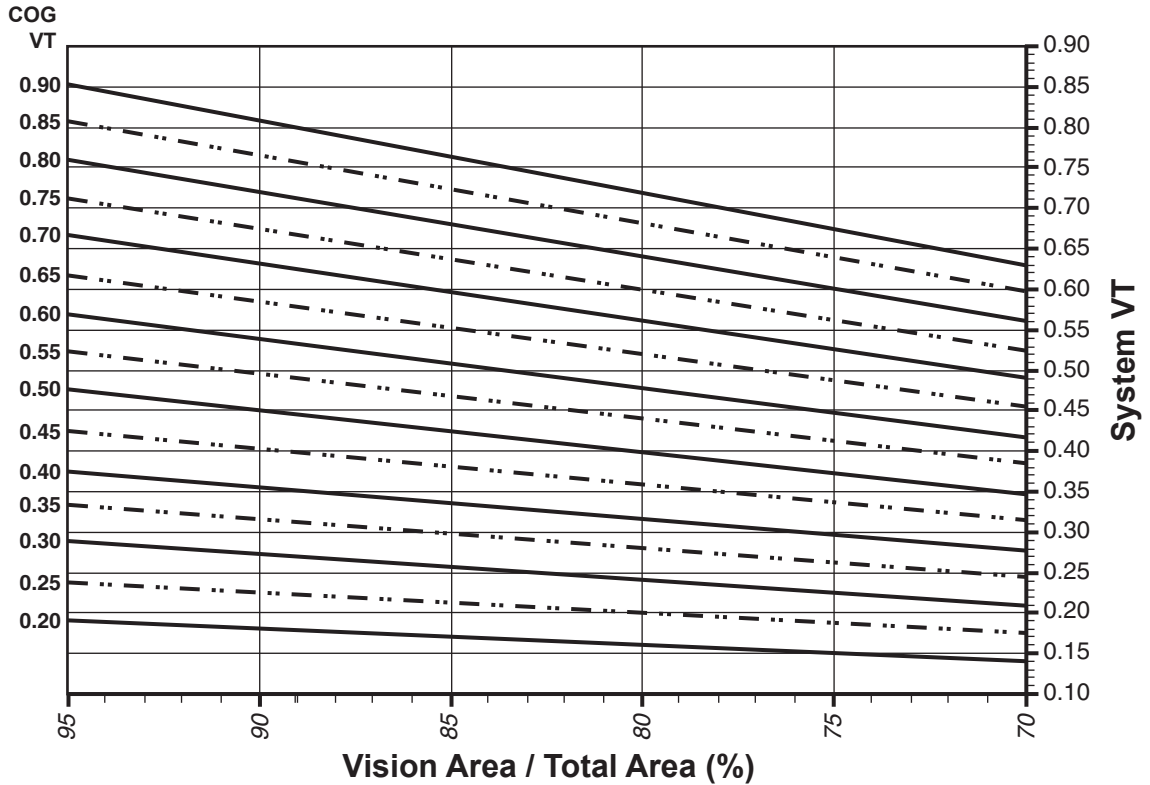
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System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area



System Visible Transmittance (VT) vs Percent of Vision Area



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Thermal Transmittance ¹ (BTU/hr • ft² • °F)

Glass U-Factor ³	Overall U-Factor ⁴
0.90	0.99
0.92	1.00
0.94	1.02
0.96	1.03
0.98	1.05
1.00	1.07
1.02	1.08
1.04	1.10
10.6	1.11

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(CENTER)

NOTE: For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.90	0.81
0.85	0.77
0.80	0.72
0.75	0.68
0.70	0.63
0.65	0.59
0.60	0.64
0.55	0.50
0.50	0.45
0.45	0.41
0.40	0.37
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19

Visible Transmittance ²

Glass VT ³	Overall VT ⁴
0.90	0.81
0.85	0.76
0.80	0.72
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.54
0.55	0.49
0.50	0.45
0.45	0.40
0.40	0.36
0.35	0.31
0.30	0.27
0.25	0.22
0.20	0.18

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