

**Features**

- Trifab® VersaGlaze® 451/451T is 4-1/2" (114.3) deep with a 2" (50.8) sightline
- 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
- Screw Spline Pre-Glazed option
- SSG / Weatherseal option
- IsoLock® lanced and debridged thermal break option with Trifab® VersaGlaze® 451T
- Infill options up to 1-1/8" (28.6) thickness
- Permanodic® anodized finishes in seven choices
- Painted finishes in standard and custom choices

**Optional Features**

- Acoustical rating per AAMA 1801 and ASTM E 1425
- Project specific U-factors (See Thermal Charts)
- Integrates with Versoleil® SunShade Outrigger System and Horizontal Single Blade System
- Profit\$Maker® Plus die sets available

**Product Applications**

- Storefront, Ribbon Window, Punched Openings or Pre-Glazed
- 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 .....11-27**

**CENTER (LARGE MISSILE IMPACT)..... 28-30**

**FRONT ..... 31-45**

**BACK ..... 47-53**

**MULTI-PLANE ..... 55-61**

**AIR/VAPOR BARRIER TIE-IN OPTION .....62**

**CHARTS (WIND LOAD, DEADLOAD, END REACTION & THERMAL) ...63-111**

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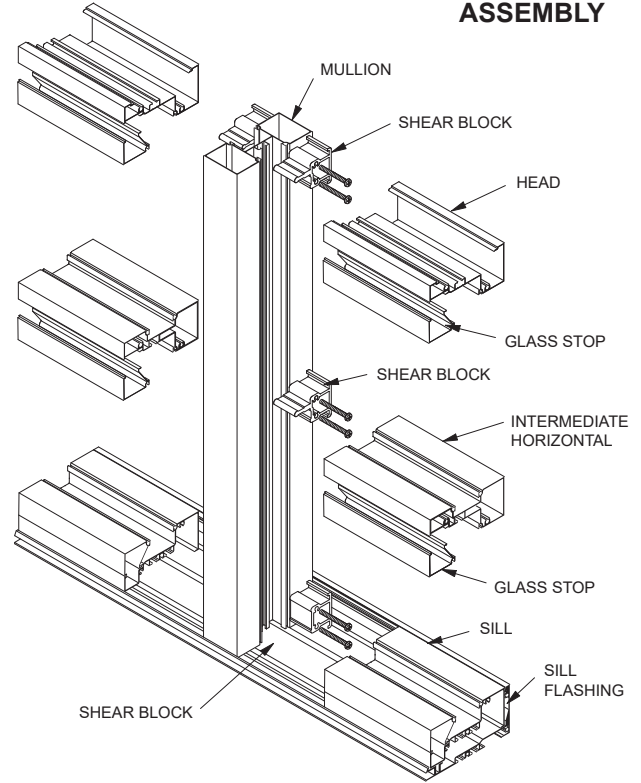
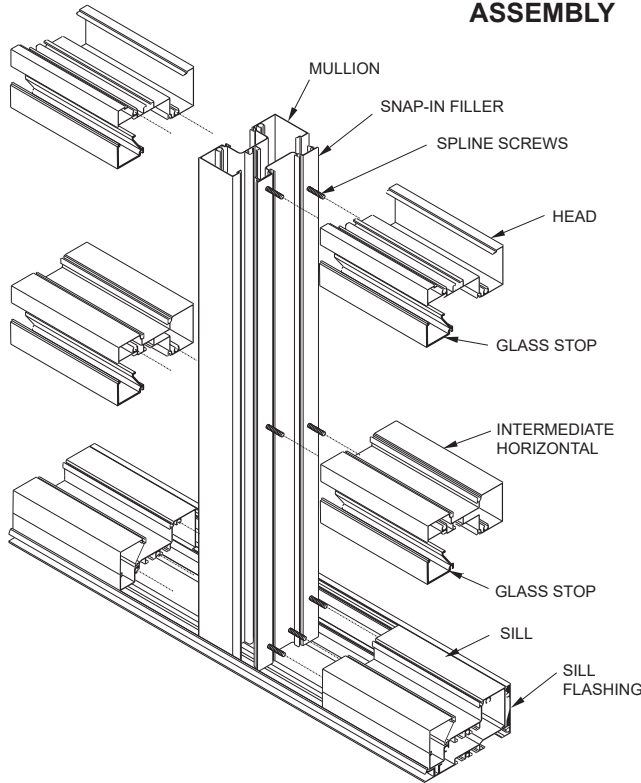
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The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The individual units are then snapped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

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.

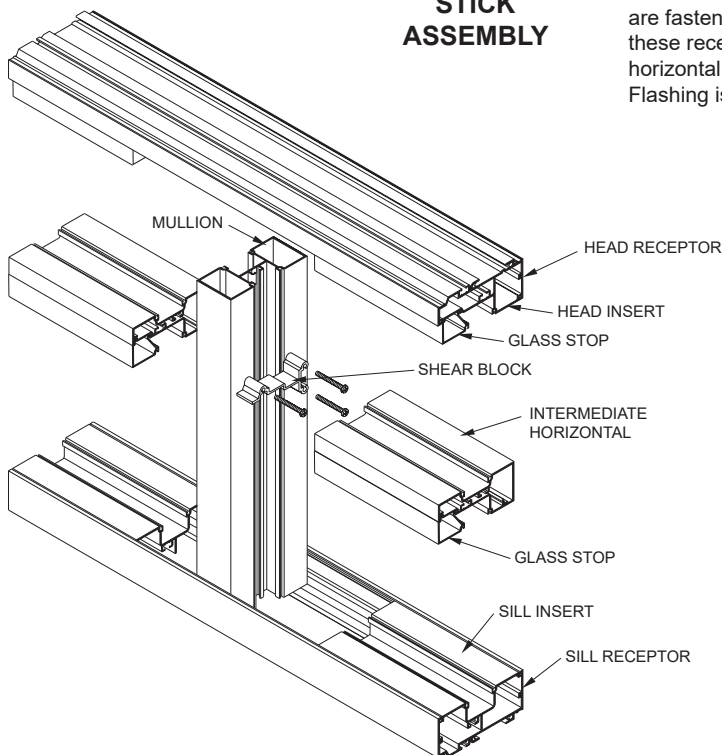
**SCREW SPLINE ASSEMBLY**

**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:**

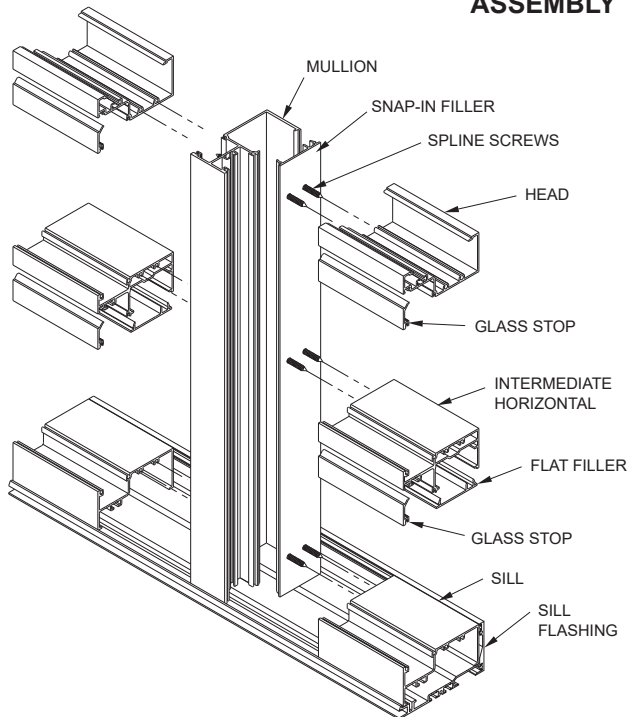
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 18)

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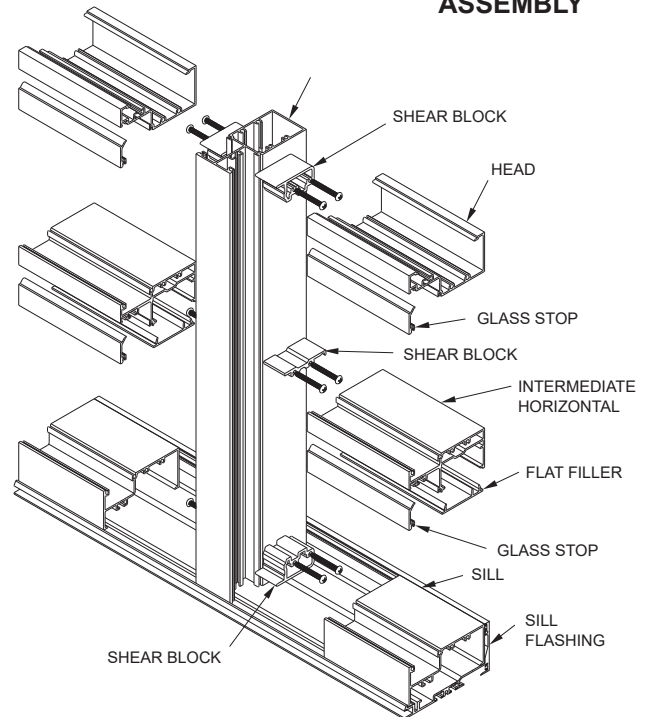
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### SCREW SPLINE ASSEMBLY

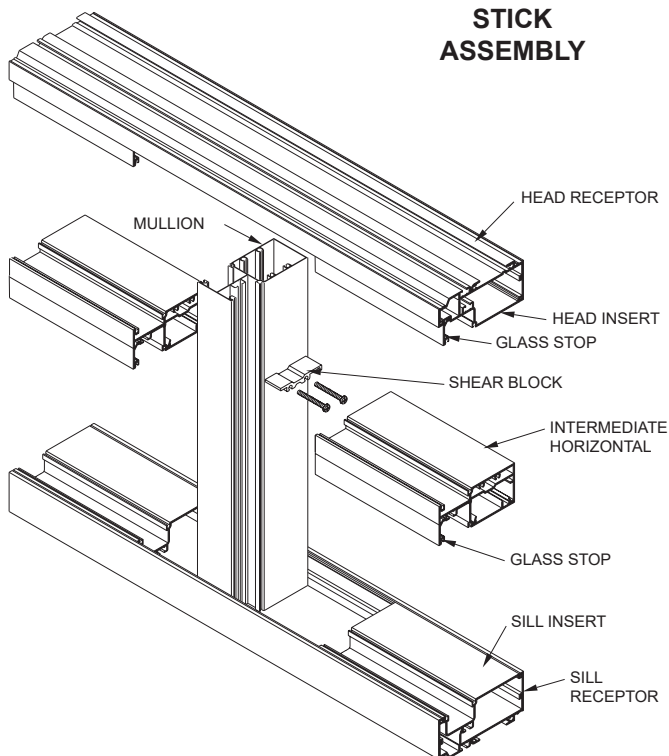


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

### 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 40)

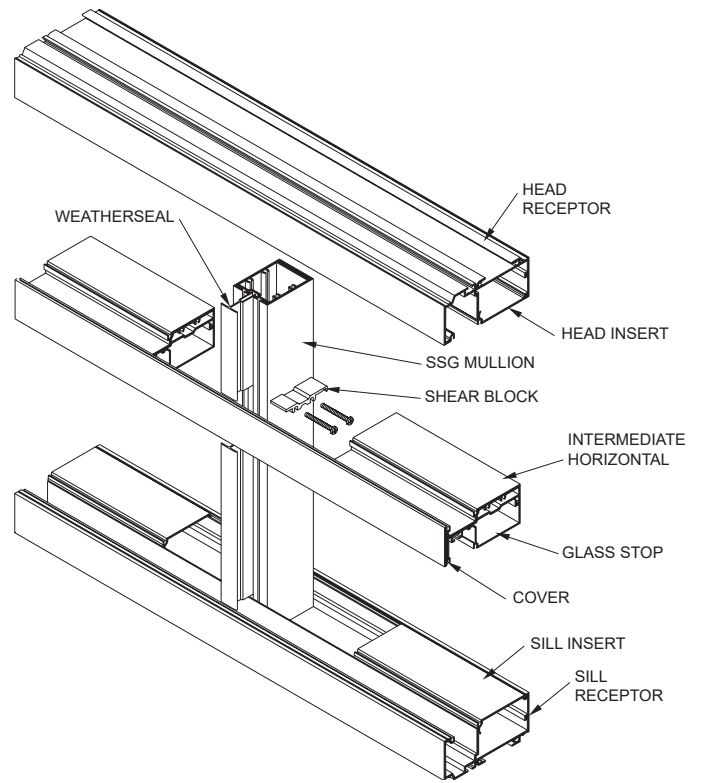
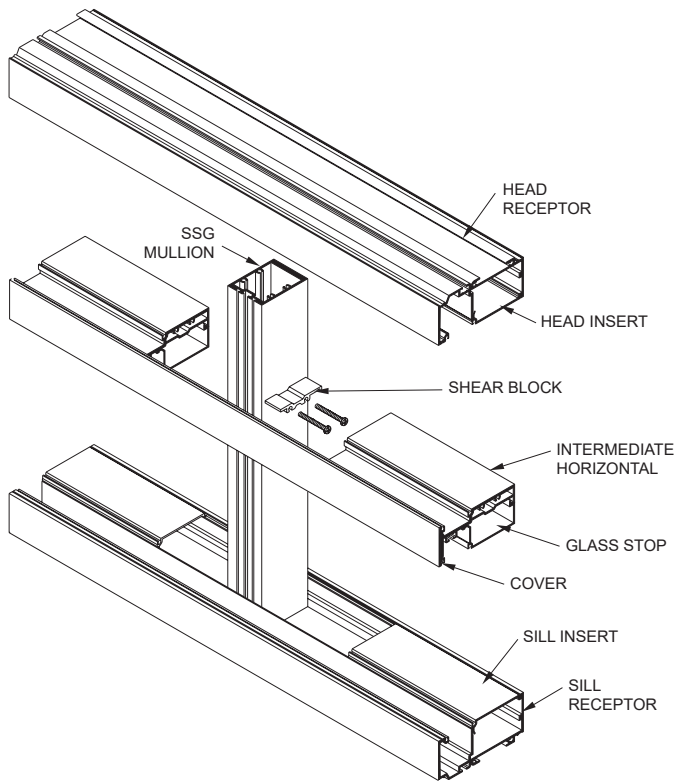
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The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to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

**STICK ASSEMBLY (SSG)**

**STICK ASSEMBLY (WEATHERSEAL)**



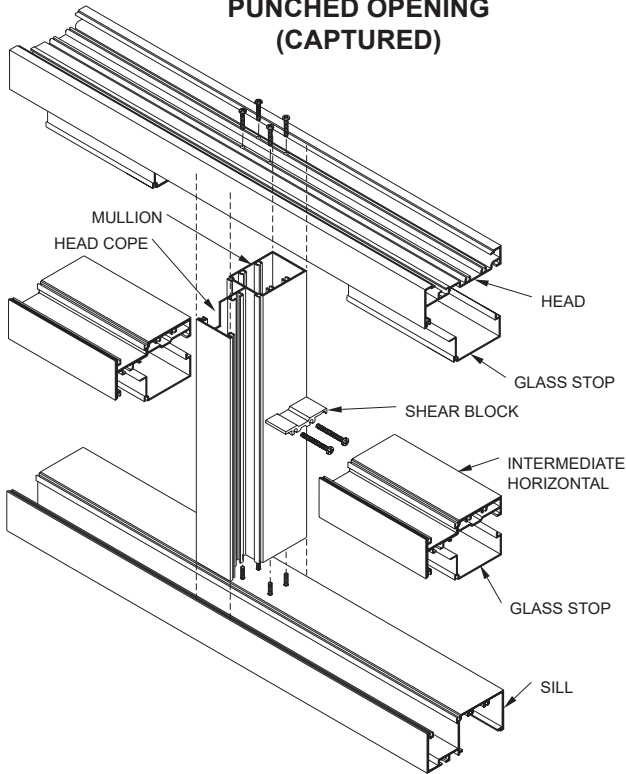
**NOTE:**  
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 40)

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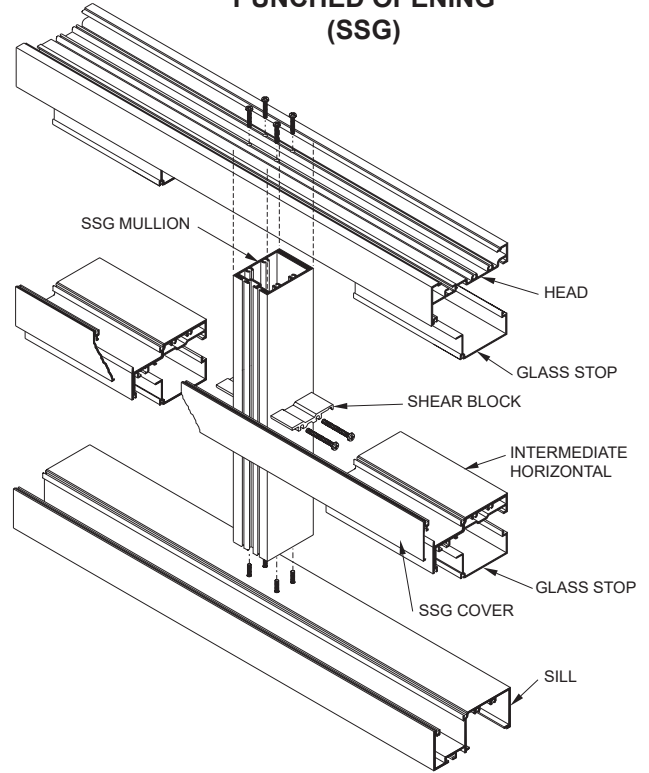
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The **CONTINUOUS HEAD AND SILL** punched opening fabrication allows a frame to be pre-assembled and installed as a single unit. Screws are driven through the back of the head and sill members into splines extruded in the vertical framing members. Intermediate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

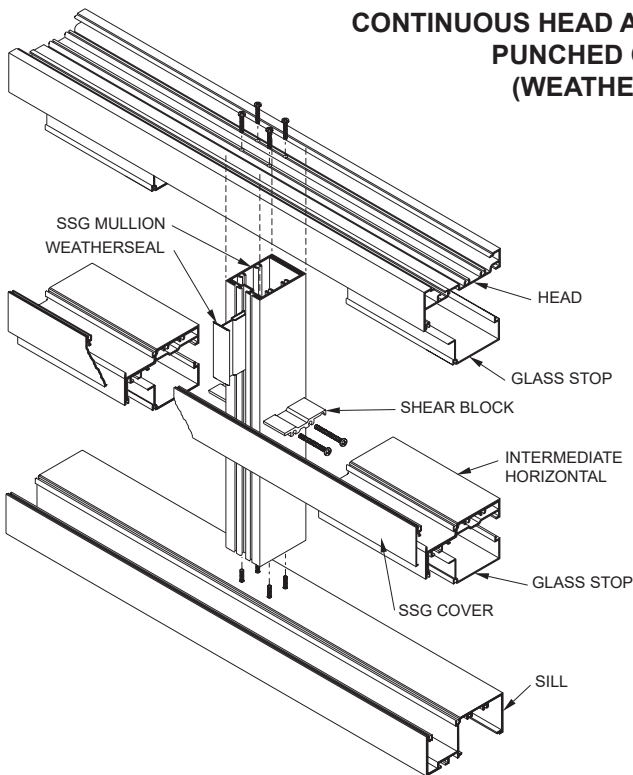
**CONTINUOUS HEAD AND SILL ASSEMBLY  
PUNCHED OPENING  
(CAPTURED)**



**CONTINUOUS HEAD AND SILL ASSEMBLY  
PUNCHED OPENING  
(SSG)**



**CONTINUOUS HEAD AND SILL ASSEMBLY  
PUNCHED OPENING  
(WEATHERSEAL)**



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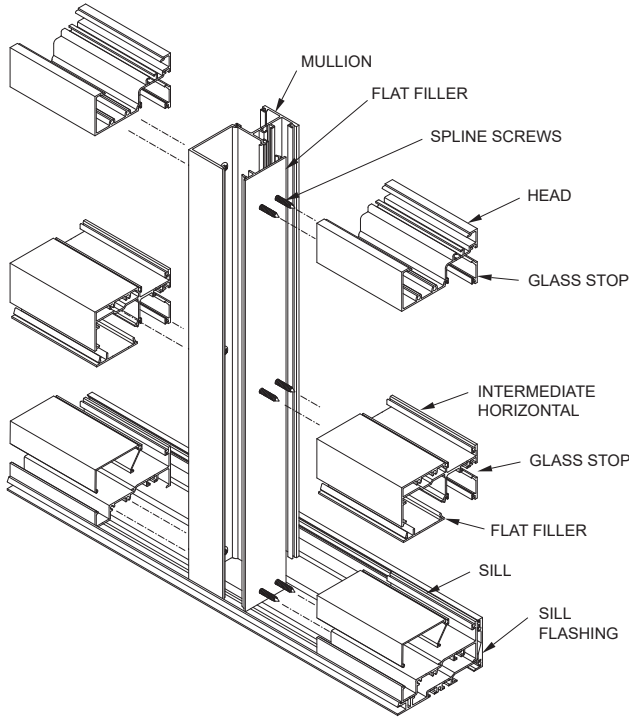
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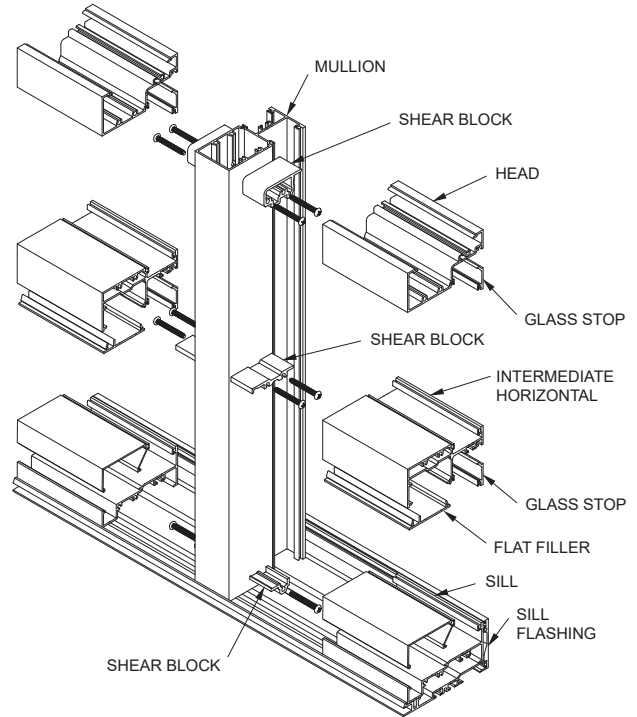
The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

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.

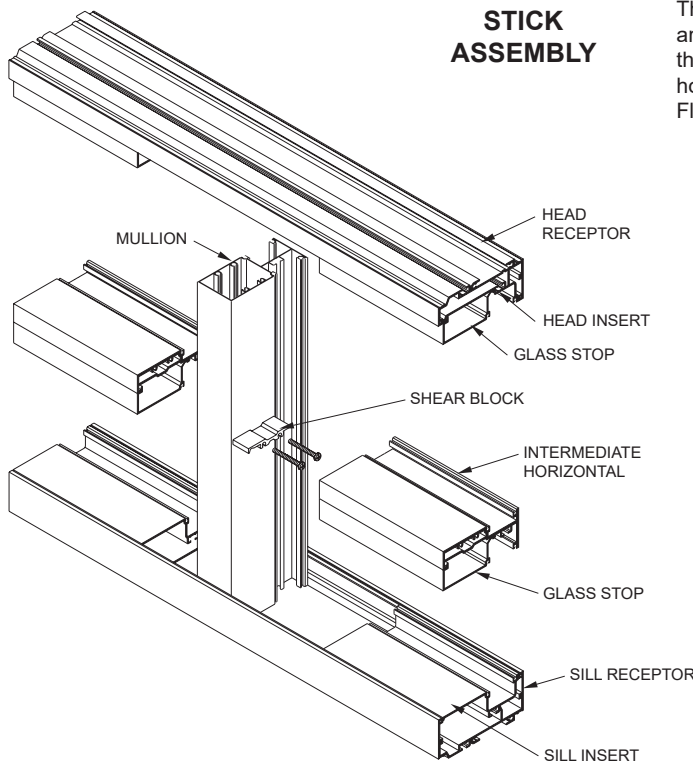
**SCREW SPLINE ASSEMBLY**



**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:**

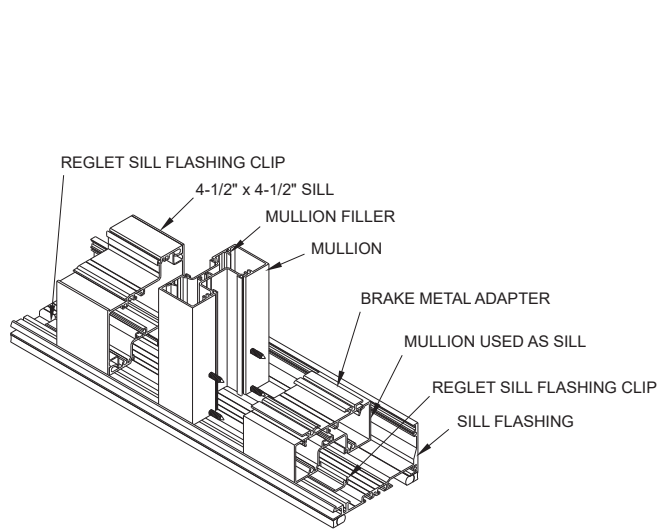
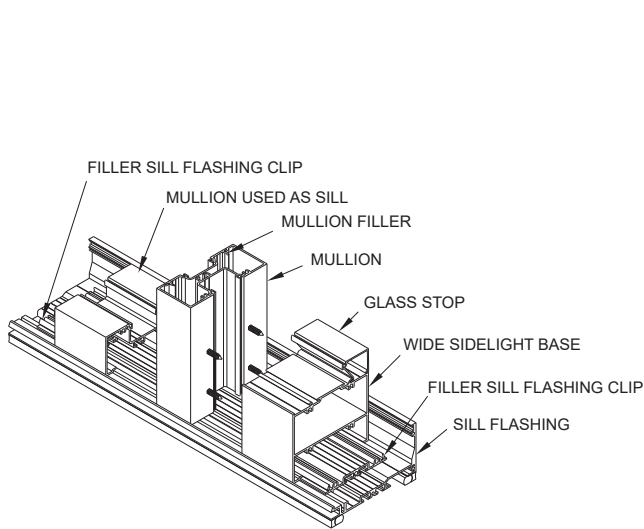
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 51)

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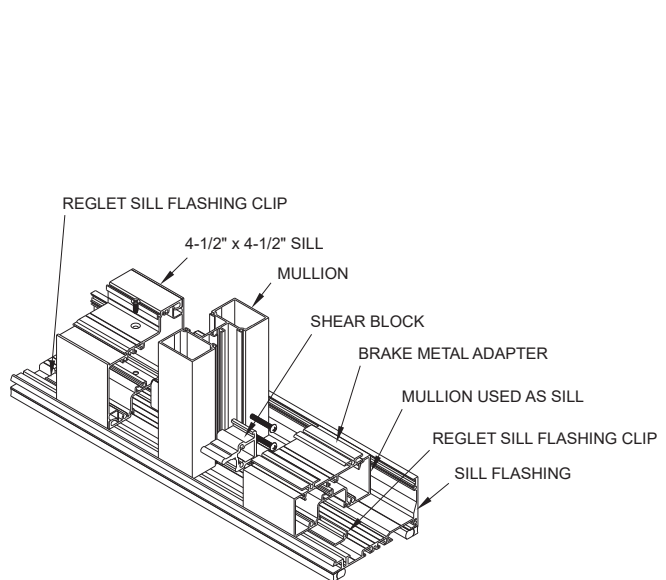
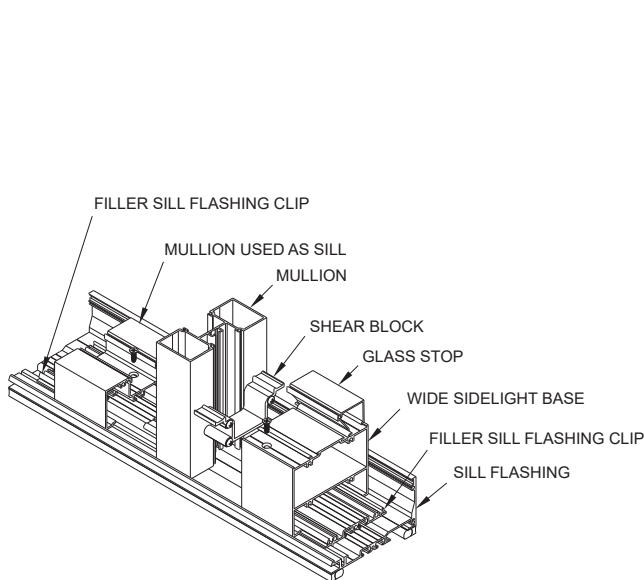
**SCREW SPLINE ASSEMBLY**

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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**BASIC FRAMING DETAILS**

**(CENTER - Outside Glazed - Stops Up).....12**

**(CENTER - Inside Glazed - Stops Down).....13**

**(CENTER - Outside Glazed - Stops Down).....14**

**PRE-GLAZED FRAMING DETAILS**

**(CENTER - Outside Glazed - Stops Up).....15**

**(CENTER - Inside Glazed - Stops Down).....16**

**(CENTER - Outside Glazed - Stops Down).....17**

**MISCELLANEOUS FRAMING..... 18-19**

**CORNERS.....20**

**CURVING & TRIM DETAILS .....21**

**ENTRANCE FRAMING .....22**

**ENTRANCE FRAMING (OPEN BACK).....23**

**250T/350T/500T INSULPOUR® THERMAL ENTRANCES ..... 24-25**

**GLASSvent® WINDOW for STOREFRONT FRAMING .....26**

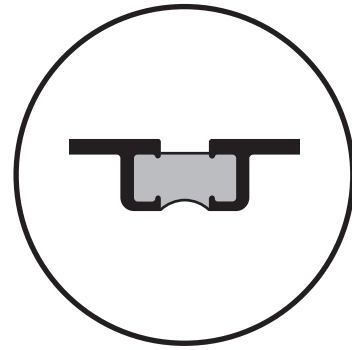
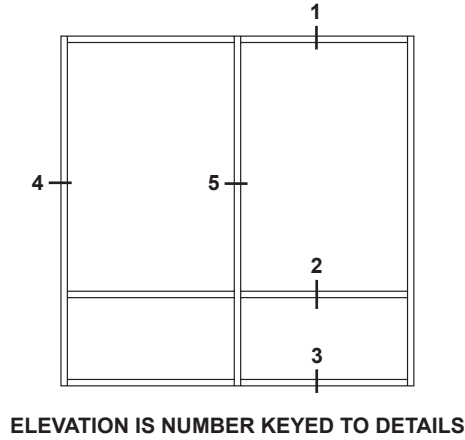
**8225TL THERMAL WINDOW DETAILS.....27**

**LARGE MISSILE IMPACT ..... 28-30**

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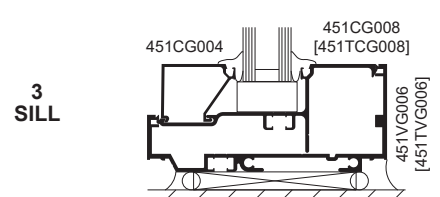
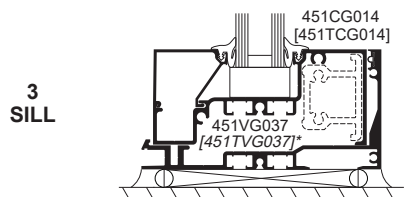
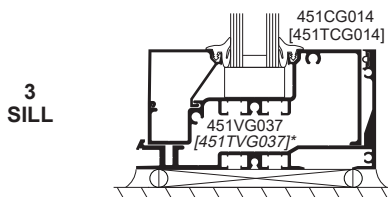
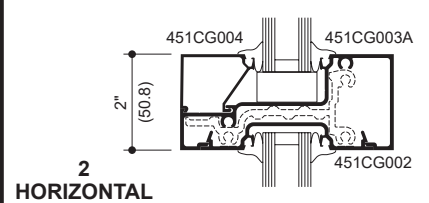
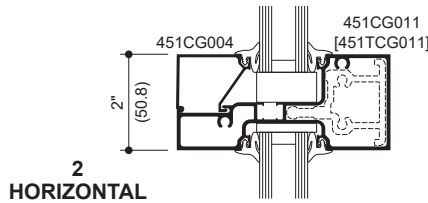
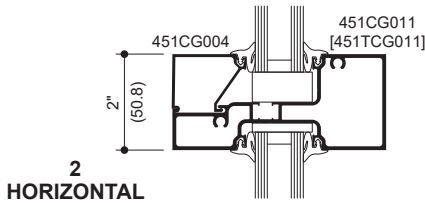
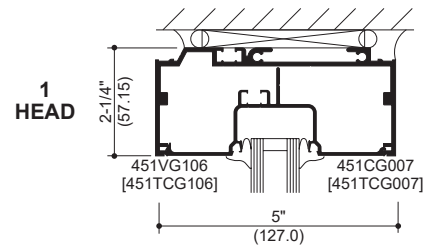
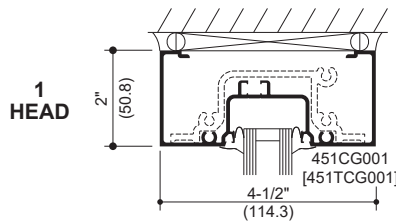
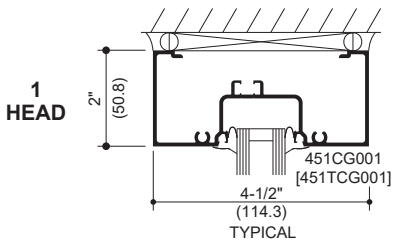
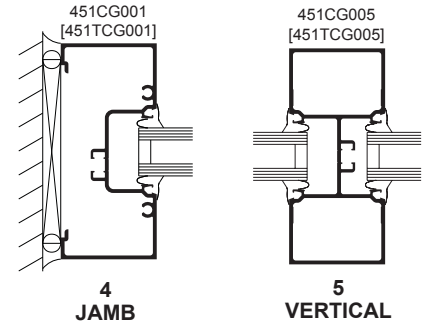
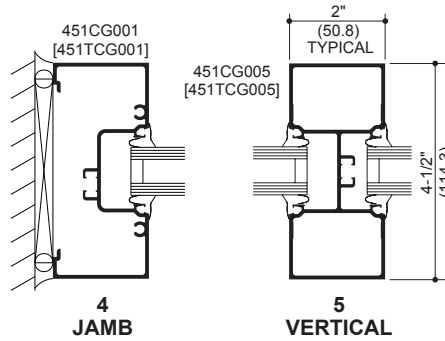
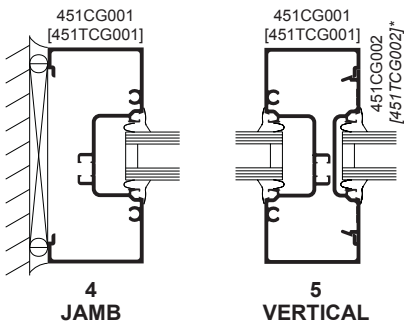


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK



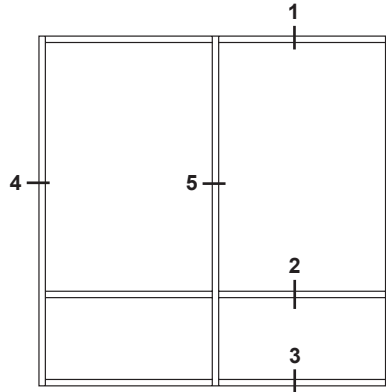
\* HP Sill Flashing shown with optional gasket.

\* HP Sill Flashing shown with optional gasket.

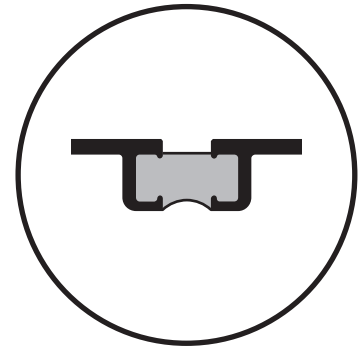
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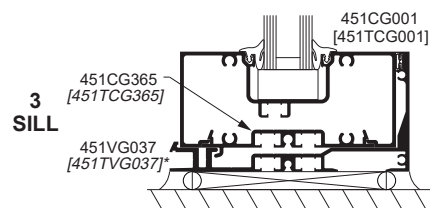
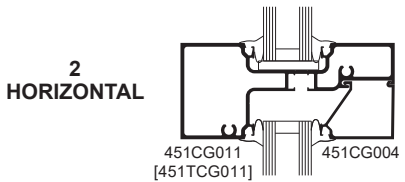
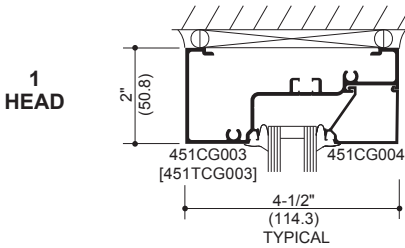
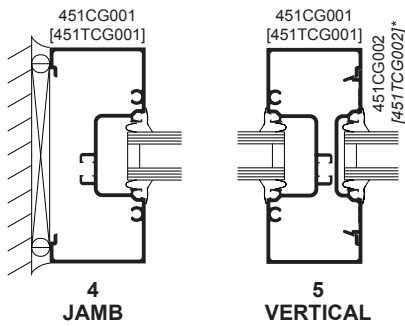


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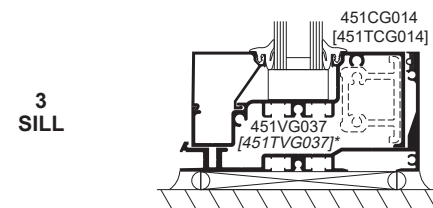
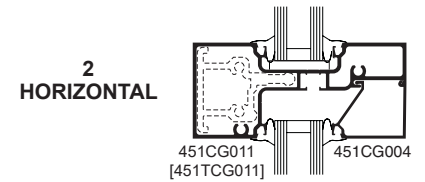
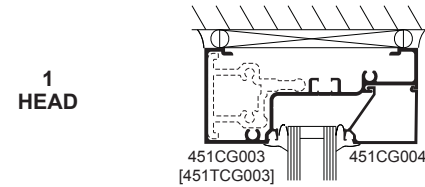
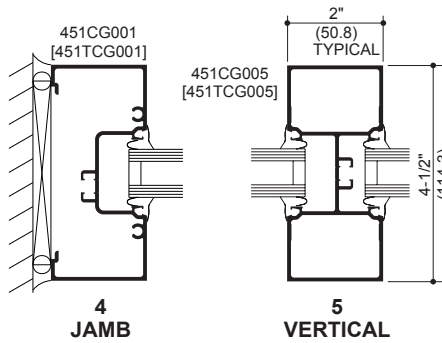
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



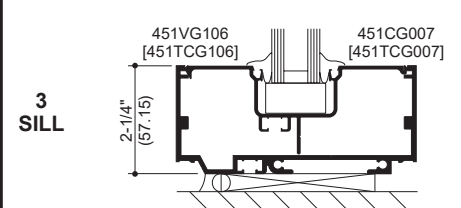
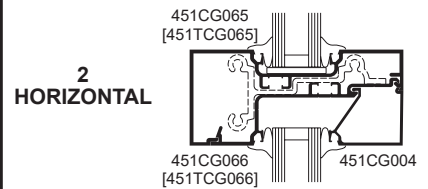
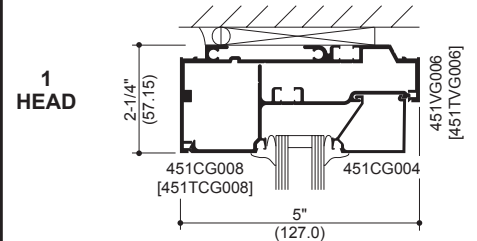
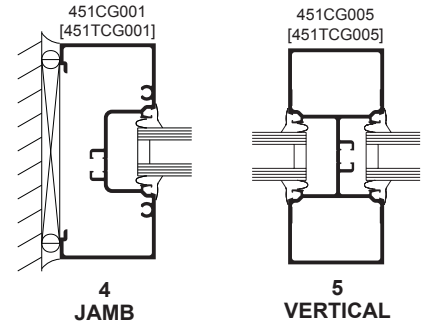
\* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



\* HP Sill Flashing shown with optional gasket.

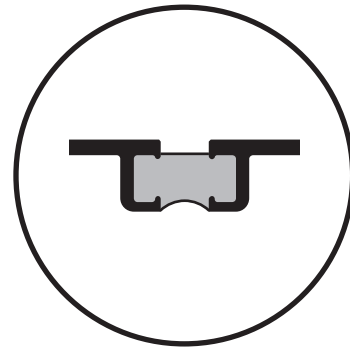
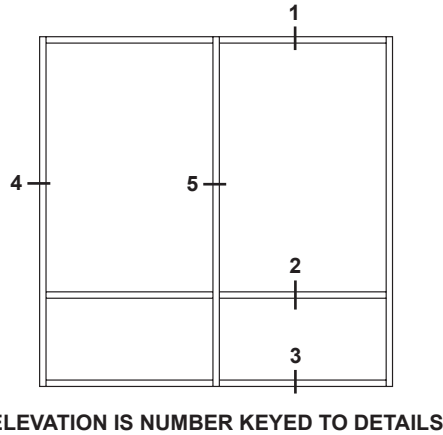
STICK



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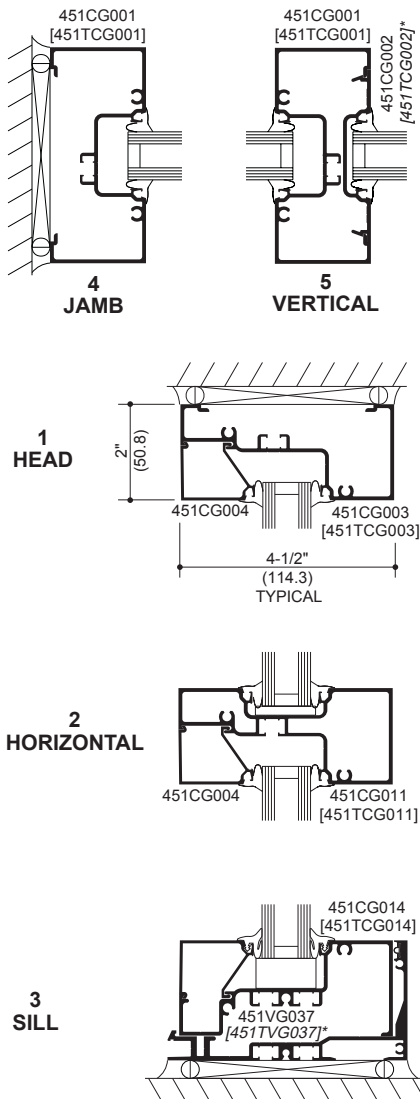
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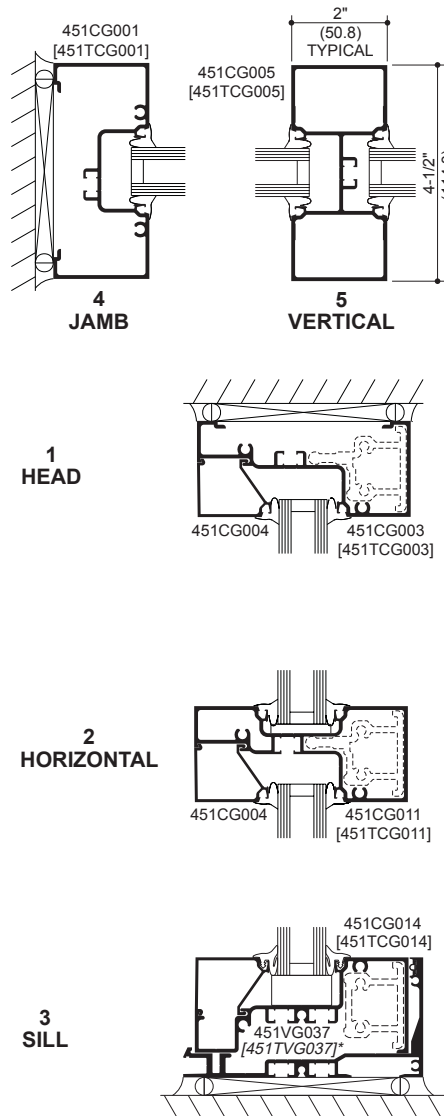
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



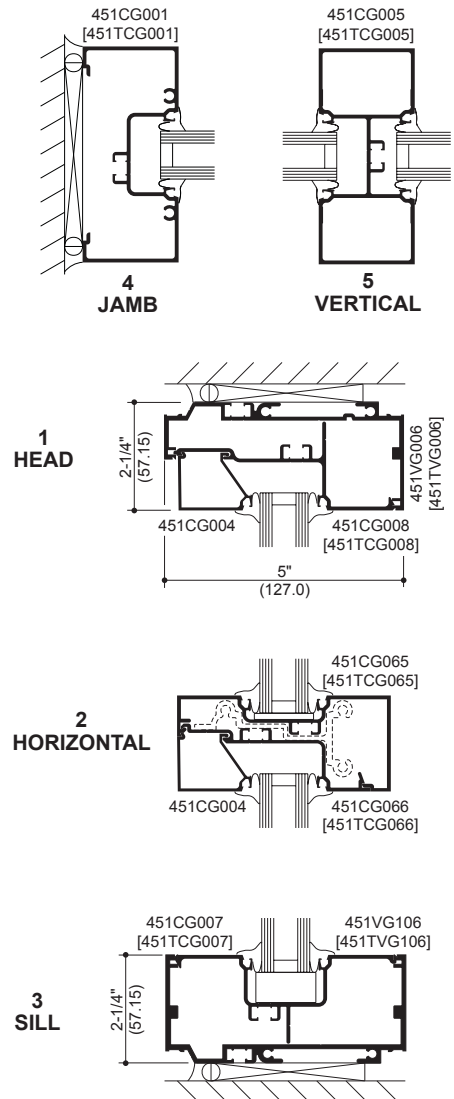
\* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



\* HP Sill Flashing shown with optional gasket.

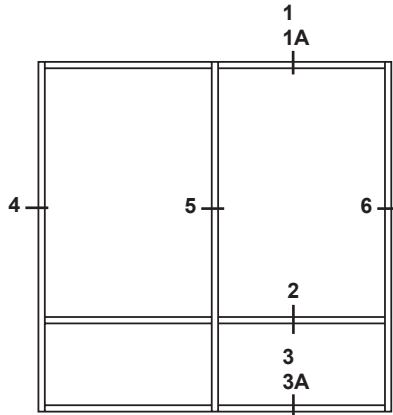
STICK



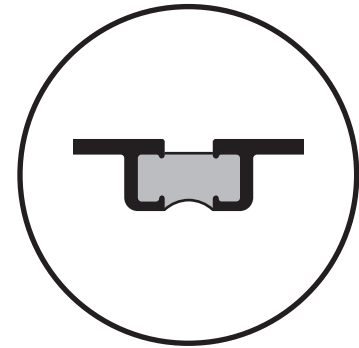
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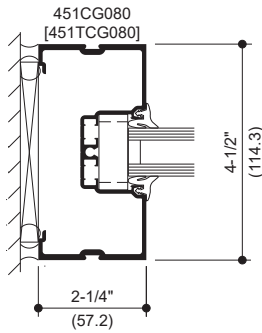


ELEVATION IS NUMBER KEYED TO DETAILS

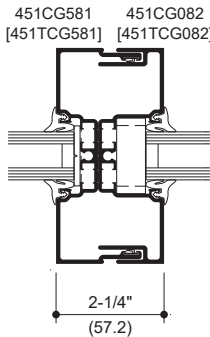


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

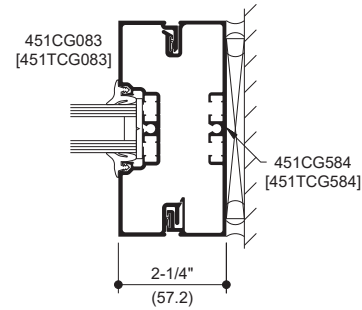
## SCREW SPLINE



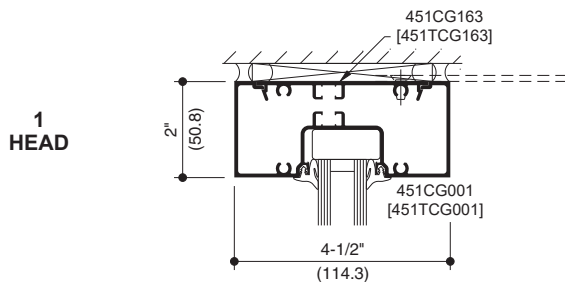
**4**  
JAMB



**5**  
VERTICAL

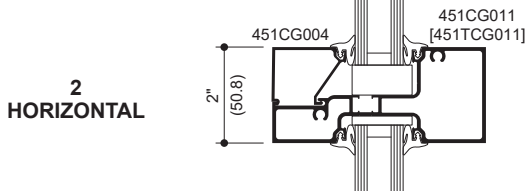
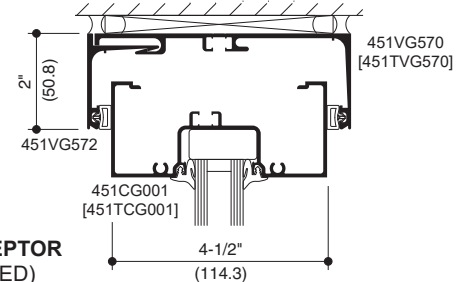


**6**  
JAMB

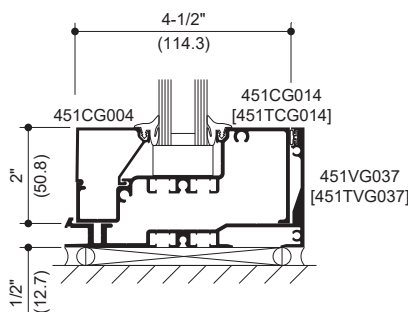


**1**  
HEAD

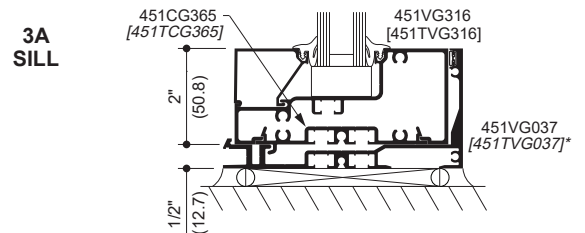
**1A**  
STANDARD  
HEAD  
COMPENSATING RECEPTOR  
(EXTERIOR INSTALLED)



**2**  
HORIZONTAL



**3**  
SILL

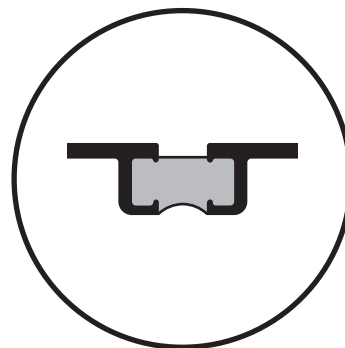
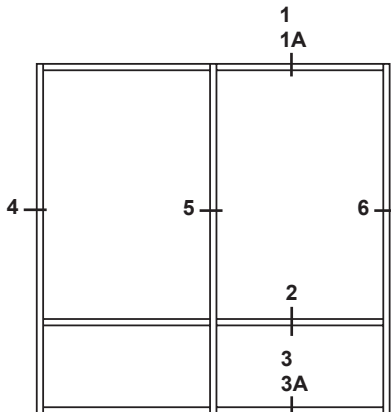


**3A**  
SILL

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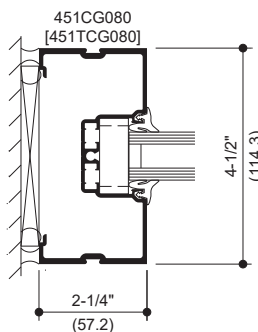
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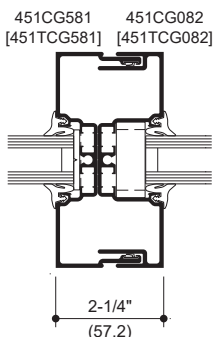
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

ELEVATION IS NUMBER KEYED TO DETAILS

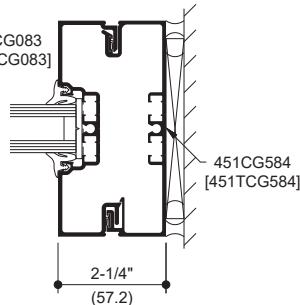
SCREW SPLINE



4 JAMB

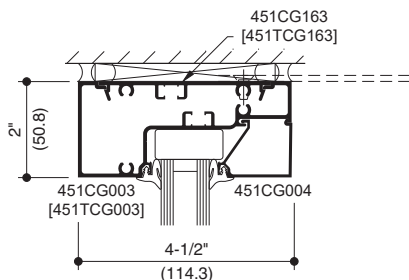


5 VERTICAL

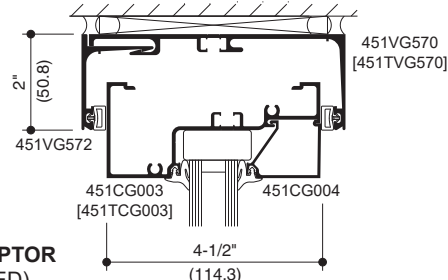


6 JAMB

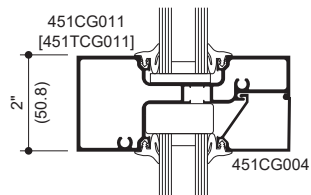
1 HEAD



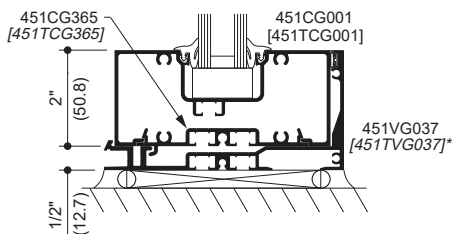
1A STANDARD HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



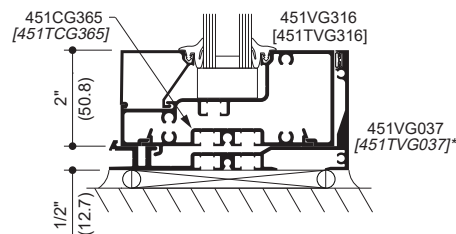
2 HORIZONTAL



3 SILL



3A SILL



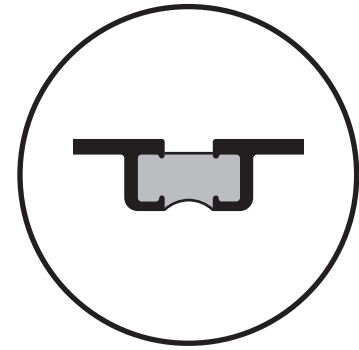
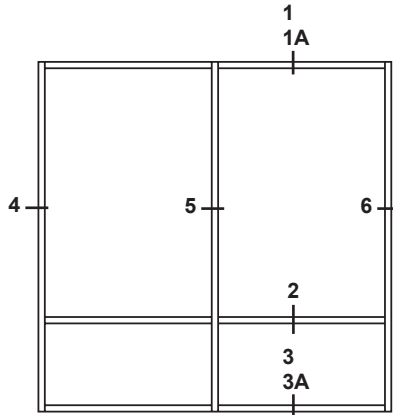
\* HP Sill Flashing shown with optional gasket.

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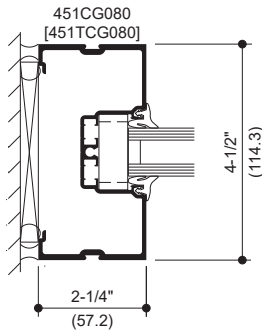
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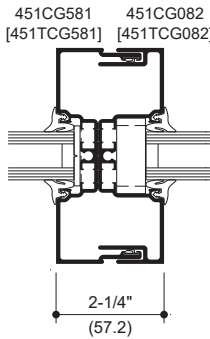
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

ELEVATION IS NUMBER KEYED TO DETAILS

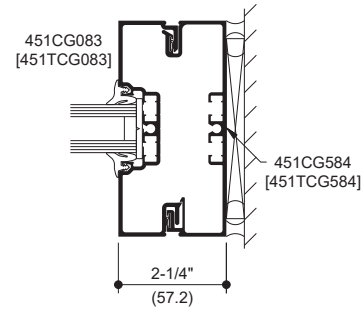
## SCREW SPLINE



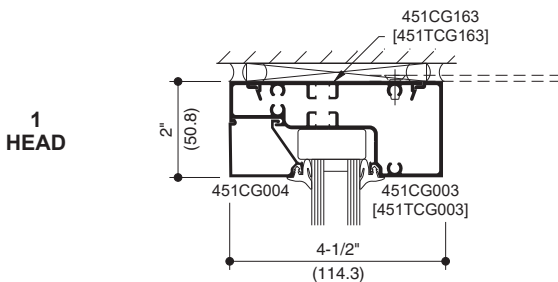
4 JAMB



5 VERTICAL

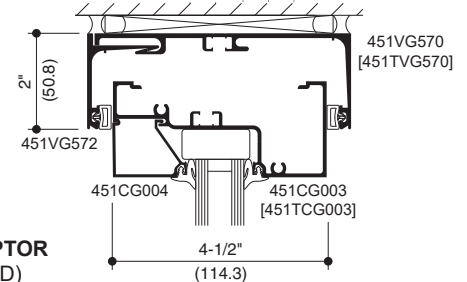


6 JAMB

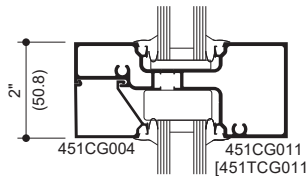


1 HEAD

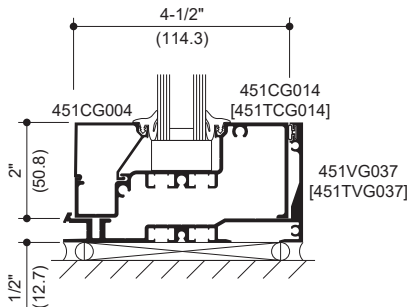
1A STANDARD HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



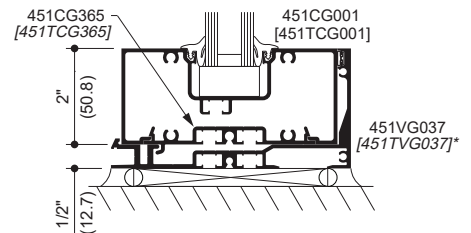
2 HORIZONTAL



3 SILL



3A SILL

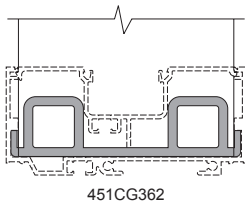
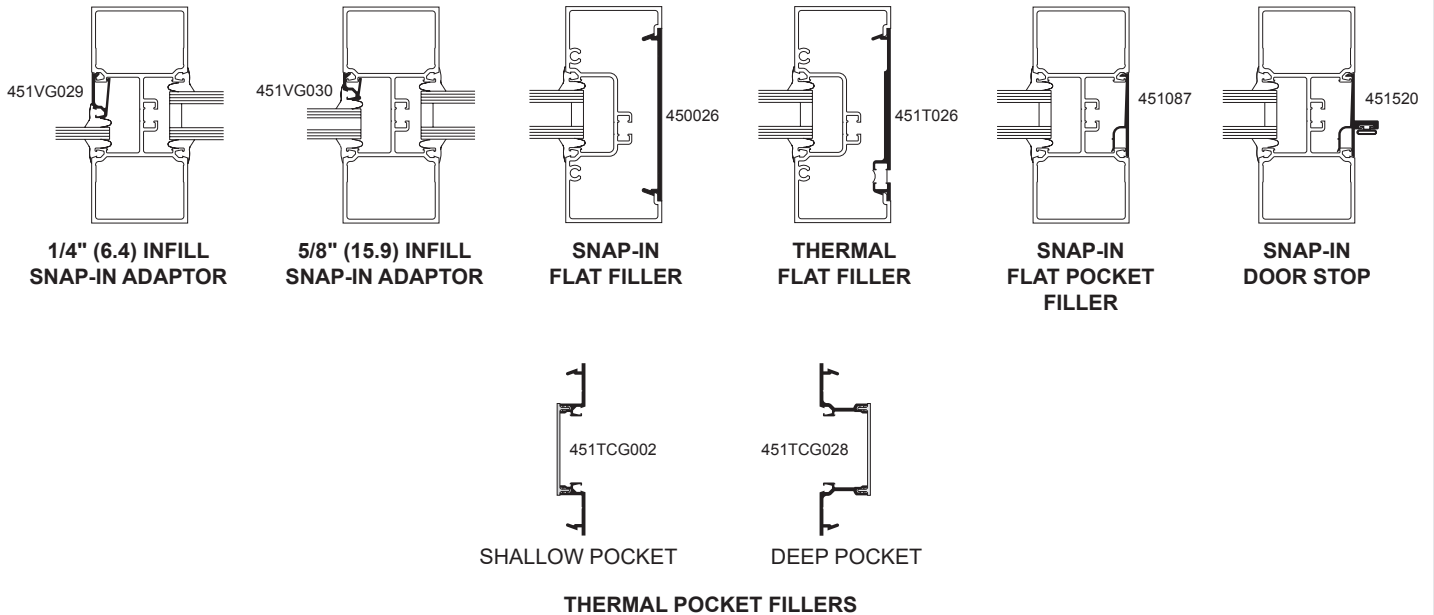
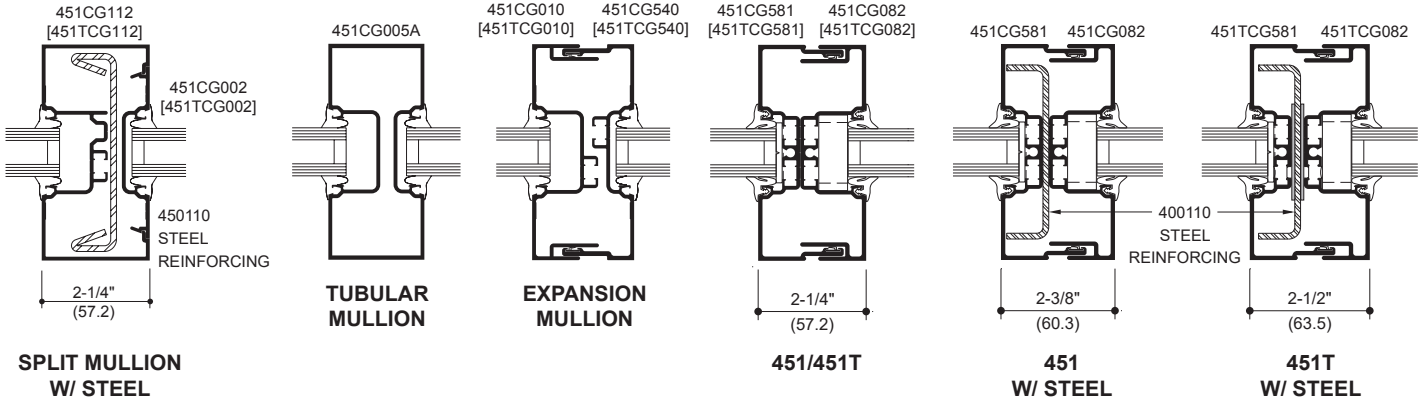


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PRE-GLAZED EXPANSION MULLIONS



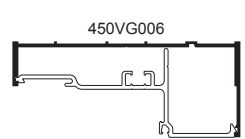
**MULLION ANCHOR**

**NOTE:**

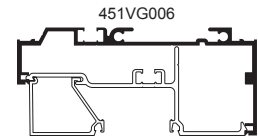
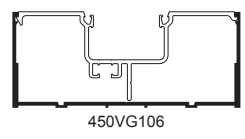
If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified wind load (psf), divided by two) is more than 500 LBS., the optional mullion anchor must be used. Consult Application Engineering.

**NOTE:**

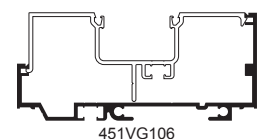
Mullion Anchor not used with Lightweight Receptor.



**OPTIONAL LIGHTWEIGHT CAN RECEPTORS**



**OPTIONAL UNEQUAL LEG CAN RECEPTORS**



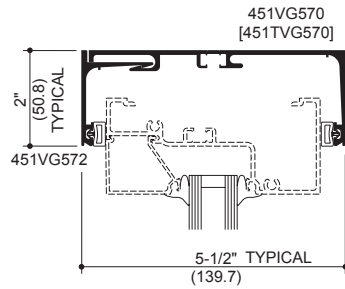
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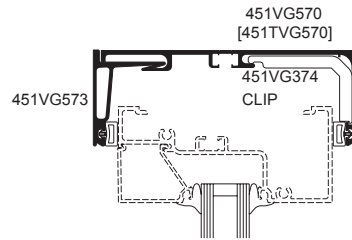
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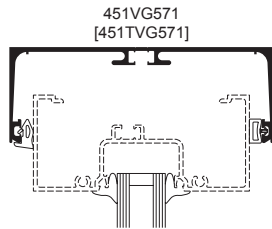
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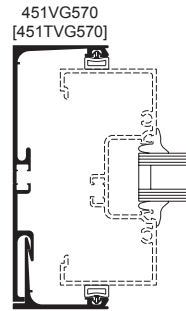
**STANDARD HEAD COMPENSATING RECEPTOR**  
(EXTERIOR INSTALLED)



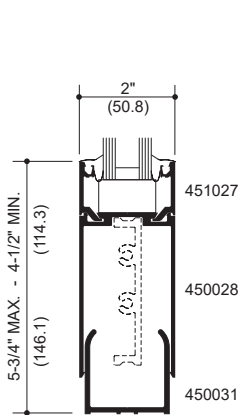
**HEAVY WEIGHT HEAD COMPENSATING RECEPTOR**  
(EXTERIOR INSTALLED)



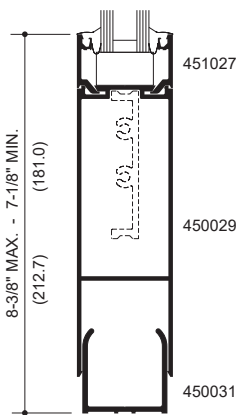
**ONE PIECE HEAD COMPENSATING RECEPTOR**



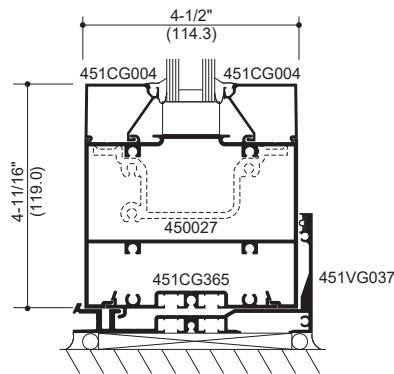
**JAMB COMPENSATING RECEPTOR**  
(EXTERIOR INSTALLED)



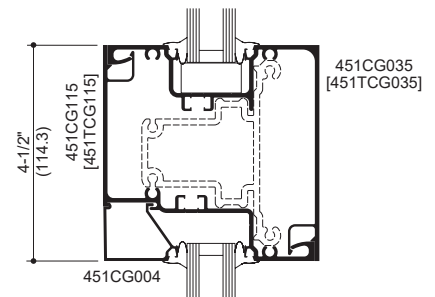
**\*NARROW SIDELITE BASE**



**\*NARROW SIDELITE BASE**



**SIDELITE BASE**



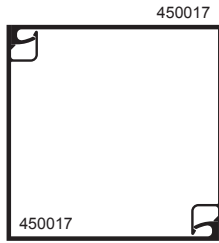
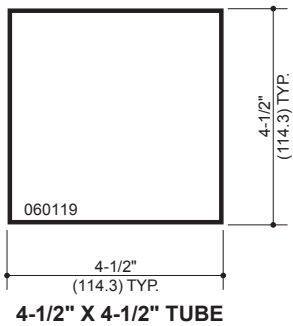
**4-1/2" (114.3) x 4-1/2" (114.3) HORIZONTAL**

**SIDELITE BASES ARE NON-THERMAL APPLICATIONS**

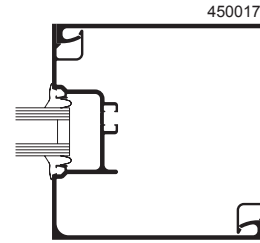
\*NARROW SIDELITE BASES REQUIRE THE USE OF NON-THERMAL 2-PIECE VERTICALS ONLY.

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

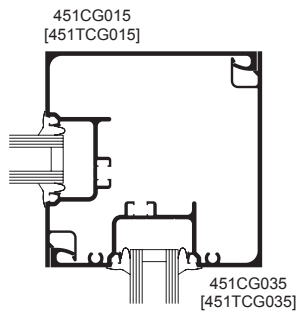
Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)



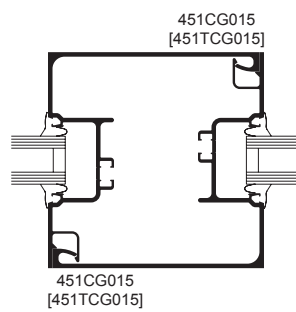
**TWO PIECE NO POCKET CORNER**



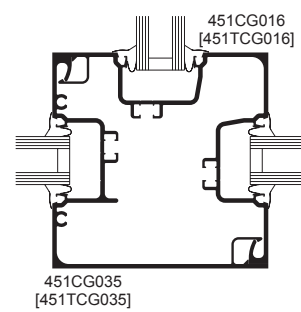
**ONE POCKET CORNER**



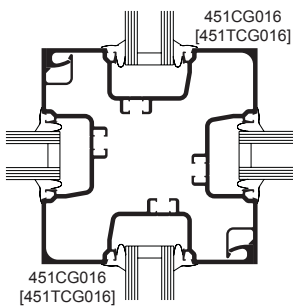
**TWO POCKET 90° CORNER**



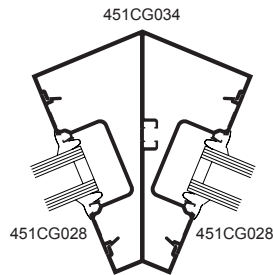
**TWO POCKET CORNER POST**



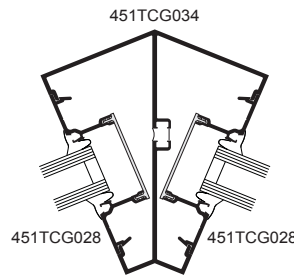
**THREE POCKET 90° CORNER**



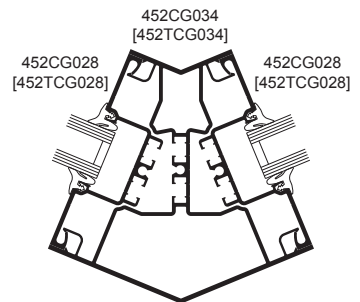
**FOUR POCKET 90° CORNER**



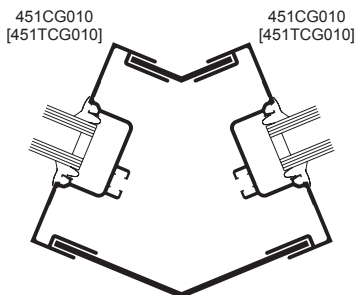
**135° CORNER (NON-THERMAL)**



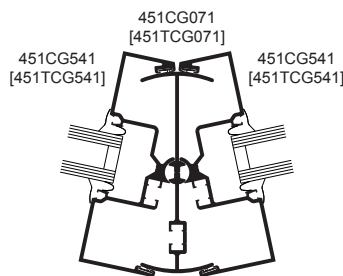
**135° CORNER (THERMAL)**



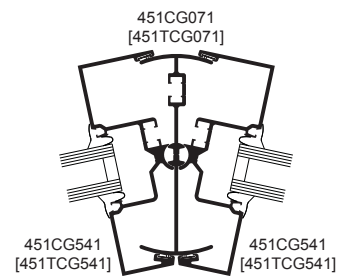
**135° CORNER**



**VARIABLE DEGREE BRAKE METAL CORNER**



**155° TO 180° PIVOT MULLION (OUTSIDE CORNER)**

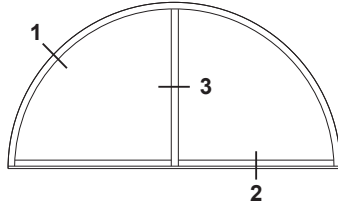


**155° TO 180° PIVOT MULLION (INSIDE CORNER)**

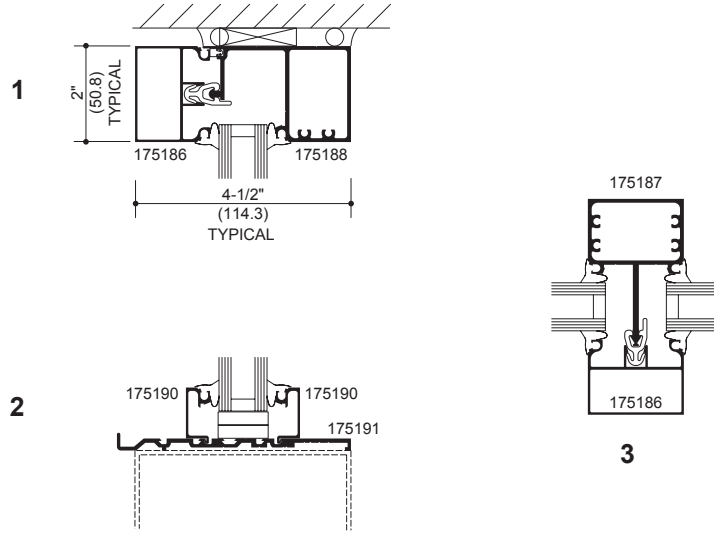
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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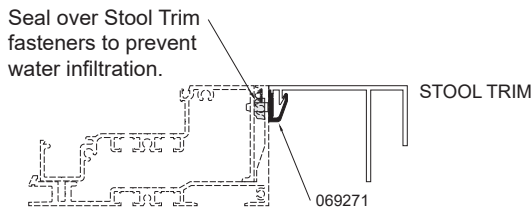
**CURVING DETAILS**  
(Center Plane Only)



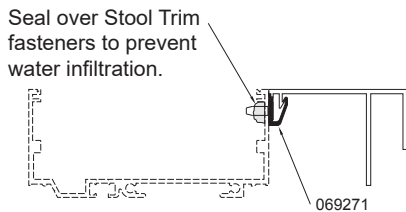
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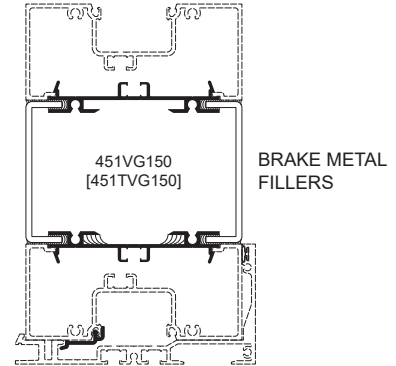
© 2018, Kawneer Company, Inc.



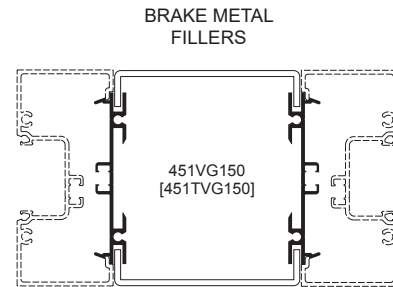
**STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING**



**STOOL TRIM CLIP FOR STICK ASSEMBLY**



**BRAKE METAL ADAPTOR AT HORIZONTAL**



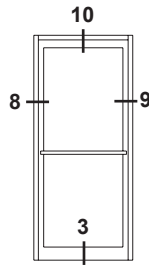
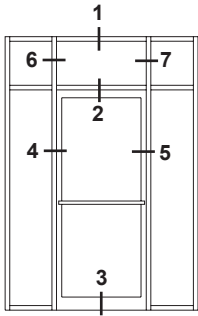
**BRAKE METAL ADAPTOR AT VERTICAL**

Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)

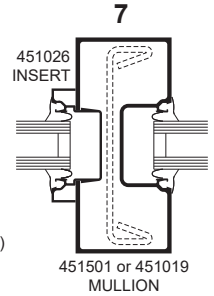
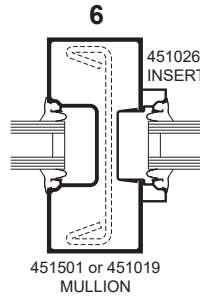
Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

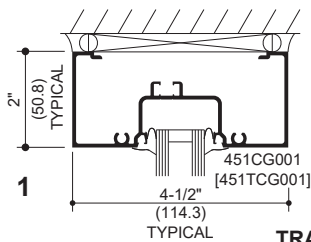


ELEVATIONS ARE NUMBER KEYED TO DETAILS

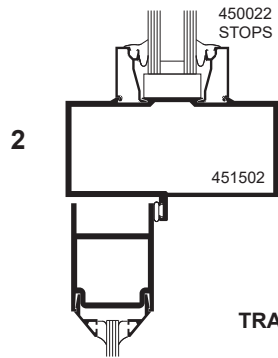
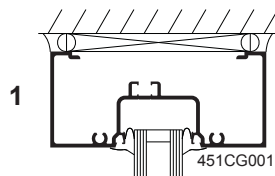


TRANSOM JAMBS

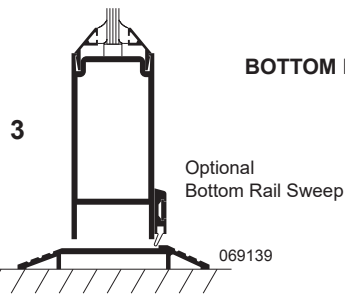
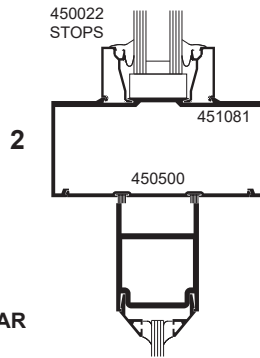
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.



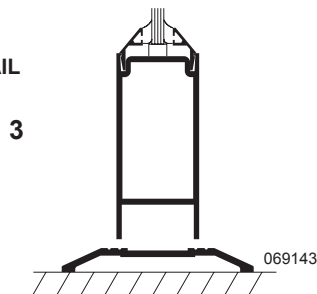
TRANSOM HEAD



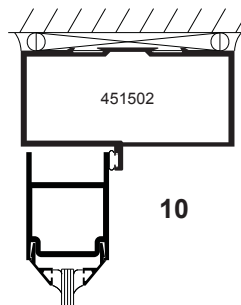
TRANSOM BAR



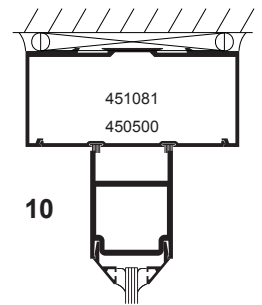
SINGLE ACTING



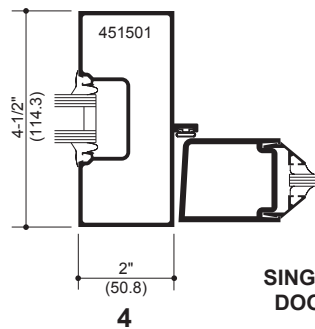
DOUBLE ACTING



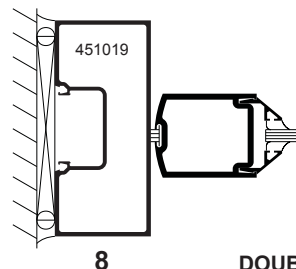
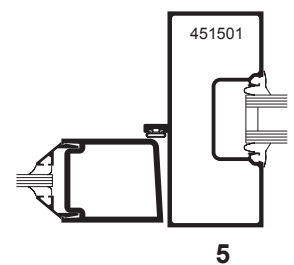
SINGLE ACTING HEADER



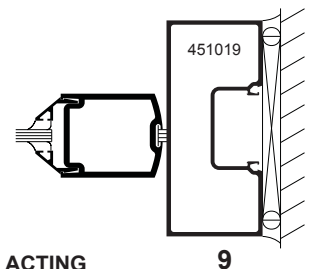
DOUBLE ACTING HEADER



SINGLE ACTING DOOR JAMBS



DOUBLE ACTING DOOR JAMBS



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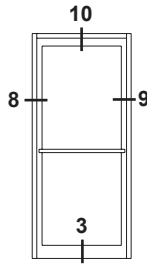
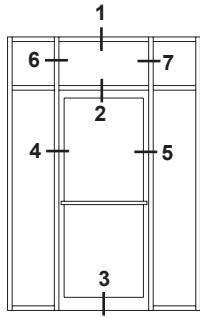
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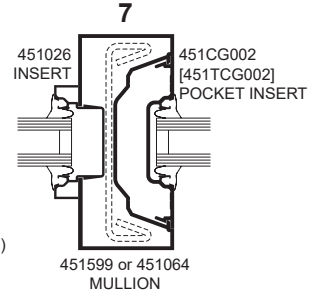
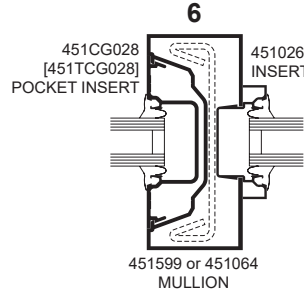
**Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.**

**DOOR FRAMING NON-THERMAL ONLY**

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

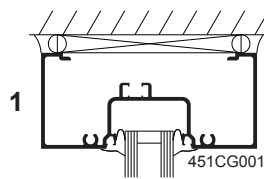
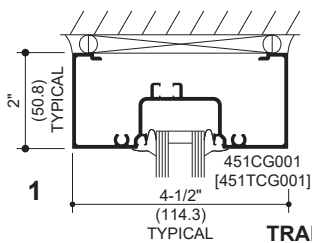


ELEVATIONS ARE NUMBER KEYED TO DETAILS

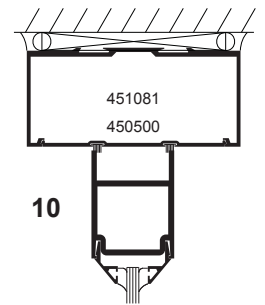
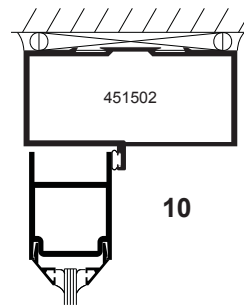


**TRANSOM JAMBS**

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.

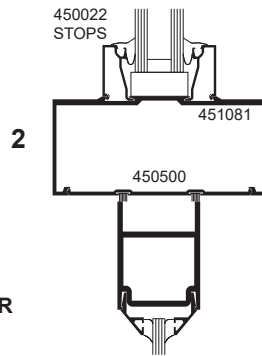
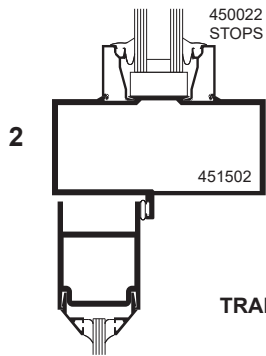


**TRANSOM HEAD**

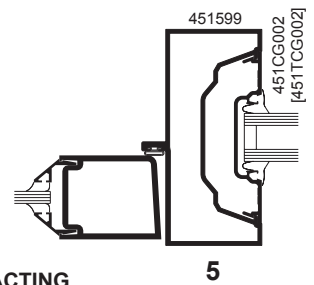
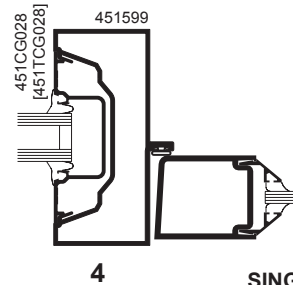


**SINGLE ACTING HEADER**

**DOUBLE ACTING HEADER**

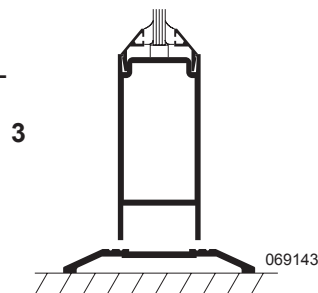
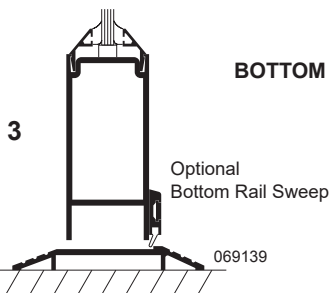


**TRANSOM BAR**



**SINGLE ACTING DOOR JAMBS**

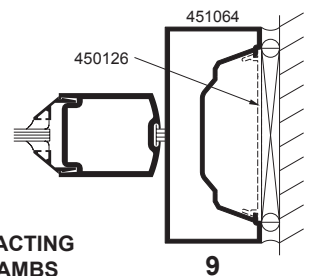
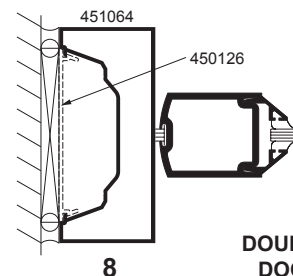
**5**



**BOTTOM RAIL**

**SINGLE ACTING**

**DOUBLE ACTING**



**DOUBLE ACTING DOOR JAMBS**

**8**

**9**

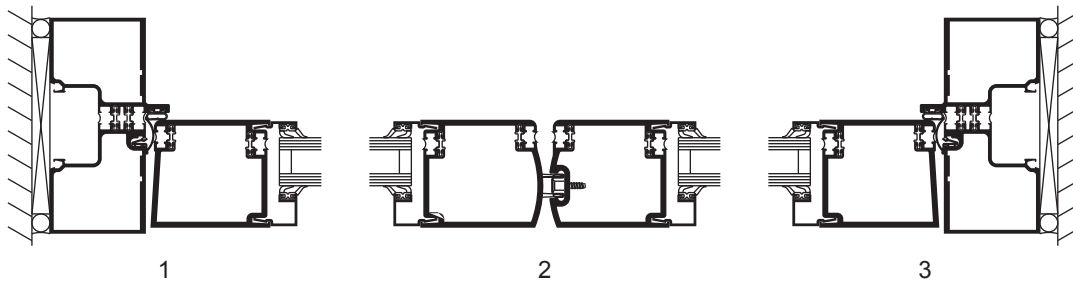
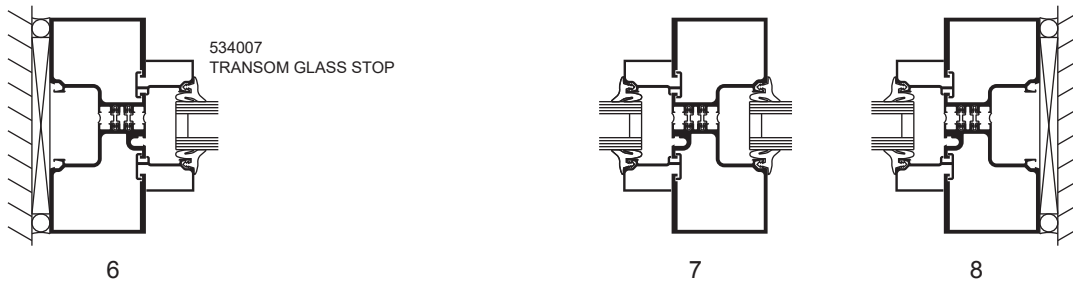
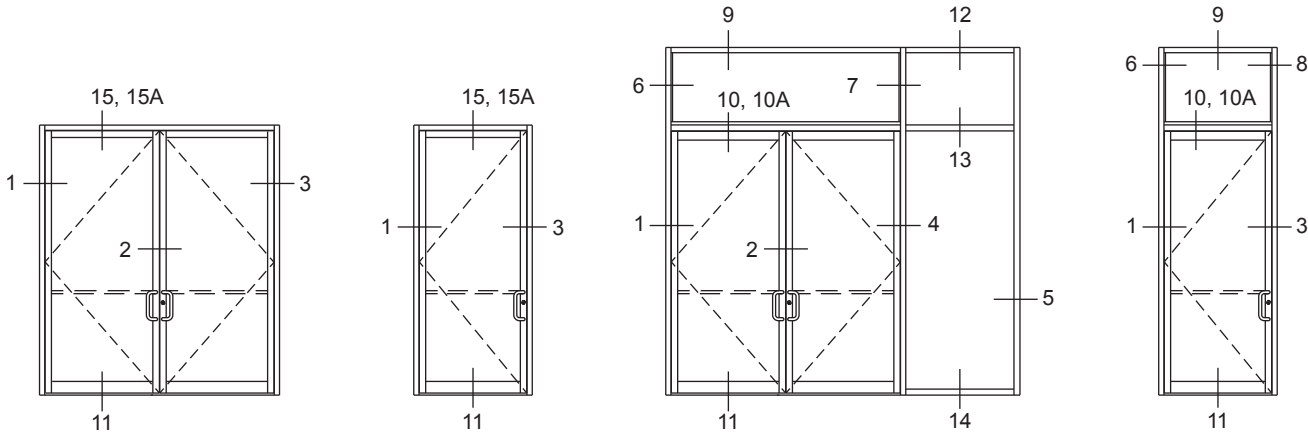
**NOTE:** Sidelite mullions must be oriented to provide at least one (1) deep vertical pocket per lite to facilitate glazing.

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.

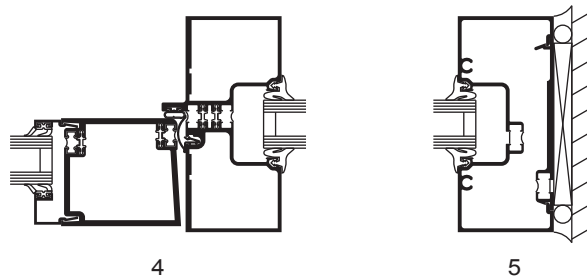
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- NOTE:**
1. SERIES 250T NARROW STILE DOORS ARE DETAILED, MEDIUM STILE 350T DOORS AND WIDE STILE 500T DOORS ALSO MAY BE USED.
  2. TRIFAB® VERSAGLAZE® 451T CENTER, 2" x 4-1/2" (50.8 x 114.3) FRAMING IS DETAILED WITH THE DOORS FOR REFERENCE. OTHER KAWNEER FRAMING SERIES OR CURTAIN WALL SYSTEMS MAY BE USED.



**SINGLE ACTING DOORS**

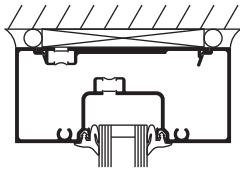


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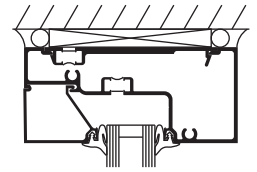
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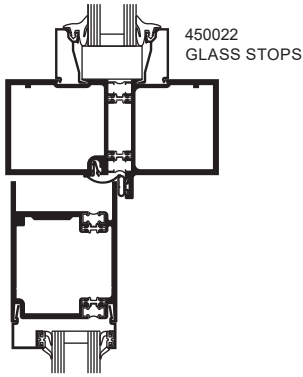
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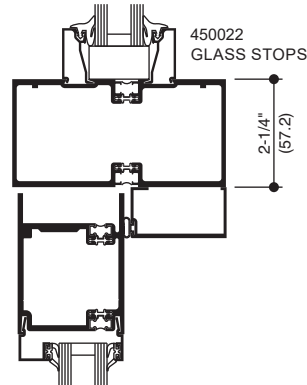
12

### SINGLE ACTING DOORS

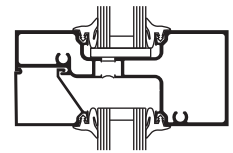
### COC WITH SINGLE ACTING OFFSET ARM



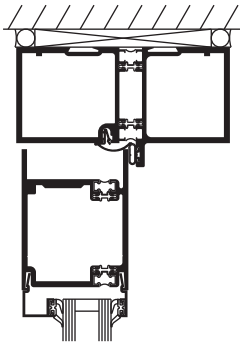
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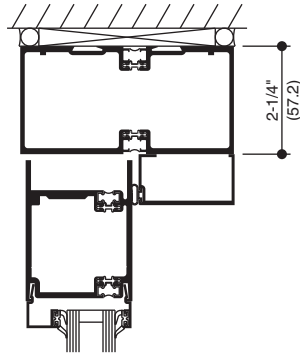
10A



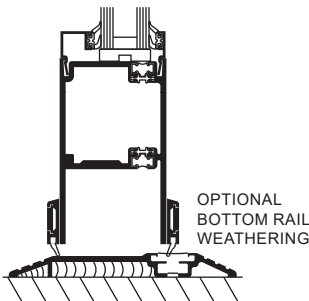
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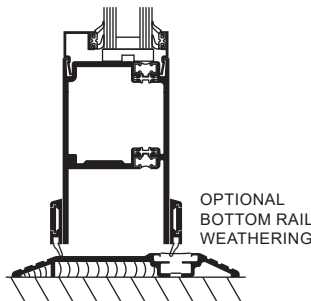
15



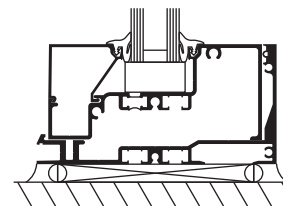
15A



11



11



14

### SURFACE OVERHEAD CLOSER

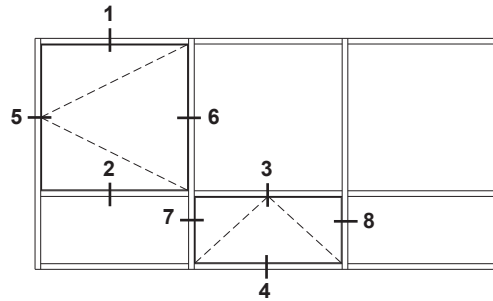
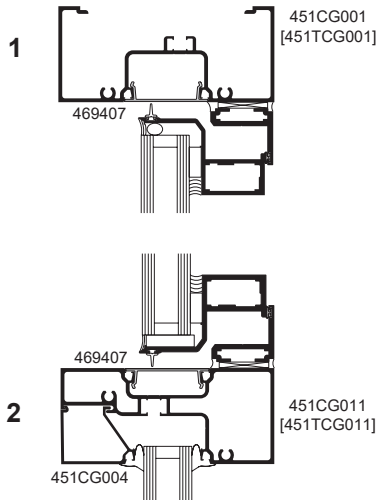
### CONSEALED OVERHEAD CLOSER

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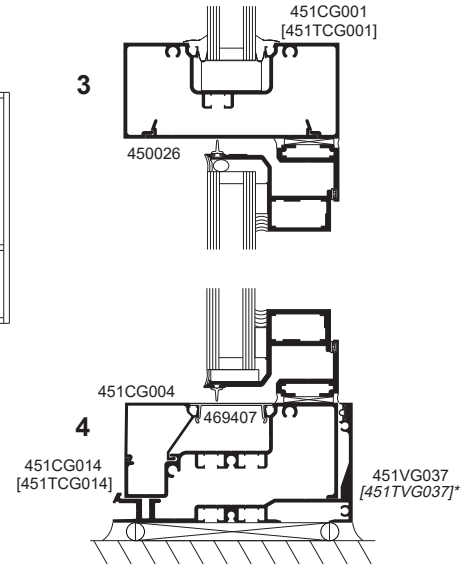
Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)

**OUTSWING CASEMENT  
VERTICAL SECTION**

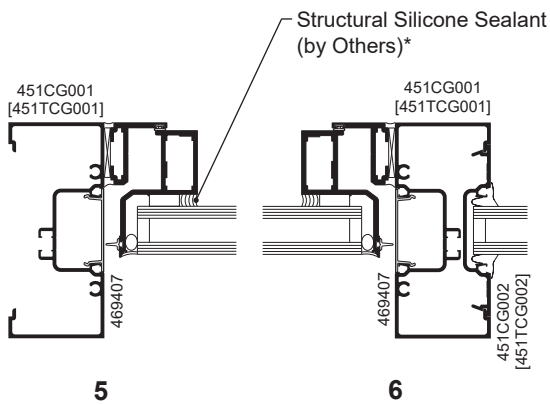


ELEVATION IS NUMBER KEYED TO DETAILS

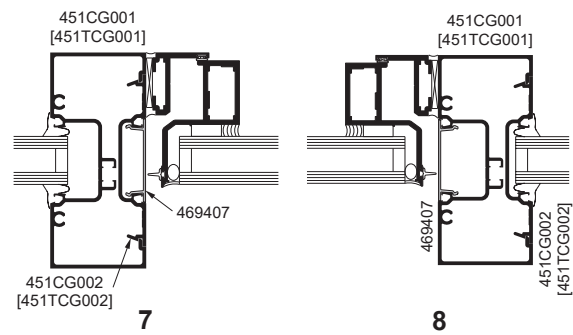
**PROJECT-OUT  
VERTICAL SECTION**



**OUTSWING CASEMENT  
HORIZONTAL SECTION**



**PROJECT-OUT  
HORIZONTAL SECTION**



**NOTE:** Black spacer is recommended when 1" (25.4) insulating glass is used.

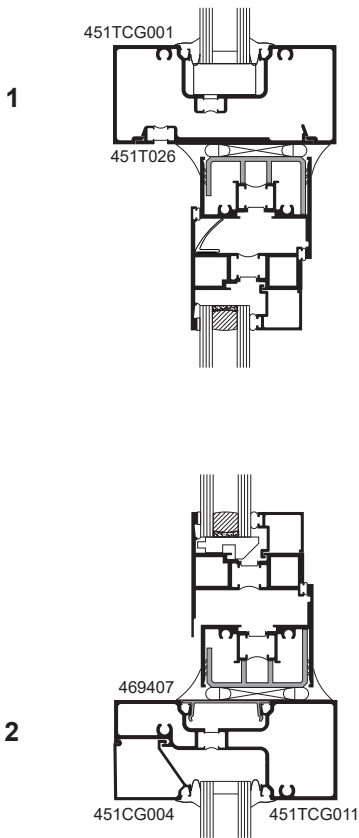
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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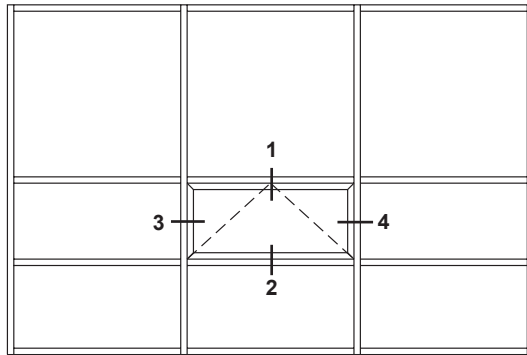
\* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)

### PROJECT-OUT VERTICAL SECTION

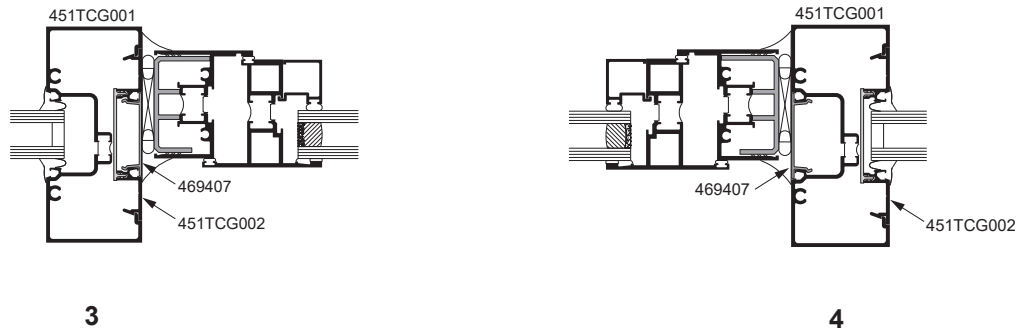


**8225TL THERMAL WINDOWS SHOWN**  
**NOTE: OTHER VENT TYPES CAN BE**  
**ACCOMMODATED, CONSULT YOUR KAWNEER**  
**REPRESENTATIVE FOR OTHER OPTIONS**



ELEVATION IS NUMBER KEYED TO DETAILS

### PROJECT-OUT HORIZONTAL SECTION

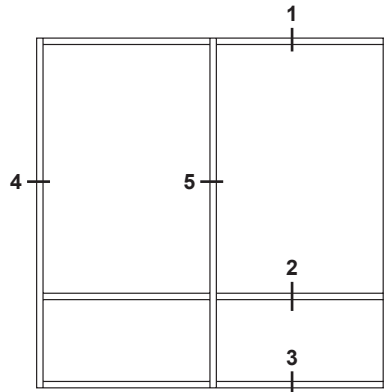


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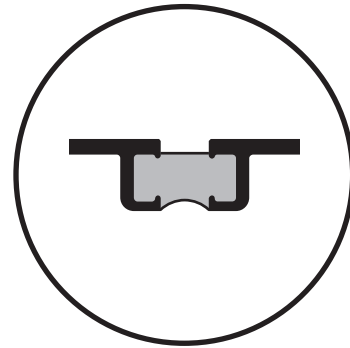
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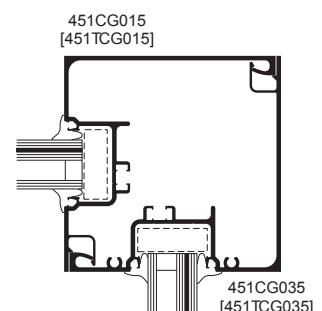
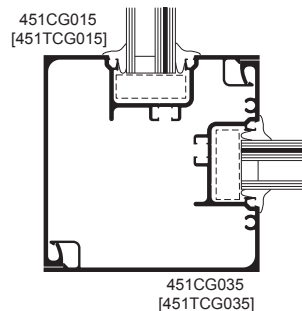
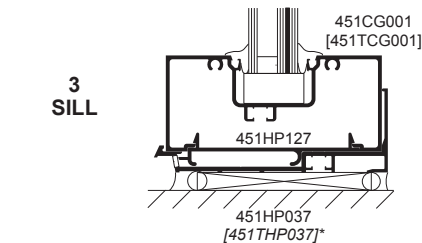
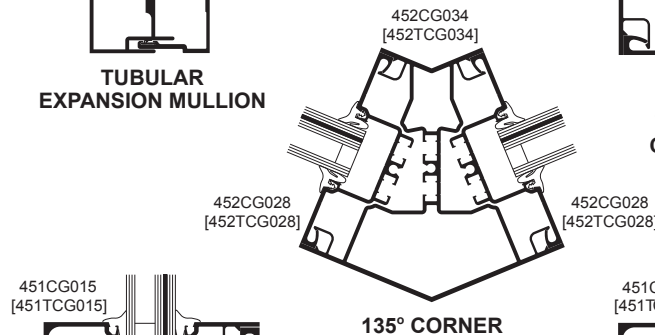
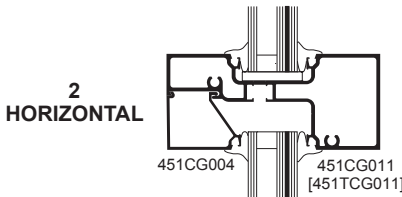
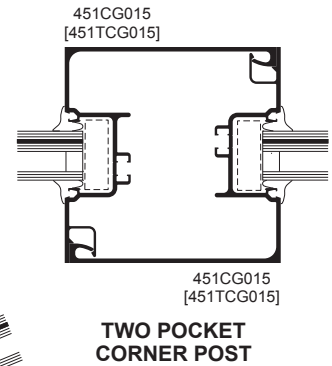
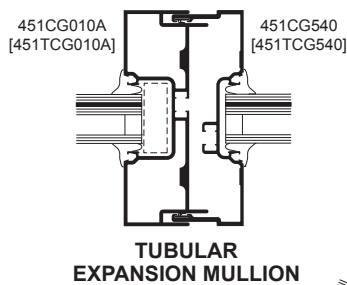
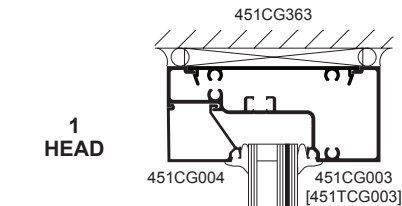
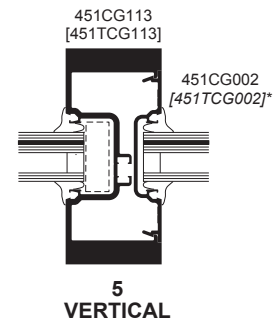
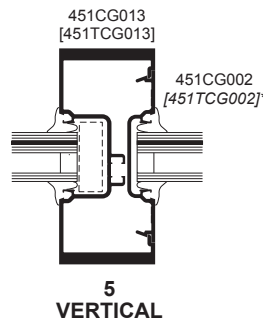
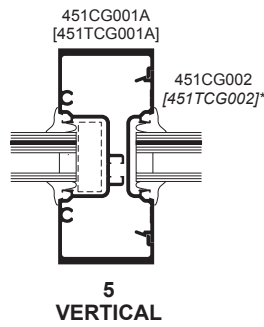
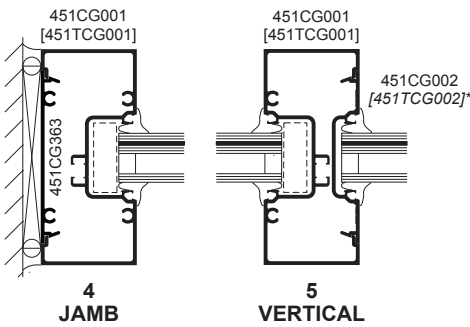
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

OPTIONAL FRAMING (CENTER)



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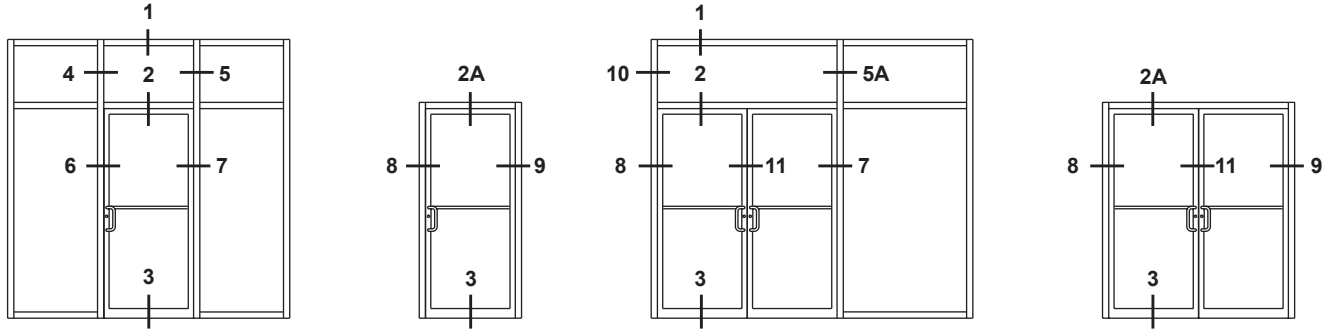
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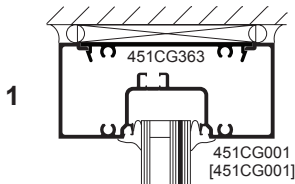
## Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “350/500 IR” DOORS (DRY GLAZED).

### DOOR FRAMING NON-THERMAL ONLY

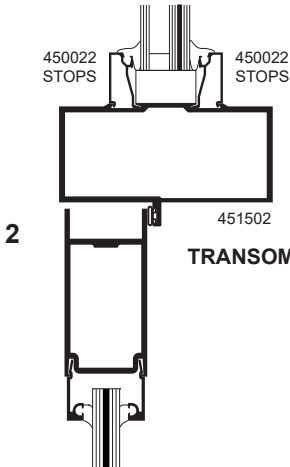
**NOTE:** OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.  
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



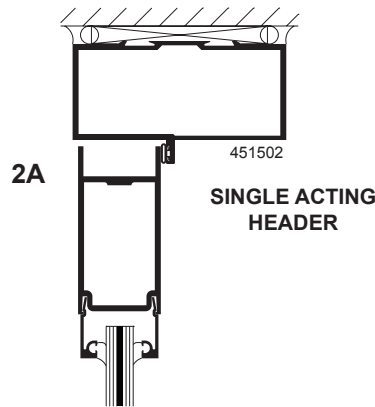
ELEVATIONS ARE NUMBER KEYED TO DETAILS



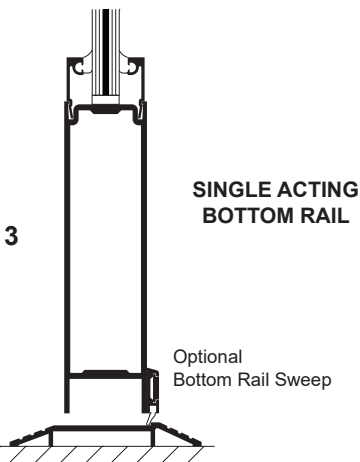
TRANSOM HEAD



TRANSOM BAR

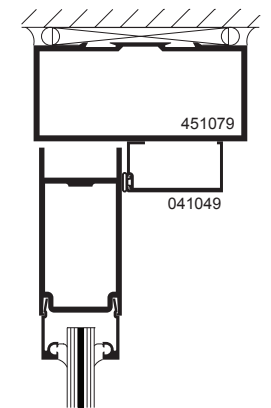
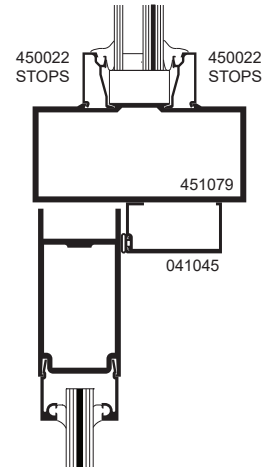


SINGLE ACTING HEADER



SINGLE ACTING BOTTOM RAIL

### CONCEALED OVERHEAD CLOSERS



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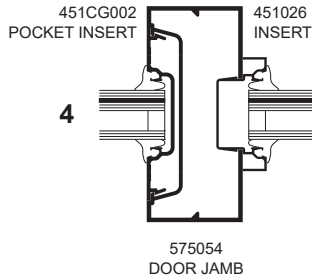
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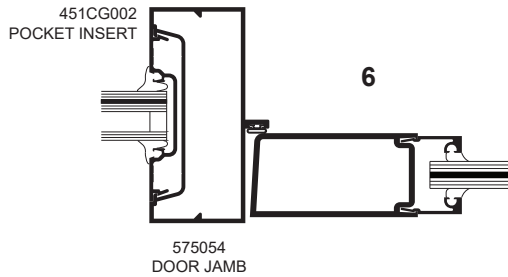
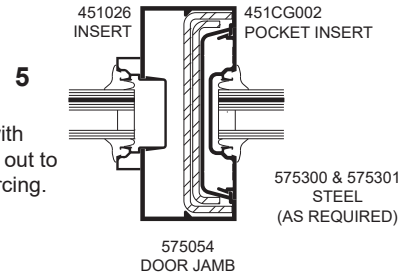
## Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “350/500 IR” DOORS (DRY GLAZED). DOOR FRAMING NON-THERMAL ONLY

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

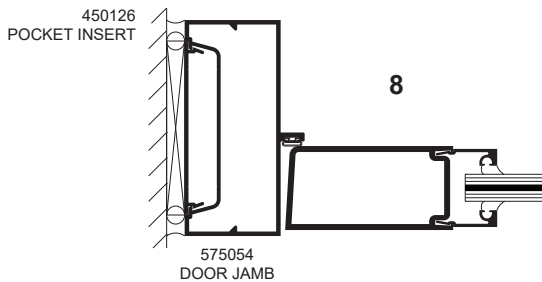
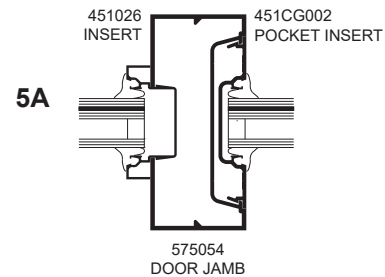
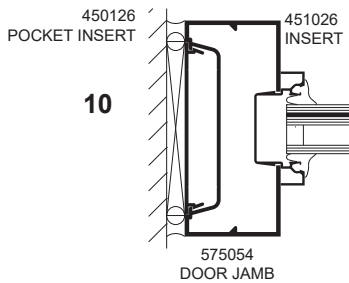
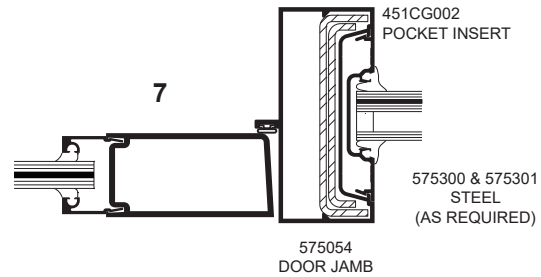


### TRANSOM JAMBS

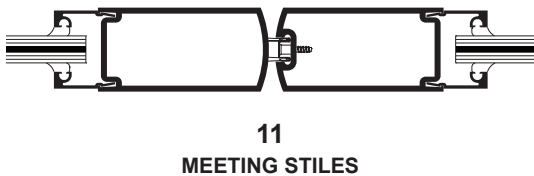
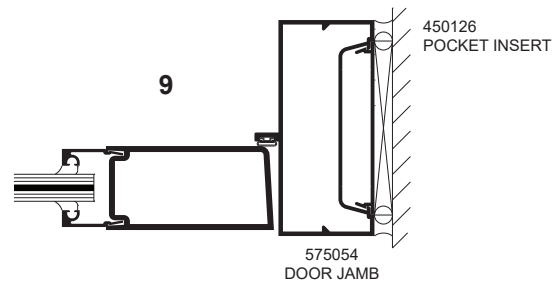
Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.



### SINGLE ACTING DOOR JAMBS



### SINGLE ACTING DOOR JAMBS



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**BASIC FRAMING DETAILS**

**(FRONT - Inside Glazed - Stops Down) .....32**

**(FRONT - Outside Glazed - Stops Down) .....33**

**STICK..... 34-36**

**PUNCHED OPENING ..... 37-38**

**MISCELLANEOUS FRAMING..... 39-40**

**CORNERS..... 41-42**

**ENTRANCE FRAMING.....43**

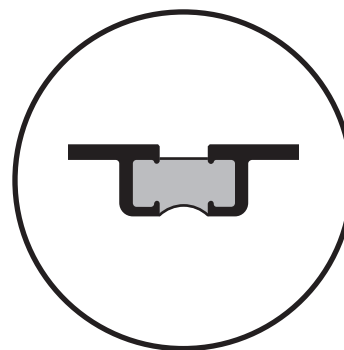
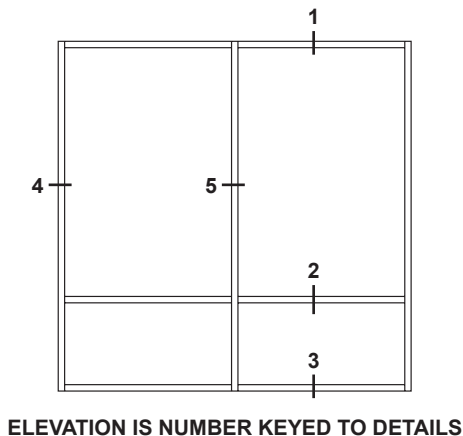
**GLASSvent® WINDOW for STOREFRONT FRAMING .....44**

**8225TL THERMAL WINDOW DETAILS.....45**

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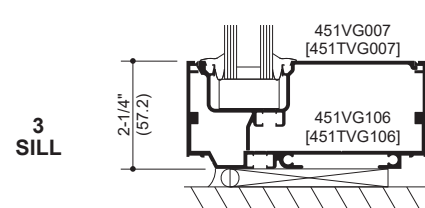
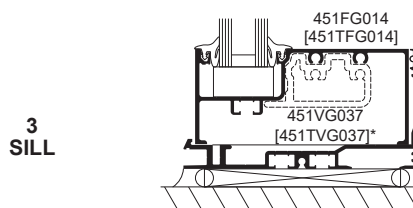
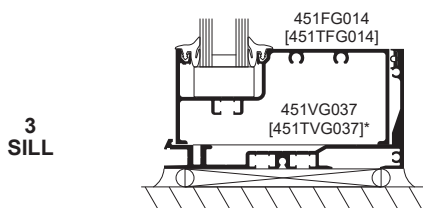
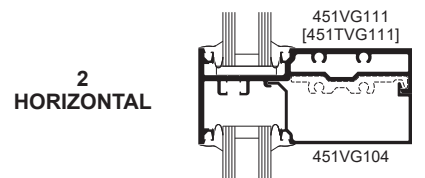
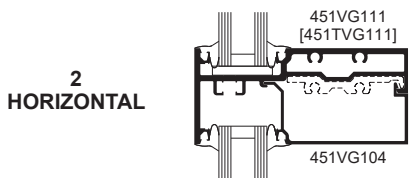
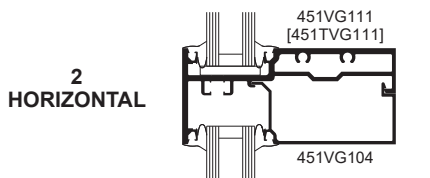
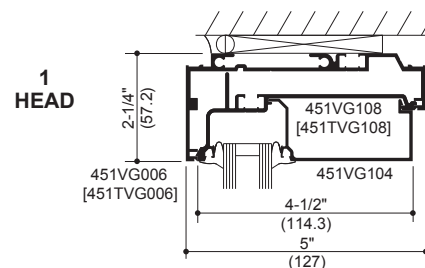
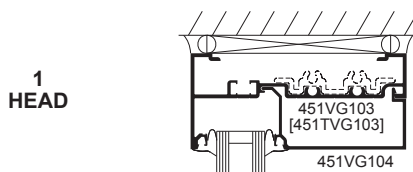
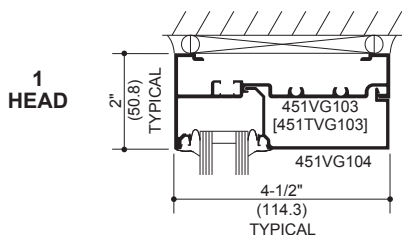
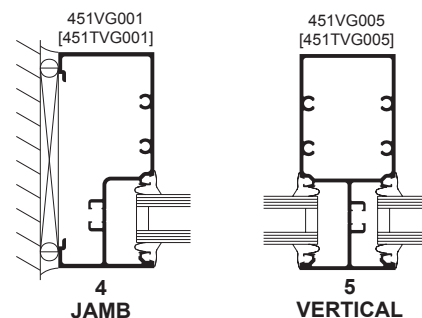
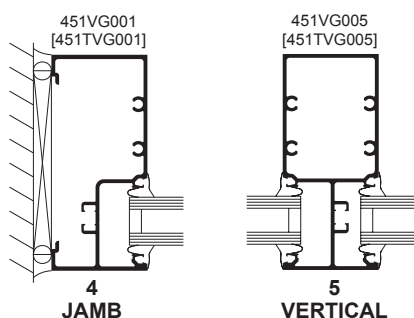
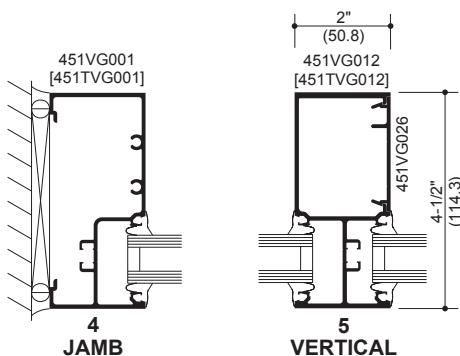


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK



\* HP Sill Flashing shown with optional gasket.

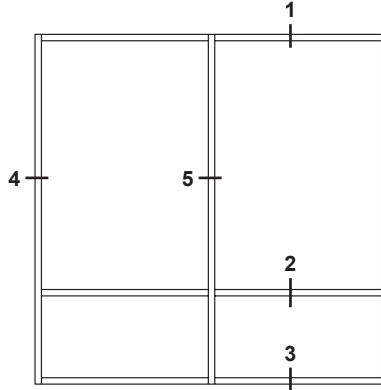
\* HP Sill Flashing shown with optional gasket.

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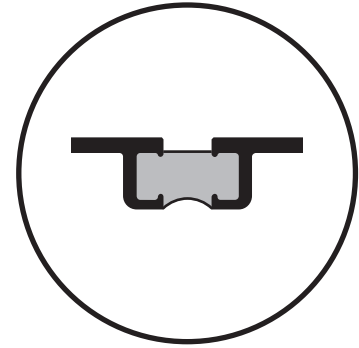
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ELEVATION IS NUMBER KEYED TO DETAILS

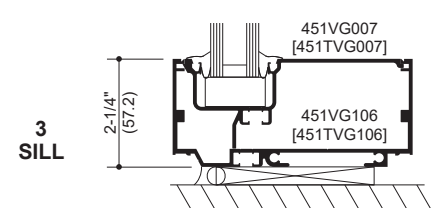
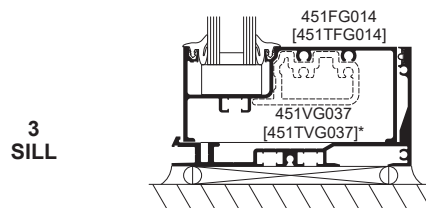
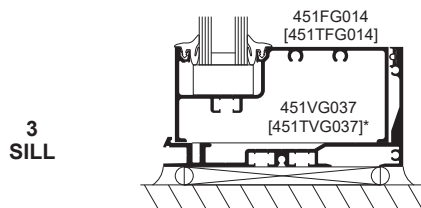
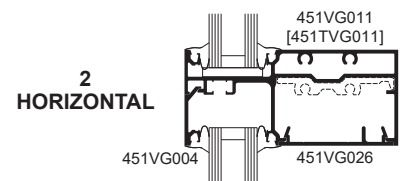
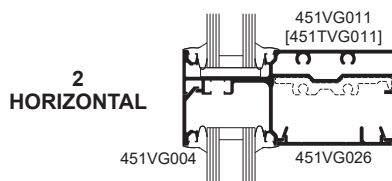
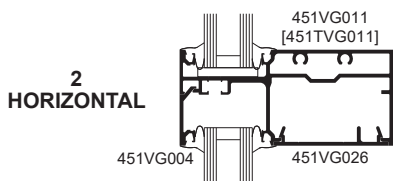
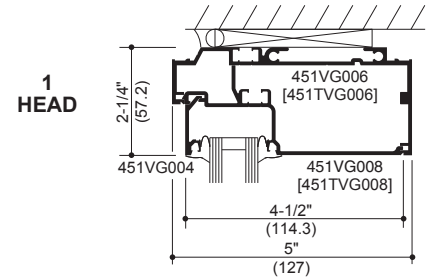
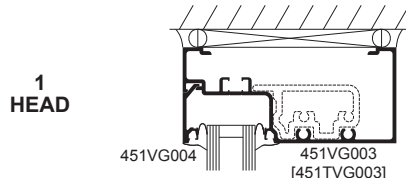
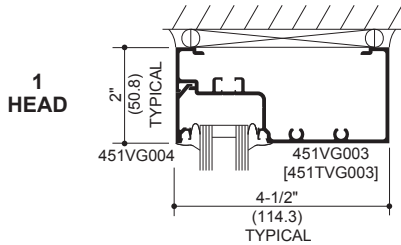
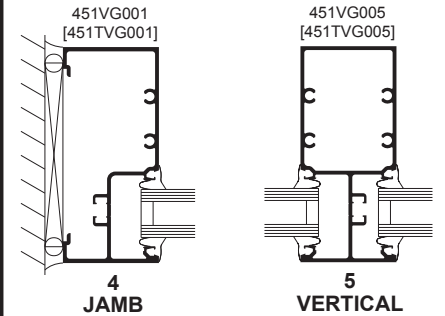
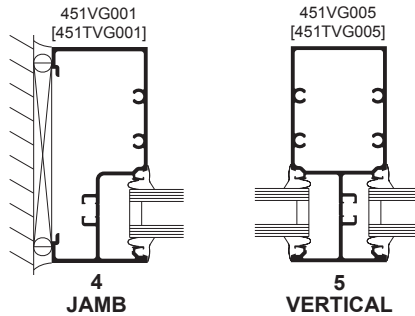
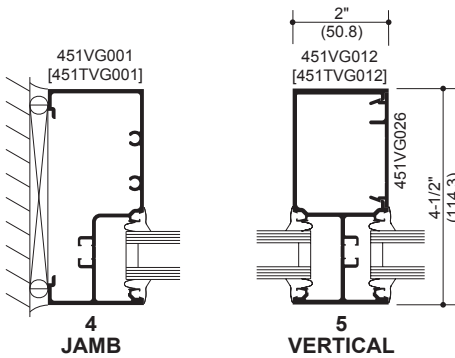


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK



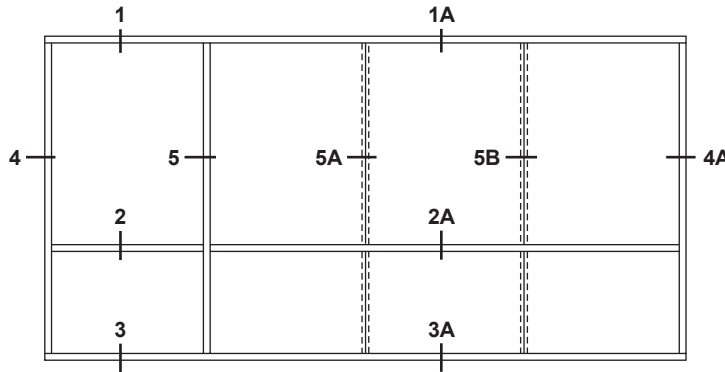
\* HP Sill Flashing shown with optional gasket.

\* HP Sill Flashing shown with optional gasket.

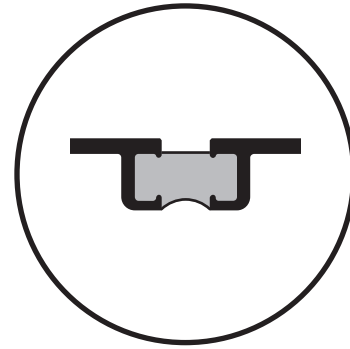
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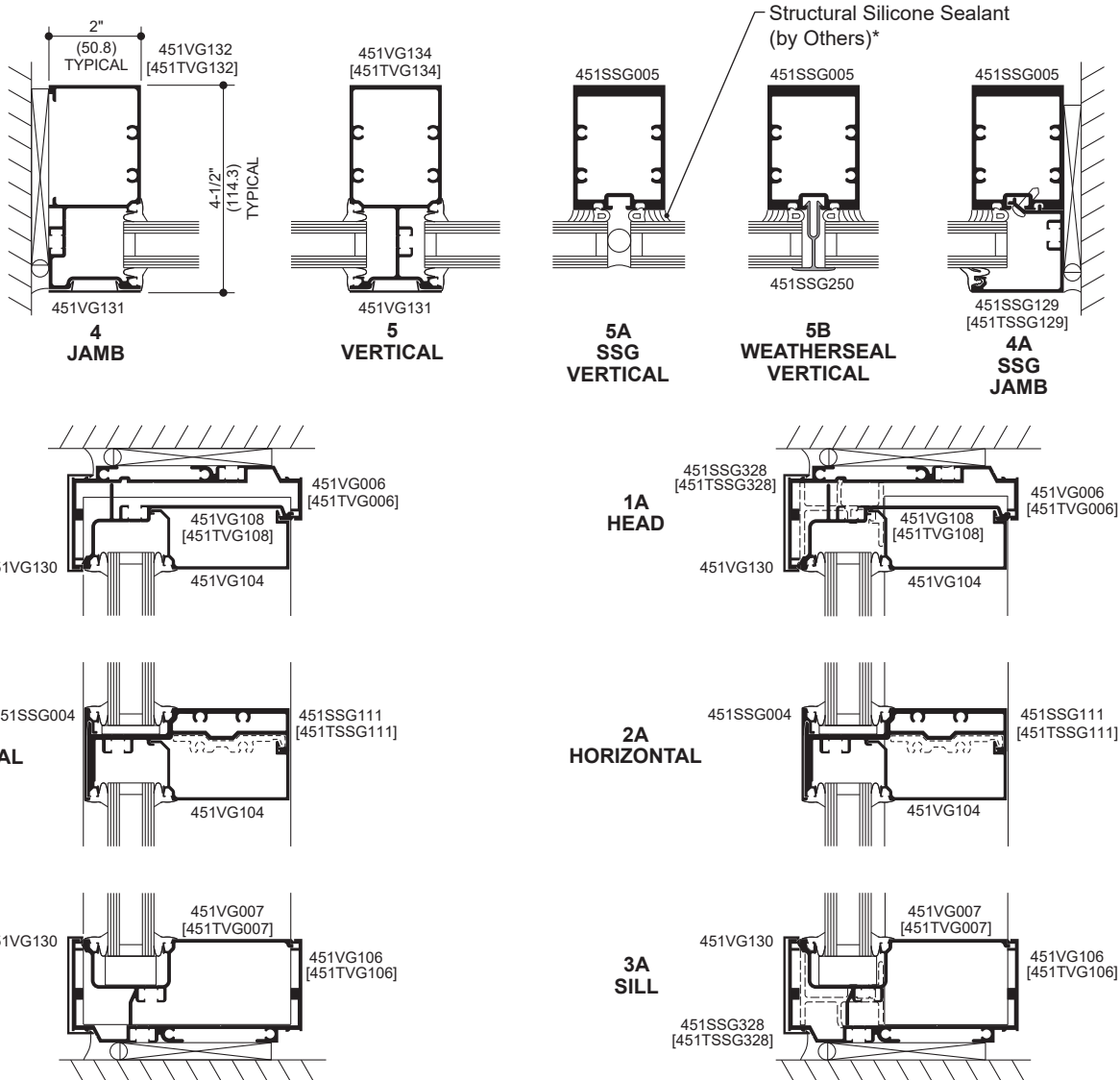
ELEVATION IS NUMBER KEYED TO DETAILS



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**STICK (INSIDE GLAZED)  
TWO COLOR OPTION**

**STANDARD RECEPTOR with SSG ADAPTOR**

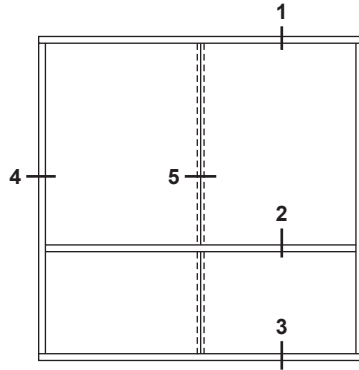


\* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

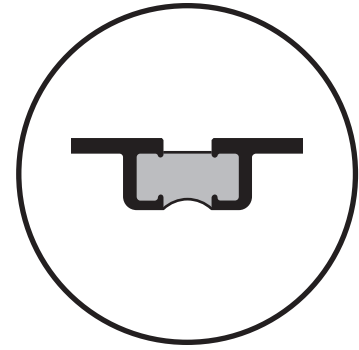
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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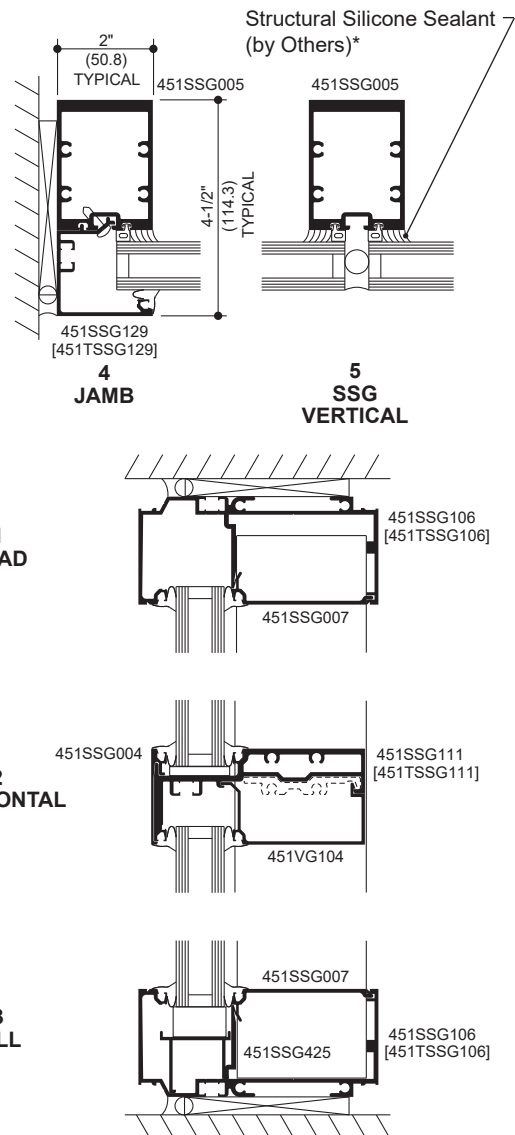
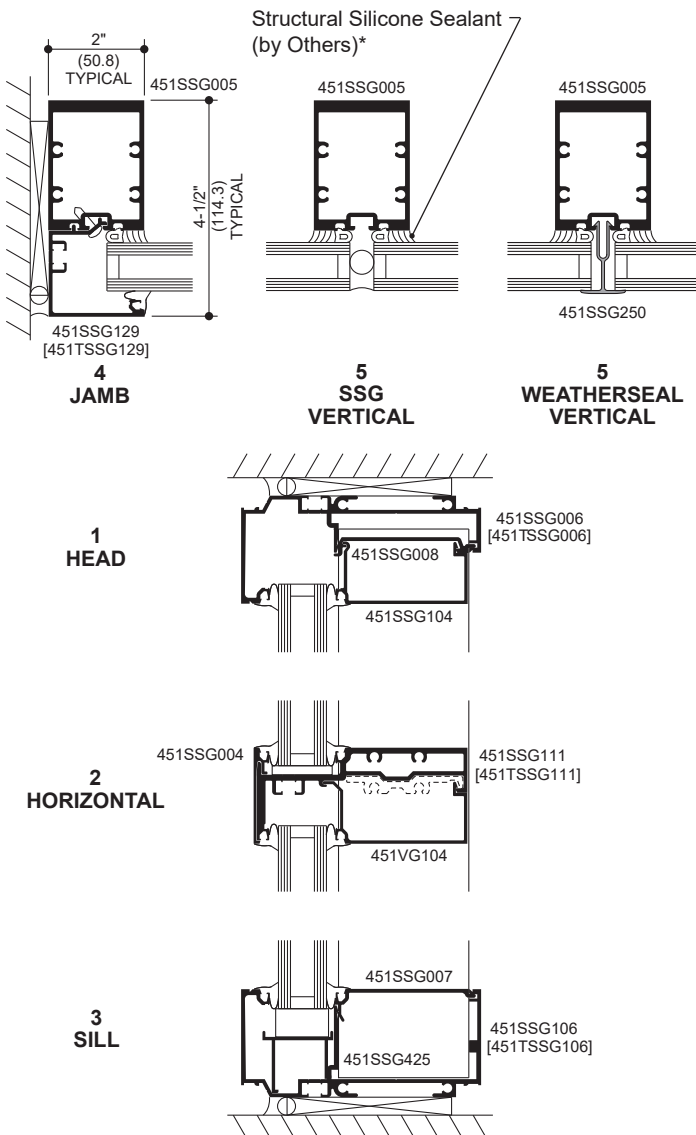
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

**STICK (INSIDE GLAZED)  
SSG RECEPTOR**

**STICK (OUTSIDE GLAZED)  
SSG RECEPTOR**

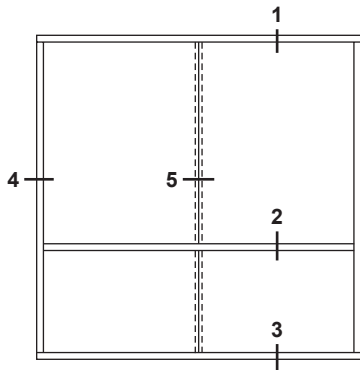


\* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

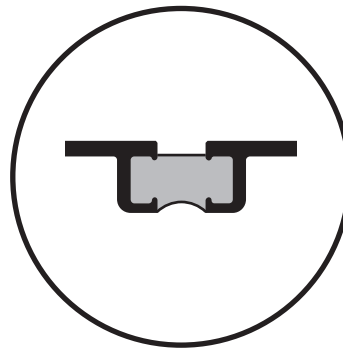
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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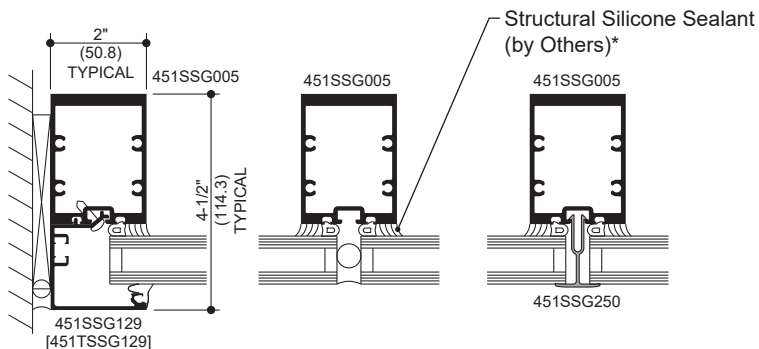
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

**STICK (INSIDE GLAZED)  
TWO COLOR OPTION**

**SSG RECEPTOR**

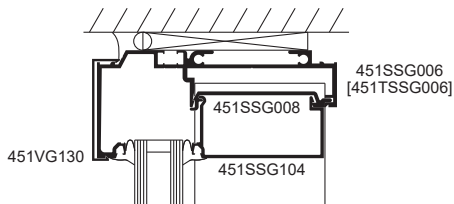


**4  
JAMB**

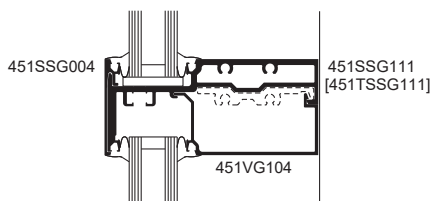
**5  
SSG  
VERTICAL**

**5  
WEATHERSEAL  
VERTICAL**

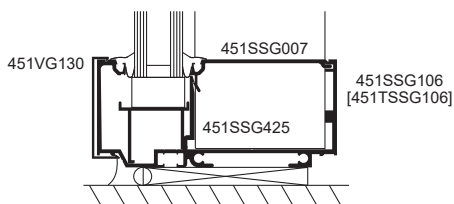
**1  
HEAD**



**2  
HORIZONTAL**

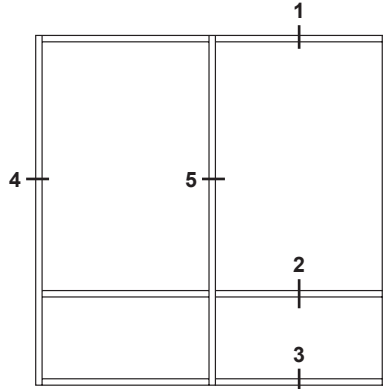


**3  
SILL**

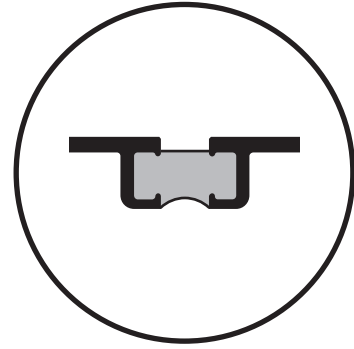


\* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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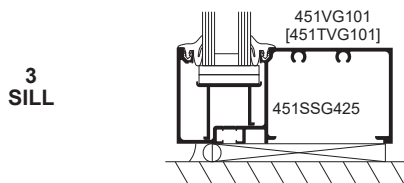
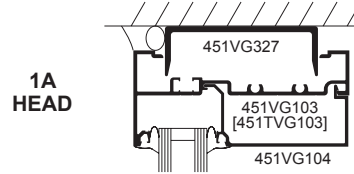
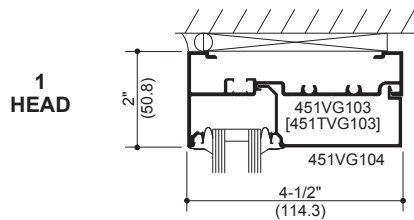
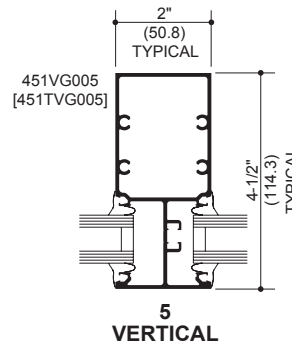
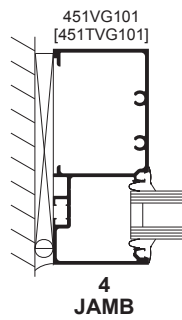
ELEVATION IS NUMBER KEYED TO DETAILS



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## CONTINUOUS HEAD AND SILL (INSIDE GLAZED)

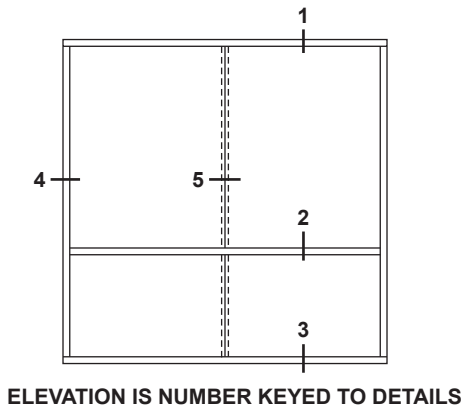
### PUNCHED OPENING



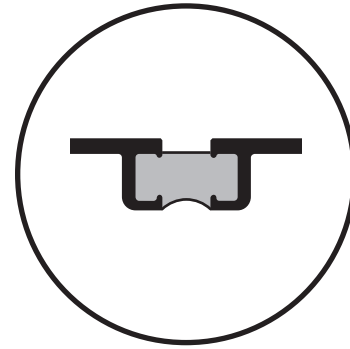
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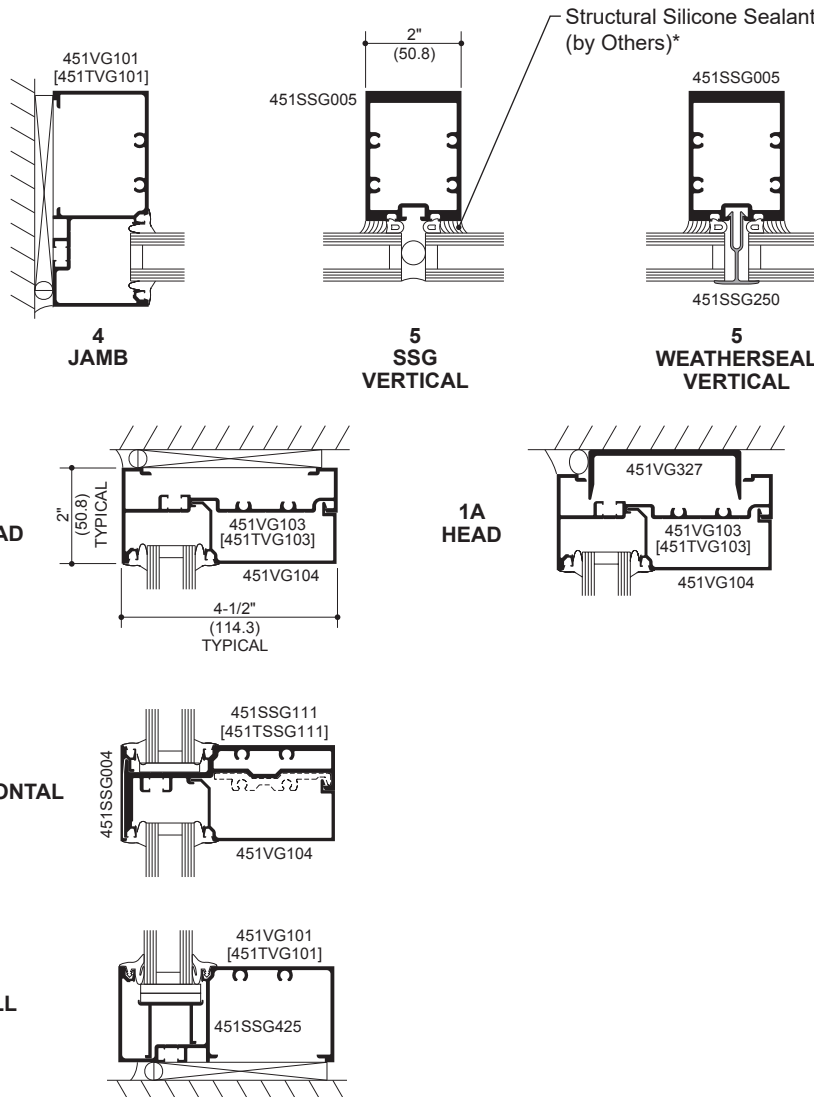


ELEVATION IS NUMBER KEYED TO DETAILS



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**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.

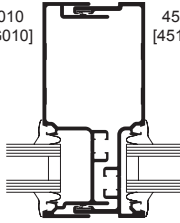
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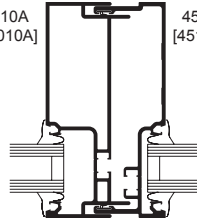
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451VG010  
[451TVG010]      451VG540  
[451TVG540]



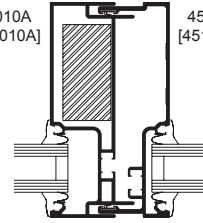
**EXPANSION MULLION**

451VG010A  
[451TVG010A]      451VG540  
[451TVG540]

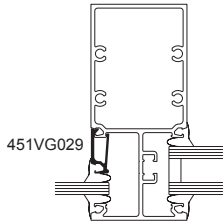


**TUBULAR  
EXPANSION MULLION**

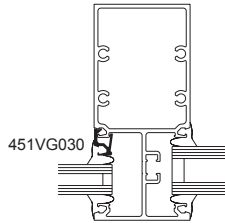
451VG010A  
[451TVG010A]      451VG540  
[451TVG540]



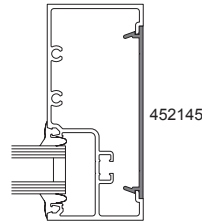
**TUBULAR  
EXPANSION MULLION  
WITH STEEL**



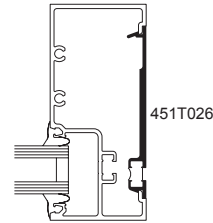
**1/4" (6.4) INFILL  
SNAP-IN ADAPTOR**



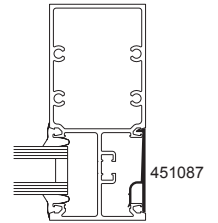
**5/8" (15.9) INFILL  
SNAP-IN ADAPTOR**



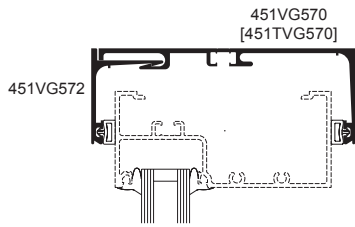
**PVC FLAT FILLER  
(NON STRUCTURAL)**



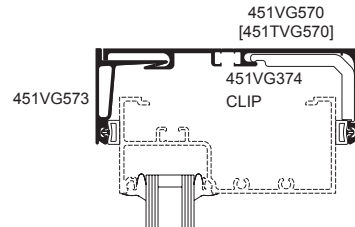
**THERMAL  
FLAT FILLER**



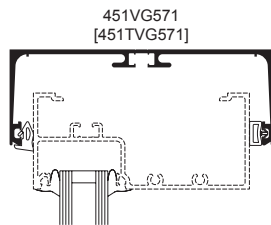
**SNAP-IN  
FLAT FILLER**



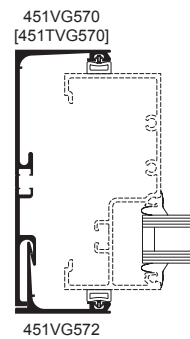
**STANDARD - HEAD  
COMPENSATING RECEPTOR  
(EXTERIOR INSTALLED)**



**HEAVY WEIGHT - HEAD  
COMPENSATING RECEPTOR**



**ONE PIECE - HEAD  
COMPENSATING RECEPTOR**

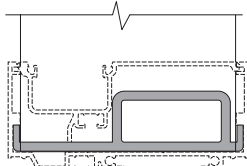


**JAMB  
COMPENSATING RECEPTOR  
(EXTERIOR INSTALLED)**

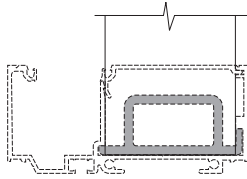
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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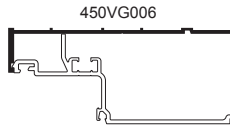
Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)



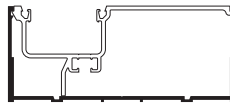
451VG362  
**MULLION ANCHOR**



451SSG362  
**SSG MULLION ANCHOR**

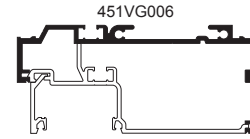


450VG006

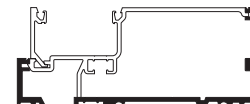


450VG106

**OPTIONAL LIGHTWEIGHT  
CAN RECEPTORS**



451VG006



451VG106

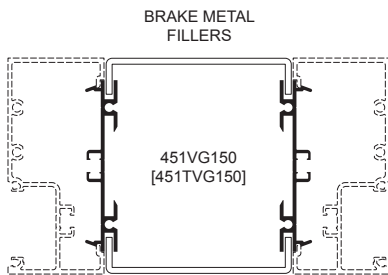
**OPTIONAL UNEQUAL LEG  
CAN RECEPTORS**

**NOTE:**

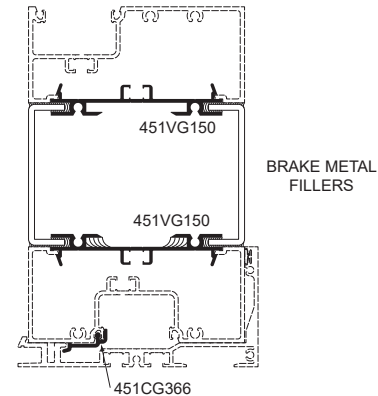
If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified wind load (psf), divided by two) is more than 500 LBS., the optional Mullion Anchor must be used. Consult Application Engineering.

**NOTE:**

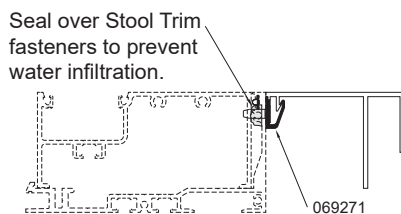
Mullion Anchor not used with Lightweight Receptor.



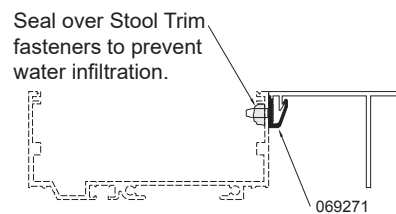
**BRAKE METAL  
ADAPTOR**



**BRAKE METAL ADAPTOR  
AT HORIZONTAL**



**STOOL TRIM CLIP  
with HP FLASHING**



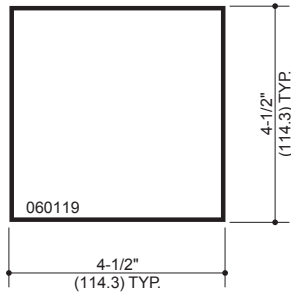
**STOOL TRIM CLIP  
FOR STICK ASSEMBLY**

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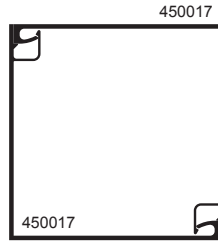
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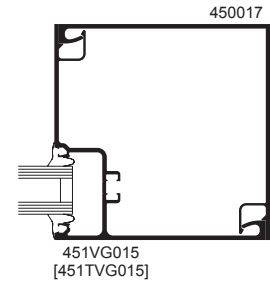
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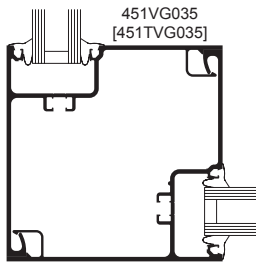
**4-1/2" X 4-1/2" TUBE**



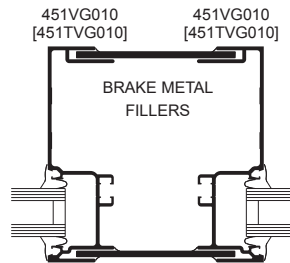
**TWO PIECE NO POCKET CORNER**



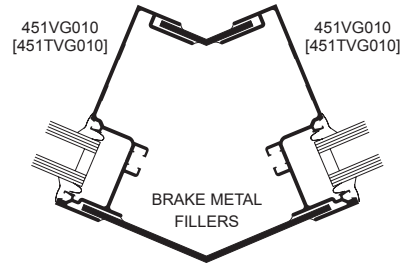
**ONE POCKET CORNER**



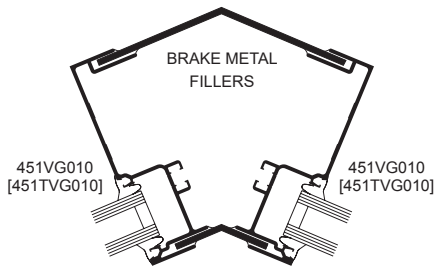
**TWO POCKET 90° CORNER**



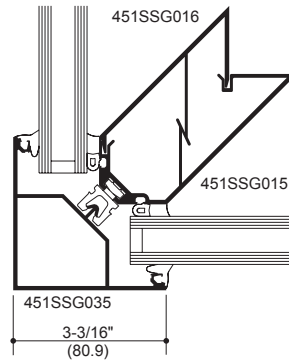
**TWO POCKET CORNER POST**



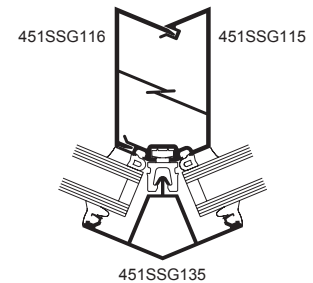
**VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER**



**VARIABLE DEGREE BRAKE METAL INSIDE CORNER**



**90° CORNER**



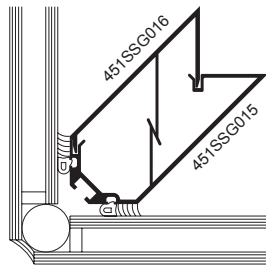
**135° CORNER**

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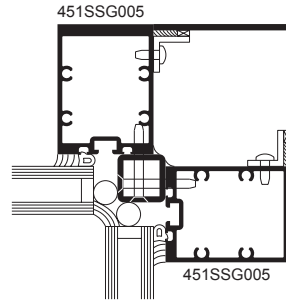
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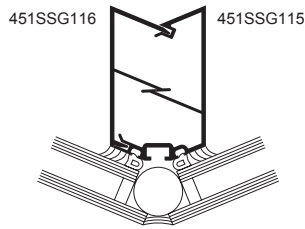
**INSIDE GLAZED**



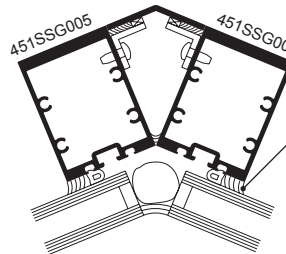
**90° OUTSIDE CORNER**



**90° INSIDE CORNER**

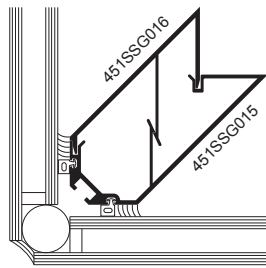


**135° OUTSIDE CORNER**

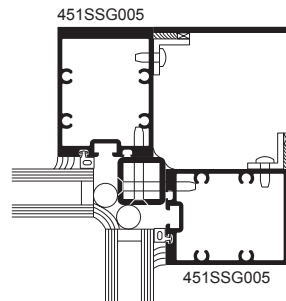


**135° INSIDE CORNER**

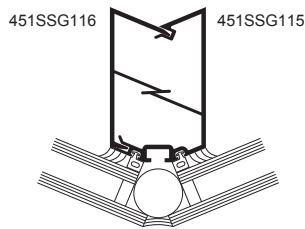
**OUTSIDE GLAZED**



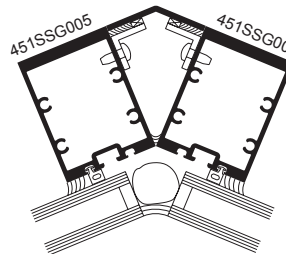
**90° OUTSIDE CORNER**



**90° INSIDE CORNER**



**135° OUTSIDE CORNER**



**135° INSIDE CORNER**

\* **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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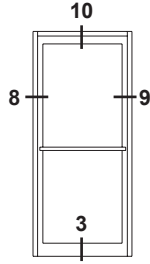
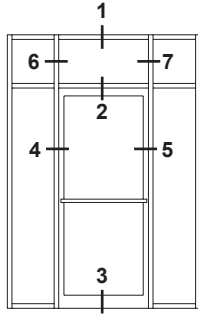
## Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER "190" DOORS.

### DOOR FRAMING NON-THERMAL ONLY

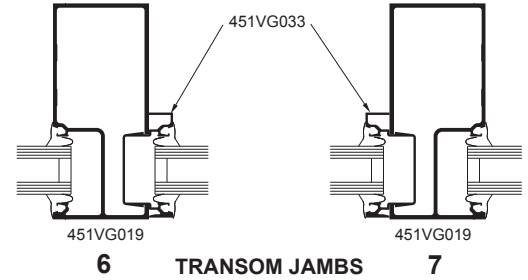
**NOTE:** OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

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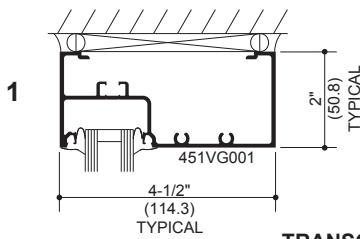
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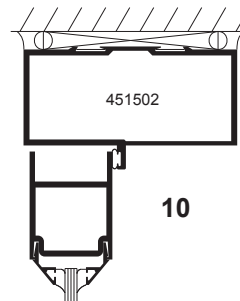
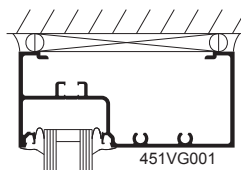
ELEVATIONS ARE NUMBER KEYED TO DETAILS



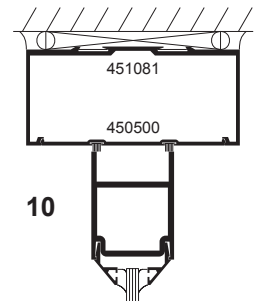
Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert.



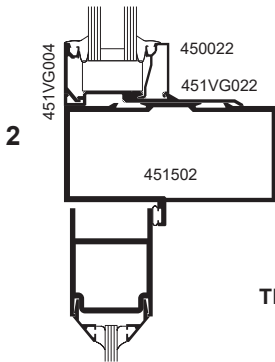
TRANSOM HEAD



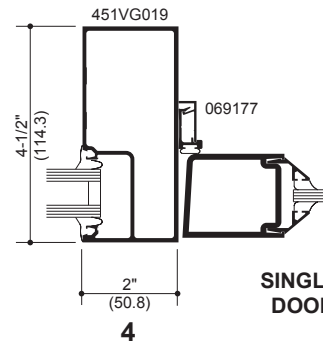
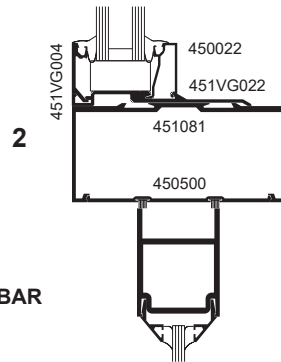
SINGLE ACTING HEADER



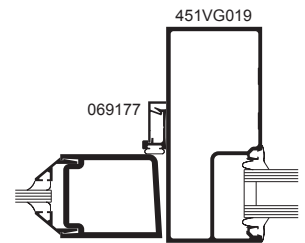
DOUBLE ACTING HEADER



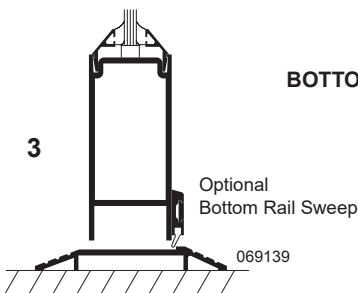
TRANSOM BAR



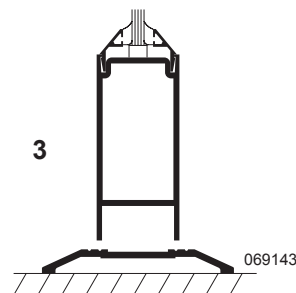
SINGLE ACTING DOOR JAMBS



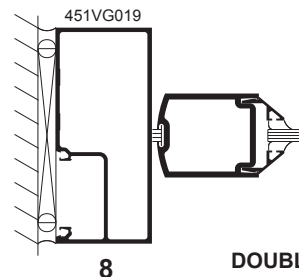
DOUBLE ACTING DOOR JAMBS



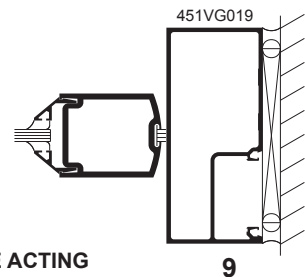
SINGLE ACTING



DOUBLE ACTING



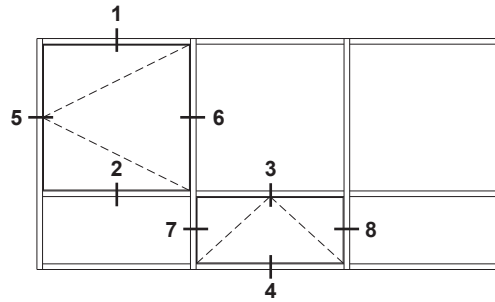
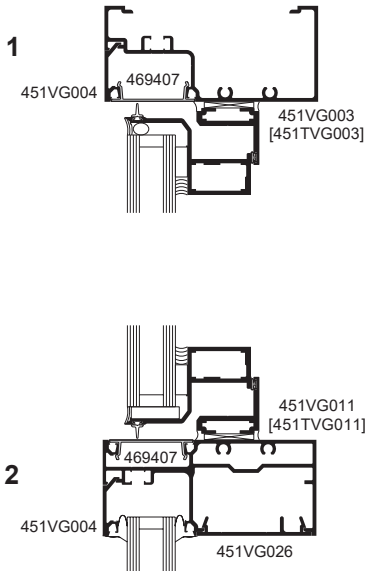
DOUBLE ACTING DOOR JAMBS



DOUBLE ACTING DOOR JAMBS

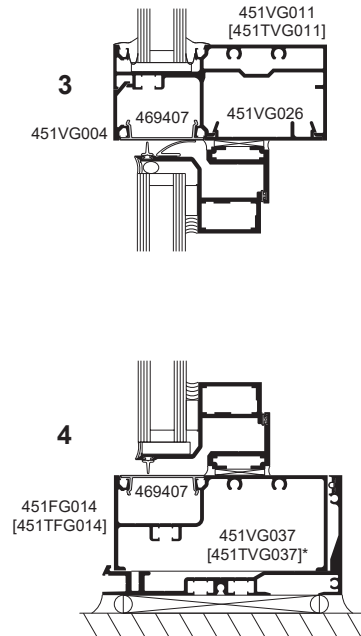
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**OUTSWING CASEMENT  
VERTICAL SECTION**

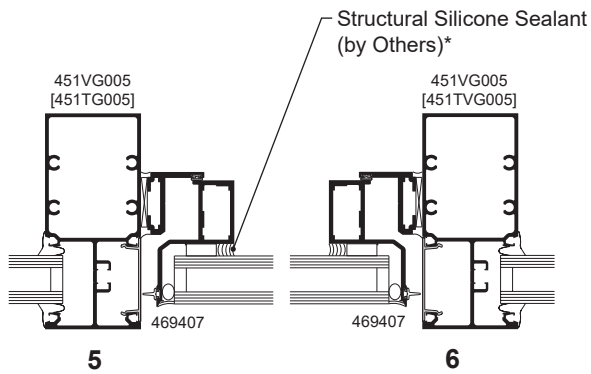


ELEVATION IS NUMBER KEYED TO DETAILS

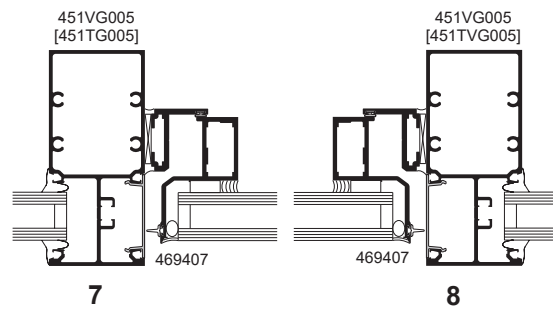
**PROJECT-OUT  
VERTICAL SECTION**



**OUTSWING CASEMENT  
HORIZONTAL SECTION**



**PROJECT-OUT  
HORIZONTAL SECTION**



**NOTE:** Black spacer is recommended when 1" insulating glass is used.

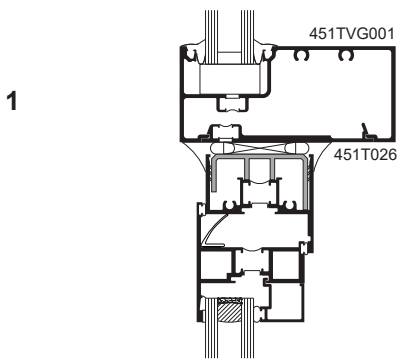
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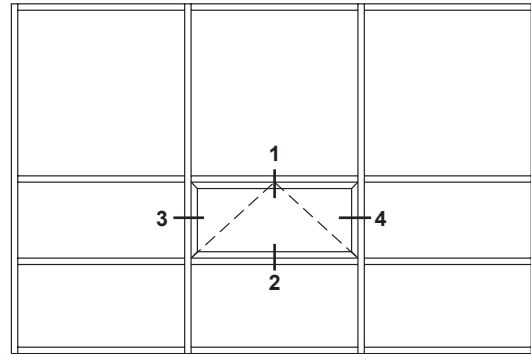
\* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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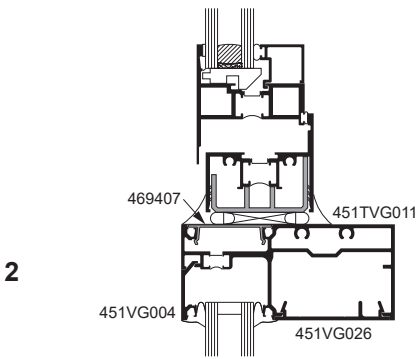
### PROJECT-OUT VERTICAL SECTION



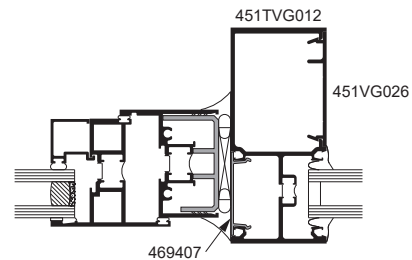
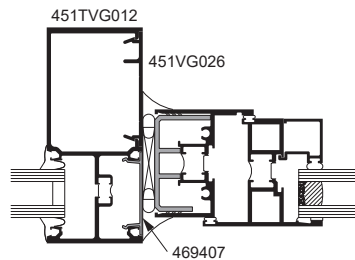
**8225TL THERMAL WINDOWS SHOWN**  
**NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS**



ELEVATION IS NUMBER KEYED TO DETAILS



### PROJECT-OUT HORIZONTAL SECTION



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**BASIC FRAMING DETAILS**

**(BACK - Inside Glazed - Stops Down) .....48**

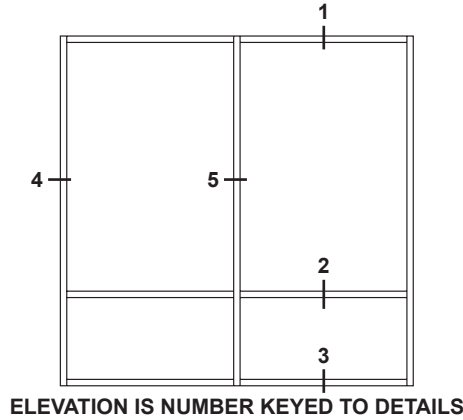
**(BACK - Outside Glazed - Stops Down) .....49**

**MISCELLANEOUS FRAMING..... 50-51**

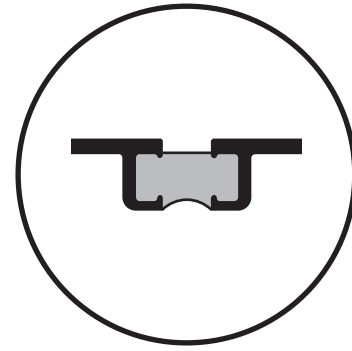
**CORNERS.....52**

**ENTRANCE FRAMING.....53**

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ELEVATION IS NUMBER KEYED TO DETAILS

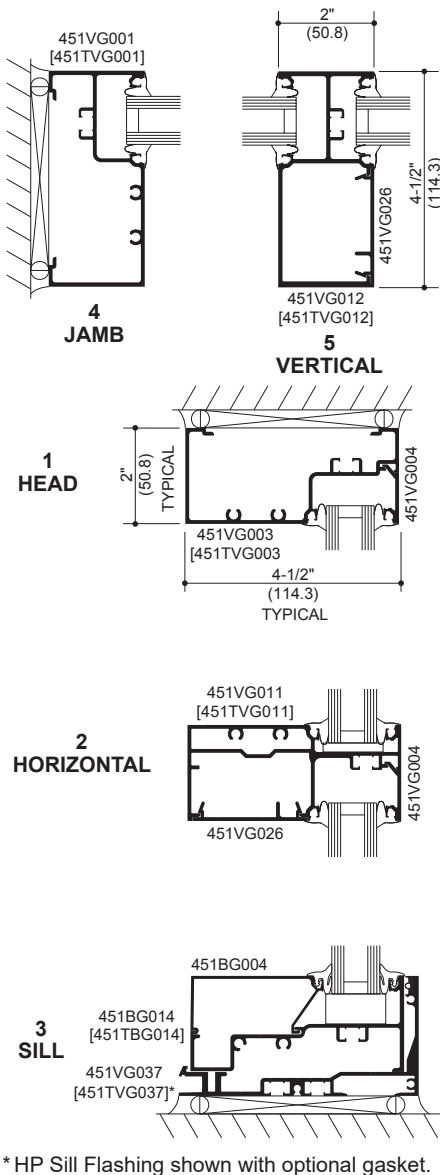


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

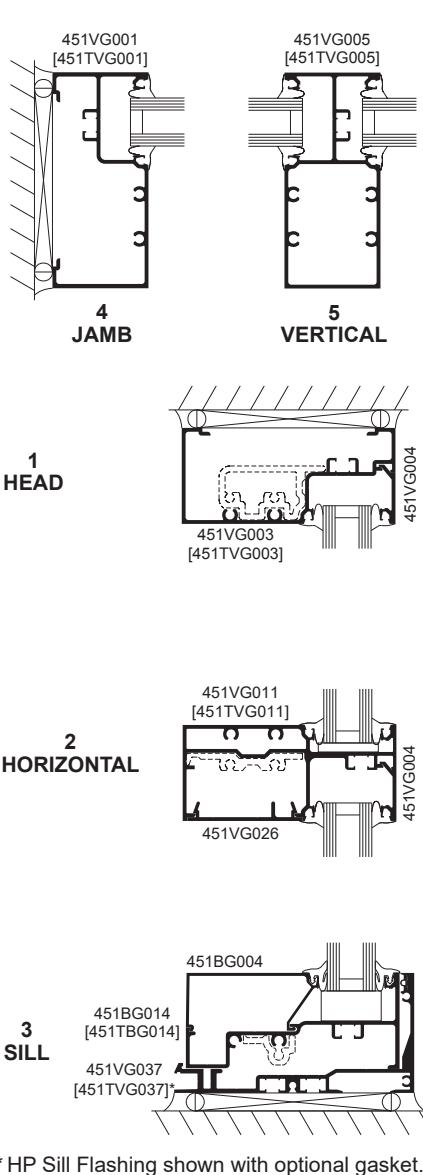
SCREW SPLINE

SHEAR BLOCK

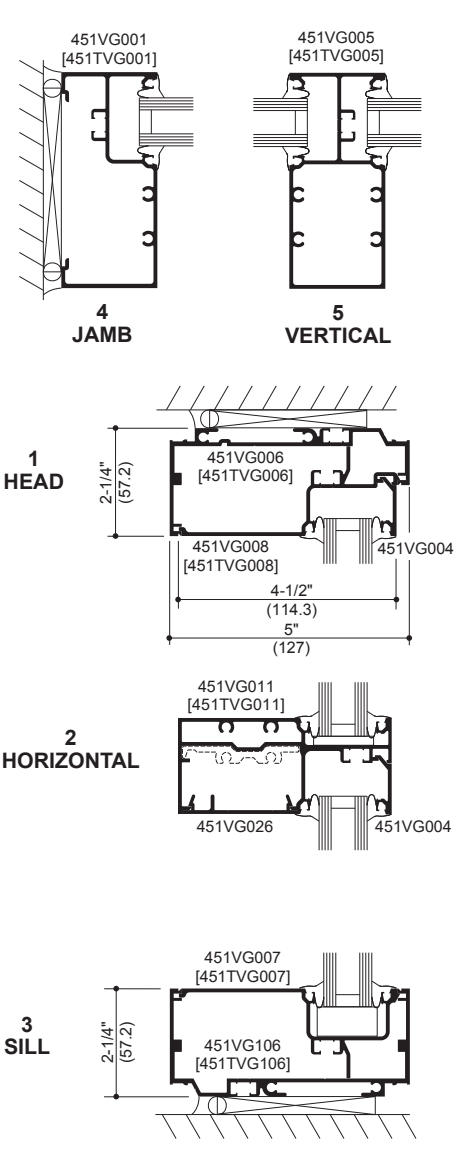
STICK



\* HP Sill Flashing shown with optional gasket.



\* HP Sill Flashing shown with optional gasket.

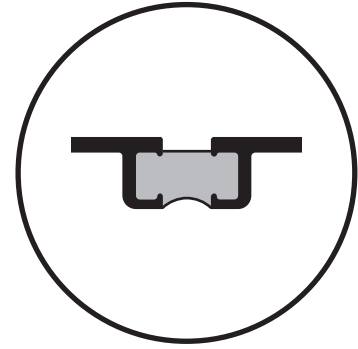
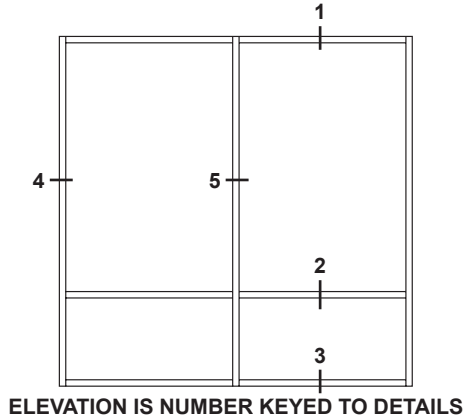


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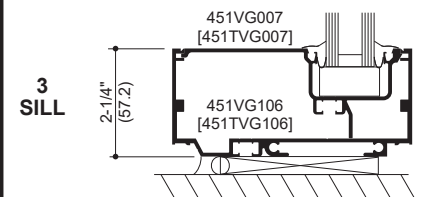
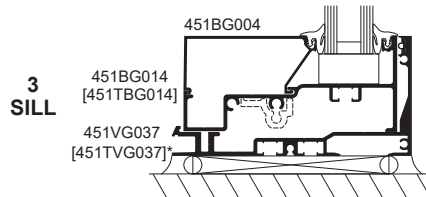
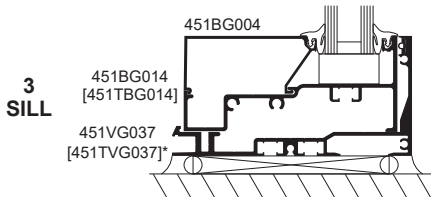
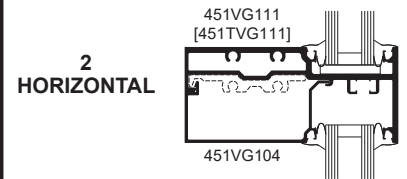
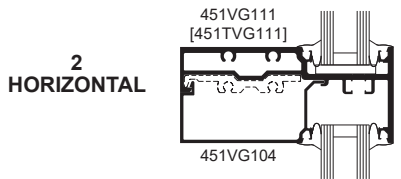
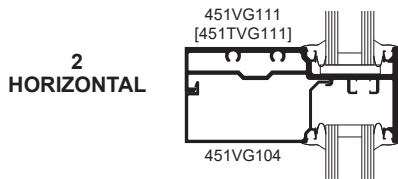
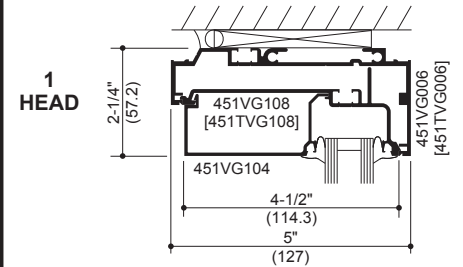
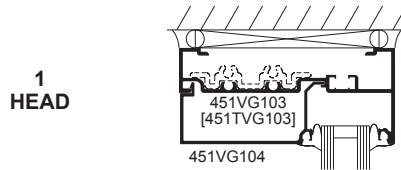
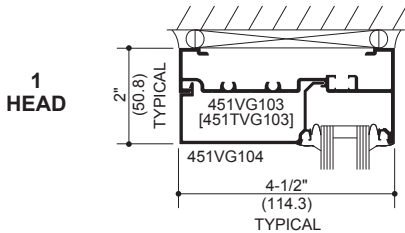
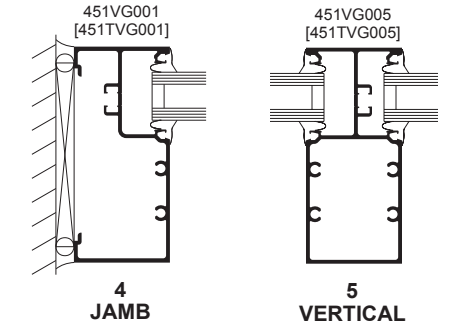
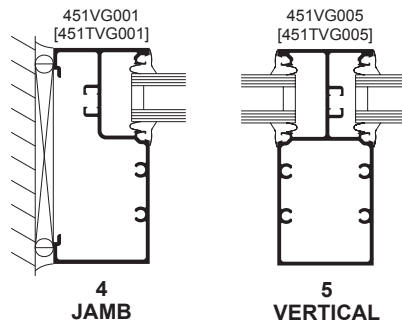
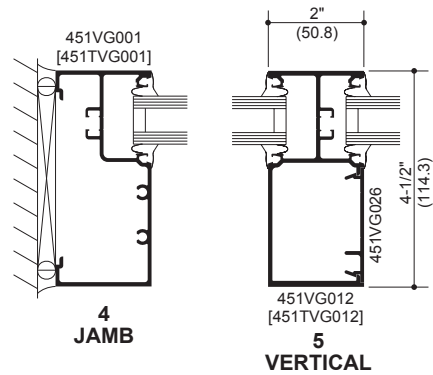


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

**SCREW SPLINE**

**SHEAR BLOCK**

**STICK**



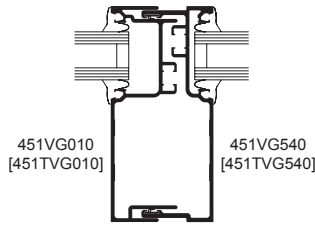
\* HP Sill Flashing shown with optional gasket.

\* HP Sill Flashing shown with optional gasket.

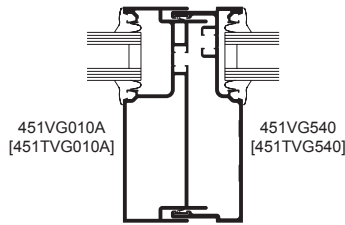
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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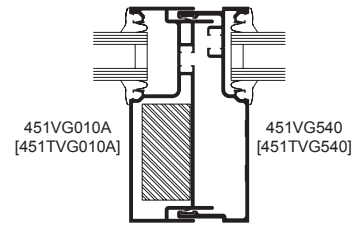
Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)



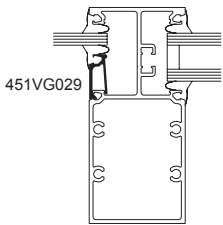
EXPANSION MULLION



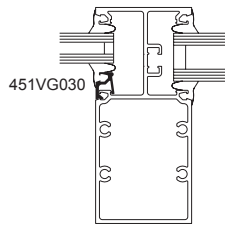
TUBULAR EXPANSION MULLION



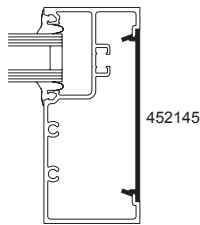
TUBULAR EXPANSION MULLION WITH STEEL



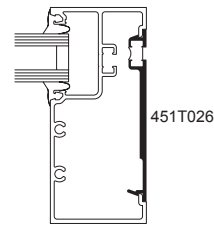
1/4" (6.4) INFILL SNAP-IN ADAPTOR



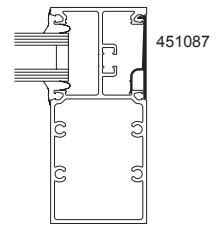
5/8" (15.9) INFILL SNAP-IN ADAPTOR



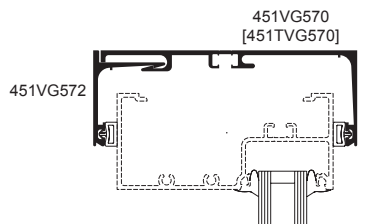
PVC FLAT FILLER (NON STRUCTURAL)



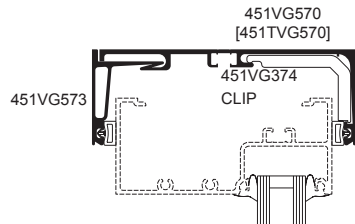
THERMAL FLAT FILLER



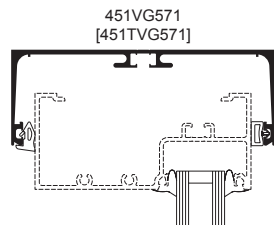
SNAP-IN FLAT FILLER



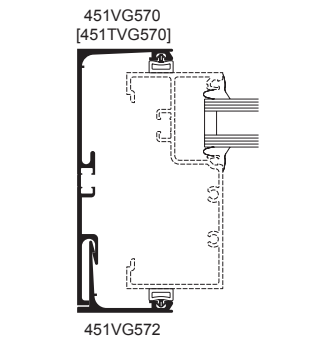
STANDARD - HEAD COMPENSATING RECEPTOR



HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



STANDARD - HEAD COMPENSATING RECEPTOR

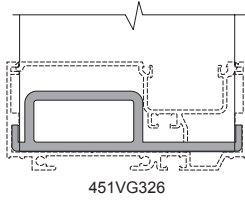


JAMB COMPENSATING RECEPTOR (EXTERIOR INSTALLED)

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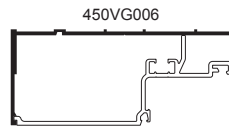
**MULLION ANCHOR**

**NOTE:**

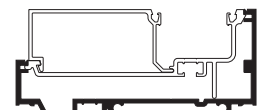
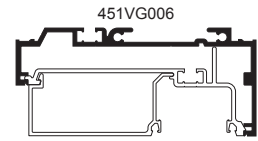
If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified wind load (psf), divided by two) is more than 500 LBS., the optional Mullion Anchor must be used. Consult Application Engineering.

**NOTE:**

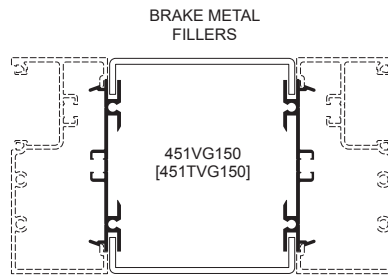
Mullion Anchor not used with Lightweight Receptor.



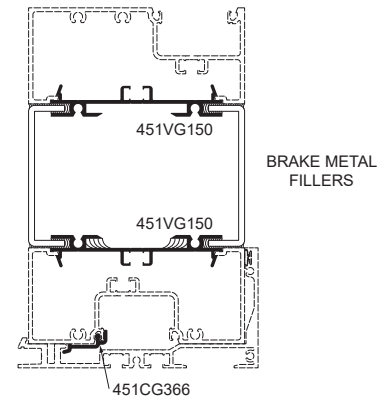
**OPTIONAL LIGHTWEIGHT CAN RECEPTORS**



**OPTIONAL UNEQUAL LEG CAN RECEPTORS**

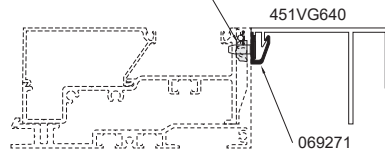


**BRAKE METAL ADAPTOR**



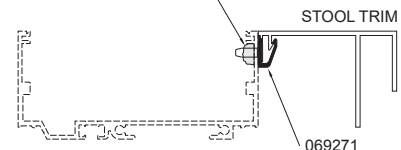
**BRAKE METAL ADAPTOR AT HORIZONTAL**

Seal over Stool Trim fasteners to prevent water infiltration.



**STOOL TRIM CLIP with HP FLASHING**

Seal over Stool Trim fasteners to prevent water infiltration.

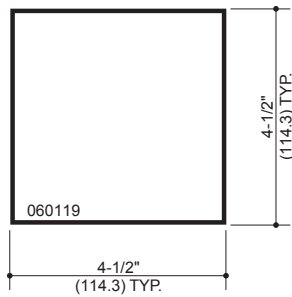


**STOOL TRIM CLIP FOR STICK ASSEMBLY**

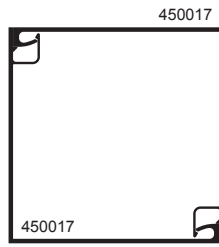
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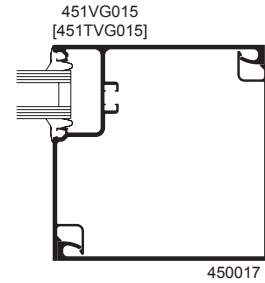
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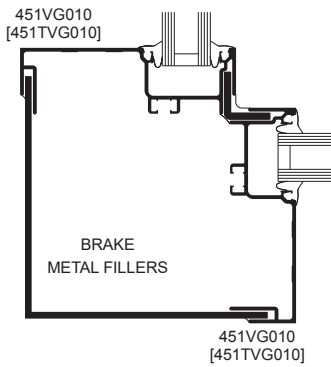
4-1/2" X 4-1/2" TUBE



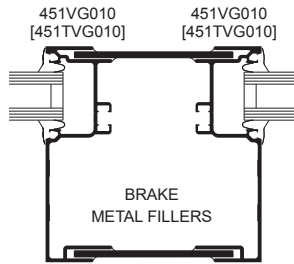
TWO PIECE NO POCKET CORNER



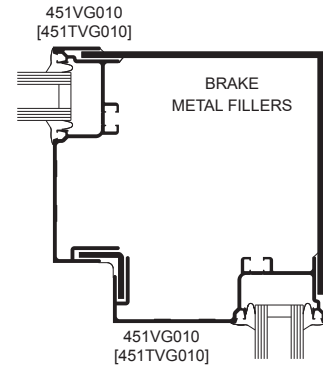
ONE POCKET CORNER



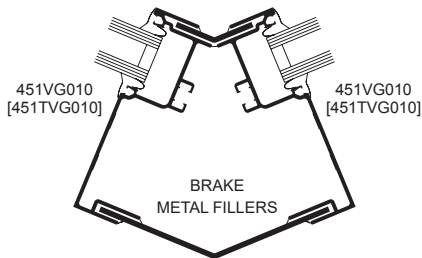
OUTSIDE 90° CORNER



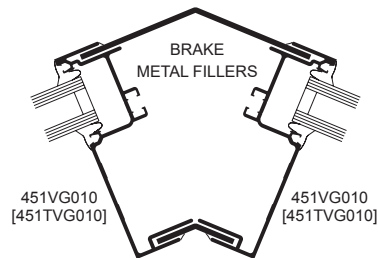
TWO POCKET CORNER POST



INSIDE 90° CORNER



135° OUTSIDE CORNER



135° INSIDE CORNER

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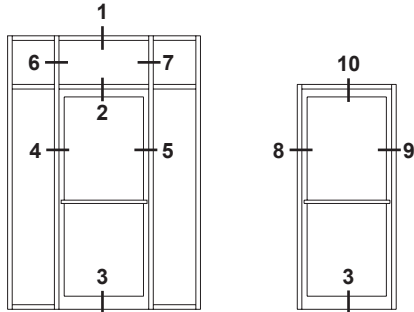
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## TRIFAB® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER “190” DOORS.

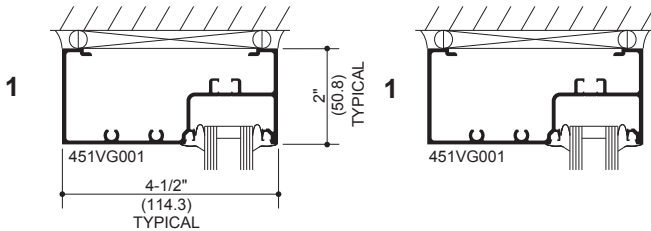
### DOOR FRAMING NON-THERMAL ONLY

**NOTE:** OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.

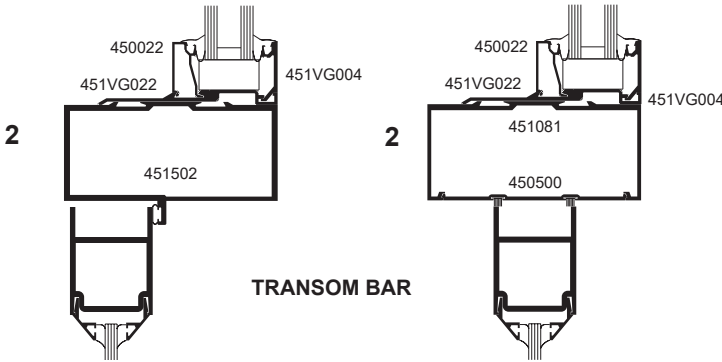
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



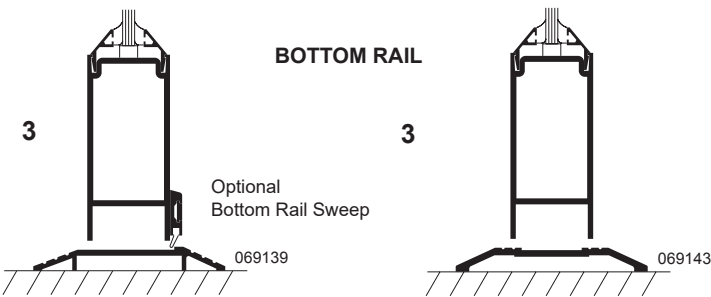
ELEVATIONS ARE NUMBER KEYED TO DETAILS



TRANSOM HEAD

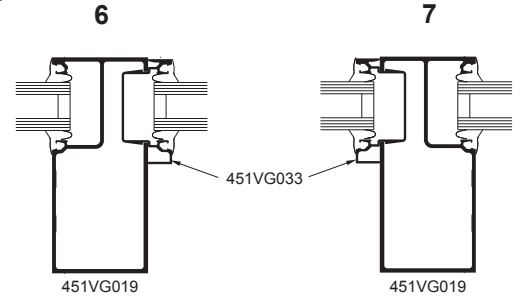


TRANSOM BAR



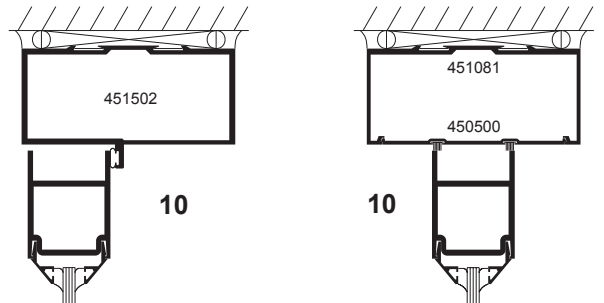
SINGLE ACTING

DOUBLE ACTING



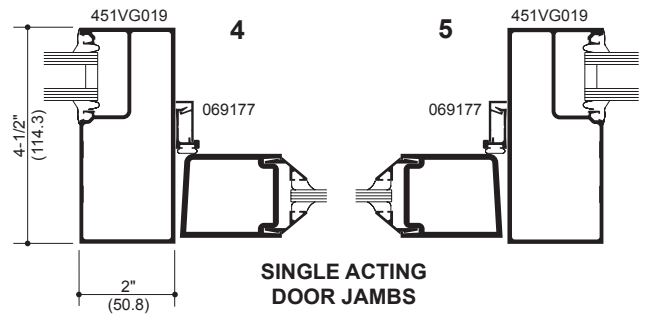
TRANSOM JAMBS

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

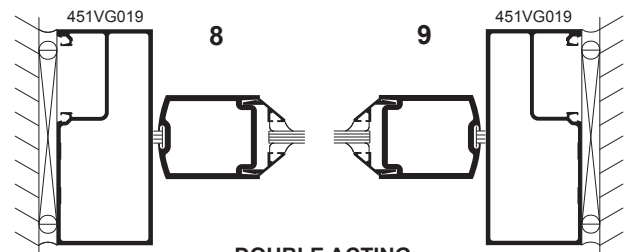


SINGLE ACTING HEADER

DOUBLE ACTING HEADER



SINGLE ACTING DOOR JAMBS



DOUBLE ACTING DOOR JAMBS

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**BASIC FRAMING DETAILS**

**SCREW SPLINE SYSTEM**

(MULTI-PLANE - Inside Glazed - Stops Down).....56

(MULTI-PLANE - Outside Glazed - Stops Down).....57

**SHEAR BLOCK SYSTEM**

(MULTI-PLANE - Inside Glazed - Stops Down).....58

(MULTI-PLANE - Outside Glazed - Stops Down).....59

**STICK SYSTEM**

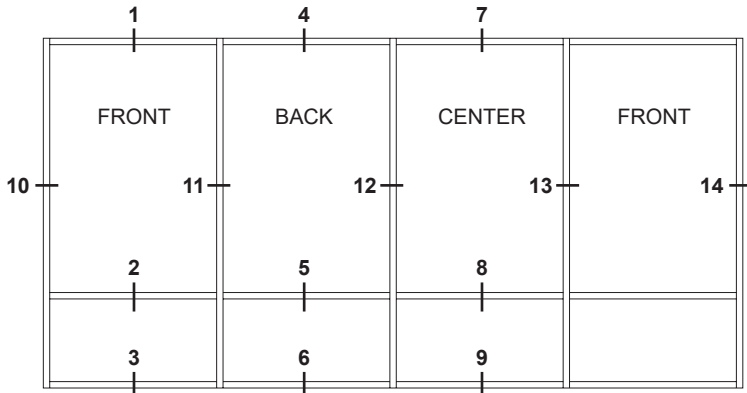
(MULTI-PLANE - Inside Glazed - Stops Down).....60

(MULTI-PLANE - Outside Glazed - Stops Down).....61

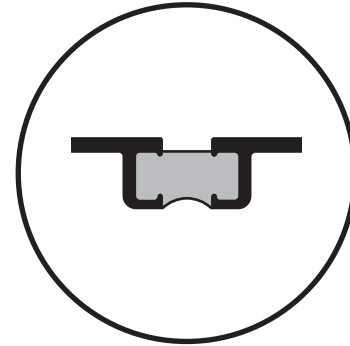
**(See appropriate Center, Front or Back Section  
for Miscellaneous Details.)**

Additional information and CAD details are available at [www.kawneer.com](http://www.kawneer.com)

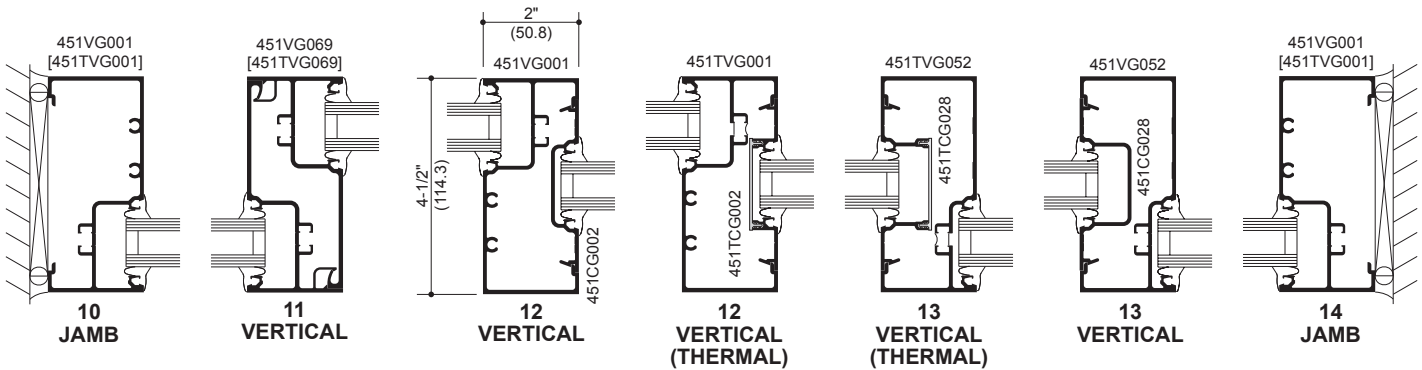
**SCREW SPLINE ASSEMBLY**



ELEVATION IS NUMBER KEYED TO DETAILS

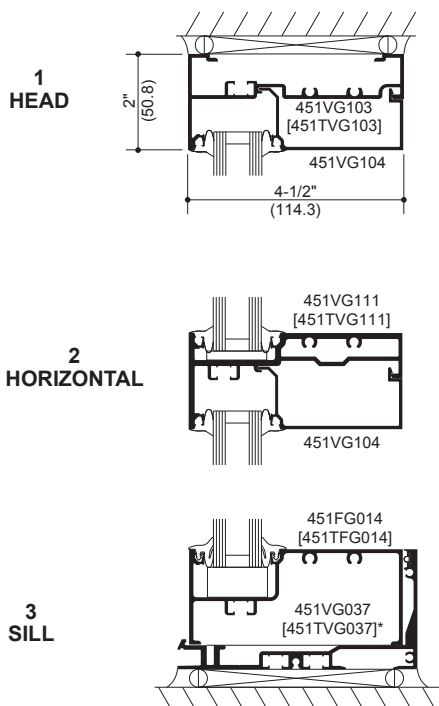


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS



**FRONT**

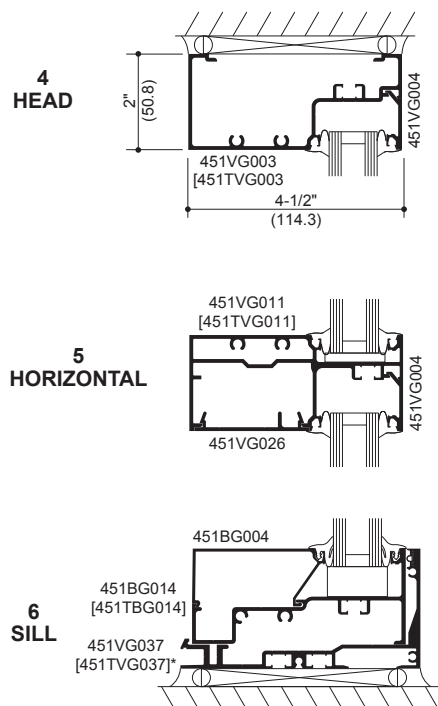
See Pages 32 thru 45 for all FRONT details.



\* HP Sill Flashing shown with optional gasket.

**BACK**

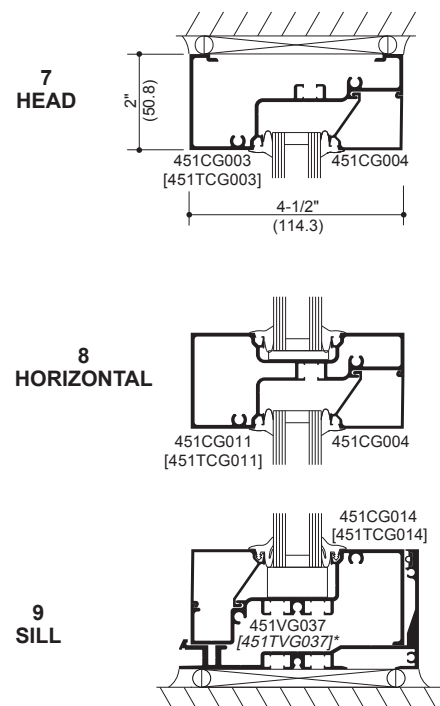
See Pages 48 thru 53 for all BACK details.



\* HP Sill Flashing shown with optional gasket.

**CENTER**

See Pages 12 thru 30 for all CENTER details.



\* HP Sill Flashing shown with optional gasket.

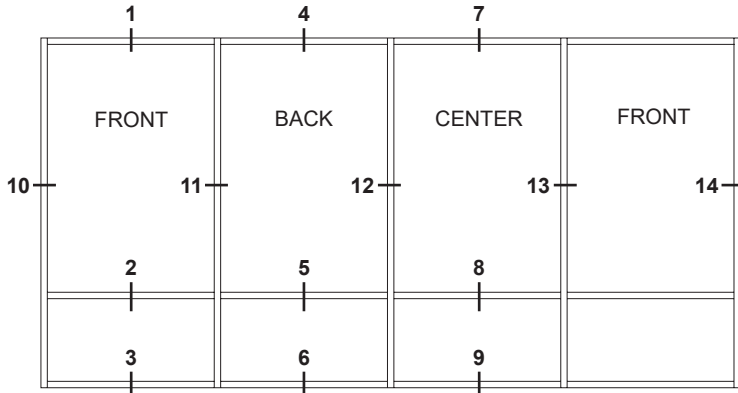
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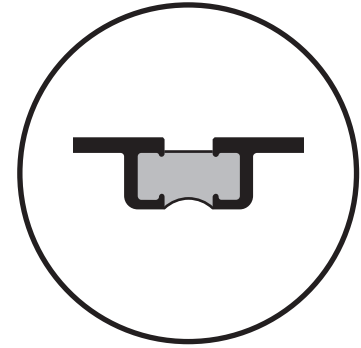


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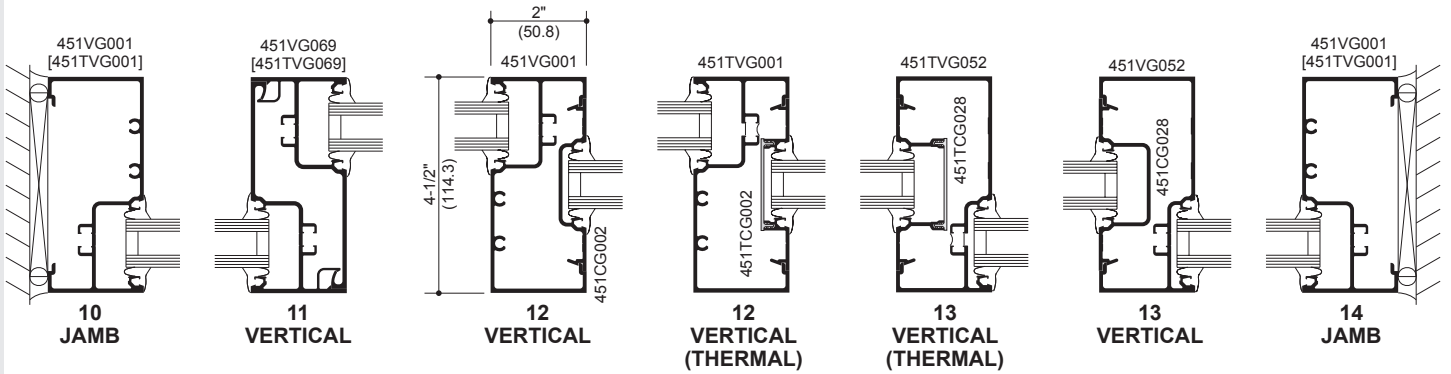
**SCREW SPLINE ASSEMBLY**



ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

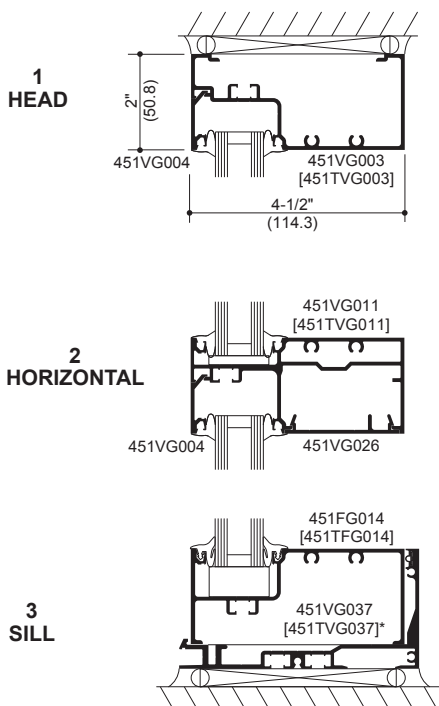


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**FRONT**

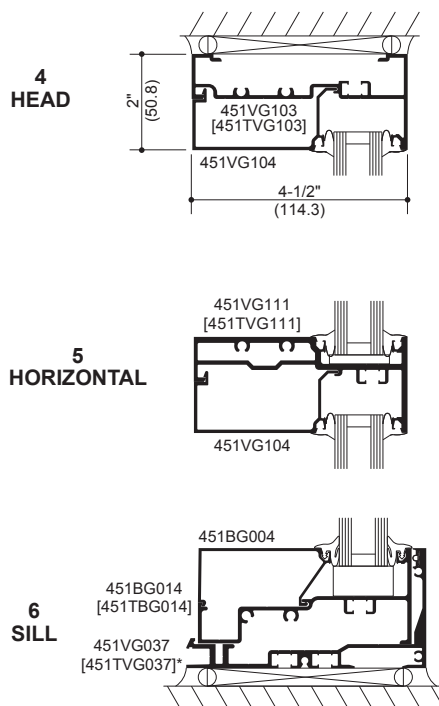
See Pages 32 thru 45 for all FRONT details.



\* HP Sill Flashing shown with optional gasket.

**BACK**

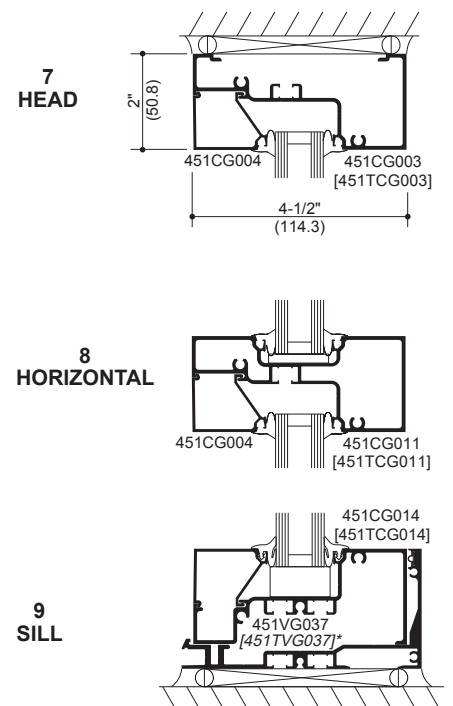
See Pages 48 thru 53 for all BACK details.



\* HP Sill Flashing shown with optional gasket.

**CENTER**

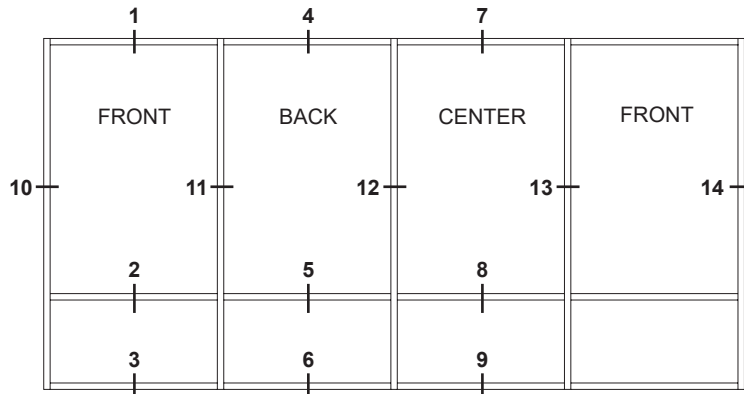
See Pages 12 thru 30 for all CENTER details.



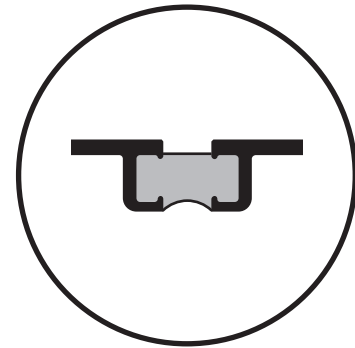
\* HP Sill Flashing shown with optional gasket.

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## SHEAR BLOCK ASSEMBLY

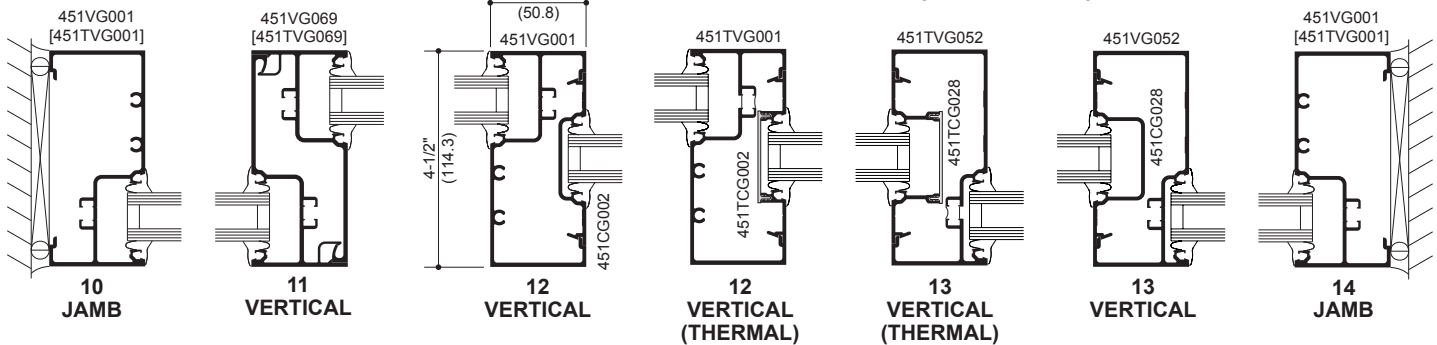


ELEVATION IS NUMBER KEYED TO DETAILS



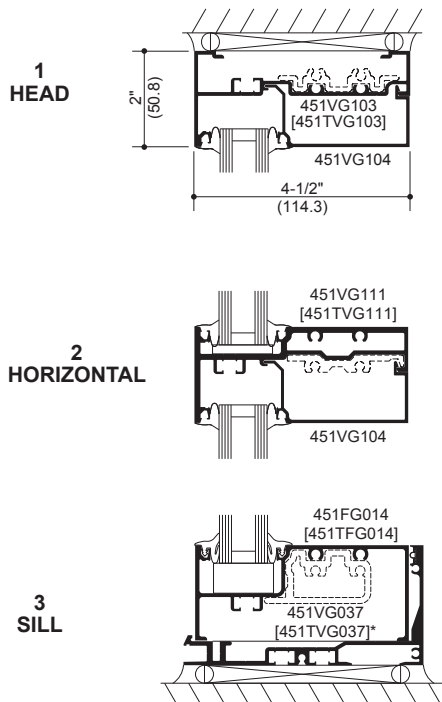
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece



### FRONT

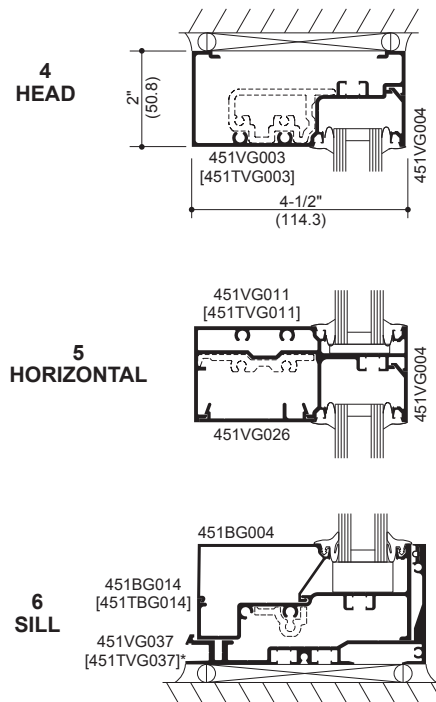
See Pages 32 thru 45 for all FRONT details.



\* HP Sill Flashing shown with optional gasket.

### BACK

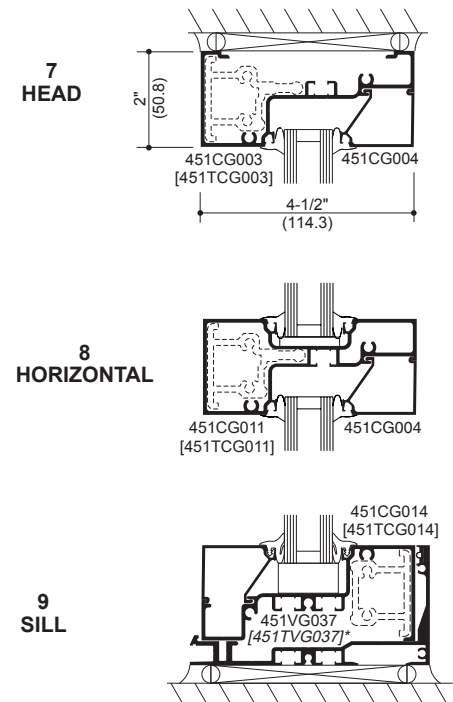
See Pages 48 thru 53 for all BACK details.



\* HP Sill Flashing shown with optional gasket.

### CENTER

See Pages 12 thru 30 for all CENTER details.



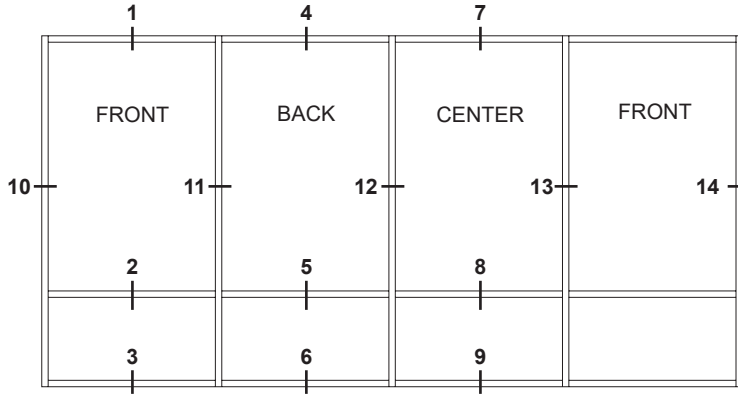
\* HP Sill Flashing shown with optional gasket.

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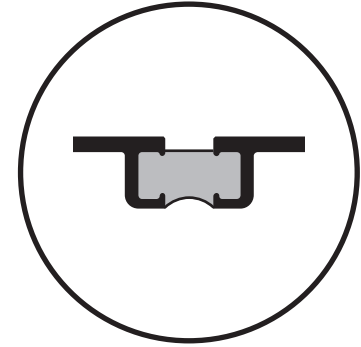
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**SHEAR BLOCK ASSEMBLY**

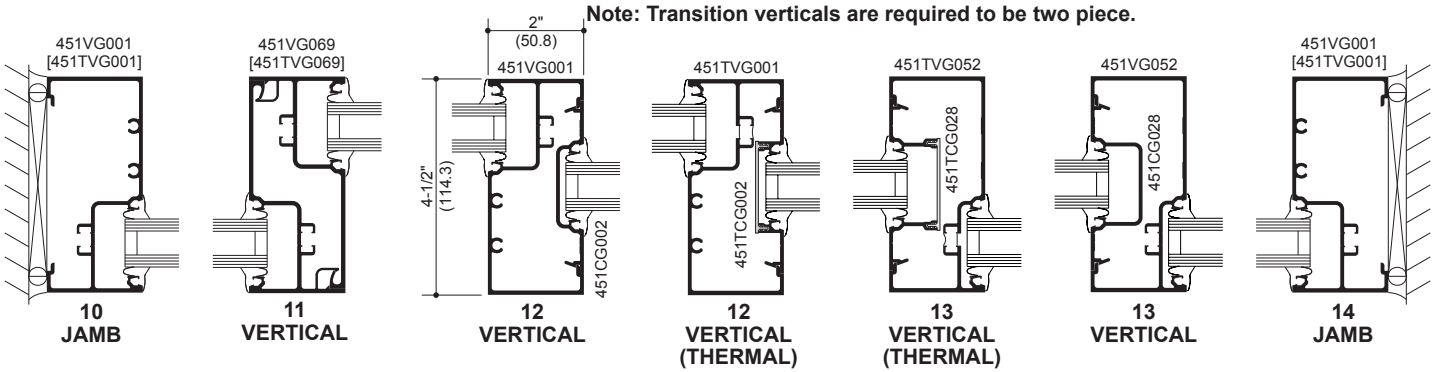


ELEVATION IS NUMBER KEYED TO DETAILS



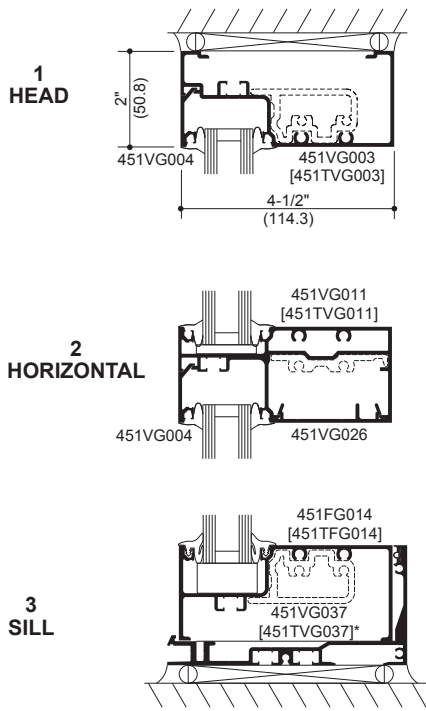
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.



**FRONT**

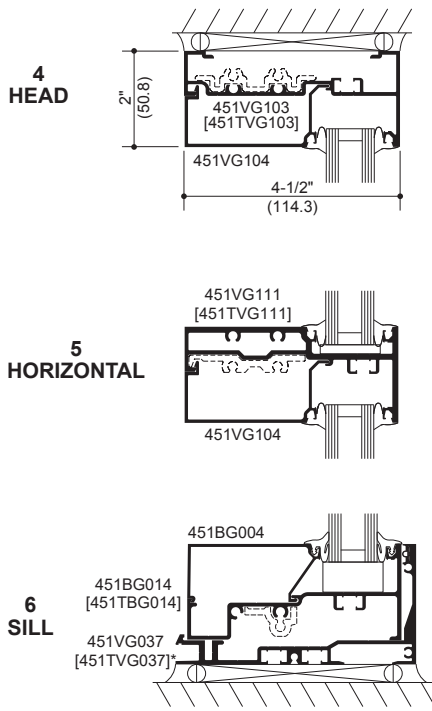
See Pages 32 thru 45 for all FRONT details.



\* HP Sill Flashing shown with optional gasket.

**BACK**

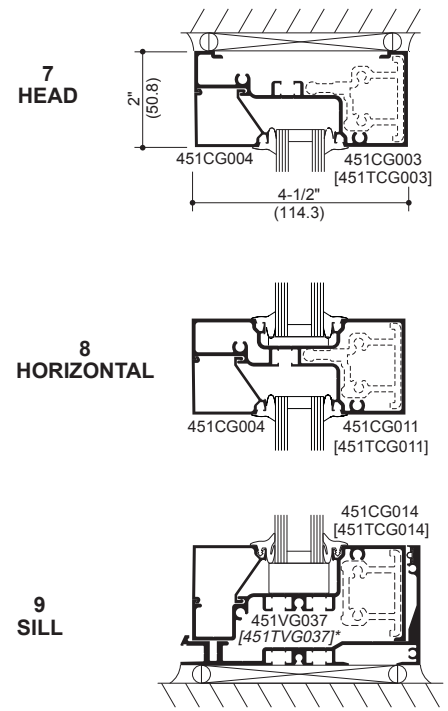
See Pages 48 thru 53 for all BACK details.



\* HP Sill Flashing shown with optional gasket.

**CENTER**

See Pages 12 thru 30 for all CENTER details.



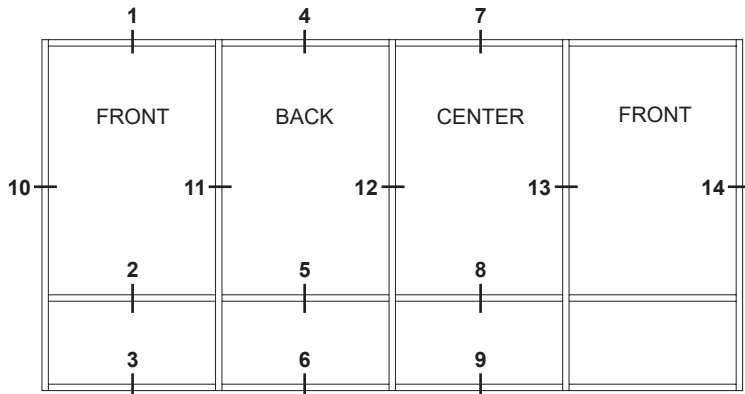
\* HP Sill Flashing shown with optional gasket.

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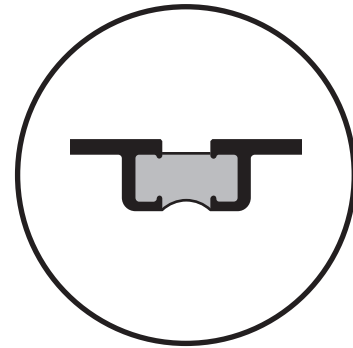
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**STICK ASSEMBLY**

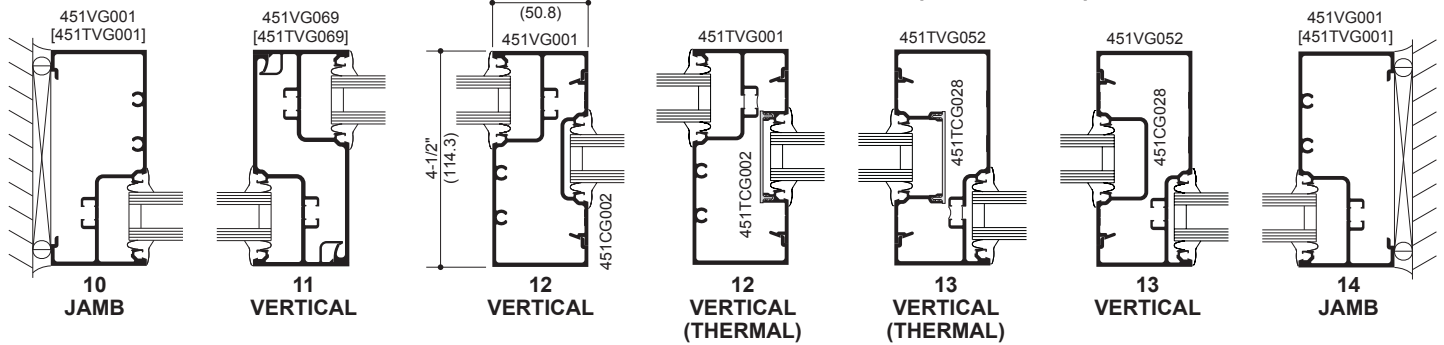


ELEVATION IS NUMBER KEYED TO DETAILS



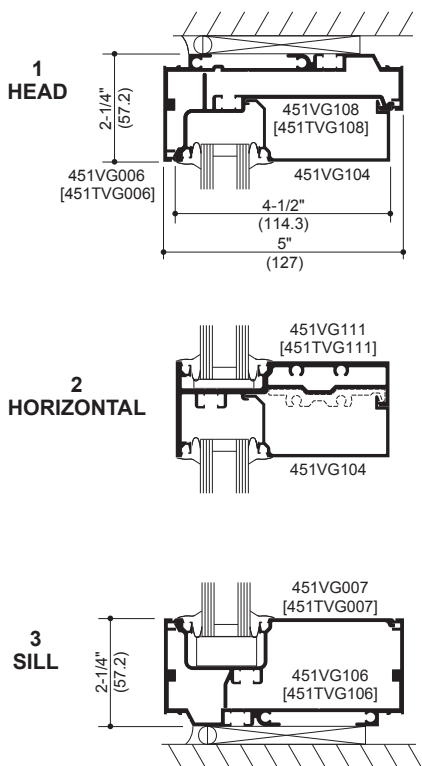
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece



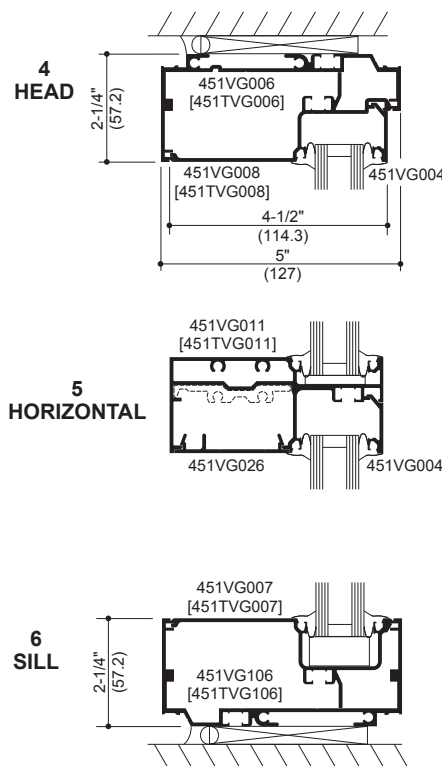
**FRONT**

See Pages 32 thru 45 for all FRONT details.



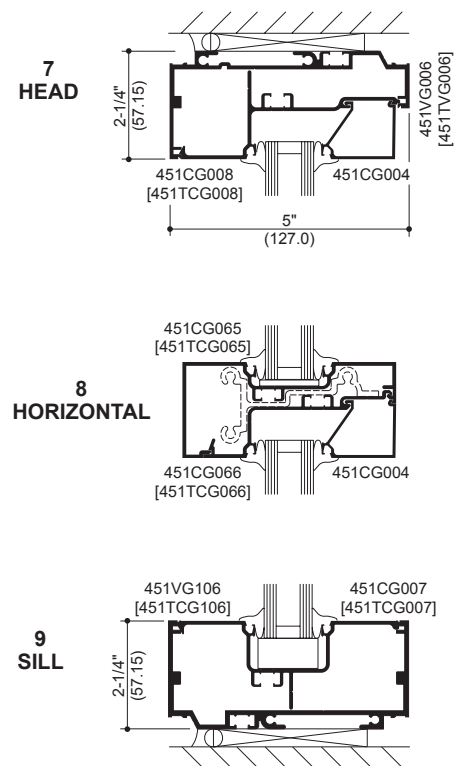
**BACK**

See Pages 48 thru 53 for all BACK details.



**CENTER**

See Pages 12 thru 30 for all CENTER details.

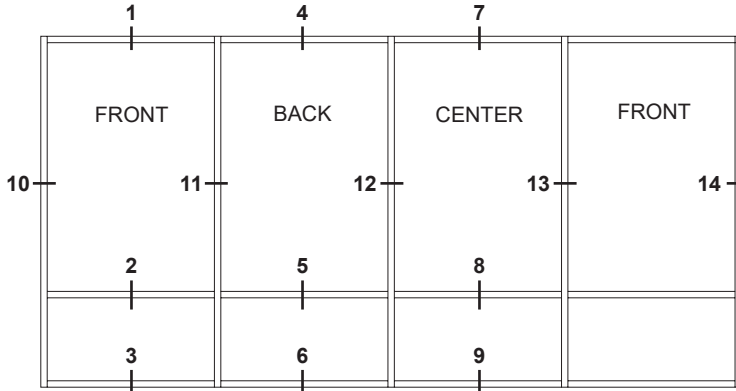


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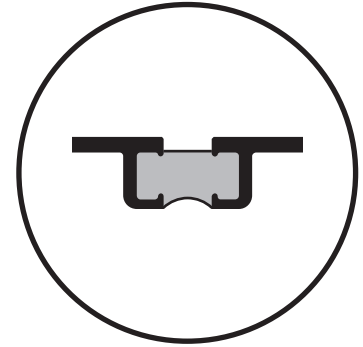
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**STICK ASSEMBLY**

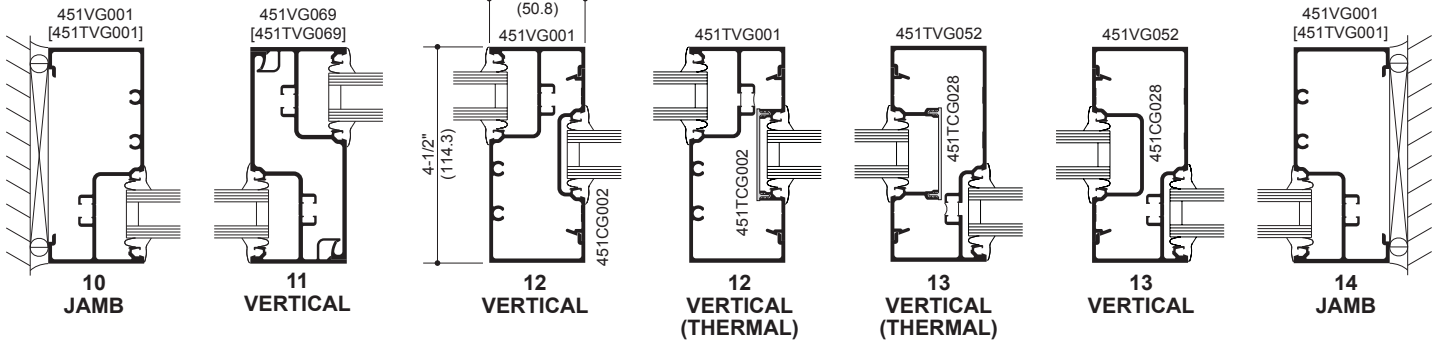


ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.

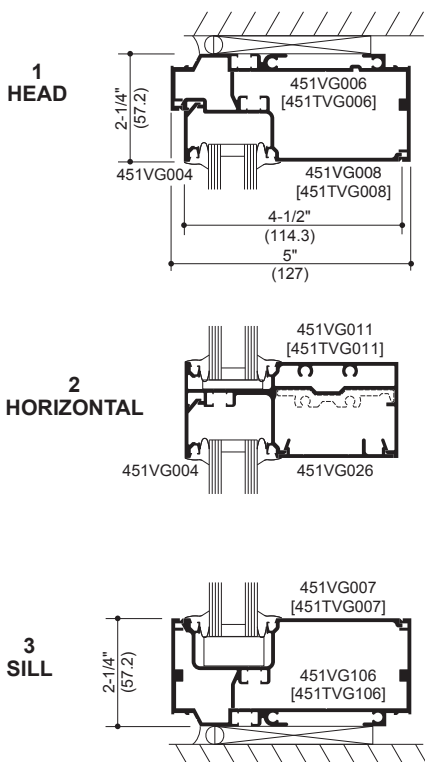


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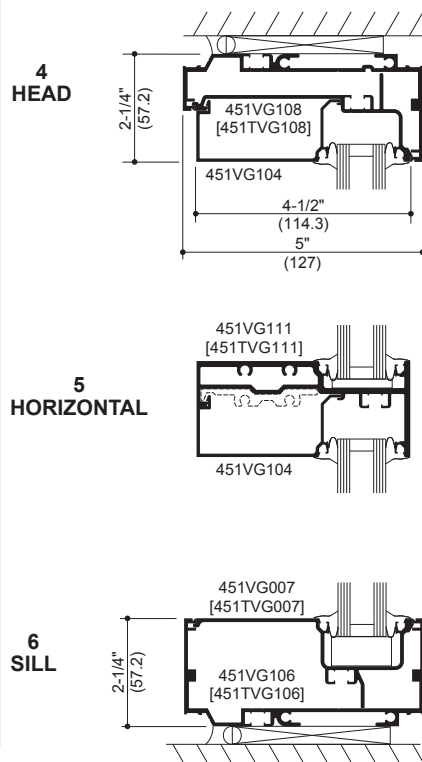
**FRONT**

See Pages 32 thru 45 for all FRONT details.



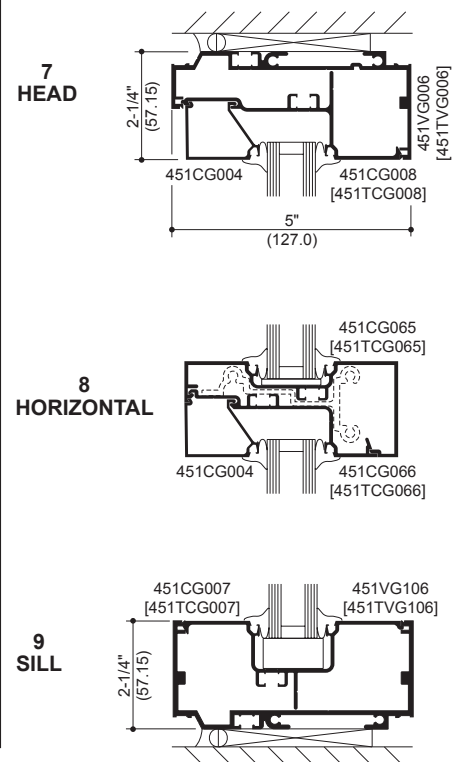
**BACK**

See Pages 48 thru 53 for all BACK details.



**CENTER**

See Pages 12 thru 30 for all CENTER details.



The following applications utilize Tremco Proglaze® ETA Connections as the transition assembly from the wall air/vapor barrier membrane to the storefront framing perimeter. Corners are sealed with either Proglaze® ETA 3D molded silicone corners or lapped Proglaze® ETA silicone sheet material. Transition assembly components are set in Tremco Spectrem® 1 silicone sealant. For complete installation instructions of Tremco Proglaze® ETA products, contact your local Tremco representative or visit [www.tremcosealants.com](http://www.tremcosealants.com).

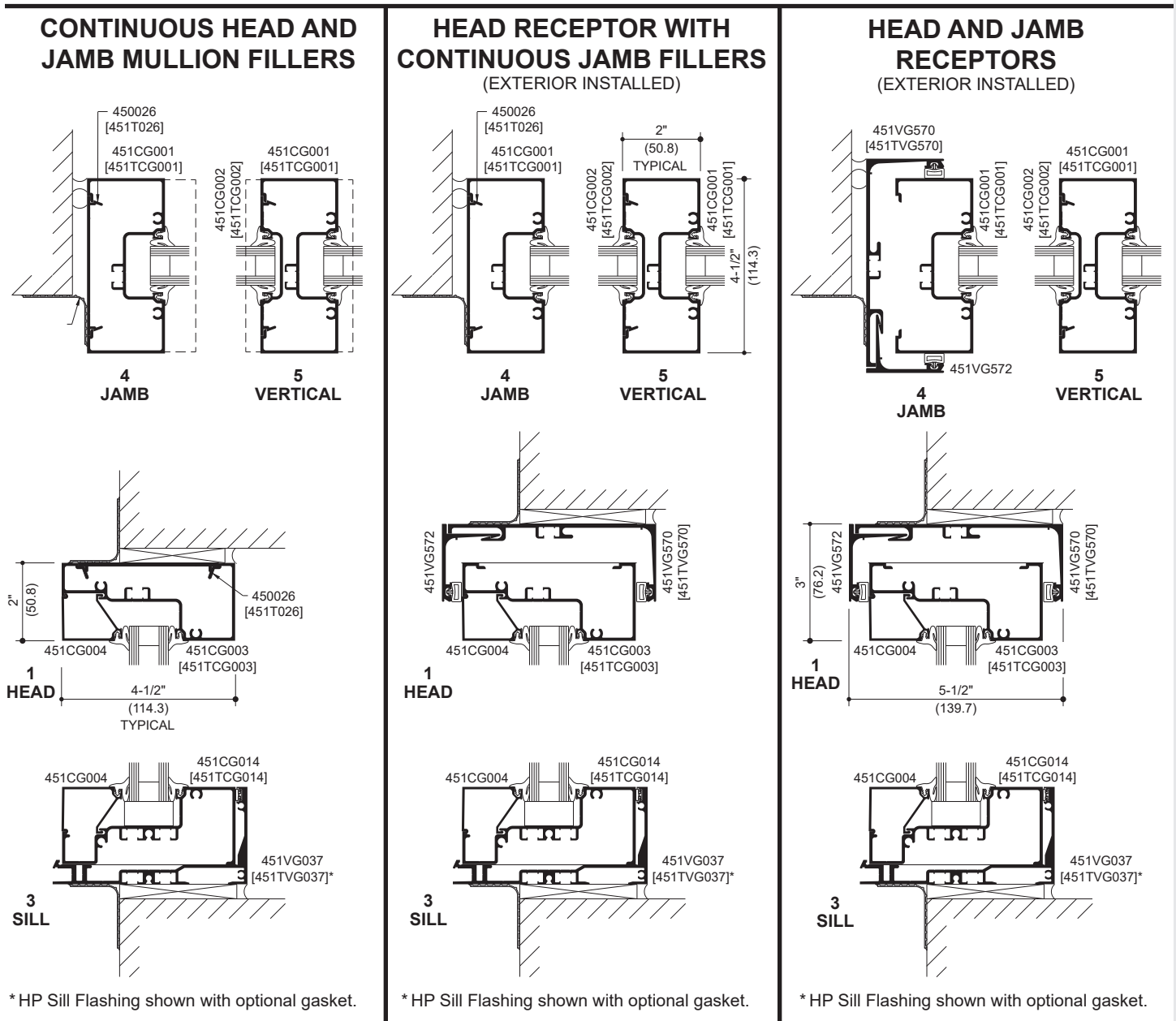
For integration of a silicone engineered transition assembly, the Trifab® storefront system must use continuous head and jamb mullion fillers, a head receptor with continuous jamb fillers or a head receptor with jamb receptors.

Reference air/vapor barrier installation instructions 451VG977EN. All storefront framing to be installed according to applicable Kawneer storefront system installation instructions, project specific plans, specifications and shop details.

Storefront installations require the sill to be structurally supported directly under the glass setting blocks and mullion locations, as well as where the sill is anchored to the substrate. Any projecting or cantilevered sill applications that are not supported must be reviewed by Kawneer application engineering.

Installer to independently confirm sealant compatibility and adhesion with all job specific storefront framing materials, silicone ETA sheet material and wall AVB material.

(451 center plane details shown, 451T and front/back/multi-plane similar.)



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**WIND LOAD CHARTS (CENTER)**

TF VG 451 (Non-Thermal)..... 65-69

TF VG 451T (Thermal)..... 70-74

**WIND LOAD CHARTS (FRONT or BACK)**

TF VG 451 (Non-Thermal)..... 75-78

TF VG 451T (Thermal)..... 79-81

**WIND LOAD CHARTS (FRONT or BACK)**

TF VG 451/451T (SSG Mullions) .....82

**WIND LOAD CHARTS (MULTI PLANE)**

TF VG 451 (Non-Thermal).....83

TF VG 451T (Thermal).....84

**WIND LOAD CHARTS (ENTRANCE FRAMING)**

TF VG 451/451T ..... 85-86

**DEADLOAD CHARTS**

TF VG 451/451T ..... 87-88

**END REACTION CHARTS .....89**

**THERMAL CHARTS**

EXAMPLE CALCULATION.....90

TF VG 451 (CENTER – Non-Thermal)..... 91-93

TF VG 451 Pre-Glazed (CENTER - Non-Thermal)..... 94-96

TF VG 451T (CENTER – Thermal)..... 97-99

TF VG 451T Pre-Glazed (CENTER – Thermal)..... 100-102

TF VG 451T (FRONT – Thermal) ..... 103-105

TF VG 451T (BACK – Thermal) ..... 106-108

TF VG 451T with Steel (CENTER)..... 109-111

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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 (104 MPa), STEEL 30,000 psi (207 MPa). 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 Heavyweight Compensating Receptor Face/Reinforcing Clip (Screw Spline/Shear Block systems) or Mullion Anchors (Stick system) must be used. Consult Application Engineering. (*Mullion Anchor not used with Standard 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" (25.4) thick insulating glass or 1/4" (6.4) thick glass supported on two setting blocks placed at the loading points shown.

**NOTE:** Charts are for THERMAL and NON-THERMAL members.

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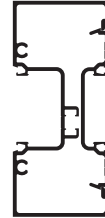
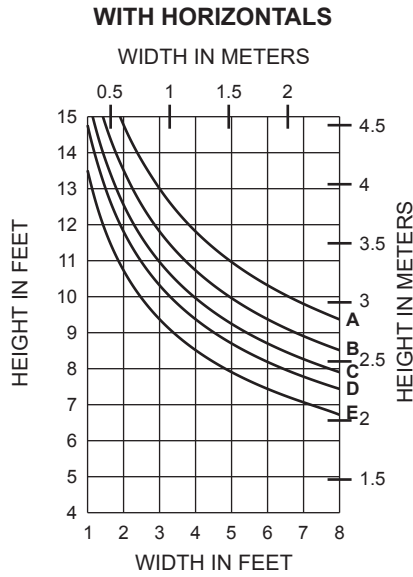
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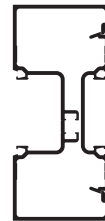
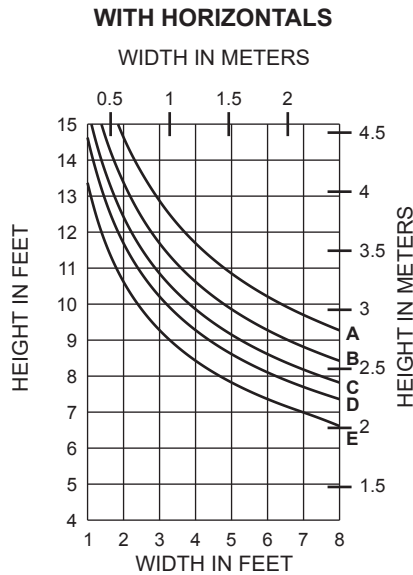
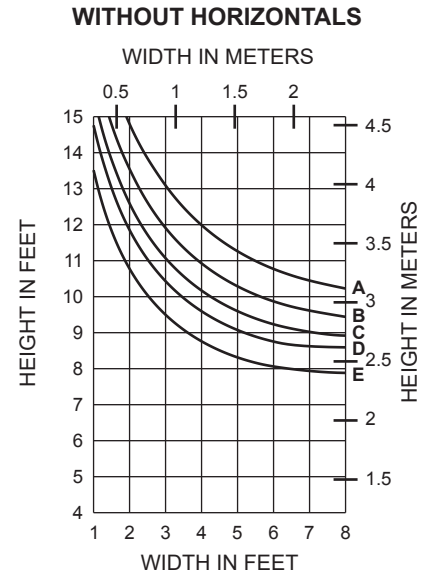
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



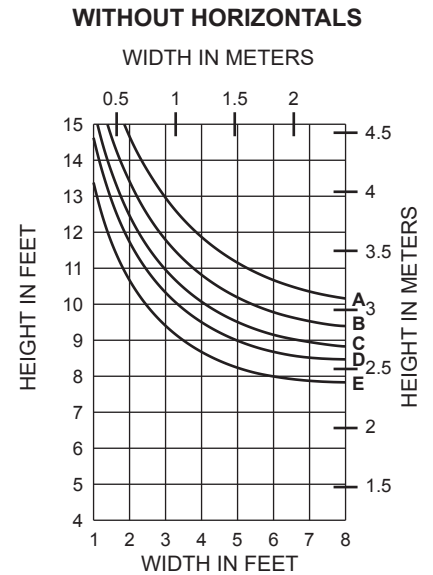
451CG001  
451CG002

I = 3.237 (134.73 x 10<sup>4</sup>)  
S = 1.431 (23.45 x 10<sup>3</sup>)

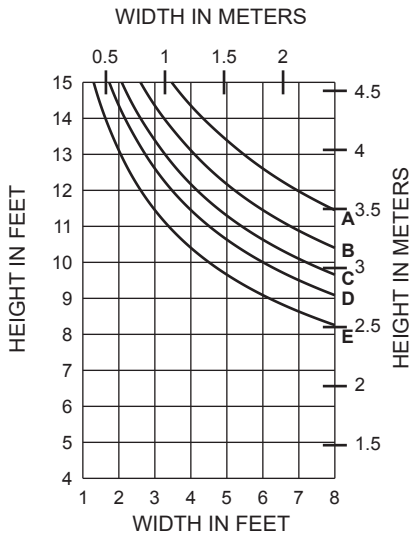


451CG012  
451CG002

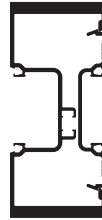
I = 3.137 (130.57 x 10<sup>4</sup>)  
S = 1.384 (22.68 x 10<sup>3</sup>)



**WITH HORIZONTALS**



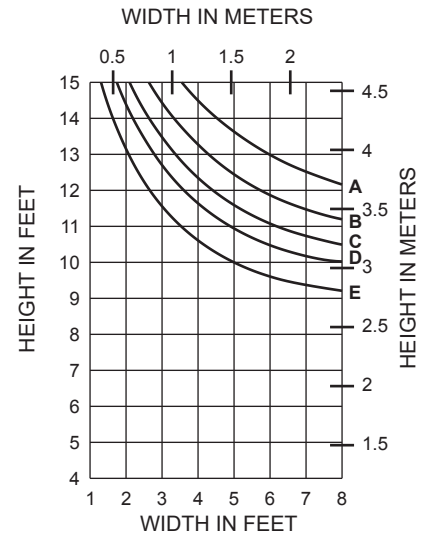
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



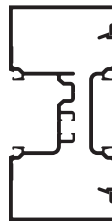
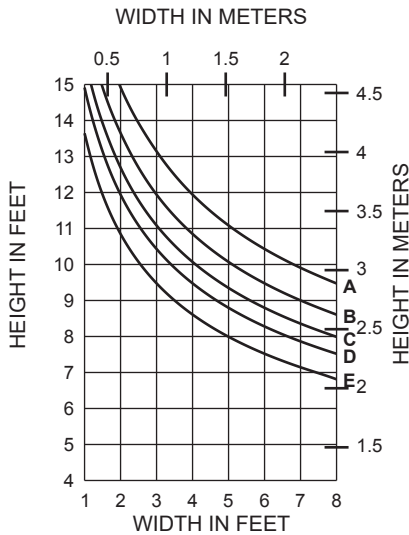
**451CG013  
451CG002**

$I = 5.907 (245.86 \times 10^4)$   
 $S = 2.615 (42.85 \times 10^3)$

**WITHOUT HORIZONTALS**



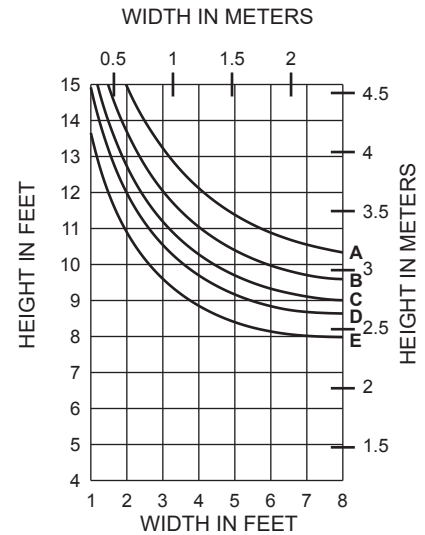
**WITH HORIZONTALS**



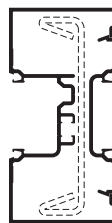
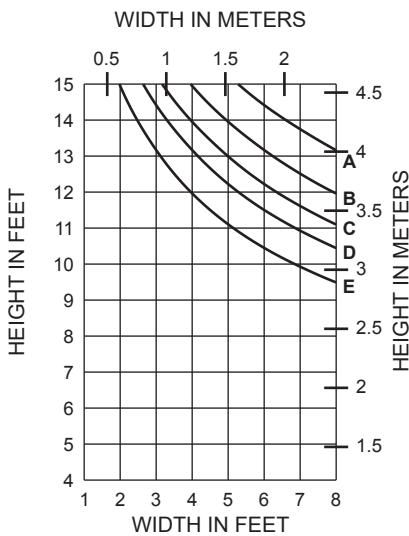
**451CG112  
451CG002**

$I = 3.346 (139.27 \times 10^4)$   
 $S = 1.474 (24.15 \times 10^3)$

**WITHOUT HORIZONTALS**



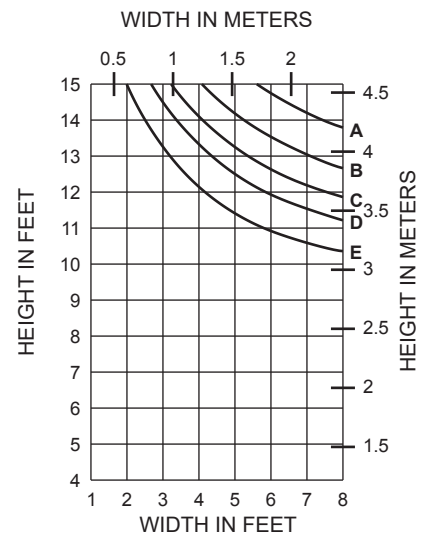
**WITH HORIZONTALS**



**451CG112  
451CG002  
with 450110 STEEL**

$I_A = 3.346 (139.27 \times 10^4)$   
 $S_A = 1.474 (24.15 \times 10^3)$   
 $I_S = 1.935 (80.54 \times 10^4)$   
 $S_S = 0.938 (15.37 \times 10^3)$

**WITHOUT HORIZONTALS**

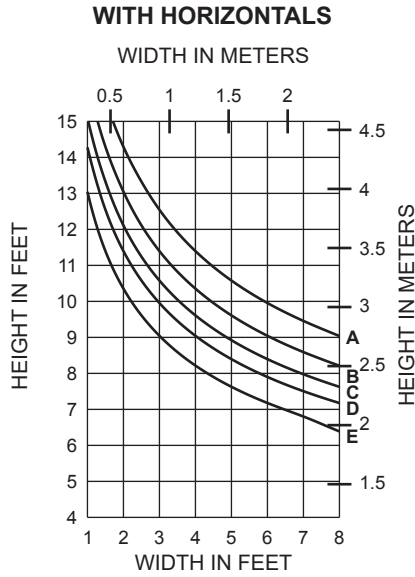


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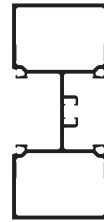
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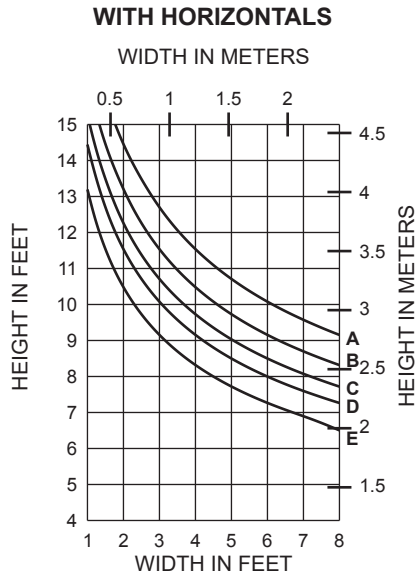
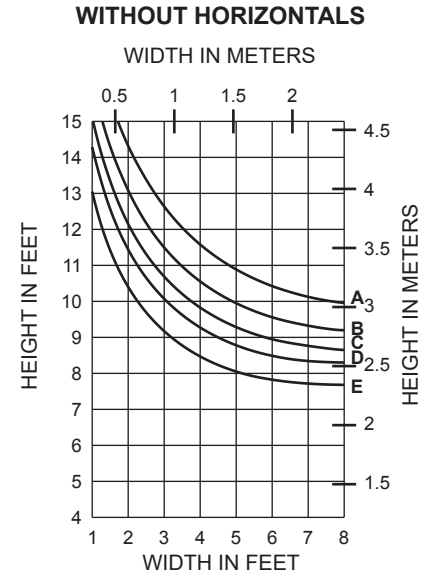


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



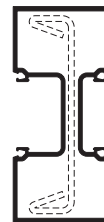
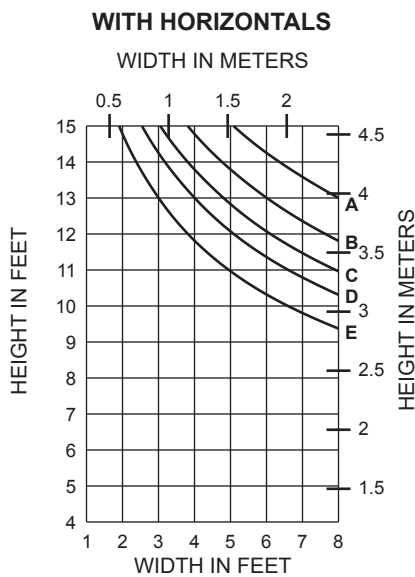
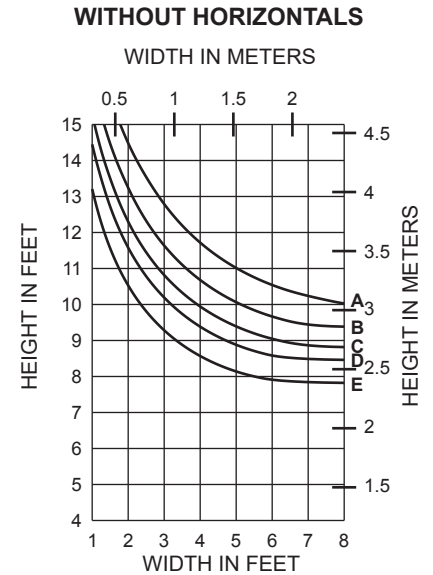
**451CG005**

$I = 2.907 (120.99 \times 10^4)$   
 $S = 1.292 (21.17 \times 10^3)$



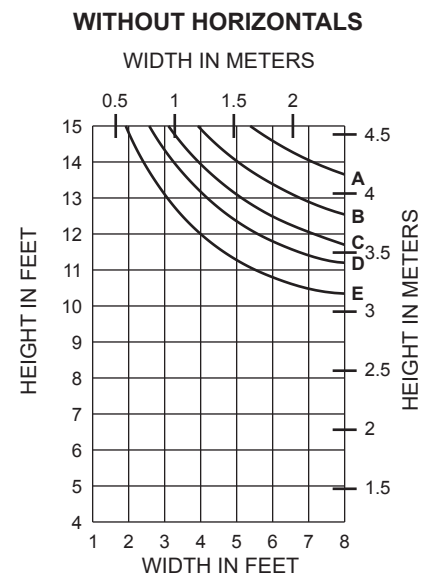
**451CG005A**

$I = 3.016 (125.53 \times 10^4)$   
 $S = 1.340 (21.96 \times 10^3)$

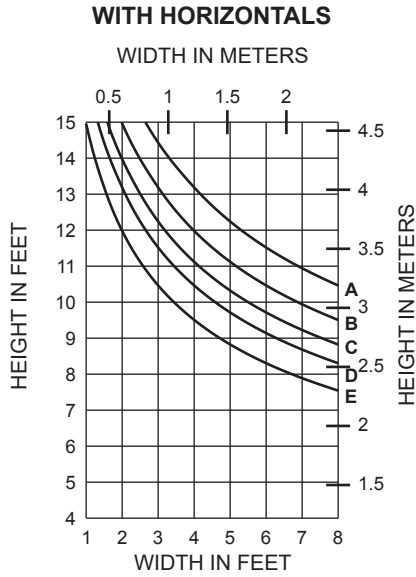


**451CG005A with 450110 STEEL**

$I_A = 3.016 (125.53 \times 10^4)$   
 $S_A = 1.340 (21.96 \times 10^3)$   
 $I_S = 1.935 (80.54 \times 10^4)$   
 $S_S = 0.938 (15.37 \times 10^3)$

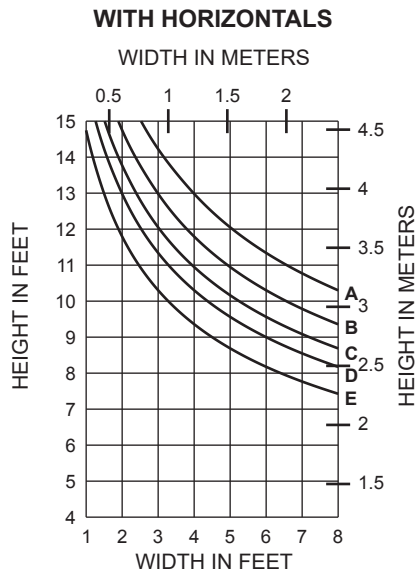
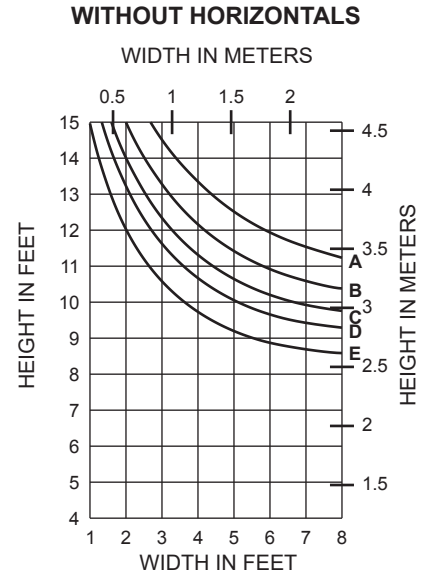


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



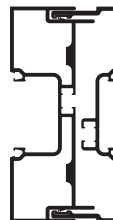
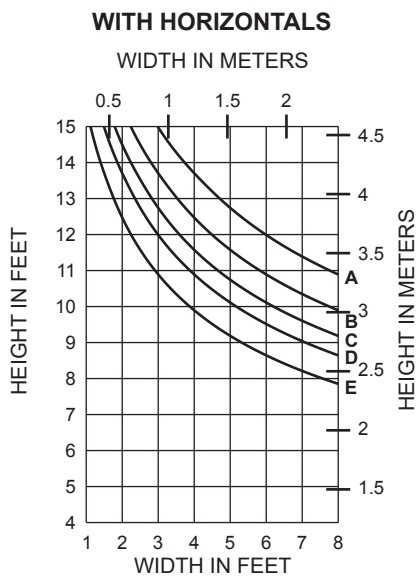
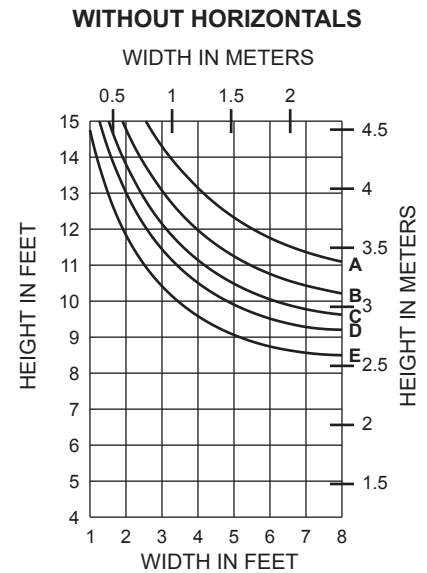
**451CG001A  
451CG002**

I = 4.507 (187.59 x 10<sup>4</sup>)  
S = 1.993 (32.66 x 10<sup>3</sup>)



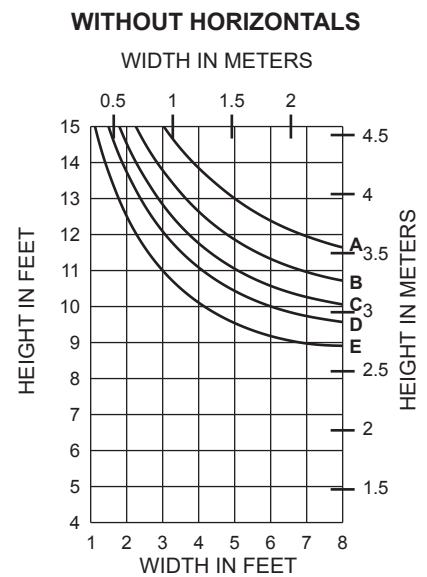
**451CG010  
451CG540**

I = 4.301 (179.02 x 10<sup>4</sup>)  
S = 1.886 (30.91 x 10<sup>3</sup>)



**451CG010A  
451CG540**

I = 5.083 (211.57 x 10<sup>4</sup>)  
S = 2.259 (37.02 x 10<sup>3</sup>)

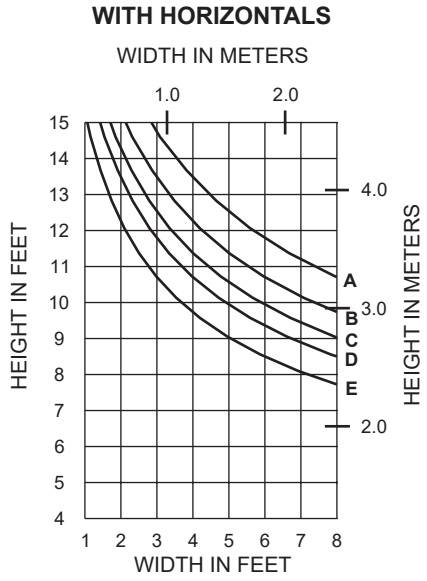


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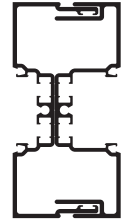
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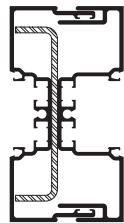
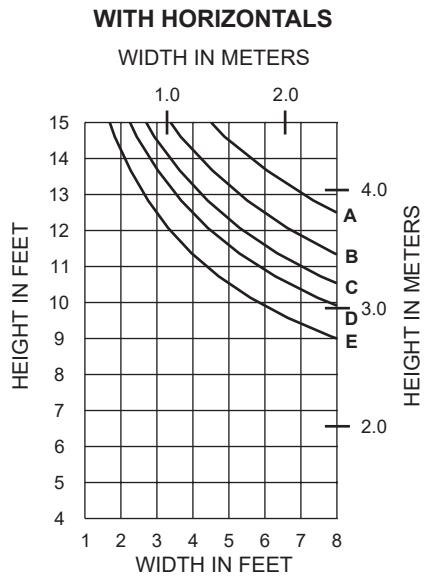
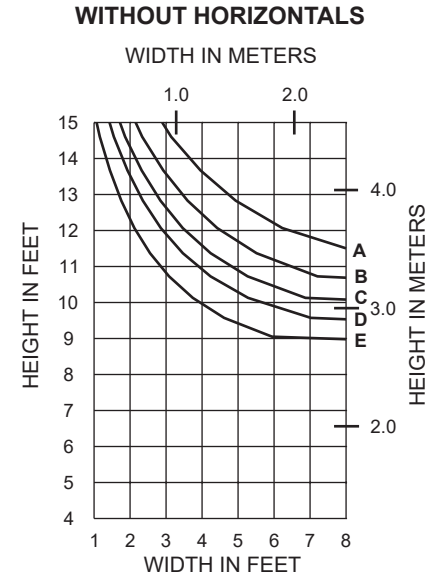
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	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50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

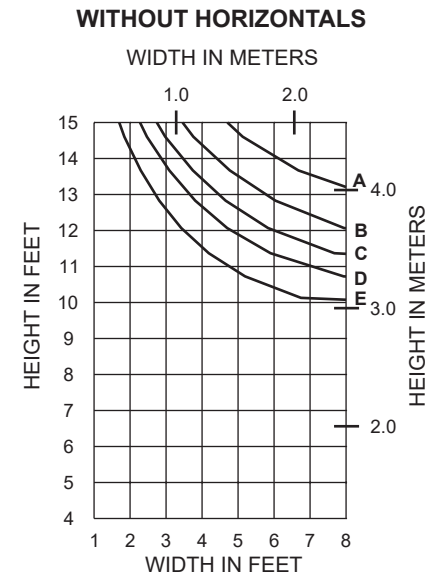


**451CG081 / 451CG082**  
 $I = 4.829 (201.00 \times 10^4)$   
 $S = 2.146 (35.17 \times 10^3)$

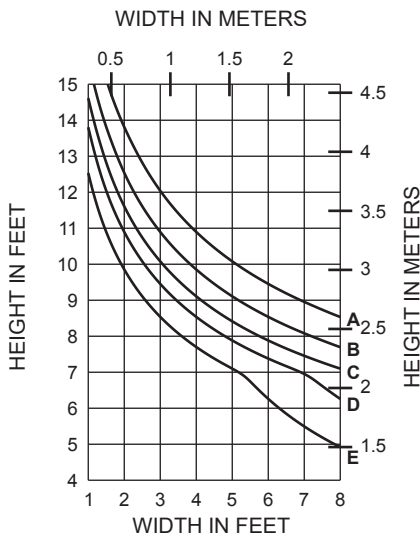


**451CG081 / 451CG082 with 400110 STEEL**

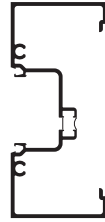
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



**WITH HORIZONTALS**



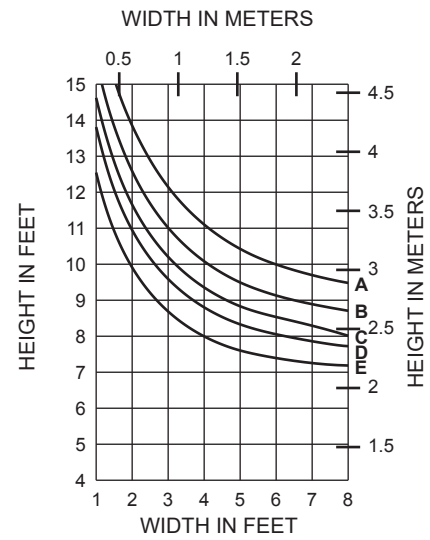
	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



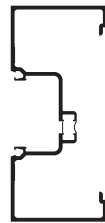
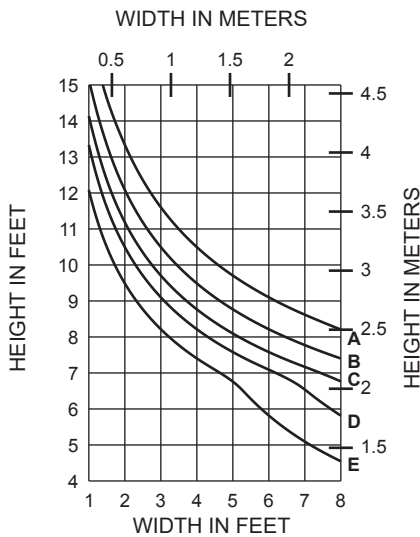
**451TCG001**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



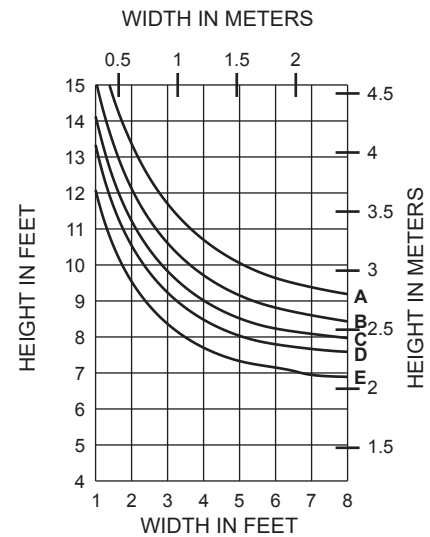
**WITH HORIZONTALS**



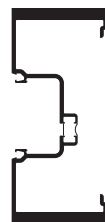
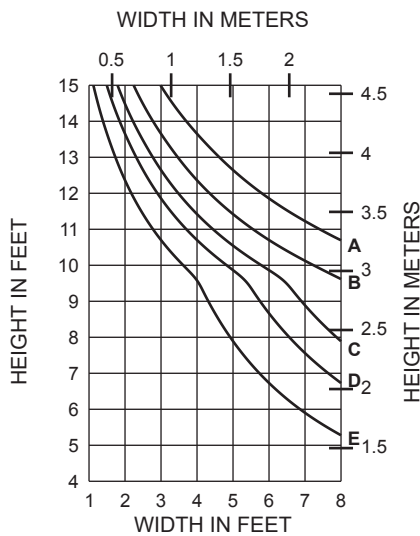
**451TCG012**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



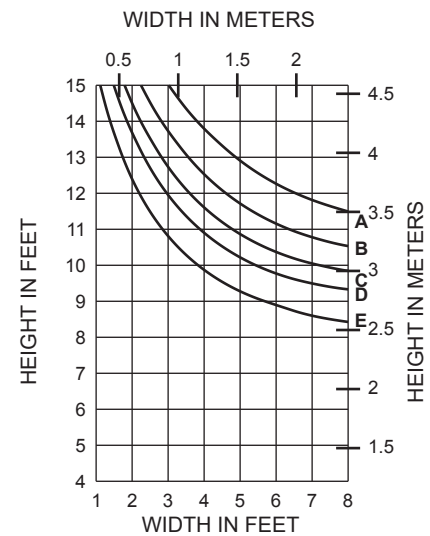
**WITH HORIZONTALS**



**451TCG013**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**

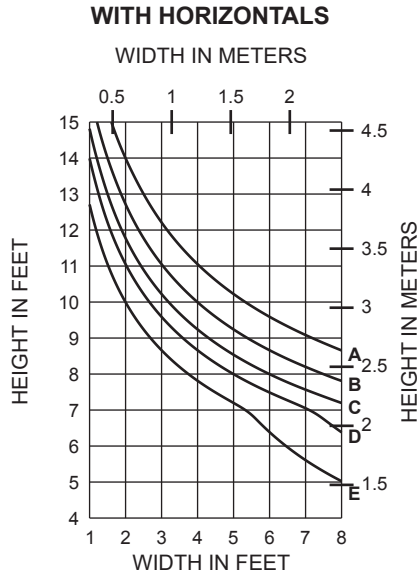


Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

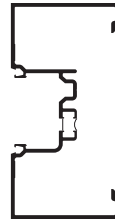
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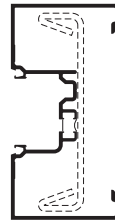
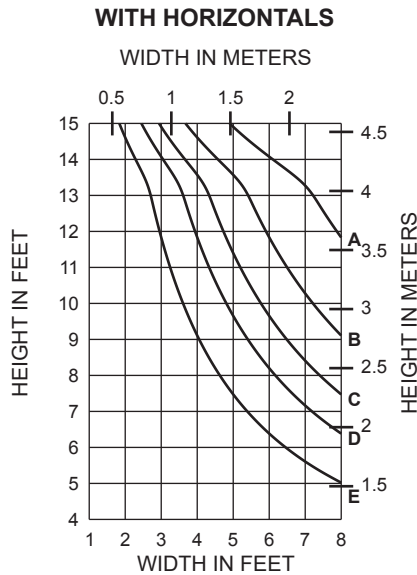
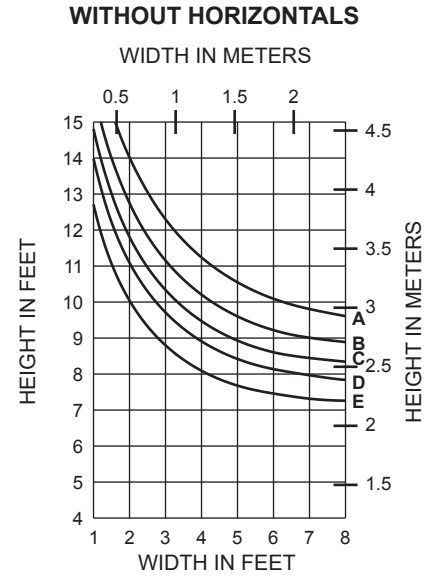


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



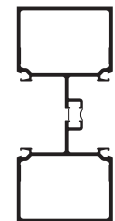
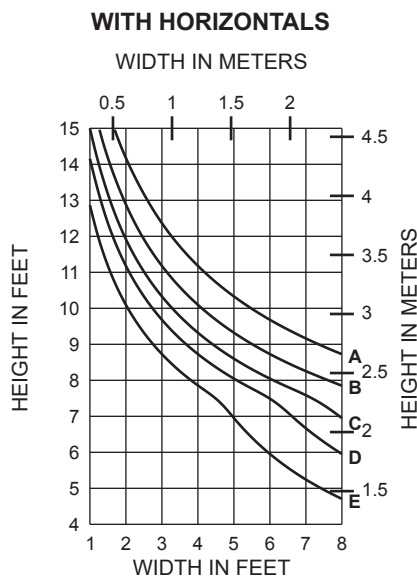
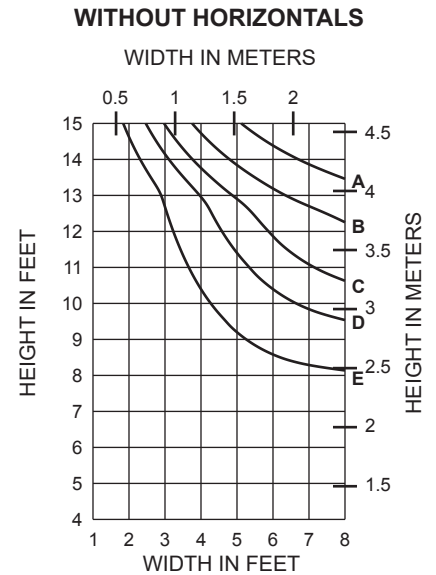
**451TCG112**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



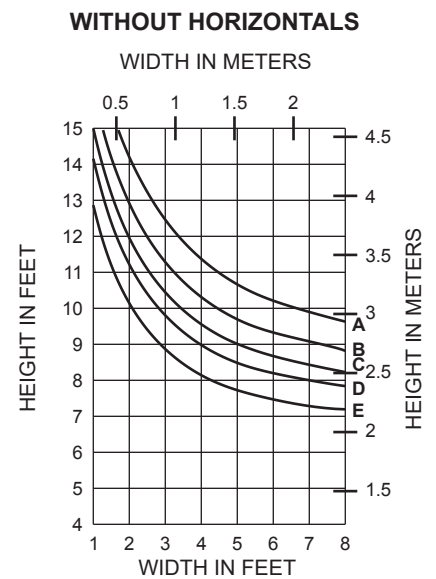
**451TCG112 with 450110 STEEL**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

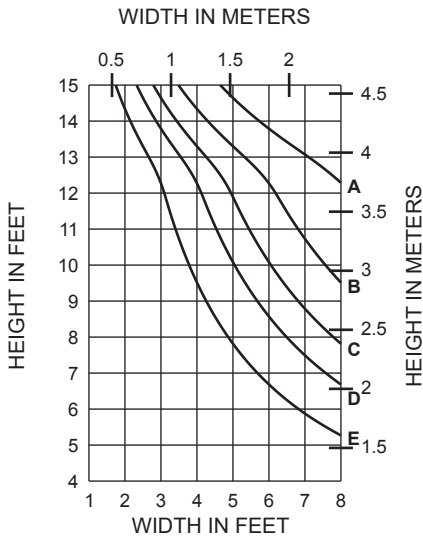


**451TCG005**

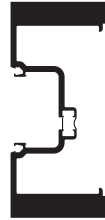
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



**WITH HORIZONTALS**



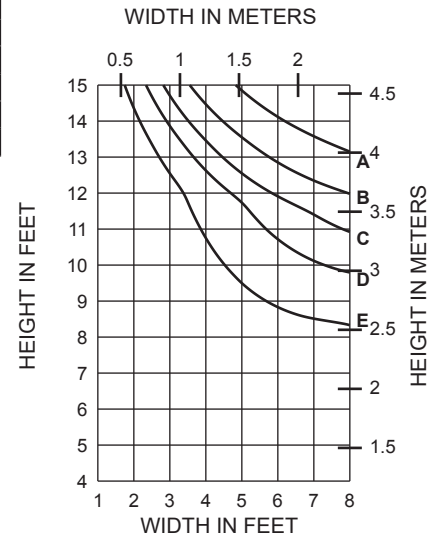
	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



**451TCG113**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



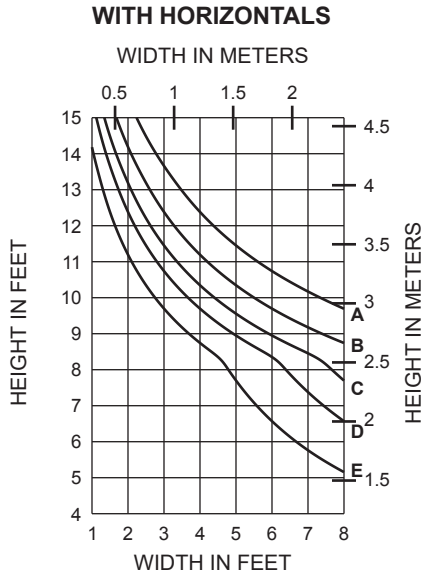
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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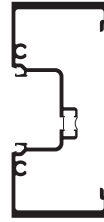


Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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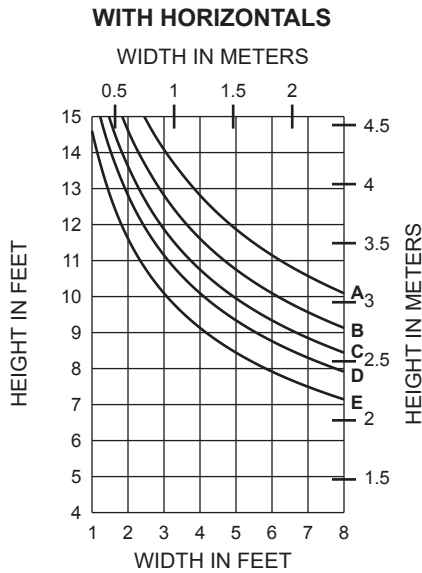
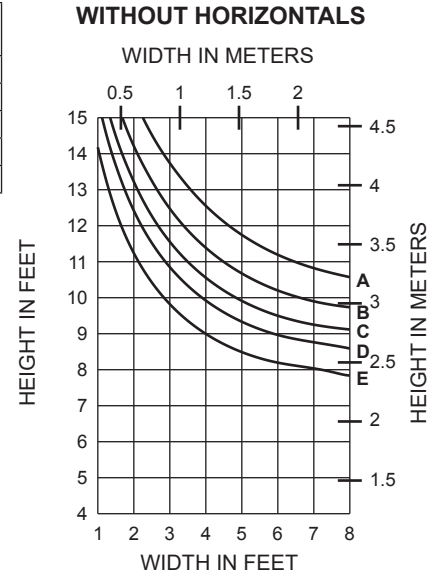


	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



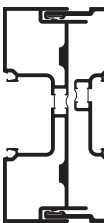
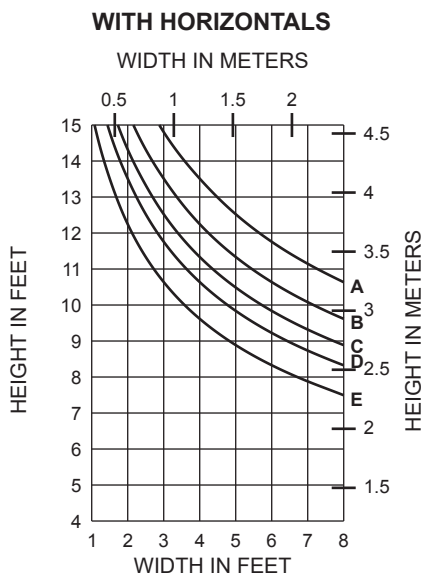
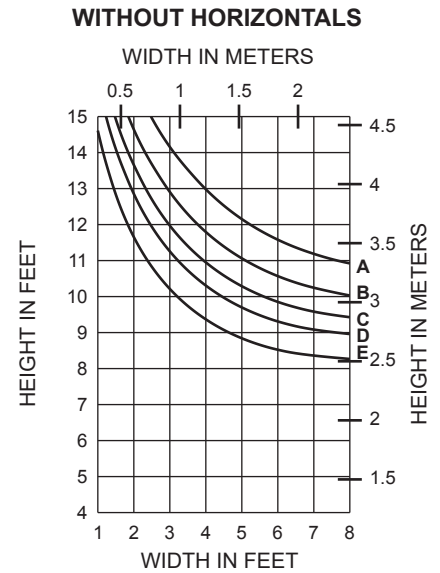
**451TCG001A**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



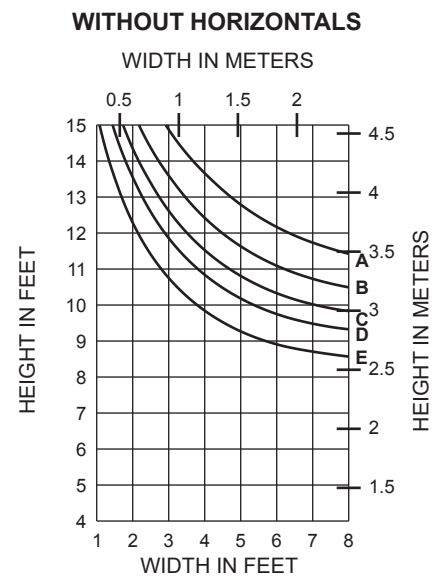
**451TCG540**  
**451TCG010**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

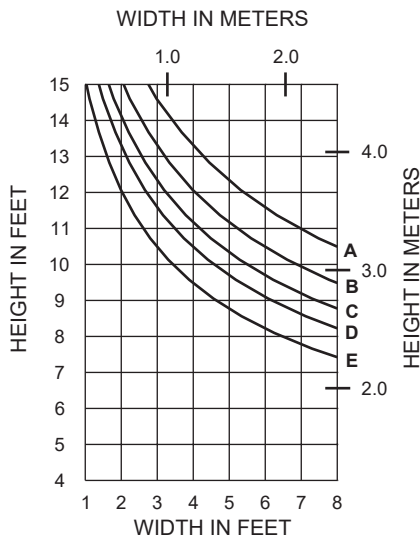


**451TCG540**  
**451TCG010A**

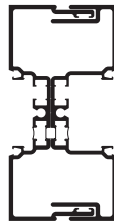
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



**WITH HORIZONTALS**



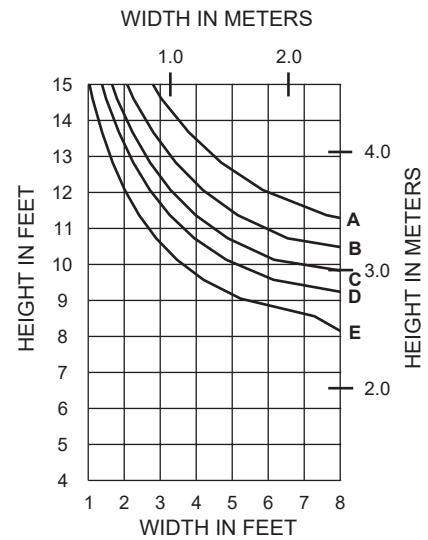
	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



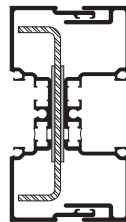
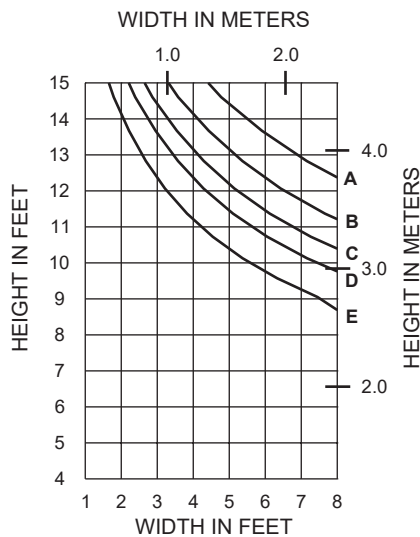
**451TCG081 / 451TCG082**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



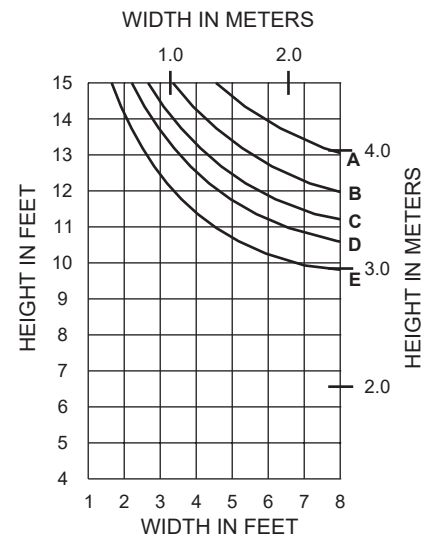
**WITH HORIZONTALS**



**451TCG081 / 451TCG082 with 400110 STEEL**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**

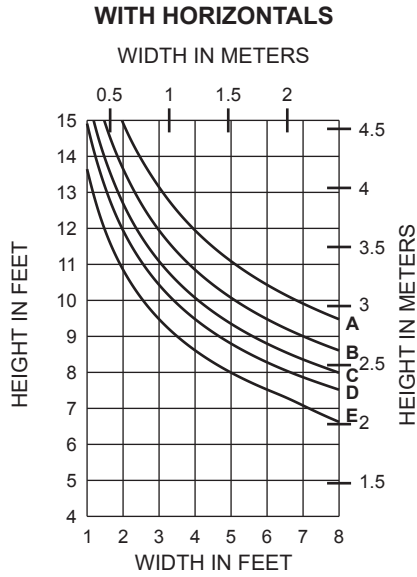


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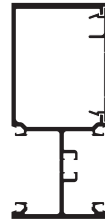
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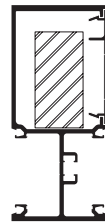
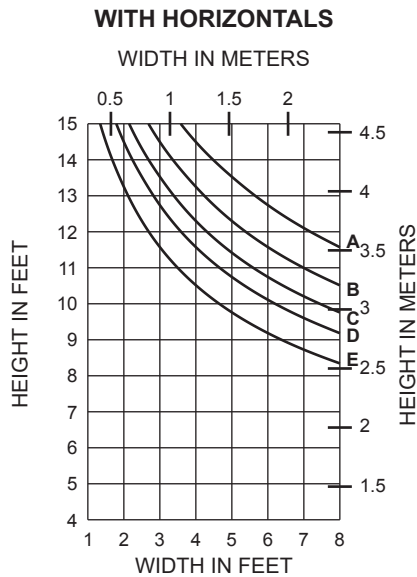
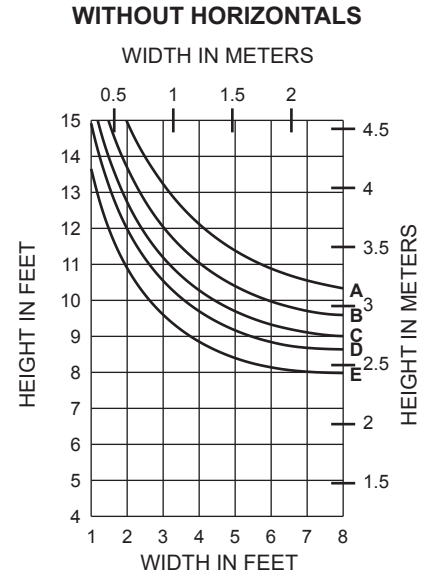


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



**451VG012**  
**451VG026**

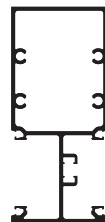
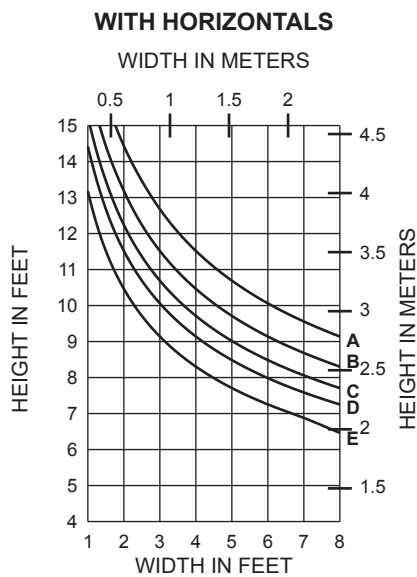
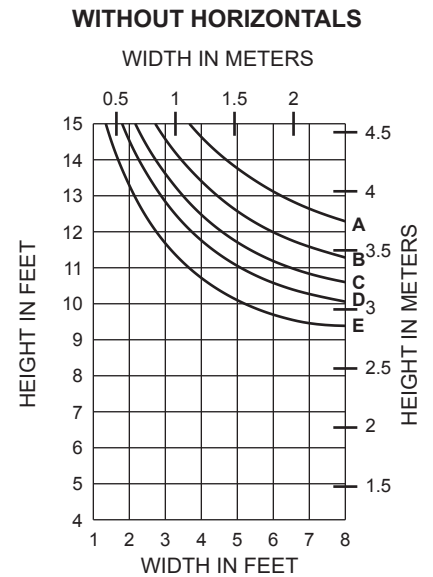
$I = 3.346 (139.27 \times 10^4)$   
 $S = 1.447 (23.71 \times 10^3)$



**451VG012**  
**451VG026**

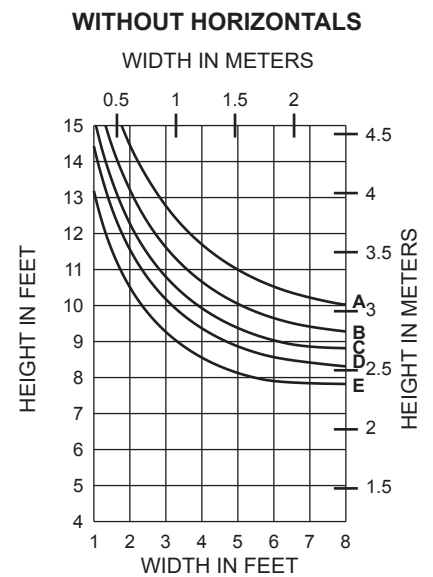
with 1" x 2-1/4" STEEL BAR

$I_A = 3.346 (139.27 \times 10^4)$   
 $S_A = 1.447 (23.71 \times 10^3)$   
 $I_S = 0.949 (39.50 \times 10^4)$   
 $S_S = 0.844 (13.83 \times 10^3)$

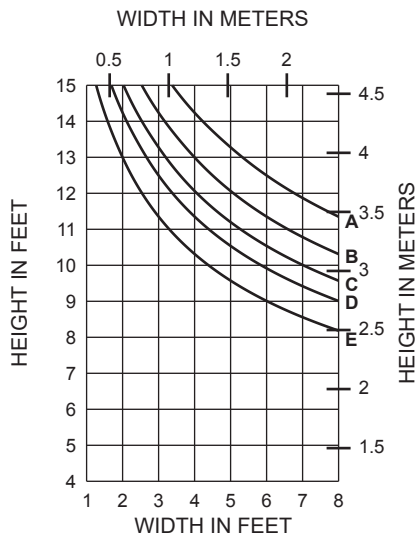


**451VG005**

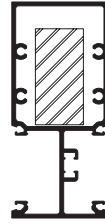
$I = 3.001 (124.91 \times 10^4)$   
 $S = 1.323 (21.68 \times 10^3)$



**WITH HORIZONTALS**



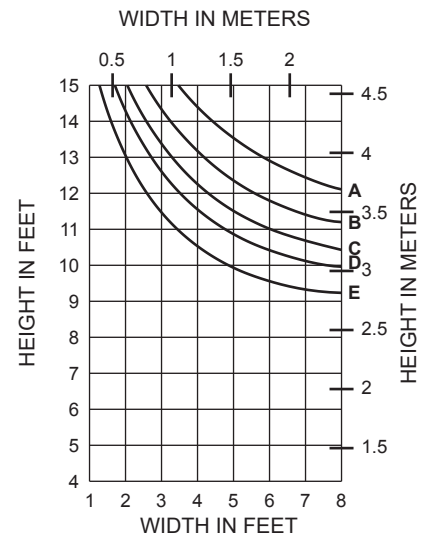
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



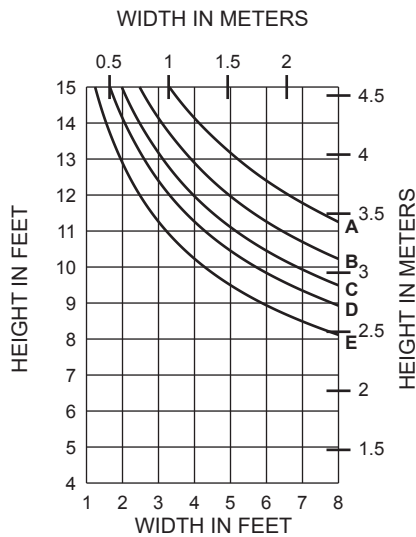
**451VG005**  
with 1" x 2-1/4" STEEL BAR

$I_A = 3.001 (124.91 \times 10^4)$   
 $S_A = 1.323 (21.68 \times 10^3)$   
 $I_S = 0.949 (39.50 \times 10^4)$   
 $S_S = 0.844 (13.83 \times 10^3)$

**WITHOUT HORIZONTALS**



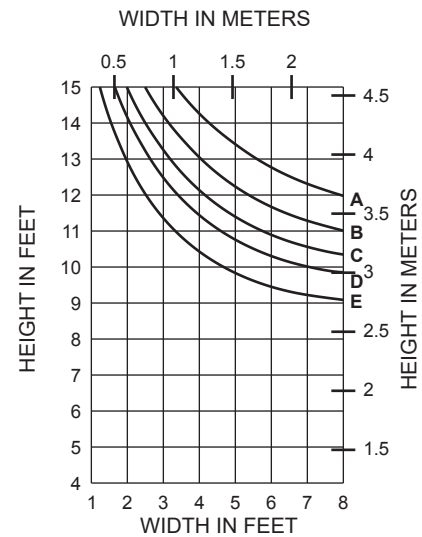
**WITH HORIZONTALS**



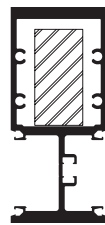
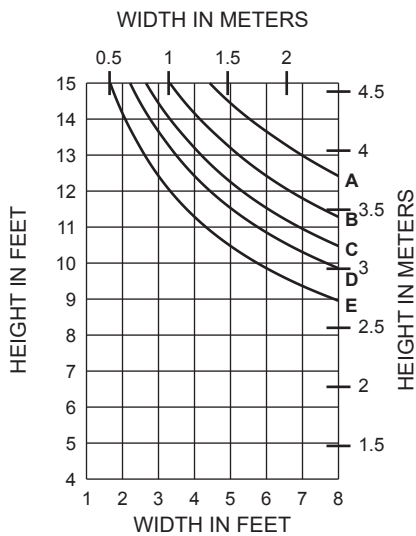
**451VG014**

$I = 5.604 (233.25 \times 10^4)$   
 $S = 2.397 (39.28 \times 10^3)$

**WITHOUT HORIZONTALS**



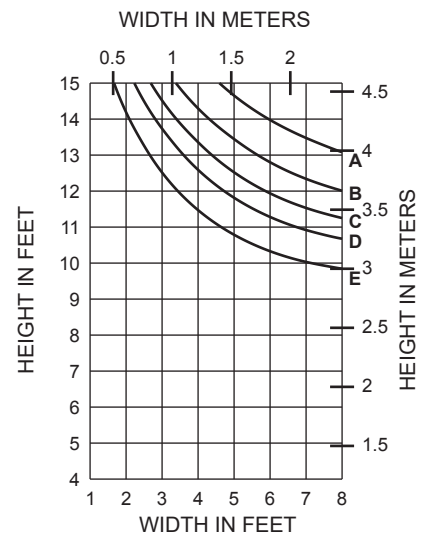
**WITH HORIZONTALS**



**451VG014**  
with 1" x 2" STEEL BAR

$I = 5.604 (233.25 \times 10^4)$   
 $S = 2.397 (39.28 \times 10^3)$   
 $I_S = 0.667 (27.26 \times 10^4)$   
 $S_S = 0.667 (10.93 \times 10^3)$

**WITHOUT HORIZONTALS**

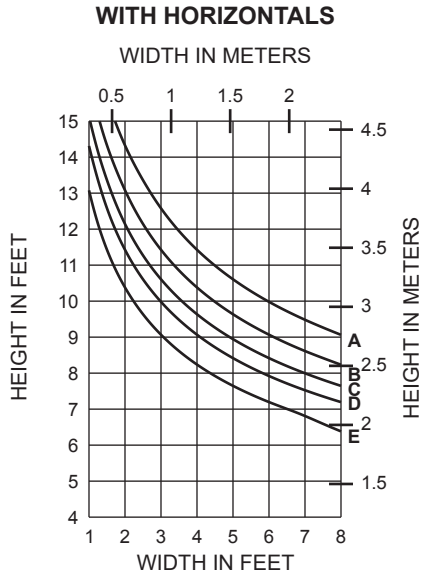


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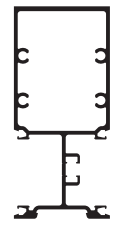
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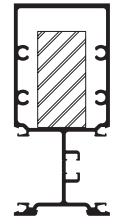
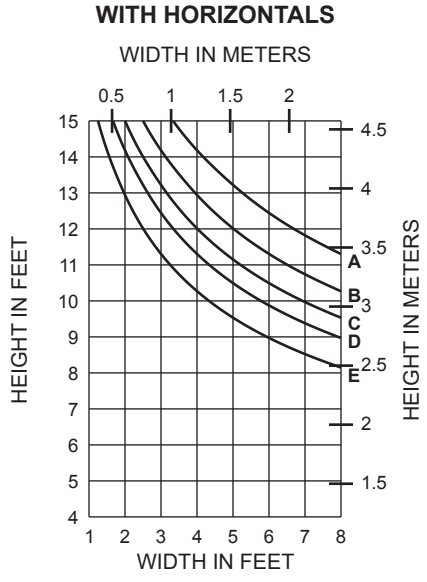
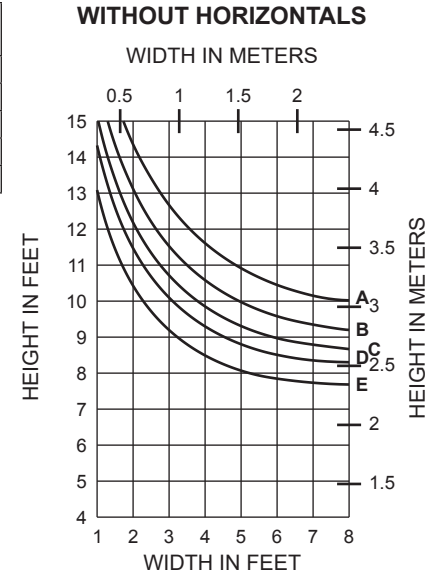


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



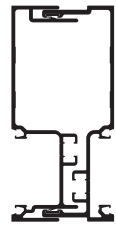
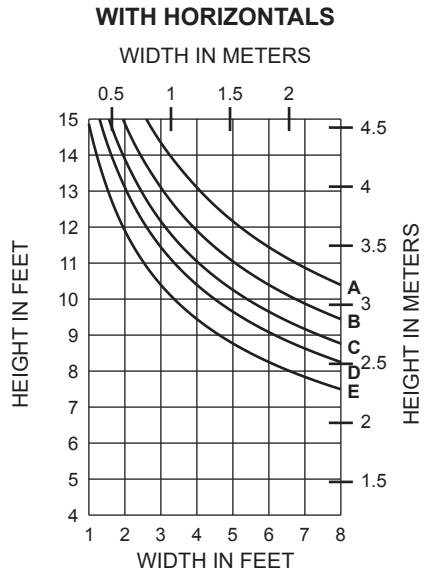
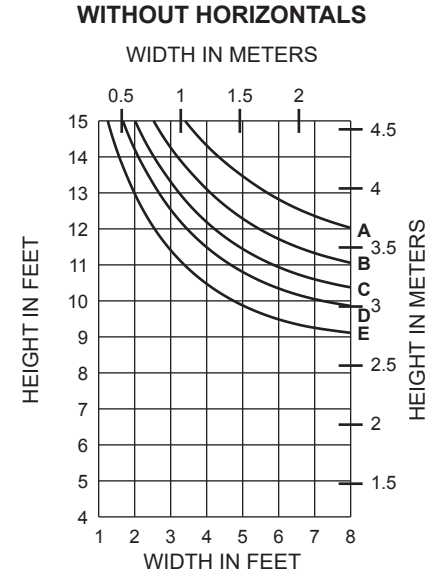
**451VG134**

$I = 2.930 (121.96 \times 10^4)$   
 $S = 1.290 (21.13 \times 10^3)$



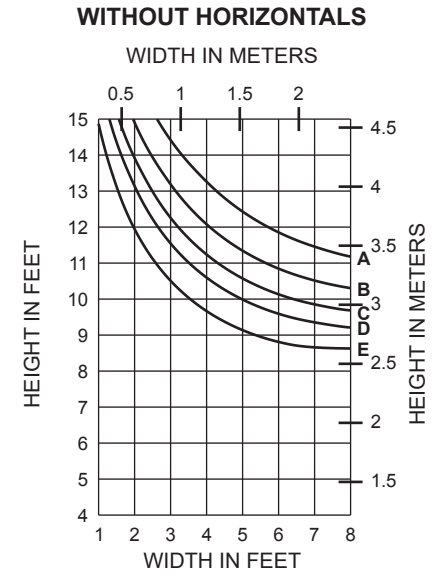
**451VG134 with 1" x 2-1/4" STEEL BAR**

$I_A = 2.930 (121.96 \times 10^4)$   
 $S_A = 1.290 (21.13 \times 10^3)$   
 $I_S = 0.949 (39.50 \times 10^4)$   
 $S_S = 0.844 (13.83 \times 10^3)$

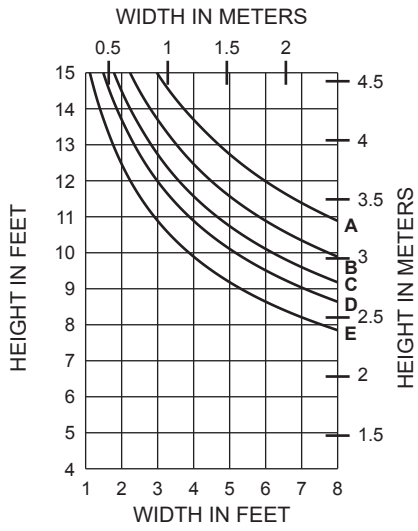


**451VG010  
451VG540**

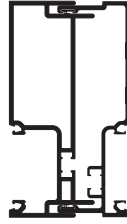
$I = 4.418 (183.89 \times 10^4)$   
 $S = 1.798 (29.46 \times 10^3)$



### WITH HORIZONTALS



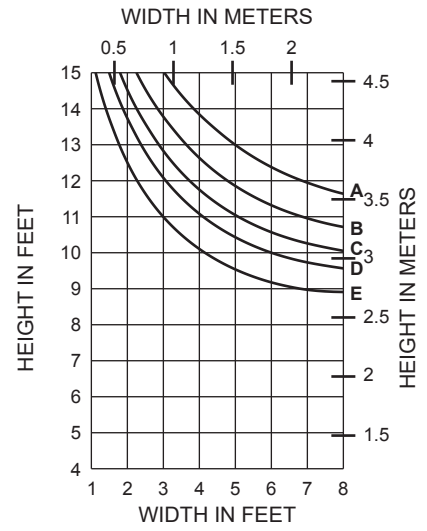
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



451VG010A  
451VG009

I = 5.076 (211.27 x 10<sup>4</sup>)  
S = 2.066 (33.86 x 10<sup>3</sup>)

### WITHOUT HORIZONTALS



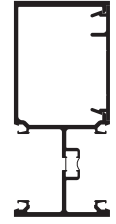
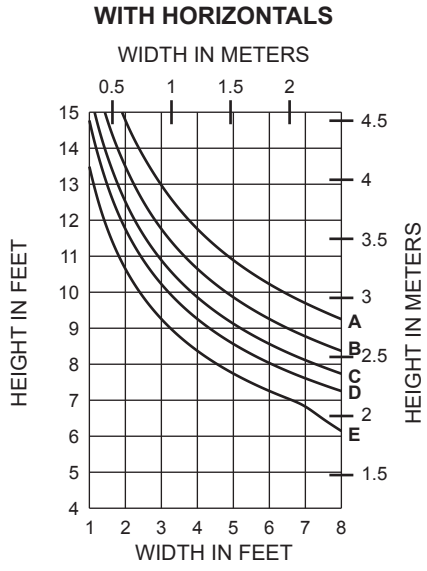
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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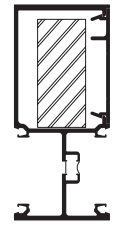
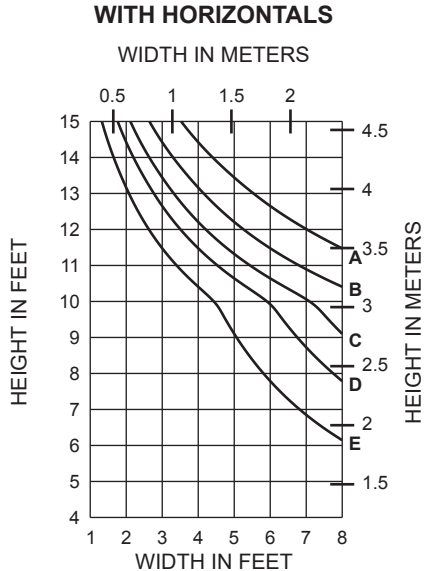
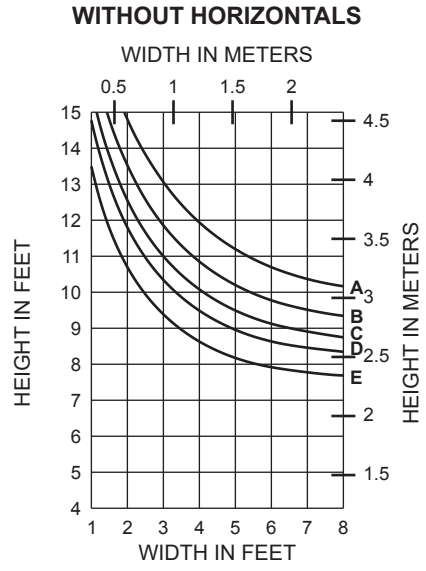
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



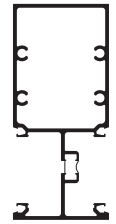
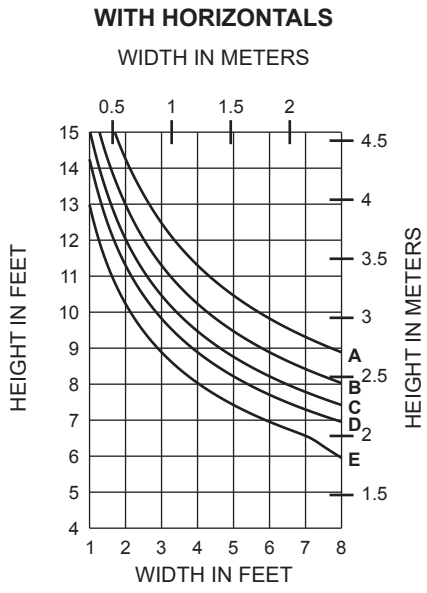
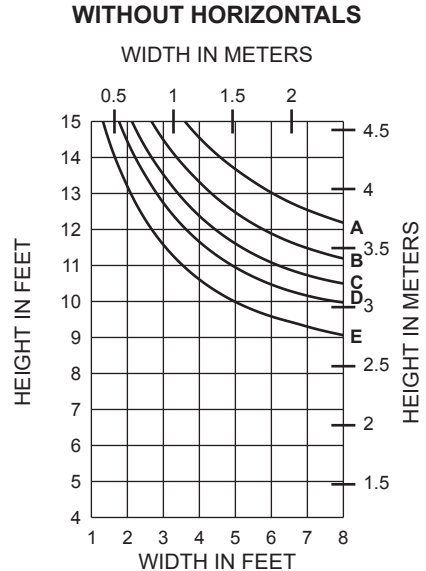
**451TVG012**  
**451VG026**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



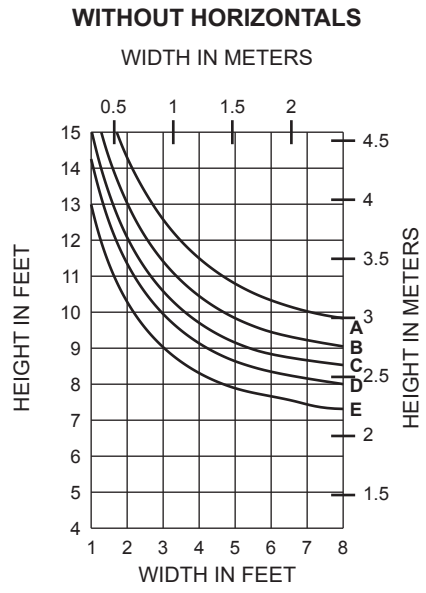
**451TVG012**  
**451VG026**  
with 1" x 2-1/4" STEEL BAR

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

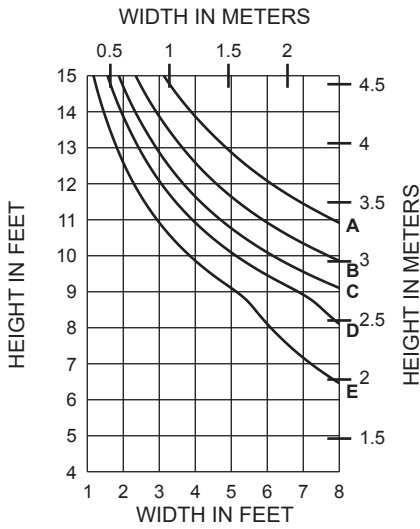


**451TVG005**

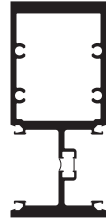
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



**WITH HORIZONTALS**



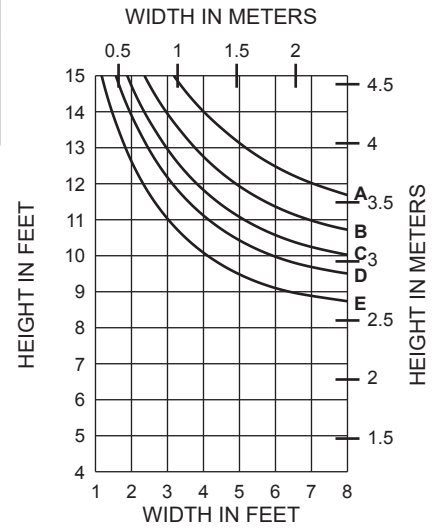
	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



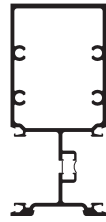
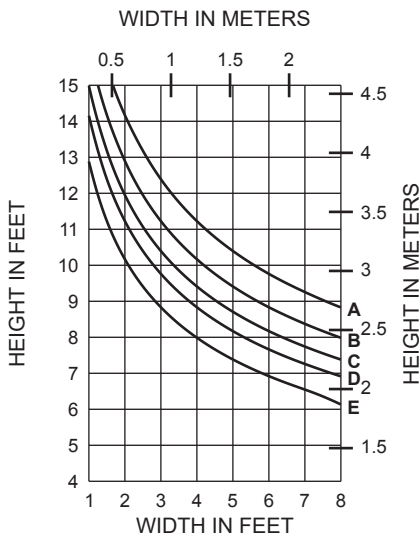
**451TVG014**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



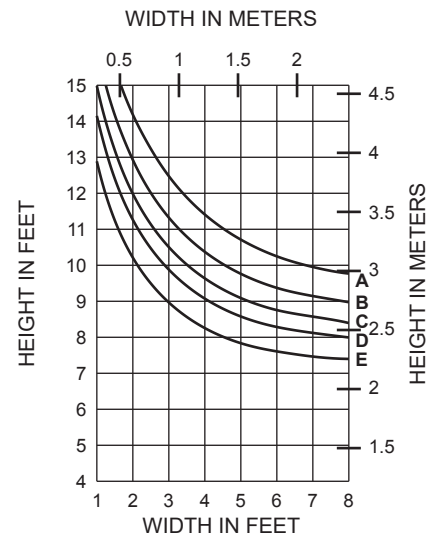
**WITH HORIZONTALS**



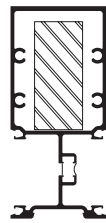
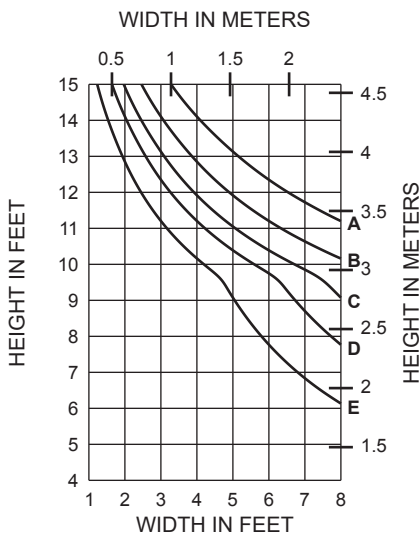
**451TVG134**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



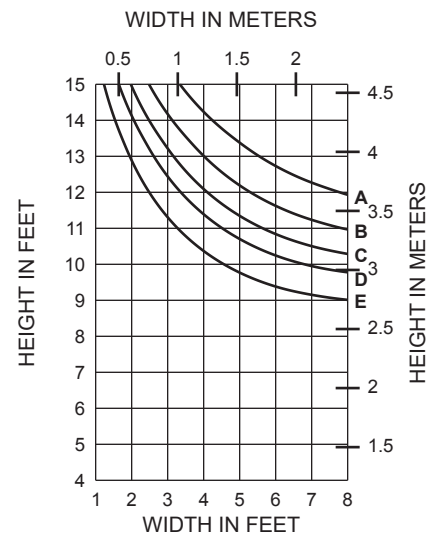
**WITH HORIZONTALS**



**451TVG134 with 1" x 2-1/4" STEEL BAR**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

**WITHOUT HORIZONTALS**



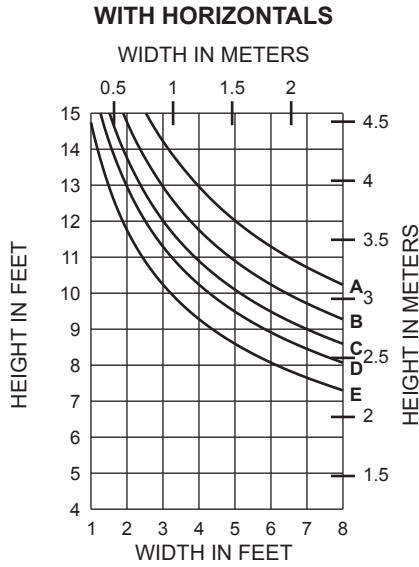
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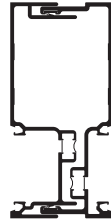


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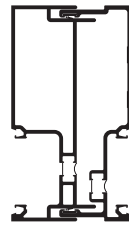
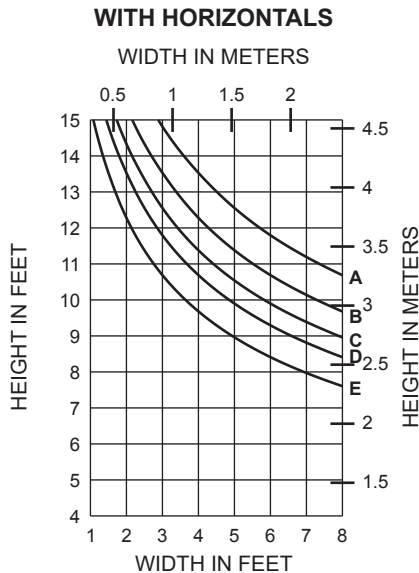
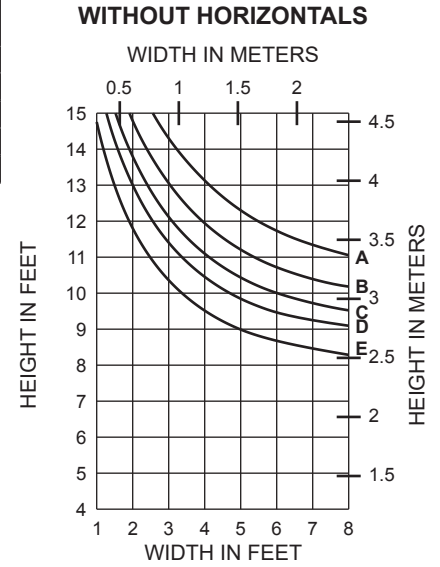


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



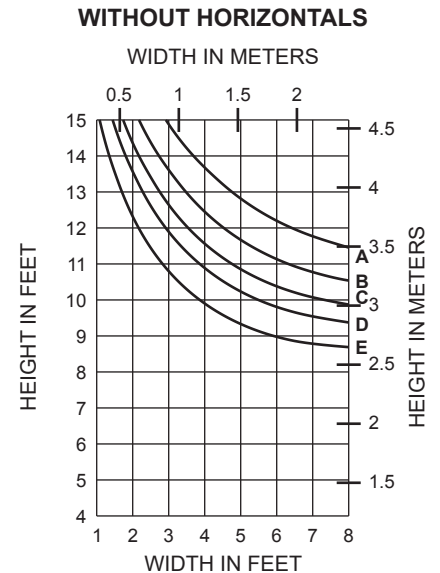
**451TVG540**  
**451TVG010**

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

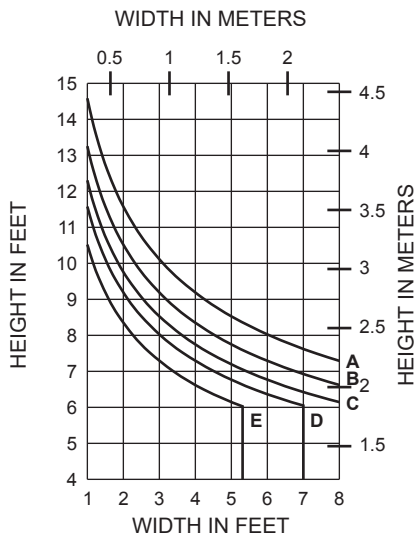


**451TVG540**  
**451TVG010A**

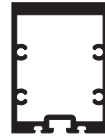
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



**WITH HORIZONTALS**



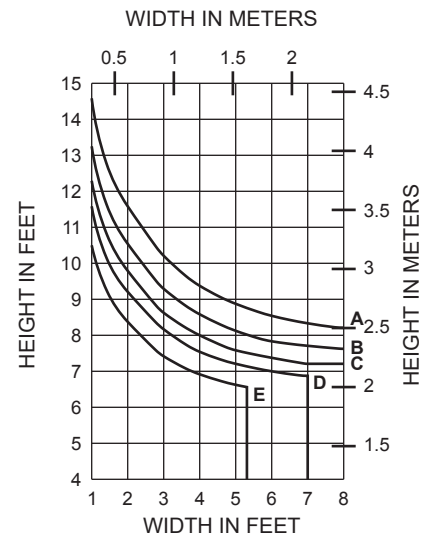
	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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



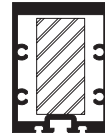
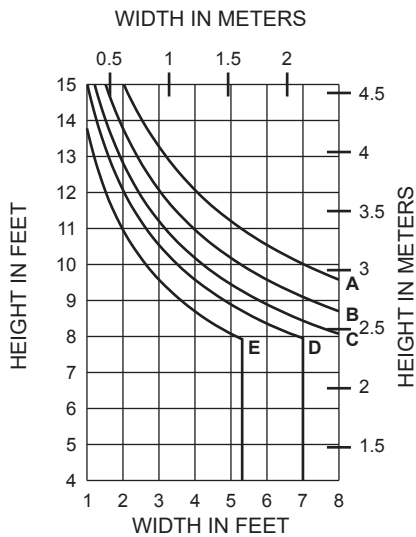
**451SSG005**

$I = 1.527 (63.55 \times 10^4)$   
 $S = 1.057 (17.32 \times 10^3)$

**WITHOUT HORIZONTALS**



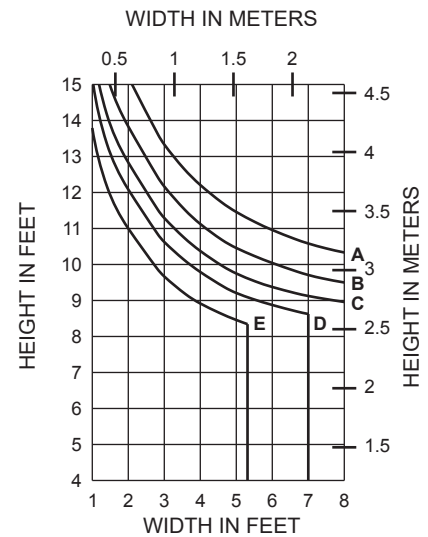
**WITH HORIZONTALS**



**451SSG005**  
**with 1" x 2" STEEL BAR**

$I_A = 1.527 (63.55 \times 10^4)$   
 $S_A = 1.057 (17.32 \times 10^3)$   
 $I_S = 0.667 (27.76 \times 10^4)$   
 $S_S = 0.667 (10.93 \times 10^3)$

**WITHOUT HORIZONTALS**

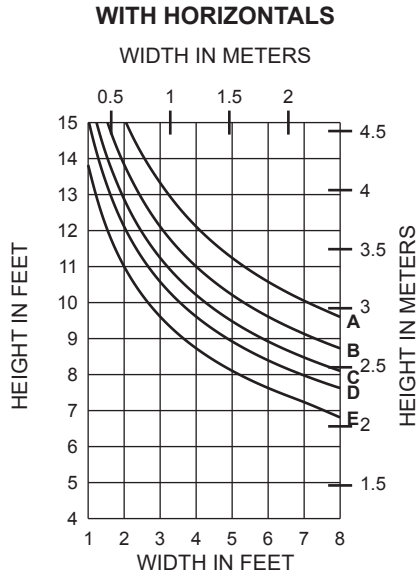


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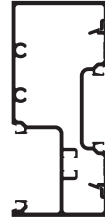
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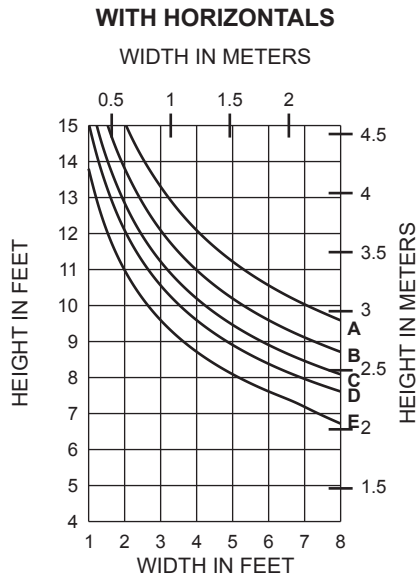
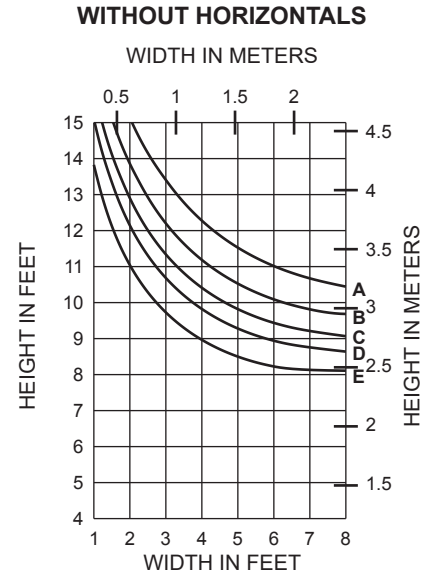


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



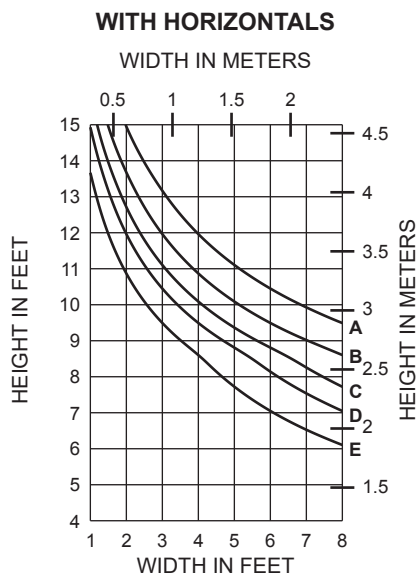
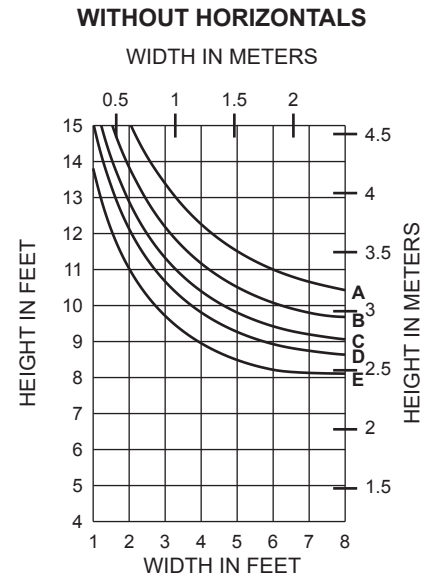
**451VG001**  
**451CG002**

I = 3.485 (145.05 x 10<sup>4</sup>)  
S = 1.468 (24.06 x 10<sup>3</sup>)



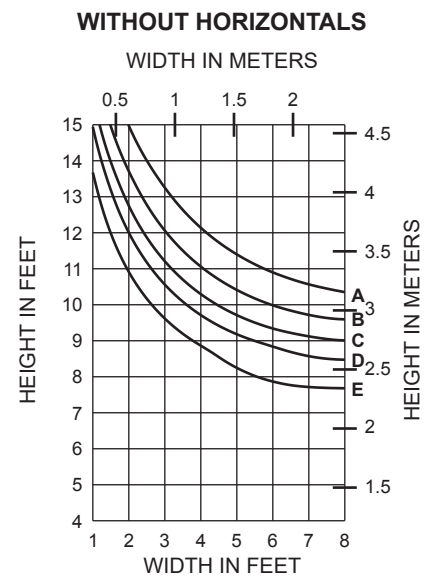
**451VG052**  
**451CG028**

I = 3.470 (144.43 x 10<sup>4</sup>)  
S = 1.431 (23.45 x 10<sup>3</sup>)

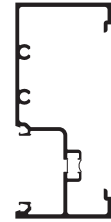
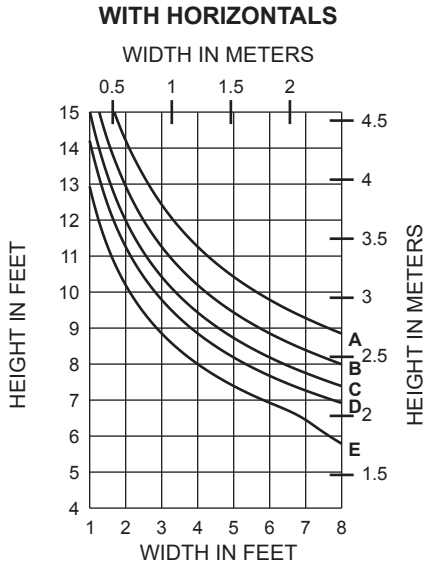


**451VG069**  
**451VG069**

I = 3.362 (139.94 x 10<sup>4</sup>)  
S = 1.181 (19.35 x 10<sup>3</sup>)

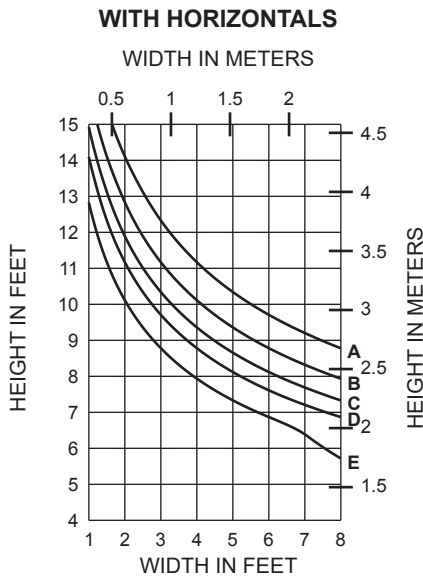
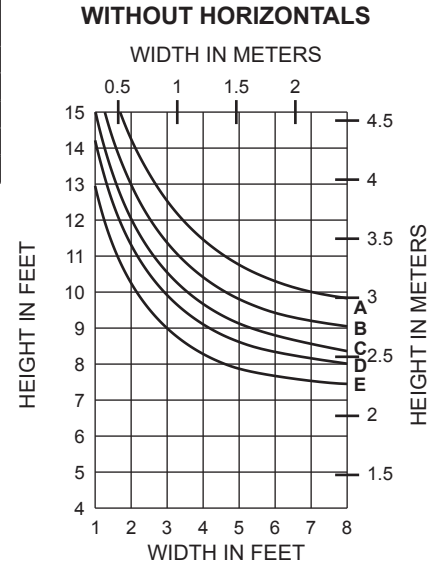


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



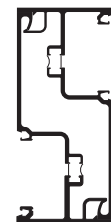
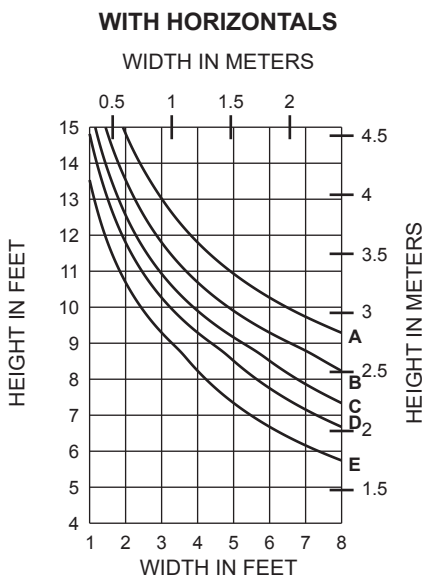
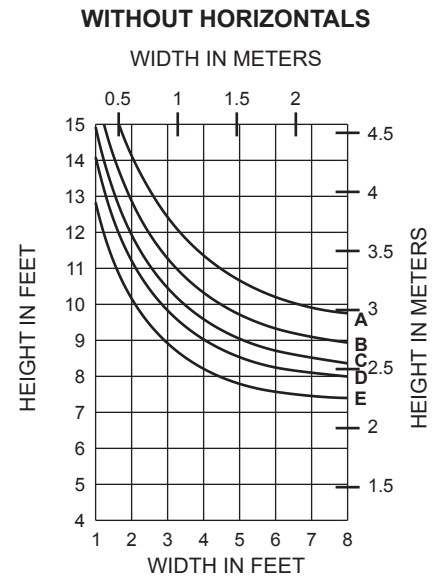
451TVG001

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



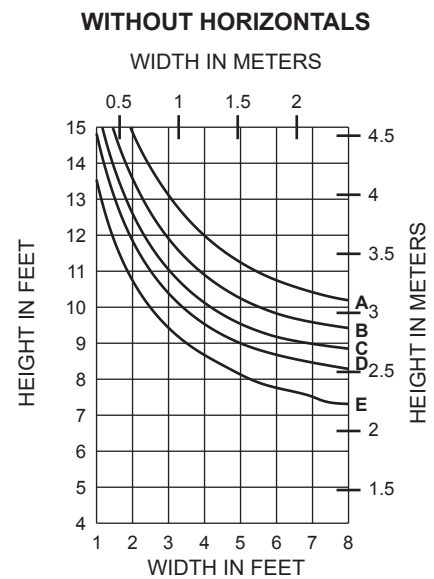
451TVG052

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



451TVG069  
451TVG069

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

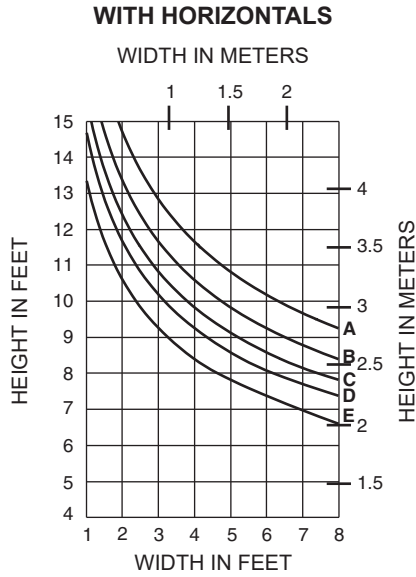


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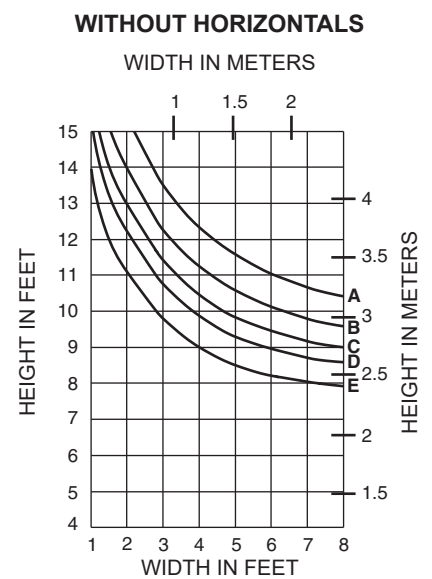
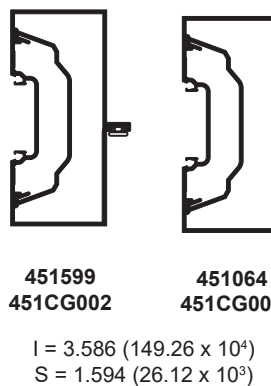
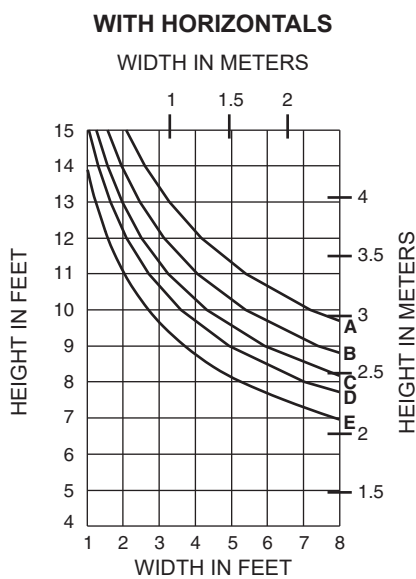
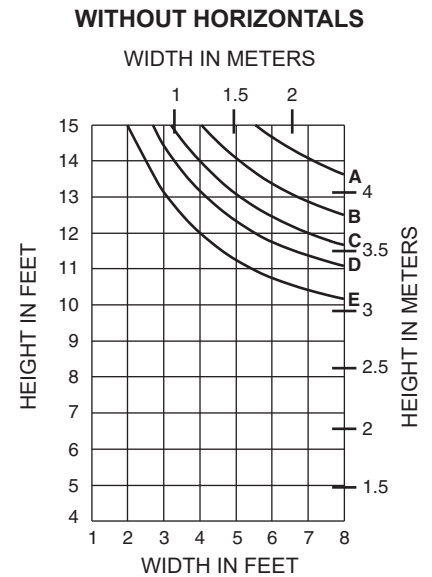
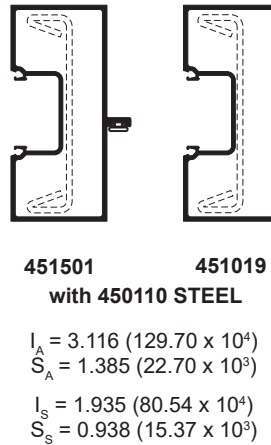
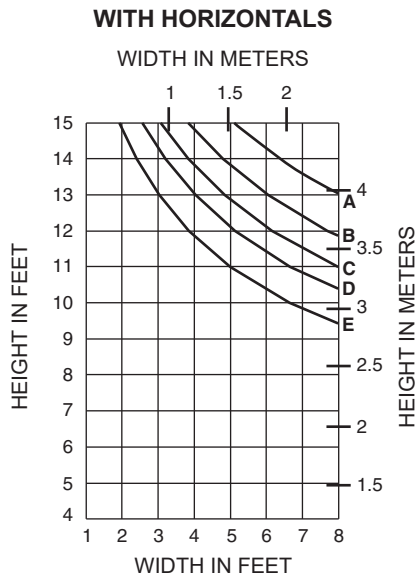
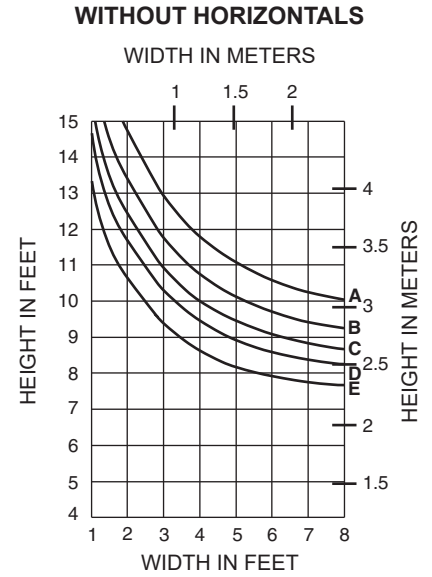
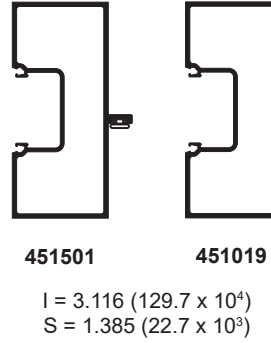
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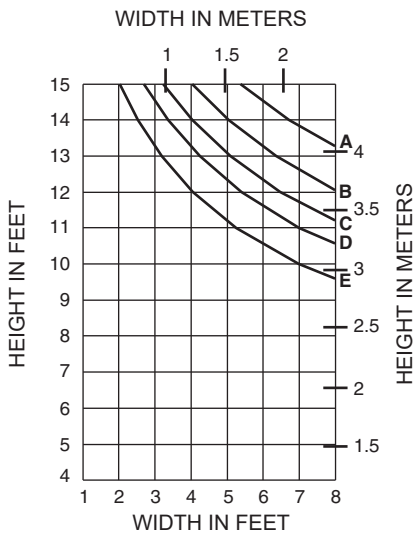
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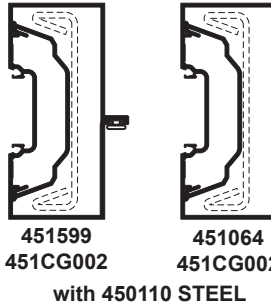
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



**WITH HORIZONTALS**

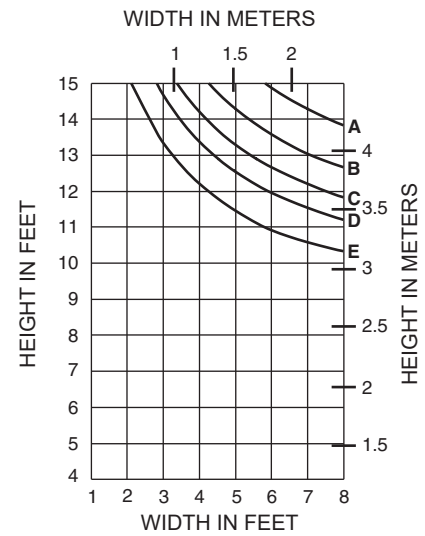


	Allowable Stress Design Load	LRFD Ultimate Design Load
<b>A =</b>	<b>15 PSF (720)</b>	<b>25 PSF (1200)</b>
<b>B =</b>	<b>20 PSF (960)</b>	<b>33 PSF (1580)</b>
<b>C =</b>	<b>25 PSF (1200)</b>	<b>42 PSF (2000)</b>
<b>D =</b>	<b>30 PSF (1440)</b>	<b>50 PSF (2400)</b>
<b>E =</b>	<b>40 PSF (1920)</b>	<b>67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

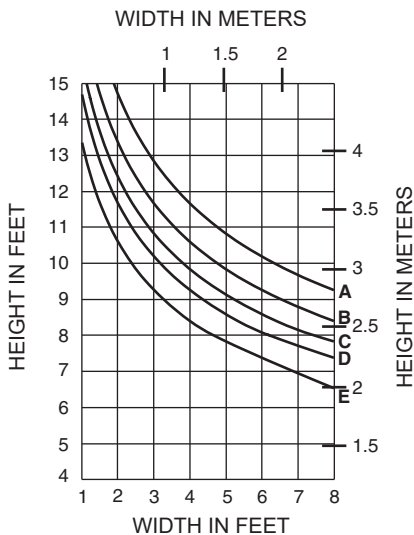


$I = 3.565 (148.39 \times 10^4)$   
 $S = 1.622 (26.58 \times 10^3)$   
 $I_s = 1.935 (80.54 \times 10^4)$   
 $S_s = 0.938 (15.37 \times 10^3)$

**WITHOUT HORIZONTALS**

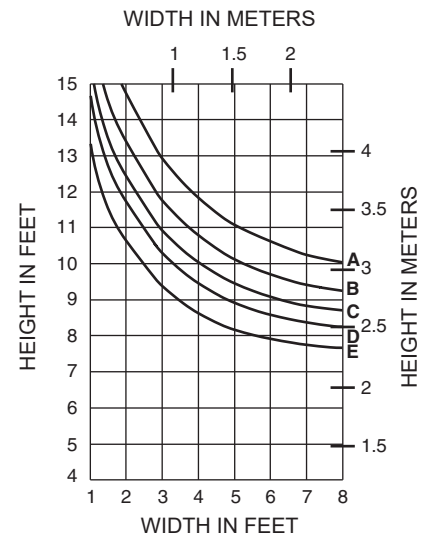


**WITH HORIZONTALS**

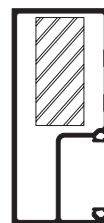
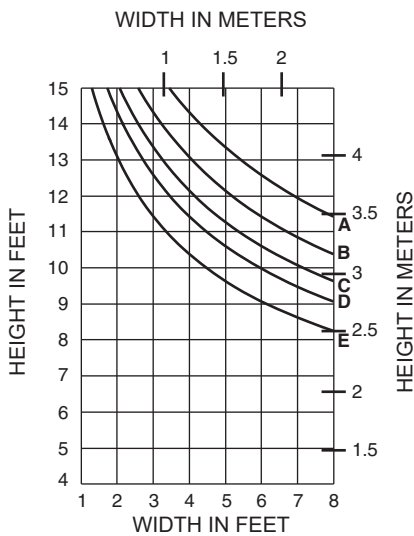


$I = 3.124 (130.03 \times 10^4)$   
 $S = 1.333 (21.84 \times 10^3)$

**WITHOUT HORIZONTALS**



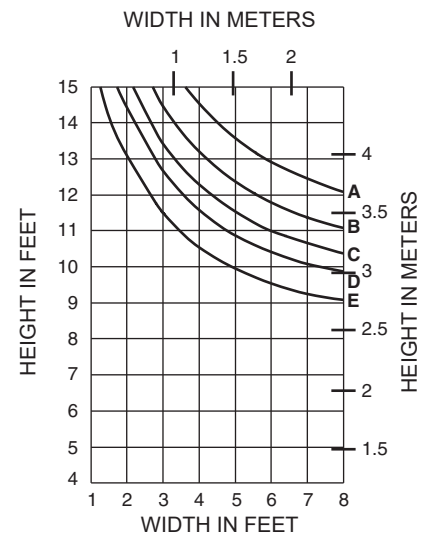
**WITH HORIZONTALS**



**with 1" x 2-1/4" STEEL BAR**

$I_A = 3.124 (130.03 \times 10^4)$   
 $S_A = 1.333 (21.84 \times 10^3)$   
 $I_s = 0.949 (39.50 \times 10^4)$   
 $S_s = 0.844 (13.83 \times 10^3)$

**WITHOUT HORIZONTALS**



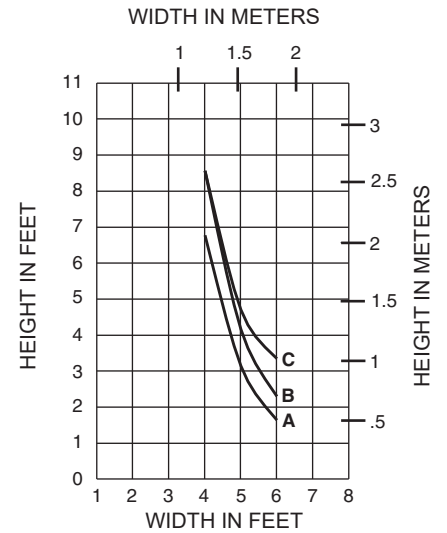
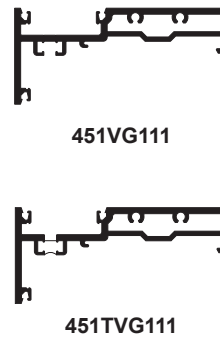
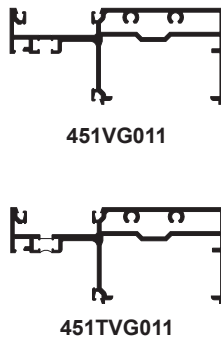
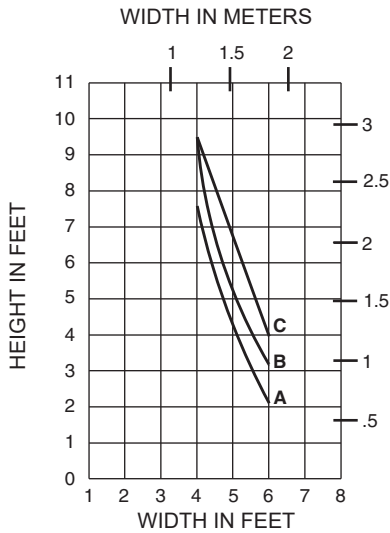
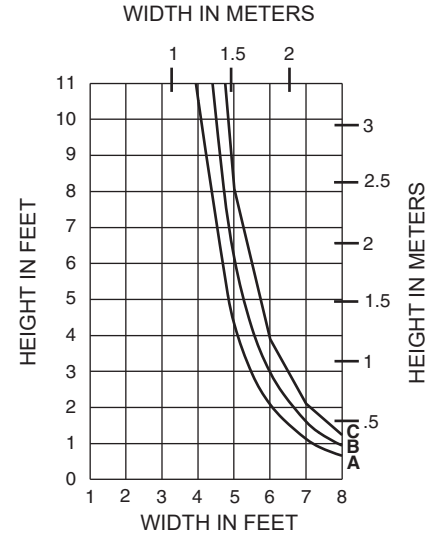
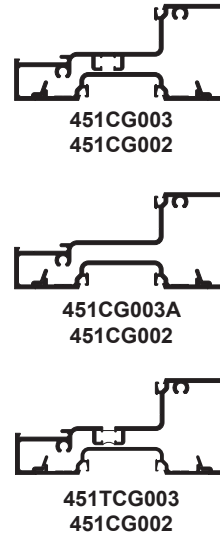
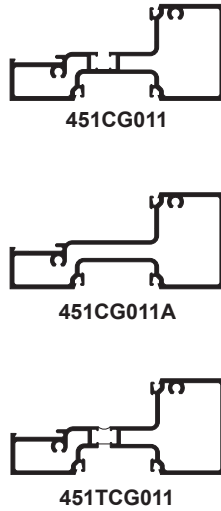
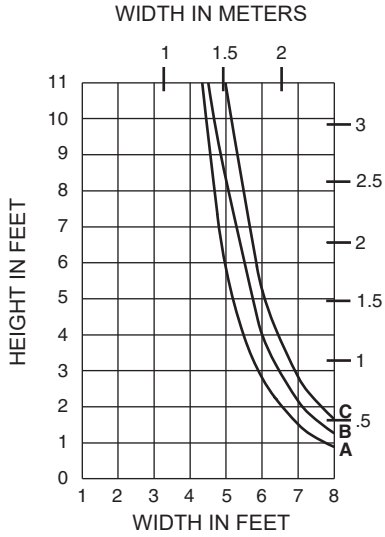
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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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" (25.4) thick insulating glass supported on two setting blocks at the loading points shown.

**NOTE:** Charts are for THERMAL and NON-THERMAL members.

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



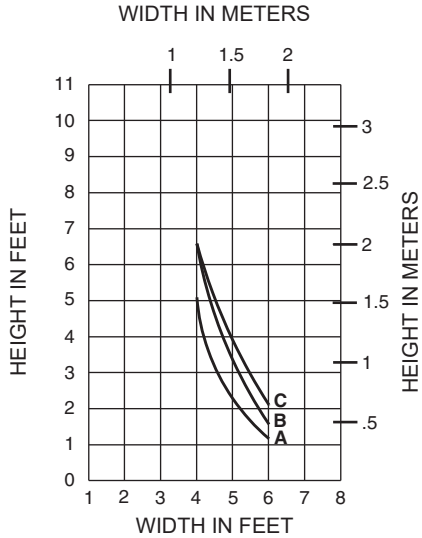
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Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks at the loading points shown.

**NOTE:** Charts are for THERMAL and NON-THERMAL members.

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



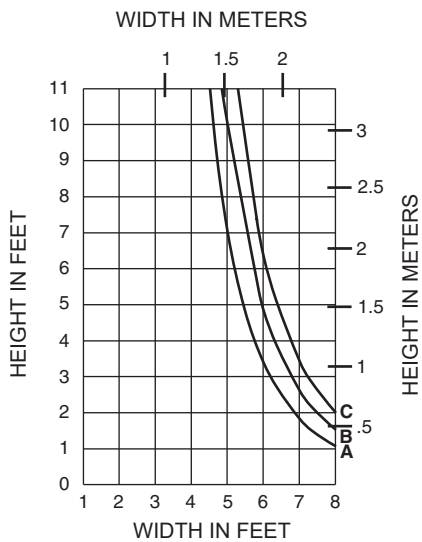
451SSG111



451TSSG111

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" (25.4) thick insulating glass supported on two setting blocks placed at the loading points shown.

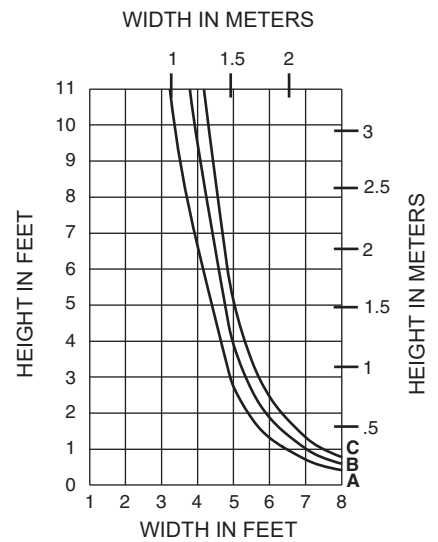
- A = (1/4 POINT LOADING)
- B = (1/6 POINT LOADING)
- C = (1/8 POINT LOADING)



451502  
SINGLE ACTING  
T-BAR



451081  
DOUBLE ACTING  
T-BAR



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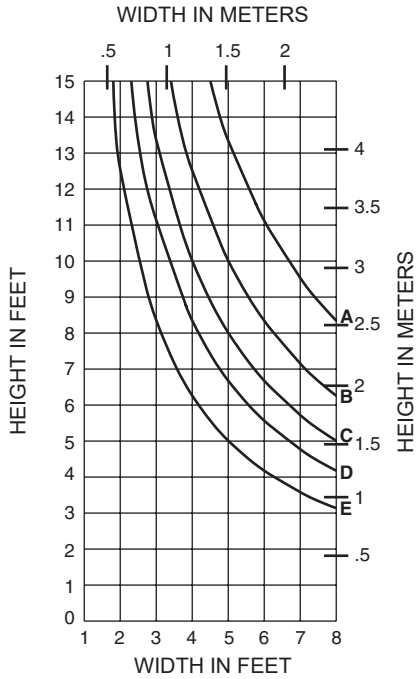
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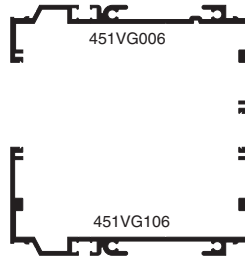
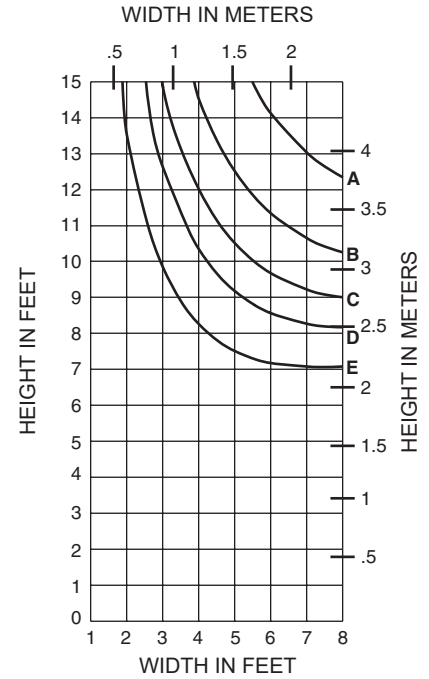
For each application, end reactions MUST be checked. These charts are used to verify that the end reactions at the head and sill receptors are 500 lbs. (2224N) or less and will meet the specified wind load.

- 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**

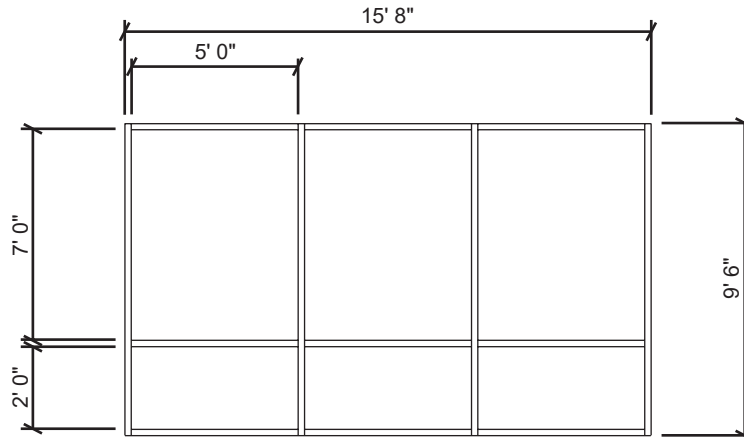


500lbs. Max. End Reaction

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



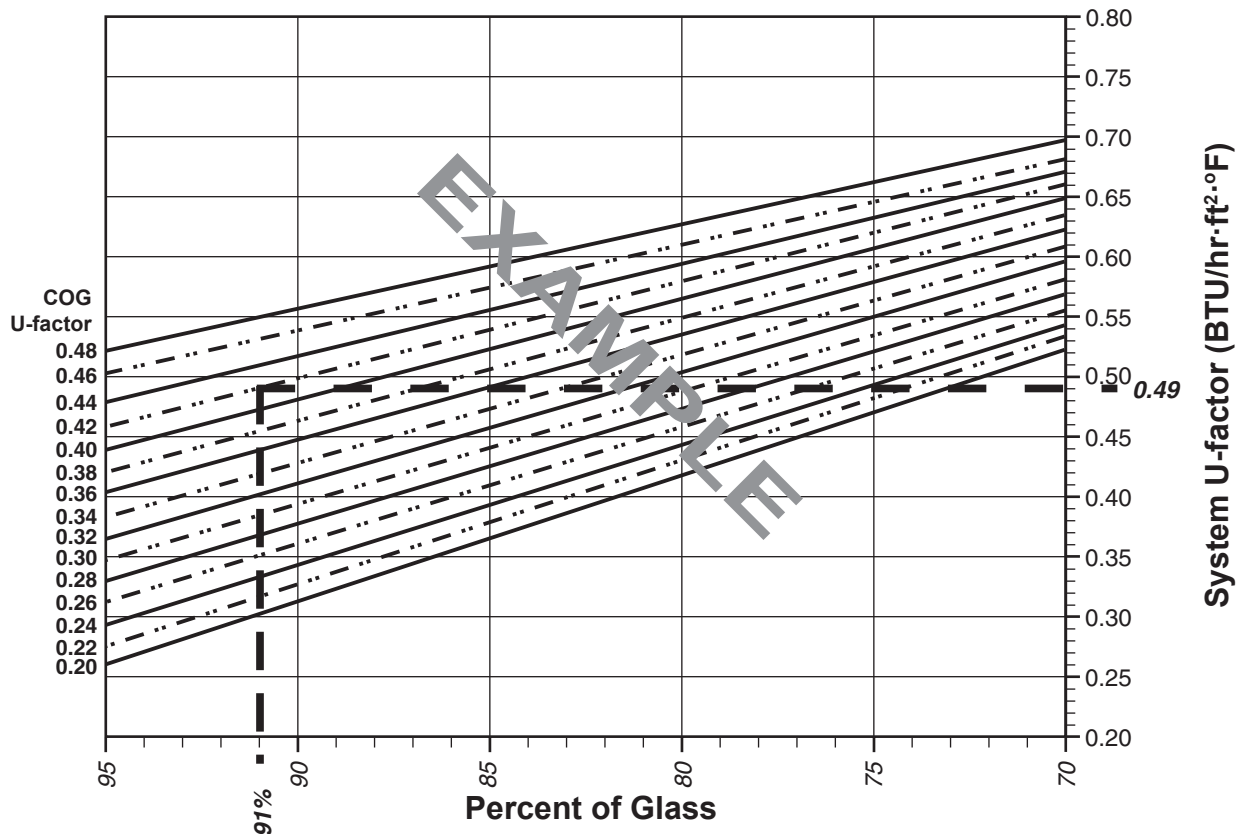
Example Glass U-factor = 0.42 Btu/hr·ft<sup>2</sup>·°F

Total Daylight Opening = 3(5' x 7') + 3(5' x 2') = 135ft<sup>2</sup>

Total Projected Area = (Total Daylight Opening + Total Area of Framing System)  
 = 15' 8" x 9' 6" = 148.83ft<sup>2</sup>

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

**System U-factor vs Percent of Glass Area**



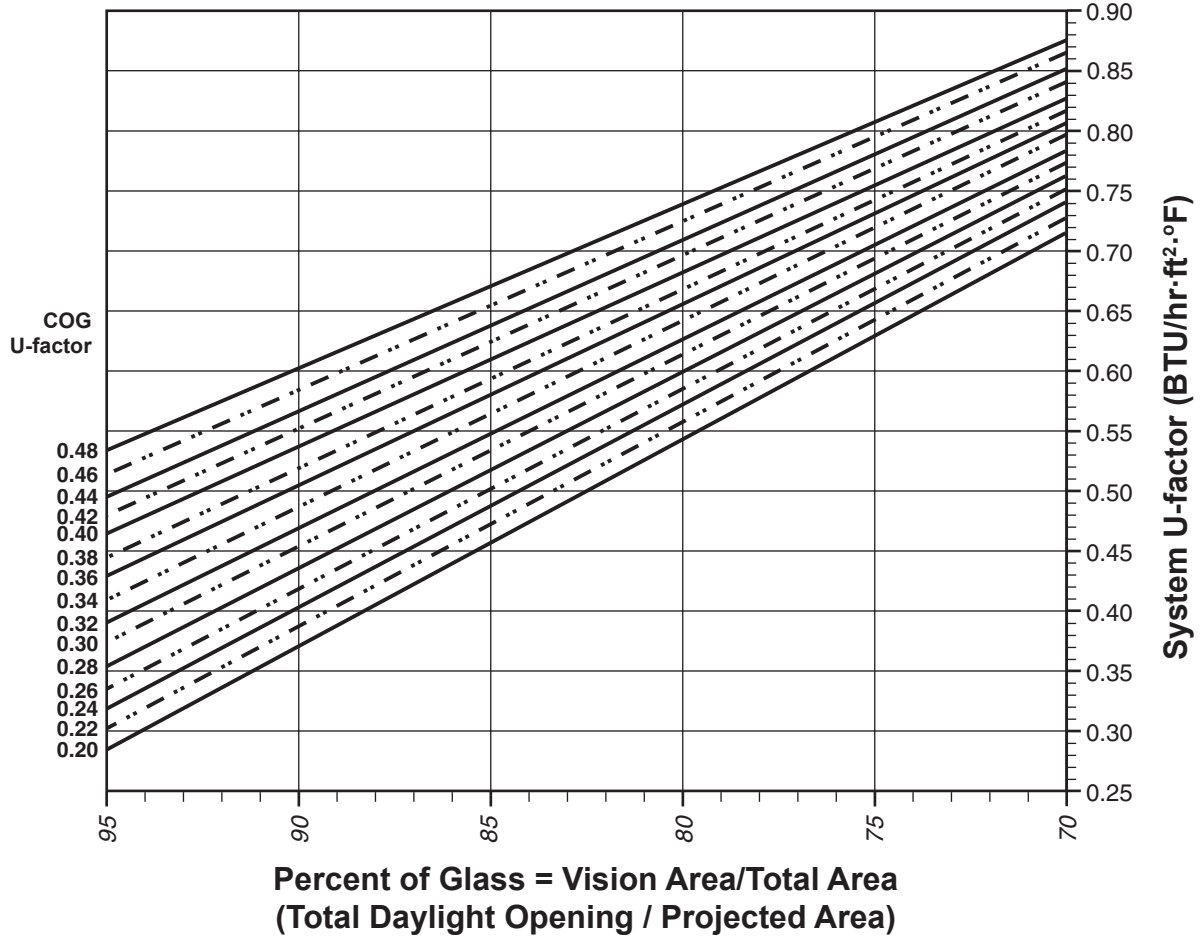
**Based on 91% glass and center of glass (COG) U-factor of 0.42**  
**System U-factor is equal to 0.49 Btu/hr x ft<sup>2</sup> x °F**

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## Trifab® VersaGlaze® 451 (CENTER – Non-Thermal)

### 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.

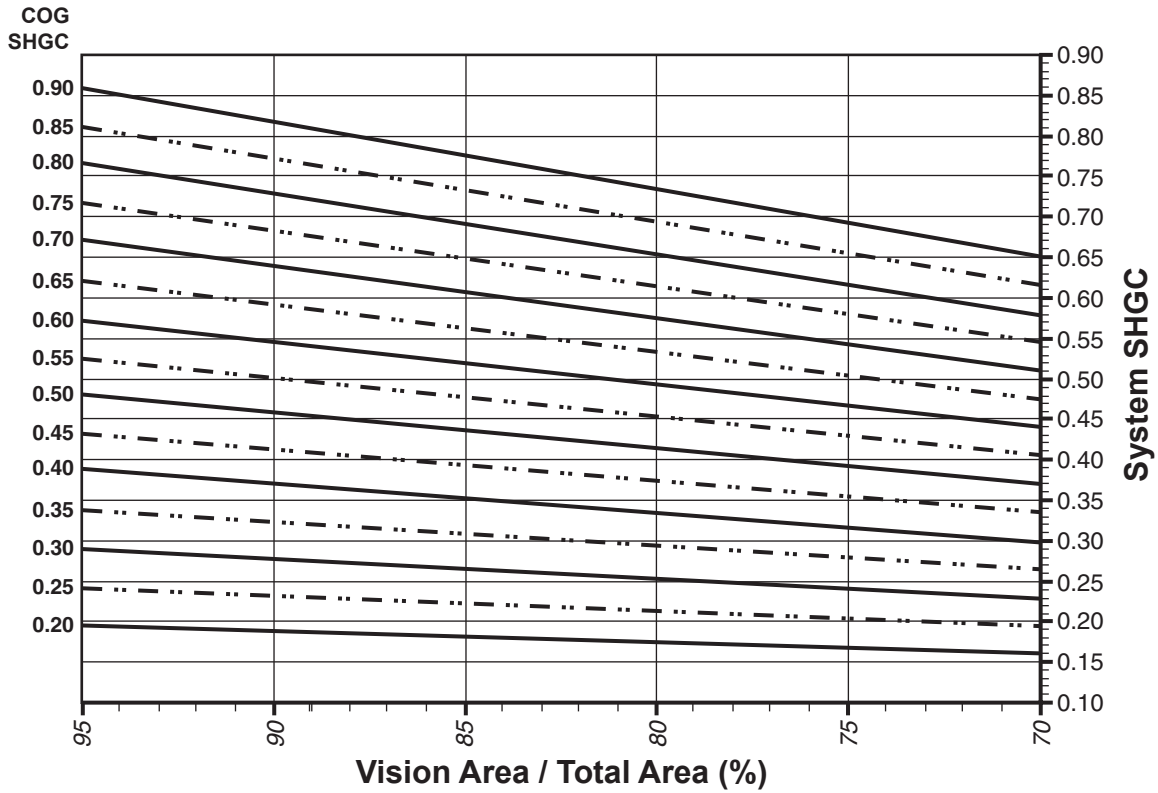
Glass properties are based on center of glass values and are obtained from your glass supplier.

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.

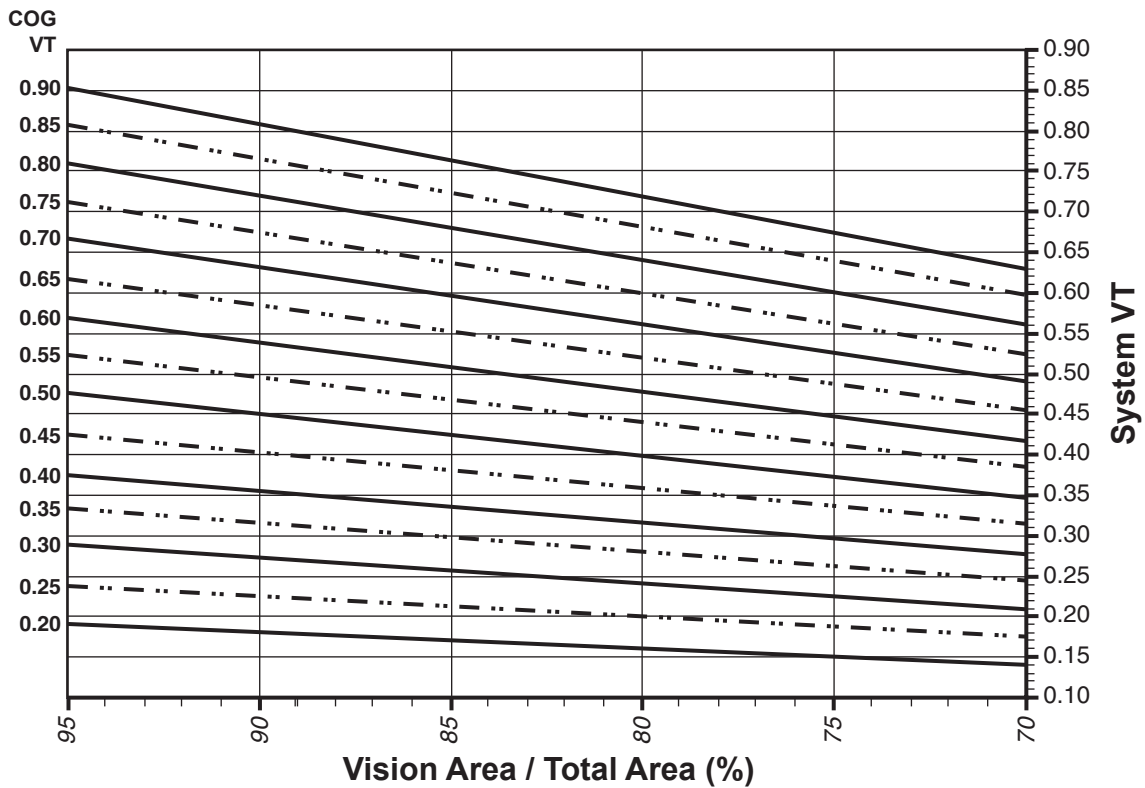
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### Trifab® VersaGlaze® 451 (CENTER – Non-Thermal)

#### 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 <sup>1</sup> (BTU/hr • ft <sup>2</sup> • °F)**

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.63
0.46	0.61
0.44	0.60
0.42	0.58
0.40	0.57
0.38	0.55
0.36	0.53
0.34	0.52
0.32	0.50
0.30	0.49
0.28	0.47
0.26	0.45
0.24	0.44
0.22	0.42
0.20	0.41

**Trifab® VersaGlaze® 451  
(CENTER – Non-Thermal)**

**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 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

**SHGC Matrix <sup>2</sup>**

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.90	0.80
0.85	0.76
0.80	0.71
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.64
0.55	0.49
0.50	0.45
0.45	0.41
0.40	0.36
0.35	0.32
0.30	0.27
0.25	0.23
0.20	0.18

**Visible Transmittance <sup>2</sup>**

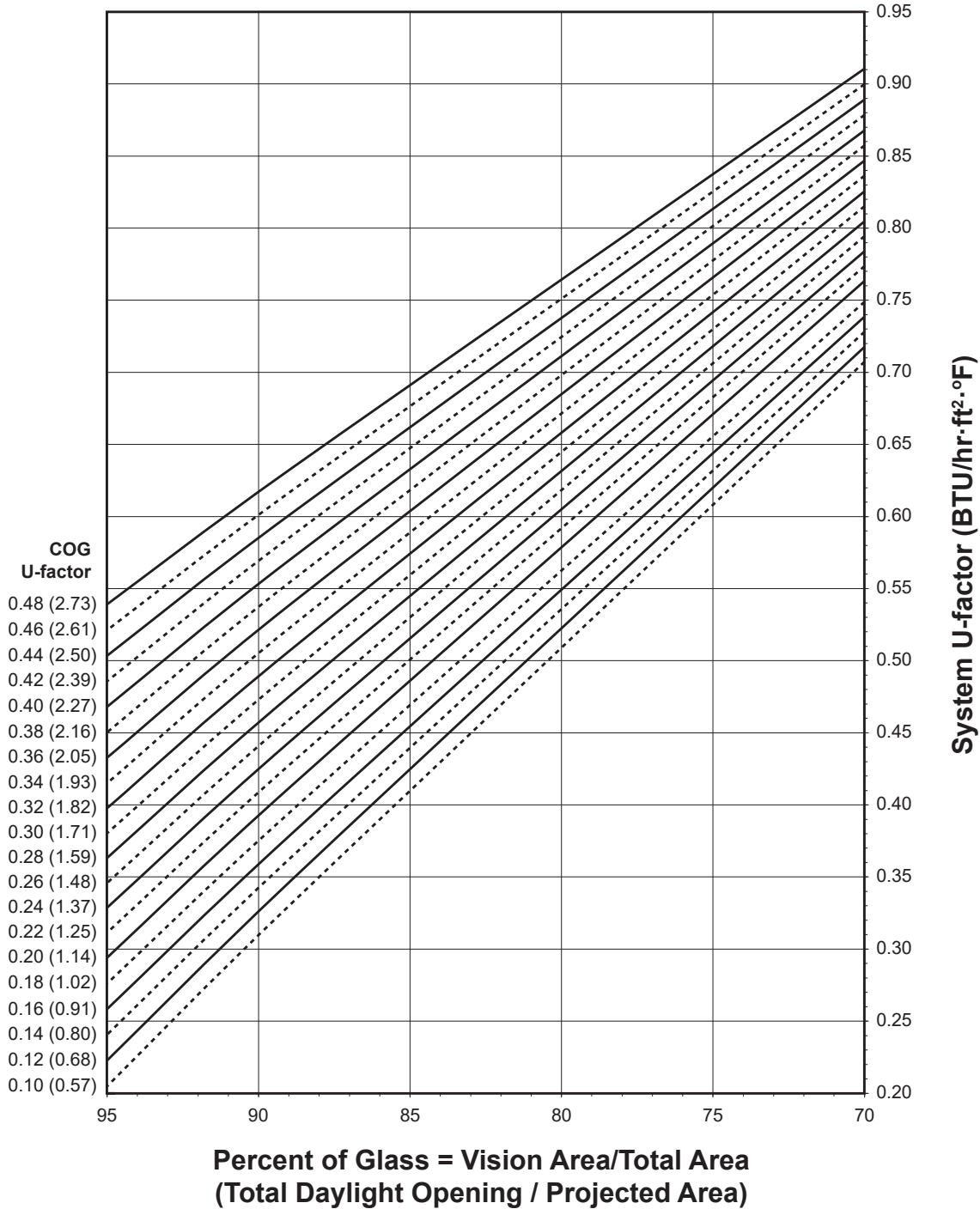
Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.90	0.79
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.57
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18

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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# Trifab® VersaGlaze® 451 Pre-Glazed (CENTER – Non-Thermal)

**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.

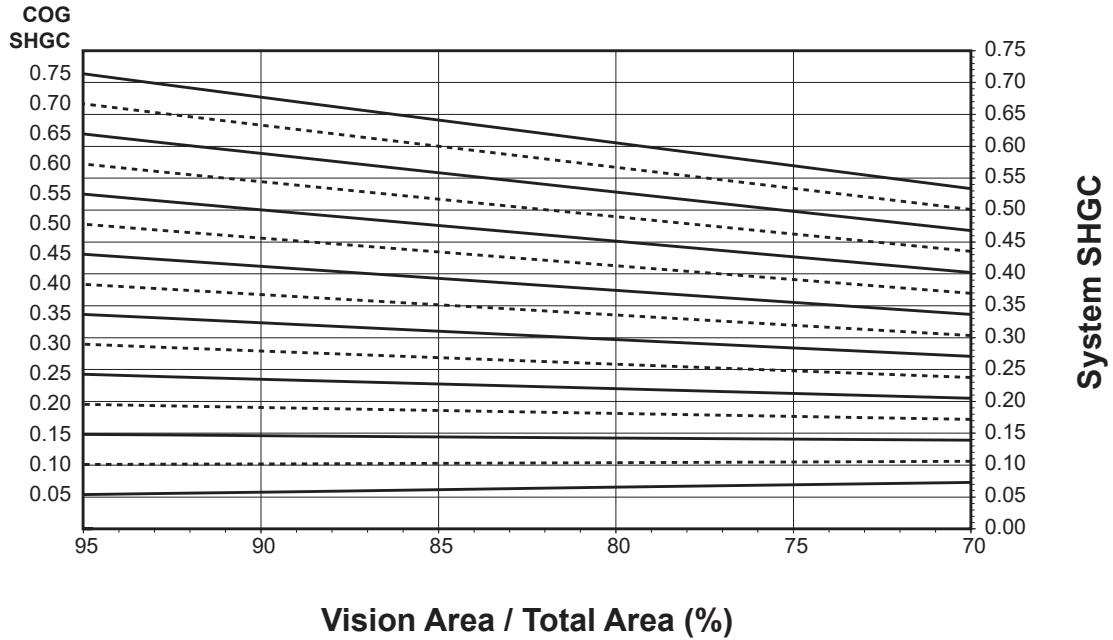
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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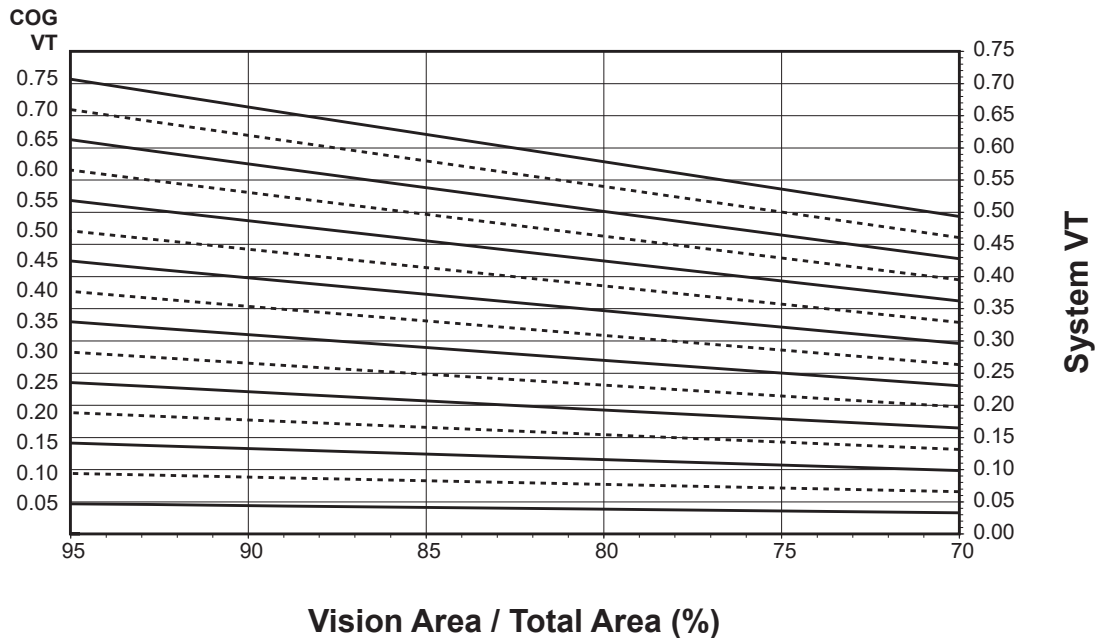
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### Trifab® VersaGlaze® 451 Pre-Glazed (CENTER – Non-Thermal)

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



#### System Visible Transmittance (VT) vs Percent of Vision Area



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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Thermal Transmittance <sup>1</sup> (BTU/hr • ft<sup>2</sup> • °F)

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.63
0.46	0.62
0.44	0.60
0.42	0.59
0.40	0.57
0.38	0.56
0.36	0.54
0.34	0.52
0.32	0.51
0.30	0.49
0.28	0.48
0.26	0.46
0.24	0.45
0.22	0.43
0.20	0.41
0.18	0.40
0.16	0.38
0.14	0.36
0.12	0.35
0.10	0.33

## Trifab® VersaGlaze® 451 Pre-Glazed (CENTER – Non-Thermal)

**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 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix <sup>2</sup>

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
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	0.41
0.40	0.36
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19
0.15	0.15
0.10	0.10
0.05	0.06

Visible Transmittance <sup>2</sup>

Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.65
0.70	0.61
0.65	0.57
0.60	0.52
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.17
0.15	0.13
0.10	0.09
0.05	0.04

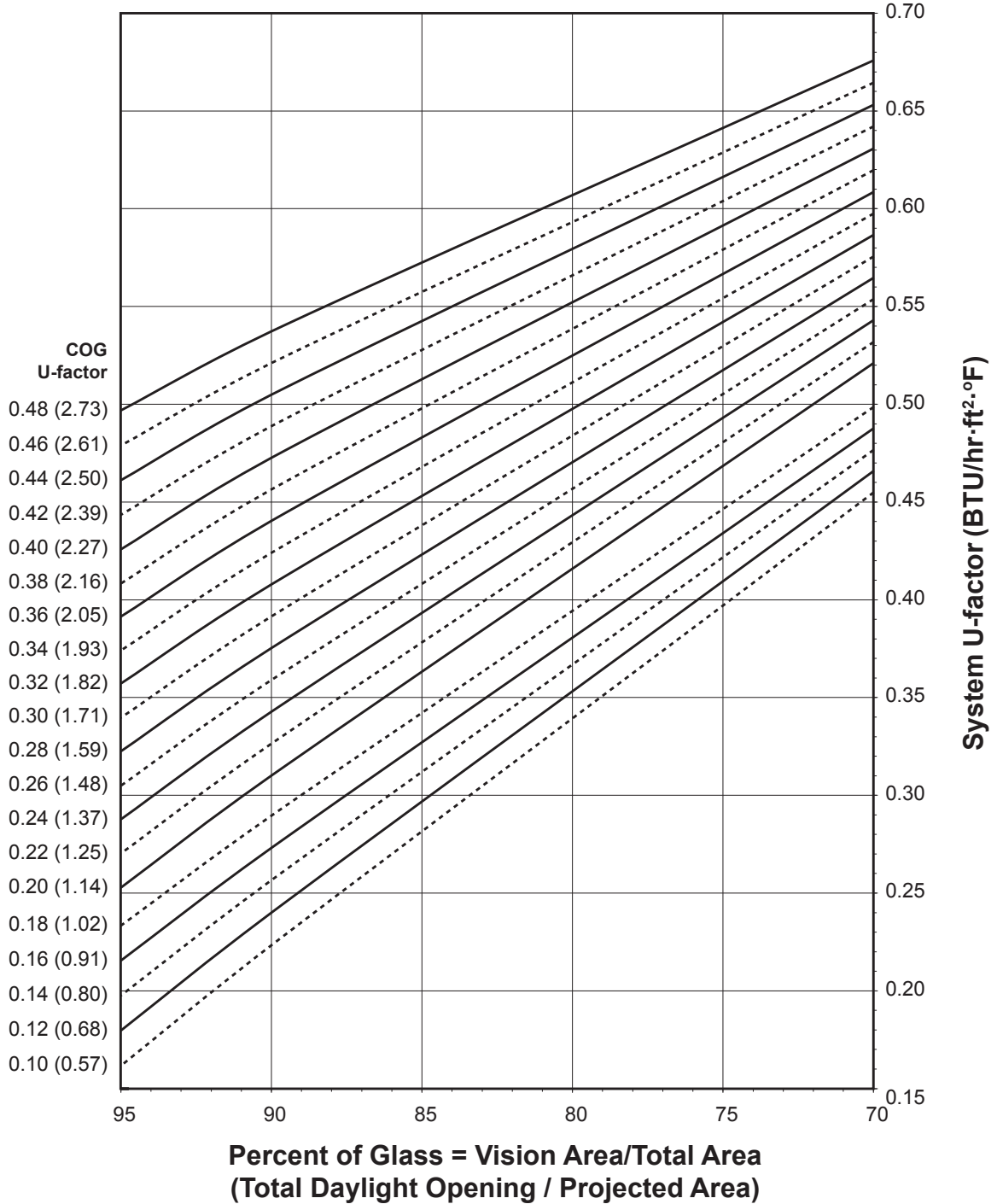
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## Trifab® VersaGlaze® 451T (CENTER – Thermal)

### 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.

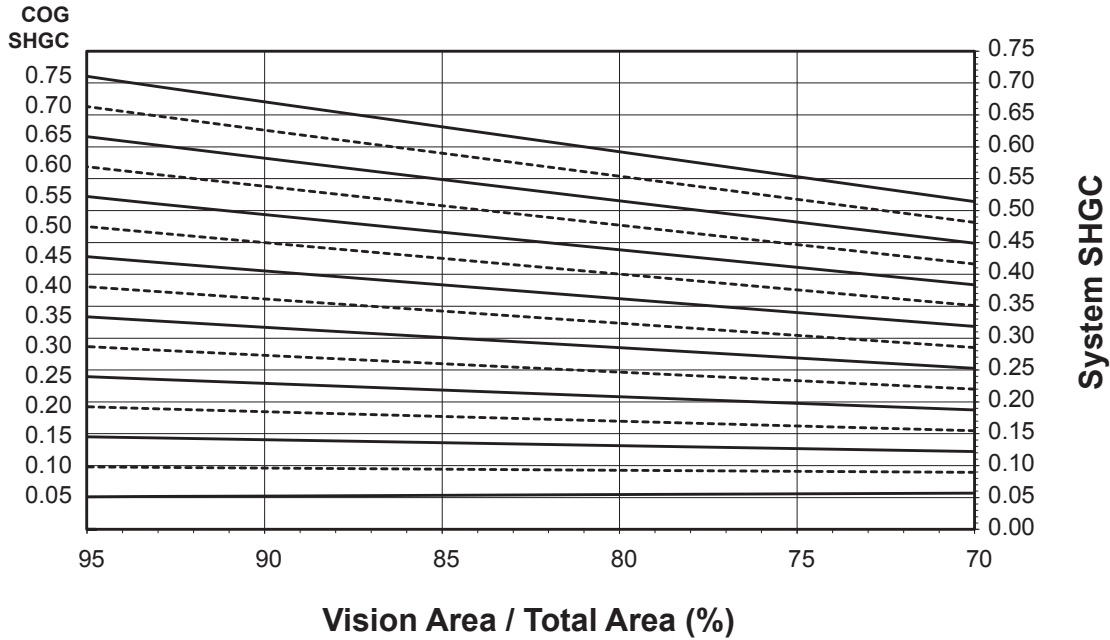
Glass properties are based on center of glass values and are obtained from your glass supplier.

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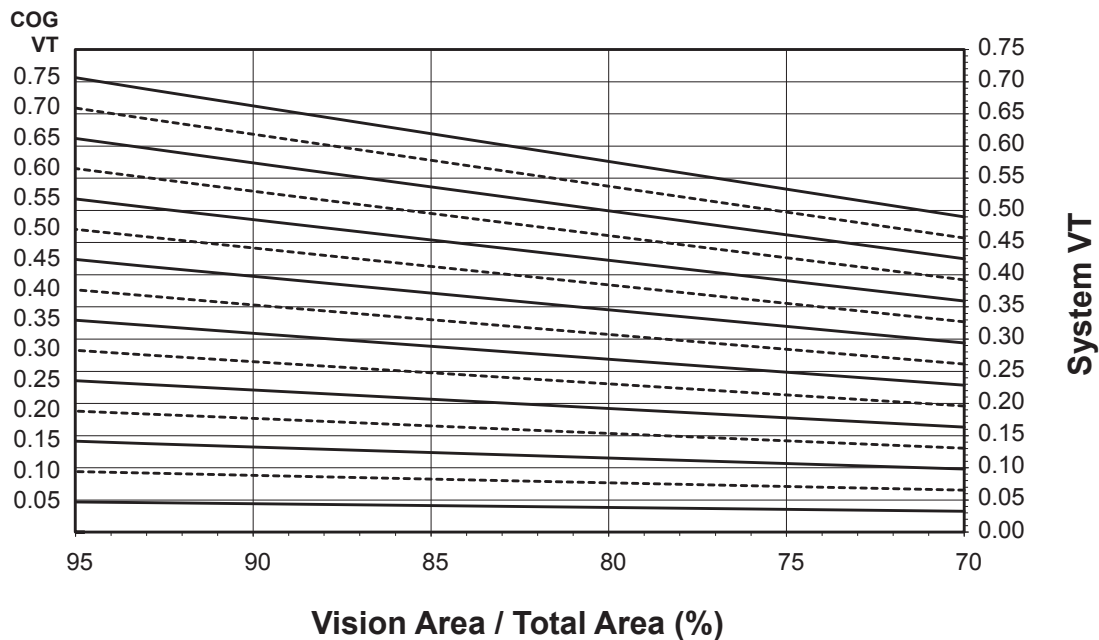
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### Trifab® VersaGlaze® 451T (CENTER – Thermal)

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



#### System Visible Transmittance (VT) vs Percent of Vision Area



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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**Thermal Transmittance <sup>1</sup> (BTU/hr • ft <sup>2</sup> • °F)**

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.54
0.46	0.52
0.44	0.51
0.42	0.49
0.40	0.48
0.38	0.46
0.36	0.44
0.34	0.43
0.32	0.41
0.30	0.40
0.28	0.38
0.26	0.36
0.24	0.35
0.22	0.33
0.20	0.32
0.18	0.29
0.16	0.28
0.14	0.26
0.12	0.25
0.10	0.23

**Trifab® VersaGlaze® 451T  
(CENTER – Thermal)**

**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 Matrices are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

**SHGC Matrix <sup>2</sup>**

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.75	0.67
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.45
0.45	0.40
0.40	0.36
0.35	0.32
0.30	0.27
0.25	0.23
0.20	0.18
0.15	0.14
0.10	0.10
0.05	0.05

**Visible Transmittance <sup>2</sup>**

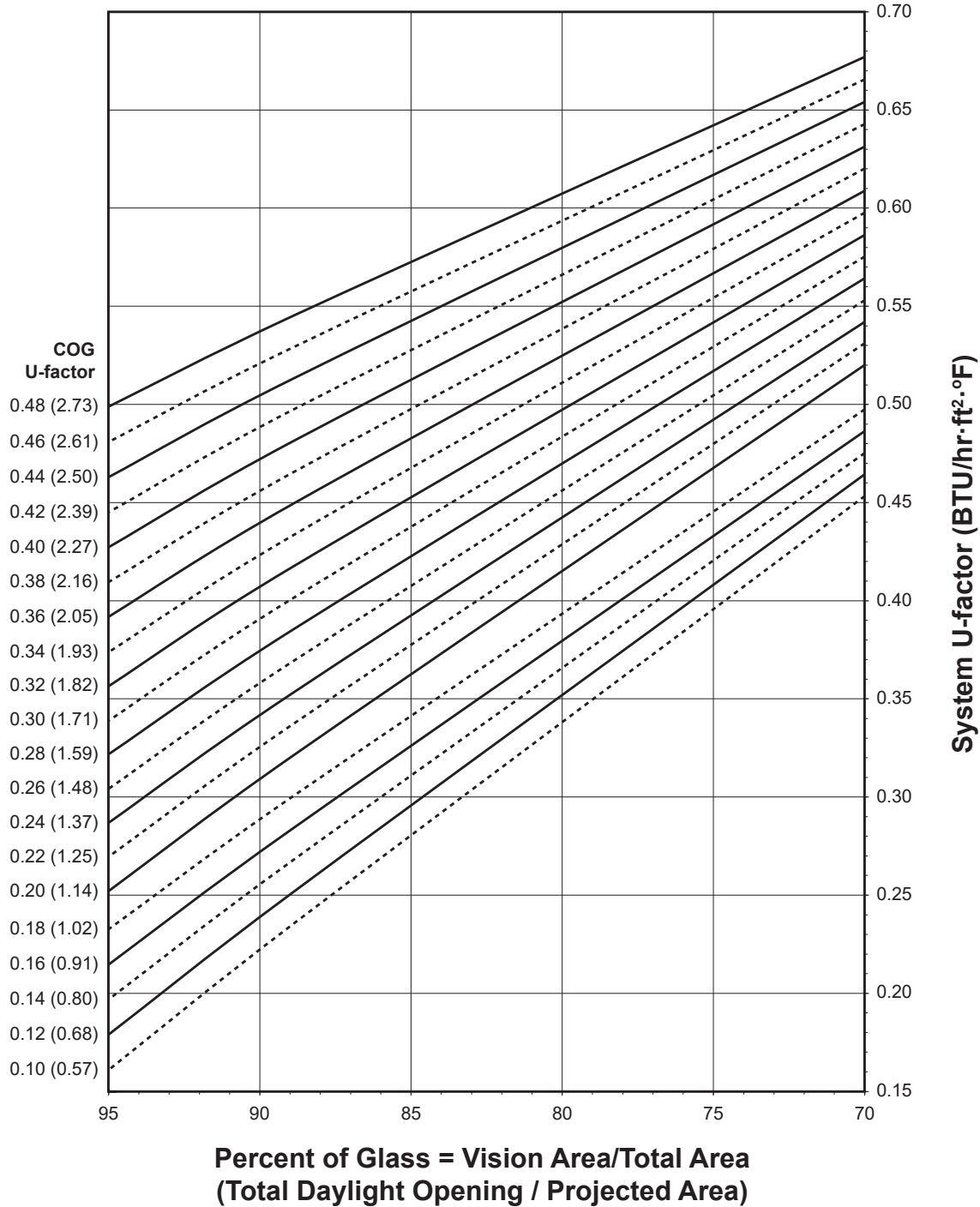
Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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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# Trifab® VersaGlaze® 451T Pre-Glazed (CENTER – Thermal)

## 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.

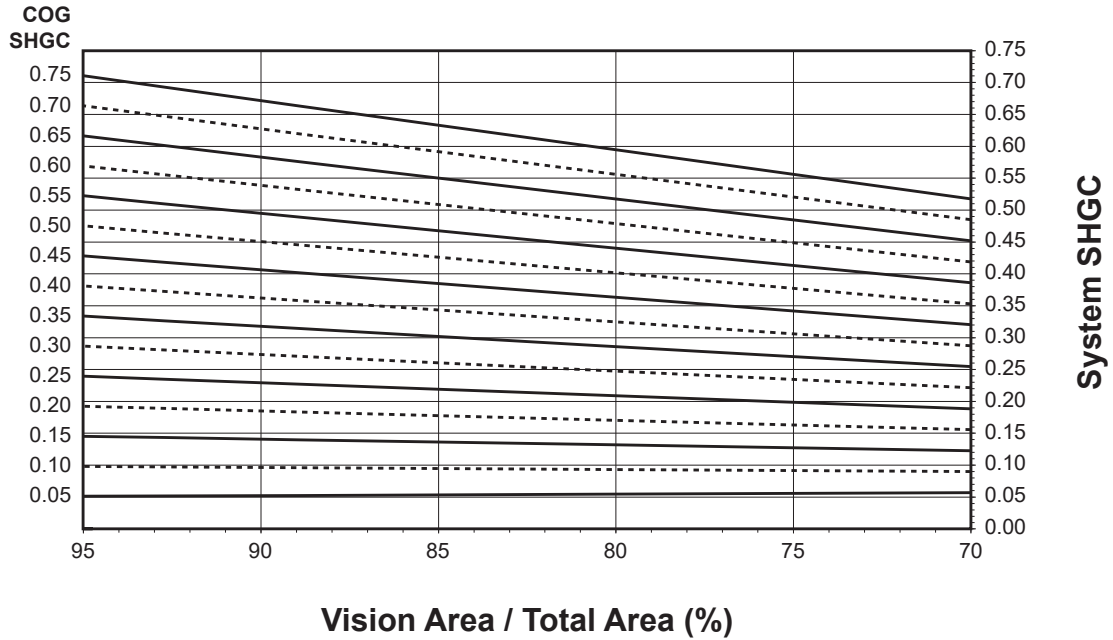
Glass properties are based on center of glass values and are obtained from your glass supplier.

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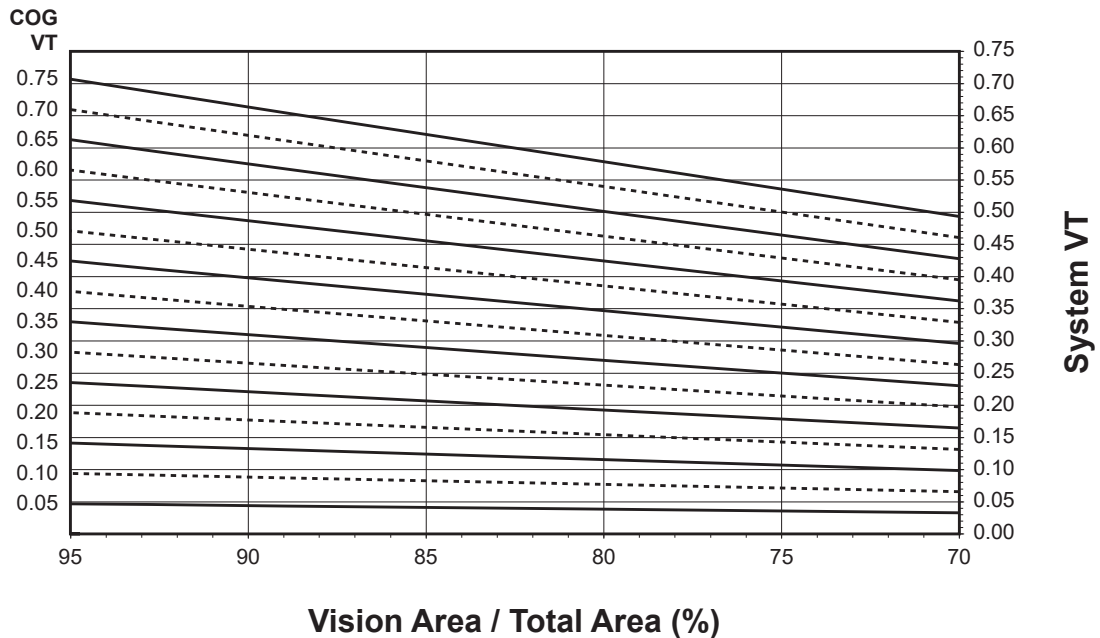
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## Trifab® VersaGlaze® 451T Pre-Glazed (CENTER – Thermal)

### 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 <sup>1</sup> (BTU/hr • ft<sup>2</sup> • °F)

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.55
0.46	0.53
0.44	0.51
0.42	0.50
0.40	0.48
0.38	0.47
0.36	0.45
0.34	0.43
0.32	0.42
0.30	0.40
0.28	0.39
0.26	0.37
0.24	0.35
0.22	0.34
0.20	0.32
0.18	0.30
0.16	0.28
0.14	0.27
0.12	0.25
0.10	0.24

## Trifab® VersaGlaze® 451T Pre-Glazed (CENTER – Thermal)

**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 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix <sup>2</sup>

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
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	0.23
0.20	0.18
0.15	0.14
0.10	0.10
0.05	0.05

Visible Transmittance <sup>2</sup>

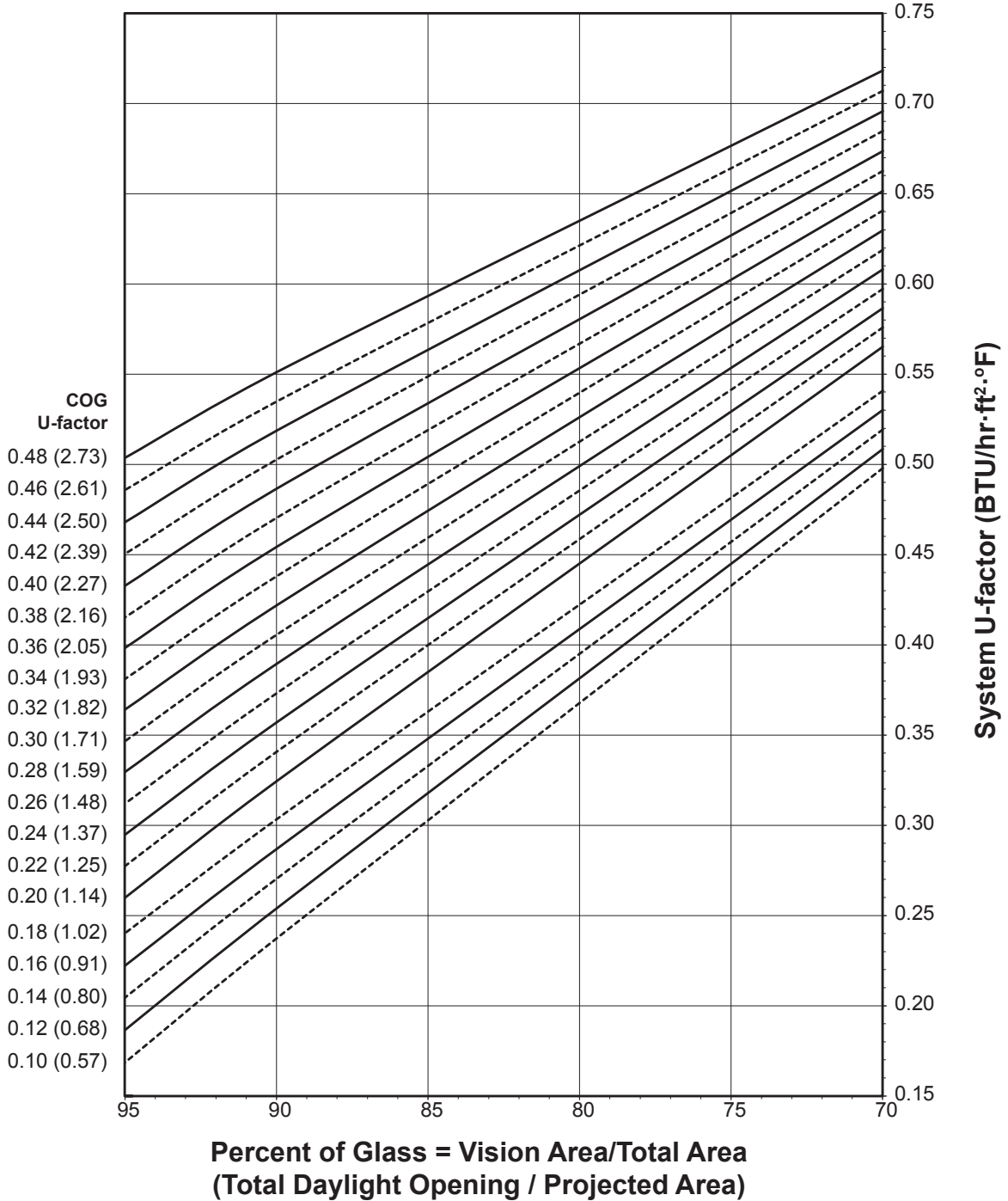
Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.65
0.70	0.61
0.65	0.57
0.60	0.52
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.17
0.15	0.13
0.10	0.09
0.05	0.04

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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## Trifab® VersaGlaze® 451T (FRONT – Thermal)

### 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.

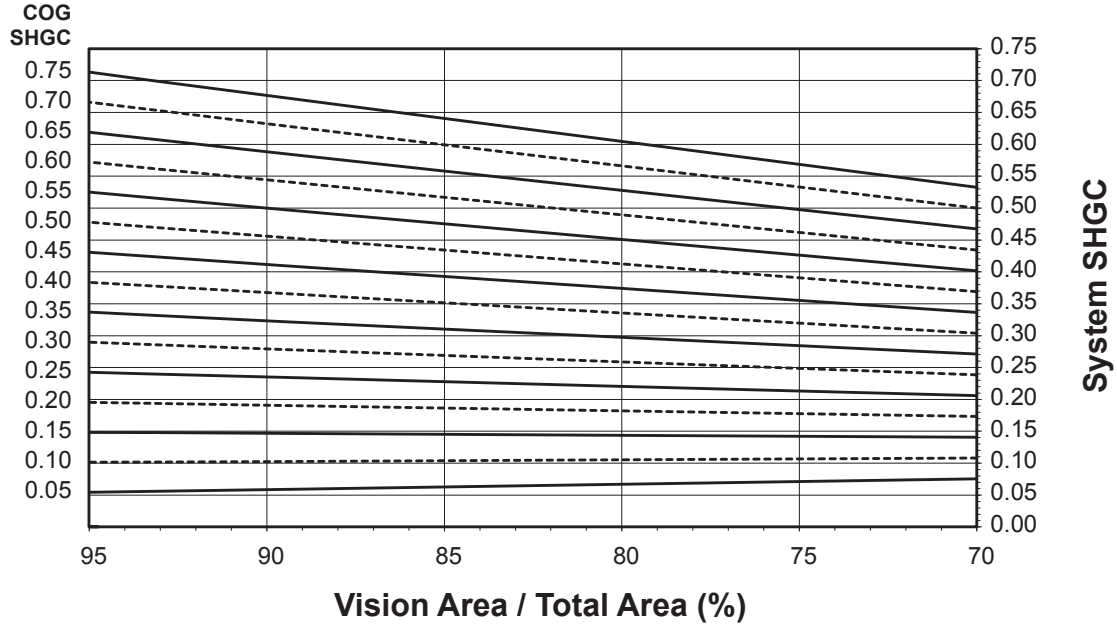
Glass properties are based on center of glass values and are obtained from your glass supplier.

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.

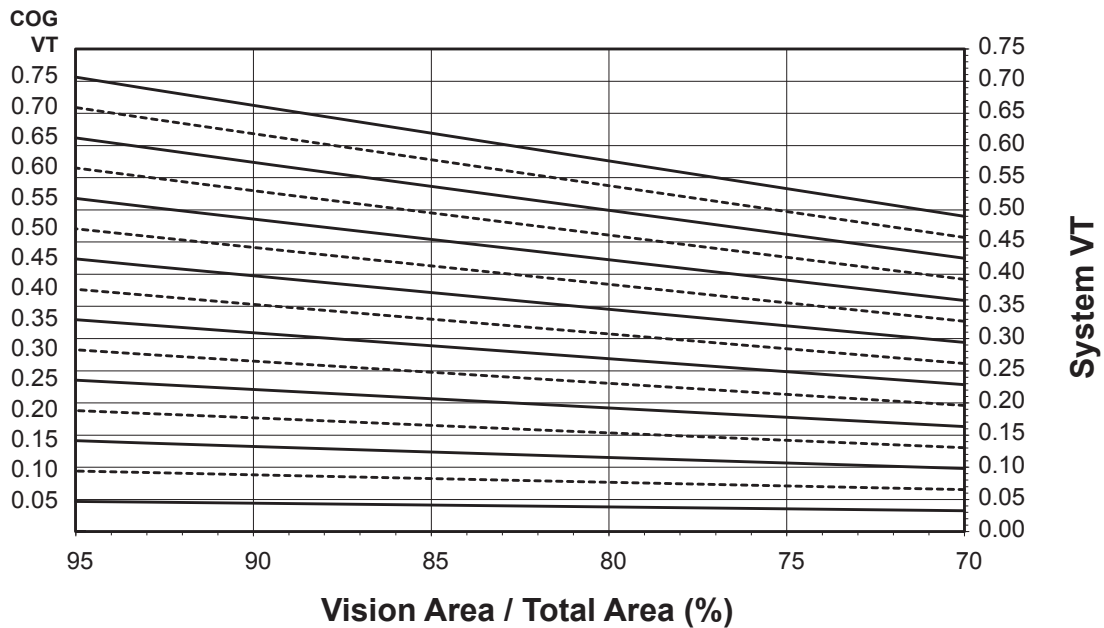
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## Trifab® VersaGlaze® 451T (FRONT – Thermal)

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



### System Visible Transmittance (VT) vs Percent of Vision Area



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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**Thermal Transmittance <sup>1</sup> (BTU/hr • ft <sup>2</sup> • °F)**

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.56
0.46	0.54
0.44	0.52
0.42	0.51
0.40	0.49
0.38	0.48
0.36	0.46
0.34	0.44
0.32	0.43
0.30	0.41
0.28	0.40
0.26	0.38
0.24	0.36
0.22	0.35
0.20	0.33
0.18	0.31
0.16	0.29
0.14	0.28
0.12	0.26
0.10	0.24

**Trifab® VersaGlaze® 451T  
(FRONT – Thermal)**

**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 Matrices are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

**SHGC Matrix <sup>2</sup>**

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.75	0.67
0.70	0.63
0.65	0.59
0.60	0.54
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
0.15	0.15
0.10	0.10
0.05	0.06

**Visible Transmittance <sup>2</sup>**

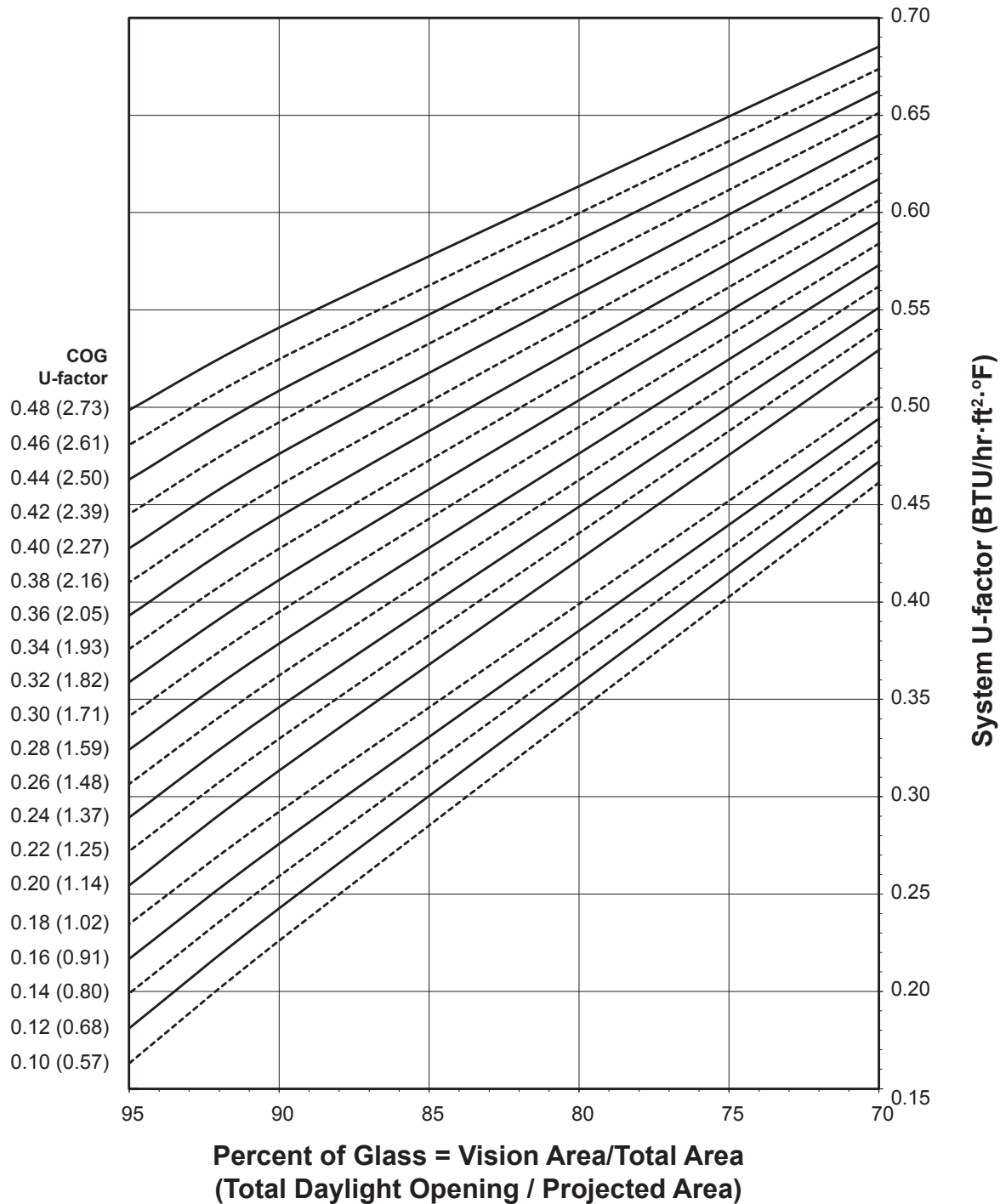
Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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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## Trifab® VersaGlaze® 451T (BACK – Thermal)

**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.

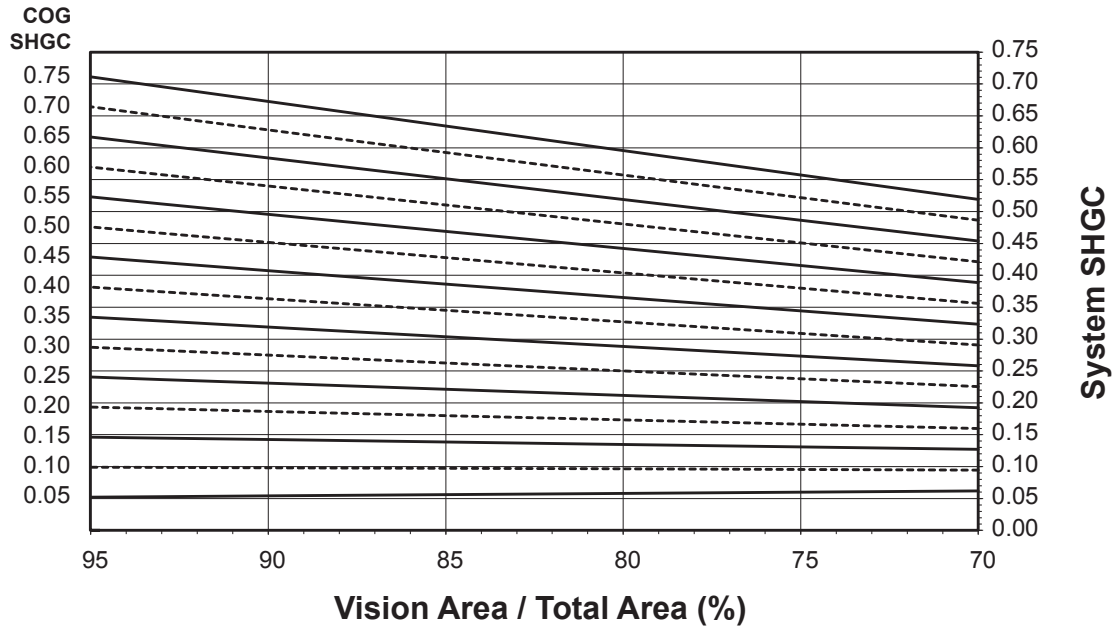
Glass properties are based on center of glass values and are obtained from your glass supplier.

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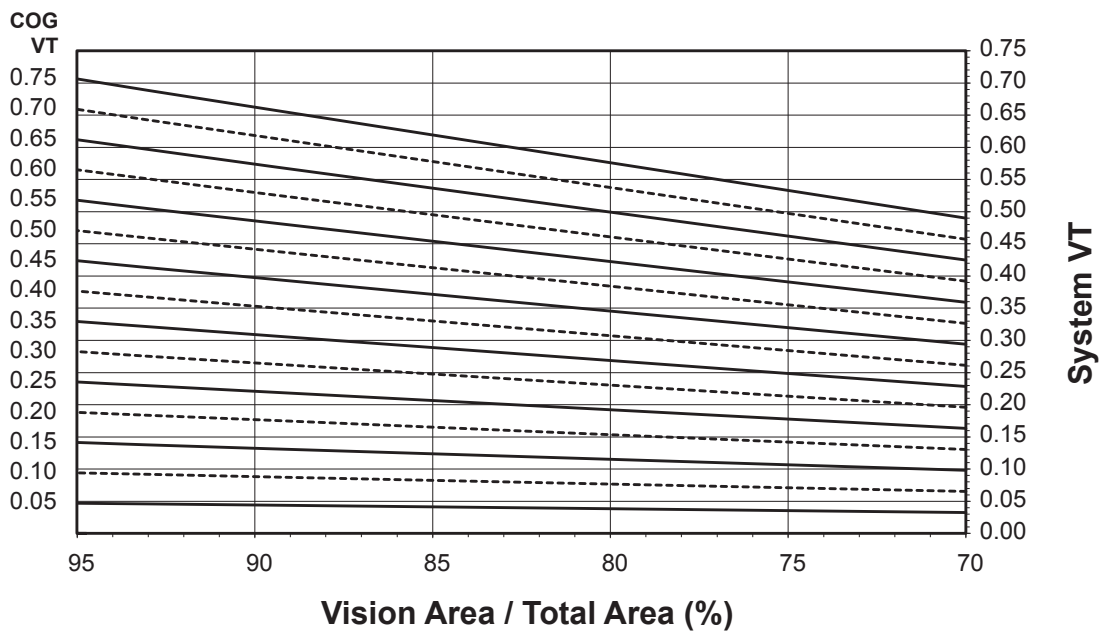
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### Trifab® VersaGlaze® 451T (BACK – Thermal)

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



#### System Visible Transmittance (VT) vs Percent of Vision Area



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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Thermal Transmittance <sup>1</sup> (BTU/hr • ft<sup>2</sup> • °F)

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.54
0.46	0.53
0.44	0.51
0.42	0.50
0.40	0.48
0.38	0.46
0.36	0.45
0.34	0.43
0.32	0.42
0.30	0.40
0.28	0.38
0.26	0.37
0.24	0.35
0.22	0.34
0.20	0.32
0.18	0.30
0.16	0.28
0.14	0.26
0.12	0.25
0.10	0.23

Trifab® VersaGlaze® 451T  
(BACK – Thermal)

**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 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix <sup>2</sup>

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.75	0.67
0.70	0.62
0.65	0.58
0.60	0.54
0.55	0.49
0.50	0.45
0.45	0.41
0.40	0.36
0.35	0.32
0.30	0.27
0.25	0.23
0.20	0.19
0.15	0.14
0.10	0.10
0.05	0.05

Visible Transmittance <sup>2</sup>

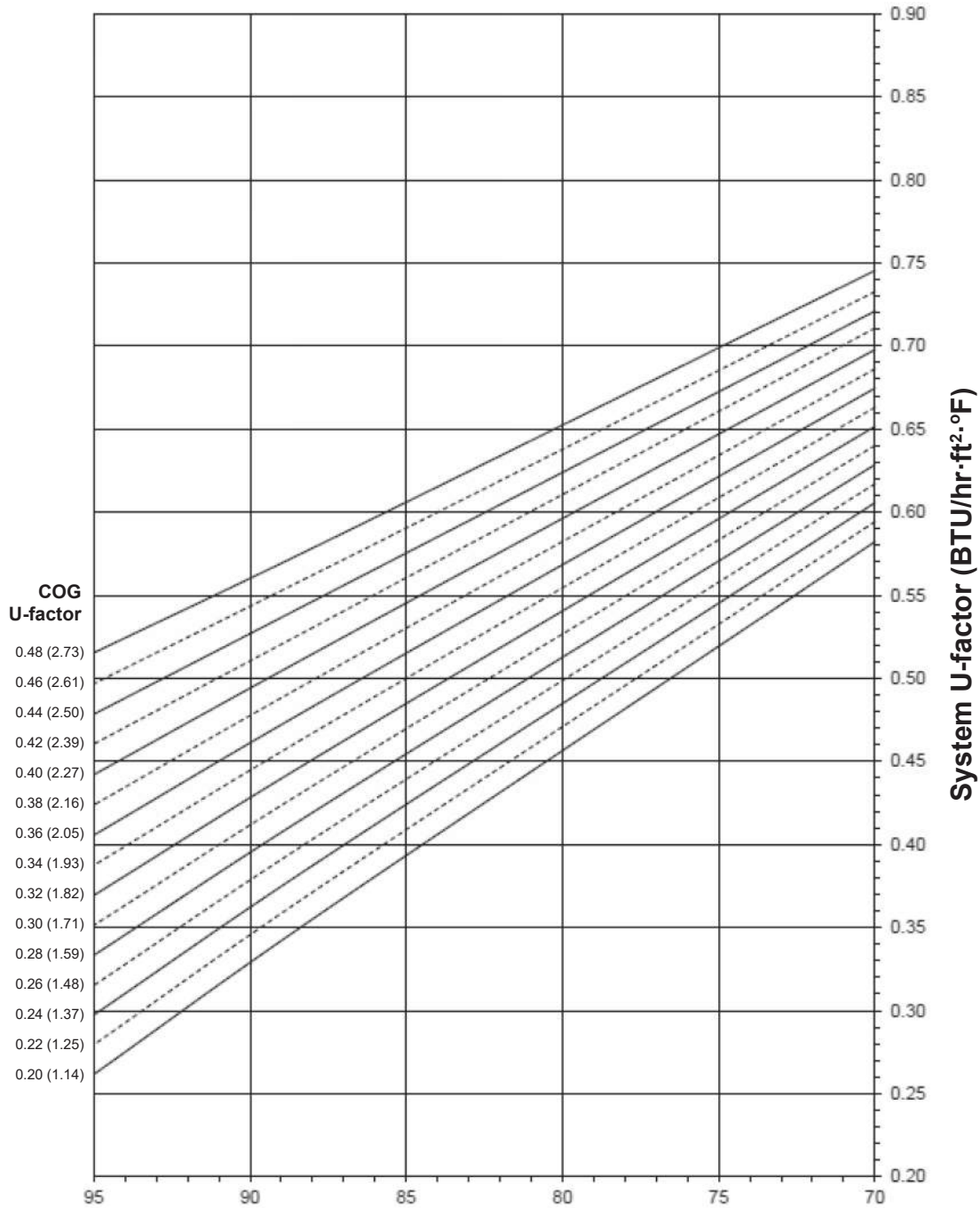
Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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## Trifab® VersaGlaze® 451T with Steel (CENTER)

### System U-factor vs Percent of Glass Area



**Percent of Glass = Vision Area/Total Area  
(Total Daylight Opening / Projected Area)**

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

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

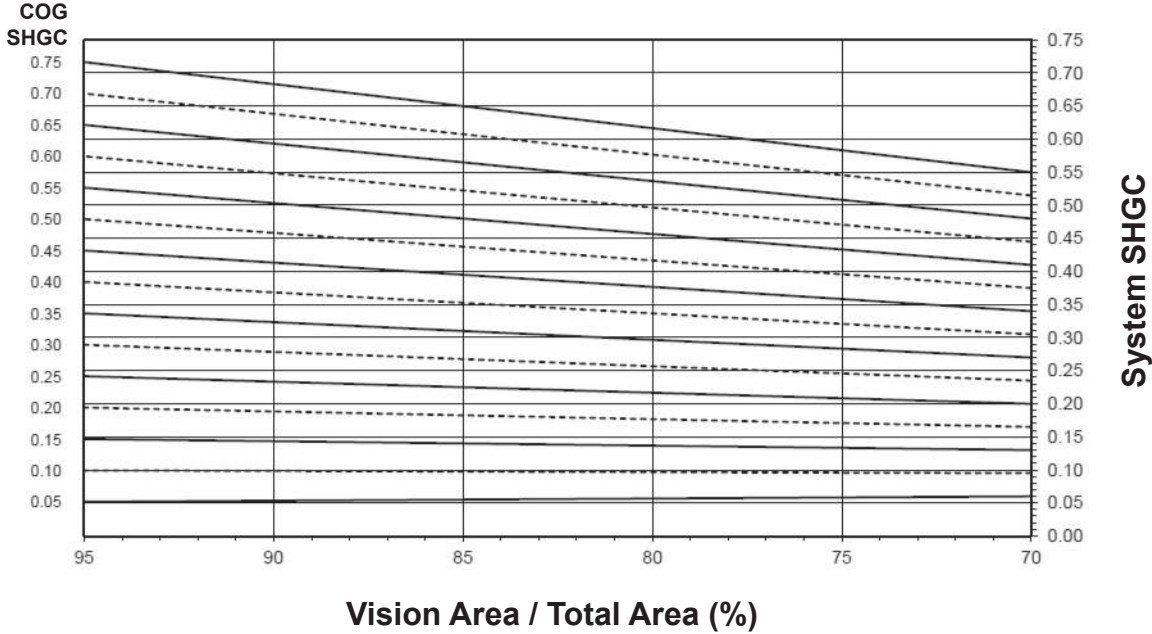
Glass properties are based on center of glass values and are obtained from your glass supplier.

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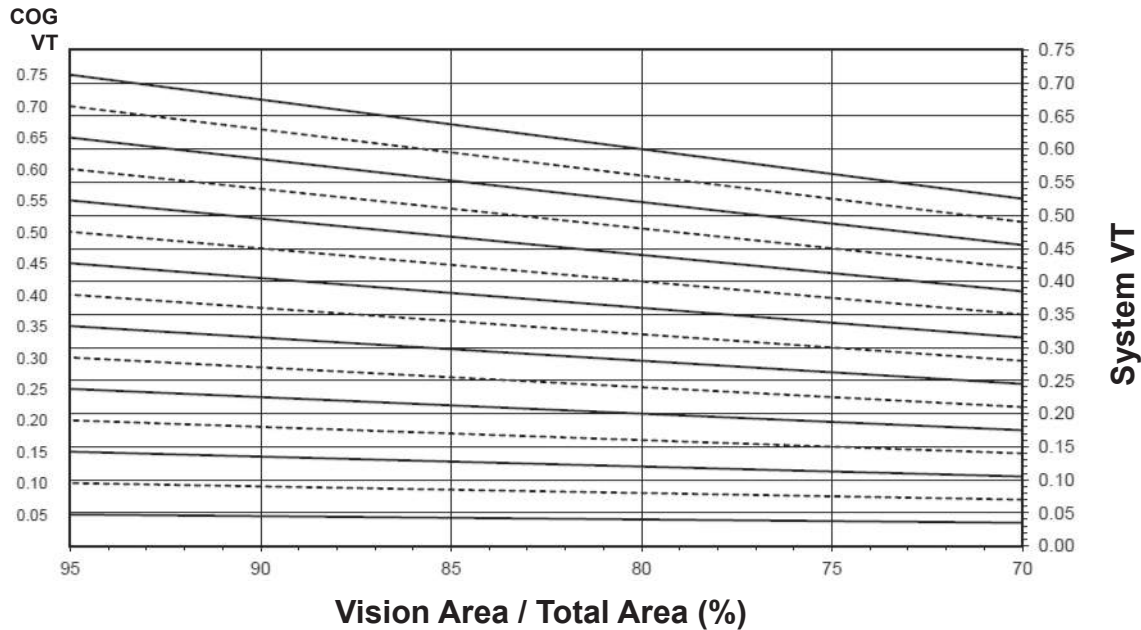
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## Trifab® VersaGlaze® 451T with Steel (CENTER)

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



### System Visible Transmittance (VT) vs Percent of Vision Area



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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**Thermal Transmittance <sup>1</sup> (BTU/hr • ft<sup>2</sup> • °F)**

Glass U-Factor <sup>3</sup>	Overall U-Factor <sup>4</sup>
0.48	0.59
0.46	0.57
0.44	0.55
0.42	0.54
0.40	0.52
0.38	0.51
0.36	0.49
0.34	0.48
0.32	0.46
0.30	0.44
0.28	0.43
0.26	0.41
0.24	0.40
0.22	0.38
0.20	0.37

**Trifab® VersaGlaze® 451T with Steel (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 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

**SHGC Matrix <sup>2</sup>**

Glass SHGC <sup>3</sup>	Overall SHGC <sup>4</sup>
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.45
0.45	0.40
0.40	0.36
0.35	0.32
0.30	0.27
0.25	0.23
0.20	0.19
0.15	0.14
0.10	0.10
0.05	0.05

**Visible Transmittance <sup>2</sup>**

Glass VT <sup>3</sup>	Overall VT <sup>4</sup>
0.75	0.65
0.70	0.61
0.65	0.57
0.60	0.52
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.17
0.15	0.13
0.10	0.09
0.05	0.04

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