Features

- Trifab® VG 451/451T is 4-1/2" deep with a 2" sightline
- Front, Center, Back or Multi-Plane glass applications
- Flush glazed from either the inside or outside
- Screw Spline, Shear Block, Stick or Type-B fabrication
- SSG / Weatherseal option
- Isolock® lanced and debridged thermal break option with Trifab® VG 451T
- Infill options up to 1-1/8" thickness
- Permanodic® anodized finishes in 7 choices
- Painted finishes in standard and custom choices

Optional Features

- High performance interlocking flashing
- Acoustical rating per AAMA 1801 and ASTM E 1425
- Project specific U-factors (See Thermal Charts)

Product Applications

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

For specific product applications,
Consult your Kawneer representative.

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EC 97911-43

LAWS AND BUILDING AND SAFETY CODES GOVERNING THE DESIGN AND USE OF 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.

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

Kawneer reserves the right to change configurations without prior notice when deemed necessary for product improvement.

TRIFAB® VG 451/451T

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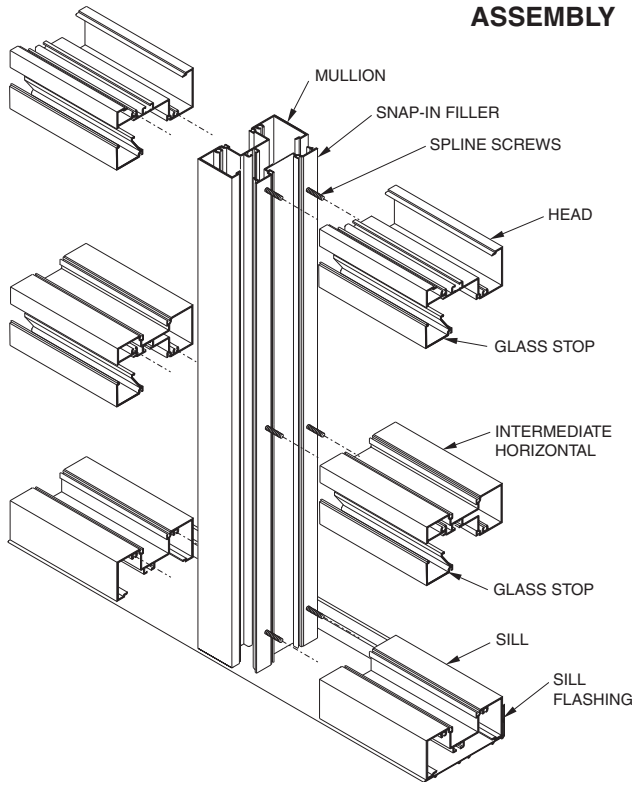
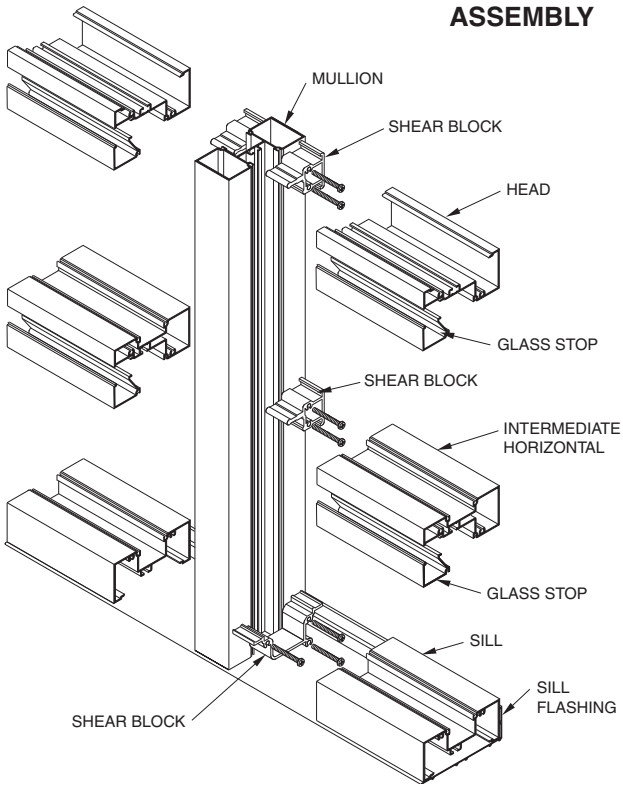
The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

SCREW SPLINE ASSEMBLY

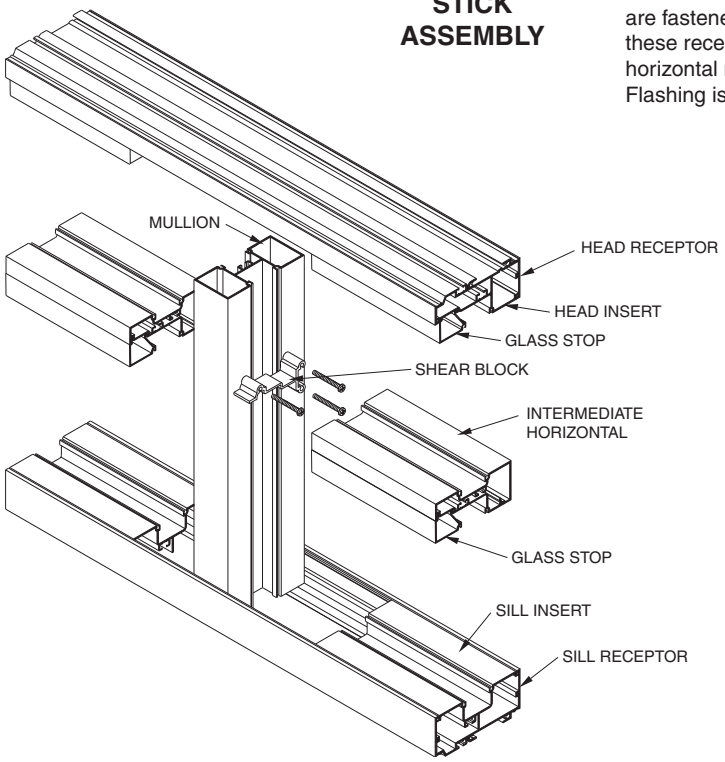


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



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

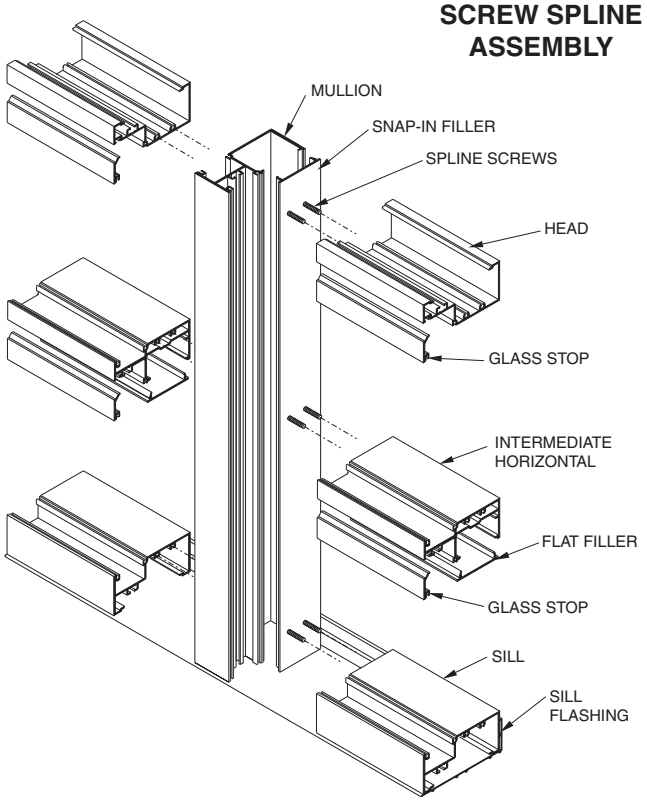
NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 14)

TRIFAB® VG 451/451T

PICTORIAL VIEW (FRONT)

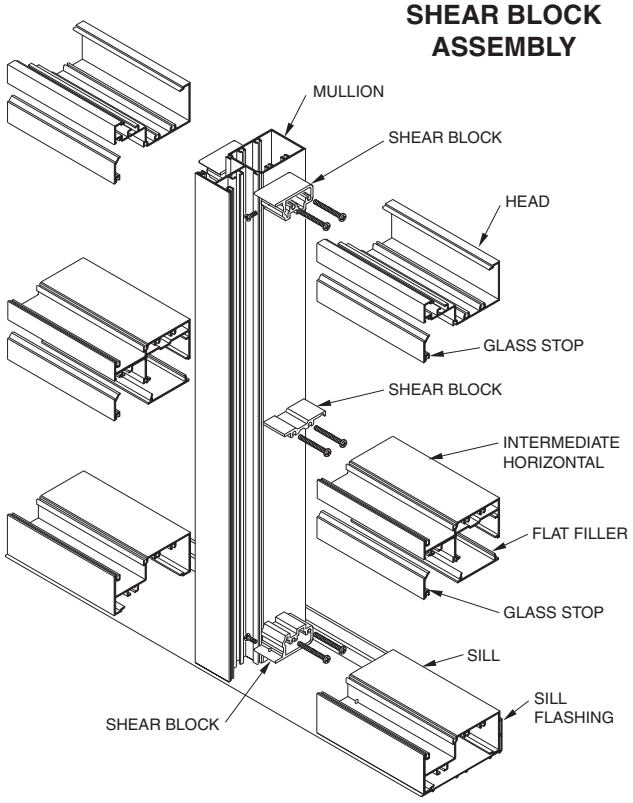
The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

SCREW SPLINE ASSEMBLY

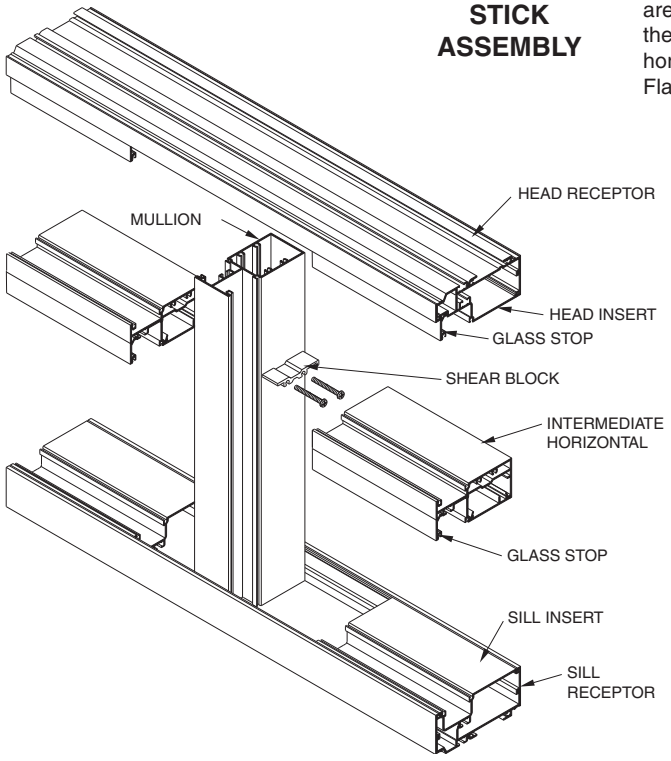


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



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NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 36)

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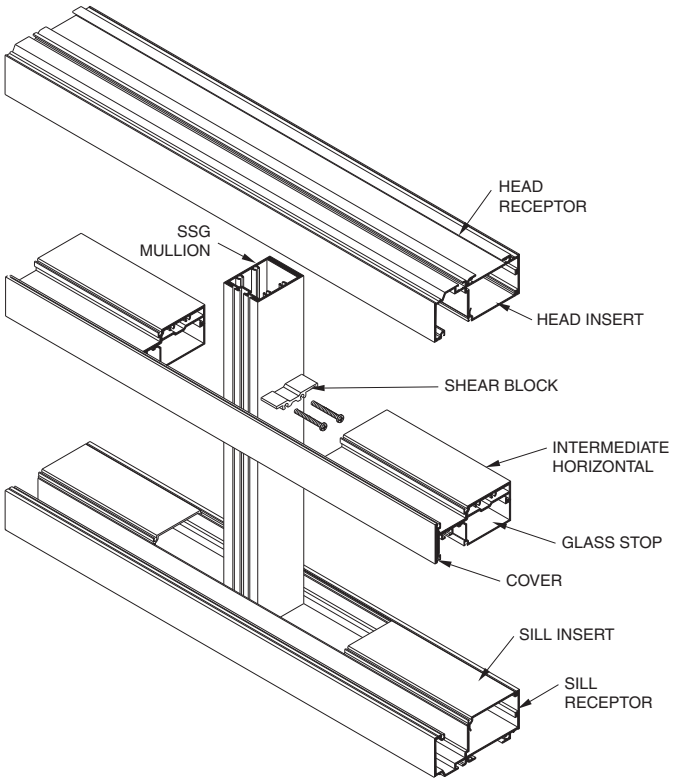
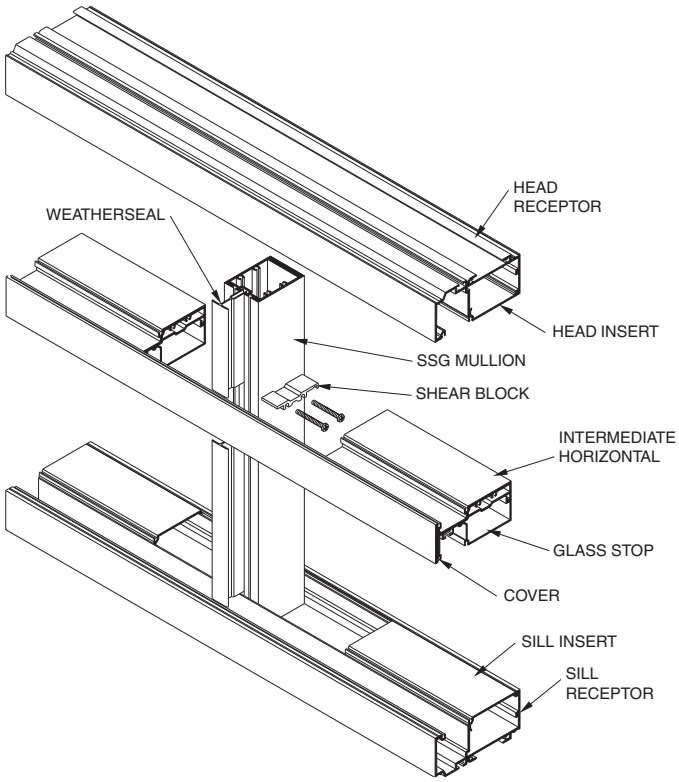
STICK ASSEMBLY (SSG)



STICK ASSEMBLY (WEATHERSEAL)



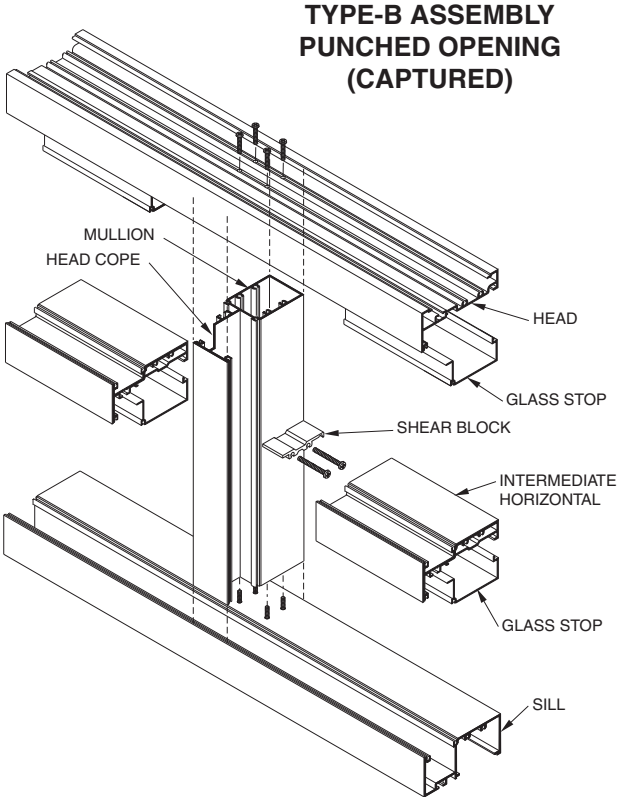
NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 36)

TRIFAB® VG 451/451T

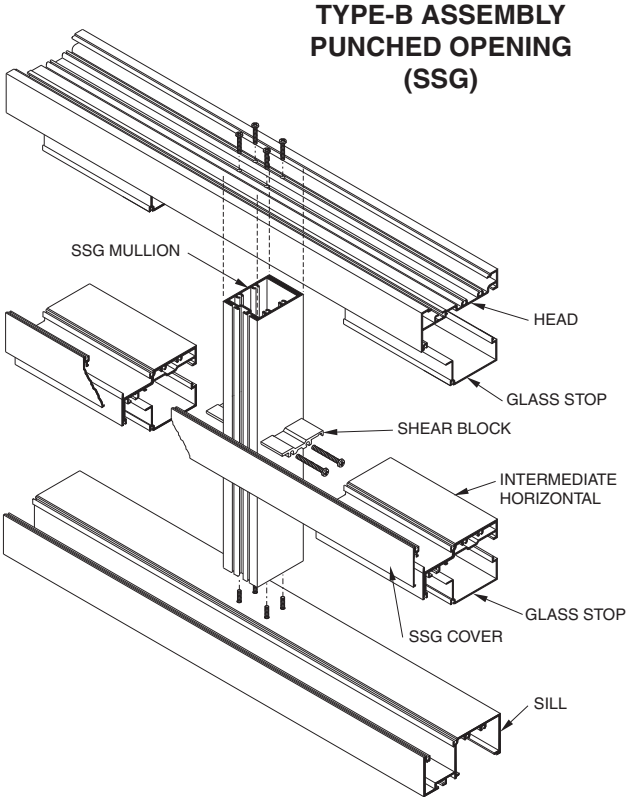
PICTORIAL VIEW (FRONT)

The **TYPE-B** 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.

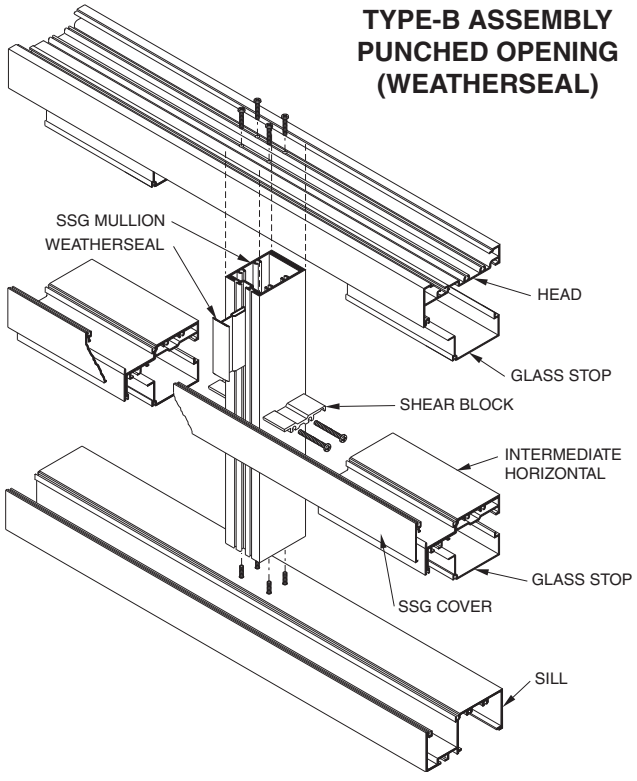
TYPE-B ASSEMBLY PUNCHED OPENING (CAPTURED)



TYPE-B ASSEMBLY PUNCHED OPENING (SSG)

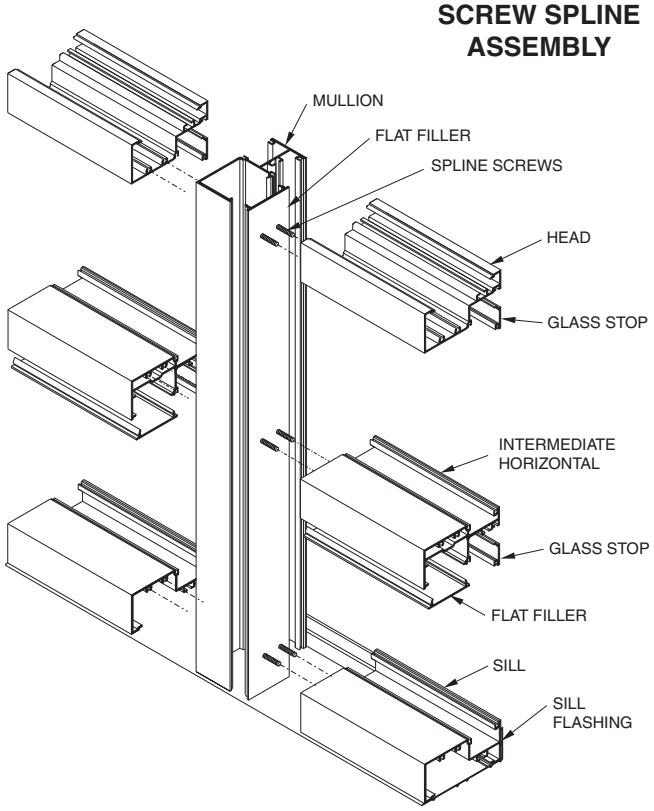


TYPE-B ASSEMBLY PUNCHED OPENING (WEATHERSEAL)



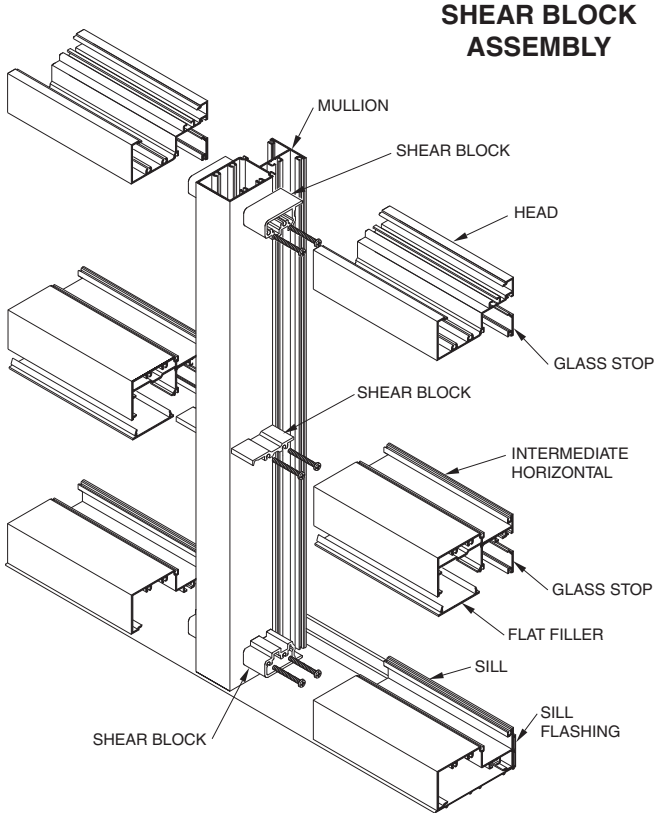
The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

SCREW SPLINE ASSEMBLY

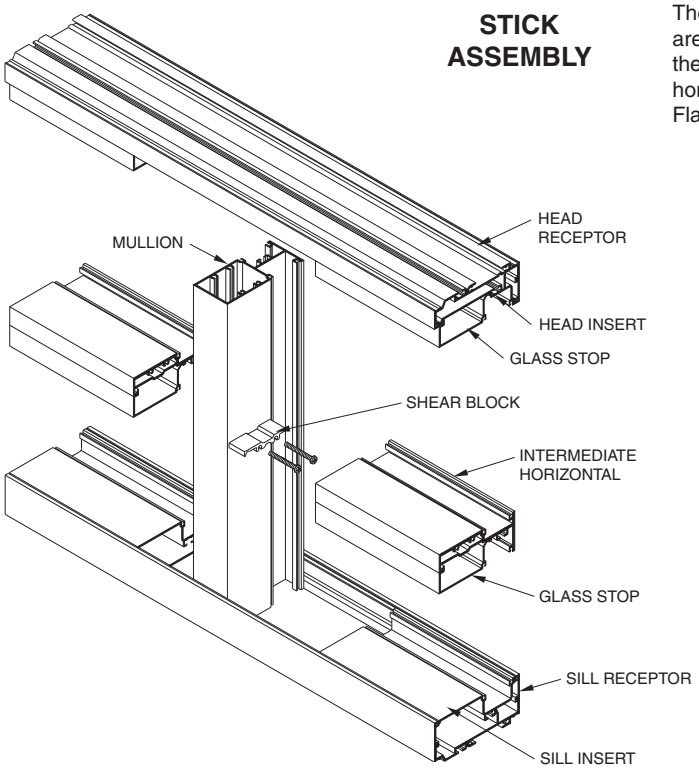


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

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 windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used.

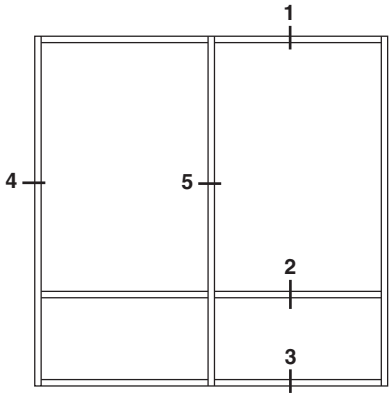
TRIFAB® VG 451/451T

MAY, 2012

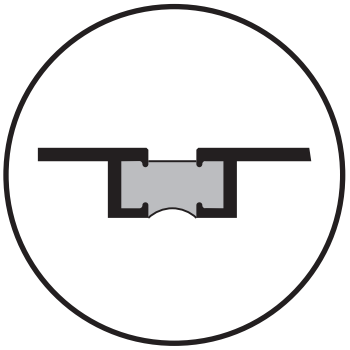
BASIC FRAMING DETAILS (CENTER - Outside Glazed)

EC 97911-43

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

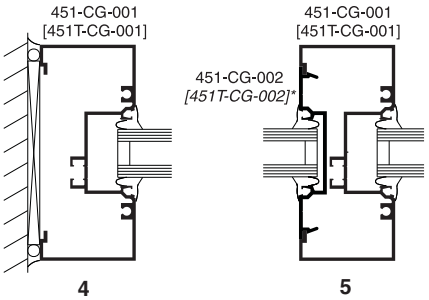


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

***Note: See Misc. Details for Thermal Pocket Filler and Thermal Flashing.**

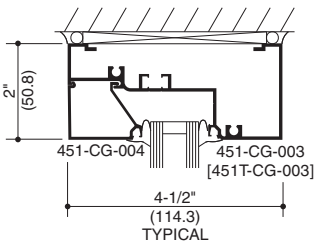
SCREW SPLINE

CAD Details (TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

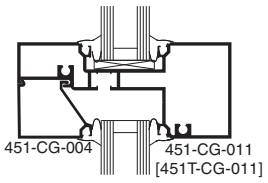


4 JAMB **5 VERTICAL**

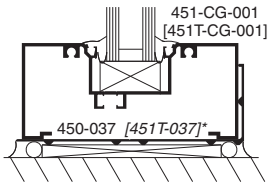
1 HEAD



2 HORIZONTAL



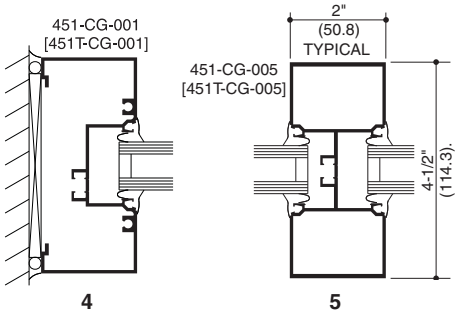
3 SILL



*See Page 14 for Thermal Flashing and Optional High Performance Flashing

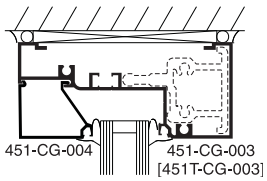
SHEAR BLOCK

CAD Details (TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

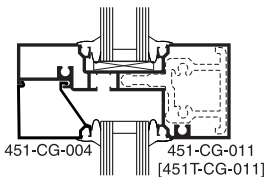


4 JAMB **5 VERTICAL**

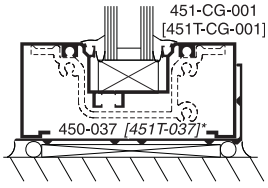
1 HEAD



2 HORIZONTAL



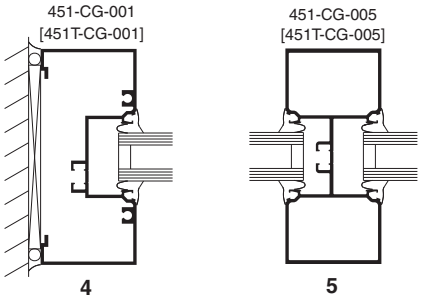
3 SILL



*See Page 14 for Thermal Flashing and Optional High Performance Flashing

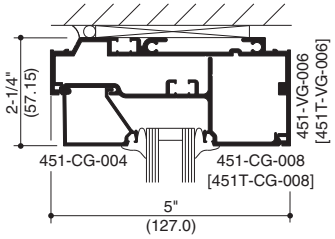
STICK

CAD Details (TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip

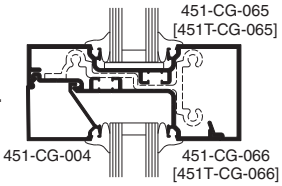


4 JAMB **5 VERTICAL**

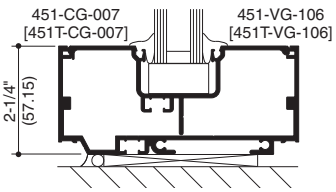
1 HEAD



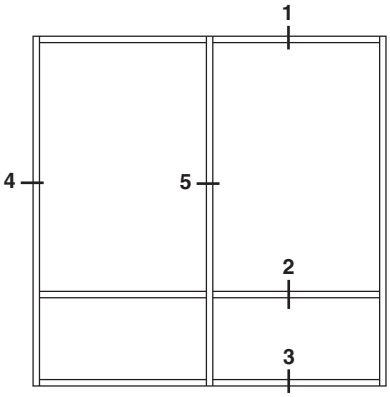
2 HORIZONTAL



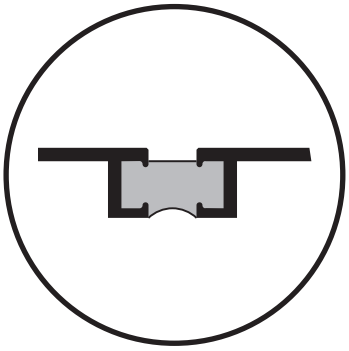
3 SILL



SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS



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***Note: See Misc. Details for Thermal Pocket Filler and Thermal Flashing.**

SCREW SPLINE

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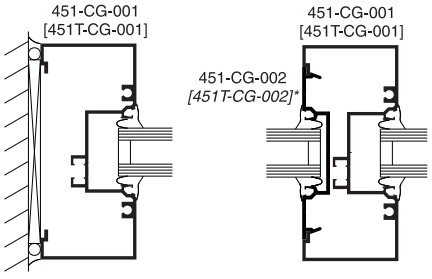
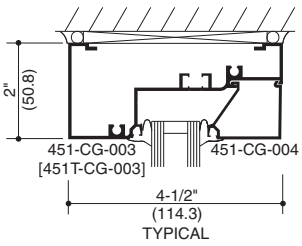
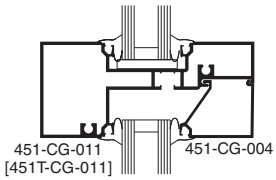


4 JAMB **5 VERTICAL**

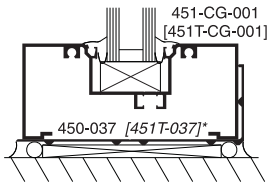
1 HEAD



2 HORIZONTAL



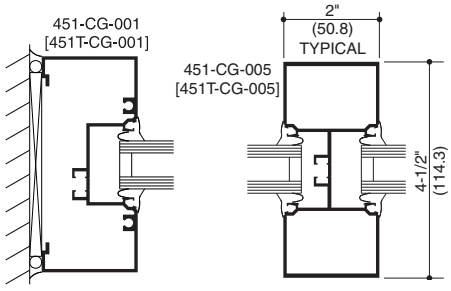
3 SILL



*See Page 14 for Thermal Flashing and Optional High Performance Flashing

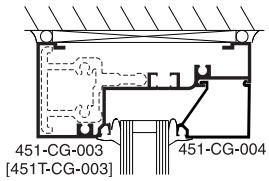
SHEAR BLOCK

CAD Details (TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

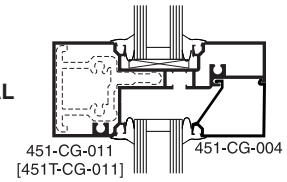


4 JAMB **5 VERTICAL**

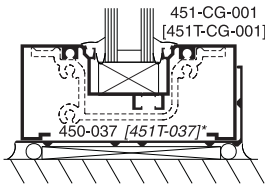
1 HEAD



2 HORIZONTAL



3 SILL



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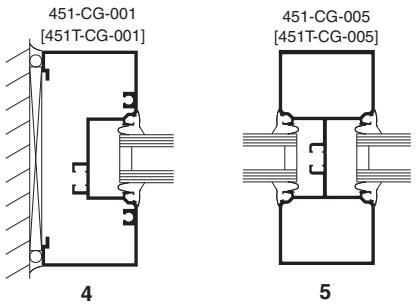
STICK

CAD Details (TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip



4 JAMB **5 VERTICAL**

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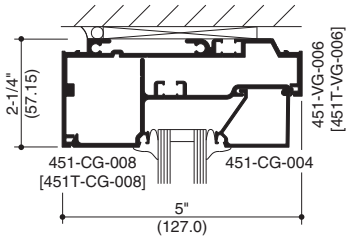
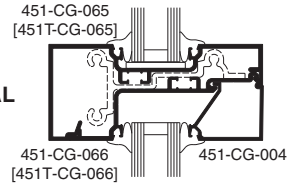
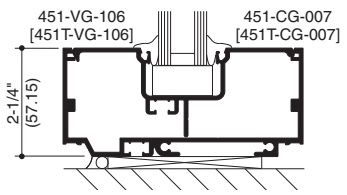


2 HORIZONTAL



3 SILL



TRIFAB® VG 451/451T

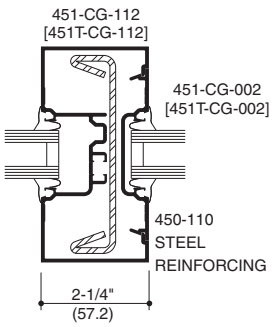
MISCELLANEOUS FRAMING (CENTER)

SCALE 3" = 1'-0"

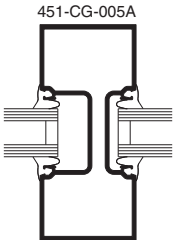
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

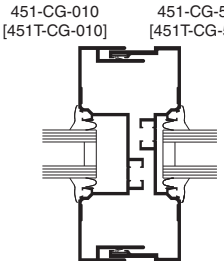
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip



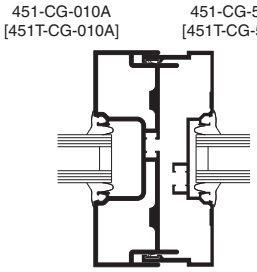
SPLIT MULLION W/ STEEL



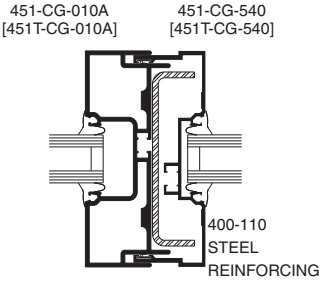
TUBULAR MULLION



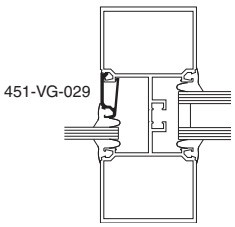
EXPANSION MULLION



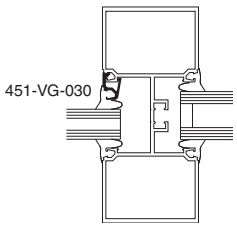
TUBULAR EXPANSION MULLION



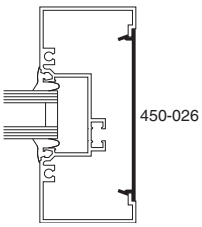
TUBULAR EXPANSION MULLION WITH OPTIONAL STEEL



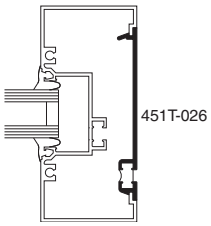
1/4" INFILL SNAP-IN ADAPTOR



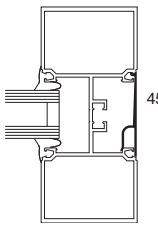
5/8" INFILL SNAP-IN ADAPTOR



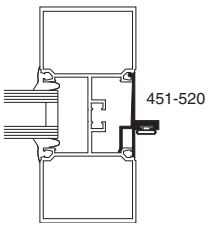
SNAP-IN FLAT FILLER



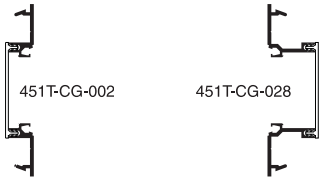
THERMAL FLAT FILLER



SNAP-IN FLAT POCKET FILLER

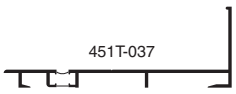


SNAP-IN DOOR STOP

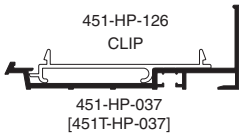


SHALLOW POCKET DEEP POCKET

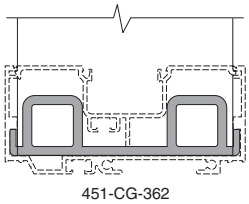
THERMAL POCKET FILLERS



THERMAL FLASHING



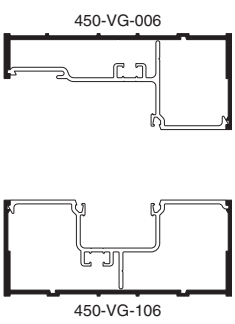
HIGH PERFORMANCE FLASHING



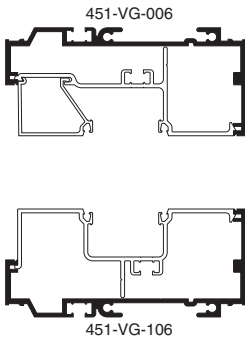
MULLION ANCHOR

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

NOTE:
Mullion Anchor not used with Lightwieght Receptor.



OPTIONAL LIGHTWEIGHT CAN RECEPTORS



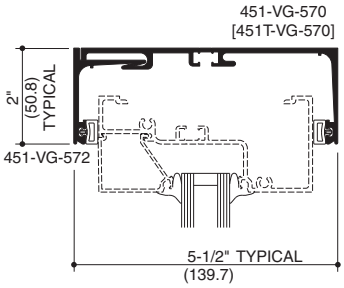
OPTIONAL UNEQUAL LEG CAN RECEPTORS

SCALE 3" = 1'-0"

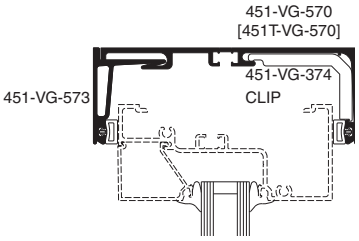
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

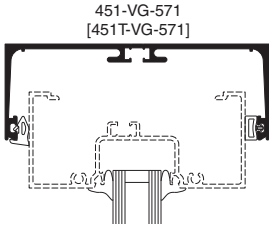
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip



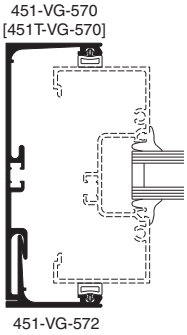
STANDARD HEAD COMPENSATING RECEPTOR



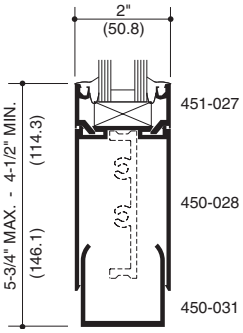
HEAVY WEIGHT HEAD COMPENSATING RECEPTOR



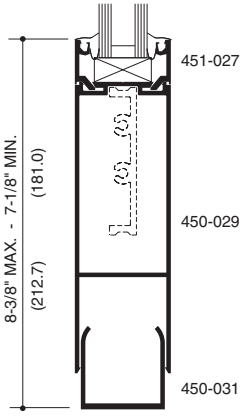
ONE PIECE HEAD COMPENSATING RECEPTOR



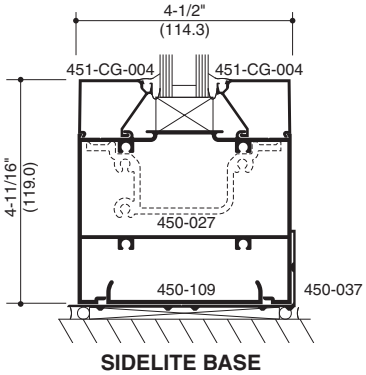
JAMB COMPENSATING RECEPTOR



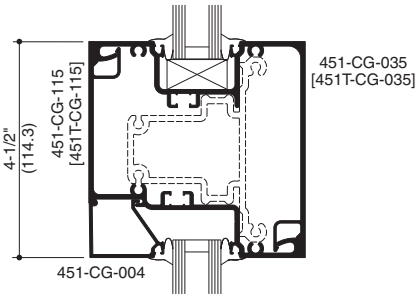
***NARROW SIDELITE BASE**



***NARROW SIDELITE BASE**



SIDELITE BASE



4-1/2" x 4-1/2" HORIZONTAL

SIDELITE BASES ARE NON-THERMAL APPLICATIONS

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

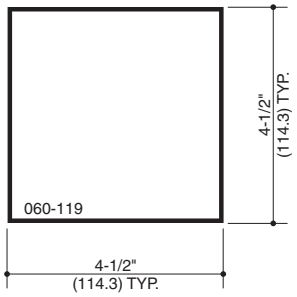
NOTE: SIDELITE BASES SHOWN ARE FOR USE WITH SCREW SPLINE AND SHEAR BLOCK SYSTEMS ONLY.

TRIFAB® VG 451/451T

CORNERS (CENTER)

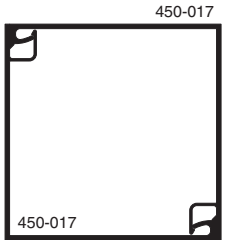
SCALE 3" = 1'-0"

CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip



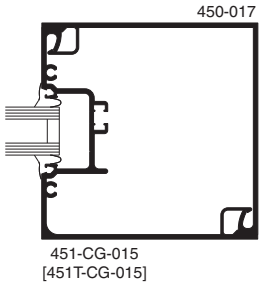
4-1/2" X 4-1/2" TUBE

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

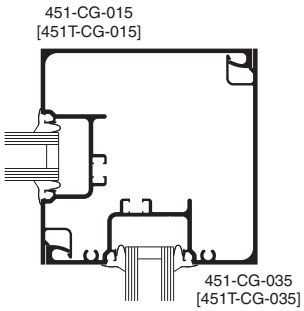


**TWO PIECE
NO POCKET CORNER**

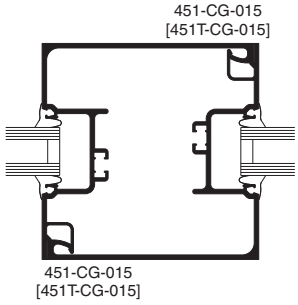
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip



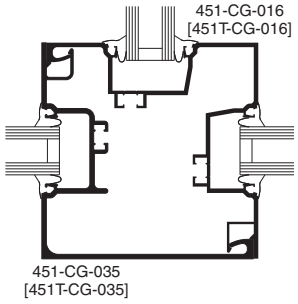
**ONE POCKET
CORNER**



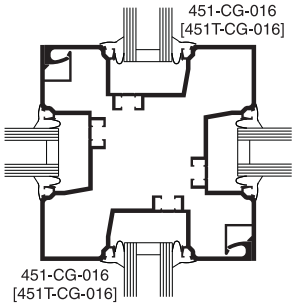
**TWO POCKET
90° CORNER**



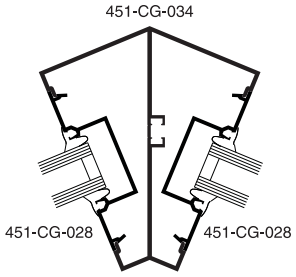
**TWO POCKET
CORNER POST**



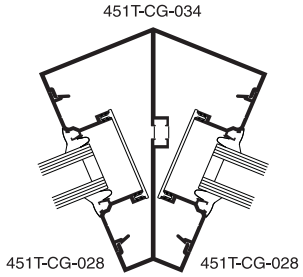
**THREE POCKET
90° CORNER**



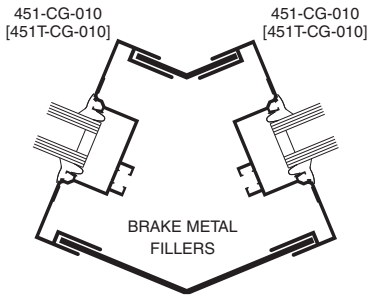
**FOUR POCKET
90° CORNER**



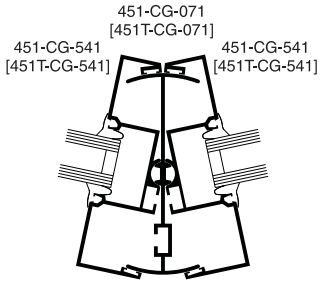
**135° CORNER
(NON-THERMAL)**



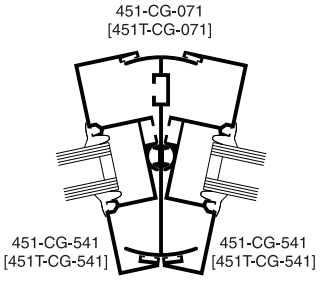
**135° CORNER
(THERMAL)**



**VARIABLE DEGREE
BRAKE METAL CORNER**

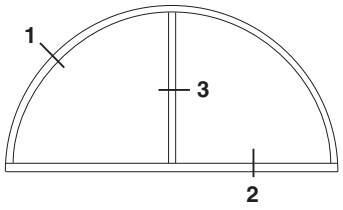


**155° TO 180° PIVOT MULLION
(OUTSIDE CORNER)**



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

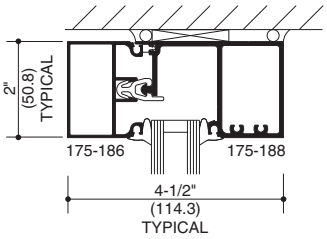
SCALE 3" = 1'-0"



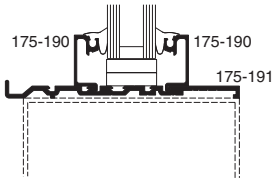
CURVING DETAILS
(Center Plane Only)

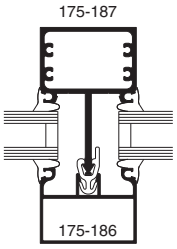
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

1



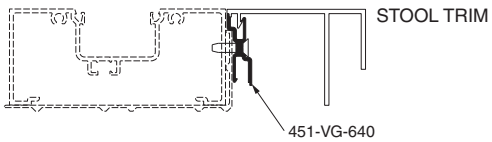
2



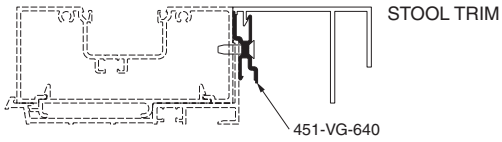


3

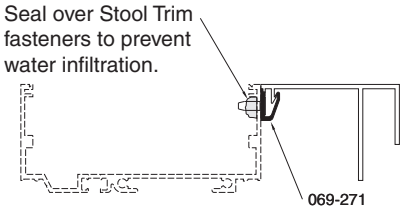
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip



STOOL TRIM CLIP
WITH STANDARD FLASHING



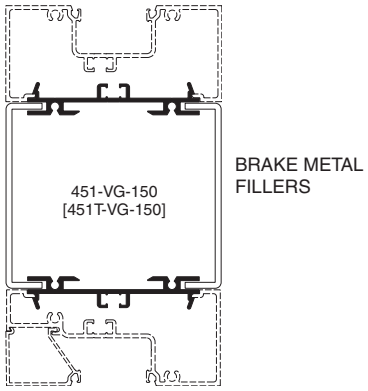
STOOL TRIM CLIP
WITH HIGH PERFORMANCE
FLASHING



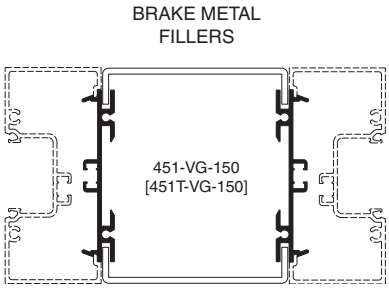
STOOL TRIM CLIP
FOR STICK ASSEMBLY

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip



BRAKE METAL
ADAPTOR AT HORIZONTAL



BRAKE METAL
ADAPTOR AT VERTICAL

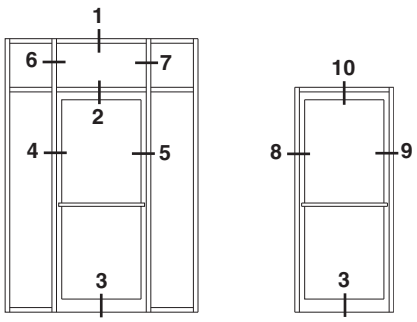
SCALE 3" = 1'-0"

CAD Details - **ENTRANCE**
(TF451) = TF_VG_451_Ent-Center--CAD.zip
(TF451T) = TF_VG_451T_Ent-Center--CAD.zip

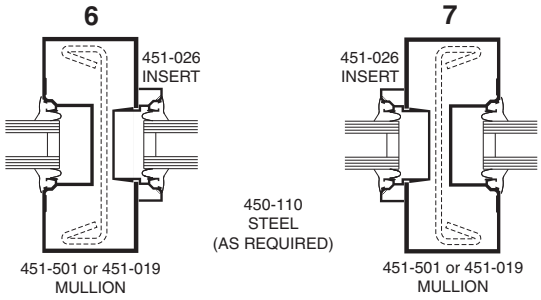
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "190" DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

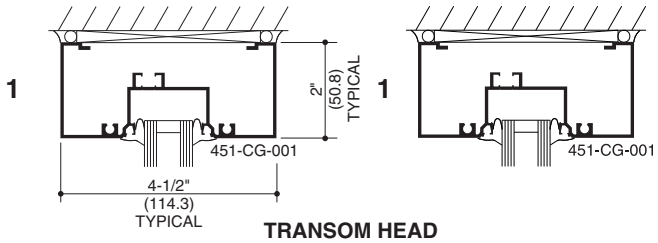


ELEVATIONS ARE NUMBER KEYED TO DETAILS

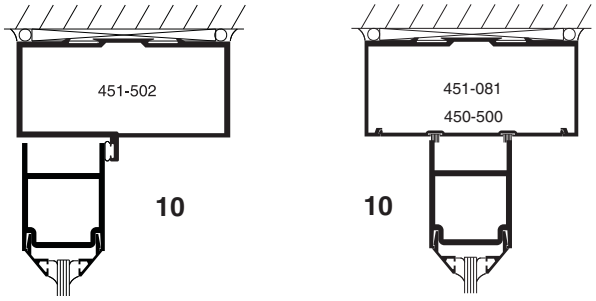


TRANSOM JAMBS

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.

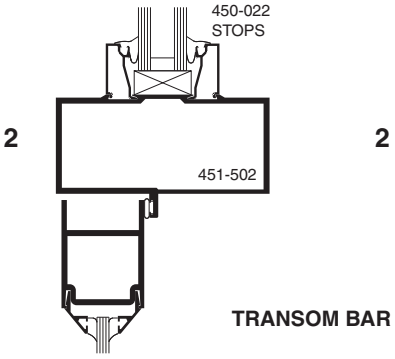


TRANSOM HEAD

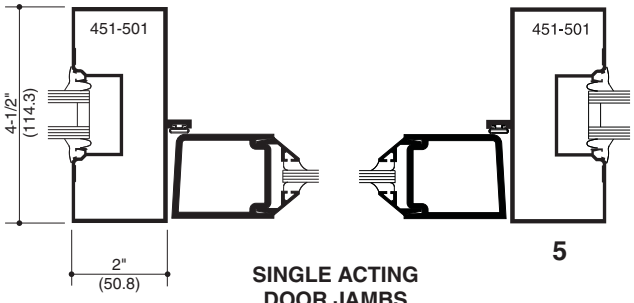


SINGLE ACTING HEADER

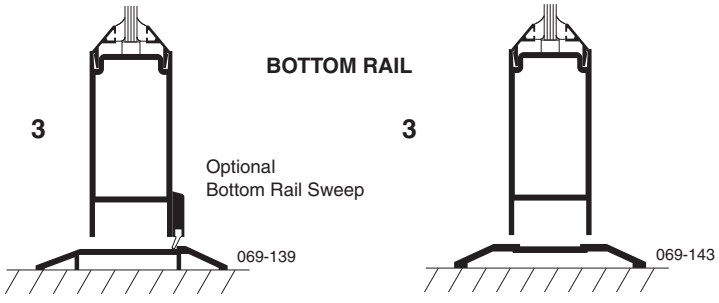
DOUBLE ACTING HEADER



TRANSOM BAR



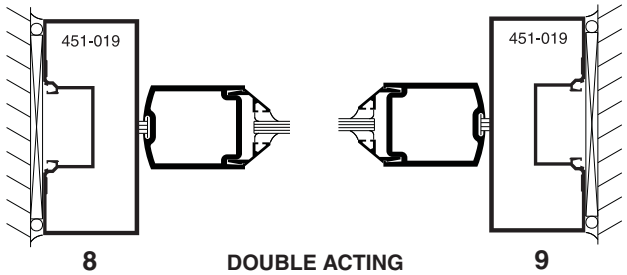
SINGLE ACTING DOOR JAMBS



BOTTOM RAIL

SINGLE ACTING

DOUBLE ACTING



DOUBLE ACTING DOOR JAMBS

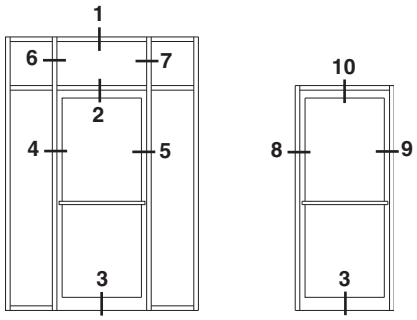
SCALE 3" = 1'-0"

CAD Details - **ENTRANCE**
(TF451) = TF_VG_451_Ent-Center--CAD.zip
(TF451T) = TF_VG_451T_Ent-Center--CAD.zip

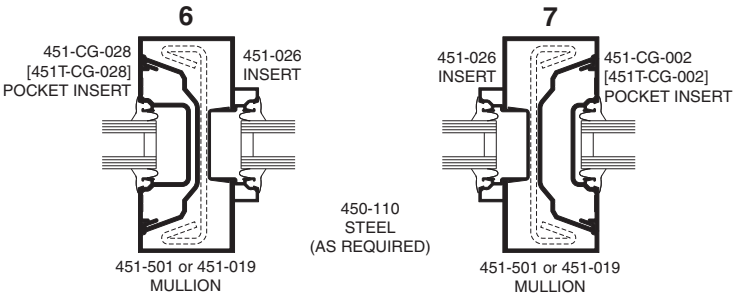
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "190" DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

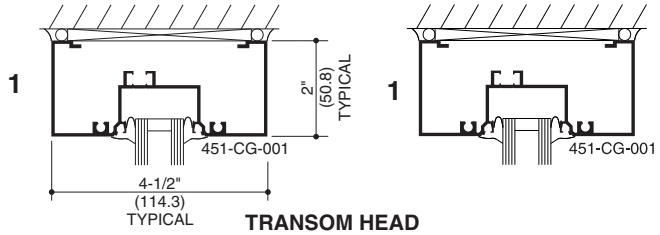


ELEVATIONS ARE NUMBER KEYED TO DETAILS

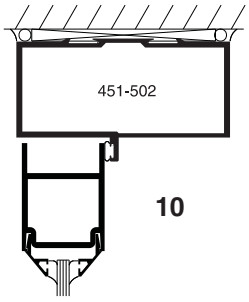


TRANSOM JAMBS

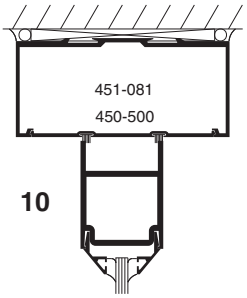
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.



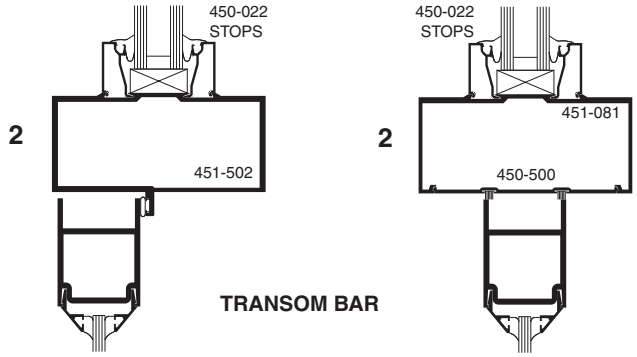
TRANSOM HEAD



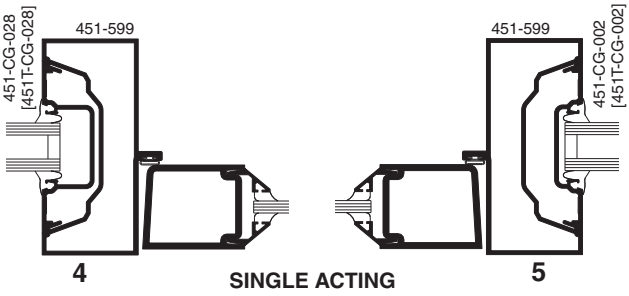
SINGLE ACTING HEADER



DOUBLE ACTING HEADER

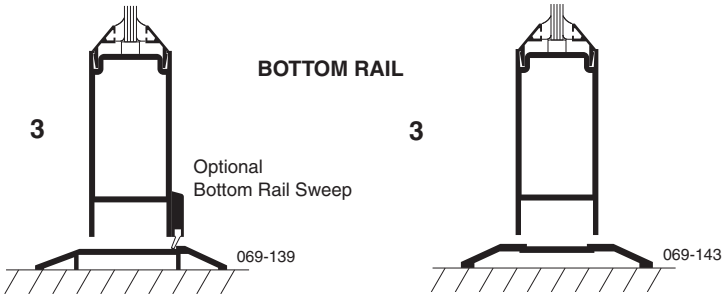


TRANSOM BAR



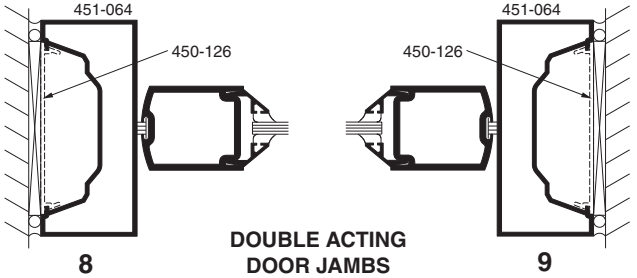
SINGLE ACTING DOOR JAMBS

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



BOTTOM RAIL

SINGLE ACTING **DOUBLE ACTING**



DOUBLE ACTING DOOR JAMBS

KAWNEER
AN ALCOA COMPANY

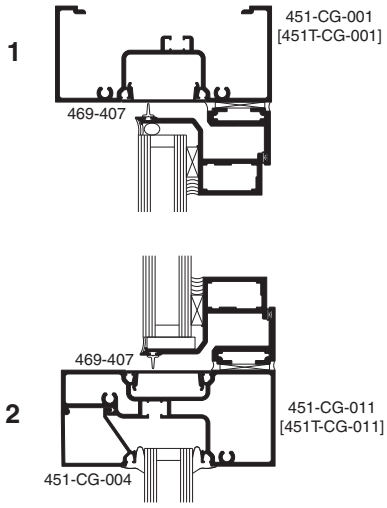
SCALE 3" = 1'-0"

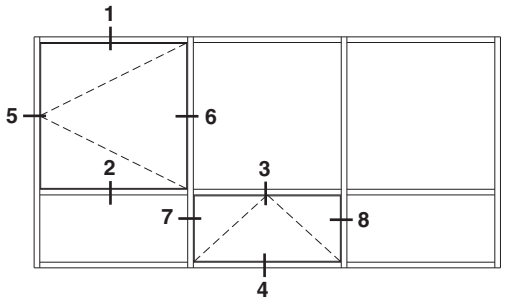
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip

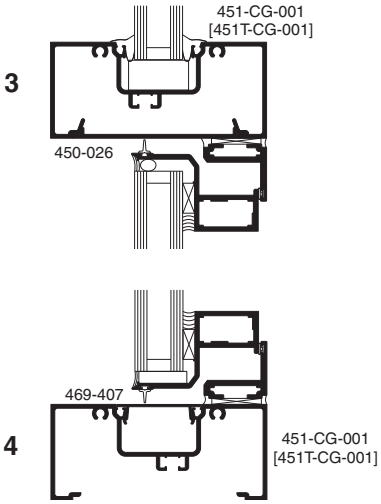
OUTSWING CASEMENT VERTICAL SECTION



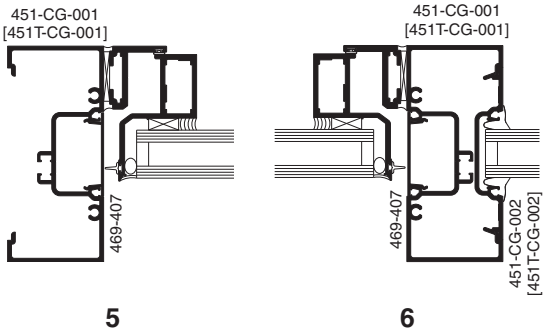


ELEVATION IS NUMBER KEYED TO DETAILS

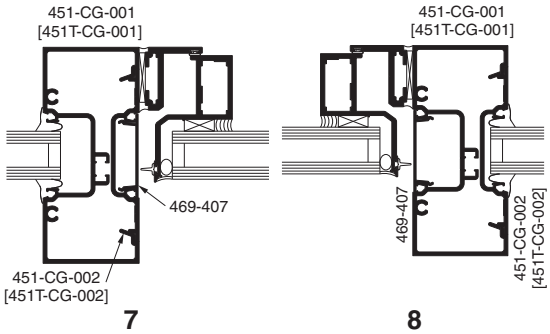
PROJECT-OUT VERTICAL SECTION



OUTSWING CASEMENT HORIZONTAL SECTION



PROJECT-OUT HORIZONTAL SECTION



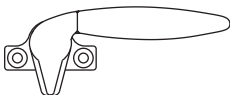
NOTE: Bronze spacer is recommended when 1" insulating glass is used.

MAXIMUM / MINIMUM SIZES (1" INFILL)

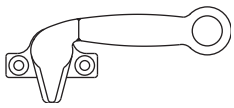
PROJECT-OUT	MAXIMUM 60" x 36" MINIMUM 14" x 14"
OUTSWING CASEMENT	MAXIMUM 36" x 60" MINIMUM 14" x 14"

STOREFRONT GLASSvent® HARDWARE SELECTION GUIDE

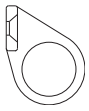
DESCRIPTION	PROJECT - OUT	OUTSWING CASEMENT
Stainless steel 4-bar hinge	STANDARD	STANDARD
Cast white bronze cam lock	STANDARD	STANDARD
Cast white bronze cam lock with pole ring	OPTIONAL	OPTIONAL
Cast white bronze custodial lock with removable handle	OPTIONAL	OPTIONAL
Cast white bronze concealed lock with removable hex key	OPTIONAL	OPTIONAL
Cast white bronze pole/pull ring	OPTIONAL	
Pivot-shoe roto-operator	OPTIONAL	
Multi-point lock with cast white bronze locking handle		OPTIONAL
Insect screen	OPTIONAL	OPTIONAL



CAM LOCK

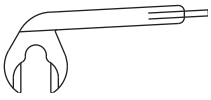


CAM LOCK WITH POLE RING

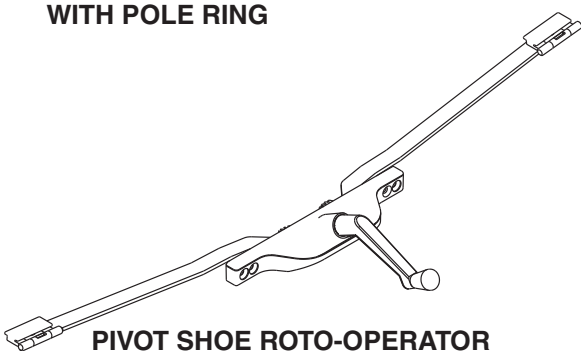


PULL RING

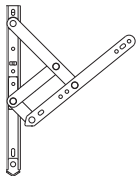
CUSTODIAL LOCK



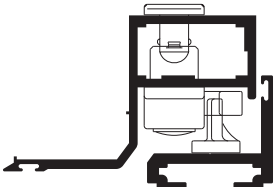
REMOVABLE HANDLE



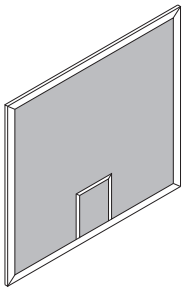
PIVOT SHOE ROTO-OPERATOR



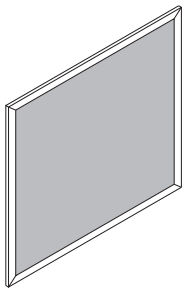
STAINLESS STEEL 4 BAR HINGES



CONCEALED LOCK



INSECT SCREEN WITH STANDARD WICKET



INSECT SCREEN WITH FULL WICKET

TRIFAB® VG 451/451T

VENTS (CENTER)

SCALE 3" = 1'-0"

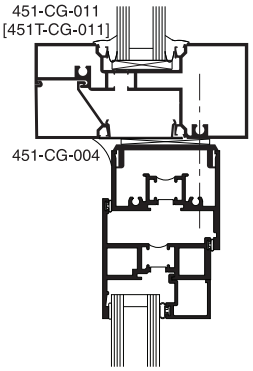
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Center--CAD.zip
(TF451T) = TF_VG_451T-SS-Center--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Center--CAD.zip
(TF451T) = TF_VG_451T-SB-Center--CAD.zip

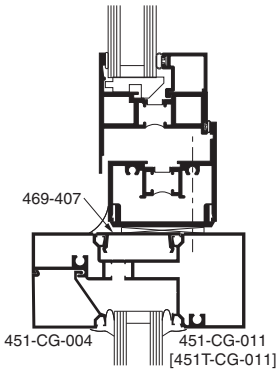
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Center--CAD.zip
(TF451T) = TF_VG_451T-Stick-Center--CAD.zip

PROJECT-OUT
VERTICAL SECTION

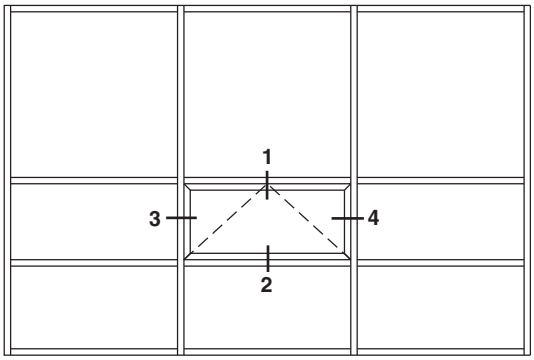
1



2

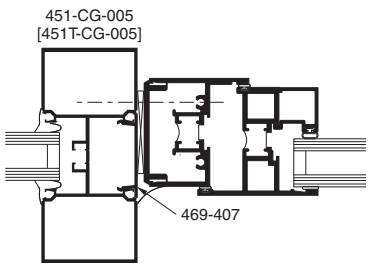


8225T•L VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

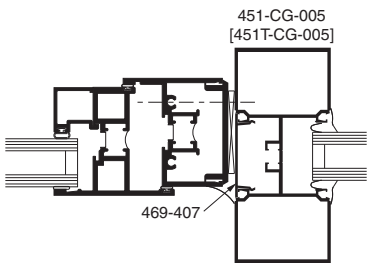


ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
HORIZONTAL SECTION

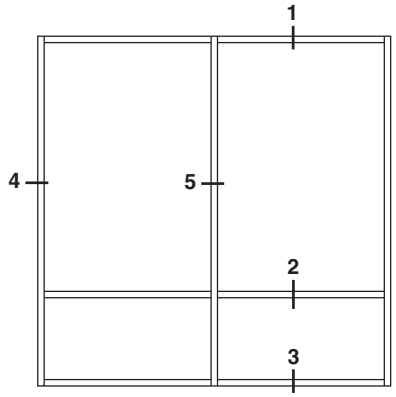


3

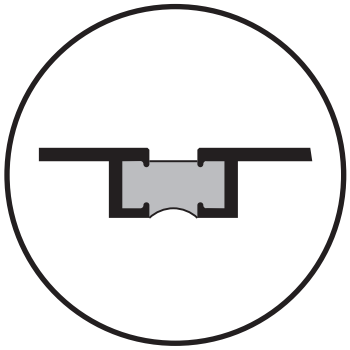


4

SCALE 3" = 1'-0"

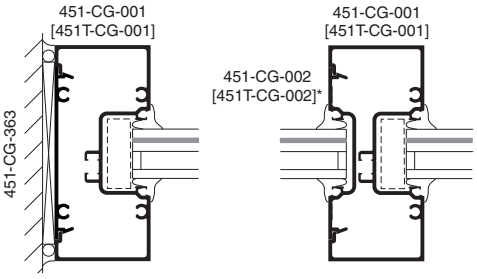


ELEVATION IS NUMBER KEYED TO DETAILS



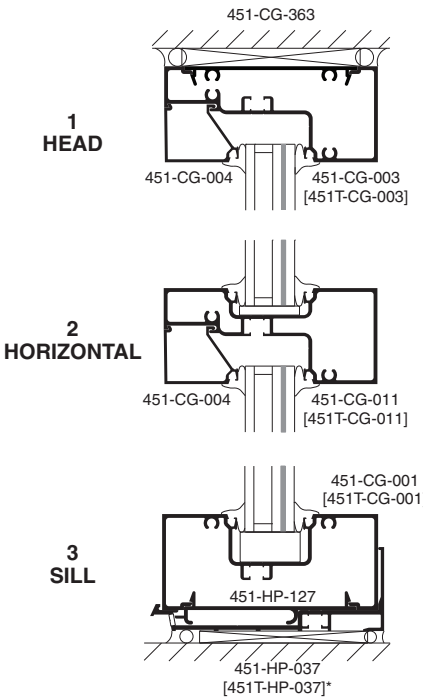
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



4 JAMB

5 VERTICAL

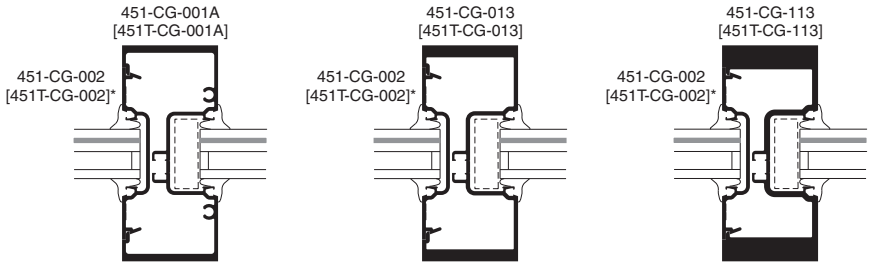


1 HEAD

2 HORIZONTAL

3 SILL

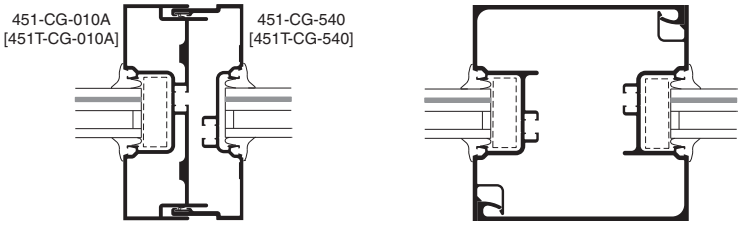
OPTIONAL FRAMING (CENTER)



5 VERTICAL

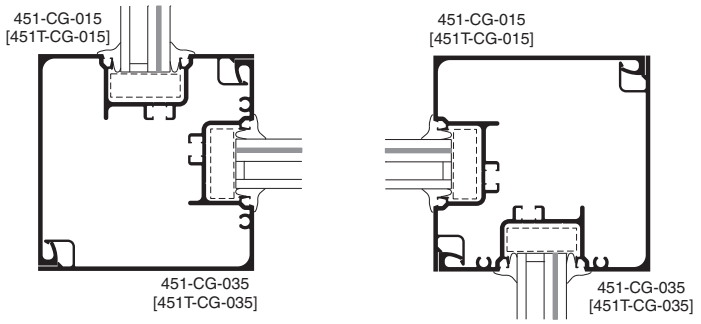
5 VERTICAL

5 VERTICAL



TUBULAR EXPANSION MULLION

TWO POCKET CORNER POST



TWO POCKET OUTSIDE CORNER POST

TWO POCKET INSIDE CORNER POST

TRIFAB® VG 451/451T

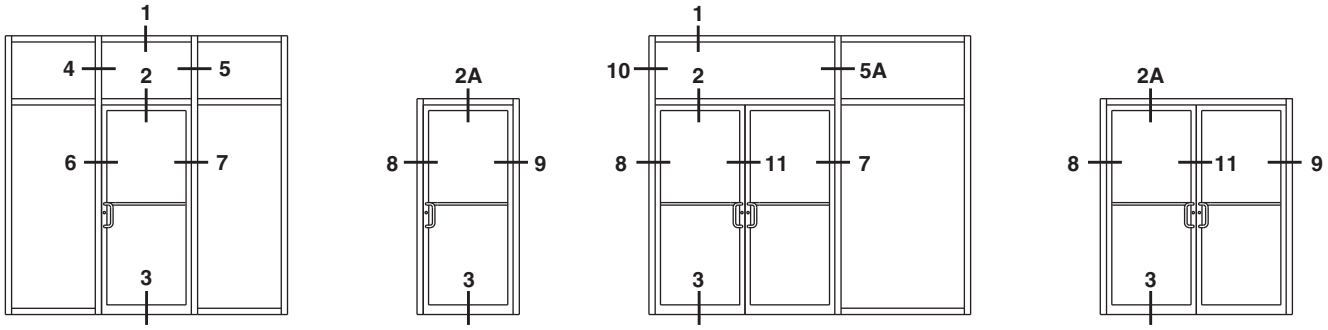
ENTRANCE FRAMING (CENTER)
LEVEL D - LARGE MISSILE IMPACT

SCALE 3" = 1'-0"

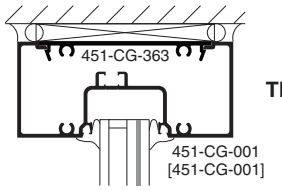
Hurricane Resistant Product

TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "350IR" DOORS (DRY GLAZED).

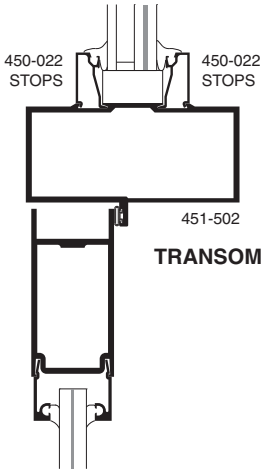
DOOR FRAMING NON-THERMAL ONLY



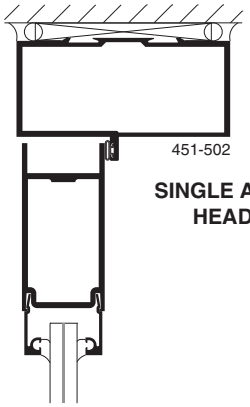
ELEVATIONS ARE NUMBER KEYED TO DETAILS



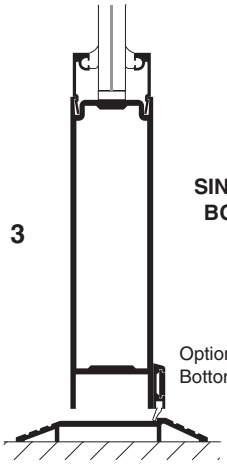
1 **TRANSOM HEAD**



2 **TRANSOM BAR**

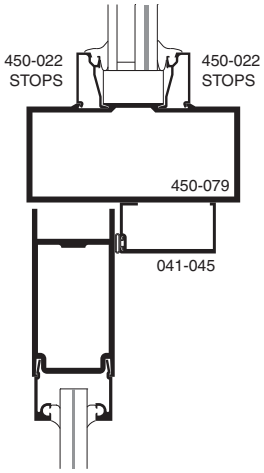


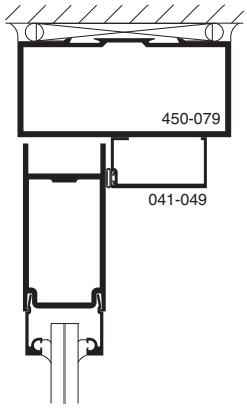
2A **SINGLE ACTING HEADER**



3 **SINGLE ACTING BOTTOM RAIL**

CONCEALED OVERHEAD CLOSERS





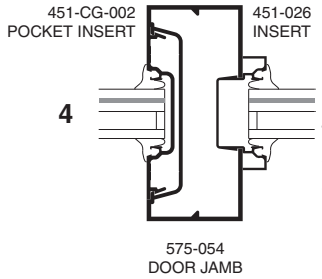
TRIFAB® VG 451/451T

ENTRANCE FRAMING (CENTER)
LEVEL D - LARGE MISSILE IMPACT
Hurricane Resistant Product

SCALE 3" = 1'-0"

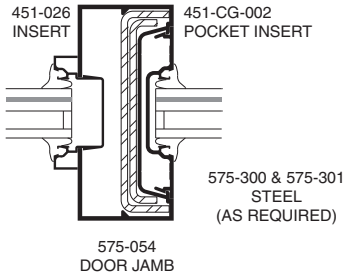
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "350 IR" DOORS (DRY GLAZED).

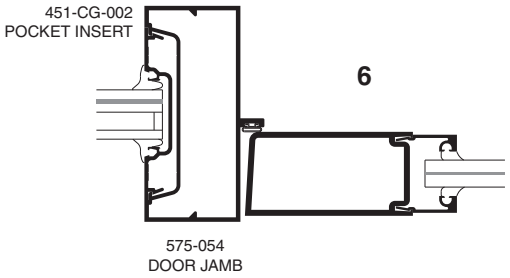
DOOR FRAMING NON-THERMAL ONLY



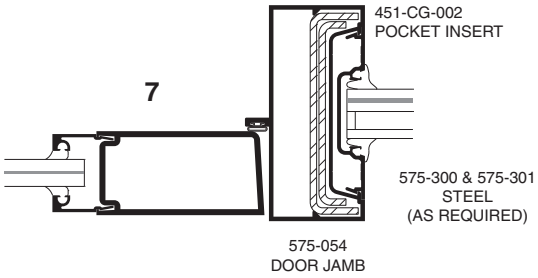
TRANSOM JAMBS

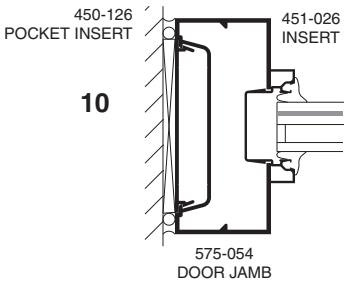
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

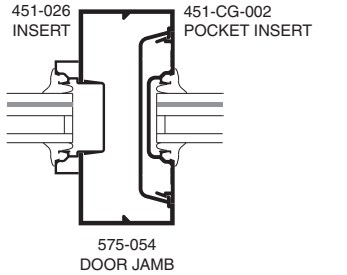


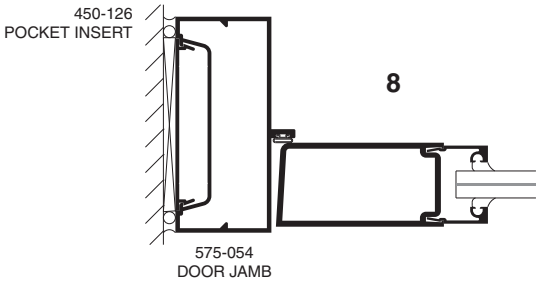


SINGLE ACTING DOOR JAMBS

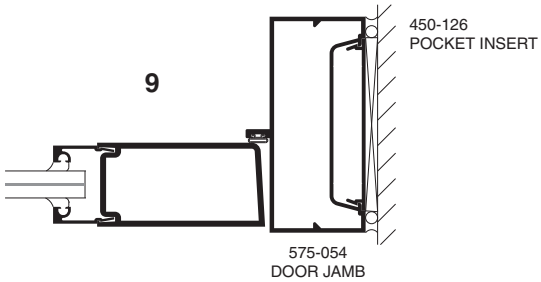


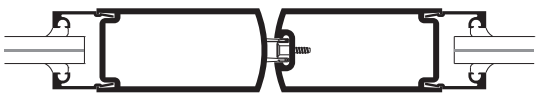




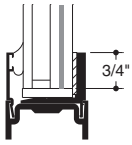


SINGLE ACTING DOOR JAMBS





11
MEETING STILES



Min. glass bite.

3M TAPE 350 IR DOOR GLAZING OPTION

KAWNEER
AN ALCOA COMPANY

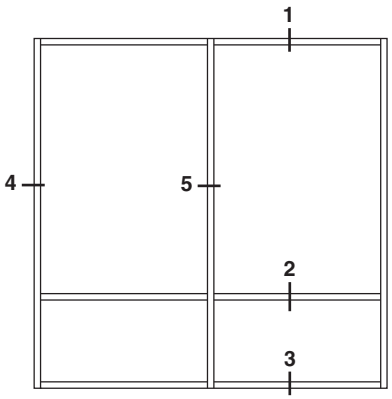
TRIFAB® VG 451/451T

MAY, 2012

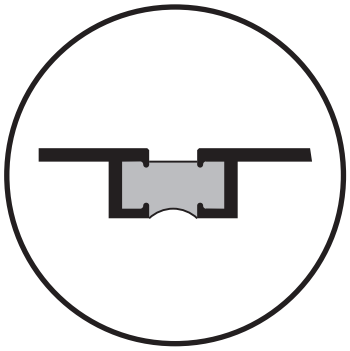
BASIC FRAMING DETAILS (FRONT - Outside Glazed)

EC 97911-43

SCALE 3" = 1'-0"



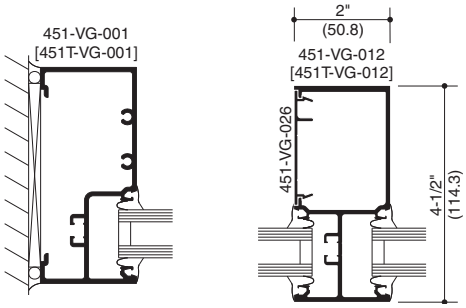
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

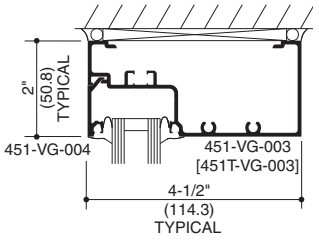
SCREW SPLINE

CAD Details (TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

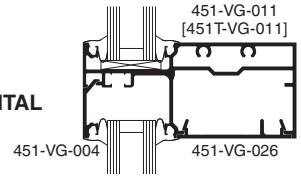


4 JAMB **5 VERTICAL**

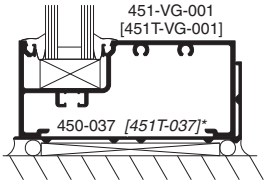
1 HEAD



2 HORIZONTAL



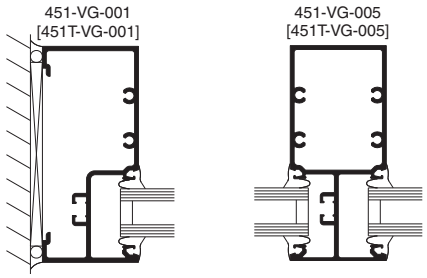
3 SILL



*See Page 35 for Thermal Flashing and Optional High Performance Flashing

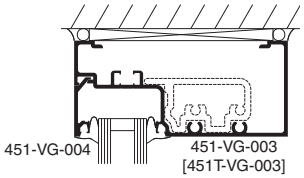
SHEAR BLOCK

CAD Details (TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

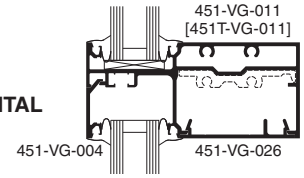


4 JAMB **5 VERTICAL**

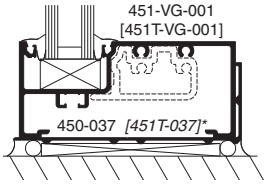
1 HEAD



2 HORIZONTAL



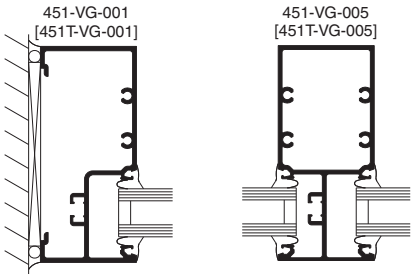
3 SILL



*See Page 35 for Thermal Flashing and Optional High Performance Flashing

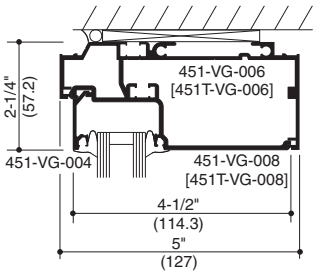
STICK

CAD Details (TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip

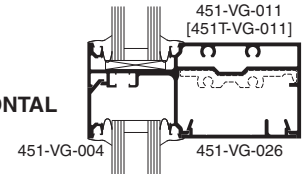


4 JAMB **5 VERTICAL**

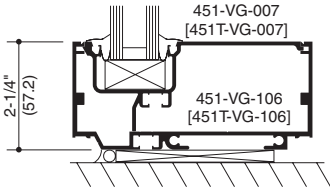
1 HEAD



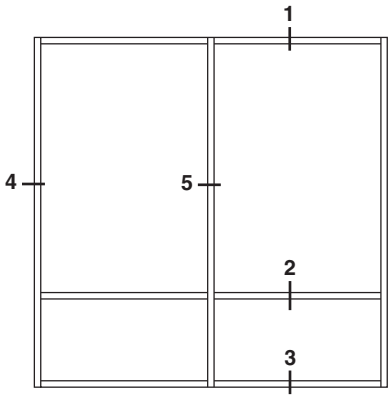
2 HORIZONTAL



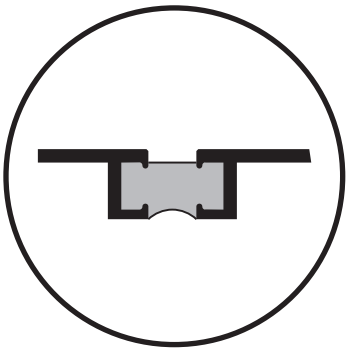
3 SILL



SCALE 3" = 1'-0"



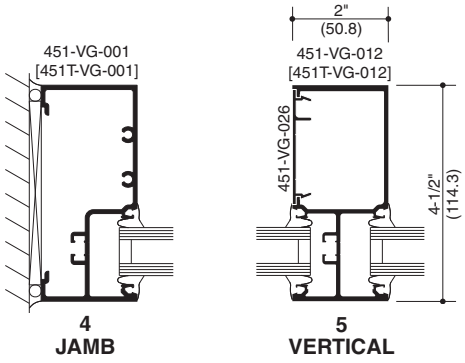
ELEVATION IS NUMBER KEYED TO DETAILS



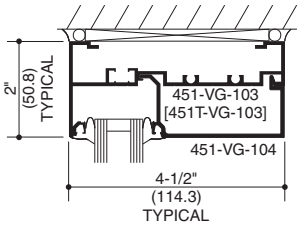
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

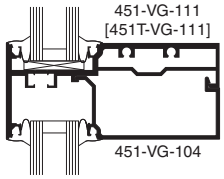
CAD Details (TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip



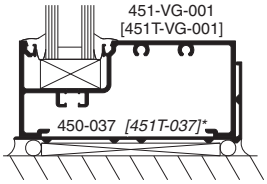
1 HEAD



2 HORIZONTAL



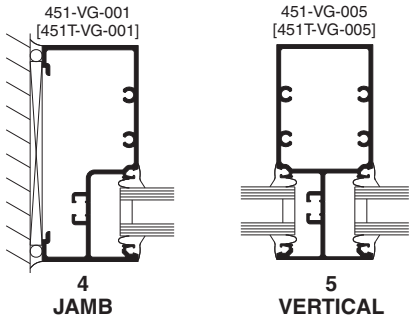
3 SILL



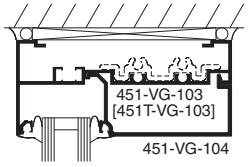
*See Page 35 for Thermal Flashing and Optional High Performance Flashing

SHEAR BLOCK

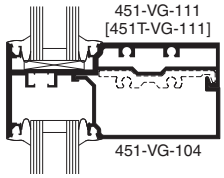
CAD Details (TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip



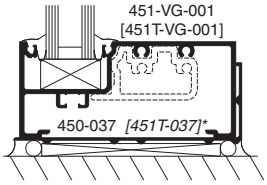
1 HEAD



2 HORIZONTAL



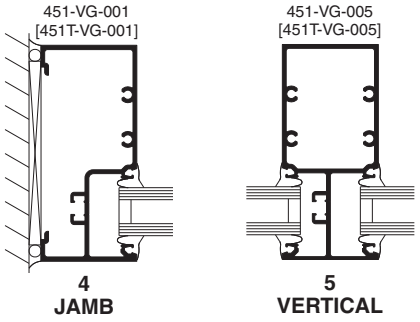
3 SILL



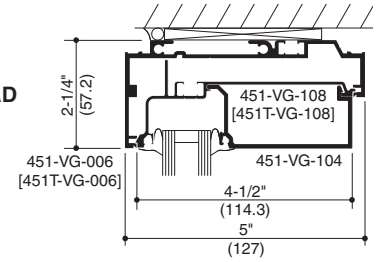
*See Page 35 for Thermal Flashing and Optional High Performance Flashing

STICK

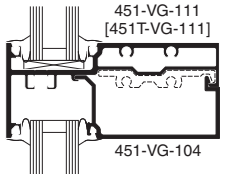
CAD Details (TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip



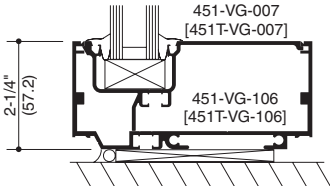
1 HEAD



2 HORIZONTAL



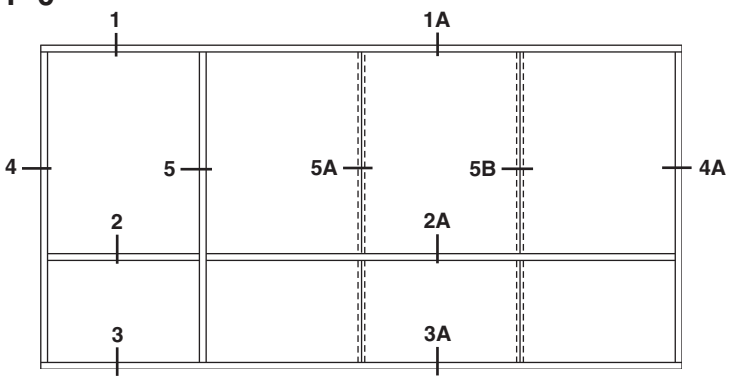
3 SILL



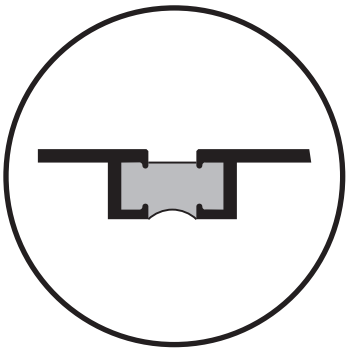
TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

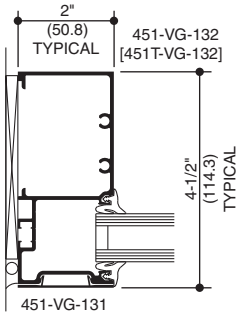


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

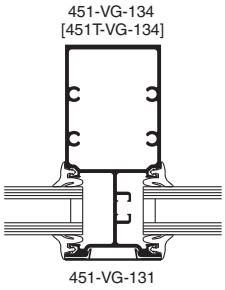
STICK (INSIDE GLAZED)
TWO COLOR OPTION

STANDARD RECEPTOR *with SSG ADAPTOR*

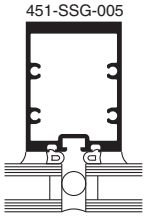
CAD Details - **STICK** (TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip



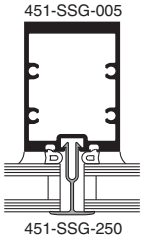
4 JAMB



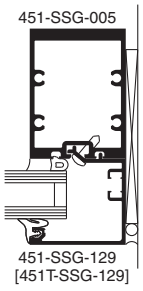
5 VERTICAL



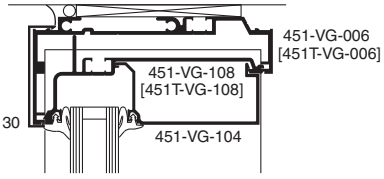
5A SSG VERTICAL



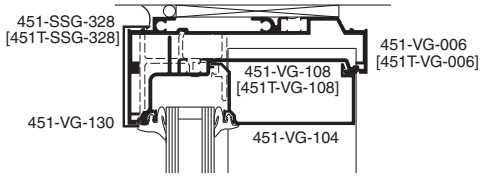
5B WEATHERSEAL VERTICAL



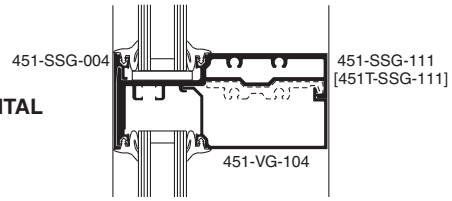
4A SSG JAMB



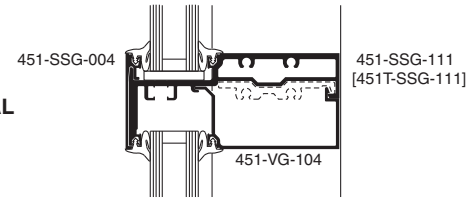
1 HEAD



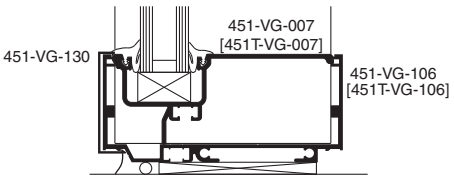
1A HEAD



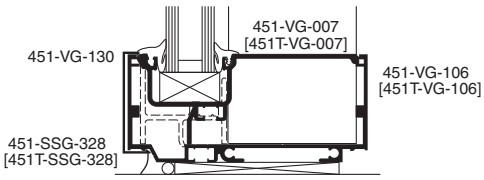
2 HORIZONTAL



2A HORIZONTAL

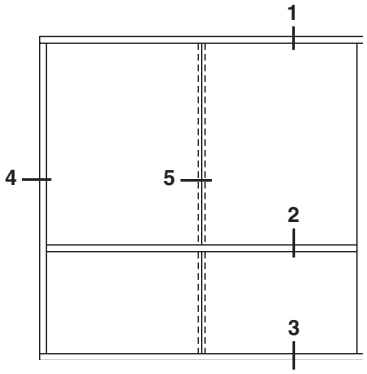


3 SILL

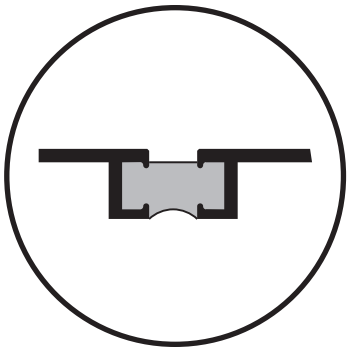


3A SILL

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

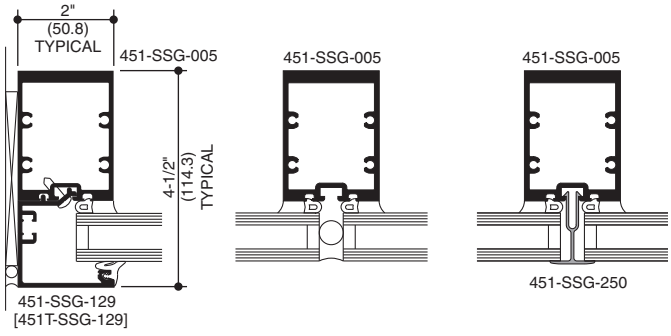


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

STICK (INSIDE GLAZED)

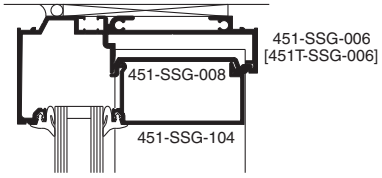
SSG RECEPTOR

CAD Details - **STICK SSG**
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

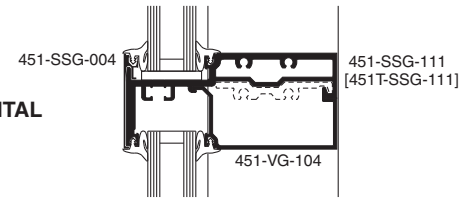


4 JAMB | **5 SSG VERTICAL** | **5 WEATHERSEAL VERTICAL**

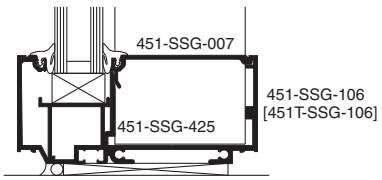
1 HEAD



2 HORIZONTAL



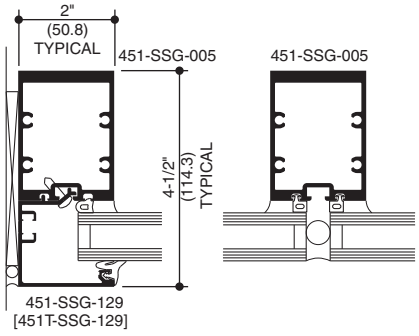
3 SILL



STICK (OUTSIDE GLAZED)

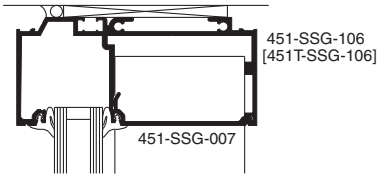
SSG RECEPTOR

CAD Details - **STICK SSG**
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

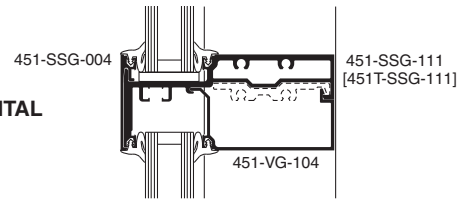


4 JAMB | **5 SSG VERTICAL**

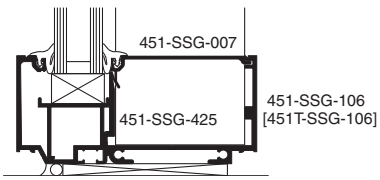
1 HEAD



2 HORIZONTAL



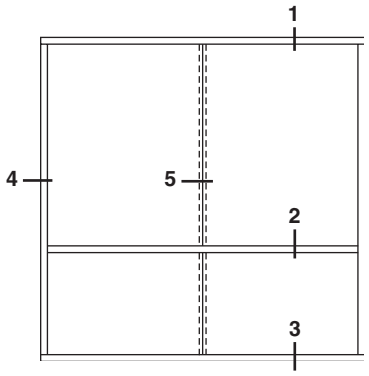
3 SILL



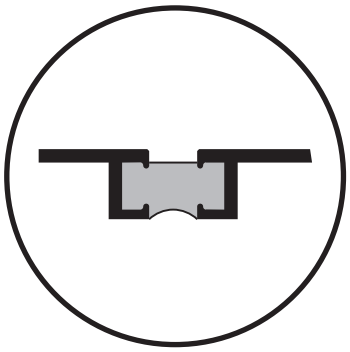
TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

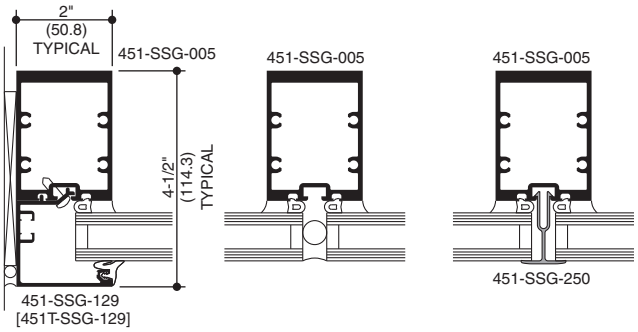


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

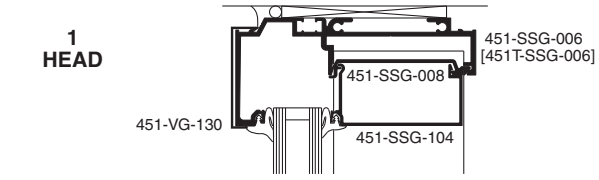
STICK (INSIDE GLAZED) TWO COLOR OPTION

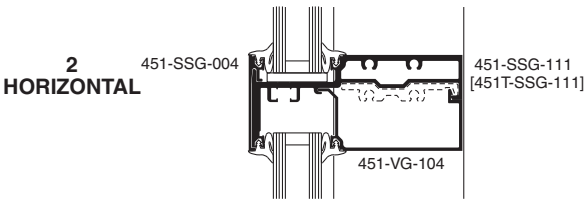
CAD Details - **STICK SSG**
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

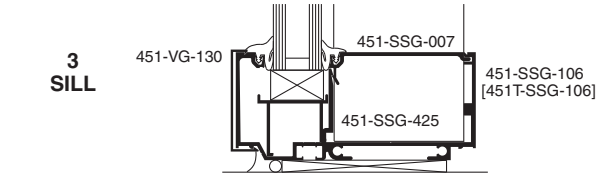
SSG RECEPTOR



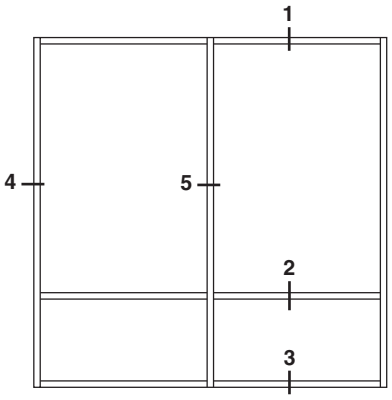
4 JAMB | **5 SSG VERTICAL** | **5 WEATHERSEAL VERTICAL**



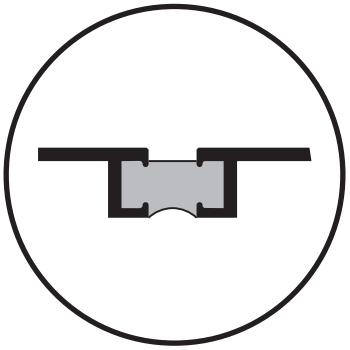




SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

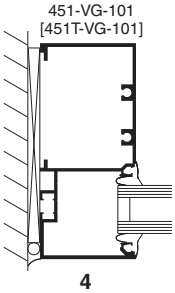


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

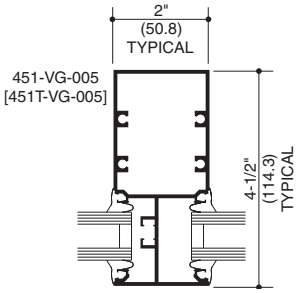
TYPE-B (INSIDE GLAZED)

CAD Details - **TYPE-B**
(TF451) = TF_VG_451-Type_B-Front--CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front--CAD.zip

PUNCHED OPENING

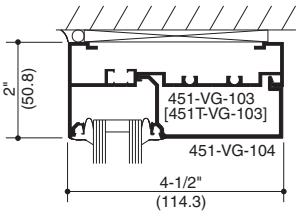


4
JAMB

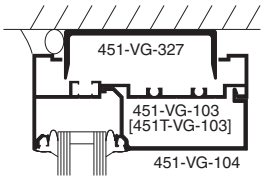


5
VERTICAL

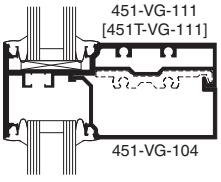
1
HEAD



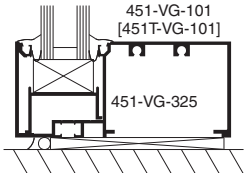
1A
HEAD



2
HORIZONTAL



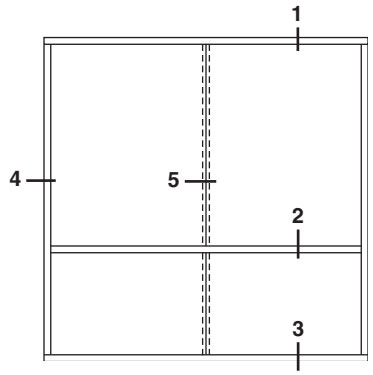
3
SILL



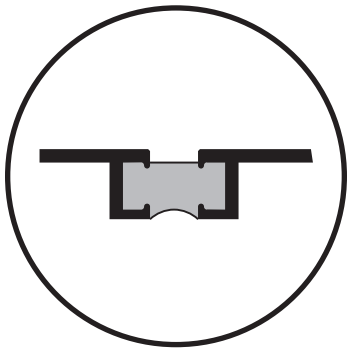
TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

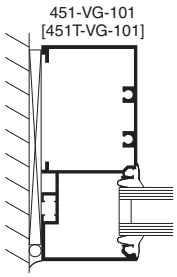


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

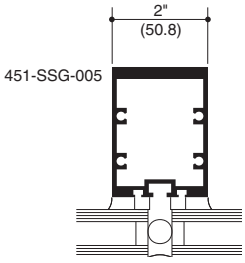
TYPE-B (INSIDE GLAZED) SSG \ WEATHERSEAL

PUNCHED OPENING

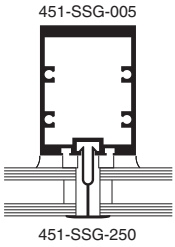
CAD Details - **TYPE-B**
(TF451) = TF_VG_451-Type_B-Front--CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front--CAD.zip



4
JAMB

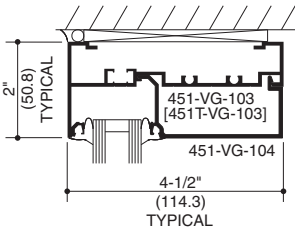


5
SSG
VERTICAL

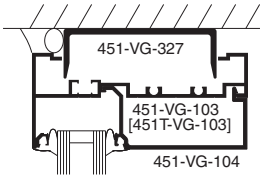


5
WEATHERSEAL
VERTICAL

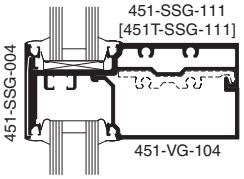
1
HEAD



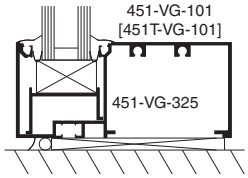
1A
HEAD



2
HORIZONTAL



3
SILL

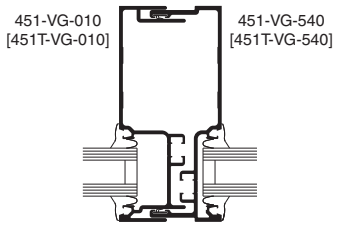


SCALE 3" = 1'-0"

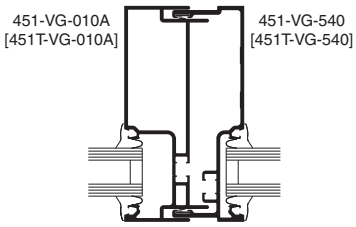
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

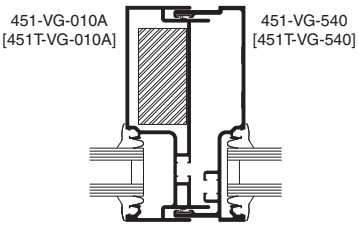
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip



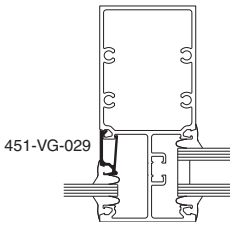
EXPANSION MULLION



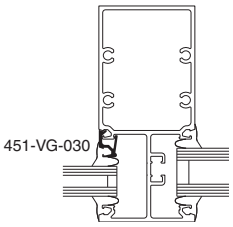
TUBULAR EXPANSION MULLION



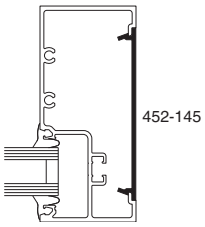
TUBULAR EXPANSION MULLION WITH STEEL



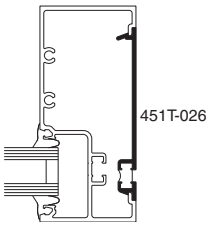
1/4" INFILL SNAP-IN ADAPTOR



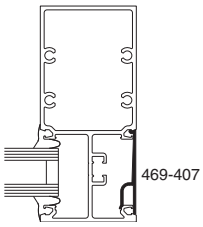
5/8" INFILL SNAP-IN ADAPTOR



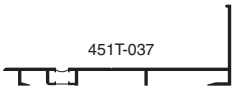
PVC FLAT FILLER (NON STRUCTURAL)



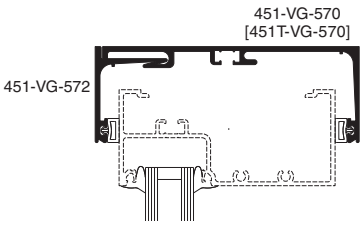
THERMAL FLAT FILLER



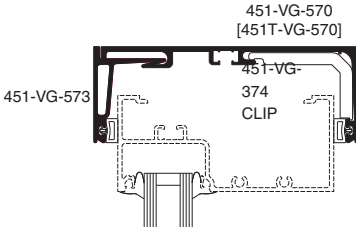
SNAP-IN FLAT FILLER



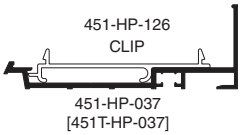
THERMAL FLASHING



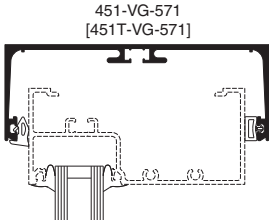
STANDARD - HEAD COMPENSATING RECEPTOR



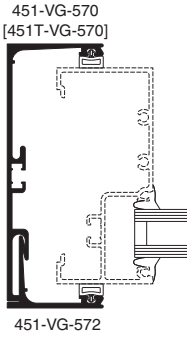
HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR



HIGH PERFORMANCE FLASHING



ONE PIECE - HEAD COMPENSATING RECEPTOR



JAMB COMPENSATING RECEPTOR

TRIFAB® VG 451/451T

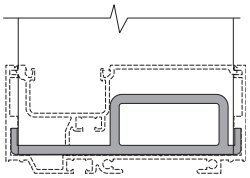
MISCELLANEOUS FRAMING (FRONT)

SCALE 3" = 1'-0"

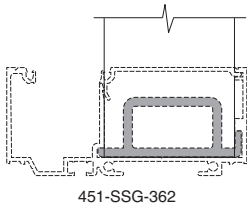
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

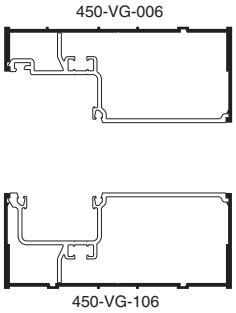
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip



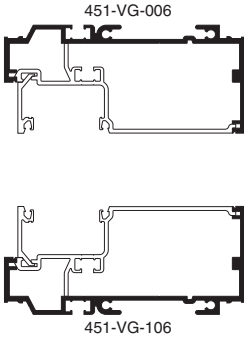
MULLION ANCHOR



SSG MULLION ANCHOR



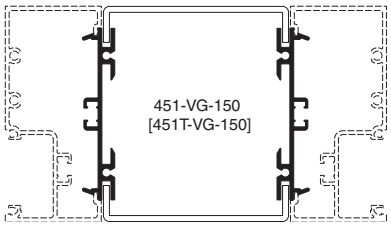
OPTIONAL LIGHTWEIGHT CAN RECEPTORS



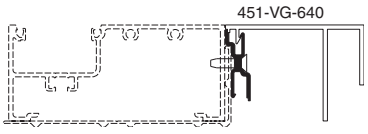
OPTIONAL UNEQUAL LEG CAN RECEPTORS

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

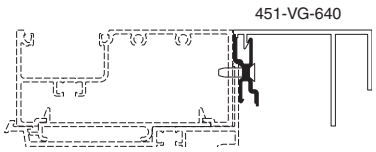
NOTE:
Mullion Anchor not used with Lightweight Receptor.



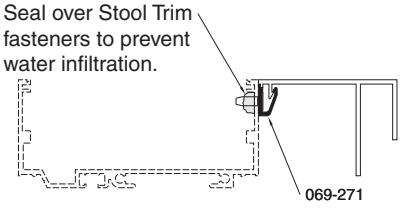
BRAKE METAL ADAPTOR



STOOL TRIM CLIP with STANDARD FLASHING



STOOL TRIM CLIP with HP FLASHING



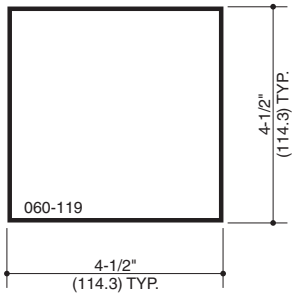
STOOL TRIM CLIP FOR STICK ASSEMBLY

SCALE 3" = 1'-0"

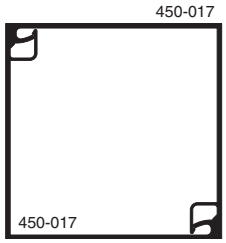
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

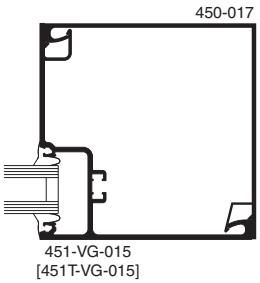
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip



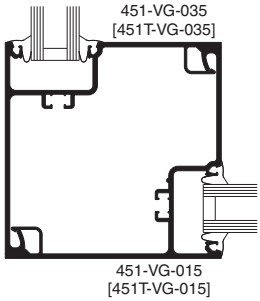
4-1/2" X 4-1/2" TUBE



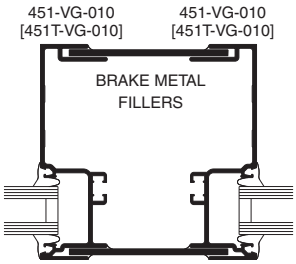
**TWO PIECE
NO POCKET CORNER**



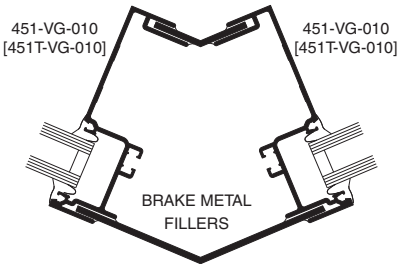
**ONE POCKET
CORNER**



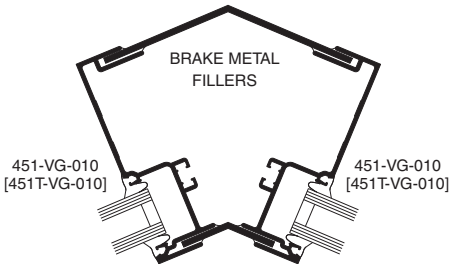
**TWO POCKET
90° CORNER**



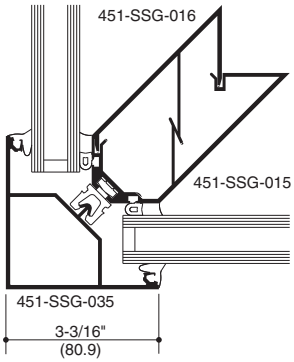
**TWO POCKET
CORNER POST**



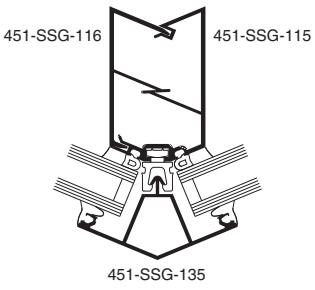
**VARIABLE DEGREE
BRAKE METAL
OUTSIDE CORNER**



**VARIABLE DEGREE
BRAKE METAL
INSIDE CORNER**



90° CORNER



135° CORNER

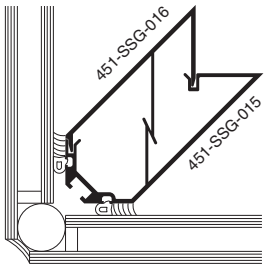
TRIFAB® VG 451/451T

CORNERS (FRONT - SSG)

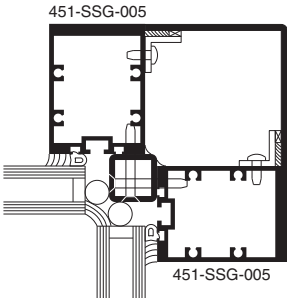
SCALE 3" = 1'-0"

CAD Details - **STICK SSG**
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

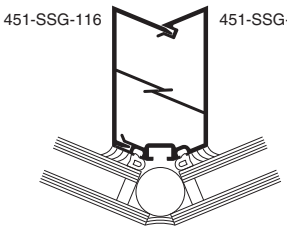
CAD Details - **TYPE-B**
(TF451) = TF_VG_451-Type_B-Front--CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front--CAD.zip



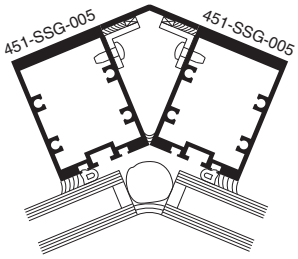
90° OUTSIDE CORNER



90° INSIDE CORNER



135° OUTSIDE CORNER



135° INSIDE CORNER

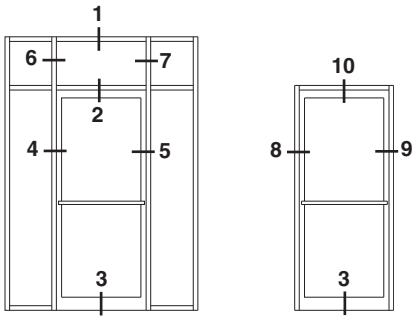
SCALE 3" = 1'-0"

CAD Details - **ENTRANCE**
(TF451) = TF_VG_451_Ent-Center--CAD.zip
(TF451T) = TF_VG_451T_Ent-Center--CAD.zip

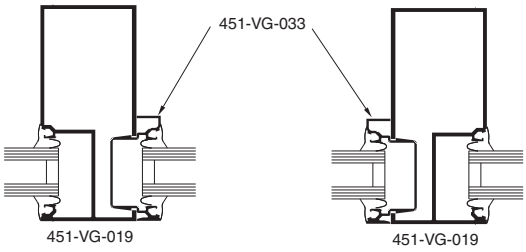
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "190" DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

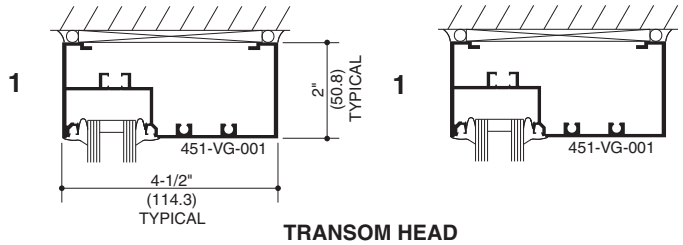


ELEVATIONS ARE NUMBER KEYED TO DETAILS

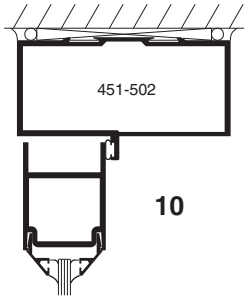


6 **TRANSOM JAMBS** **7**

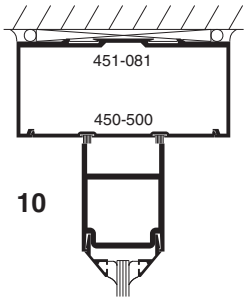
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.



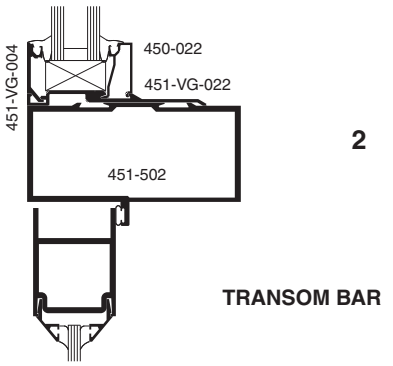
TRANSOM HEAD

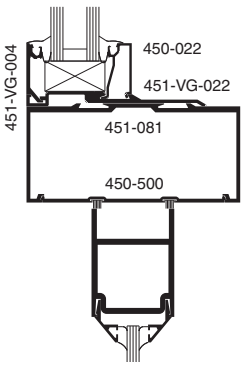


SINGLE ACTING HEADER

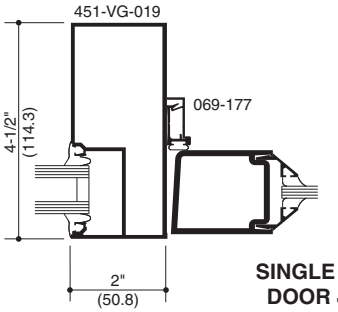


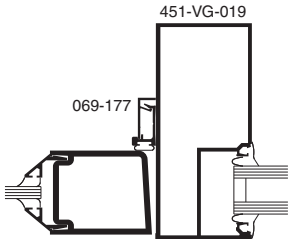
DOUBLE ACTING HEADER



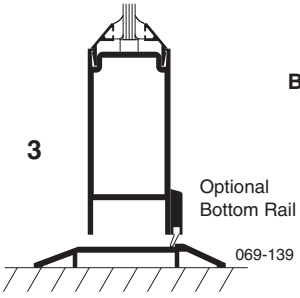


TRANSOM BAR



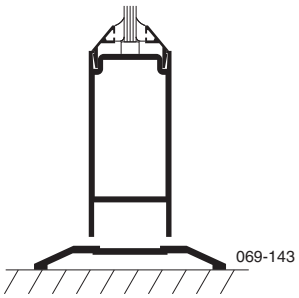


SINGLE ACTING DOOR JAMBS

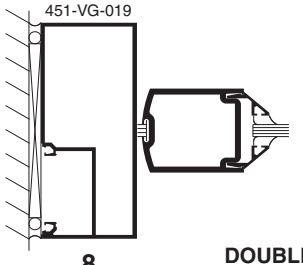


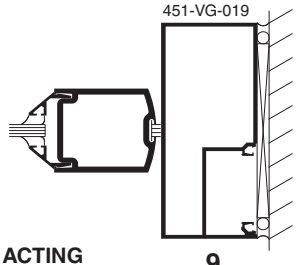
SINGLE ACTING

BOTTOM RAIL



DOUBLE ACTING





DOUBLE ACTING DOOR JAMBS

KAWNEER
AN ALCOA COMPANY

TRIFAB® VG 451/451T

GLASSvent® (FRONT)

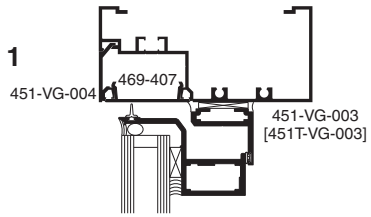
SCALE 3" = 1'-0"

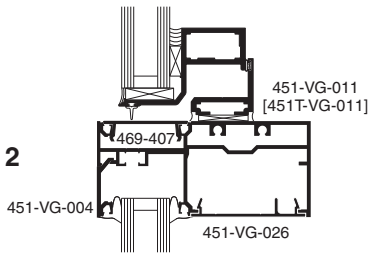
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

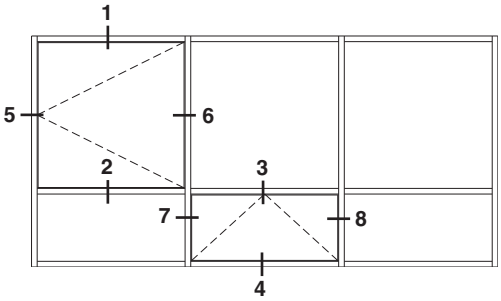
CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip

OUTSWING CASEMENT VERTICAL SECTION

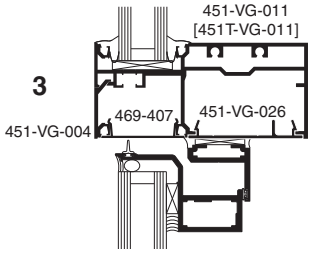


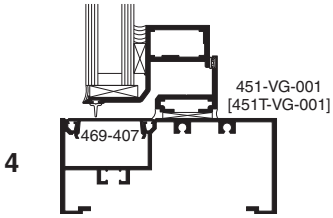




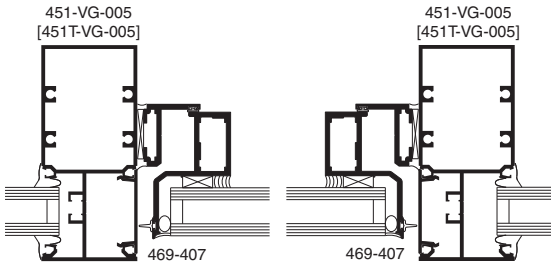
ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT VERTICAL SECTION

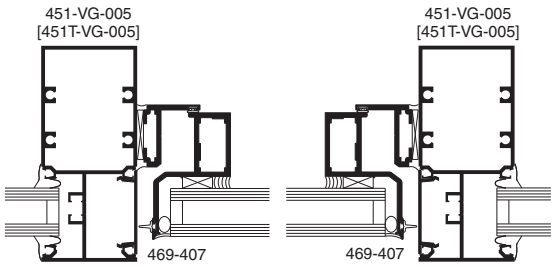




OUTSWING CASEMENT HORIZONTAL SECTION



PROJECT-OUT HORIZONTAL SECTION



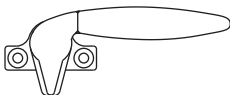
NOTE: Bronze spacer is recommended when 1" insulating glass is used.

MAXIMUM / MINIMUM SIZES (1" INFILL)

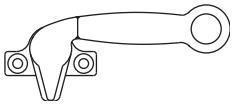
PROJECT-OUT	MAXIMUM 60" x 36" MINIMUM 14" x 14"
OUTSWING CASEMENT	MAXIMUM 36" x 60" MINIMUM 14" x 14"

STOREFRONT GLASSvent® HARDWARE SELECTION GUIDE

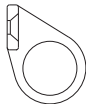
DESCRIPTION	PROJECT - OUT	OUTSWING CASEMENT
Stainless steel 4-bar hinge	STANDARD	STANDARD
Cast white bronze cam lock	STANDARD	STANDARD
Cast white bronze cam lock with pole ring	OPTIONAL	OPTIONAL
Cast white bronze custodial/ Air conditioning locks with removable handle	OPTIONAL	OPTIONAL
Cast white bronze concealed lock with removable hex key	OPTIONAL	OPTIONAL
Cast white bronze pole/pull ring	OPTIONAL	
Pivot-shoe roto-operator	OPTIONAL	
Multi-point lock with cast white bronze locking handle		OPTIONAL
Insect screen	OPTIONAL	OPTIONAL



CAM LOCK



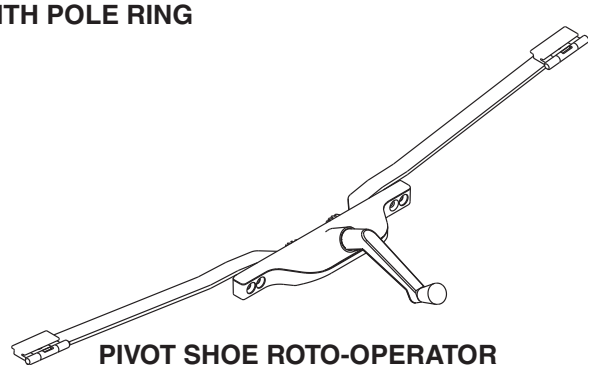
CAM LOCK WITH POLE RING



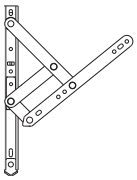
PULL RING

CUSTODIAL LOCK

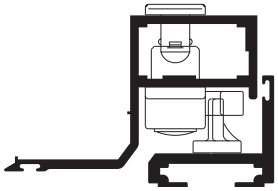
REMOVABLE HANDLE



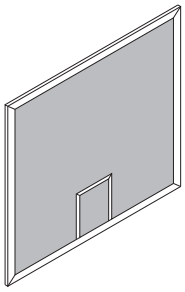
PIVOT SHOE ROTO-OPERATOR



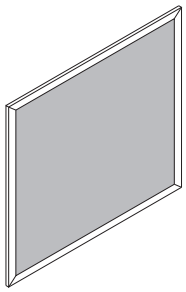
STAINLESS STEEL 4 BAR HINGES



CONCEALED LOCK



INSECT SCREEN WITH STANDARD WICKET



INSECT SCREEN WITH FULL WICKET

TRIFAB® VG 451/451T

VENTS (FRONT)

SCALE 3" = 1'-0"

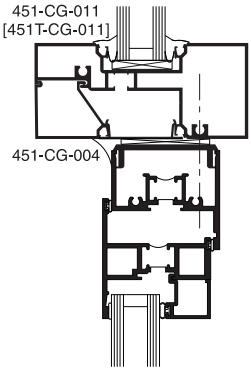
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Front--CAD.zip
(TF451T) = TF_VG_451T-SB-Front--CAD.zip

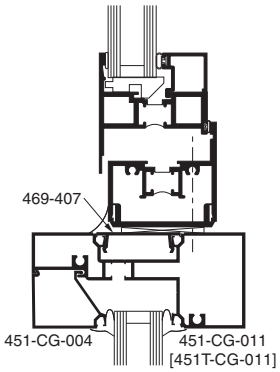
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip

PROJECT-OUT
VERTICAL SECTION

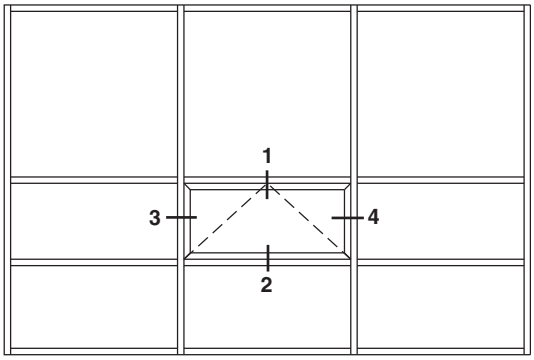
1



2

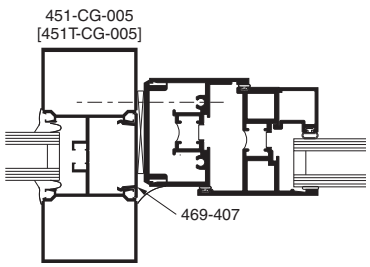


8225T•L VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

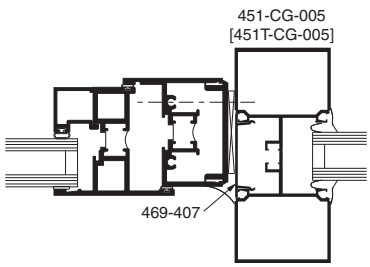


ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
HORIZONTAL SECTION



3



4

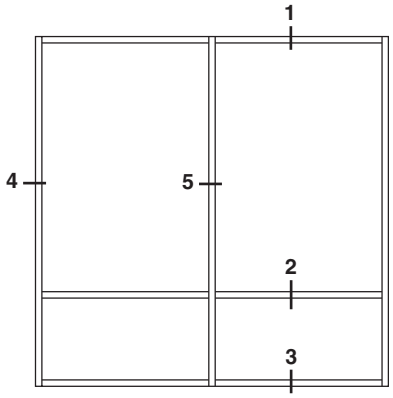
TRIFAB® VG 451/451T

MAY, 2012

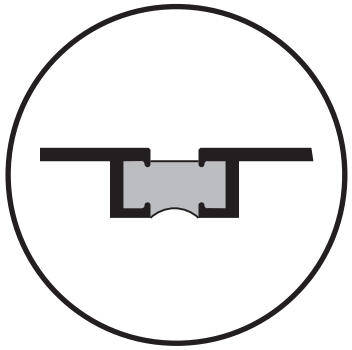
BASIC FRAMING DETAILS (BACK - Outside Glazed)

EC 97911-43

SCALE 3" = 1'-0"



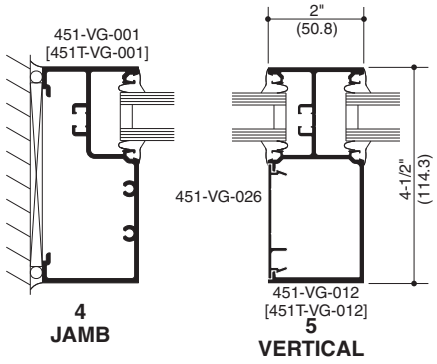
ELEVATION IS NUMBER KEYED TO DETAILS



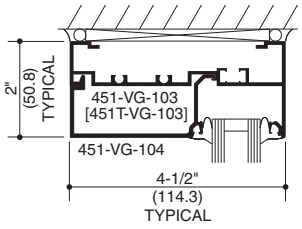
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

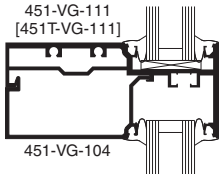
CAD Details (TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip



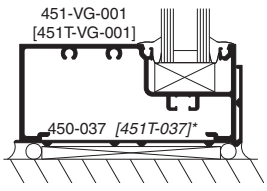
1 HEAD



2 HORIZONTAL



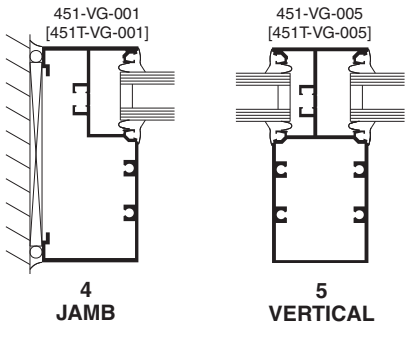
3 SILL



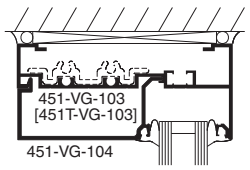
*See Page 46 for Thermal Flashing and Optional High Performance Flashing

SHEAR BLOCK

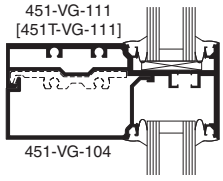
CAD Details (TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip



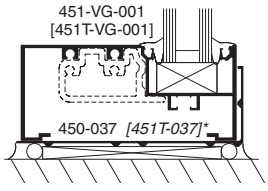
1 HEAD



2 HORIZONTAL



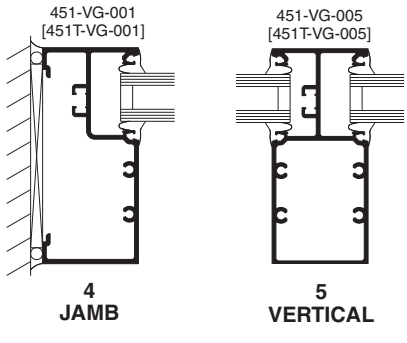
3 SILL



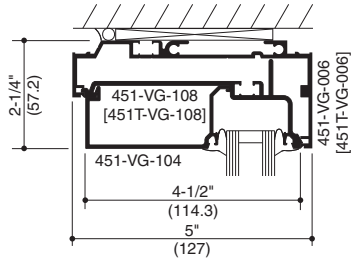
*See Page 46 for Thermal Flashing and Optional High Performance Flashing

STICK

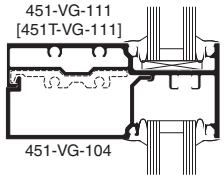
CAD Details (TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip



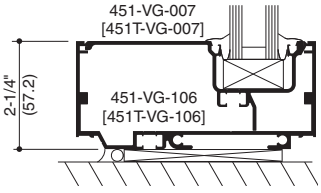
1 HEAD



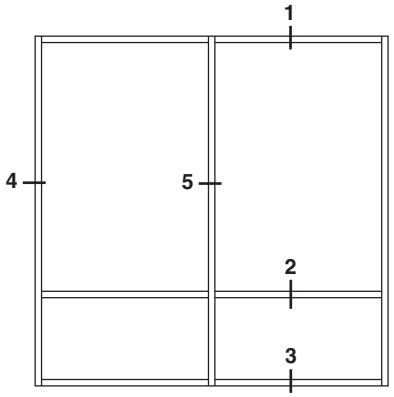
2 HORIZONTAL



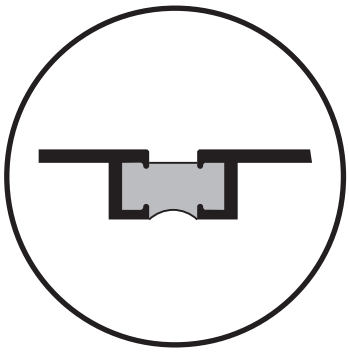
3 SILL



SCALE 3" = 1'-0"



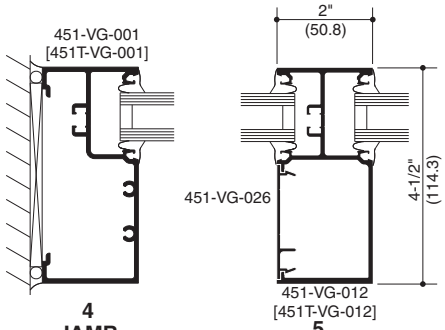
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

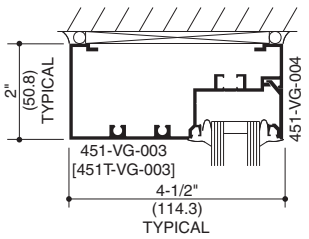
SCREW SPLINE

CAD Details (TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip

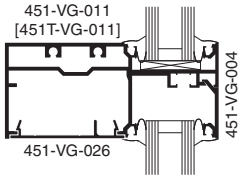


4 JAMB **5 VERTICAL**

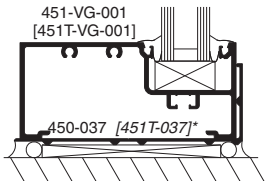
1 HEAD



2 HORIZONTAL



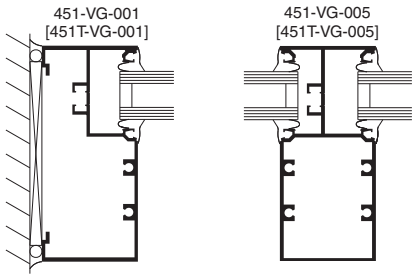
3 SILL



*See Page 46 for Thermal Flashing and Optional High Performance Flashing

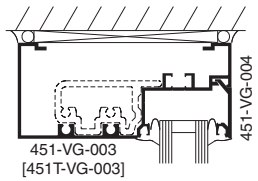
SHEAR BLOCK

CAD Details (TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip

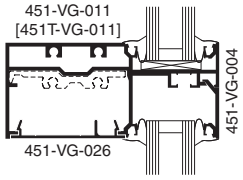


4 JAMB **5 VERTICAL**

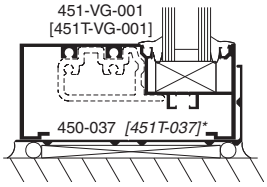
1 HEAD



2 HORIZONTAL



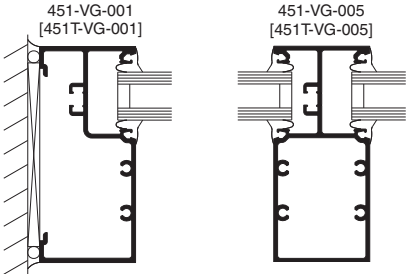
3 SILL



*See Page 46 for Thermal Flashing and Optional High Performance Flashing

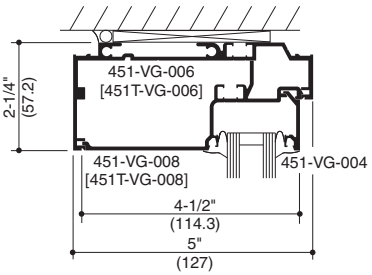
STICK

CAD Details (TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip

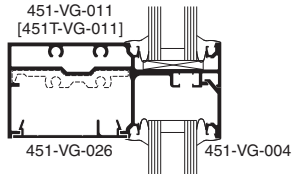


4 JAMB **5 VERTICAL**

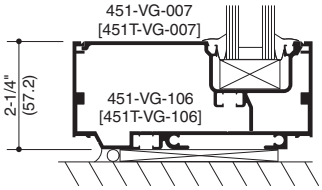
1 HEAD



2 HORIZONTAL



3 SILL

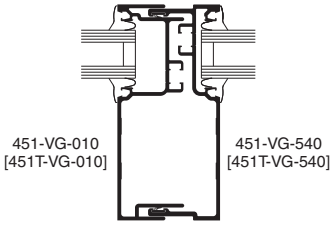


TRIFAB® VG 451/451T

MISCELLANEOUS FRAMING (BACK)

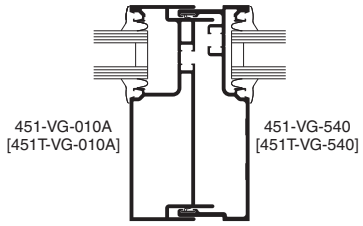
SCALE 3" = 1'-0"

CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip



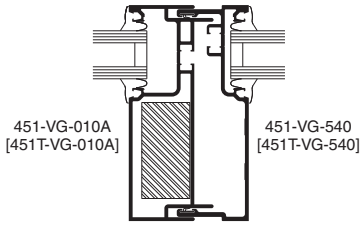
EXPANSION MULLION

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip

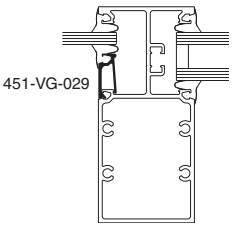


TUBULAR EXPANSION MULLION

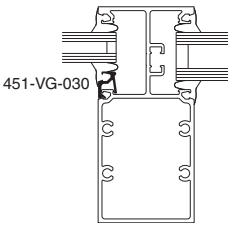
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip



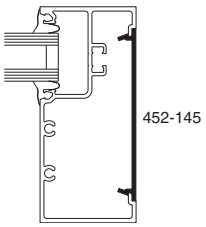
TUBULAR EXPANSION MULLION WITH STEEL



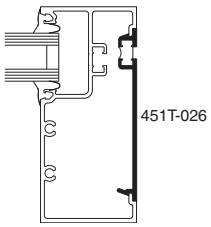
1/4" INFILL SNAP-IN ADAPTOR



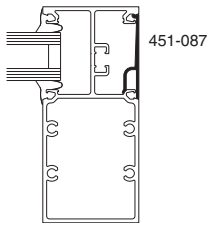
5/8" INFILL SNAP-IN ADAPTOR



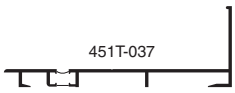
PVC FLAT FILLER (NON STRUCTURAL)



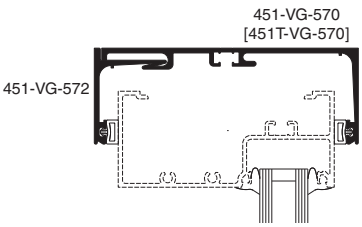
THERMAL FLAT FILLER



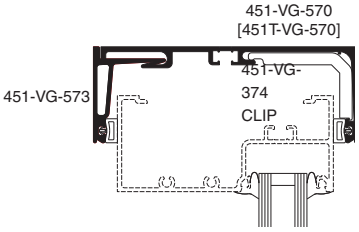
SNAP-IN FLAT FILLER



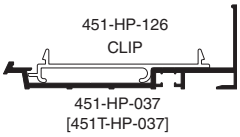
THERMAL FLASHING



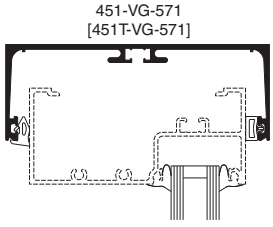
STANDARD - HEAD COMPENSATING RECEPTOR



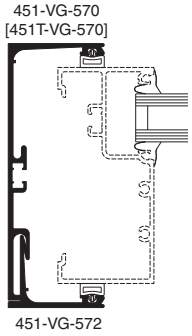
HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR



HIGH PERFORMANCE FLASHING



STANDARD - HEAD COMPENSATING RECEPTOR



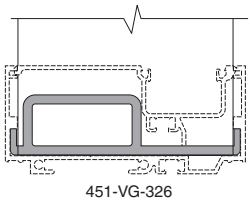
JAMB COMPENSATING RECEPTOR

SCALE 3" = 1'-0"

CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip

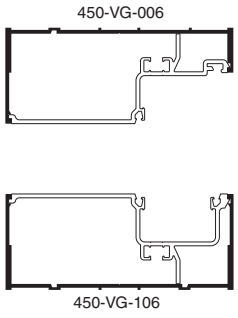
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip



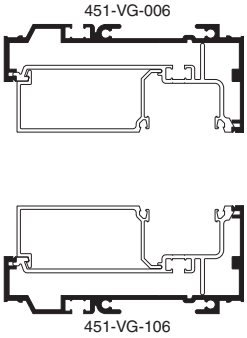
MULLION ANCHOR

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

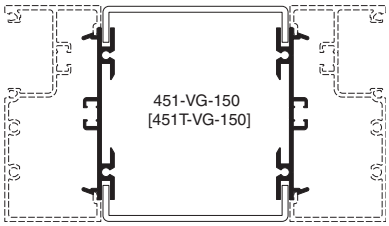
NOTE:
Mullion Anchor not used with Lightweight Receptor.



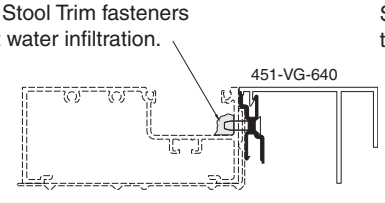
OPTIONAL LIGHTWEIGHT CAN RECEPTORS



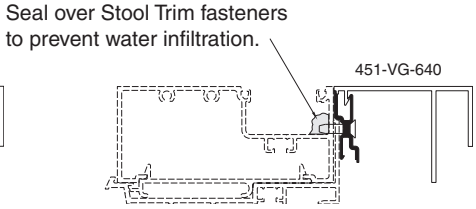
OPTIONAL UNEQUAL LEG CAN RECEPTORS



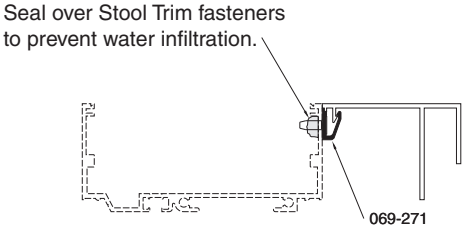
BRAKE METAL ADAPTOR



STOOL TRIM CLIP with STANDARD FLASHING



STOOL TRIM CLIP with HP FLASHING



STOOL TRIM CLIP FOR STICK ASSEMBLY

TRIFAB® VG 451/451T

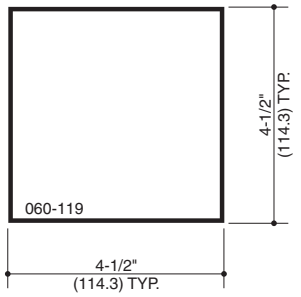
CORNERS (BACK)

SCALE 3" = 1'-0"

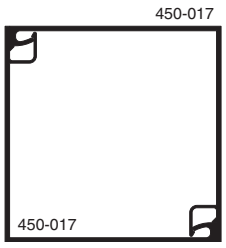
CAD Details - **SCREW SPLINE**
(TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip

CAD Details - **SHEAR BLOCK**
(TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip

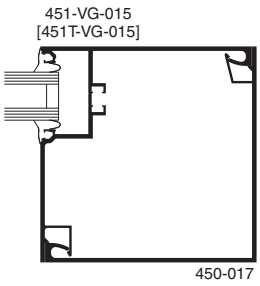
CAD Details - **STICK**
(TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip



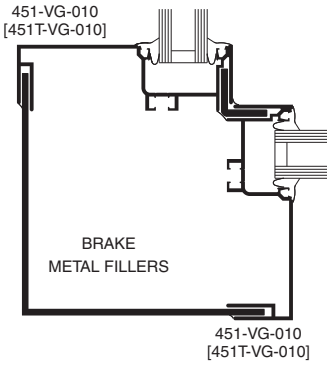
4-1/2" X 4-1/2" TUBE



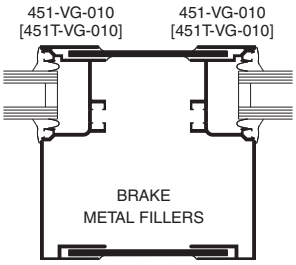
**TWO PIECE
NO POCKET CORNER**



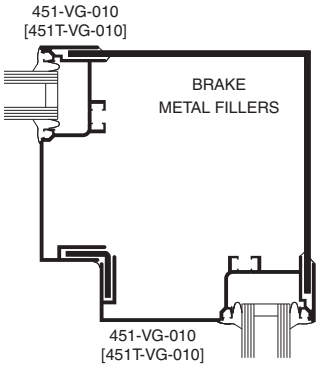
**ONE POCKET
CORNER**



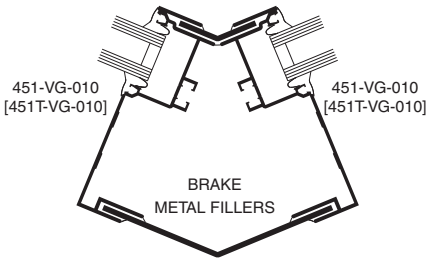
**OUTSIDE
90° CORNER**



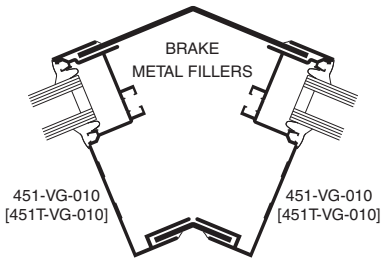
**TWO POCKET
CORNER POST**



**INSIDE
90° CORNER**



**135° OUTSIDE
CORNER**



**135° INSIDE
CORNER**

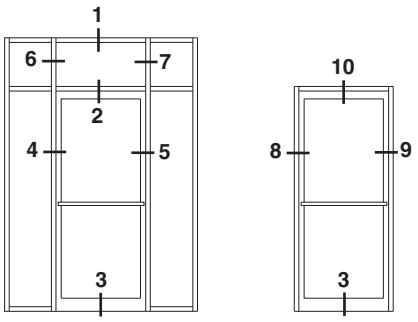
SCALE 3" = 1'-0"

CAD Details - **ENTRANCE**
(TF451) = TF_VG_451_Ent-Back--CAD.zip
(TF451T) = TF_VG_451T_Ent-Back--CAD.zip

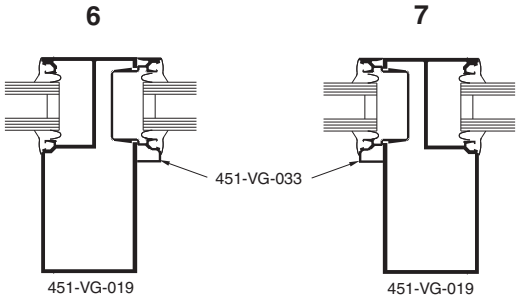
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® "190" DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

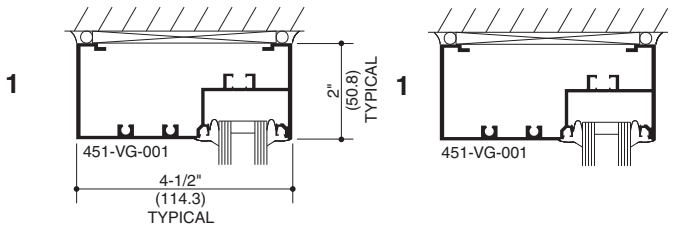


ELEVATIONS ARE NUMBER KEYED TO DETAILS

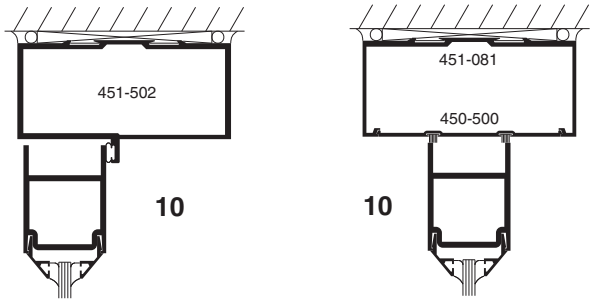


TRANSOM JAMBS

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

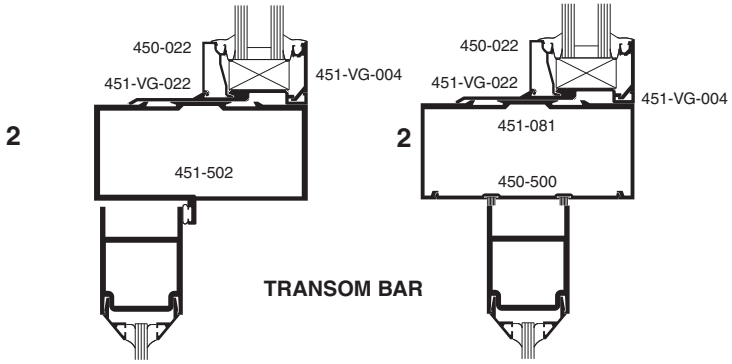


TRANSOM HEAD

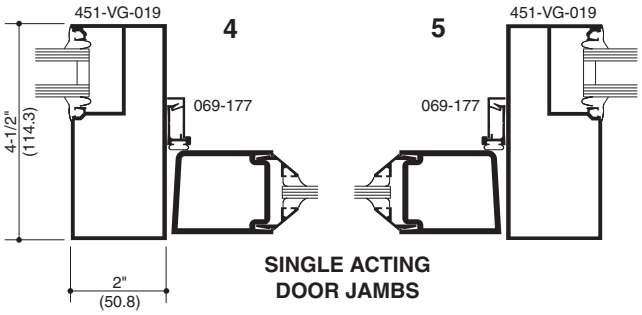


SINGLE ACTING HEADER

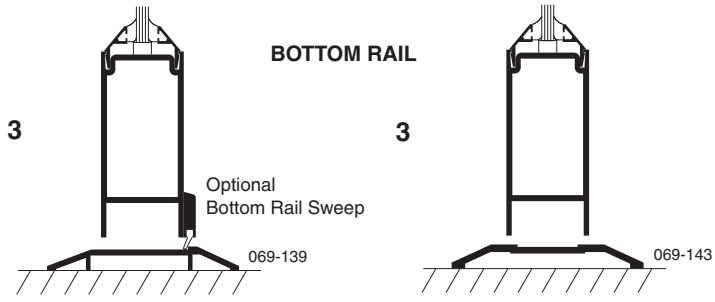
DOUBLE ACTING HEADER



TRANSOM BAR



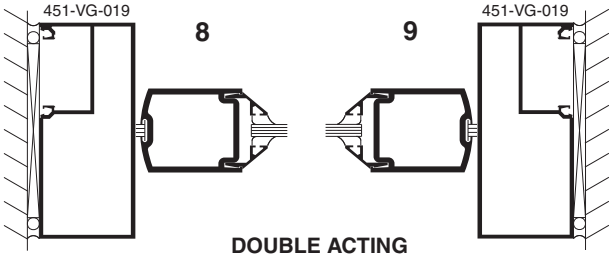
SINGLE ACTING DOOR JAMBS



BOTTOM RAIL

SINGLE ACTING

DOUBLE ACTING



DOUBLE ACTING DOOR JAMBS

KAWNEER
AN ALCOA COMPANY

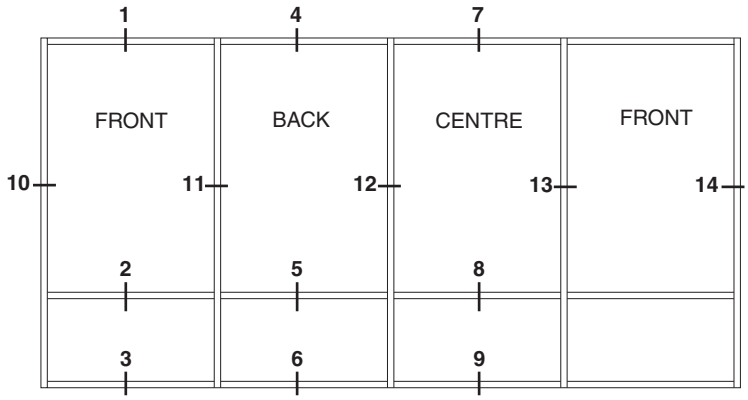
TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)

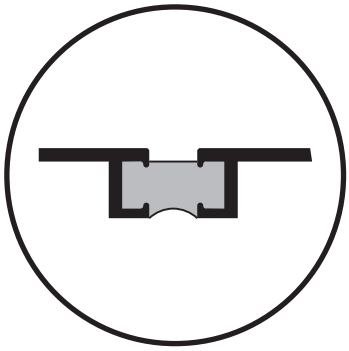
SCALE 3" = 1'-0"

CAD Details - **MULTI-PLANE**
(TF451) = TF_VG_451-SS+SB-Multi--CAD.zip
(TF451T) = TF_VG_451T-SS+SB-Multi--CAD.zip

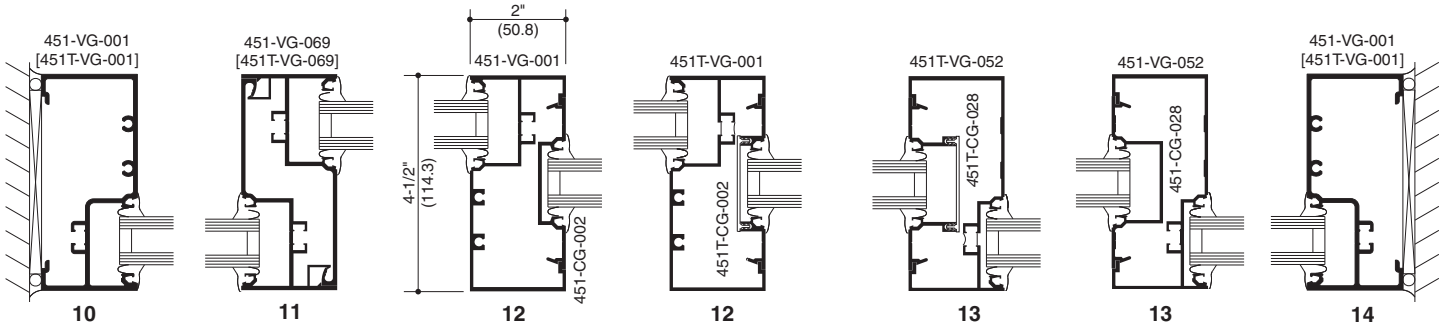
SCREW SPLINE ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

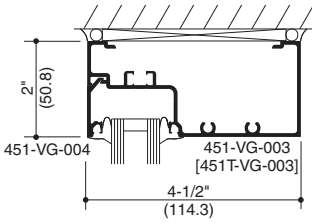


10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **12 VERTICAL (THERMAL)** | **13 VERTICAL (THERMAL)** | **13 VERTICAL** | **14 JAMB**

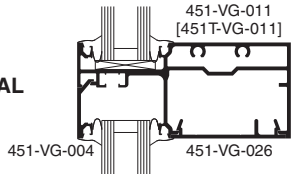
FRONT

See Pages 28 thru 42 for all FRONT details.

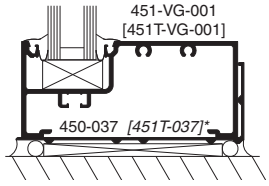
1 HEAD



2 HORIZONTAL



3 SILL

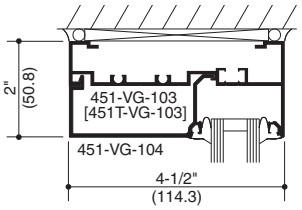


*See Page 35 for Thermal Flashing and Optional High Performance Flashing

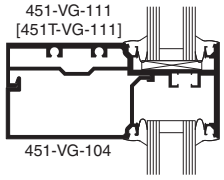
BACK

See Pages 44 thru 49 for all BACK details.

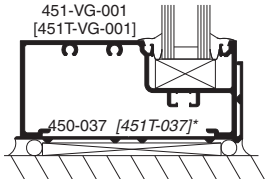
4 HEAD



5 HORIZONTAL



6 SILL

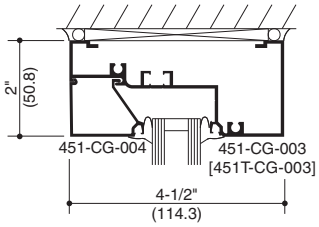


*See Page 46 for Thermal Flashing and Optional High Performance Flashing

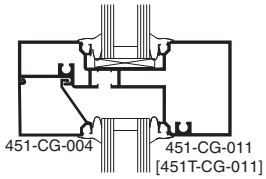
CENTER

See Pages 12 thru 22 for all CENTER details.

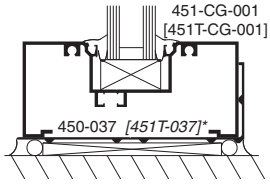
7 HEAD



8 HORIZONTAL



9 SILL

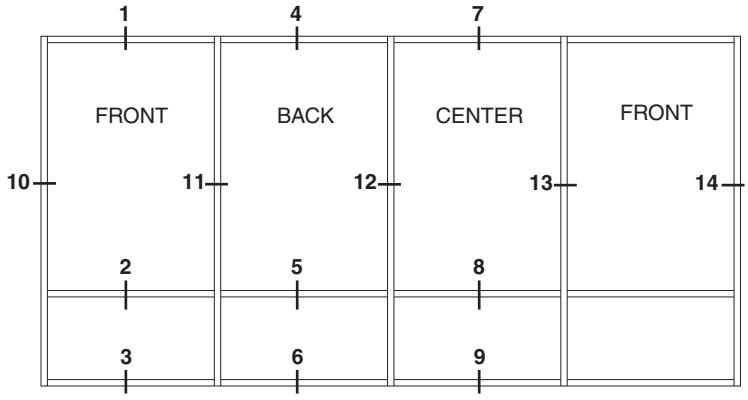


*See Page 14 for Thermal Flashing and Optional High Performance Flashing

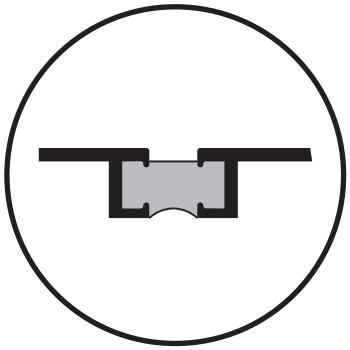
SCALE 3" = 1'-0"

CAD Details - **MULTI-PLANE**
(TF451) = TF_VG_451-SS+SB-Multi--CAD.zip
(TF451T) = TF_VG_451T-SS+SB-Multi--CAD.zip

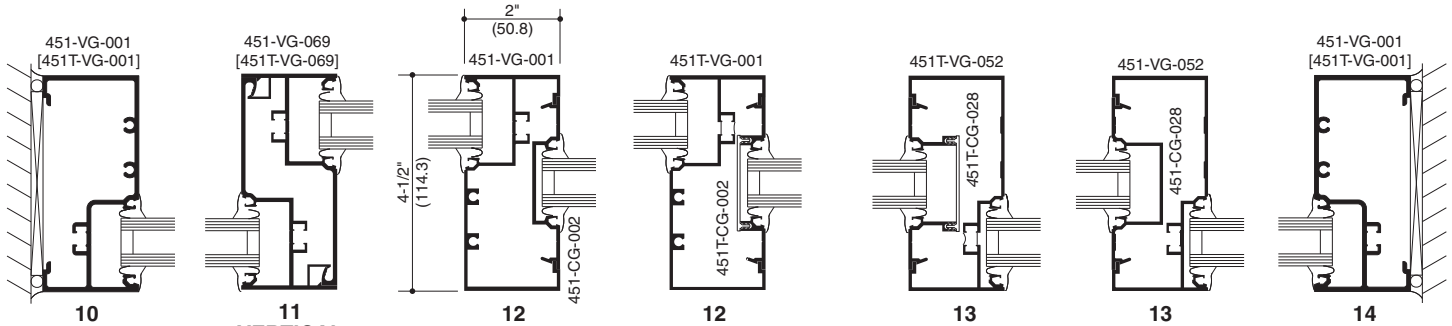
SCREW SPLINE ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

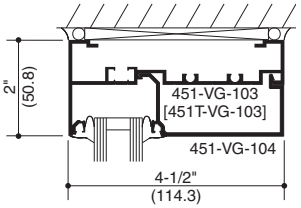


10 JAMB | 11 VERTICAL | 12 VERTICAL | 12 VERTICAL (THERMAL) | 13 VERTICAL (THERMAL) | 13 VERTICAL | 14 JAMB

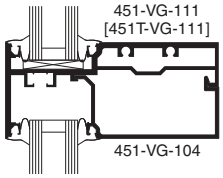
FRONT

See Pages 28 thru 41 for all FRONT details.

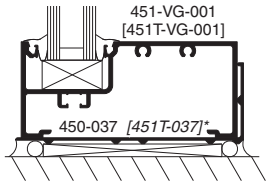
1 HEAD



2 HORIZONTAL



3 SILL

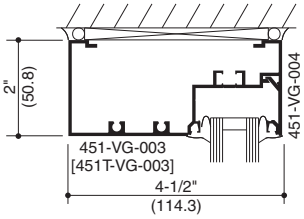


*See Page 35 for Thermal Flashing and Optional High Performance Flashing

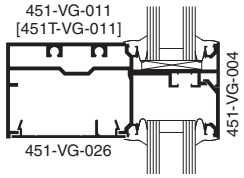
BACK

See Pages 44 thru 49 for all BACK details.

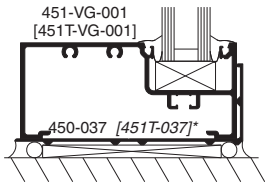
4 HEAD



5 HORIZONTAL



6 SILL

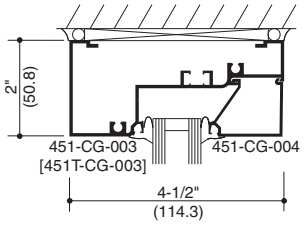


*See Page 46 for Thermal Flashing and Optional High Performance Flashing

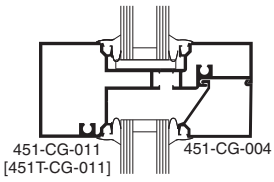
CENTER

See Pages 12 thru 22 for all CENTER details.

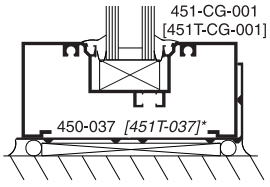
7 HEAD



8 HORIZONTAL



9 SILL



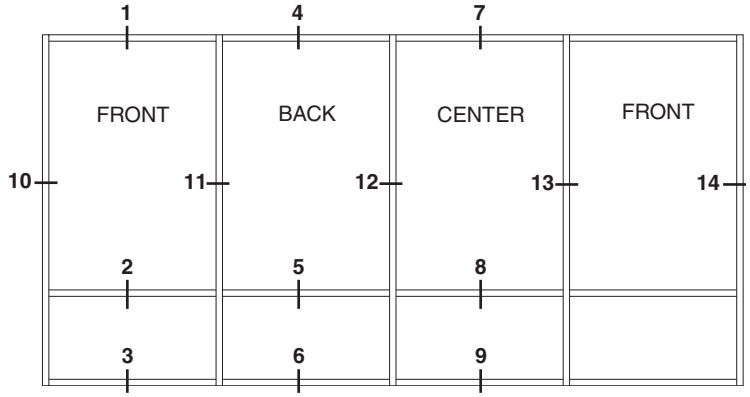
*See Page 14 for Thermal Flashing and Optional High Performance Flashing

TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)

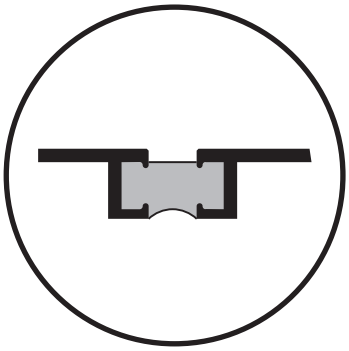
SCALE 3" = 1'-0"

SHEAR BLOCK ASSEMBLY



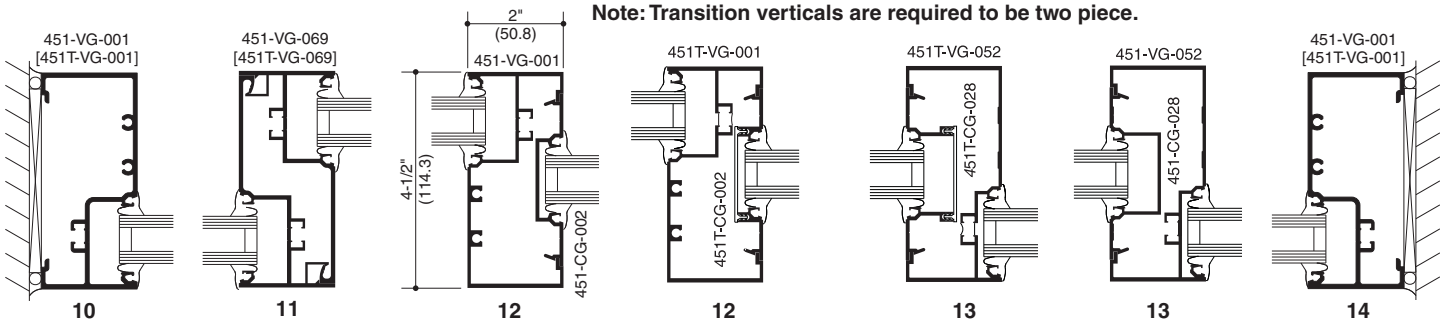
ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details - **MULTI-PLANE**
(TF451) = TF_VG_451-SS+SB-Multi--CAD.zip
(TF451T) = TF_VG_451T-SS+SB-Multi--CAD.zip



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.

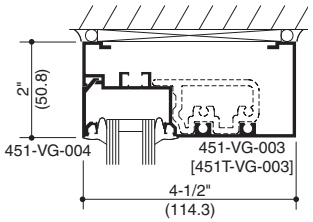


10 JAMB | 11 VERTICAL | 12 VERTICAL | 12 VERTICAL (THERMAL) | 13 VERTICAL (THERMAL) | 13 VERTICAL | 14 JAMB

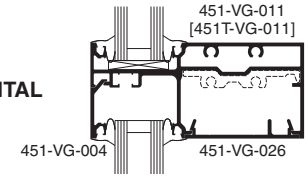
FRONT

See Pages 28 thru 42 for all FRONT details.

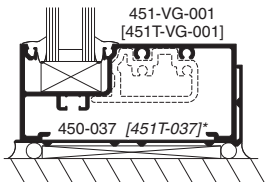
1 HEAD



2 HORIZONTAL



3 SILL

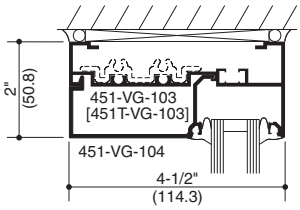


*See Page 35 for Thermal Flashing and Optional High Performance Flashing

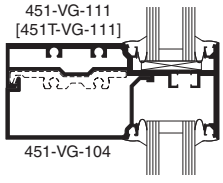
BACK

See Pages 44 thru 49 for all BACK details.

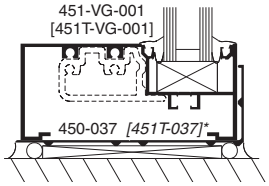
4 HEAD



5 HORIZONTAL



6 SILL

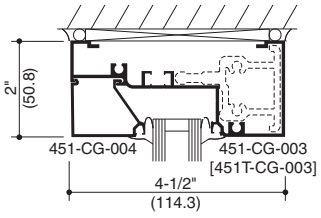


*See Page 46 for Thermal Flashing and Optional High Performance Flashing

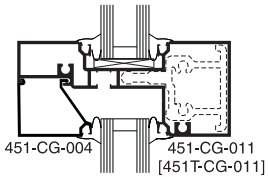
CENTER

See Pages 12 thru 22 for all CENTER details.

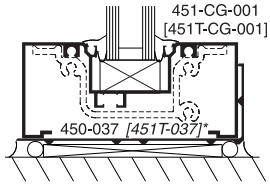
7 HEAD



8 HORIZONTAL



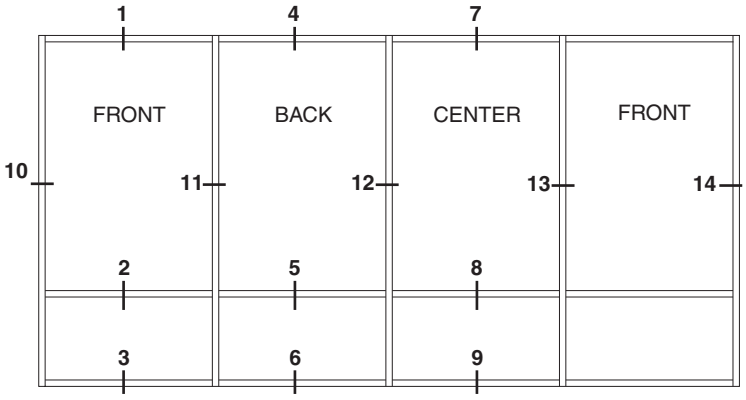
9 SILL



*See Page 14 for Thermal Flashing and Optional High Performance Flashing

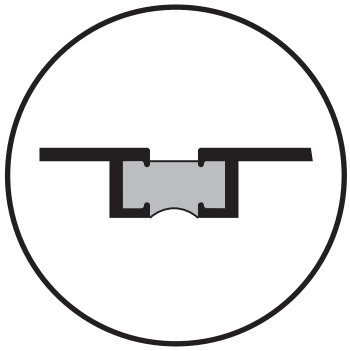
SCALE 3" = 1'-0"

SHEAR BLOCK ASSEMBLY



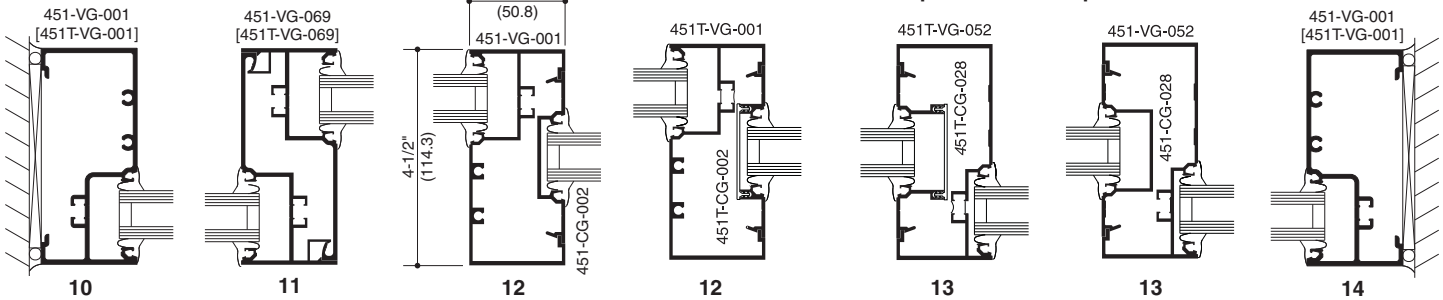
ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details - **MULTI-PLANE**
(TF451) = TF_VG_451-SS+SB-Multi--CAD.zip
(TF451T) = TF_VG_451T-SS+SB-Multi--CAD.zip



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

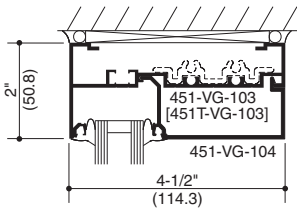
Note: Transition verticals are required to be two piece



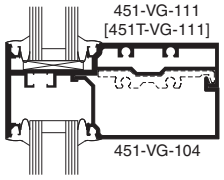
FRONT

See Pages 28 thru 42 for all FRONT details.

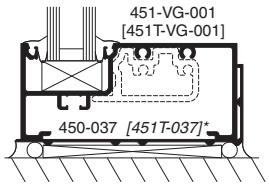
1 HEAD



2 HORIZONTAL



3 SILL

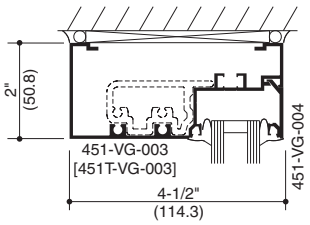


*See Page 35 for Thermal Flashing and Optional High Performance Flashing

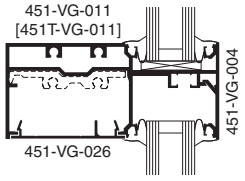
BACK

See Pages 44 thru 49 for all BACK details.

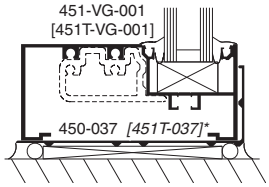
4 HEAD



5 HORIZONTAL



6 SILL

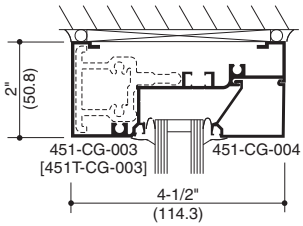


*See Page 46 for Thermal Flashing and Optional High Performance Flashing

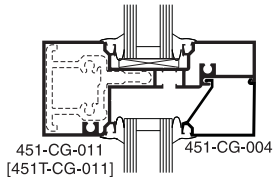
CENTER

See Pages 12 thru 22 for all CENTER details.

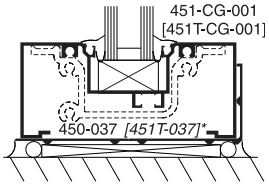
7 HEAD



8 HORIZONTAL



9 SILL



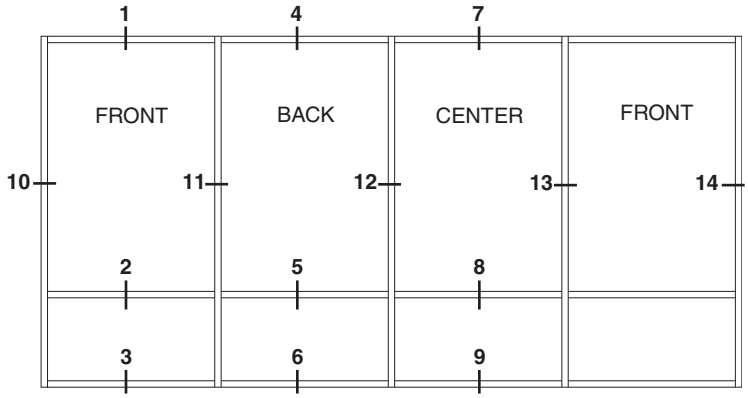
*See Page 14 for Thermal Flashing and Optional High Performance Flashing

TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)

SCALE 3" = 1'-0"

STICK ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details - **MULTI-PLANE**
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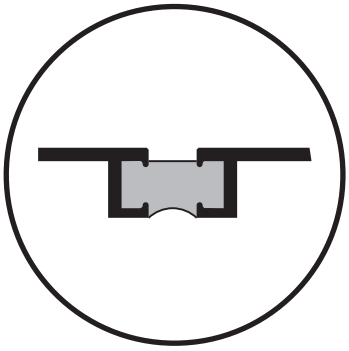
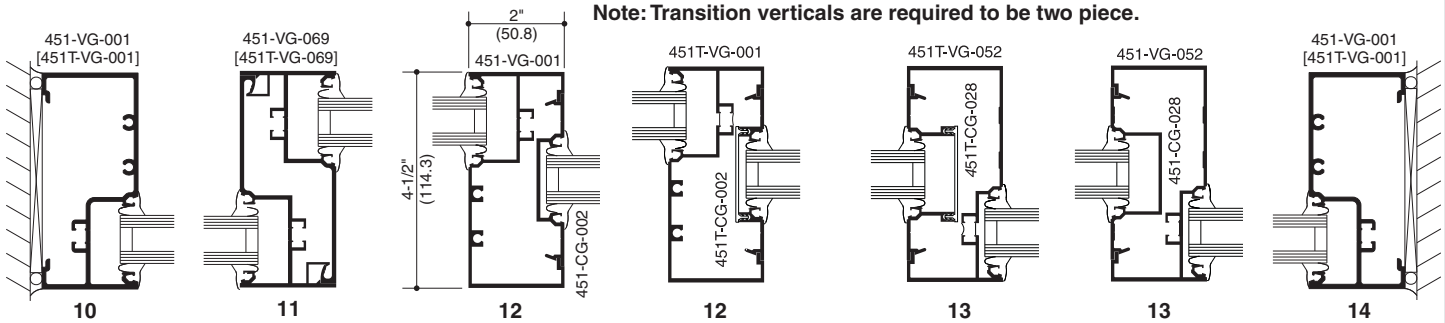
(TF451T) = TF_VG_451T-Stick-Multi--CAD.zip



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.

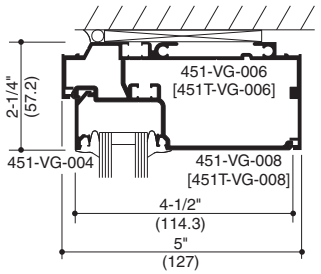


10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **12 VERTICAL (THERMAL)** | **13 VERTICAL (THERMAL)** | **13 VERTICAL** | **14 JAMB**

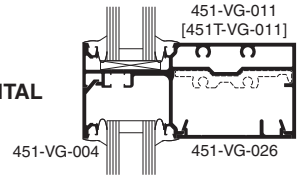
FRONT

See Pages 28 thru 42 for all FRONT details.

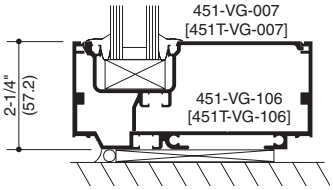
1 HEAD



2 HORIZONTAL



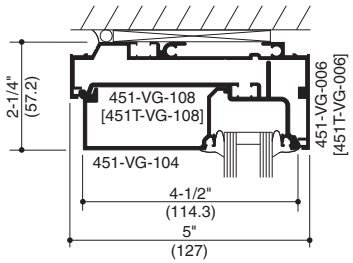
3 SILL



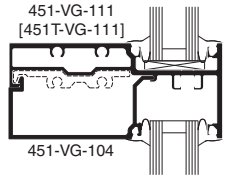
BACK

See Pages 44 thru 49 for all BACK details.

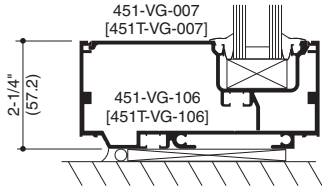
4 HEAD



5 HORIZONTAL



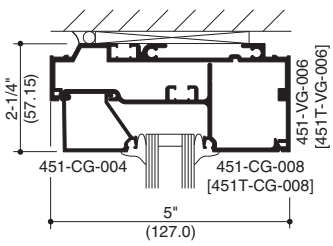
6 SILL



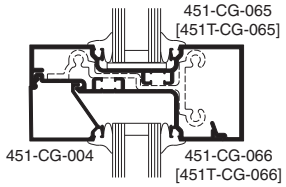
CENTER

See Pages 12 thru 22 for all CENTER details.

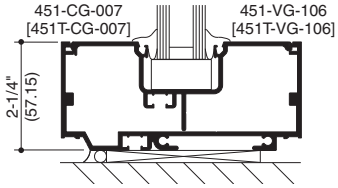
7 HEAD



8 HORIZONTAL

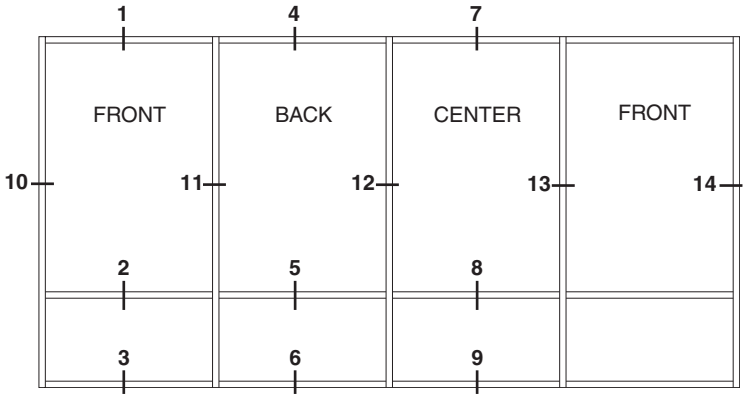


9 SILL



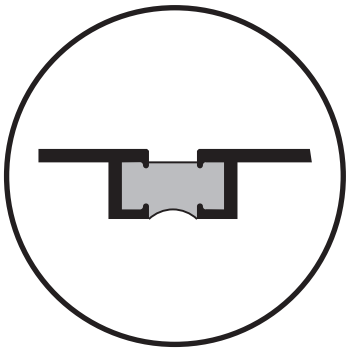
SCALE 3" = 1'-0"

STICK ASSEMBLY



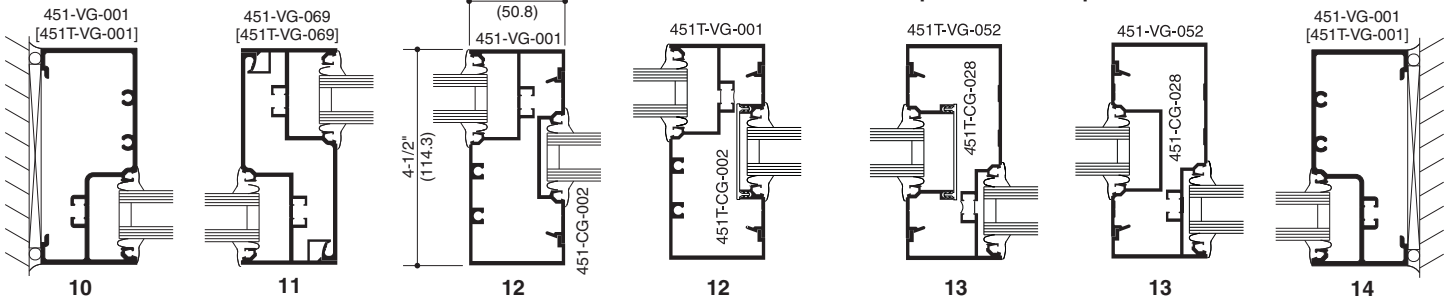
ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details - **MULTI-PLANE**
(TF451) = TF_VG_451-Stick-Multi--CAD.zip
(TF451T) = TF_VG_451T-Stick-Multi--CAD.zip



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece

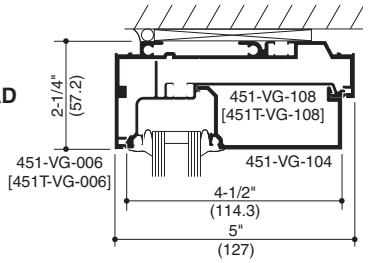


10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **12 VERTICAL (THERMAL)** | **13 VERTICAL (THERMAL)** | **13 VERTICAL** | **14 JAMB**

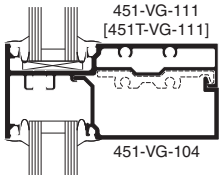
FRONT

See Pages 28 thru 42 for all FRONT details.

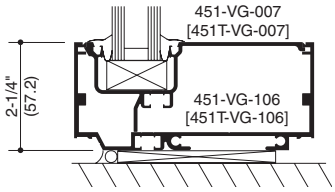
1 HEAD



2 HORIZONTAL



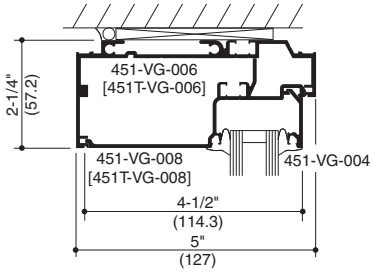
3 SILL



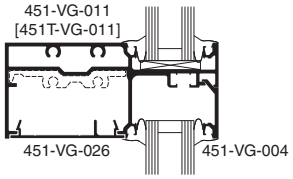
BACK

See Pages 44 thru 49 for all BACK details.

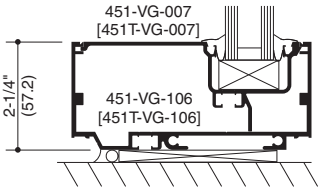
4 HEAD



5 HORIZONTAL



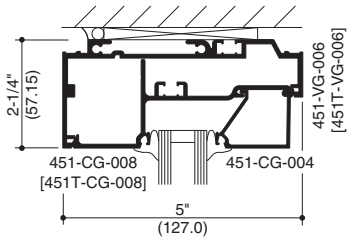
6 SILL



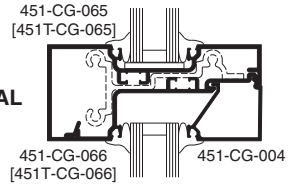
CENTER

See Pages 12 thru 22 for all CENTER details.

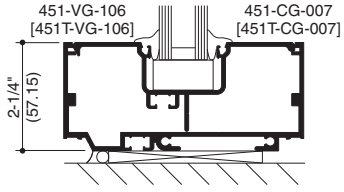
7 HEAD



8 HORIZONTAL



9 SILL



TRIFAB® VG 451

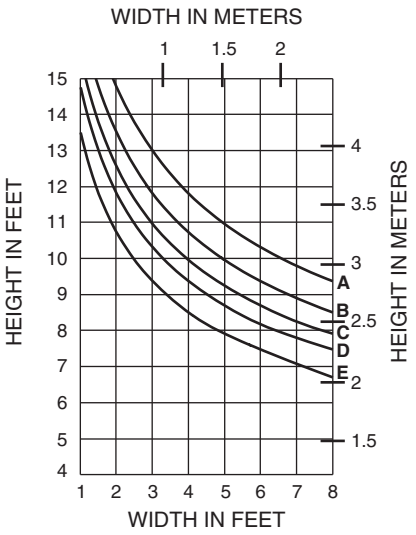
WINDLOAD CHARTS (CENTER) Non-Thermal

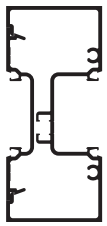
Mullions are designed for deflection limitations in accordance with AAMA TIR-A11 of L\175 up to 13'-6" and L\240 + 1/4" above 13'-6". These curves are for mullions WITH and WITHOUT HORIZONTALS and are based on engineering calculations for stress and deflection. Allowable windload stress for ALUMINUM (assuming full lateral buckling support) 15,152 P.S.I. (104 MPa), FORMED STEEL 30,000 P.S.I. (207 MPa), STEEL BAR 20,000 P.S.I. (138 MPa). Charted curves, in all cases, are for the limiting value. For special situations not covered by these curves, contact your Kawneer representative for additional information.

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

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

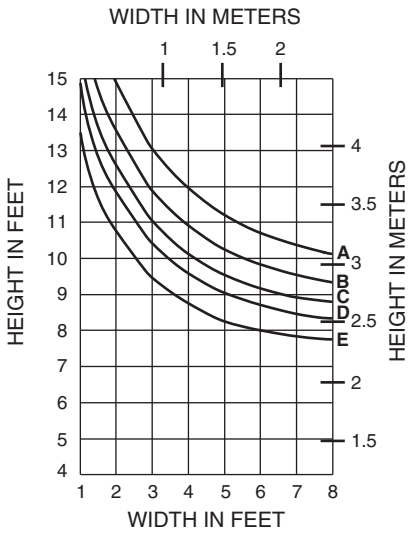




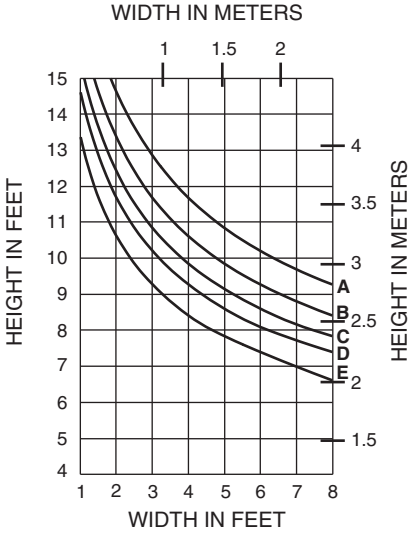
451-CG-001
451-CG-002

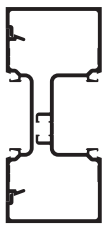
I = 3.237 (134.73 x 10^4)
S = 1.429 (23.42 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

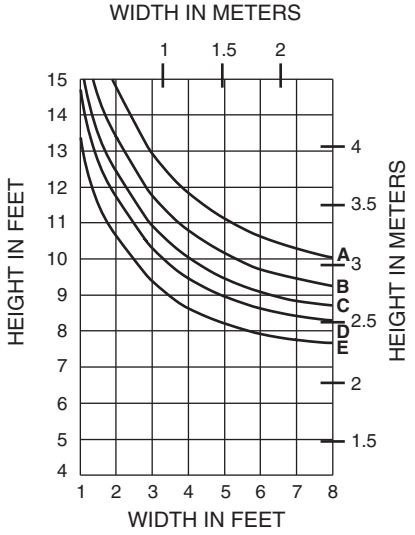




451-CG-012
451-CG-002

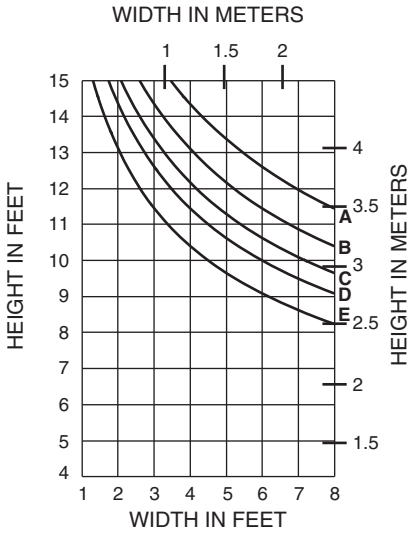
I = 3.137 (130.57 x 10^4)
S = 1.384 (22.68 x 10^3)

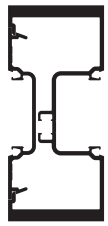
WITHOUT HORIZONTALS



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

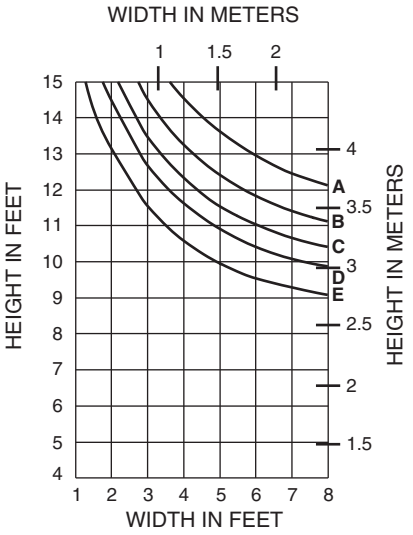




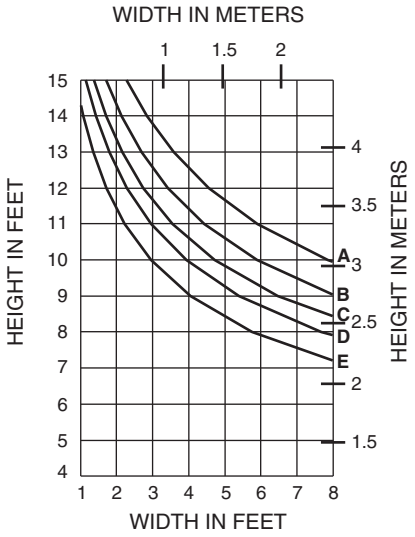
451-CG-013
451-CG-002

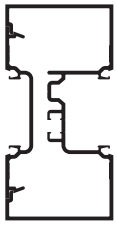
I = 5.907 (245.86 x 10^4)
S = 2.615 (42.85 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

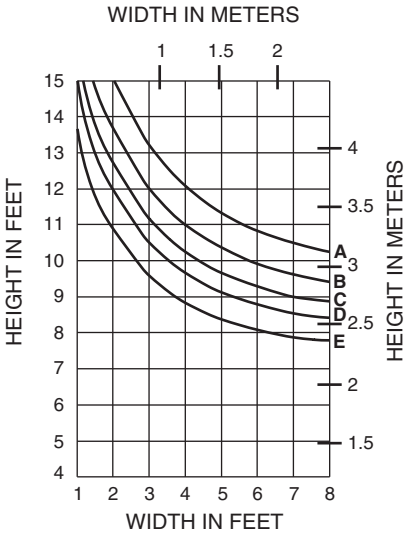




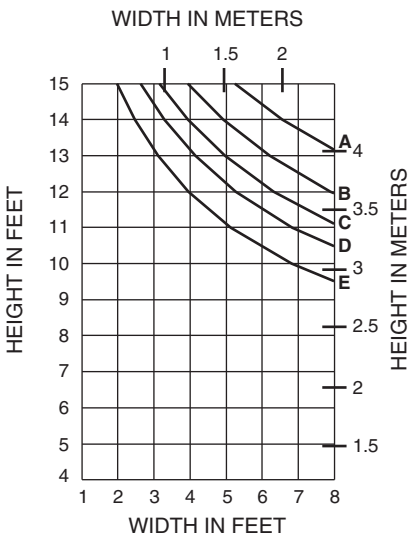
451-CG-112
451-CG-002

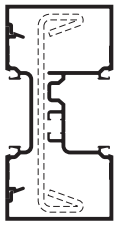
I = 3.346 (139.27 x 10^4)
S = 1.474 (24.15 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



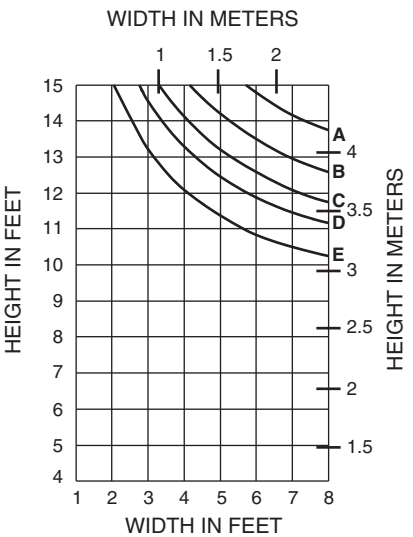


451-CG-112
451-CG-002
with 450-110 STEEL

I_A = 3.346 (139.27 x 10^4)
S_A = 1.474 (24.15 x 10^3)

I_S = 1.935 (80.54 x 10^4)
S_S = 0.938 (15.37 x 10^3)

WITHOUT HORIZONTALS

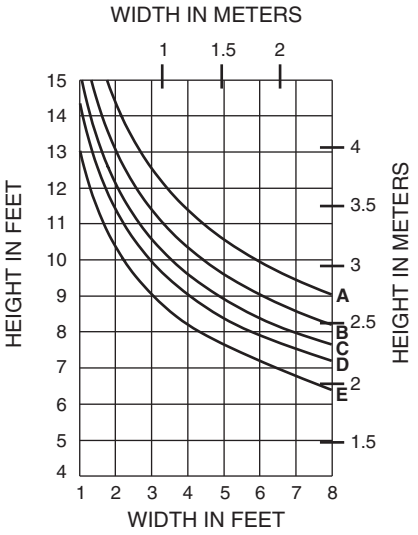


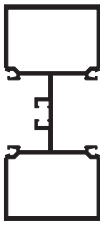
TRIFAB® VG 451

WINDLOAD CHARTS (CENTER) Non-Thermal

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

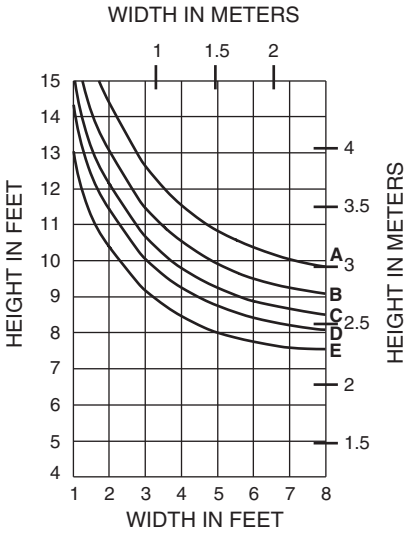




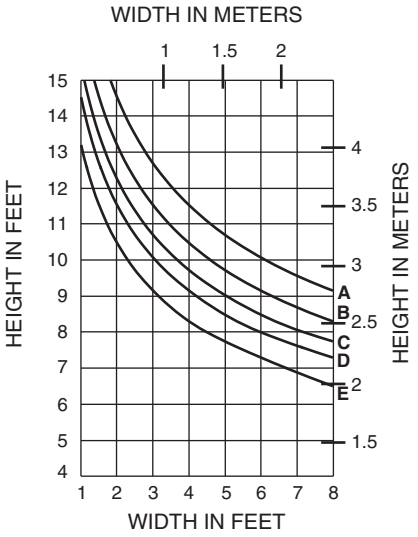
451-CG-005

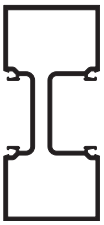
I = 2.907 (120.99 x 10^4)
S = 1.292 (21.17 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

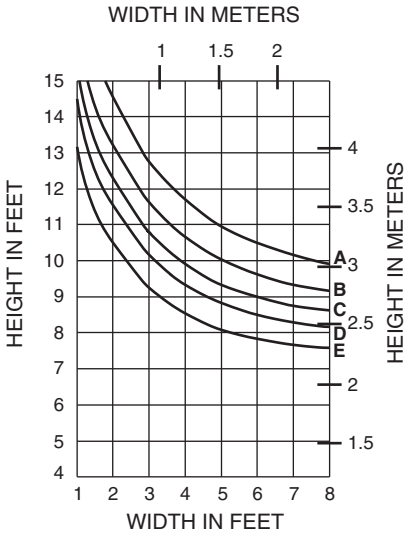




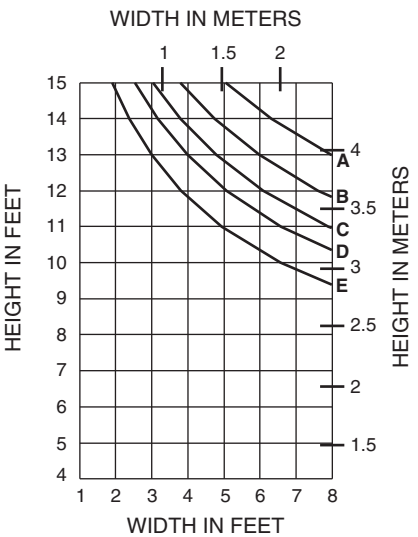
451-CG-005A

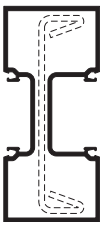
I = 3.016 (125.53 x 10^4)
S = 1.340 (21.96 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

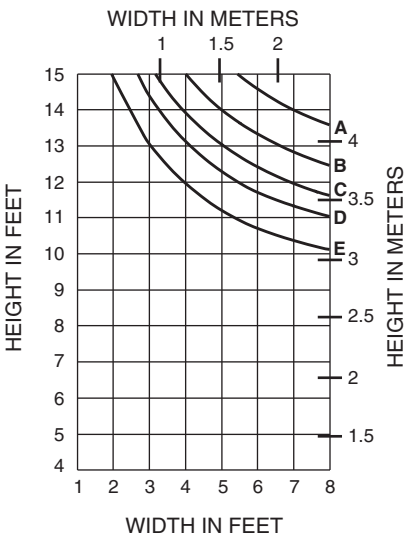




451-CG-005A
with 450-110 STEEL

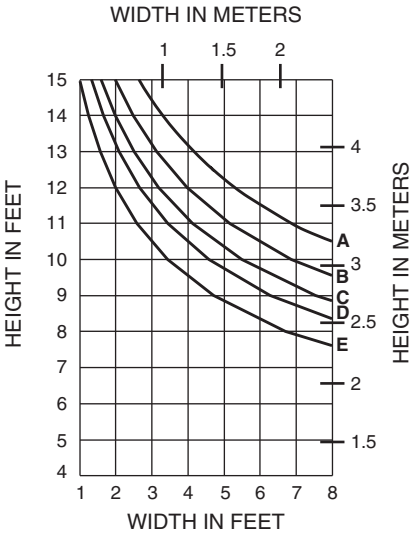
I_A = 3.016 (125.53 x 10^4)
S_A = 1.340 (21.96 x 10^3)
I_S = 1.935 (80.54 x 10^4)
S_S = 0.938 (15.37 x 10^3)

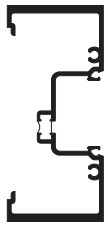
WITHOUT HORIZONTALS



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

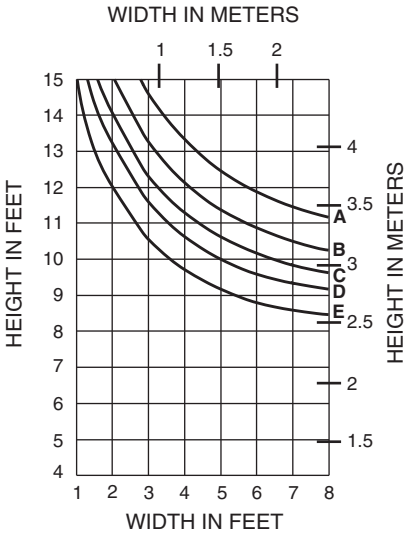




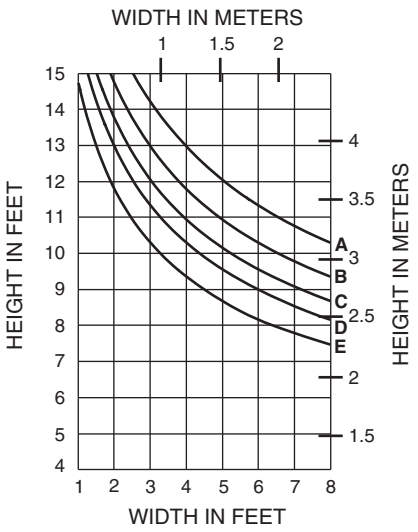
451-CG-001A
451-CG-002

I = 4.507 (187.59 x 10^4)
S = 1.993 (32.66 x 10^3)

WITHOUT HORIZONTALS



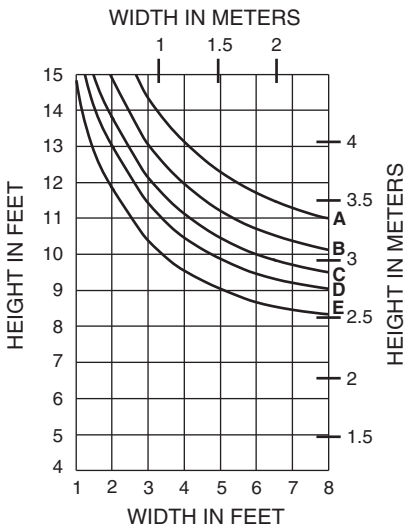
WITH HORIZONTALS



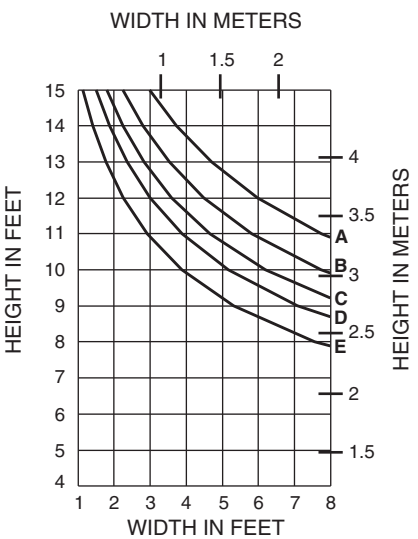
451-CG-010
451-CG-540

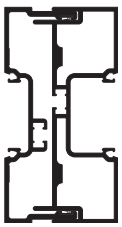
I = 4.301 (179.02 x 10^4)
S = 1.887 (30.92 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

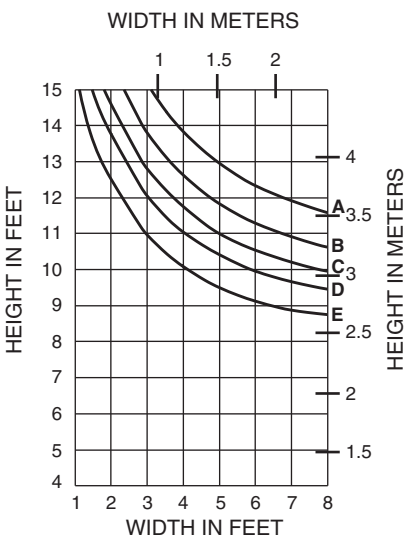




451-CG-010A
451-CG-540

I = 5.083 (211.57 x 10^4)
S = 2.230 (36.54 x 10^3)

WITHOUT HORIZONTALS

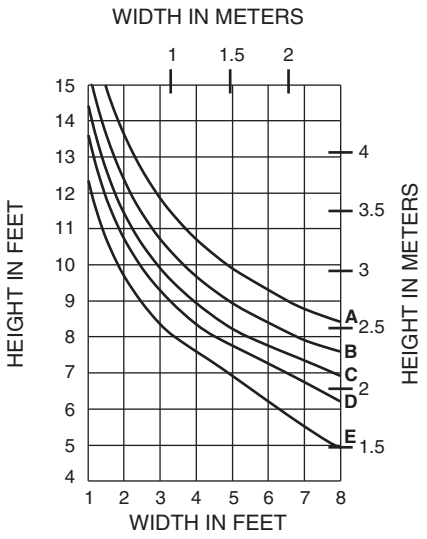


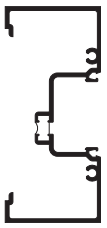
TRIFAB® VG 451T

WINDLOAD CHARTS (CENTER) Thermal

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

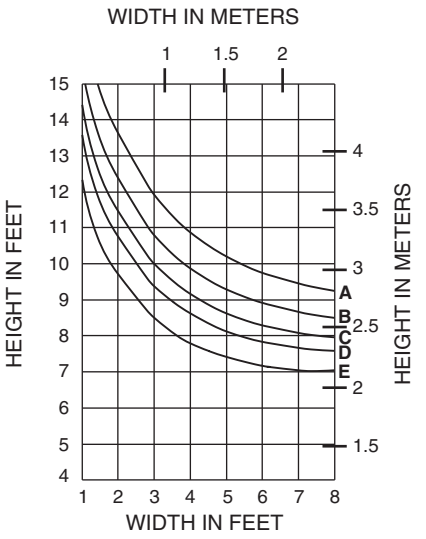




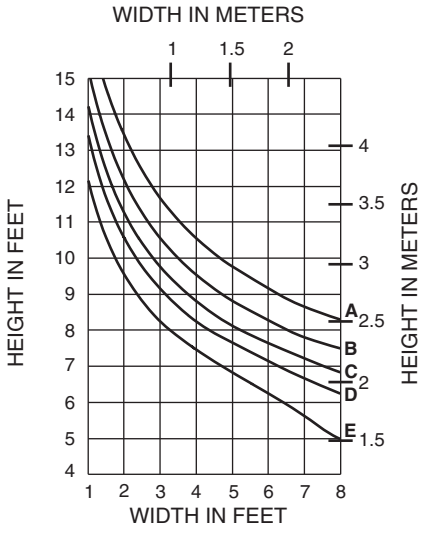
451T-CG-001

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

WITHOUT HORIZONTALS



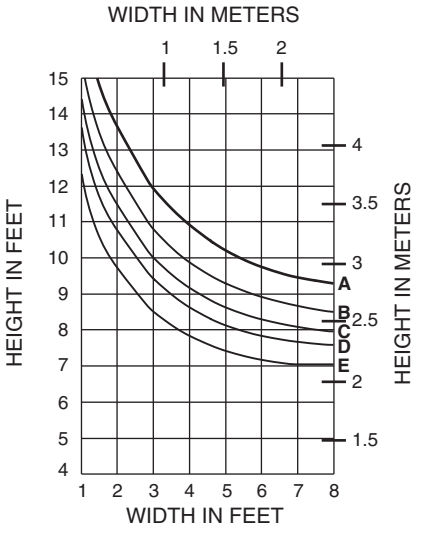
WITH HORIZONTALS



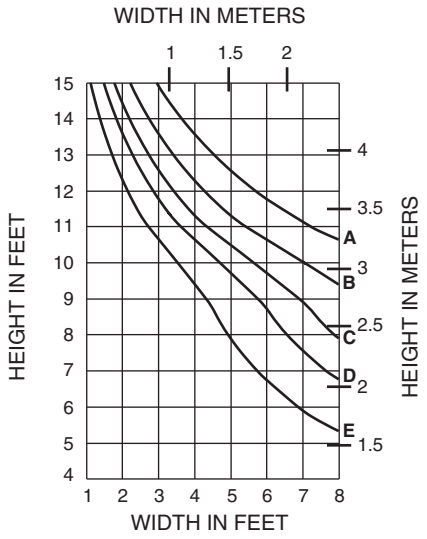
451T-CG-012

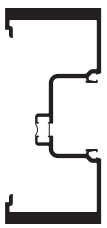
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

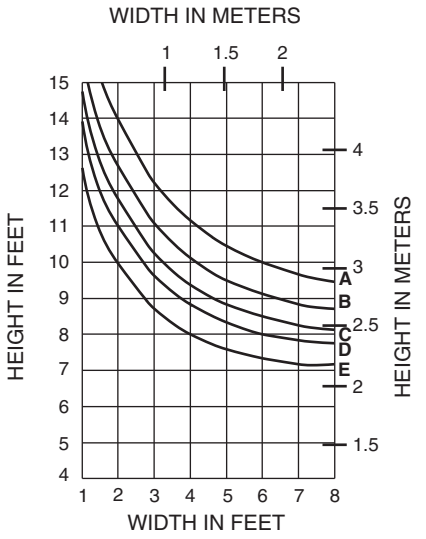




451T-CG-013

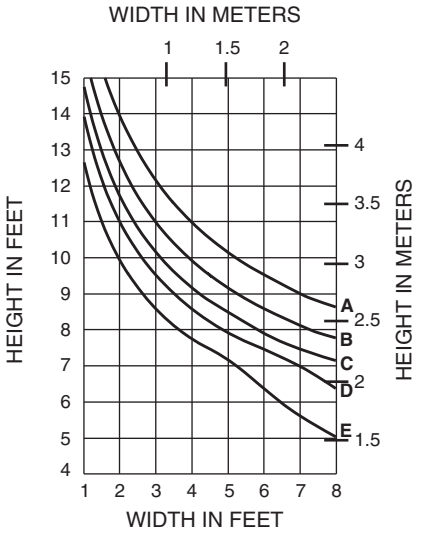
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

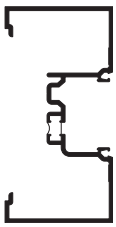
WITHOUT HORIZONTALS



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

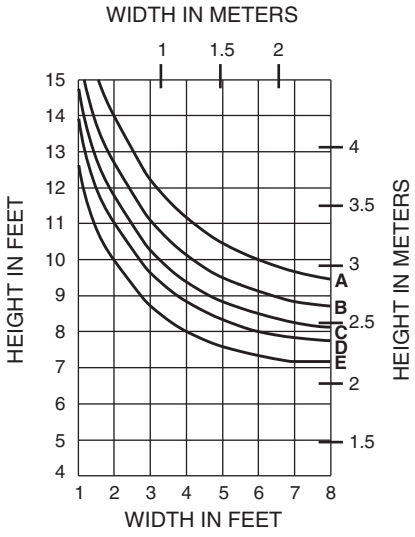




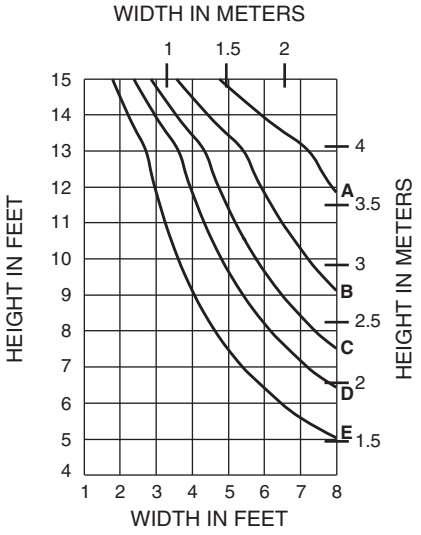
451T-CG-112

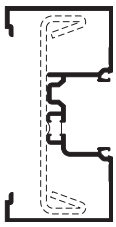
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

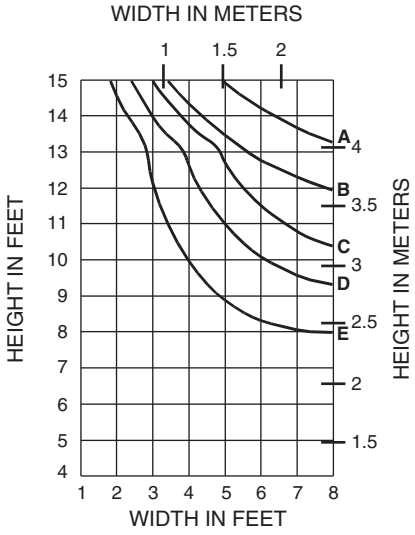




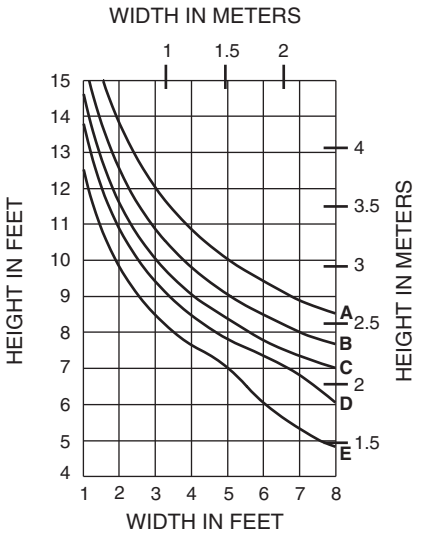
451T-CG-112
with 450-110 STEEL

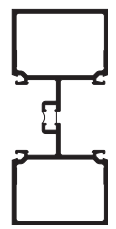
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

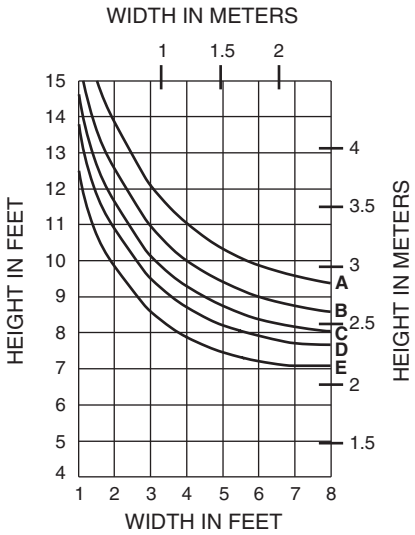




451T-CG-005

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

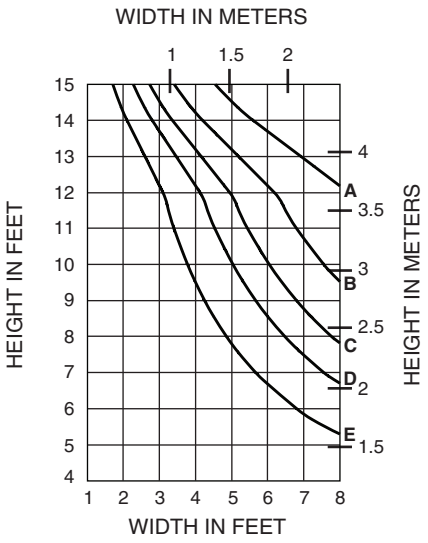
WITHOUT HORIZONTALS



TRIFAB® VG 451T

WINDLOAD CHARTS (CENTER) Thermal

WITH HORIZONTALS

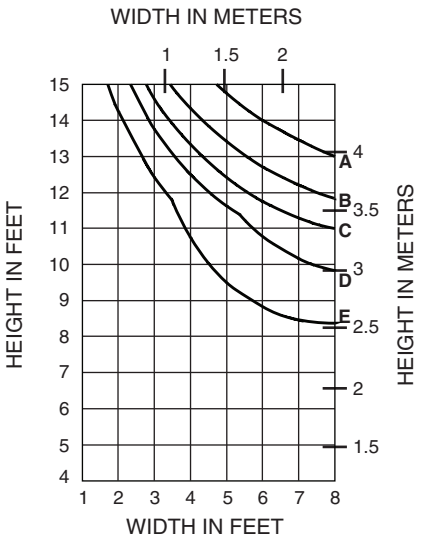


A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

451T-CG-113

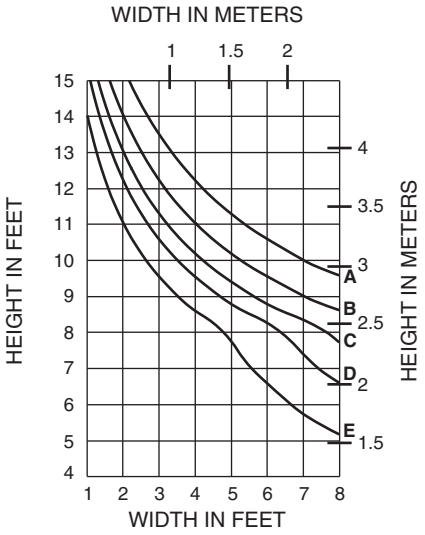
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

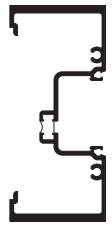
WITHOUT HORIZONTALS



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

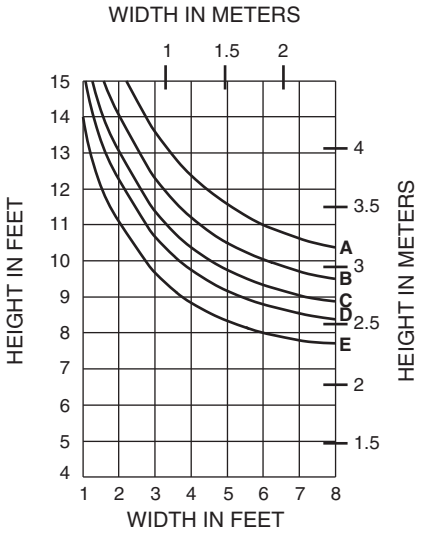




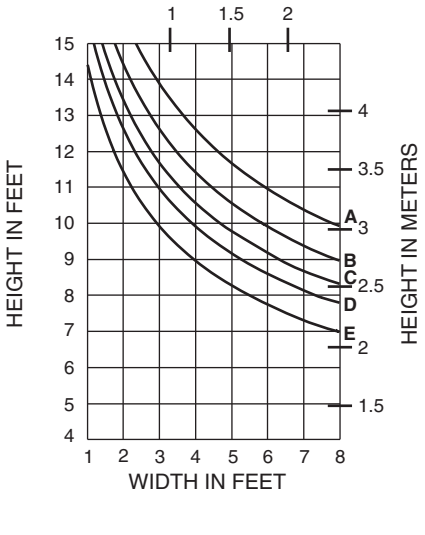
451T-CG-001A

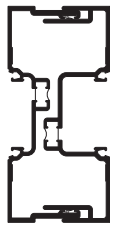
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

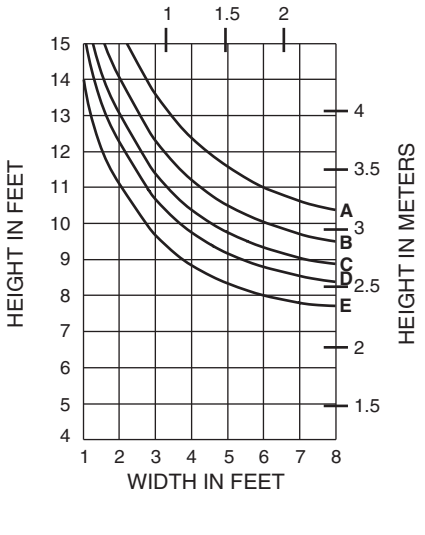




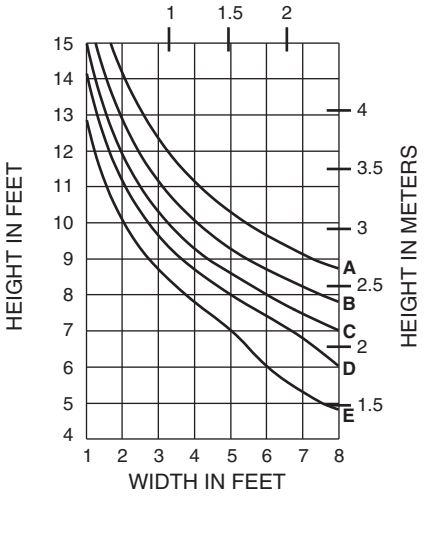
451T-CG-540
451T-CG-010

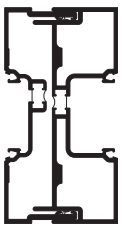
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

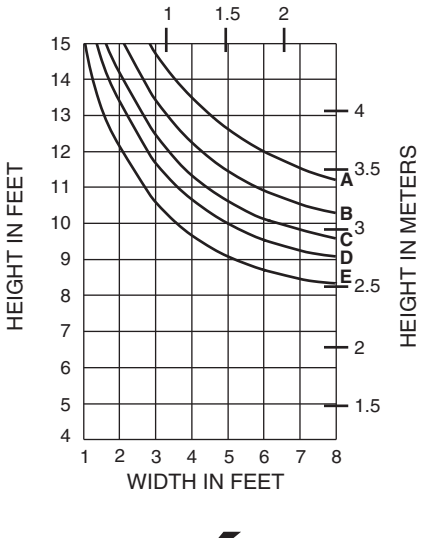




451T-CG-540
451T-CG-010A

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

WITHOUT HORIZONTALS

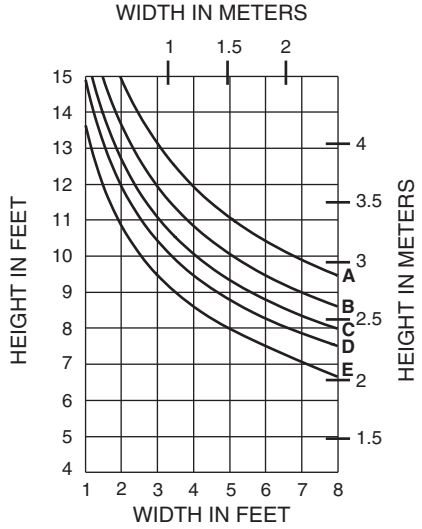


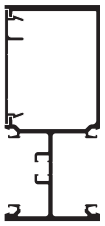
TRIFAB® VG 451

WINDLOAD CHARTS (FRONT/BACK) Non-Thermal

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

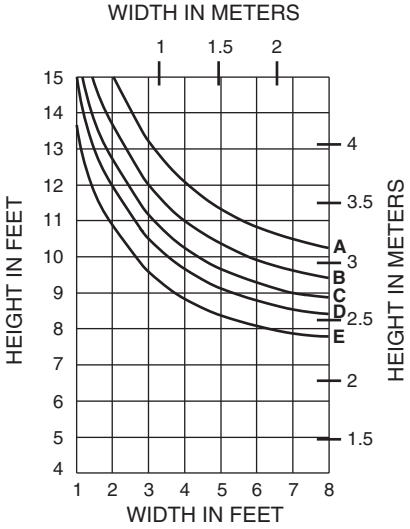




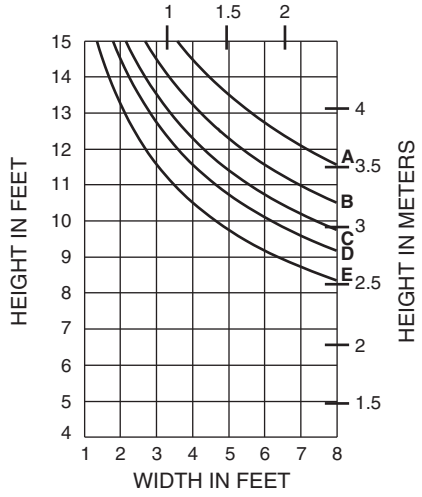
451-VG-012
451-VG-026

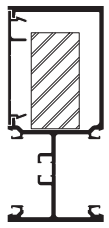
I = 3.346 (139.27 x 10^4)
S = 1.447 (23.71 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



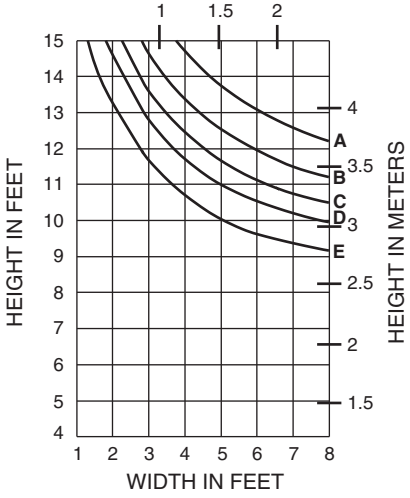


451-VG-012
451-VG-026
with 1" x 2-1/4" STEEL BAR

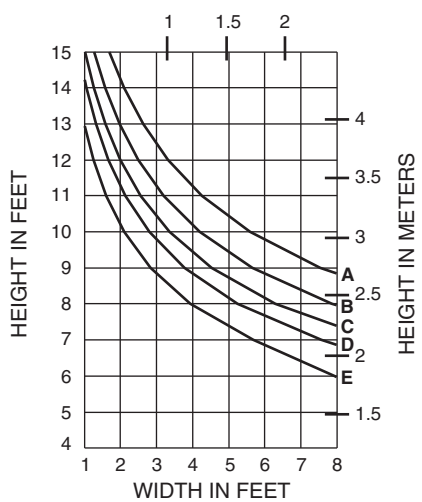
I_A = 3.346 (139.27 x 10^4)
S_A = 1.447 (23.71 x 10^3)

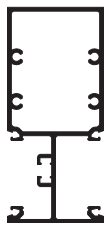
I_S = 0.949 (39.50 x 10^4)
S_S = 0.844 (13.83 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

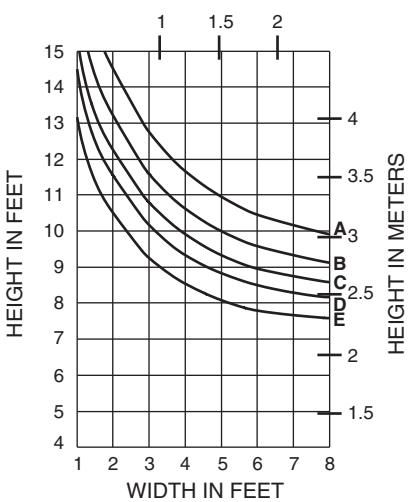




451-VG-005

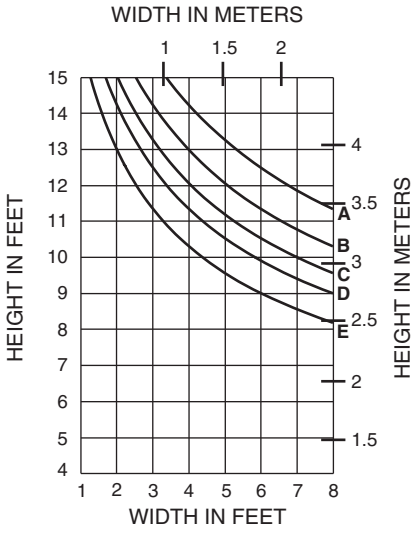
I = 3.001 (124.91 x 10^4)
S = 1.323 (21.68 x 10^3)

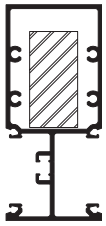
WITHOUT HORIZONTALS



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



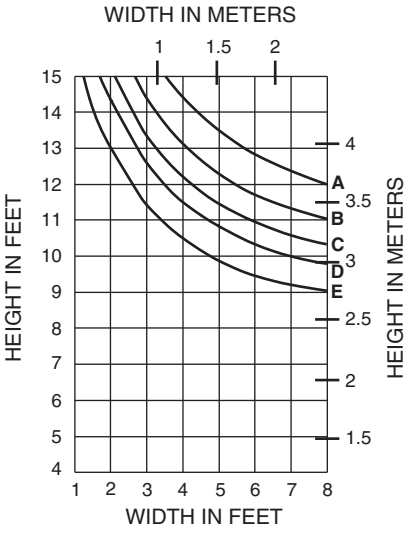


451-VG-005
with 1" x 2-1/4" STEEL BAR

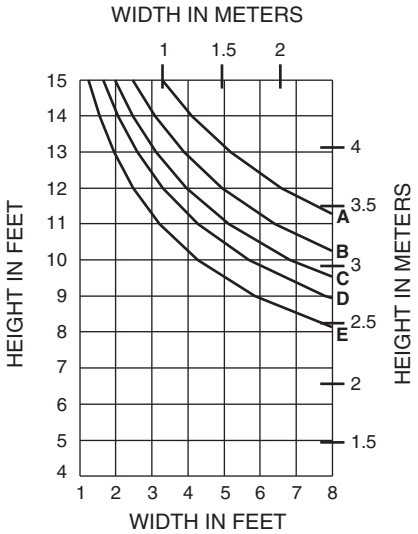
I_A = 3.001 (124.91 x 10^4)
S_A = 1.323 (21.68 x 10^3)

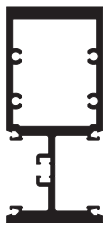
I_S = 0.949 (39.50 x 10^4)
S_S = 0.844 (13.83 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

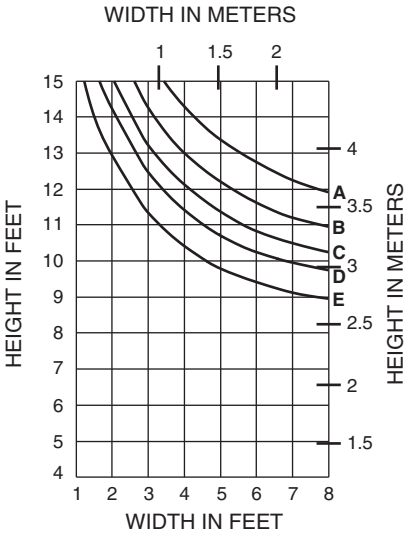




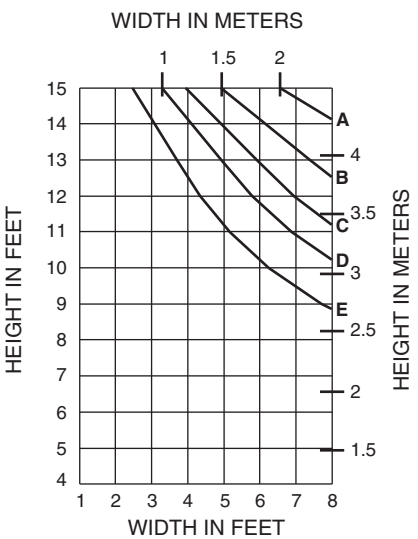
451-VG-014

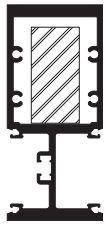
I = 5.604 (233.25 x 10^4)
S = 2.397 (39.28 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



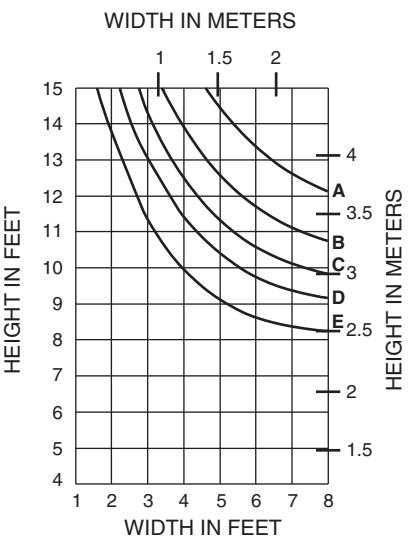


451-VG-014
with 1" x 2" STEEL BAR

I = 5.604 (233.25 x 10^4)
S = 2.397 (39.28 x 10^3)

I_S = 0.667 (27.26 x 10^4)
S_S = 0.667 (10.93 x 10^3)

WITHOUT HORIZONTALS

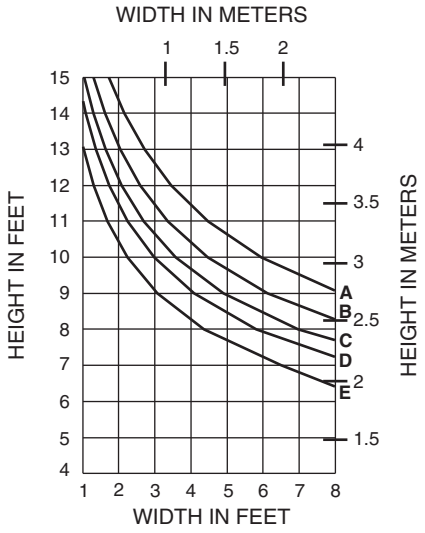


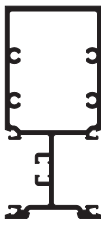
TRIFAB® VG 451

WINDLOAD CHARTS (FRONT/BACK) Non-Thermal

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

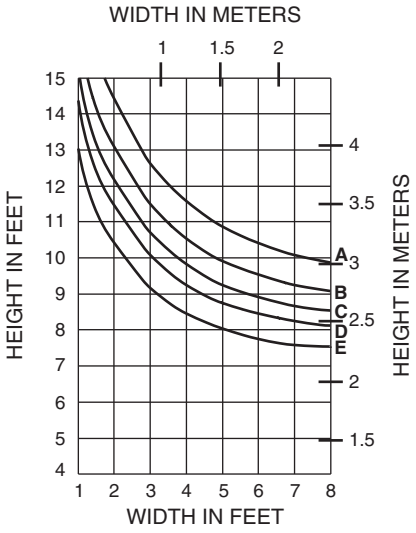




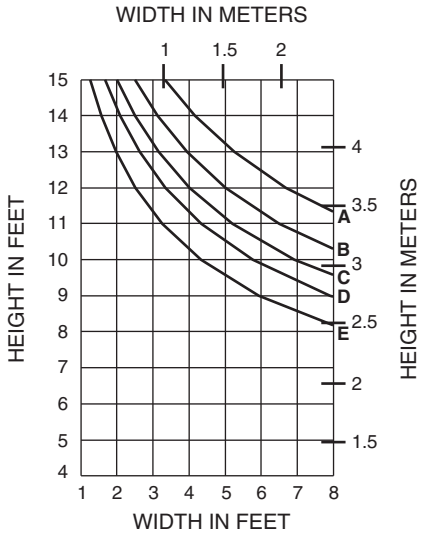
451-VG-134

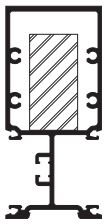
I = 2.930 (121.96 x 10^4)
S = 1.290 (21.13 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



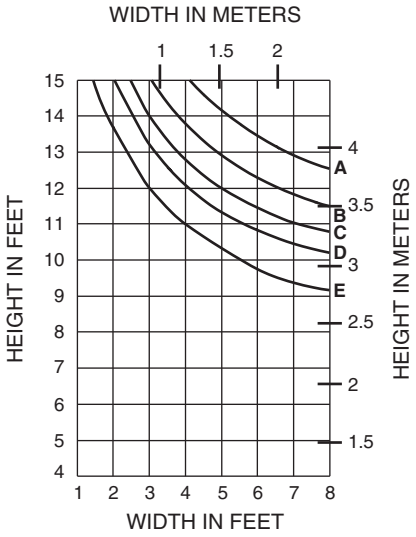


451-VG-134
with 1" x 2-1/4" STEEL BAR

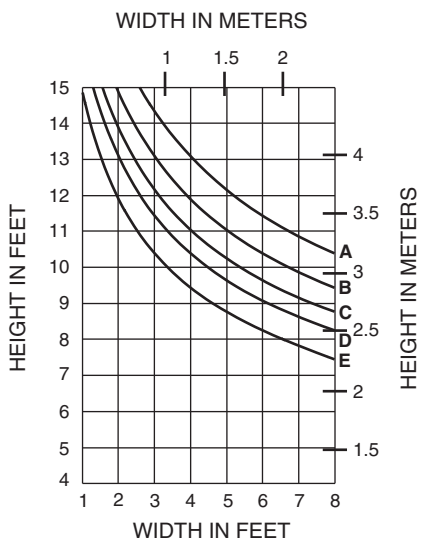
I_A = 2.930 (121.96 x 10^4)
S_A = 1.290 (21.13 x 10^3)

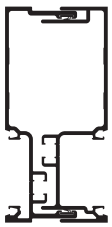
I_S = 0.949 (39.50 x 10^4)
S_S = 0.844 (13.83 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

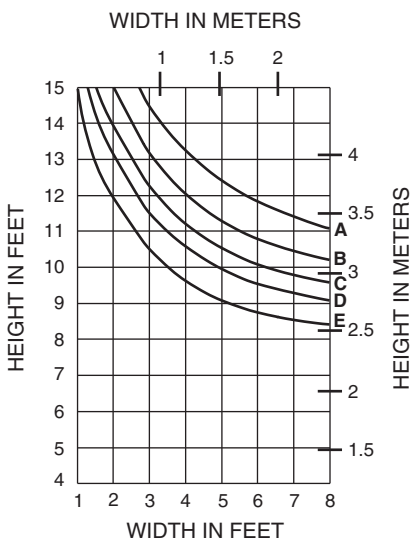




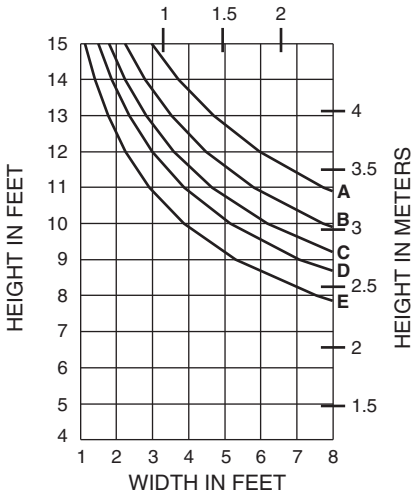
451-VG-010
451-VG-540

I = 4.418 (183.89 x 10^4)
S = 1.831 (30.00 x 10^3)

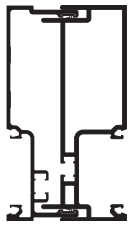
WITHOUT HORIZONTALS



WITH HORIZONTALS



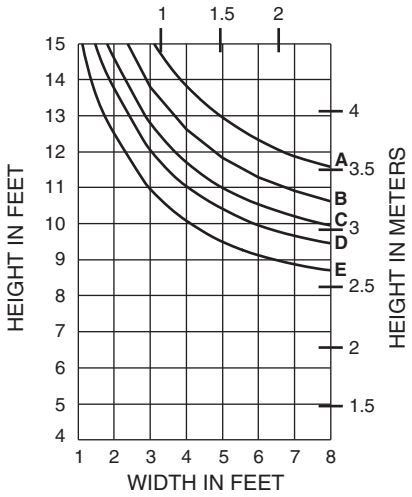
A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)



451T-CG-010A
451T-CG-540

$I = 5.076 (211.27 \times 10^4)$
$S = 2.133 (34.95 \times 10^3)$

WITHOUT HORIZONTALS

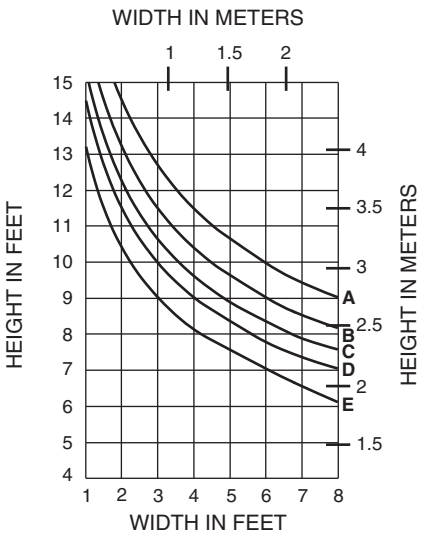


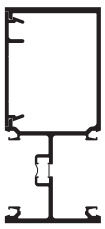
TRIFAB® VG 451T

WINDLOAD CHARTS (FRONT/BACK) Thermal

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

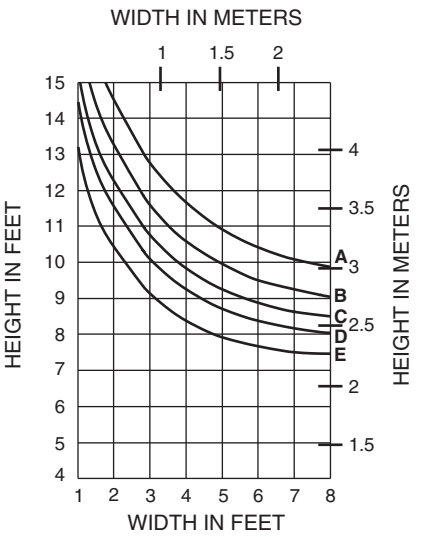




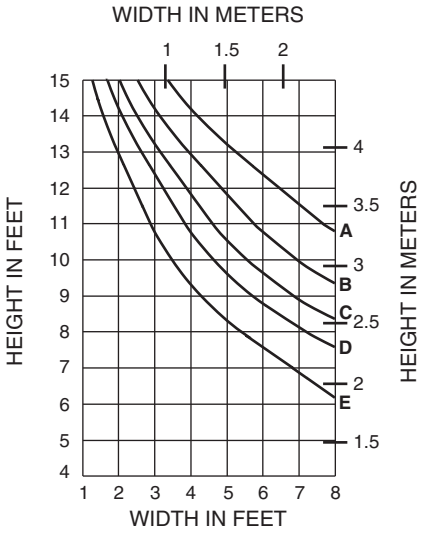
451T-VG-012
451-VG-026

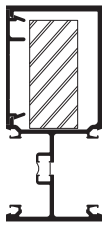
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

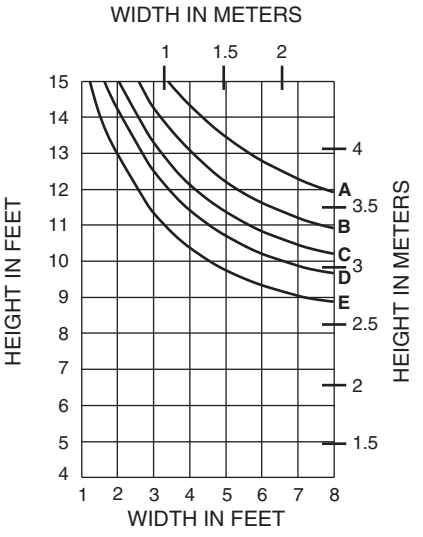




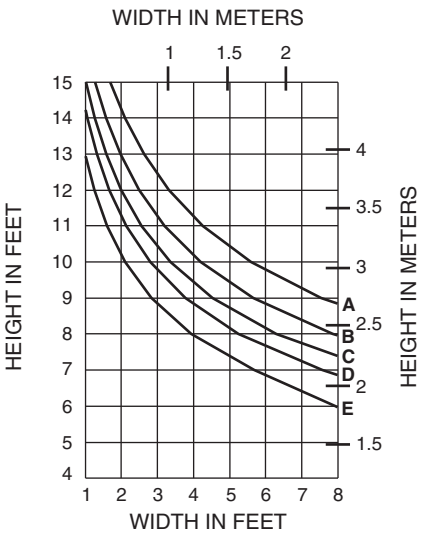
451T-VG-012
451-VG-026
with 1" x 2-1/4" STEEL BAR

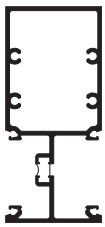
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

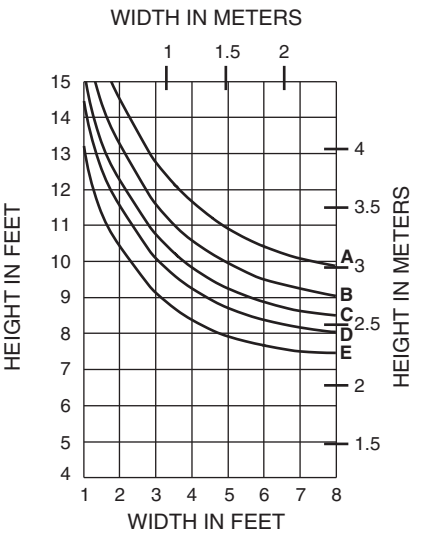




451T-VG-005

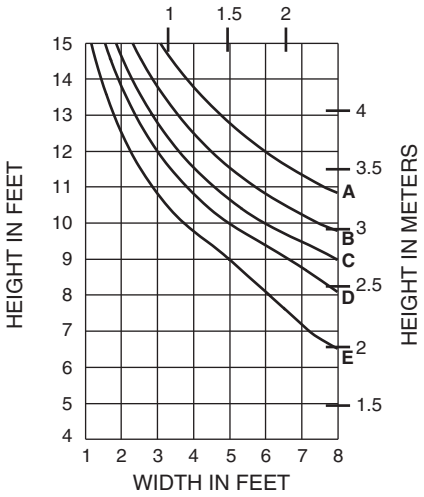
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

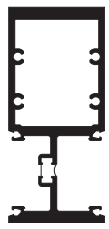
WITHOUT HORIZONTALS



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

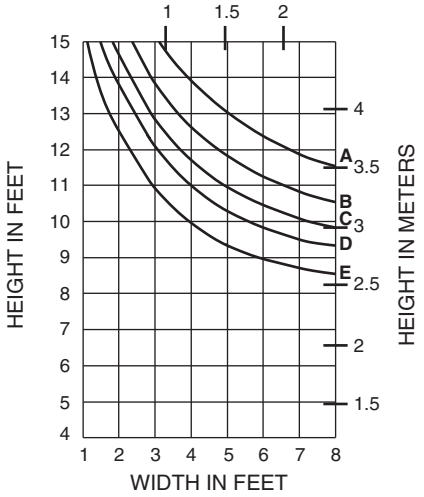




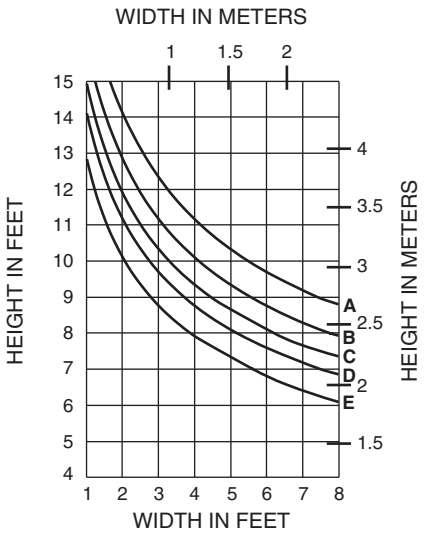
451T-VG-014

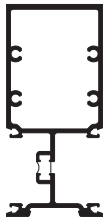
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

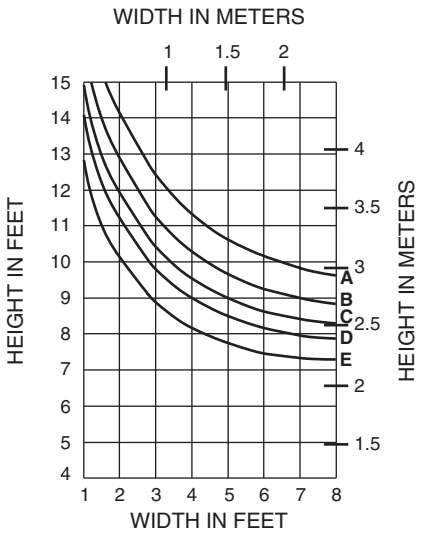




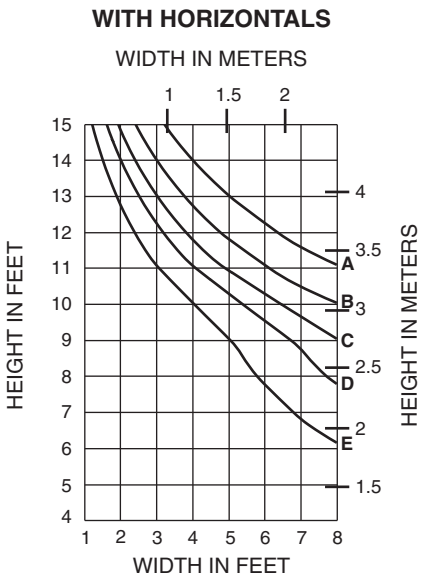
451T-VG-134

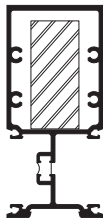
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

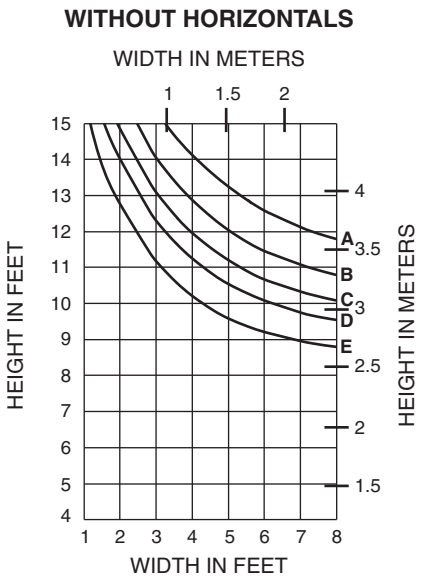




451T-VG-134
with 1" x 2-1/4" STEEL BAR

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

WITHOUT HORIZONTALS

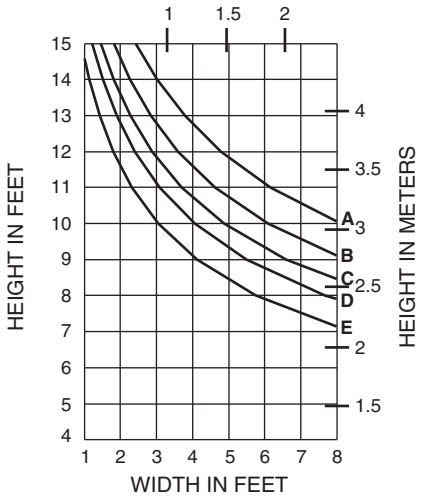


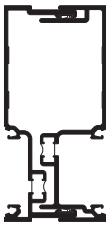
TRIFAB® VG 451T

WINDLOAD CHARTS (FRONT/BACK) Thermal

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

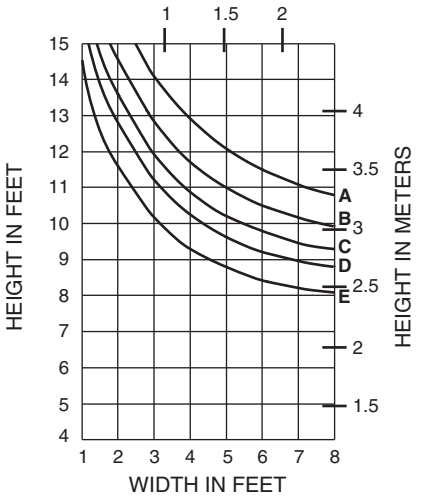




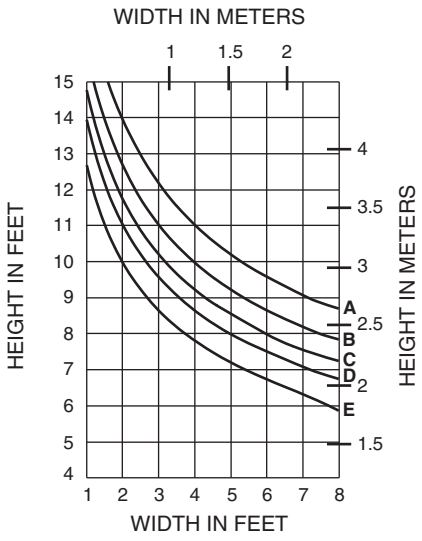
451T-VG-540
451T-VG-010

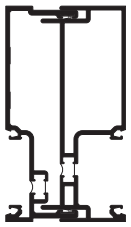
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

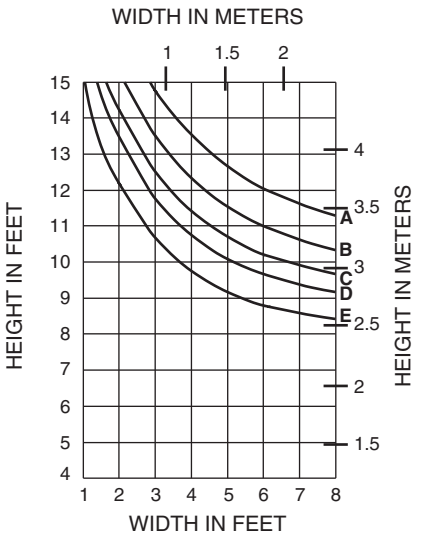




451T-VG-540
451T-VG-010A

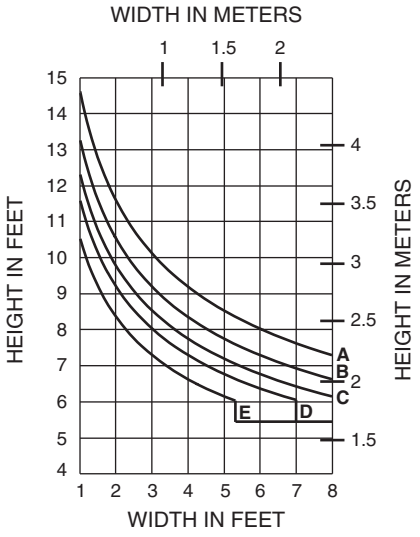
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

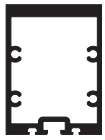
WITHOUT HORIZONTALS



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

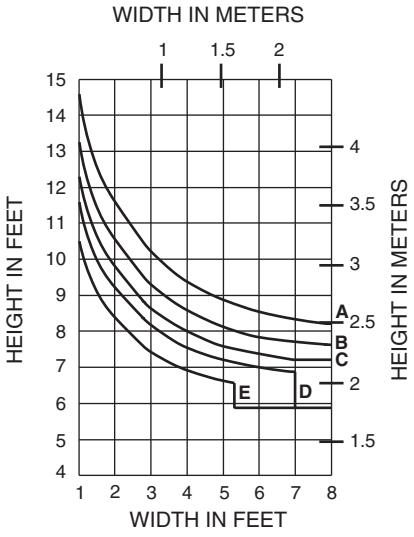




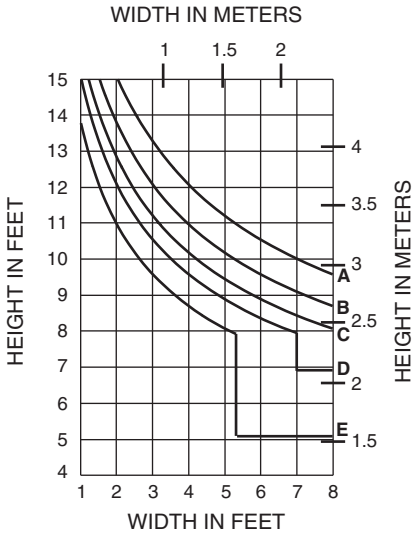
451-SSG-005

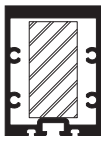
I = 1.527 (63.55 x 10^4)
S = 1.057 (17.32 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



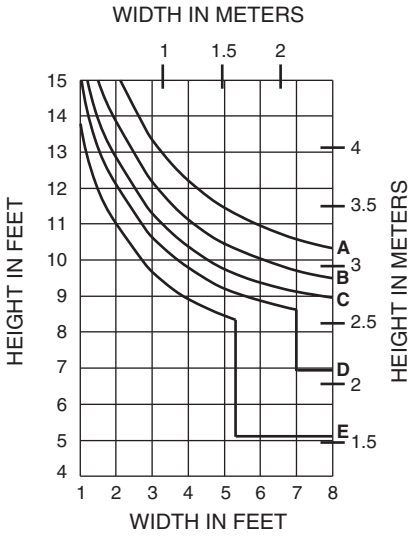


451-SSG-005
with 1" x 2" STEEL BAR

I_A = 1.527 (63.55 x 10^4)
S_A = 1.057 (17.32 x 10^3)

I_S = 0.667 (27.76 x 10^4)
S_S = 0.667 (10.93 x 10^3)

WITHOUT HORIZONTALS

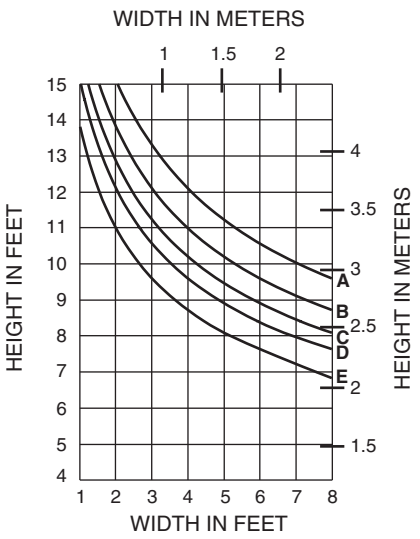


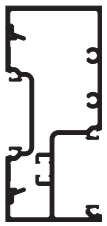
TRIFAB® VG 451

WINDLOAD CHARTS (MULTI-PLANE) Non-Thermal

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

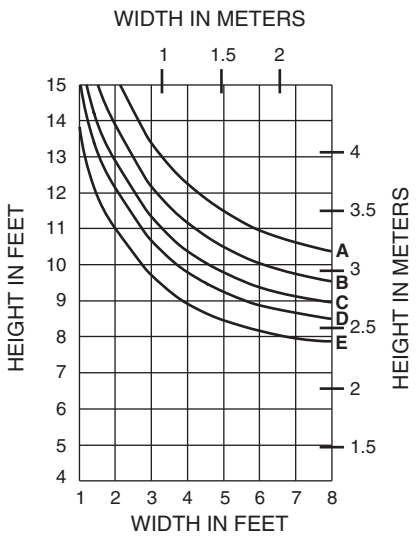




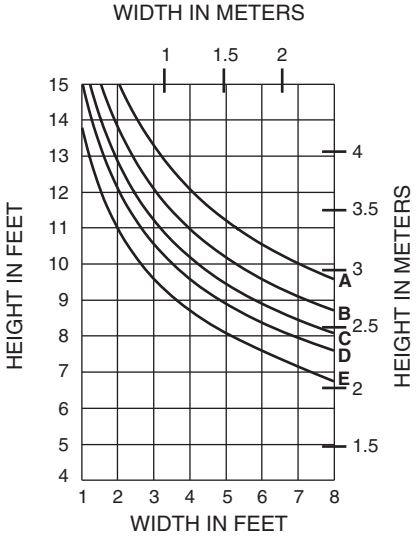
451-VG-001
451-CG-002

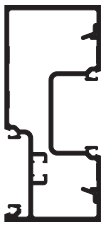
I = 3.485 (145.05 x 10^4)
S = 1.468 (24.06 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

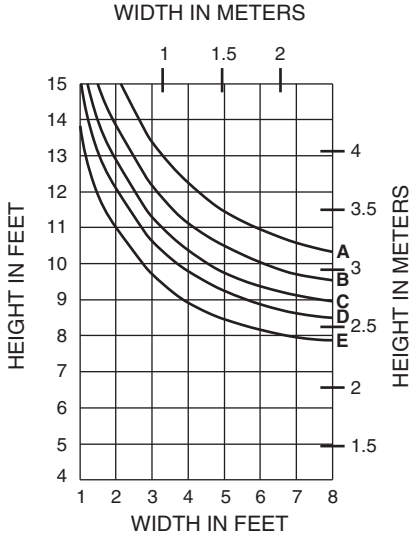




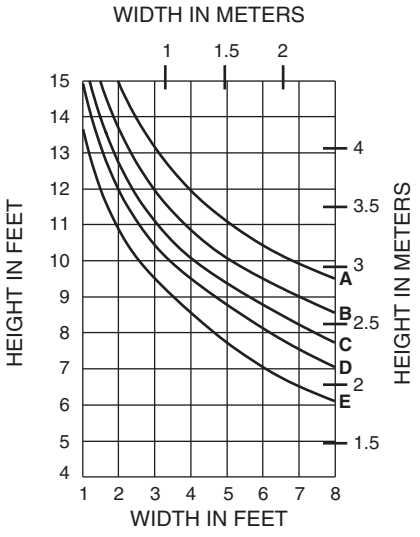
451-VG-052
451-CG-028

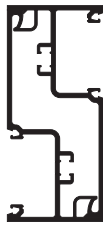
I = 3.470 (144.43 x 10^4)
S = 1.431 (23.45 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

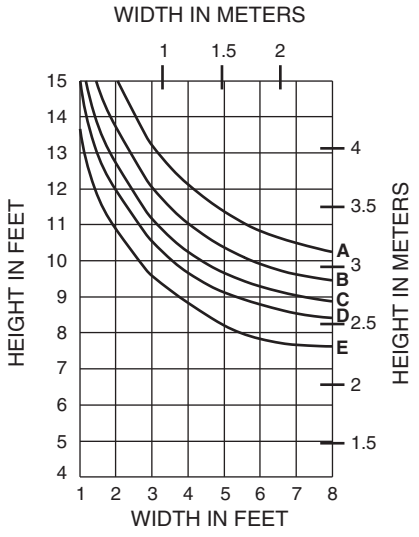




451-VG-069
451-VG-069

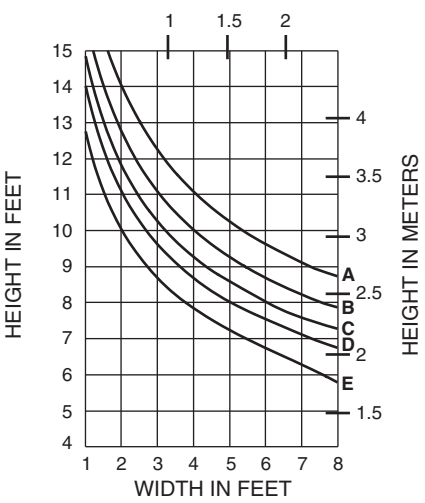
I = 3.362 (139.94 x 10^4)
S = 1.180 (19.34 x 10^3)

WITHOUT HORIZONTALS



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)

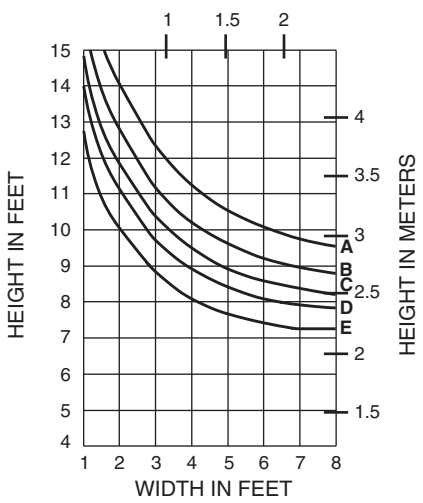
WITH HORIZONTALS



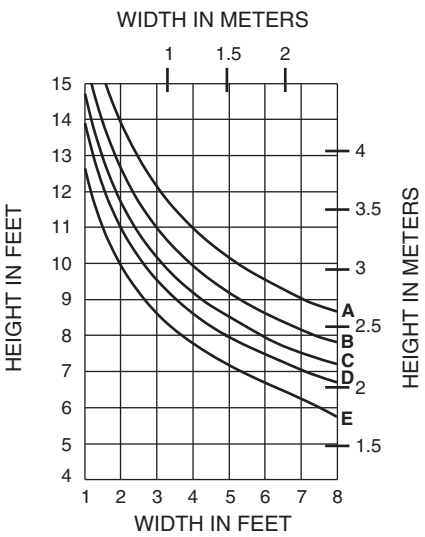
451T-VG-001

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

WITHOUT HORIZONTALS



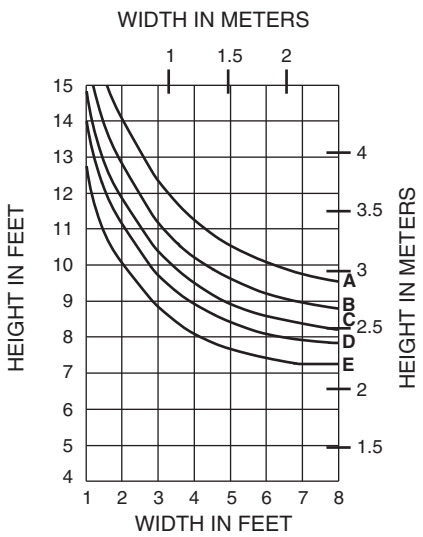
WITH HORIZONTALS



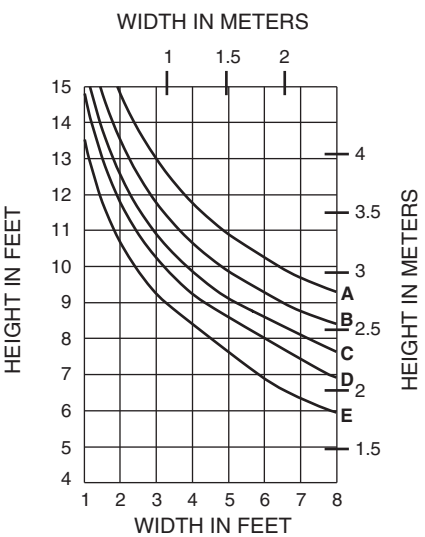
451T-VG-052

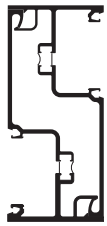
WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS

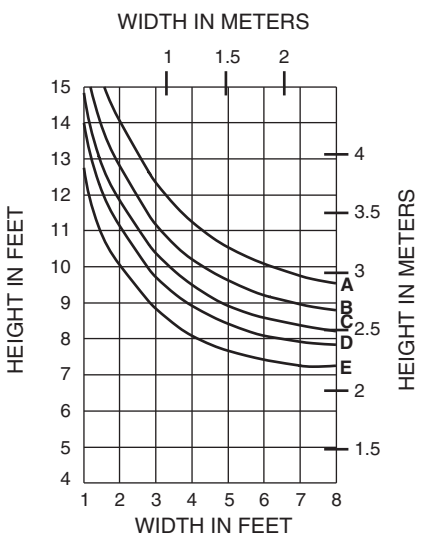




451T-VG-069
451T-VG-069

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

WITHOUT HORIZONTALS

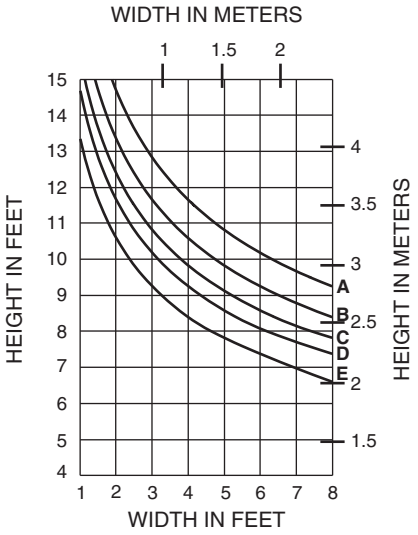


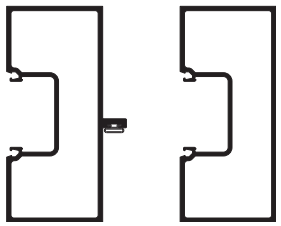
TRIFAB® VG 451/451T

WINDLOAD CHARTS (ENTRANCES) Non-Thermal

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

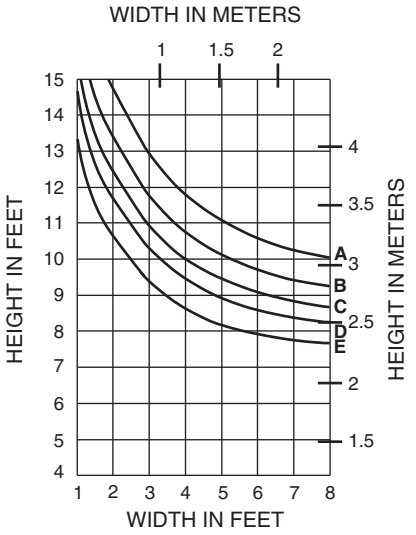




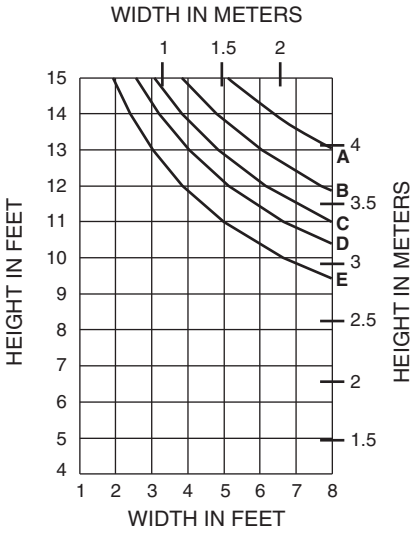
451-501 **451-019**

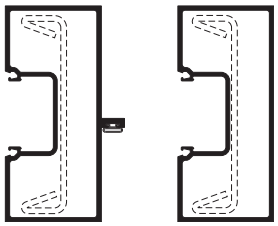
I = 3.116 (129.7 x 10^4)
S = 1.385 (22.7 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



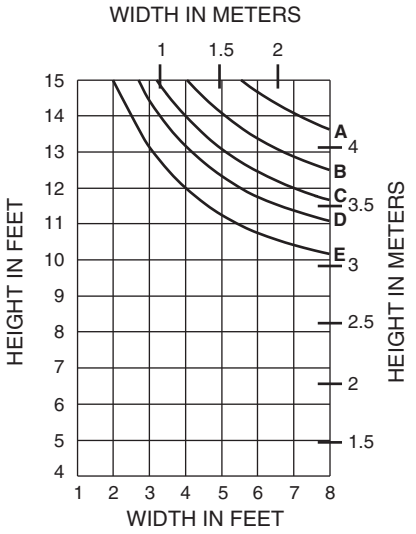


451-501 **451-019**
with 450-110 STEEL

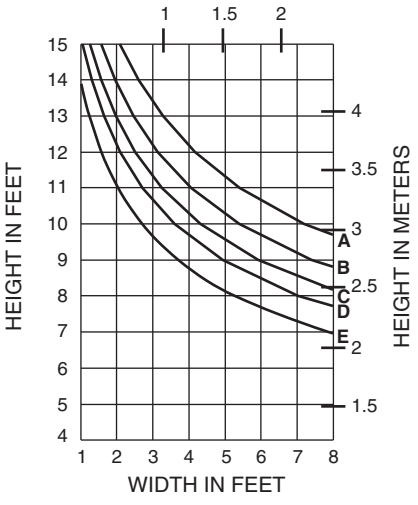
I_A = 3.116 (129.70 x 10^4)
S_A = 1.385 (22.70 x 10^3)

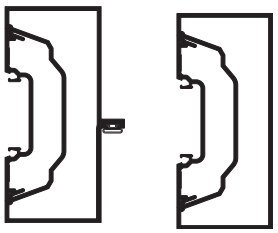
I_S = 1.935 (80.54 x 10^4)
S_S = 0.938 (15.37 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

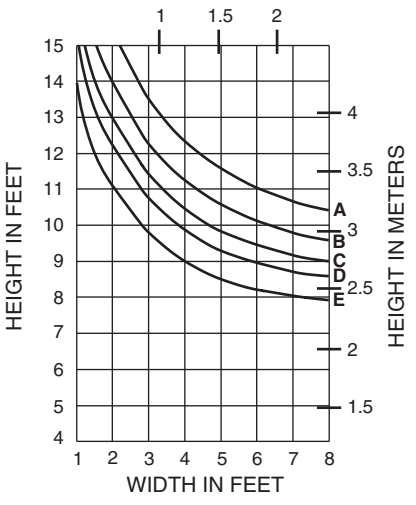




451-599 **451-064**
451-CG-002 **451-CG-002**

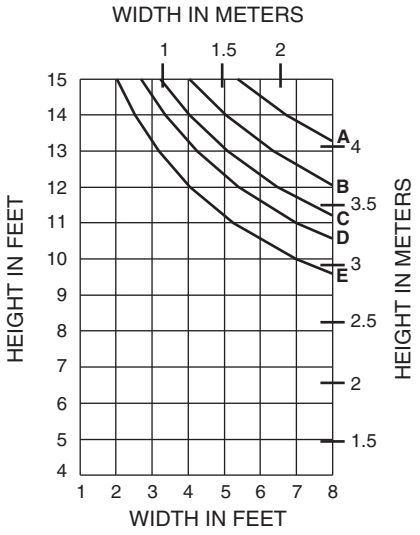
I = 3.565 (148.39 x 10^4)
S = 1.559 (25.55 x 10^3)

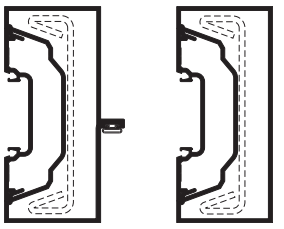
WITHOUT HORIZONTALS



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





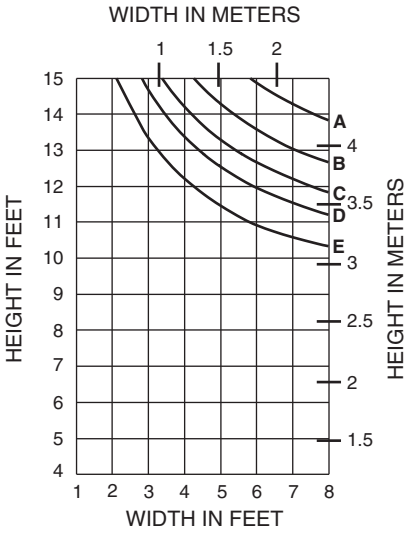
451-599
451-CG-002

451-064
451-CG-002
with 450-110 STEEL

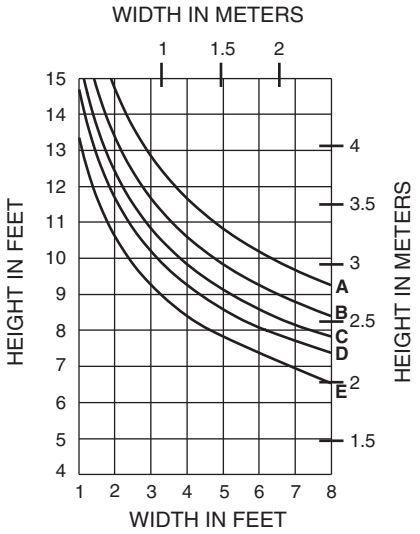
I = 3.565 (148.39 x 10^4)
S = 1.559 (25.55 x 10^3)

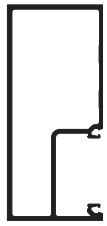
I_S = 1.935 (80.54 x 10^4)
S_S = 0.938 (15.37 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

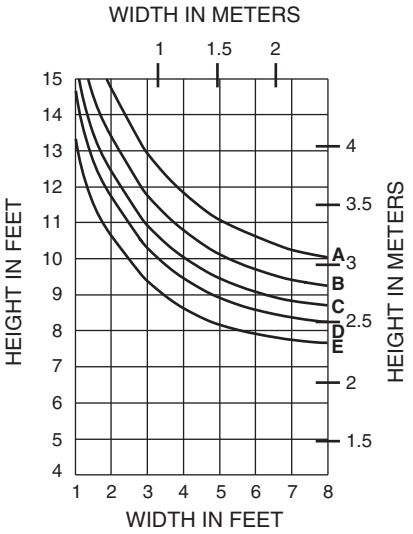




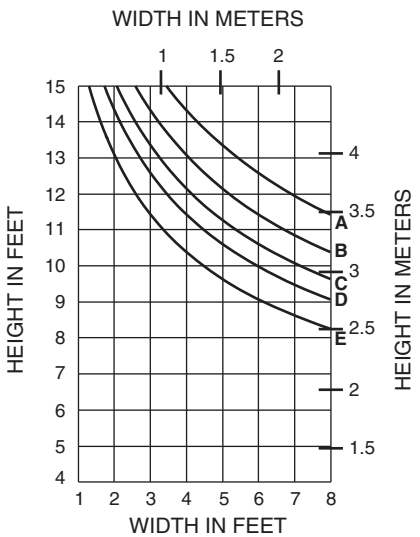
451-VG-019

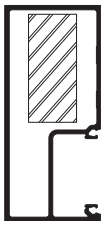
I = 3.124 (130.03 x 10^4)
S = 1.333 (21.84 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



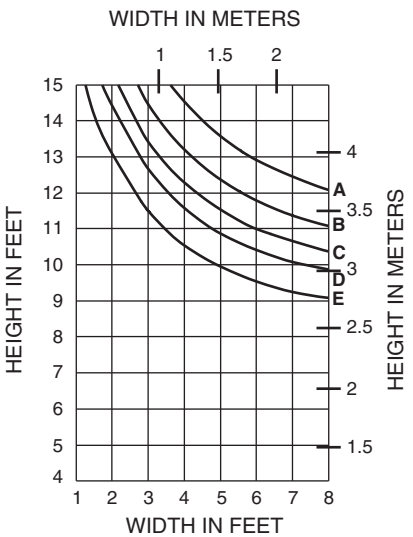


451-VG-019
with 1" x 2-1/4" STEEL BAR

I_A = 3.124 (130.03 x 10^4)
S_A = 1.333 (21.84 x 10^3)

I_S = 0.949 (39.50 x 10^4)
S_S = 0.844 (13.83 x 10^3)

WITHOUT HORIZONTALS



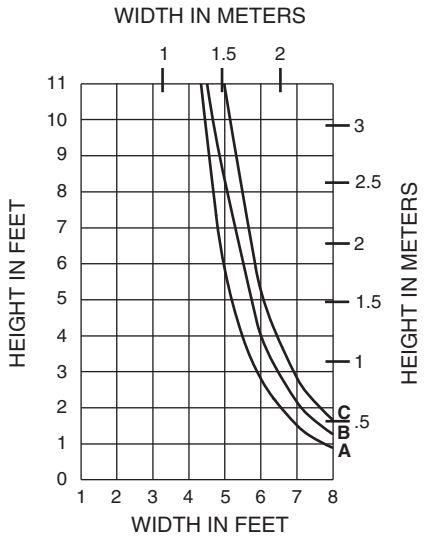
TRIFAB® VG 451/451T

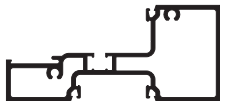
DEADLOAD CHARTS

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 supported on two setting blocks at the loading points shown.

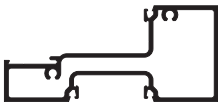
NOTE: Charts are for THERMAL and NON-THERMAL members.

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

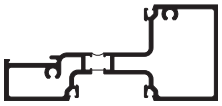




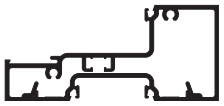
451-CG-011



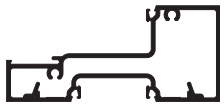
451-CG-011A



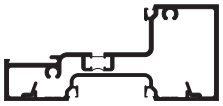
451T-CG-011



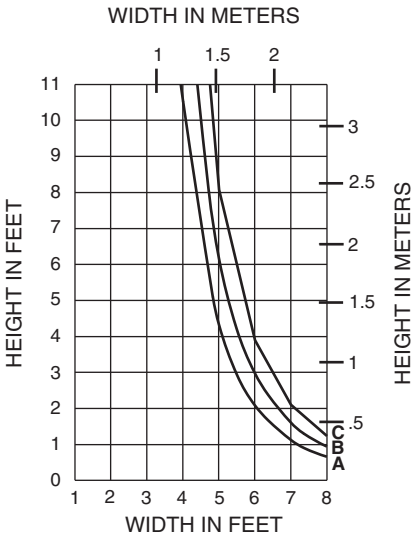
451-CG-003
451-CG-002

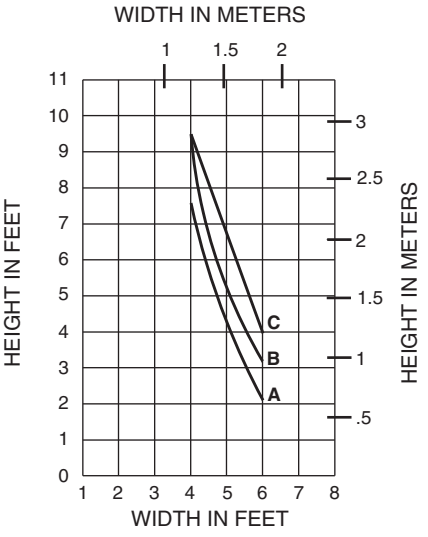


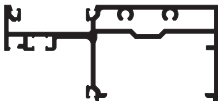
451-CG-003A
451-CG-002



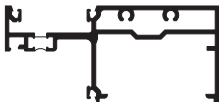
451T-CG-003
451-CG-002







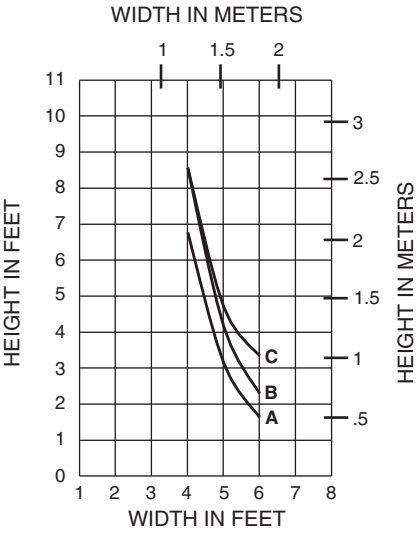
451-VG-011



451T-VG-011

451-VG-111

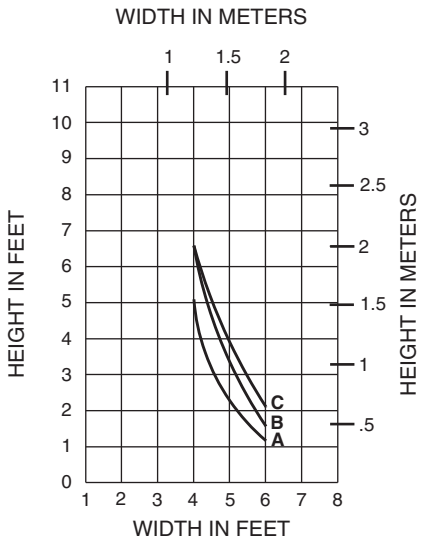
451T-VG-111



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)

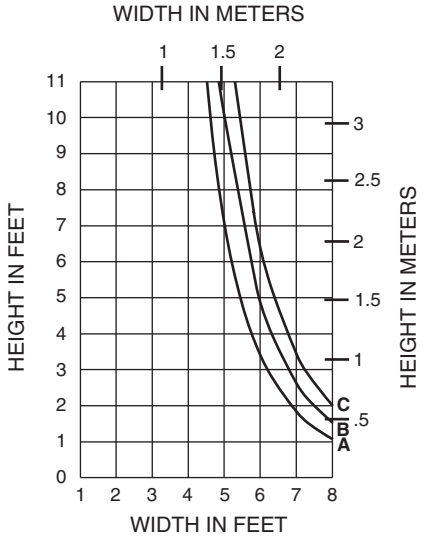


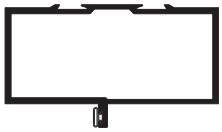
451-SSG-111

451T-SSG-111

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.

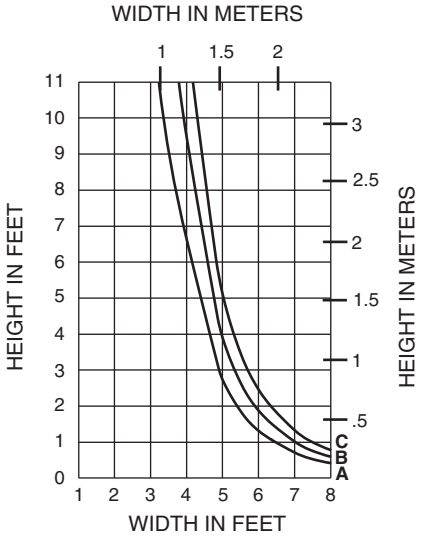
A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)





451-502
SINGLE ACTING
T-BAR

451-081
DOUBLE ACTING
T-BAR



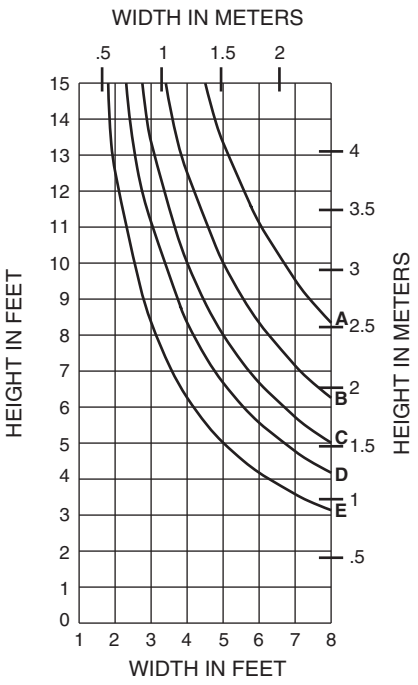
TRIFAB® VG 451/451T

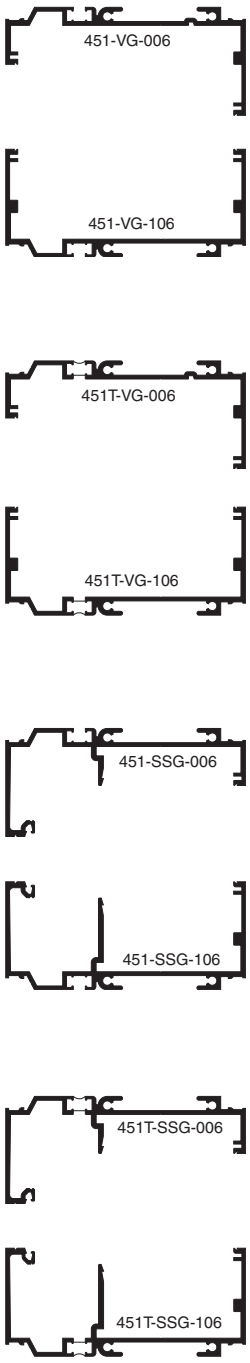
END REACTION CHARTS

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

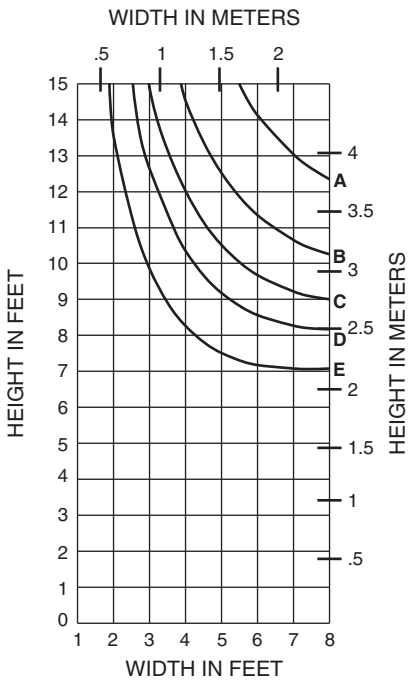
A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WITH HORIZONTALS



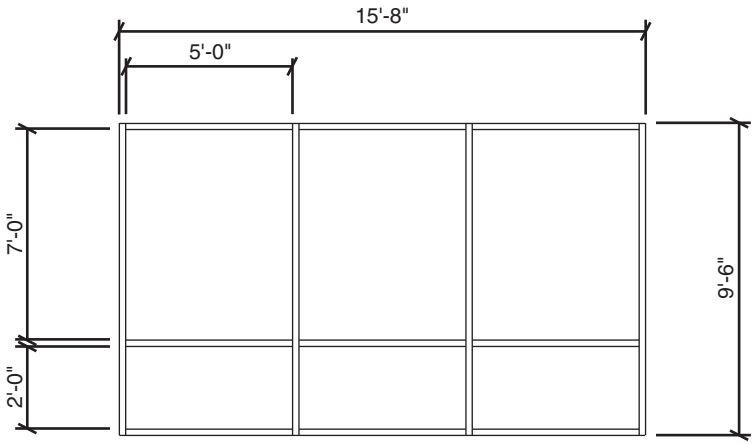


WITHOUT HORIZONTALS



500lbs. Max. End Reaction

Project Specific U-factor Example Calculation



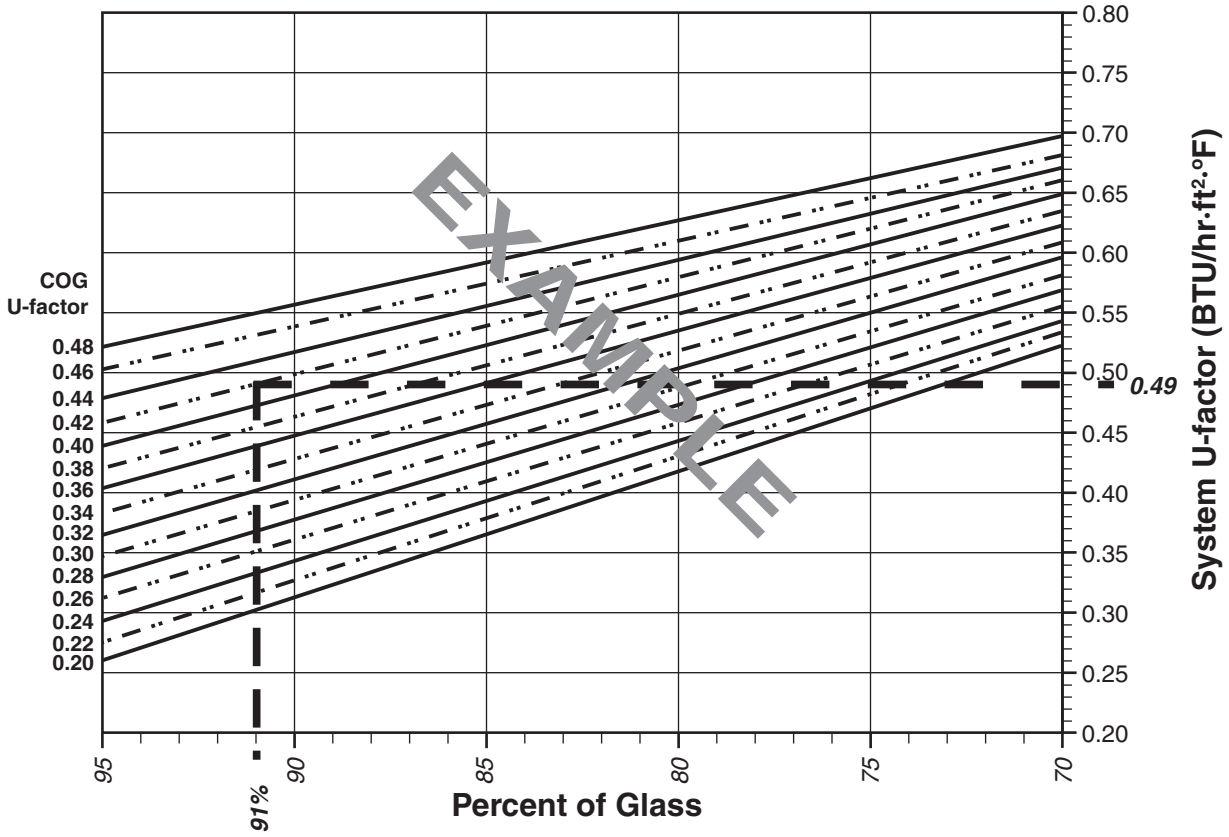
Example Glass U-factor = 0.42 Btu/hr·ft²·°F

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

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

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

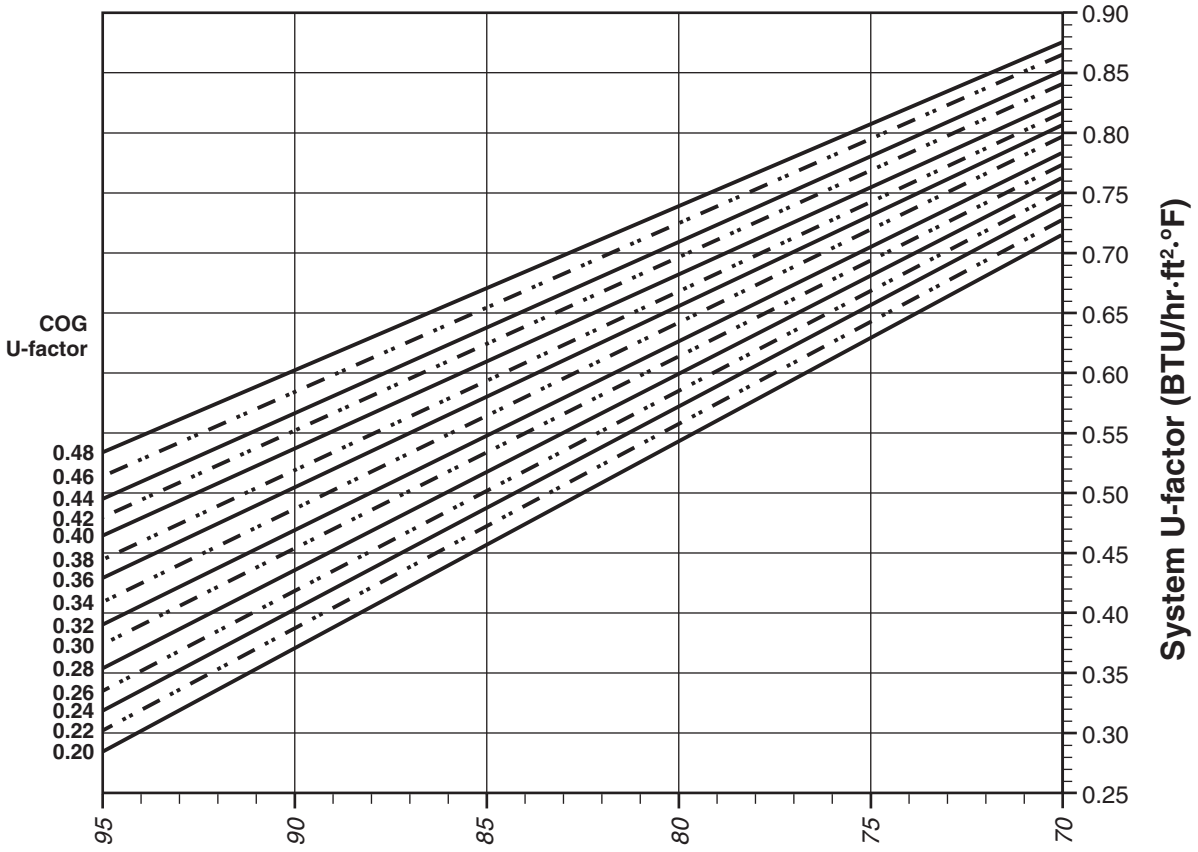
System U-factor vs Percent of Glass Area



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

TRIFAB® VG 451 (CENTER – Non-Thermal)

System U-factor vs Percent of Glass Area



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

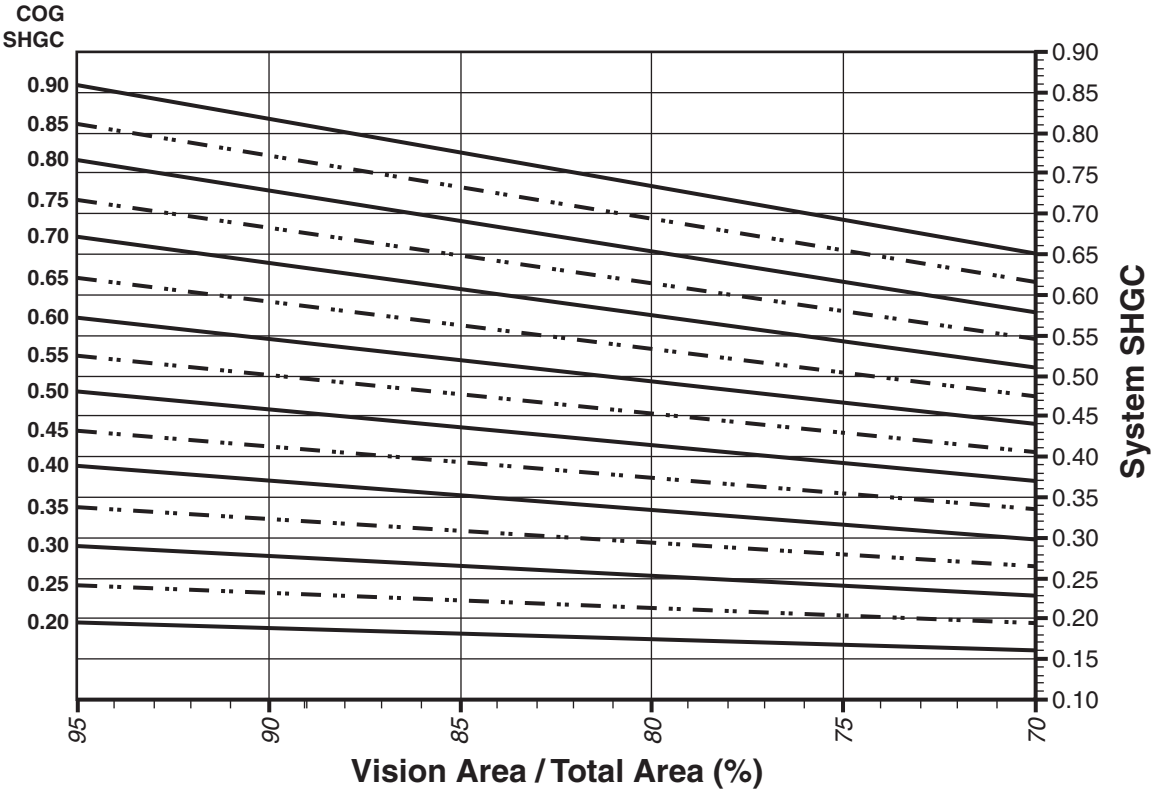
Notes for System U-Factor, SHGC and VT charts:

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

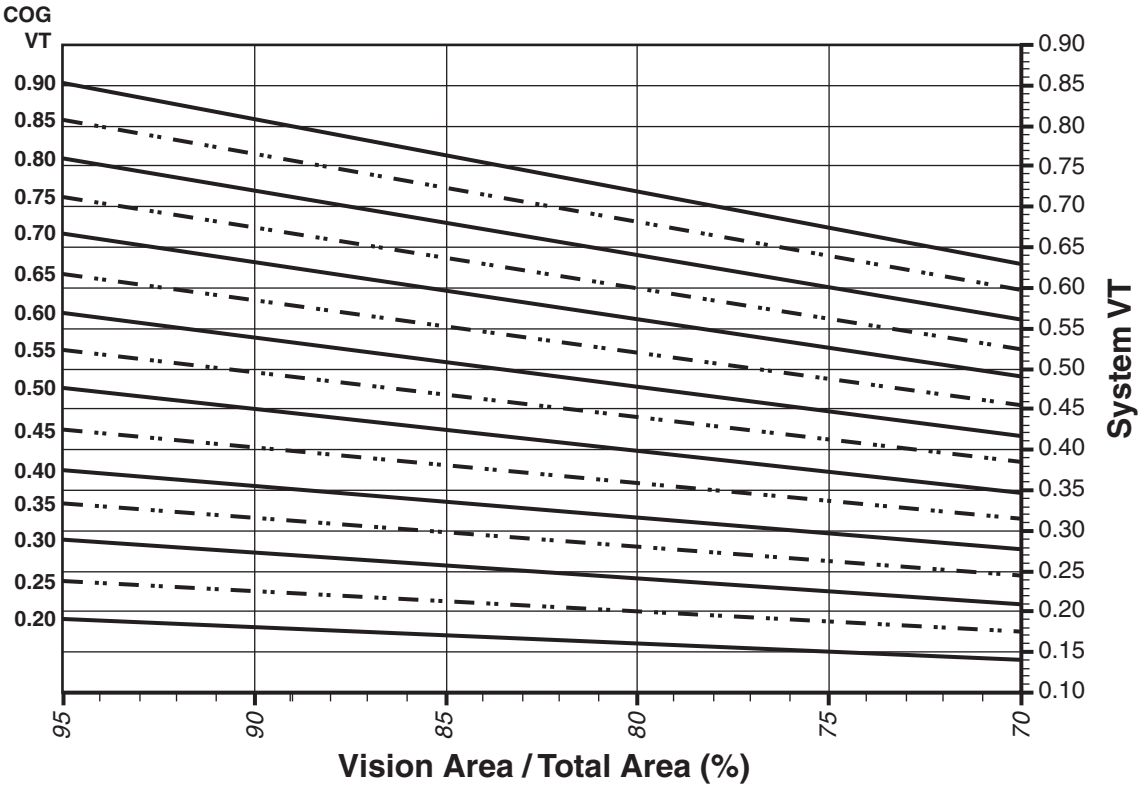
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 451 (CENTER – Non-Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 451 (CENTER – Non-Thermal)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
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

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
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	0.54
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	0.18

Visible Transmittance [2]

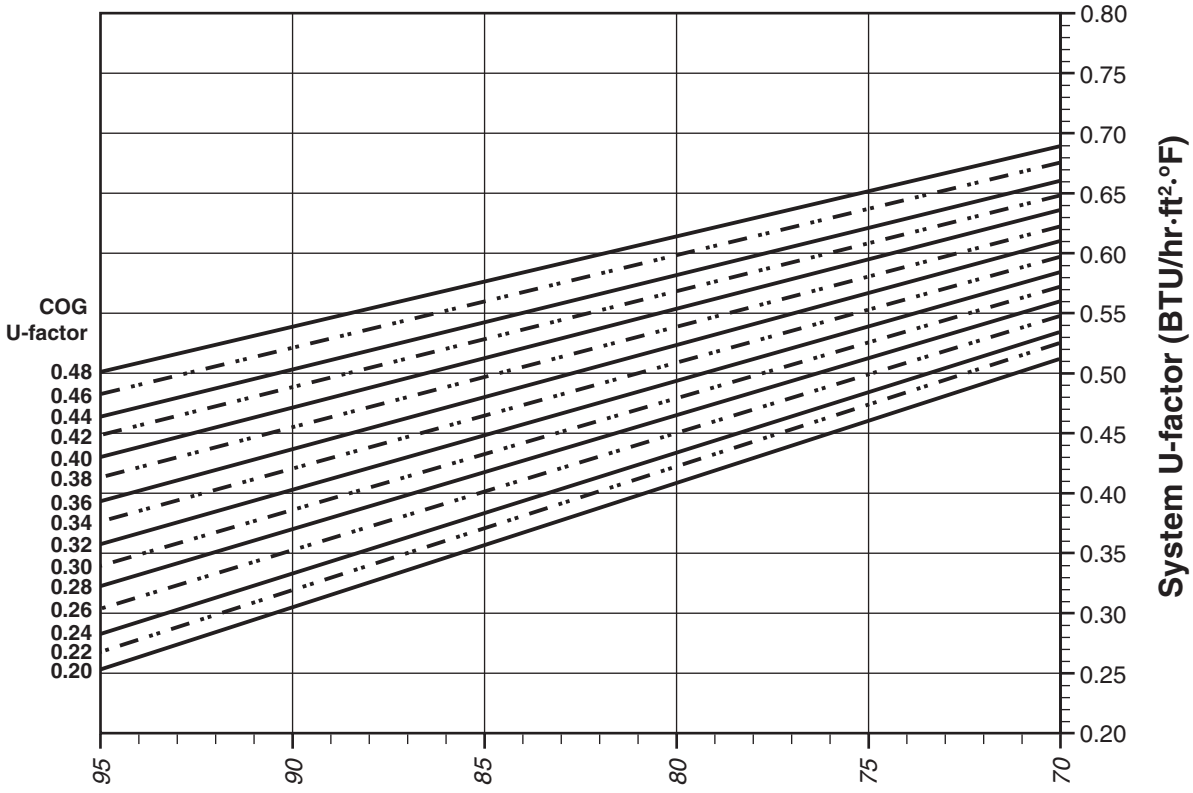
Glass VT [3]	Overall VT [4]
0.90	0.79
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.57
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18

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

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

TRIFAB® VG 451T (CENTER – Thermal)

System U-factor vs Percent of Glass Area



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

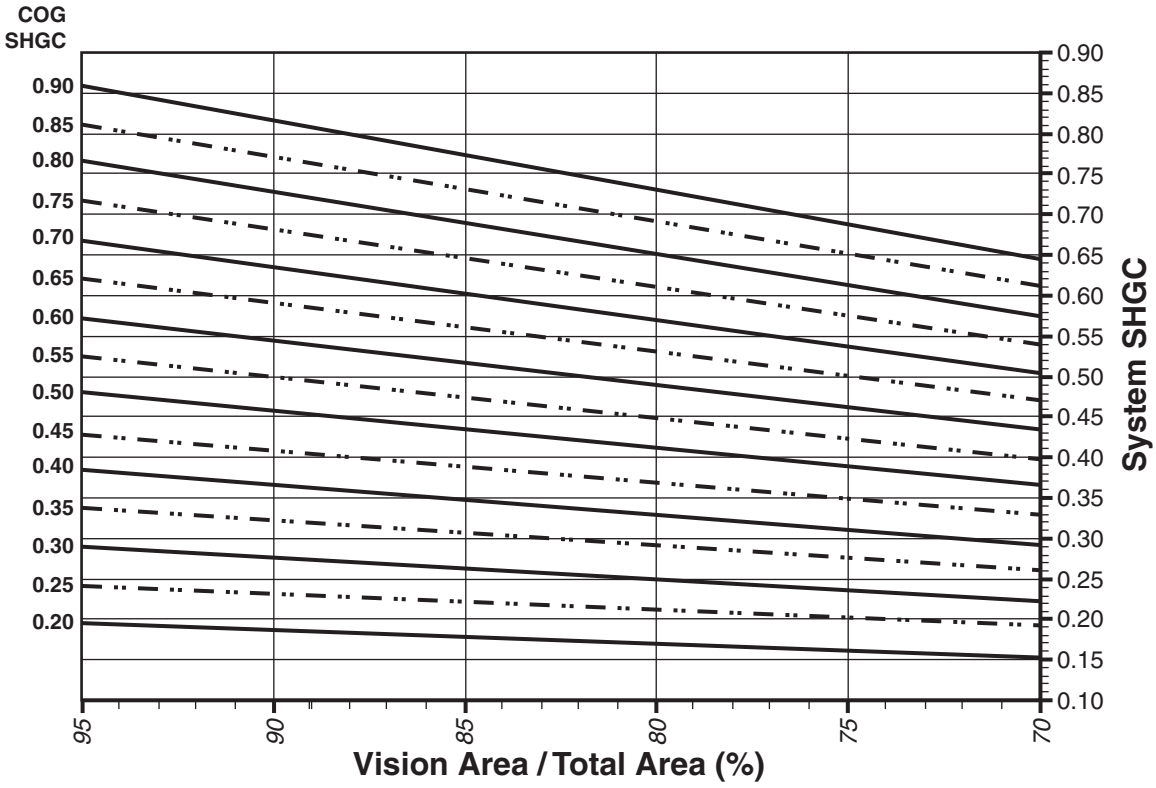
Notes for System U-Factor, SHGC and VT charts:

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

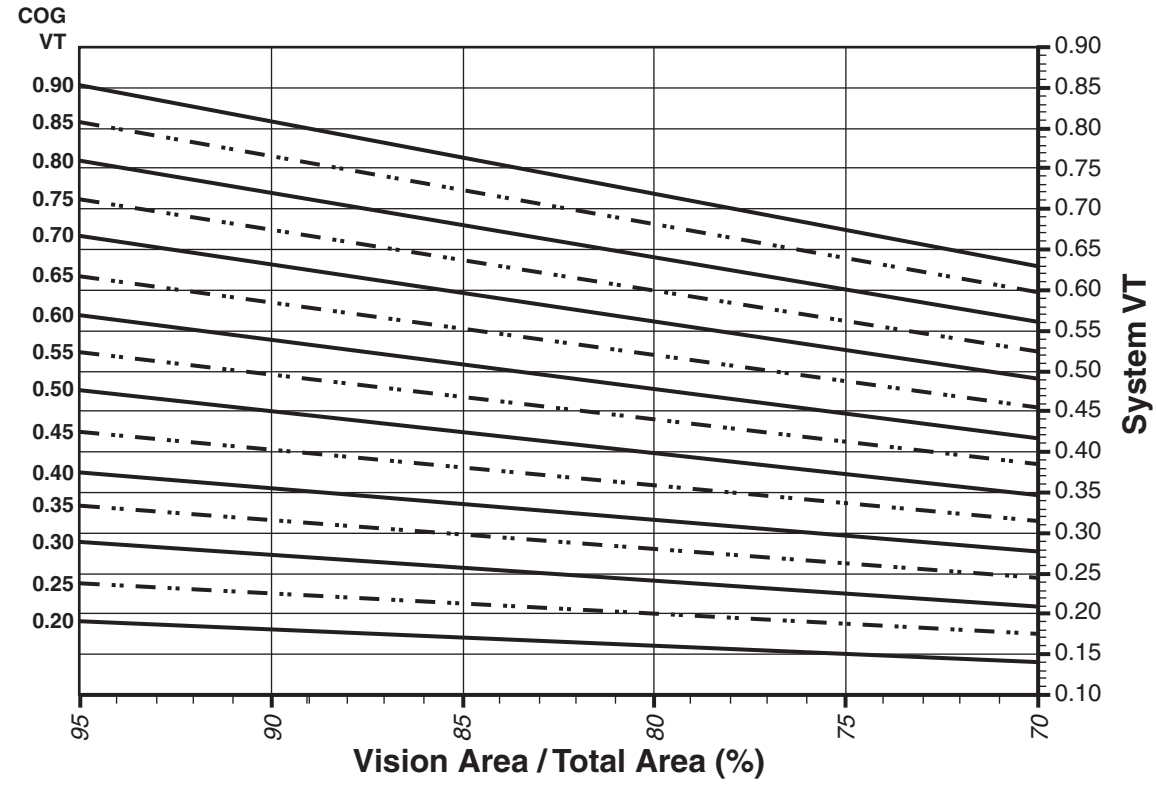
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 451T (CENTER – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 451T (CENTER – Thermal)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
0.48	0.55
0.46	0.54
0.44	0.52
0.42	0.51
0.40	0.49
0.38	0.47
0.36	0.46
0.34	0.44
0.32	0.43
0.30	0.41
0.28	0.39
0.26	0.38
0.24	0.36
0.22	0.34
0.20	0.33

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
0.90	0.80
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.36
0.35	0.31
0.30	0.27
0.25	0.23
0.20	0.18

Visible Transmittance [2]

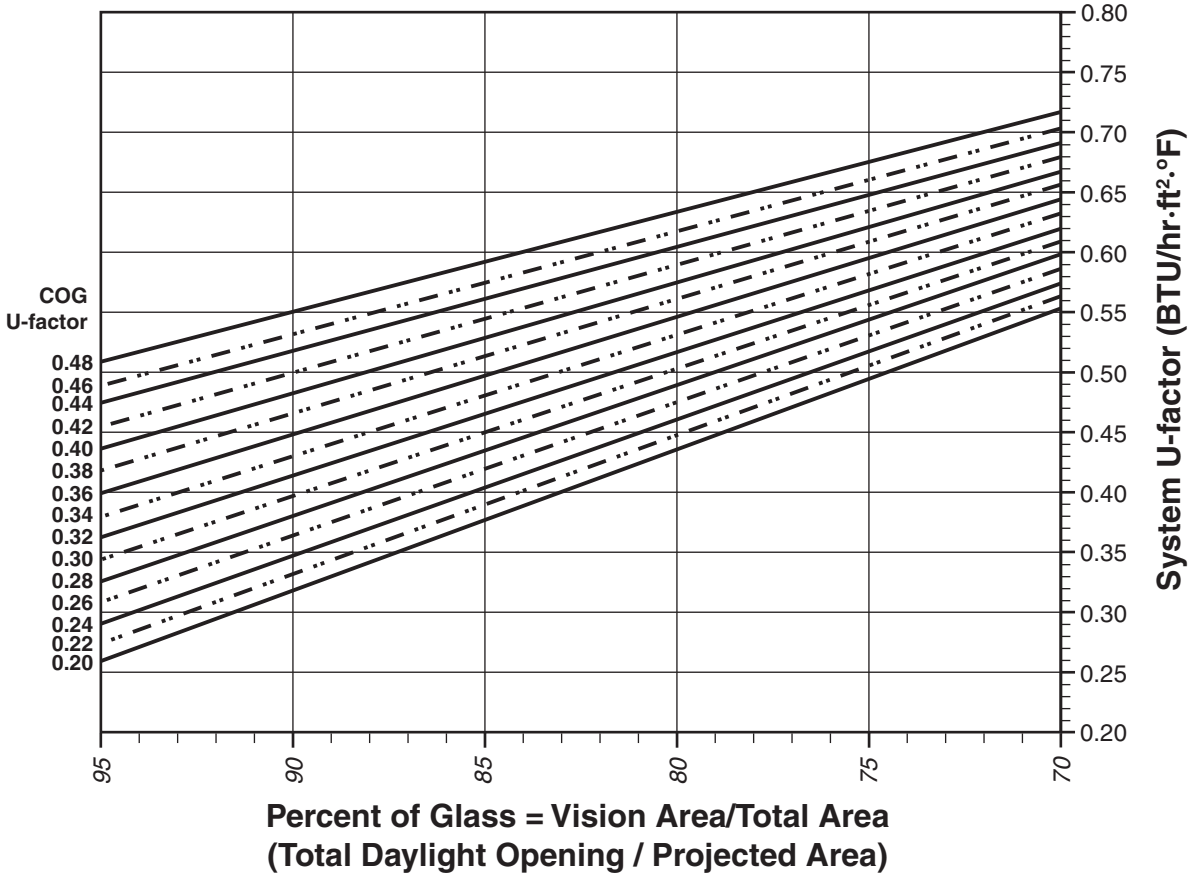
Glass VT [3]	Overall VT [4]
0.90	0.79
0.85	0.75
0.80	0.70
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18

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

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

TRIFAB® VG 451T (FRONT – Thermal)

System U-factor vs Percent of Glass Area



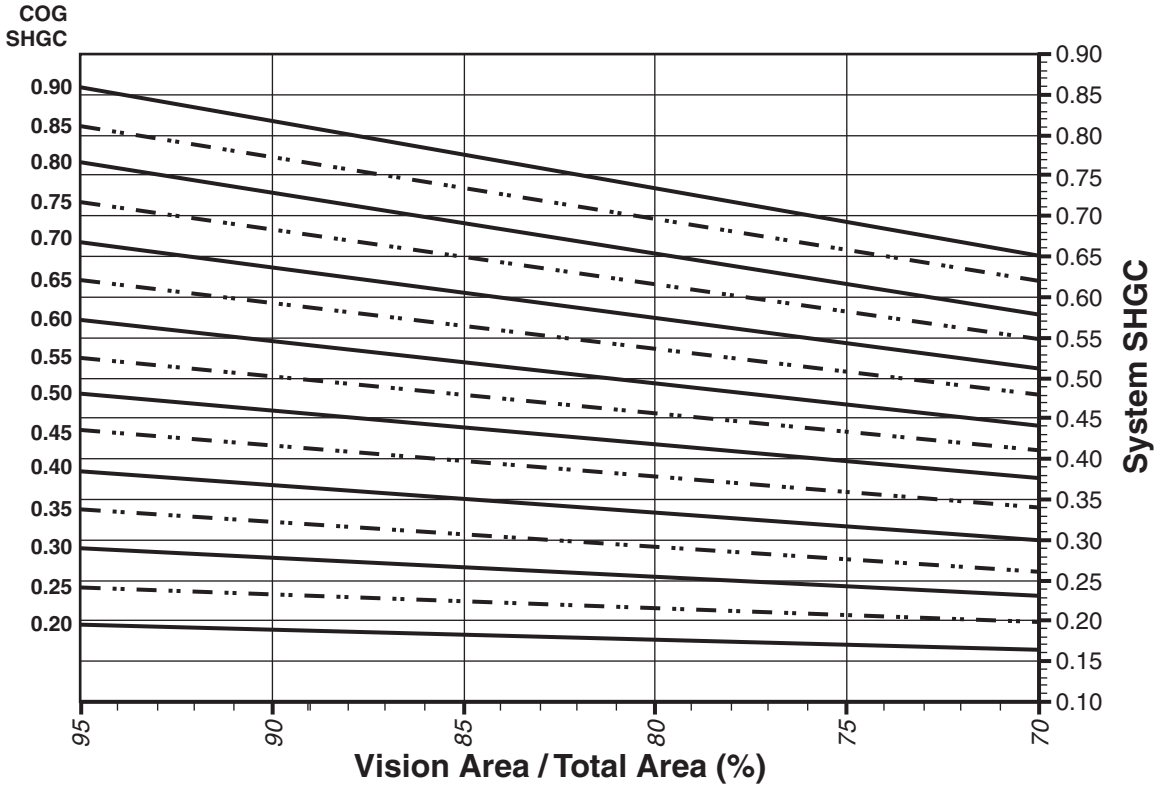
Notes for System U-Factor, SHGC and VT charts:

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

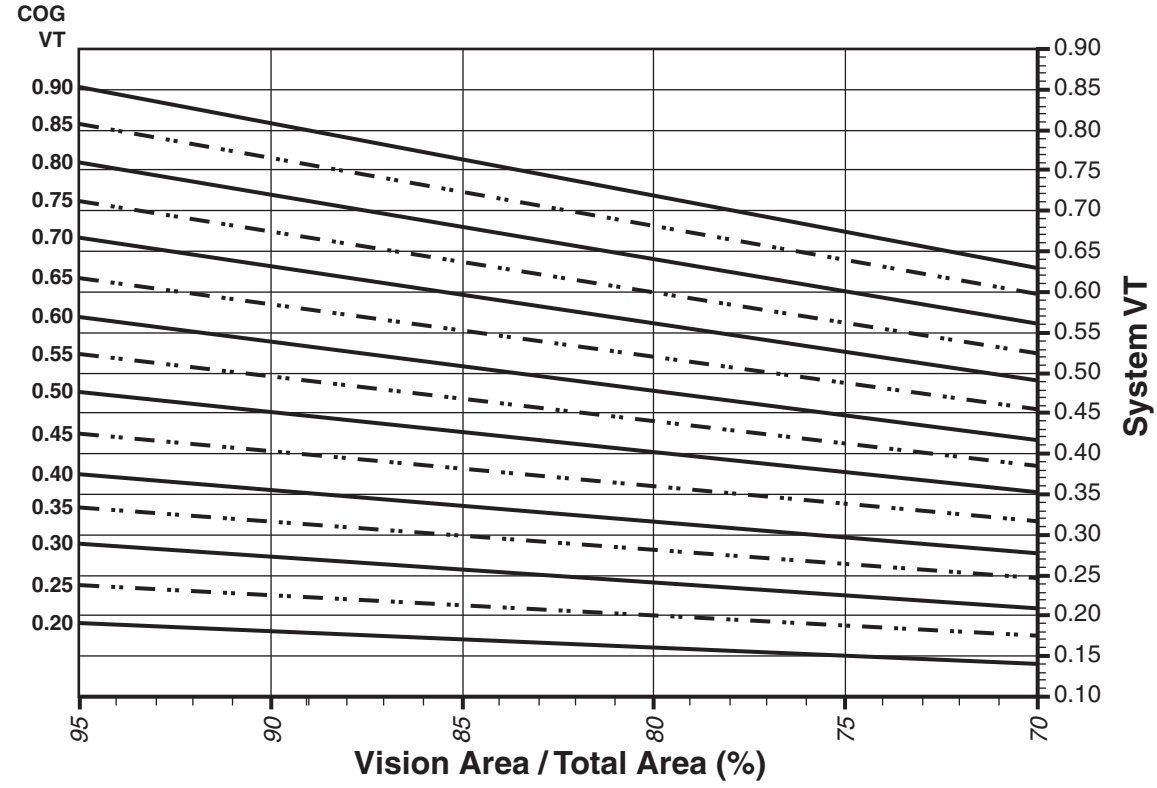
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 451T (FRONT – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 451T (FRONT – Thermal)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
0.48	0.56
0.46	0.55
0.44	0.53
0.42	0.51
0.40	0.50
0.38	0.48
0.36	0.46
0.34	0.45
0.32	0.43
0.30	0.42
0.28	0.40
0.26	0.38
0.24	0.37
0.22	0.35
0.20	0.34

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
0.90	0.81
0.85	0.76
0.80	0.72
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.54
0.55	0.50
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

Visible Transmittance [2]

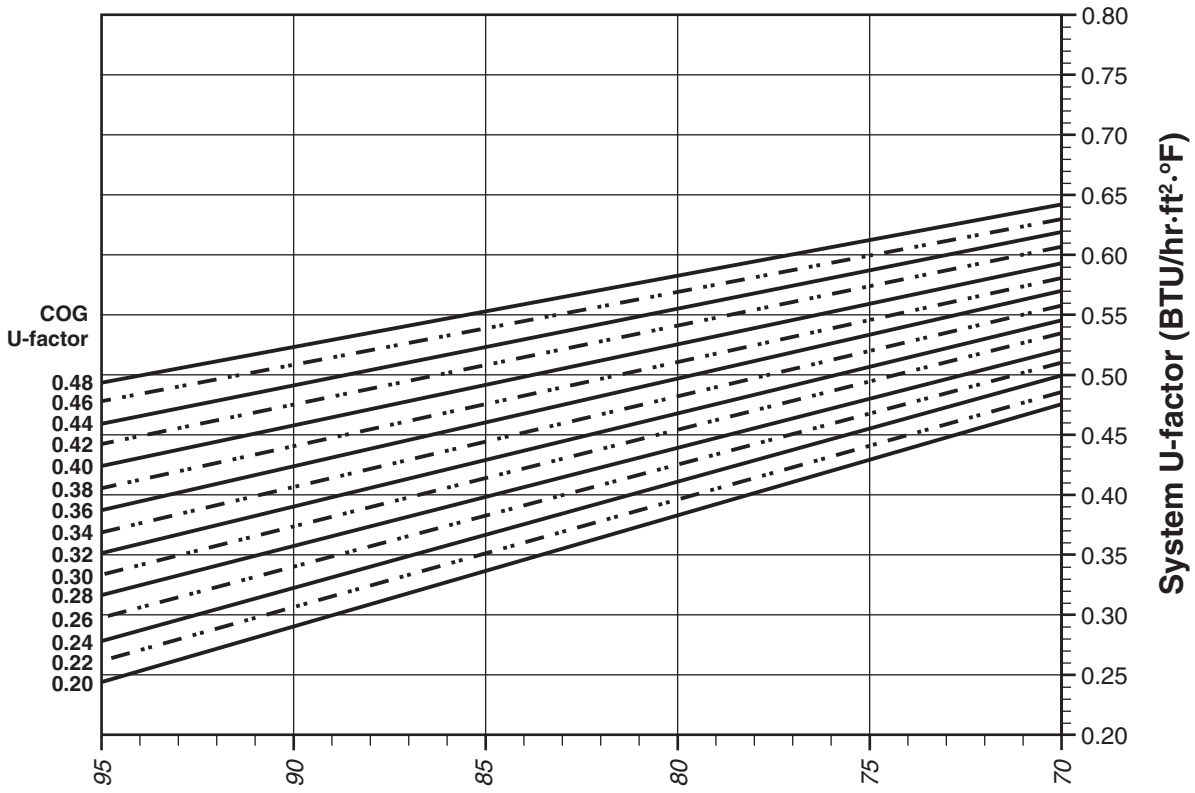
Glass VT [3]	Overall VT [4]
0.90	0.80
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.27
0.25	0.22
0.20	0.18

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

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

TRIFAB® VG 451T (BACK – Thermal)

System U-factor vs Percent of Glass Area



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

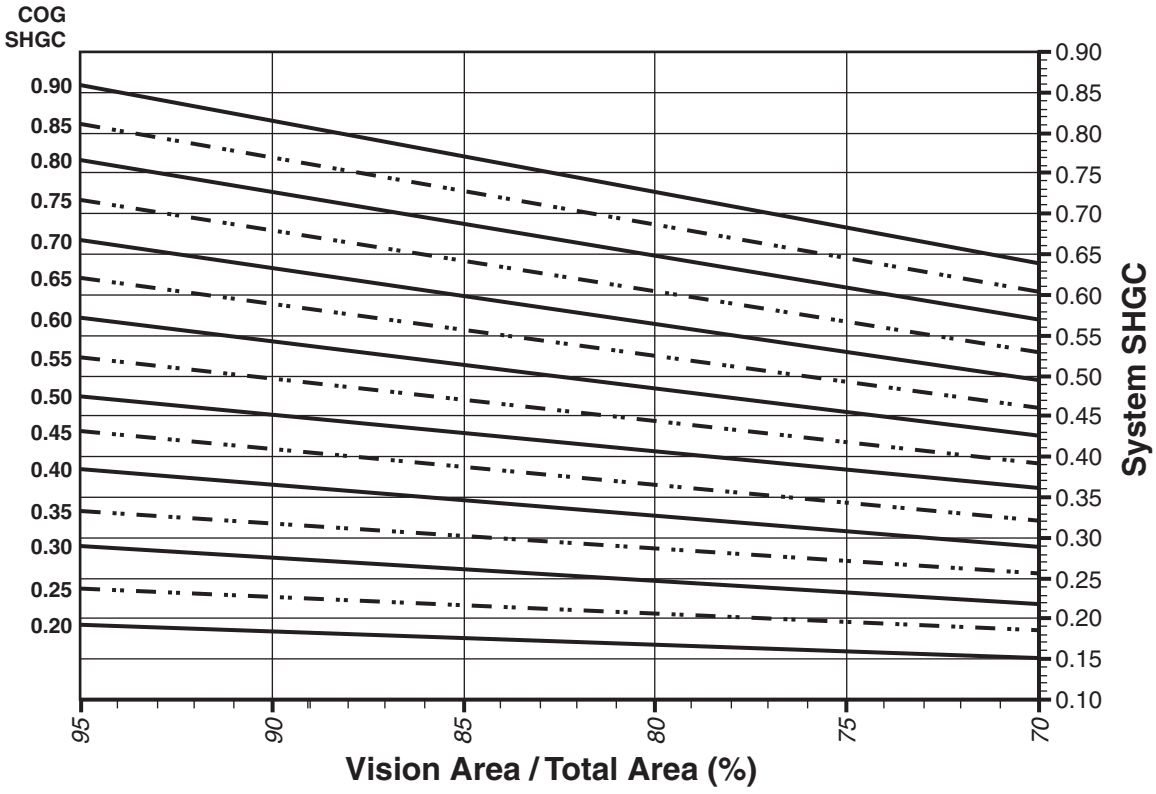
Notes for System U-Factor, SHGC and VT charts:

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

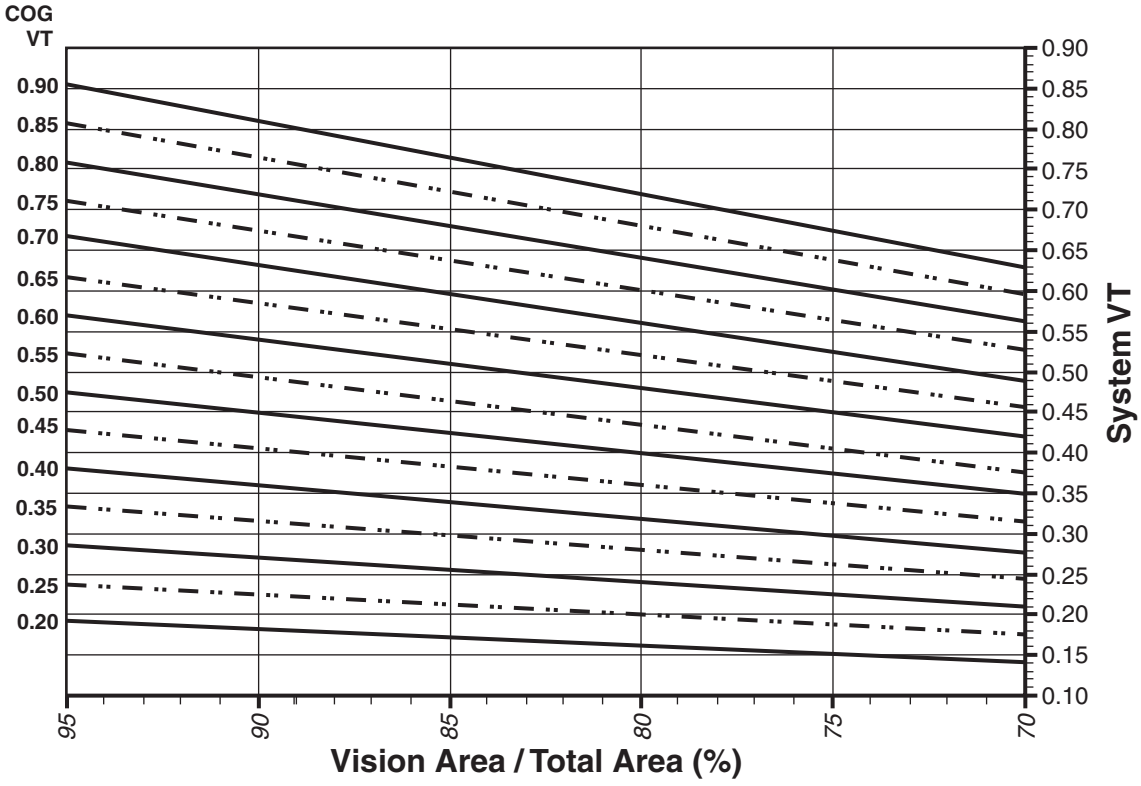
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 451T (BACK – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 451T (BACK – Thermal)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
0.48	0.53
0.46	0.52
0.44	0.50
0.42	0.49
0.40	0.47
0.38	0.45
0.36	0.44
0.34	0.42
0.32	0.41
0.30	0.39
0.28	0.37
0.26	0.36
0.24	0.34
0.22	0.32
0.20	0.31

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
0.90	0.80
0.85	0.76
0.80	0.71
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	0.31
0.30	0.27
0.25	0.22
0.20	0.18

Visible Transmittance [2]

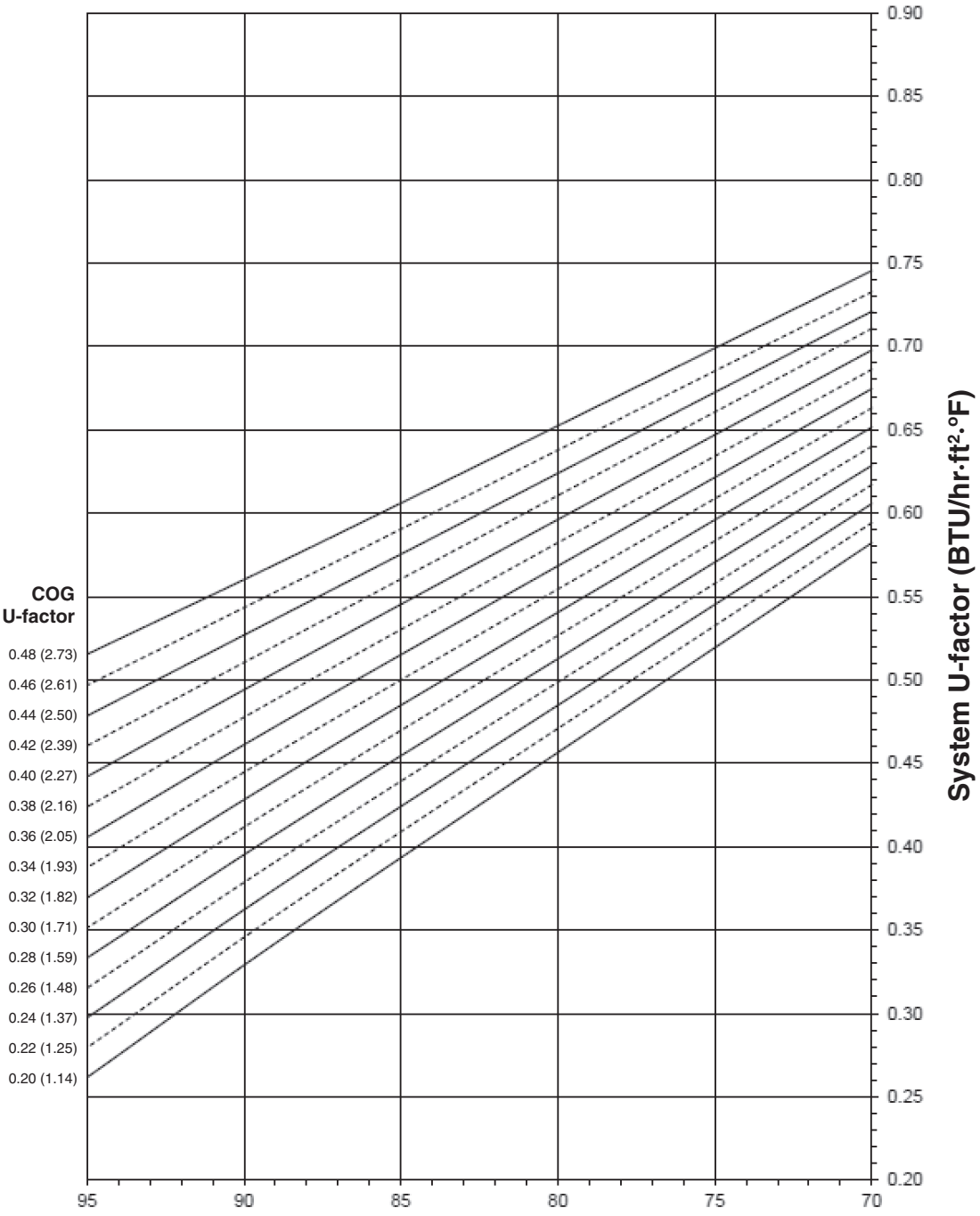
Glass VT [3]	Overall VT [4]
0.90	0.80
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.27
0.25	0.22
0.20	0.18

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

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

TRIFAB® VG 451T with Steel (CENTER)

System U-factor vs Percent of Glass Area



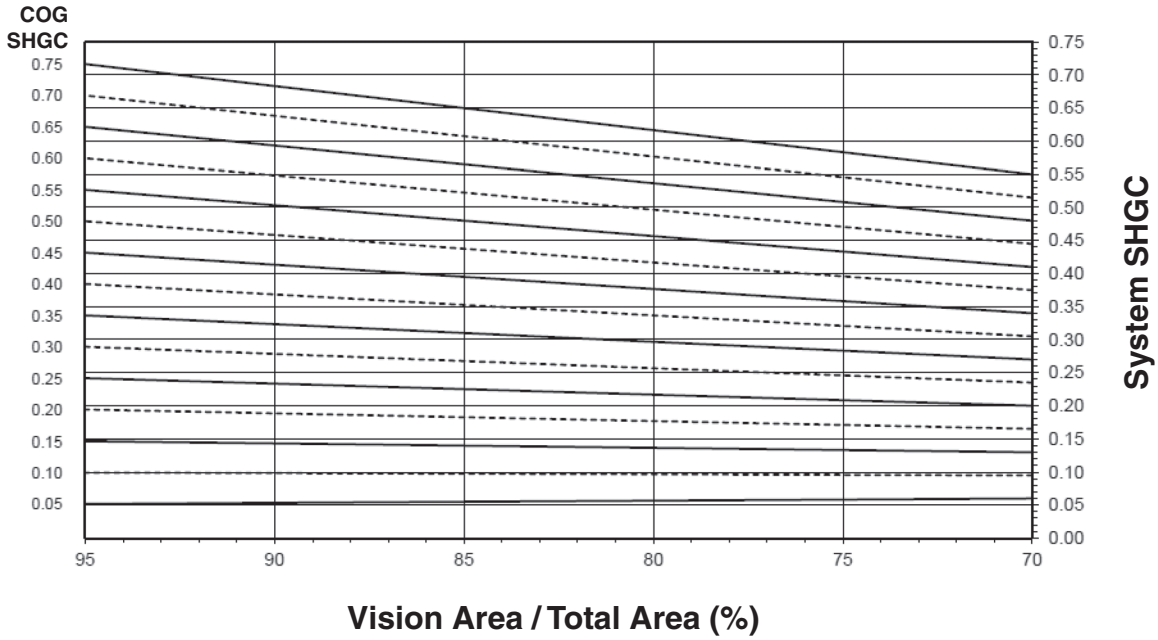
Notes for System U-Factor, SHGC and VT charts:

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

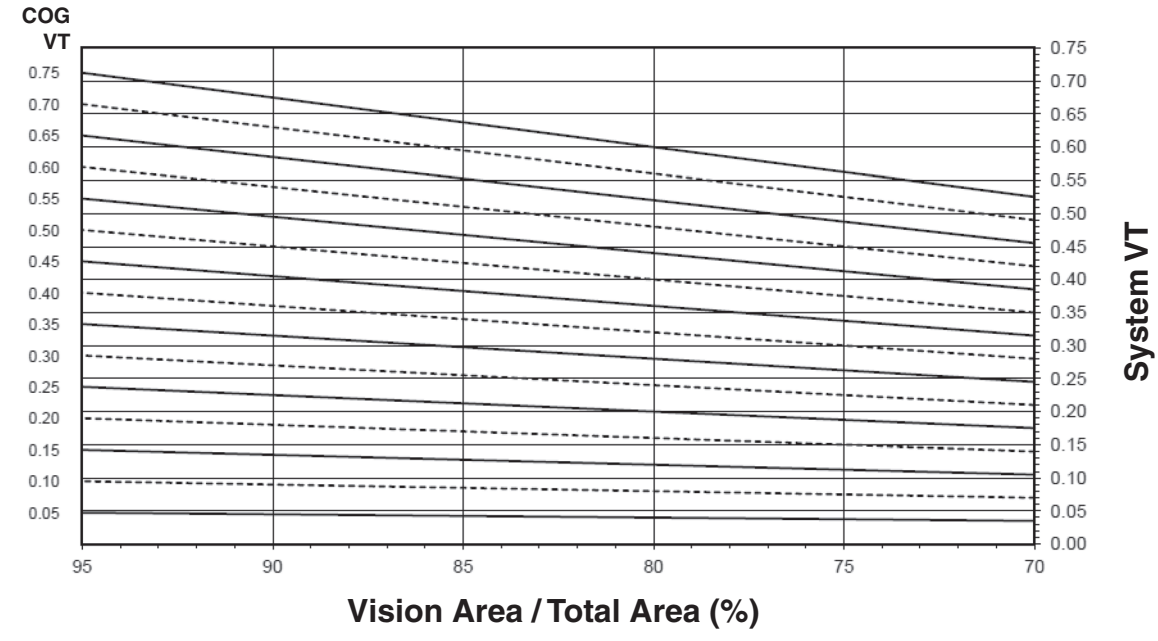
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 451T with Steel (CENTER)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 451T with Steel (CENTER)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
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

SHGC Matrix [2]

Glass SHGC [3]	Overall SHGC [4]
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 [2]

Glass VT [3]	Overall VT [4]
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

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

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