Features

- Trifab® VG 450 is 4-1/2" deep with a 1-3/4" sight line
- 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
- 1/8", 1/4" or 3/8" infill options
- Permanodic® anodized finishes in 7 choices
- Painted finishes in standard and custom choices

Optional Features

- High performance interlocking flashing

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.

PICTORIAL VIEWS **5-9**
CENTER **11**
FRONT **23**
BACK **39**
MULTI-PLANE **47**
CHARTS (WINDLOAD, DEADLOAD, END REACTION & THERMAL) **55-73**

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.

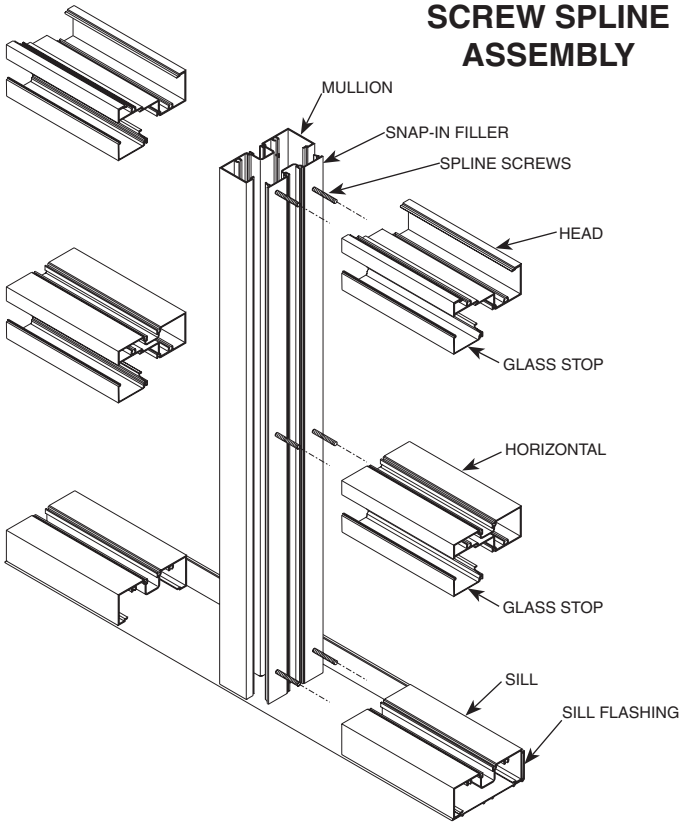
The following metric (SI) units are found in these details:

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.

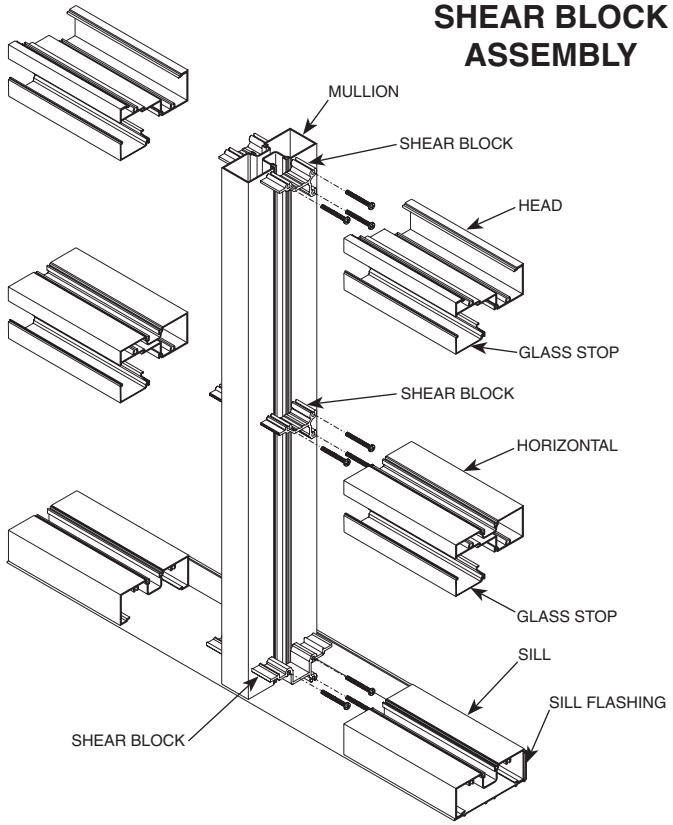
THE SPLIT VERTICAL IN THE SCREW SPLINE SYSTEM ALLOWS A FRAME TO BE INSTALLED FROM UNITIZED ASSEMBLIES. SCREWS ARE DRIVEN THROUGH THE BACK OF THE VERTICALS INTO SPLINES EXTRUDED IN THE HORIZONTAL FRAMING MEMBERS. THE INDIVIDUAL UNITS ARE THEN SNAPPED TOGETHER TO FORM A COMPLETED FRAME.

SCREW SPLINE ASSEMBLY



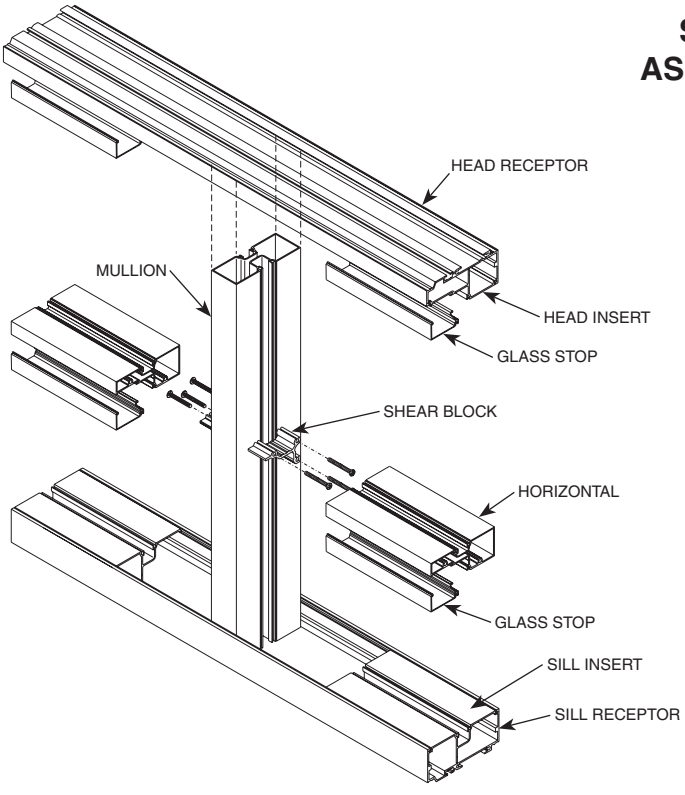
THE SHEAR BLOCK SYSTEM OF FABRICATION ALLOWS A FRAME TO BE PRE-ASSEMBLED AND INSTALLED AS A SINGLE UNIT. HORIZONTALS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS.

SHEAR BLOCK ASSEMBLY



THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. HEAD AND SILL RECEPTORS ARE FASTENED TO THE SURROUND. VERTICAL MULLIONS ARE THEN INSTALLED IN THESE RECEPTORS AND ARE HELD IN PLACE BY SNAP-IN INSERTS. INTERMEDIATE HORIZONTAL MEMBERS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS. FLASHING IS NOT REQUIRED.

STICK ASSEMBLY

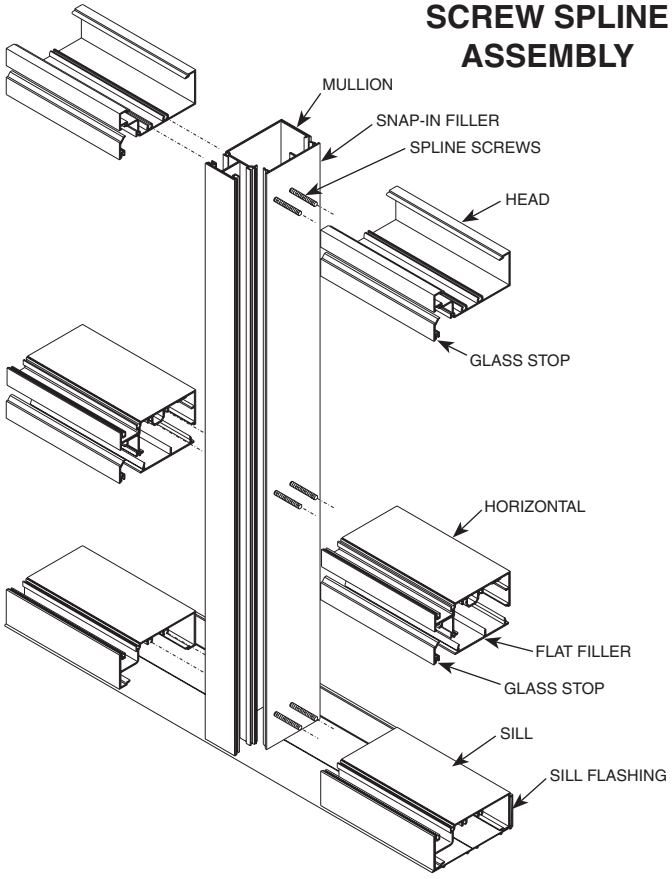


NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 14)

KAWNEER
AN ALCOA COMPANY

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

SCREW SPLINE ASSEMBLY



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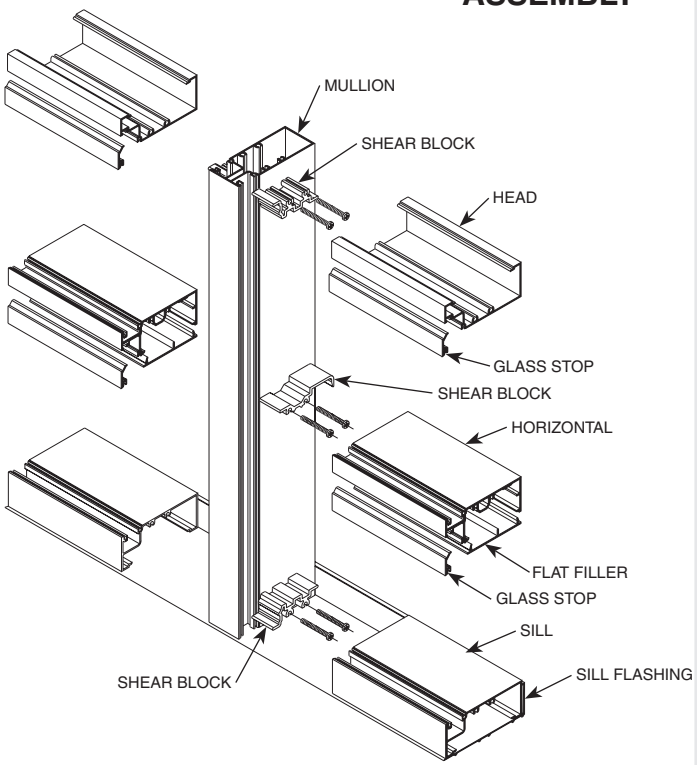
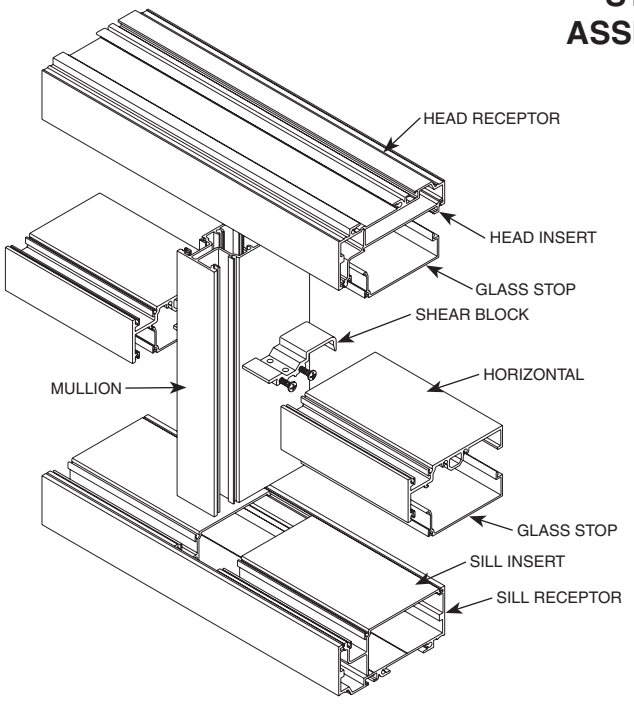
SHEAR BLOCK ASSEMBLY



THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. HEAD AND SILL RECEPTORS ARE FASTENED TO THE SURROUND. VERTICAL MULLIONS ARE THEN INSTALLED IN THESE RECEPTORS AND ARE HELD IN PLACE BY SNAP-IN INSERTS. INTERMEDIATE HORIZONTAL MEMBERS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS. FLASHING IS NOT REQUIRED.

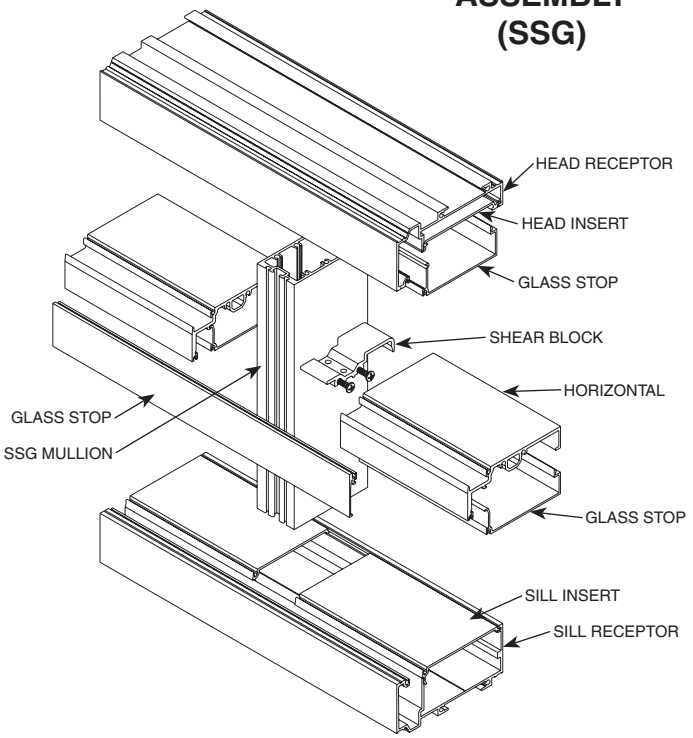
STICK ASSEMBLY



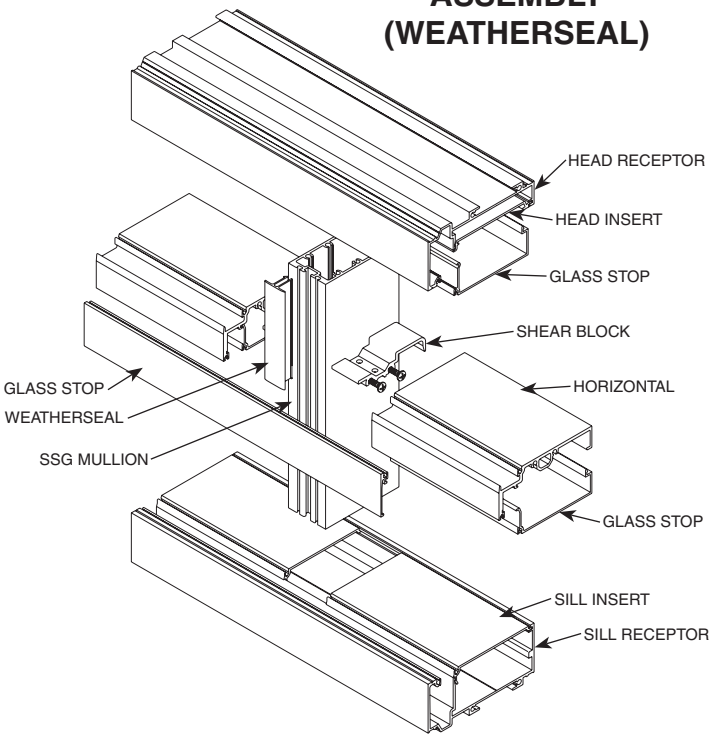
NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 32)

THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. HEAD AND SILL RECEPTORS ARE FASTENED TO THE SURROUND. VERTICAL MULLIONS ARE THEN INSTALLED IN THESE RECEPTORS AND ARE HELD IN PLACE BY SNAP-IN INSERTS. INTERMEDIATE HORIZONTAL MEMBERS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS. FLASHING IS NOT REQUIRED.

STICK ASSEMBLY (SSG)



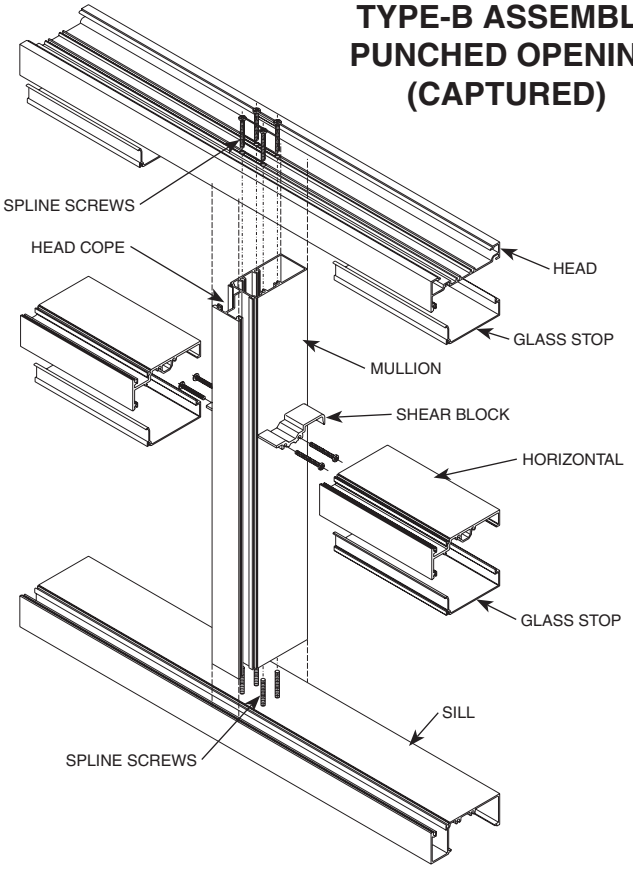
STICK ASSEMBLY (WEATHERSEAL)



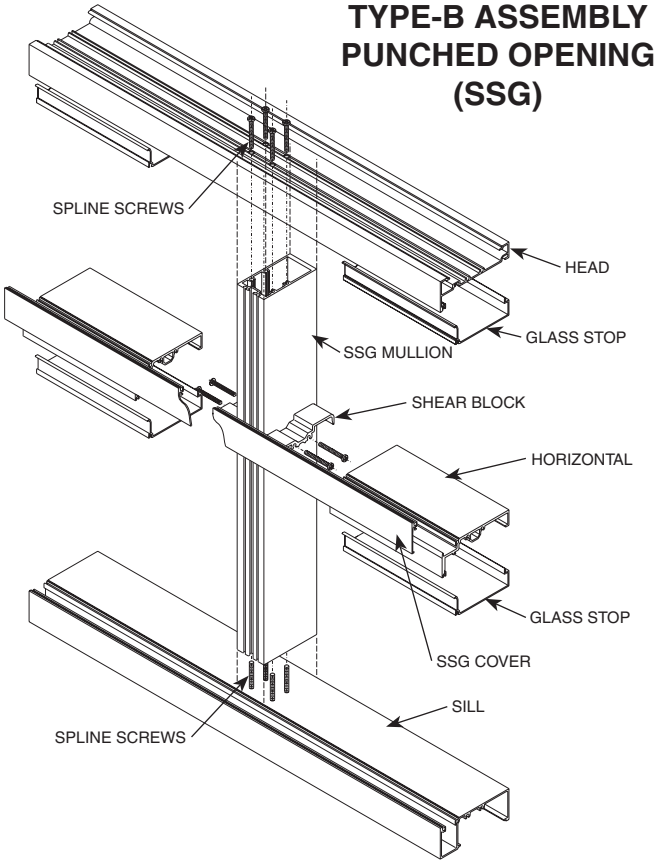
NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 32)

THE 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)



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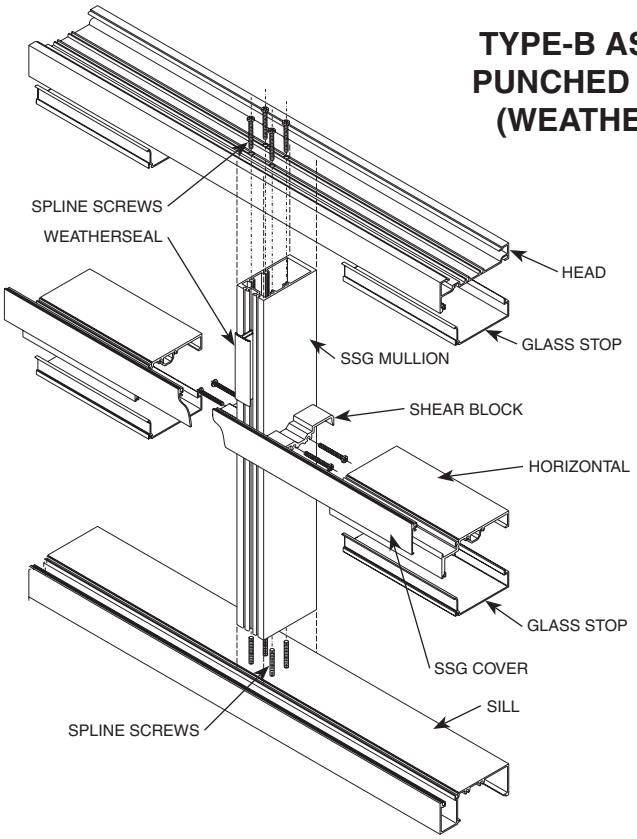
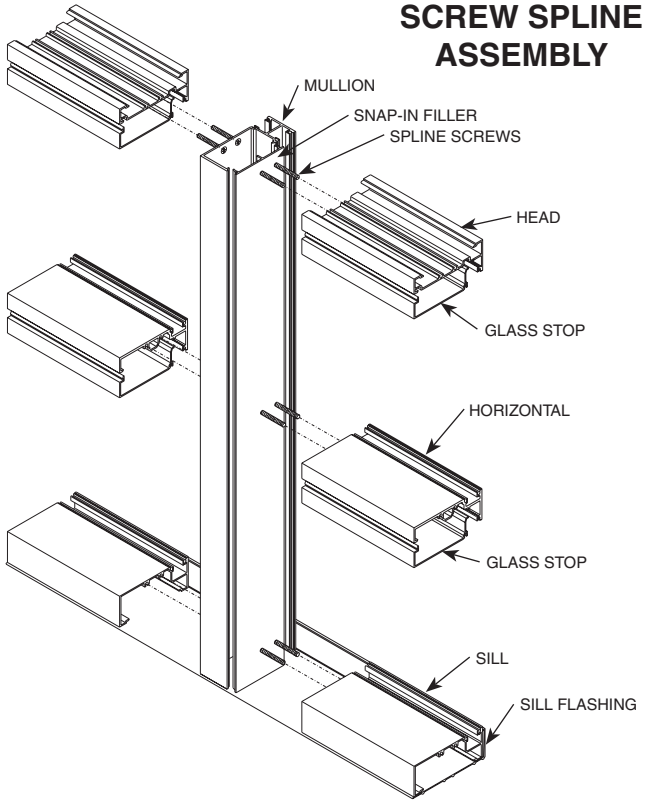
TYPE-B ASSEMBLY PUNCHED OPENING (WEATHERSEAL)



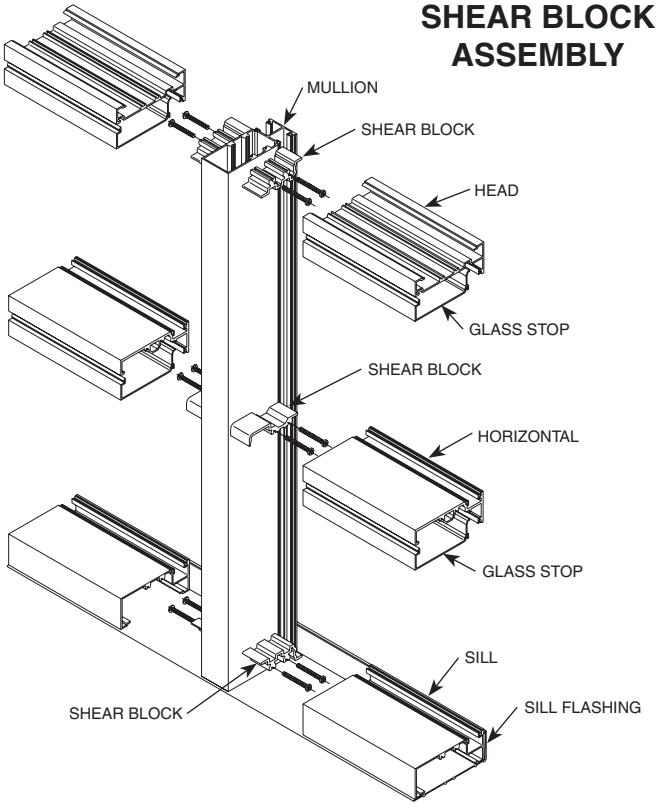
THE SPLIT VERTICAL IN THE SCREW SPLINE SYSTEM ALLOWS A FRAME TO BE INSTALLED FROM UNITIZED ASSEMBLIES. SCREWS ARE DRIVEN THROUGH THE BACK OF THE VERTICALS INTO SPLINES EXTRUDED IN THE HORIZONTAL FRAMING MEMBERS. THE INDIVIDUAL UNITS ARE THEN SNAPPED TOGETHER TO FORM A COMPLETED FRAME.

SCREW SPLINE ASSEMBLY



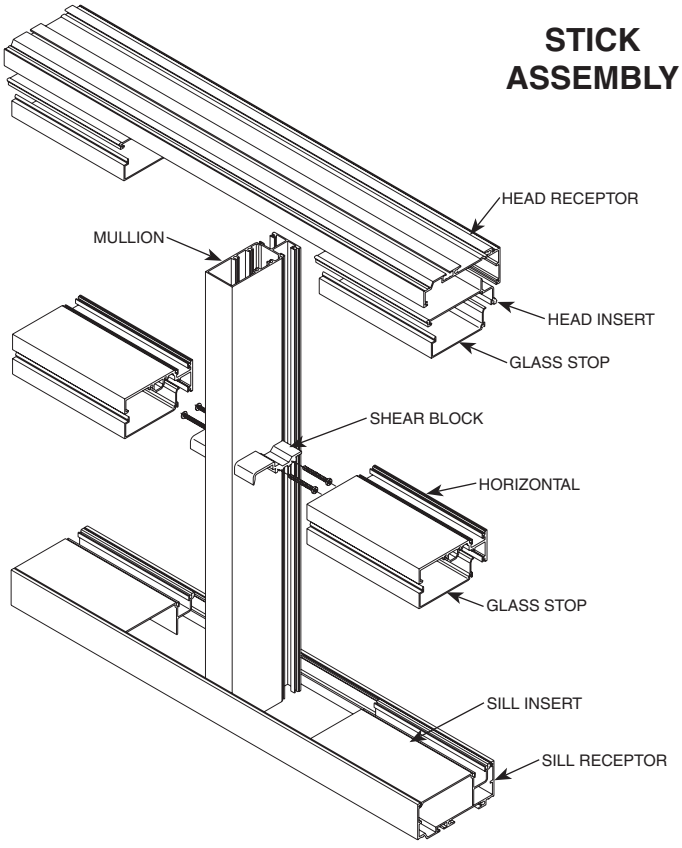
THE SHEAR BLOCK SYSTEM OF FABRICATION ALLOWS A FRAME TO BE PRE-ASSEMBLED AND INSTALLED AS A SINGLE UNIT. HORIZONTALS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS.

SHEAR BLOCK ASSEMBLY



THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. HEAD AND SILL RECEPTORS ARE FASTENED TO THE SURROUND. VERTICAL MULLIONS ARE THEN INSTALLED IN THESE RECEPTORS AND ARE HELD IN PLACE BY SNAP-IN INSERTS. INTERMEDIATE HORIZONTAL MEMBERS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS. FLASHING IS NOT REQUIRED.

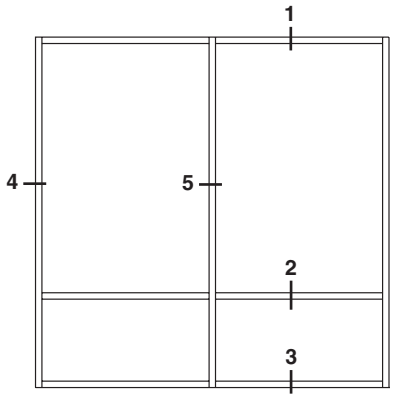
STICK ASSEMBLY



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 43)

BASIC FRAMING DETAILS..... 12,13
MISCELLANEOUS FRAMING..... 14,15
CORNERS..... 16
CURVING & TRIM DETAILS..... 17
ENTRANCE FRAMING 18
ENTRANCE FRAMING (OPEN BACK)..... 19
GLASSvent™ 20,21
VENTS..... 22

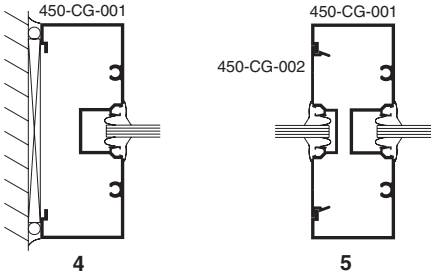
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

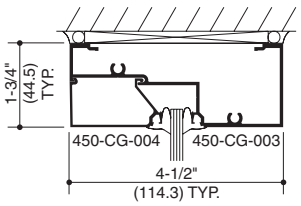
CAD Details = TF_VG_450-SS-Center--CAD.zip



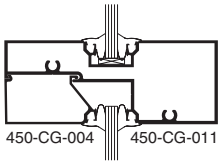
4 JAMB

5 VERTICAL

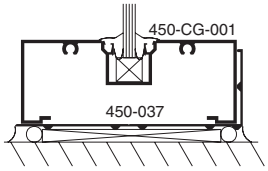
1 HEAD



2 HORIZONTAL



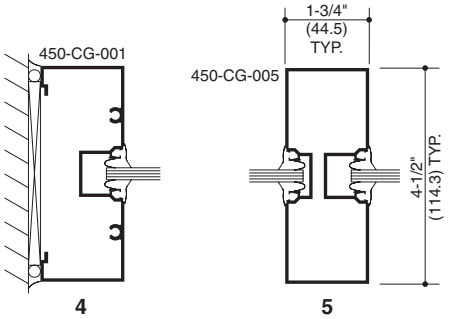
3 SILL



*See page 14 for Optional High Performance Flashing.

SHEAR BLOCK

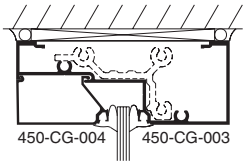
CAD Details = TF_VG_450-SB-Center--CAD.zip



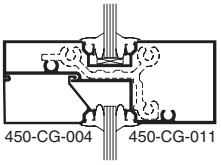
4 JAMB

5 VERTICAL

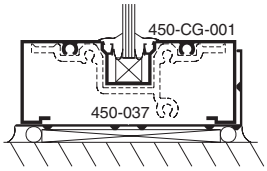
1 HEAD



2 HORIZONTAL



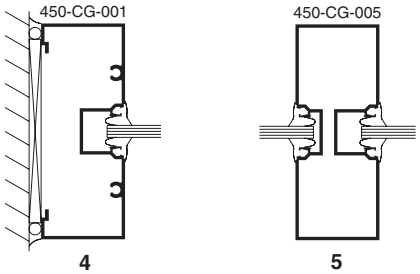
3 SILL



*See page 14 for Optional High Performance Flashing.

STICK

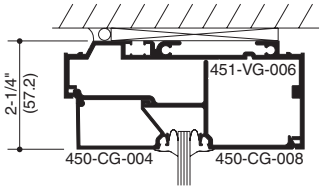
CAD Details = TF_VG_450-Stick-Center--CAD.zip



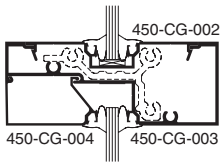
4 JAMB

5 VERTICAL

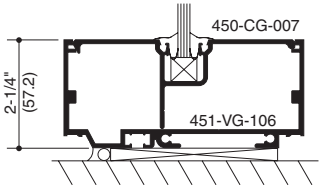
1 HEAD



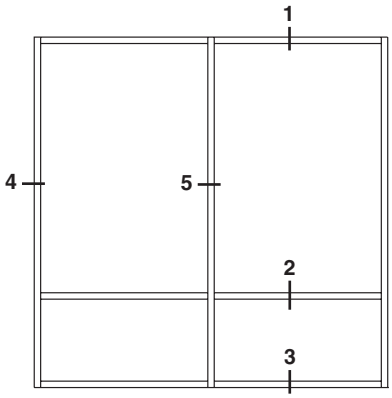
2 HORIZONTAL



3 SILL



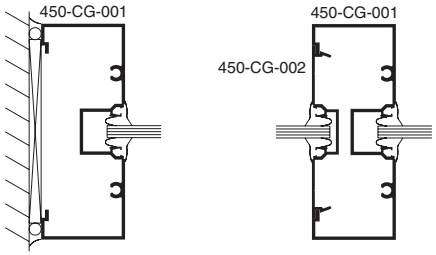
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

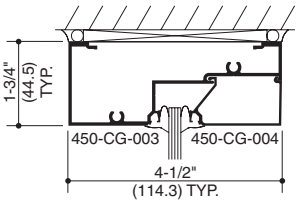
SCREW SPLINE

CAD Details = TF_VG_450-SS-Center--CAD.zip

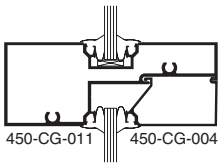


4 JAMB **5 VERTICAL**

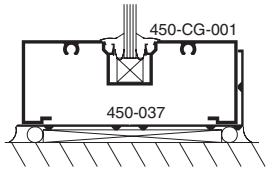
1 HEAD



2 HORIZONTAL



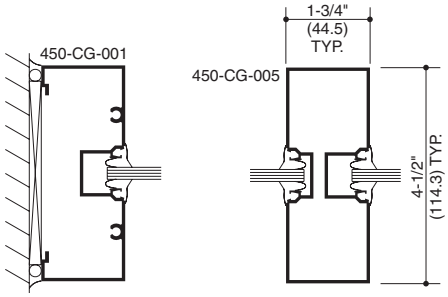
3 SILL



*See page 14 for Optional High Performance Flashing.

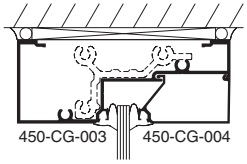
SHEAR BLOCK

CAD Details = TF_VG_450-SB-Center--CAD.zip

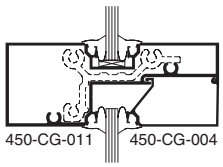


4 JAMB **5 VERTICAL**

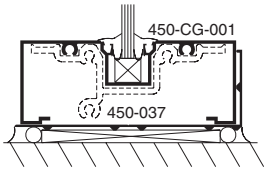
1 HEAD



2 HORIZONTAL



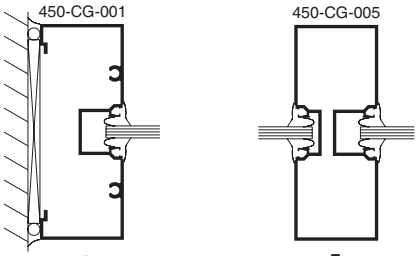
3 SILL



*See page 14 for Optional High Performance Flashing.

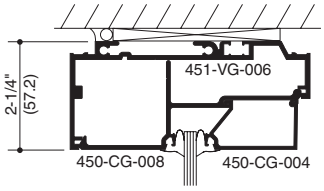
STICK

CAD Details = TF_VG_450-Stick-Center--CAD.zip

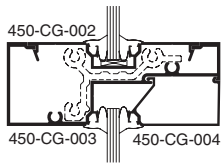


4 JAMB **5 VERTICAL**

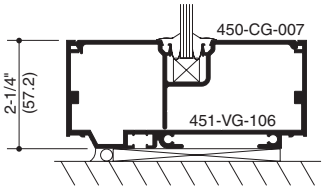
1 HEAD



2 HORIZONTAL



3 SILL

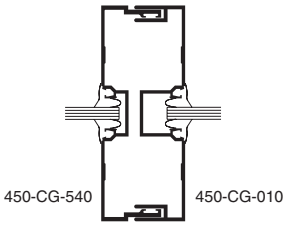


SCALE 3" = 1'-0"

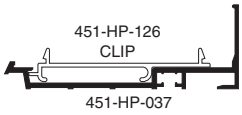
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip

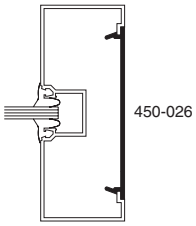
CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip



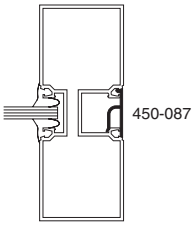
EXPANSION MULLION



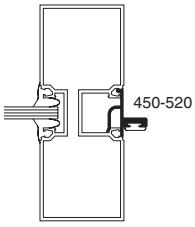
HIGH PERFORMANCE FLASHING



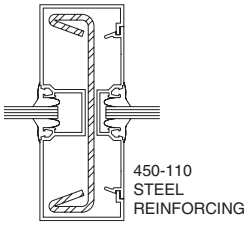
SNAP-IN FLAT FILLER



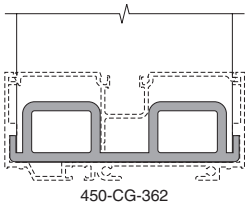
SNAP-IN FLAT POCKET FILLER



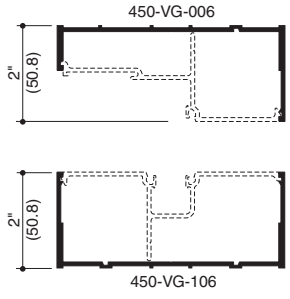
SNAP-IN DOOR STOP



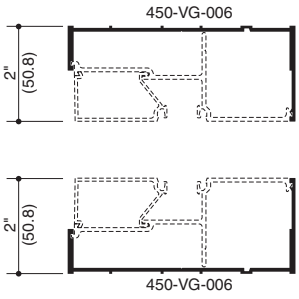
STEEL REINFORCEMENT



MULLION ANCHOR



OPTIONAL LIGHTWEIGHT CAN RECEPTORS (Stick System)



OPTIONAL UNEQUAL LEG CAN RECEPTORS (Stick System)

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

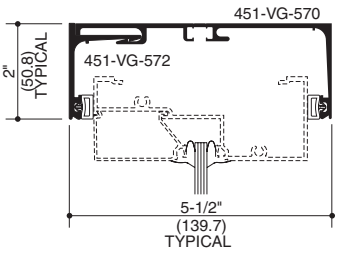
NOTE:
Mullion Anchor not used with Lightweight Receptor.

SCALE 3" = 1'-0"

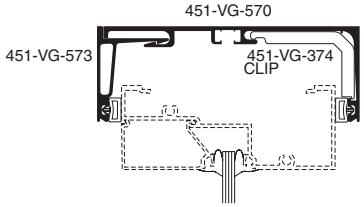
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip

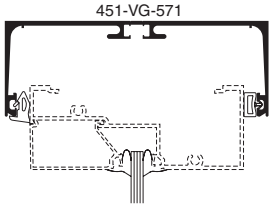
CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip



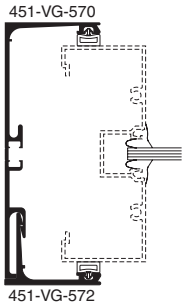
**STANDARD HEAD
COMPENSATING RECEPTOR**



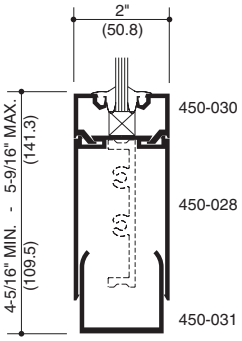
**HEAVY WEIGHT
HEAD
COMPENSATING RECEPTOR**



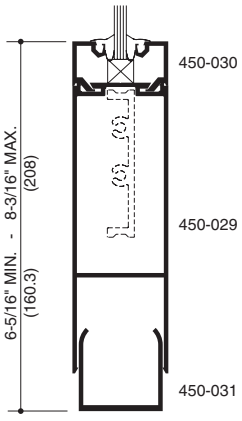
**ONE PIECE
HEAD
COMPENSATING RECEPTOR**



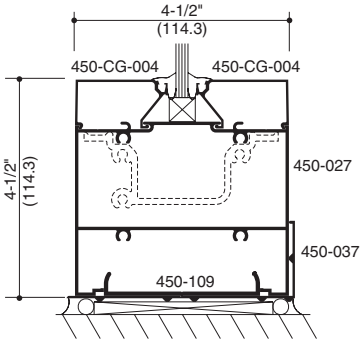
**JAMB
COMPENSATING RECEPTOR**



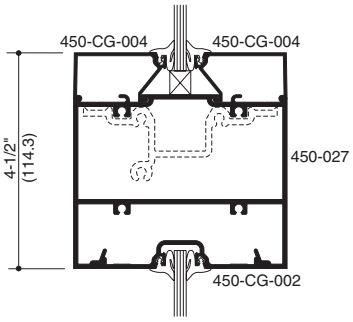
**NARROW
SIDELITE BASE**



**NARROW
SIDELITE BASE**



SIDELITE BASE

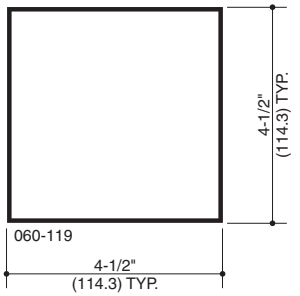


**4-1/2" X 4-1/2"
HORIZONTAL**

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

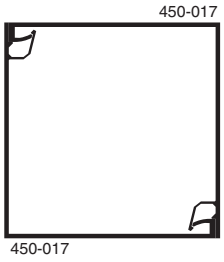
SCALE 3" = 1'-0"

CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip



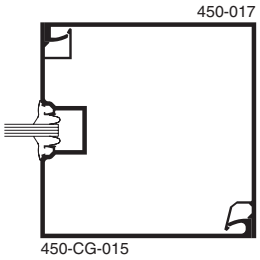
4-1/2" x 4-1/2" TUBE

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip

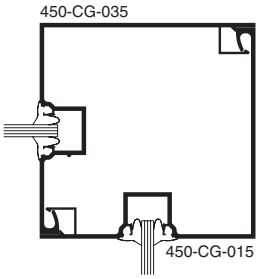


TWO PIECE
NO POCKET CORNER

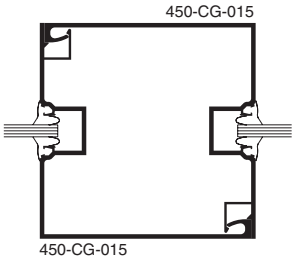
CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip



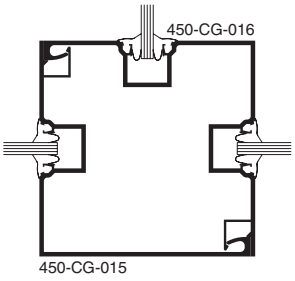
ONE POCKET
CORNER



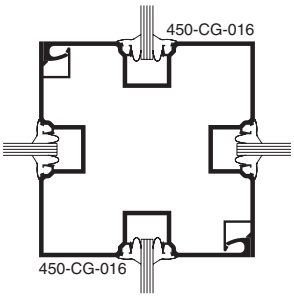
TWO POCKET
90° CORNER



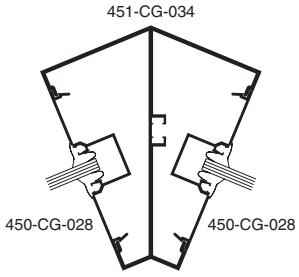
TWO POCKET
VERTICAL POST



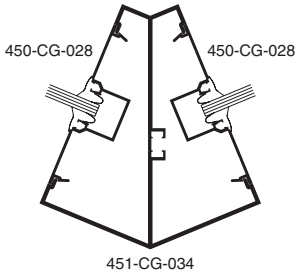
THREE POCKET
90° CORNER



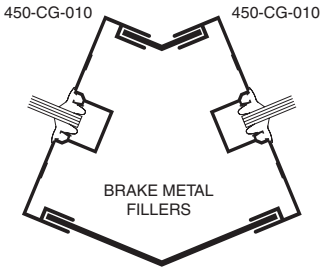
FOUR POCKET
90° CORNER



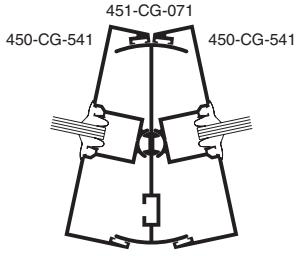
135° INSIDE
CORNER



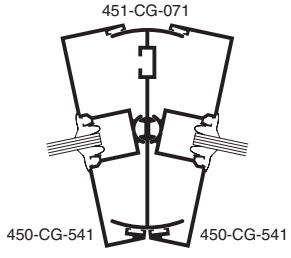
135° OUTSIDE
CORNER



VARIABLE DEGREE
BRAKE METAL CORNER



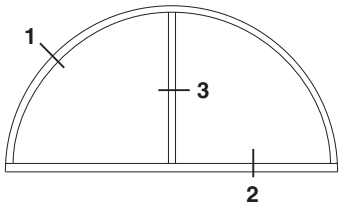
155° TO 180° PIVOT MULLION
(OUTSIDE CORNER)



155° TO 180° PIVOT MULLION
(INSIDE CORNER)

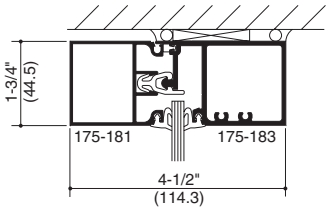
SCALE 3" = 1'-0"

CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip

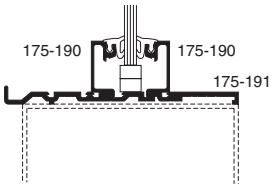


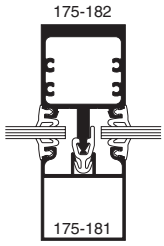
CURVING DETAILS
(Center Plane Only)

1



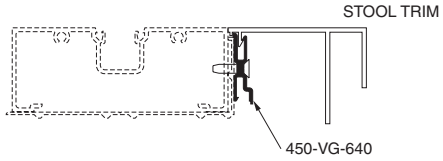
2



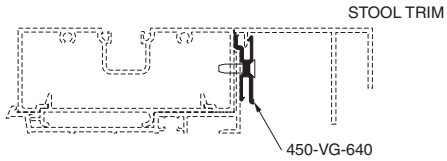


3

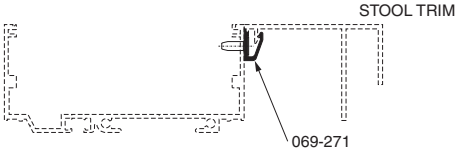
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip



STOOL TRIM CLIP
WITH STANDARD FLASHING

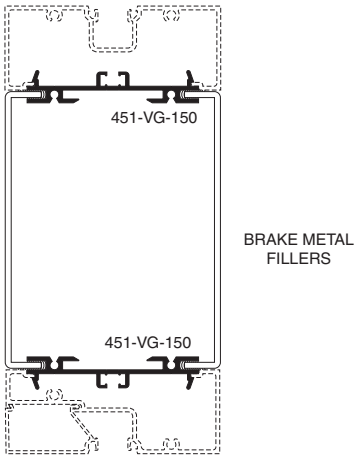


STOOL TRIM CLIP
WITH HIGH PERFORMANCE
FLASHING

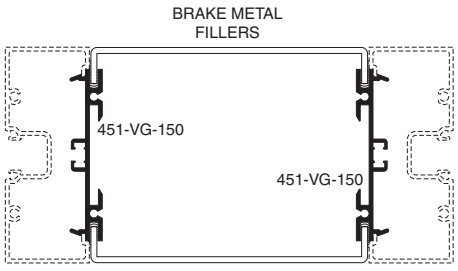


STOOL TRIM CLIP
FOR STICK/TYPE-B ASSEMBLY

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip



BRAKE METAL ADAPTOR
AT HORIZONTAL



BRAKE METAL ADAPTOR
AT VERTICAL

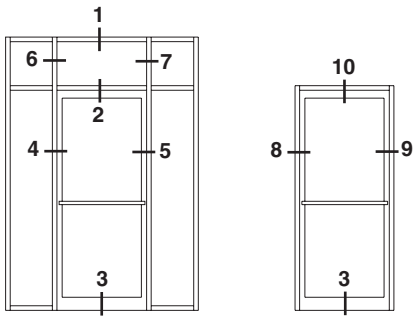
CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip

SCALE 3" = 1'-0"

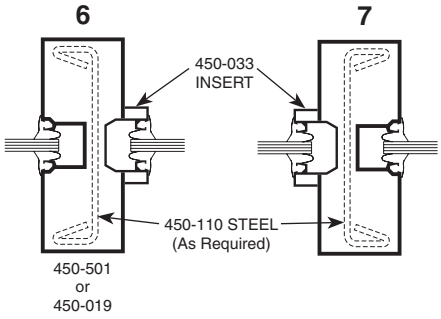
CAD Details **ENTRANCE**
= TF_VG_450_Ent-Center--CAD.zip

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

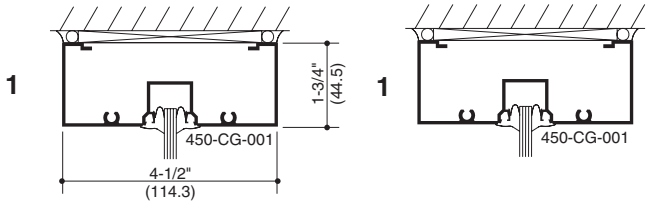
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



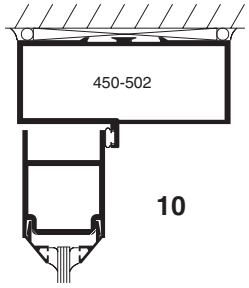
ELEVATIONS ARE NUMBER KEYED TO DETAILS



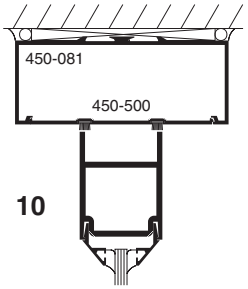
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

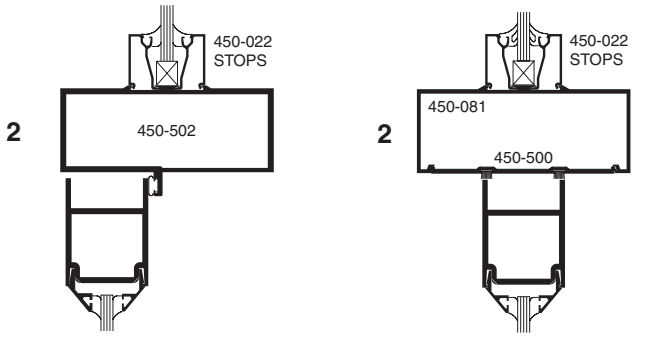


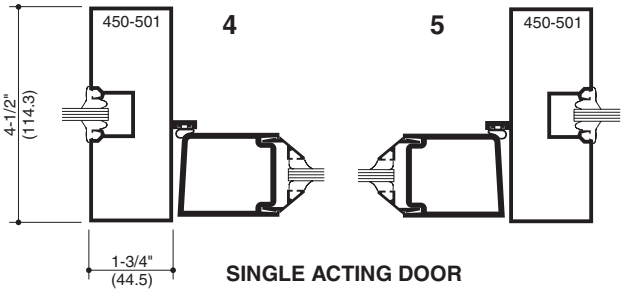
SINGLE ACTING



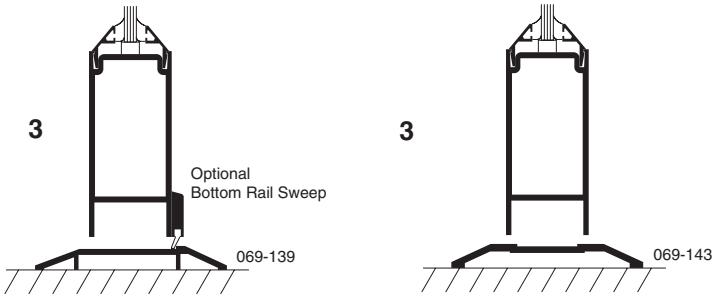
DOUBLE ACTING





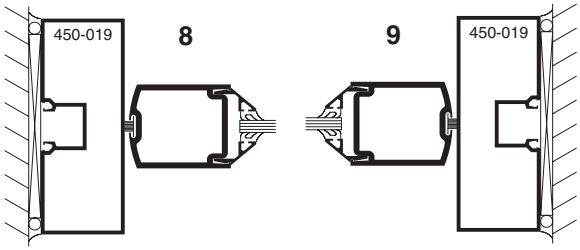


SINGLE ACTING DOOR



SINGLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR WITH TRANSOM



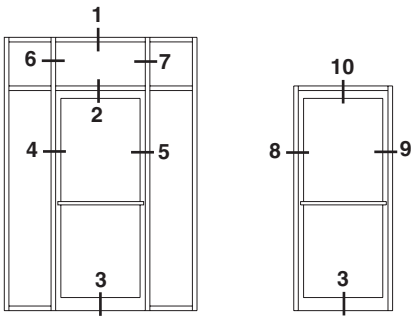
DOUBLE ACTING DOOR

SCALE 3" = 1'-0"

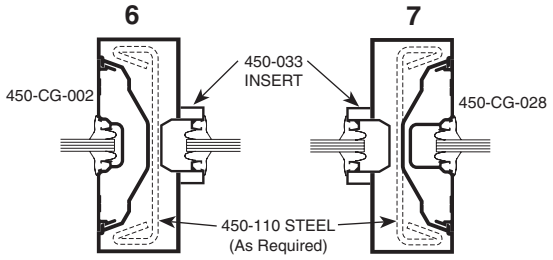
CAD Details **ENTRANCE**
= TF_VG_450_Ent-Center--CAD.zip

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

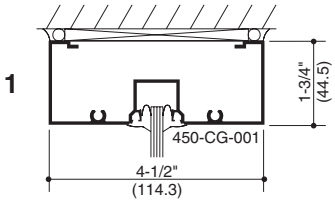
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

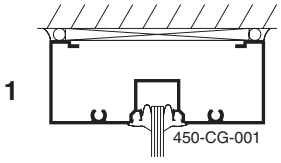


ELEVATIONS ARE NUMBER KEYED TO DETAILS

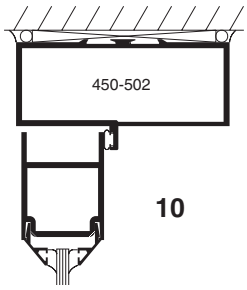


Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

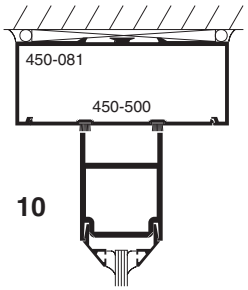


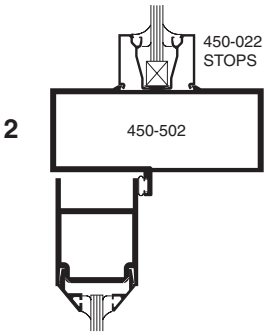


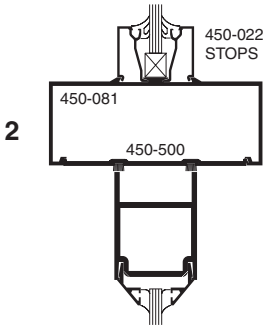
SINGLE ACTING

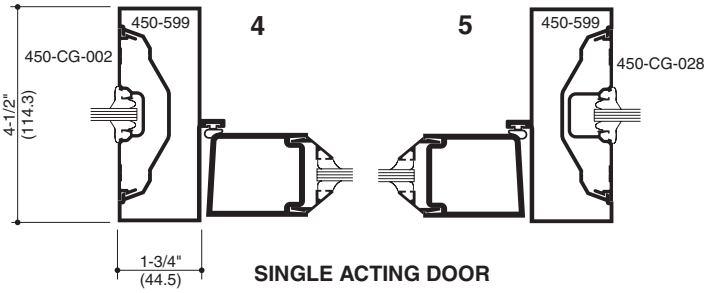


DOUBLE ACTING



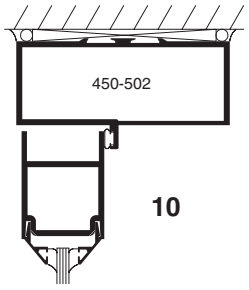




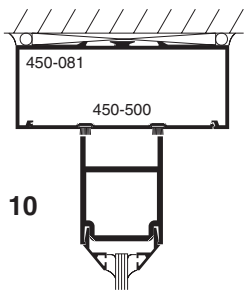


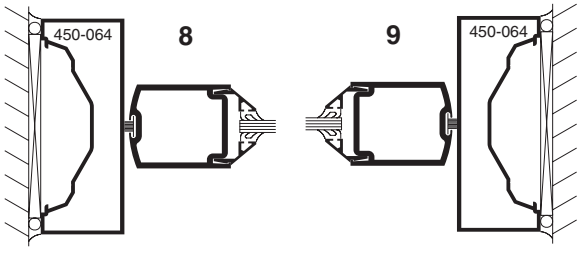
SINGLE ACTING DOOR

SINGLE ACTING



DOUBLE ACTING





DOUBLE ACTING DOOR

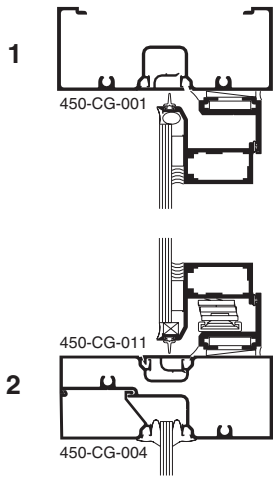
SCALE 3" = 1'-0"

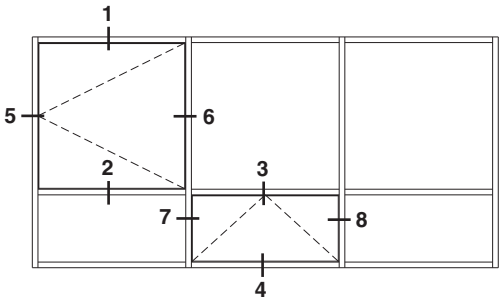
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip

CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip

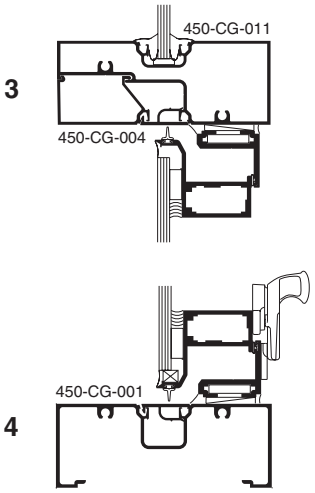
OUTSWING CASEMENT
VERTICAL SECTION SHOWN



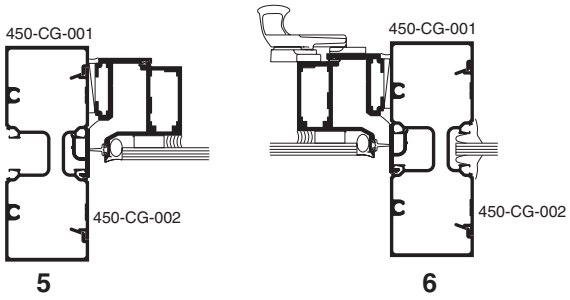


ELEVATION IS NUMBER KEYED TO DETAILS

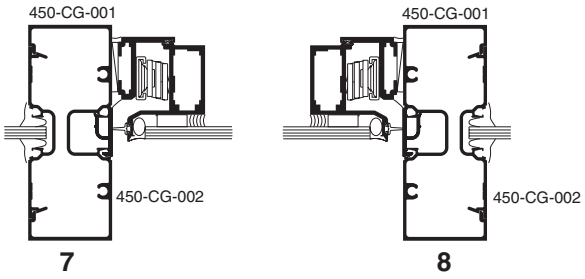
PROJECT-OUT
VERTICAL SECTION SHOWN



OUTSWING CASEMENT
HORIZONTAL SECTION SHOWN



PROJECT-OUT
HORIZONTAL SECTION SHOWN

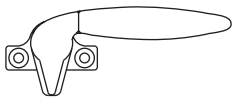


MAXIMUM / MINIMUM SIZES (1/4" INFILL)

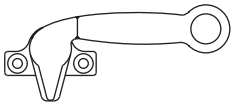
PROJECT-OUT	MAXIMUM 60" x 36" MINIMUM 12" x 12"
OUTSWING CASEMENT	MAXIMUM 36" x 60" MINIMUM 12" x 12"

STOREFRONT GLASSvent™ HARDWARE SELECTION GUIDE

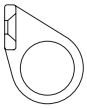
DESCRIPTION	PROJECT - OUT	OUTSWING CASEMENT
Stainless steel 4-bar hinge	STANDARD	STANDARD
Cast white bronze cam lock	STANDARD	STANDARD
Cast white bronze cam lock with pole ring	OPTIONAL	OPTIONAL
Cast white bronze custodial lock with removable handle	OPTIONAL	OPTIONAL
Cast white bronze concealed lock 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

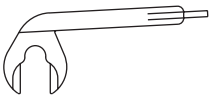


CAM LOCK WITH POLE RING

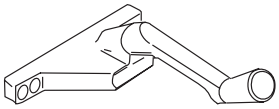


PULL RING

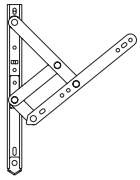
CUSTODIAL LOCK



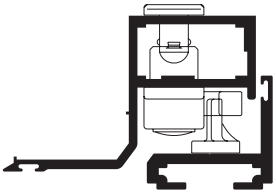
REMOVABLE HANDLE



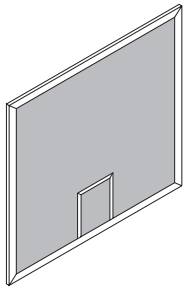
ROTO-OPERATOR



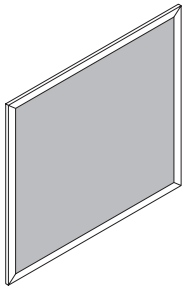
STAINLESS STEEL 4 BAR HINGES



CONCEALED LOCK



INSECT SCREEN WITH STANDARD WICKET



INSECT SCREEN WITH FULL WICKET

SCALE 3" = 1'-0"

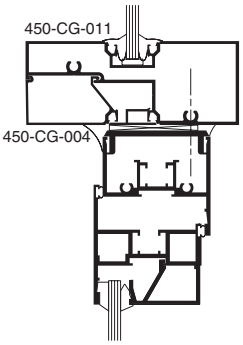
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Center--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Center--CAD.zip

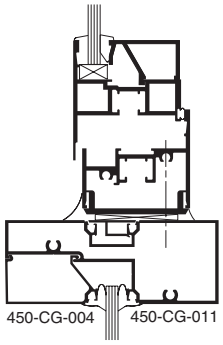
CAD Details **STICK**
= TF_VG_450-Stick-Center--CAD.zip

PROJECT-OUT
VERTICAL SECTION

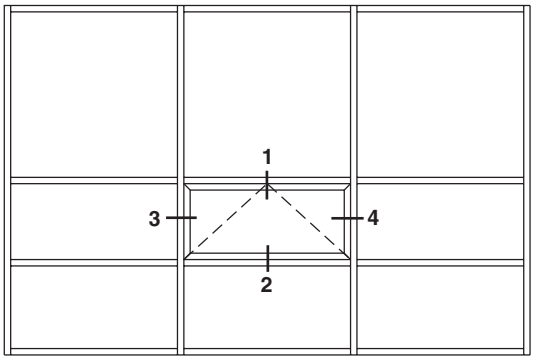
1



2

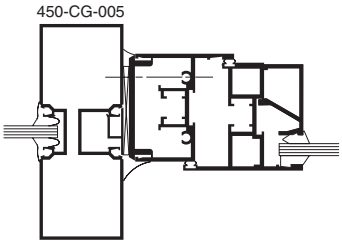


7225 VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

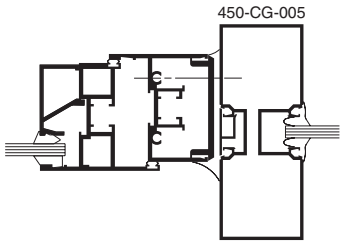


ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
HORIZONTAL SECTION



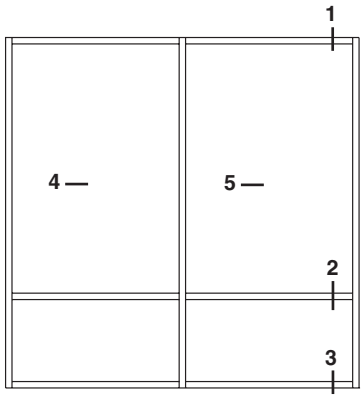
3



4

BASIC FRAMING DETAILS..... 24-30
MISCELLANEOUS FRAMING..... 31,32
CORNERS..... 33
ENTRANCE FRAMING..... 34
GLASSvent™ 35-36
VENTS..... 37

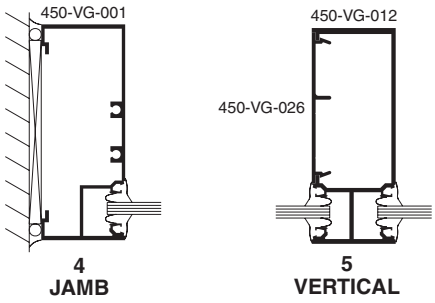
SCALE 3" = 1'-0"



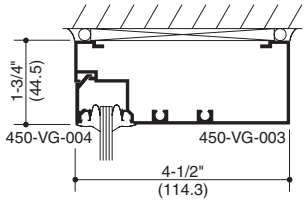
ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

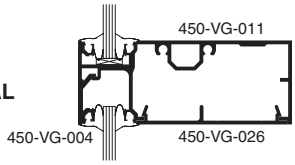
CAD Details = TF_VG_450-SS-Front--CAD.zip



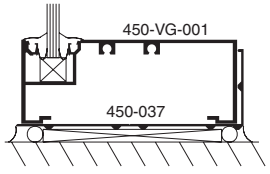
1 HEAD



2 HORIZONTAL



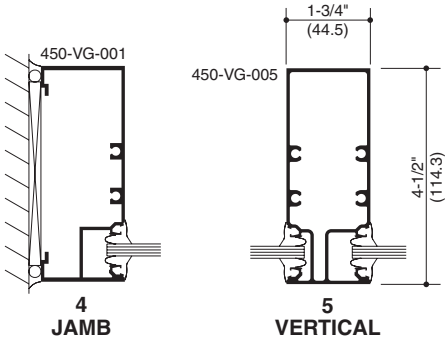
3 SILL



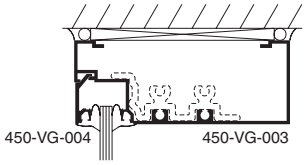
*See page 31 for Optional High Performance Flashing.

SHEAR BLOCK

CAD Details = TF_VG_450-SB-Front--CAD.zip



1 HEAD



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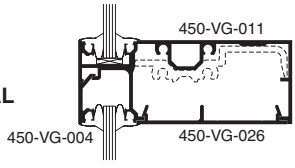
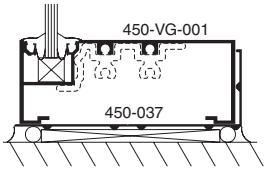


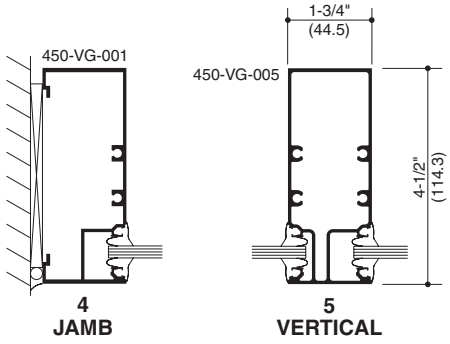
3 SILL



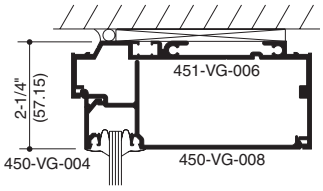
*See page 31 for Optional High Performance Flashing.

STICK

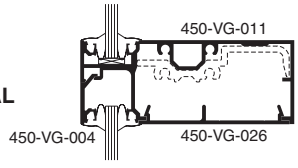
CAD Details = TF_VG_450-Stick-Front--CAD.zip



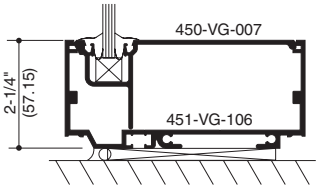
1 HEAD



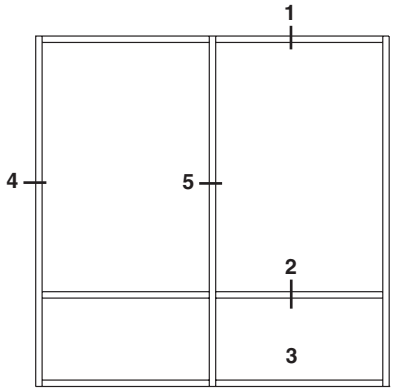
2 HORIZONTAL



3 SILL



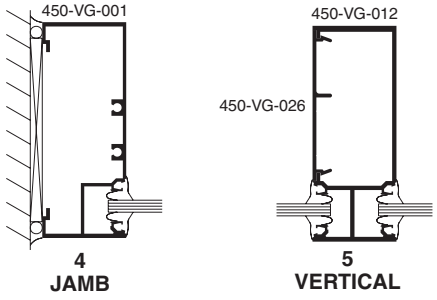
SCALE 3" = 1'-0"



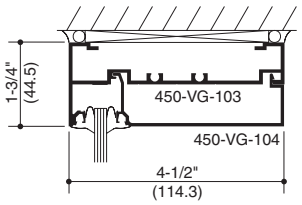
ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

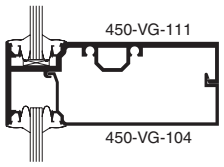
CAD Details = TF_VG_450-SS-Front--CAD.zip



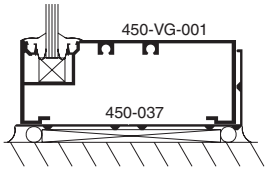
1 HEAD



2 HORIZONTAL



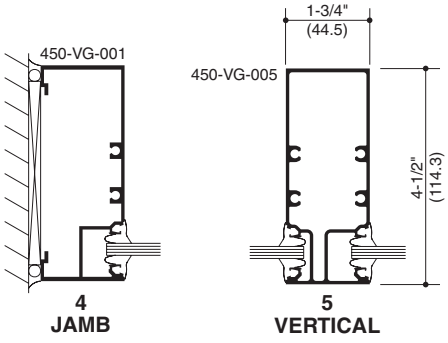
3 SILL



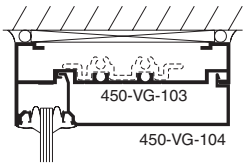
*See page 31 for Optional High Performance Flashing.

SHEAR BLOCK

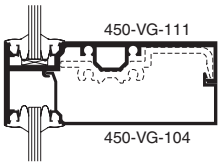
CAD Details = TF_VG_450-SB-Front--CAD.zip



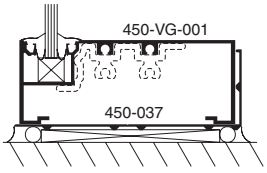
1 HEAD



2 HORIZONTAL



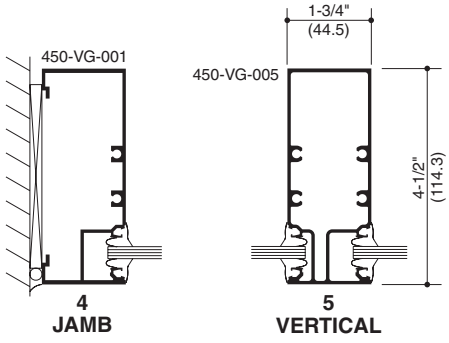
3 SILL



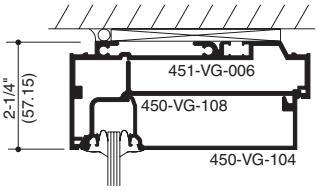
*See page 31 for Optional High Performance Flashing.

STICK

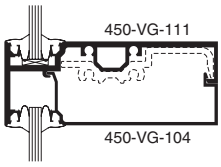
CAD Details = TF_VG_450-Stick-Front--CAD.zip



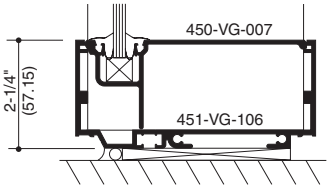
1 HEAD



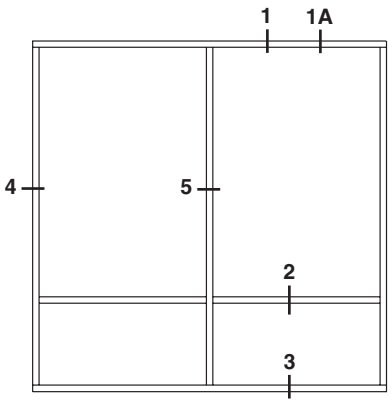
2 HORIZONTAL



3 SILL



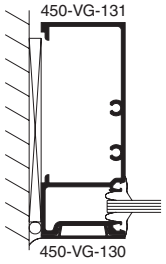
SCALE 3" = 1'-0"



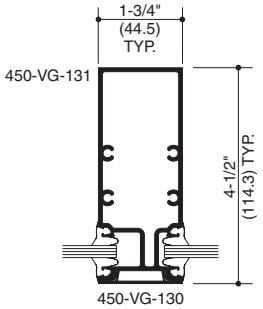
ELEVATION IS NUMBER KEYED TO DETAILS

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

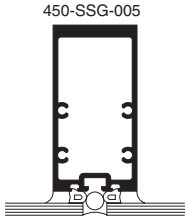
CAD Details **STICK** = TF_VG_450-Stick-Front--CAD.zip



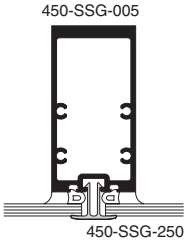
4
JAMB



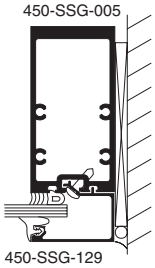
5
VERTICAL



5A
SSG
VERTICAL

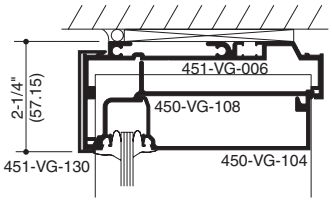


5B
WEATHERSEAL
VERTICAL

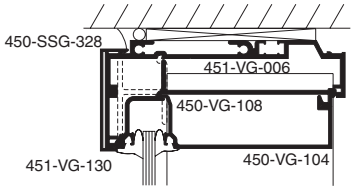


4A
SSG
JAMB

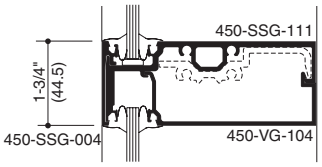
1
HEAD



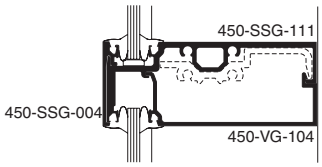
1A
HEAD



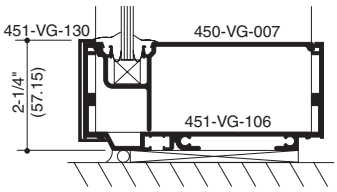
2
HORIZONTAL



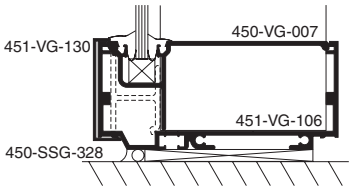
2A
HORIZONTAL



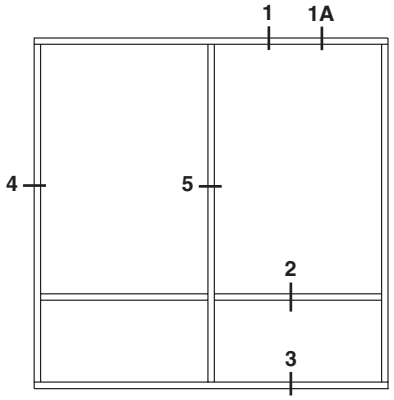
3
SILL



3A
SILL



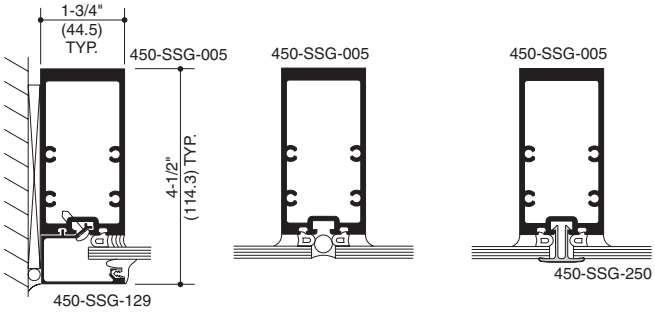
SCALE 3" = 1'-0"



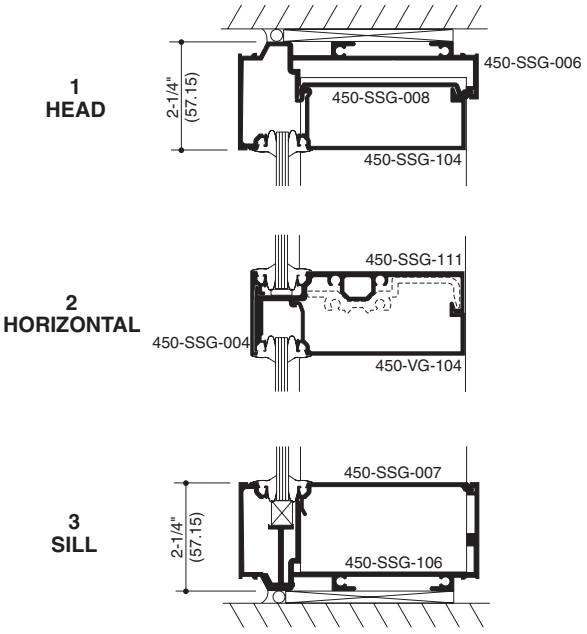
ELEVATION IS NUMBER KEYED TO DETAILS

STICK SYSTEM (INSIDE GLAZED) SSG RECEPTOR

CAD Details **STICK SSG** = TF_VG_450-Stick-SSG-Front--CAD.zip

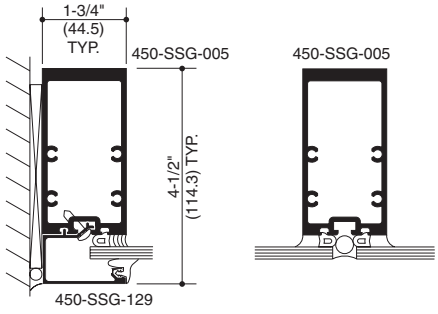


4 SSG JAMB | **5 SSG VERTICAL** | **5 WEATHERSEAL VERTICAL**

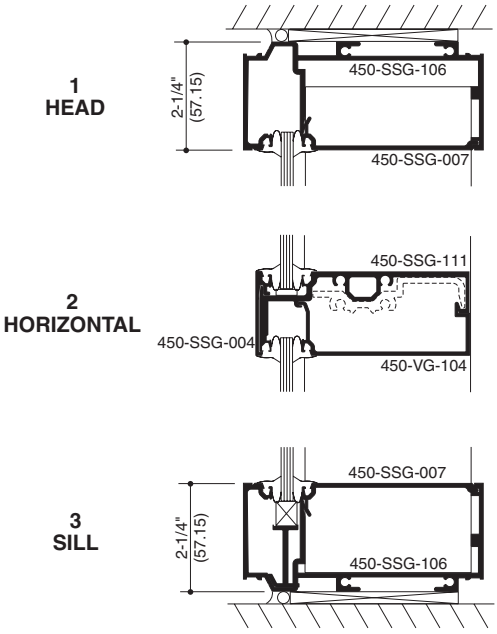


STICK SYSTEM (OUTSIDE GLAZED) SSG RECEPTOR

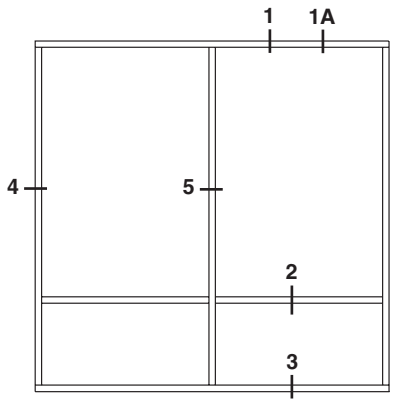
CAD Details **STICK SSG** = TF_VG_450-Stick-SSG-Front--CAD.zip



4 SSG JAMB | **5 SSG VERTICAL**



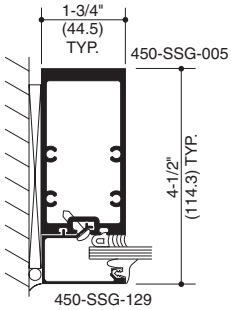
SCALE 3" = 1'-0"



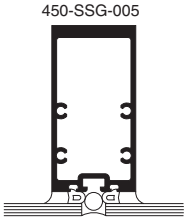
ELEVATION IS NUMBER KEYED TO DETAILS

STICK SYSTEM (INSIDE GLAZED)
SSG RECEPTOR
TWO COLOR OPTION

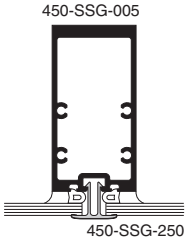
CAD Details **STICK SSG** = TF_VG_450-Stick-SSG-Front--CAD.zip



4
SSG
JAMB

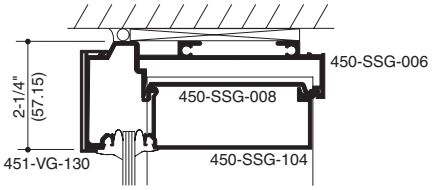


5
SSG
VERTICAL

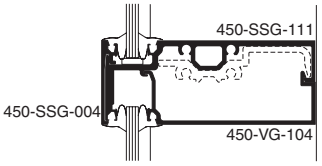


5
WEATHERSEAL
VERTICAL

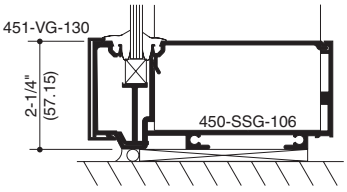
1
HEAD



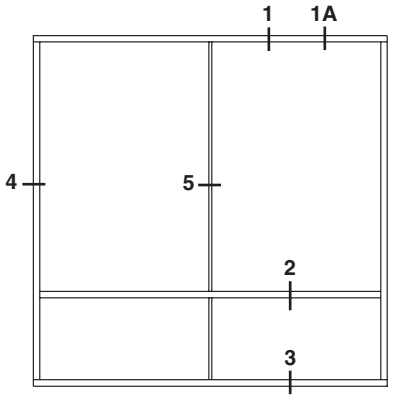
2
HORIZONTAL



3
SILL



SCALE 3" = 1'-0"

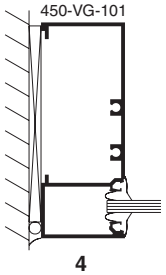


ELEVATION IS NUMBER KEYED TO DETAILS

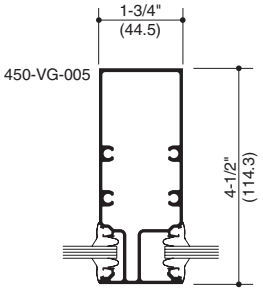
TYPE-B MULTI-LITE PUNCHED OPENINGS
(20 FEET MAXIMUM UNIT WIDTH)

TYPE-B (INSIDE GLAZED) PUNCHED OPENING

CAD Details **TYPE-B** = TF_VG_450_Type-B_Front--CAD.zip

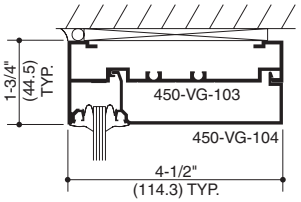


4
JAMB

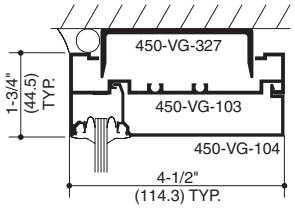


5
VERTICAL

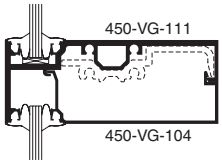
1
HEAD



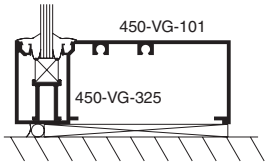
1A
HEAD



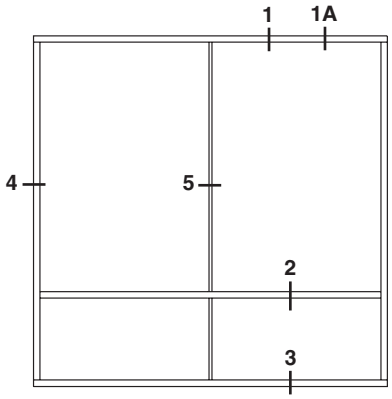
2
HORIZONTAL



3
SILL



SCALE 3" = 1'-0"

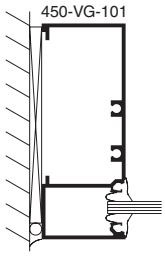


ELEVATION IS NUMBER KEYED TO DETAILS

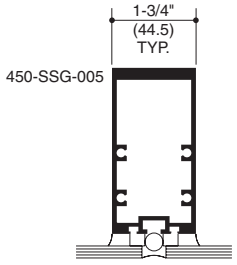
TYPE B: MULTI-LITE PUNCHED OPENINGS
(20 FEET MAXIMUM UNIT WIDTH)

TYPE-B (INSIDE GLAZED)
SSG/WEATHERSEAL
PUNCHED OPENING

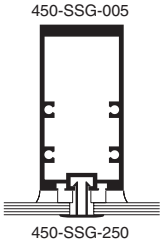
CAD Details **TYPE-B** = TF_VG_450_Type-B_Front--CAD.zip



4
JAMB

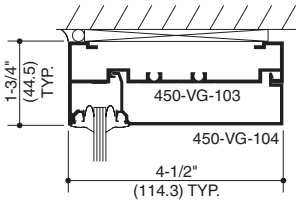


5
SSG
VERTICAL

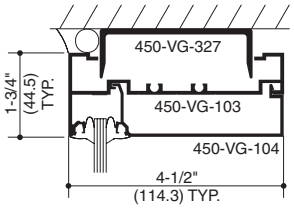


5A
WEATHERSEAL
VERTICAL

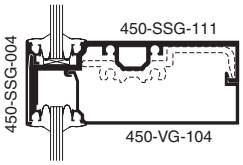
1
HEAD



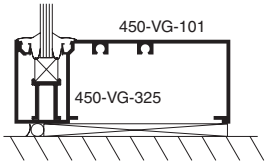
1A
HEAD



2
HORIZONTAL



3
SILL

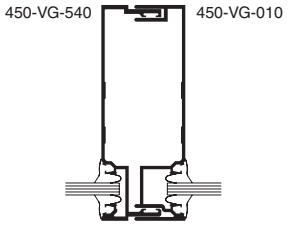


SCALE 3" = 1'-0"

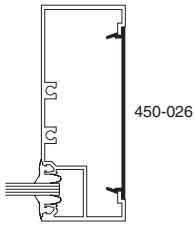
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Front--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Front--CAD.zip

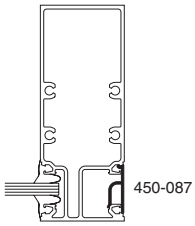
CAD Details **STICK**
= TF_VG_450-Stick-Front--CAD.zip



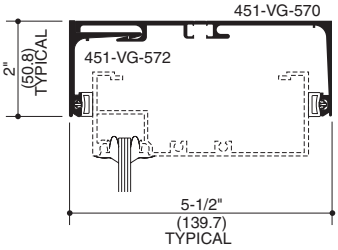
EXPANSION MULLION



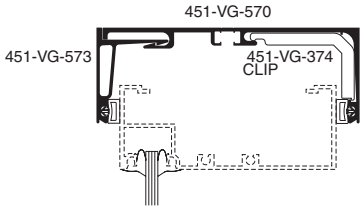
SNAP-IN FLAT FILLER



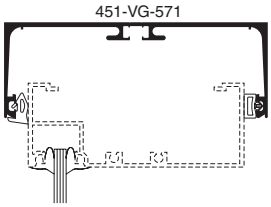
SNAP-IN FLAT POCKET FILLER



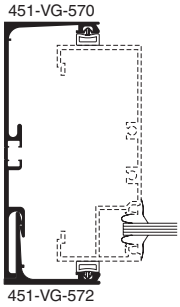
STANDARD HEAD COMPENSATING RECEPTOR



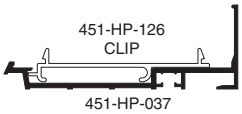
HEAVY WEIGHT HEAD COMPENSATING RECEPTOR



ONE PIECE HEAD COMPENSATING RECEPTOR



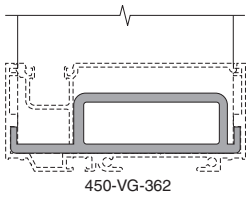
JAMB COMPENSATING RECEPTOR



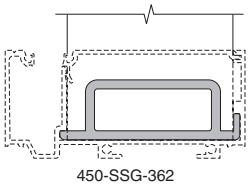
HIGH PERFORMANCE FLASHING

SCALE 3" = 1'-0"

CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Front--CAD.zip

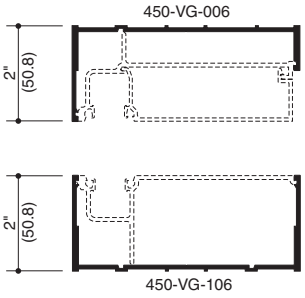


MULLION ANCHOR



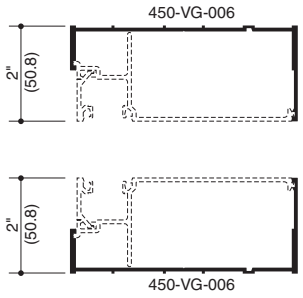
SSG MULLION ANCHOR

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Front--CAD.zip



OPTIONAL LIGHTWEIGHT CAN RECEPTORS (Stick System)

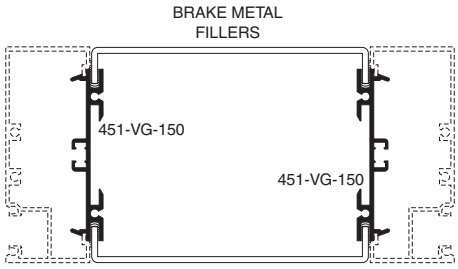
CAD Details **STICK**
= TF_VG_450-Stick-Front--CAD.zip



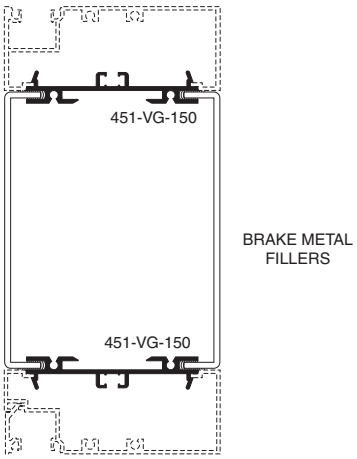
OPTIONAL UNEQUAL LEG CAN RECEPTORS (Stick System)

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

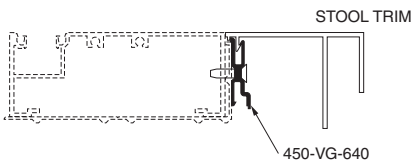
NOTE:
Mullion Anchor not used with Lightweight Receptor.



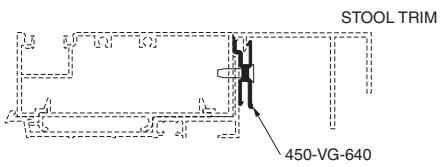
BRAKE METAL ADAPTOR AT VERTICAL



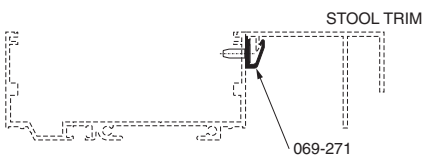
BRAKE METAL ADAPTOR AT HORIZONTAL



STOOL TRIM CLIP WITH STANDARD FLASHING



STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING



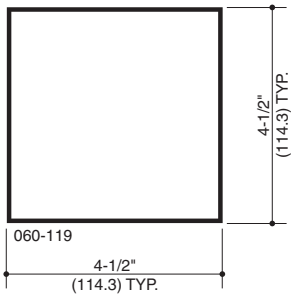
STOOL TRIM CLIP FOR STICK/TYPE-B ASSEMBLY

SCALE 3" = 1'-0"

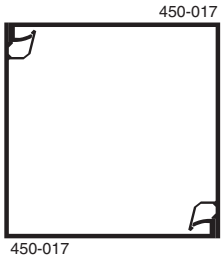
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Front--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Front--CAD.zip

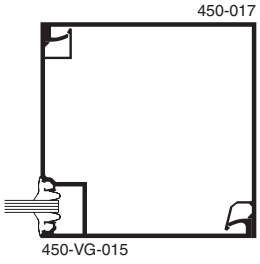
CAD Details **STICK**
= TF_VG_450-Stick-Front--CAD.zip



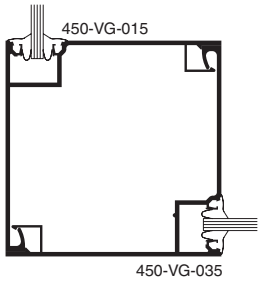
4-1/2" x 4-1/2" TUBE



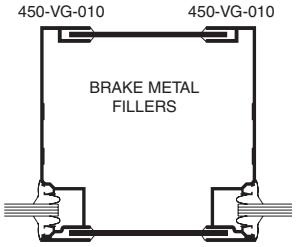
**TWO PIECE
NO POCKET CORNER**



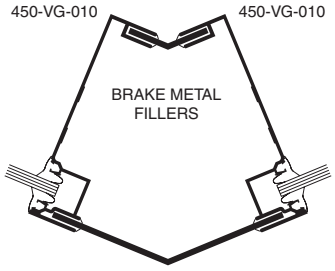
**ONE POCKET
CORNER**



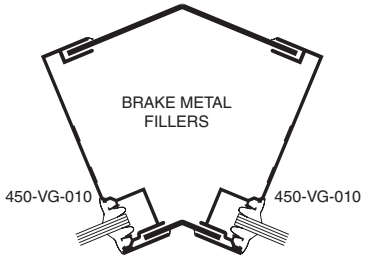
**TWO POCKET
90° CORNER**



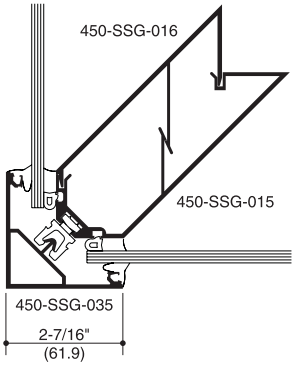
**TWO POCKET
BRAKE METAL POST**



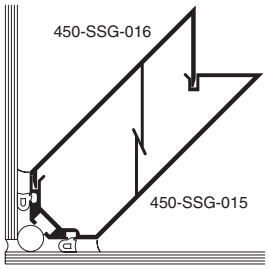
**VARIABLE DEGREE
BRAKE METAL
OUTSIDE CORNER**



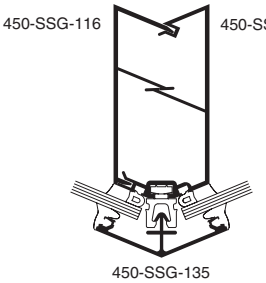
**VARIABLE DEGREE
BRAKE METAL
INSIDE CORNER**



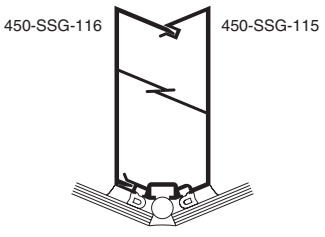
90° CORNER



90° SSG CORNER



135° CORNER



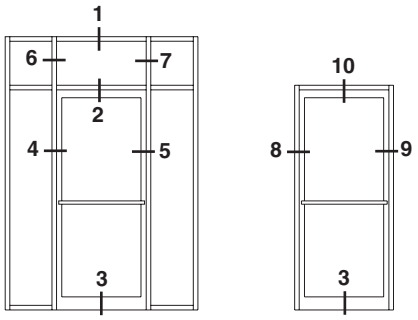
135° SSG CORNER

SCALE 3" = 1'-0"

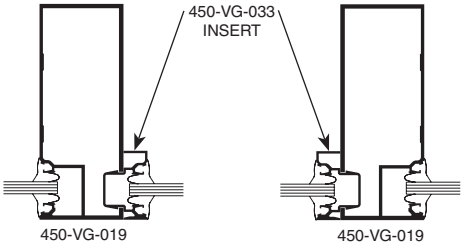
CAD Details **ENTRANCE** = TF_VG_450-Entrance-Front--CAD.zip

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

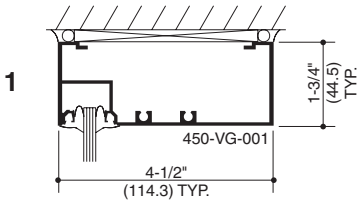
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

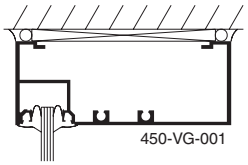


ELEVATIONS ARE NUMBER KEYED TO DETAILS

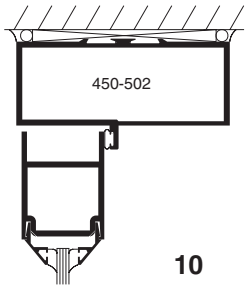


Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.

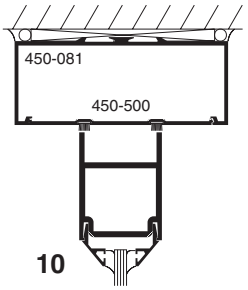


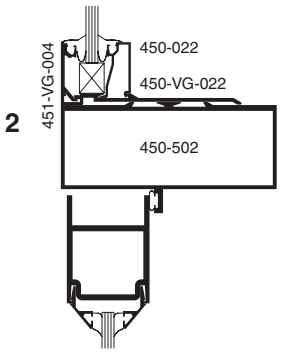


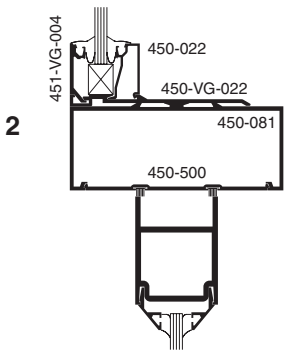
SINGLE ACTING

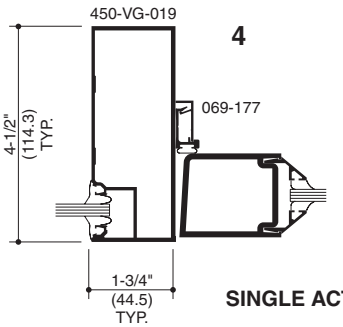


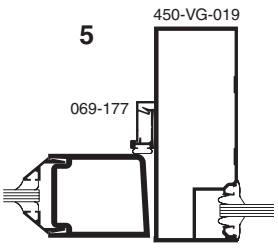
DOUBLE ACTING



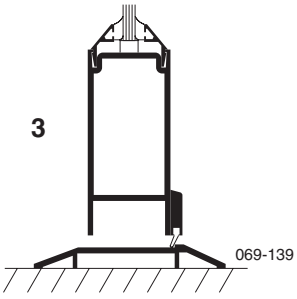




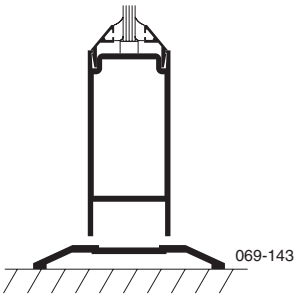




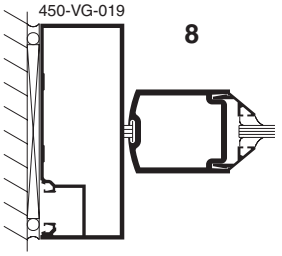
SINGLE ACTING DOOR

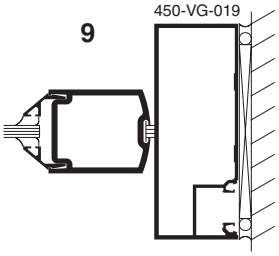


SINGLE ACTING DOOR WITH TRANSOM



DOUBLE ACTING DOOR WITH TRANSOM





DOUBLE ACTING DOOR

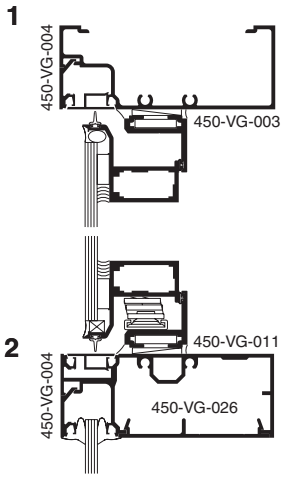
SCALE 3" = 1'-0"

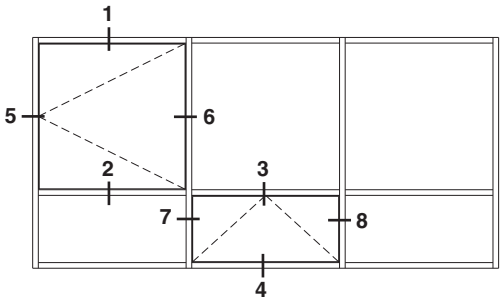
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Front--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Front--CAD.zip

CAD Details **STICK**
= TF_VG_450-Stick-Front--CAD.zip

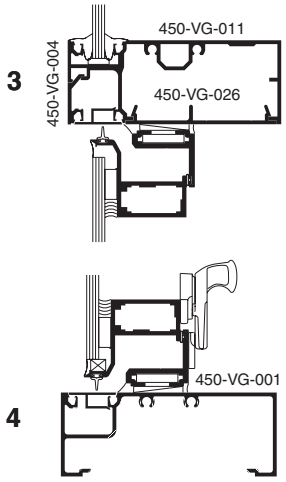
OUTSWING CASEMENT
VERTICAL SECTION SHOWN



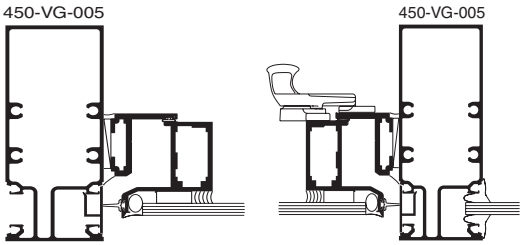


ELEVATION IS NUMBER KEYED TO DETAILS

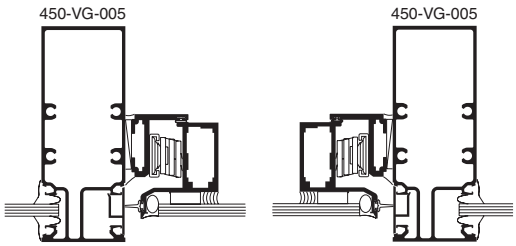
PROJECT-OUT
VERTICAL SECTION SHOWN



OUTSWING CASEMENT
HORIZONTAL SECTION SHOWN



PROJECT-OUT
HORIZONTAL SECTION SHOWN

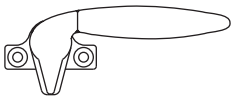


MAXIMUM / MINIMUM SIZES (1/4" INFILL)

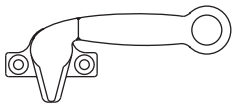
PROJECT-OUT	MAXIMUM 60" x 36" MINIMUM 12" x 12"
OUTSWING CASEMENT	MAXIMUM 36" x 60" MINIMUM 12" x 12"

STOREFRONT GLASSvent™ HARDWARE SELECTION GUIDE

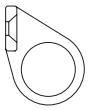
DESCRIPTION	PROJECT - OUT	OUTSWING CASEMENT
Stainless steel 4-bar hinge	STANDARD	STANDARD
Cast white bronze cam lock	STANDARD	STANDARD
Cast white bronze cam lock with pole ring	OPTIONAL	OPTIONAL
Cast white bronze custodial lock with removable handle	OPTIONAL	OPTIONAL
Cast white bronze concealed lock 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

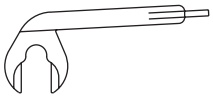


CAM LOCK WITH POLE RING

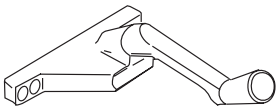


PULL RING

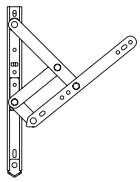
CUSTODIAL LOCK



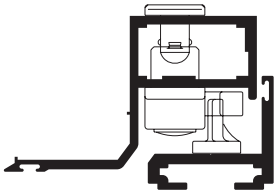
REMOVABLE HANDLE



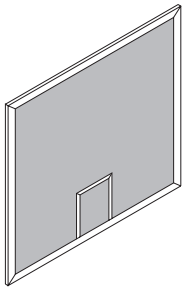
ROTO-OPERATOR



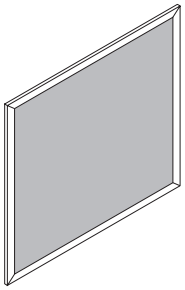
STAINLESS STEEL 4 BAR HINGES



CONCEALED LOCK



INSECT SCREEN WITH STANDARD WICKET



INSECT SCREEN WITH FULL WICKET

SCALE 3" = 1'-0"

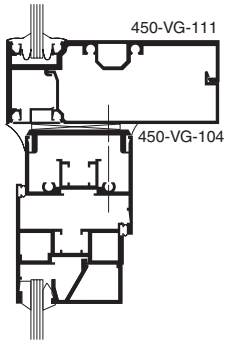
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Front--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Front--CAD.zip

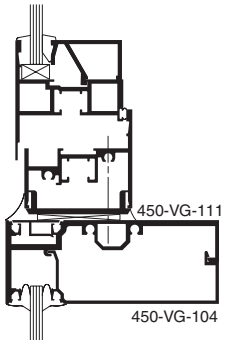
CAD Details **STICK**
= TF_VG_450-Stick-Front--CAD.zip

PROJECT-OUT
VERTICAL SECTION

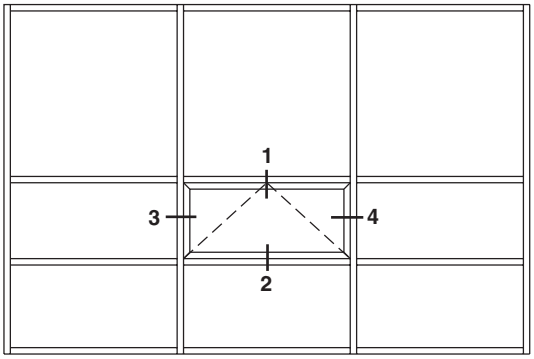
1



2

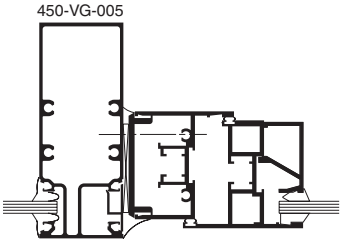


7225 VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

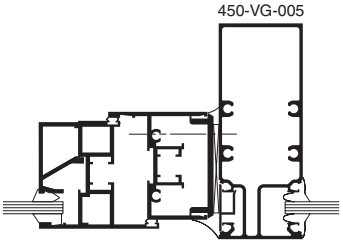


ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
HORIZONTAL SECTION



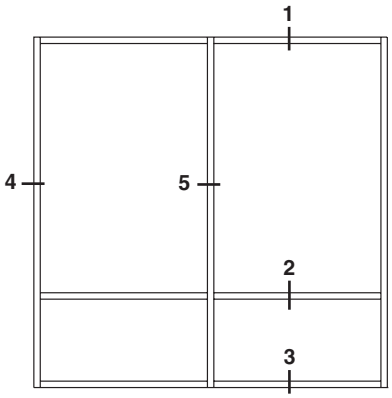
3



4

BASIC FRAMING DETAILS..... 40,41
MISCELLANEOUS FRAMING..... 42,43
CORNERS..... 44
ENTRANCE FRAMING..... 45

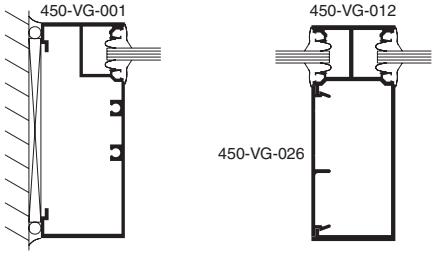
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

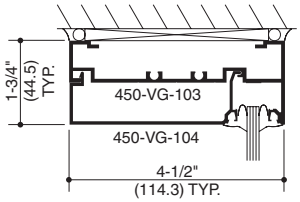
SCREW SPLINE

CAD Details = TF_VG_450-SS-Back--CAD.zip

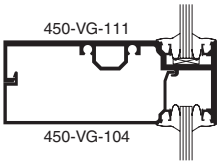


4 JAMB **5 VERTICAL**

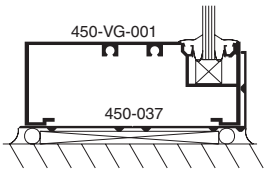
1 HEAD



2 HORIZONTAL



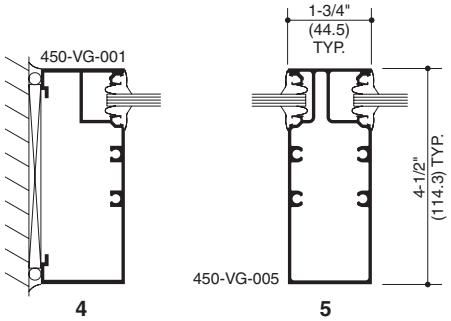
3 SILL



*See page 42 for Optional High Performance Flashing.

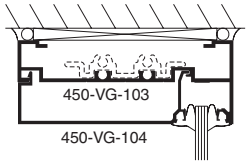
SHEAR BLOCK

CAD Details = TF_VG_450-SB-Back--CAD.zip

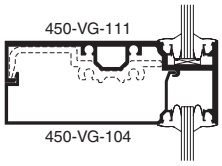


4 JAMB **5 VERTICAL**

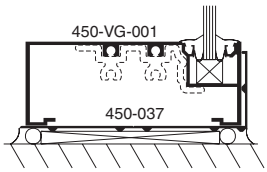
1 HEAD



2 HORIZONTAL



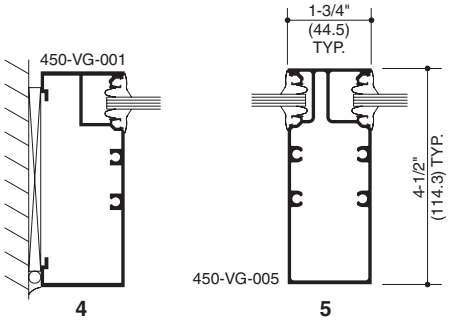
3 SILL



*See page 42 for Optional High Performance Flashing.

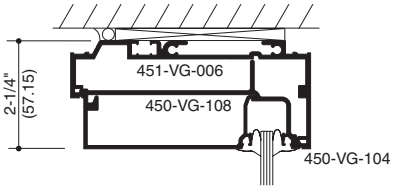
STICK

CAD Details = TF_VG_450-Stick-Back--CAD.zip

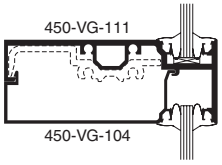


4 JAMB **5 VERTICAL**

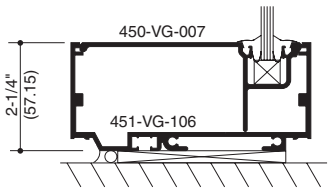
1 HEAD



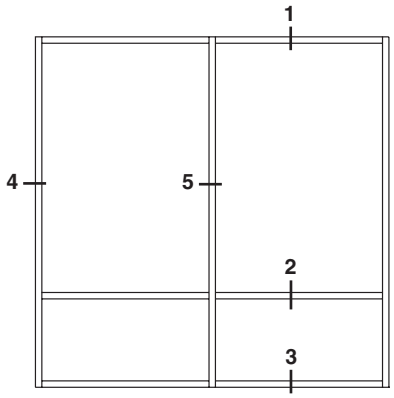
2 HORIZONTAL



3 SILL



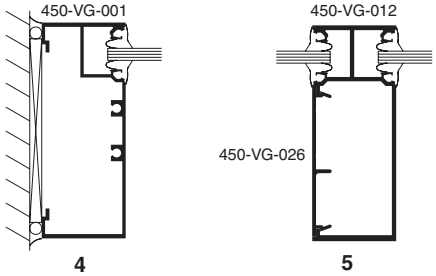
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

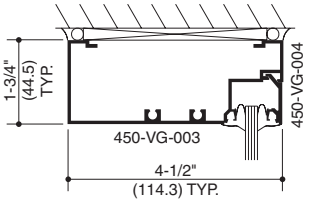
SCREW SPLINE

CAD Details = TF_VG_450-SS-Back--CAD.zip

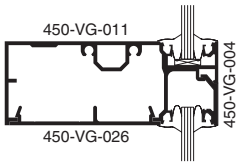


4 JAMB **5 VERTICAL**

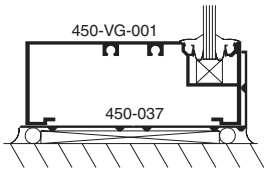
1 HEAD



2 HORIZONTAL



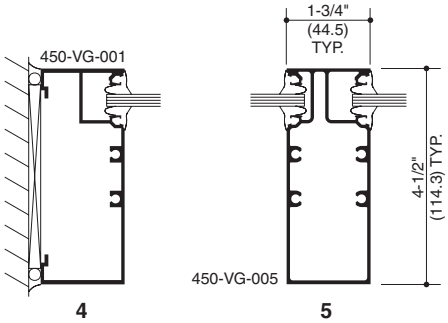
3 SILL



*See page 42 for Optional High Performance Flashing.

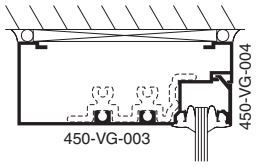
SHEAR BLOCK

CAD Details = TF_VG_450-SB-Back--CAD.zip

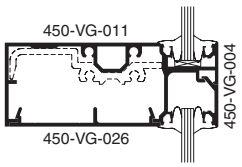


4 JAMB **5 VERTICAL**

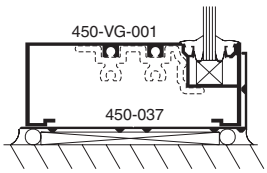
1 HEAD



2 HORIZONTAL



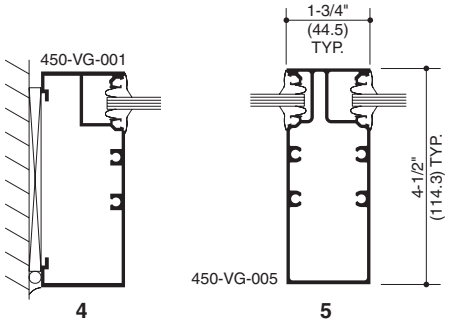
3 SILL



*See page 42 for Optional High Performance Flashing.

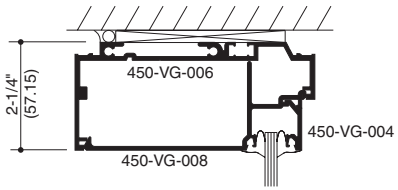
STICK

CAD Details = TF_VG_450-Stick-Back--CAD.zip

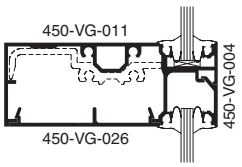


4 JAMB **5 VERTICAL**

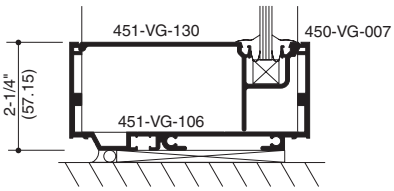
1 HEAD



2 HORIZONTAL



3 SILL



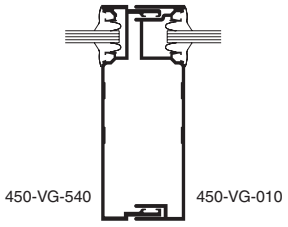
*See page 42 for Optional High Performance Flashing.

SCALE 3" = 1'-0"

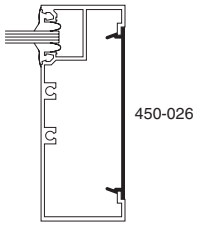
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Back--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Back--CAD.zip

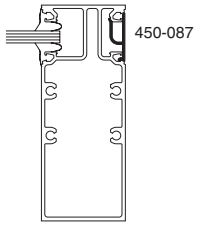
CAD Details **STICK**
= TF_VG_450-Stick-Back--CAD.zip



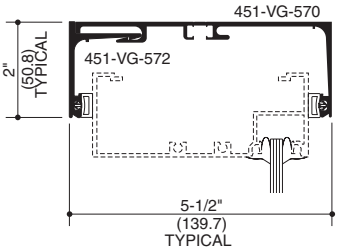
EXPANSION MULLION



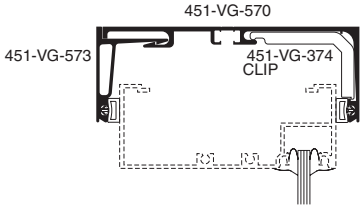
FLAT FILLER



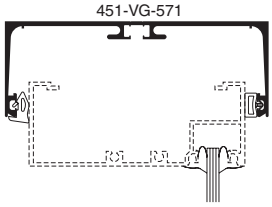
SNAP-IN FLAT FILLER



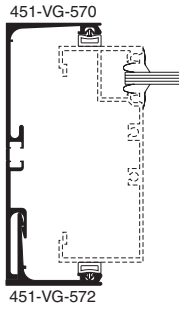
STANDARD HEAD COMPENSATING RECEPTOR



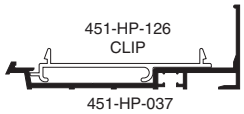
HEAVY WEIGHT HEAD COMPENSATING RECEPTOR



ONE PIECE HEAD COMPENSATING RECEPTOR



JAMB COMPENSATING RECEPTOR



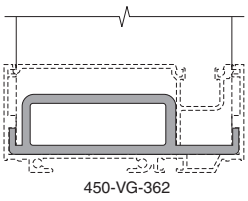
HIGH PERFORMANCE FLASHING

SCALE 3" = 1'-0"

CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Back--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Back--CAD.zip

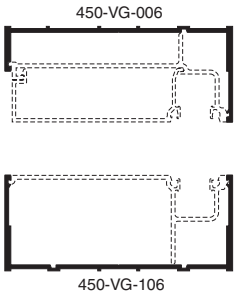
CAD Details **STICK**
= TF_VG_450-Stick-Back--CAD.zip



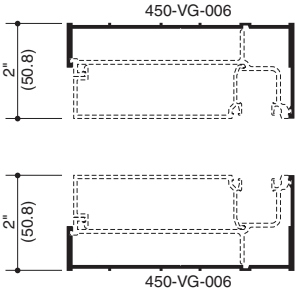
MULLION ANCHOR

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 Anchors must be used.

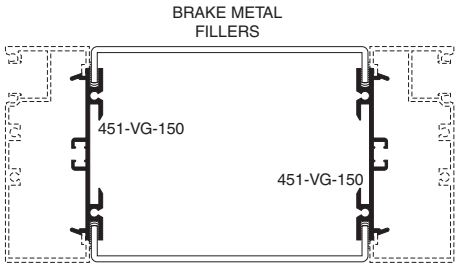
NOTE:
Mullion Anchor not used with Lightweight Receptor.



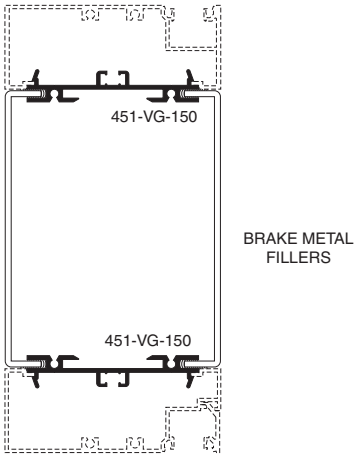
OPTIONAL LIGHTWEIGHT CAN RECEPTORS



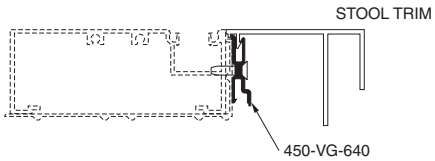
OPTIONAL UNEQUAL LEG CAN RECEPTORS (Stick System)



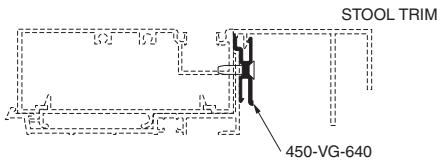
BRAKE METAL ADAPTOR AT VERTICAL



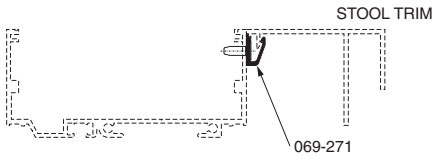
BRAKE METAL ADAPTOR AT HORIZONTAL



STOOL TRIM CLIP WITH STANDARD FLASHING



STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING



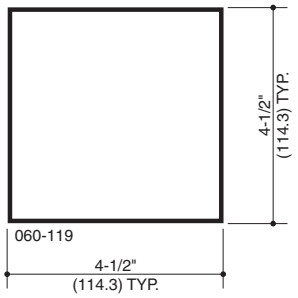
STOOL TRIM CLIP FOR STICK ASSEMBLY

SCALE 3" = 1'-0"

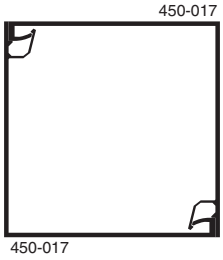
CAD Details **SCREW SPLINE**
= TF_VG_450-SS-Back--CAD.zip

CAD Details **SHEAR BLOCK**
= TF_VG_450-SB-Back--CAD.zip

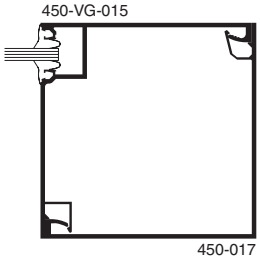
CAD Details **STICK**
= TF_VG_450-Stick-Back--CAD.zip



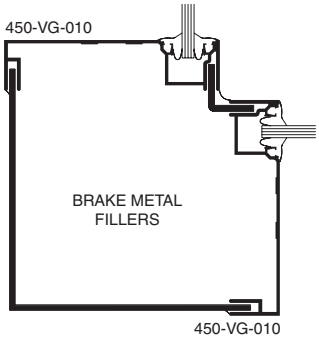
4-1/2" x 4-1/2" TUBE



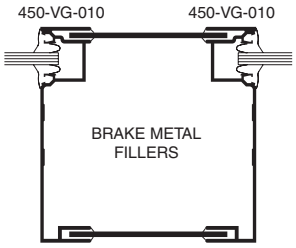
**TWO PIECE
NO POCKET CORNER**



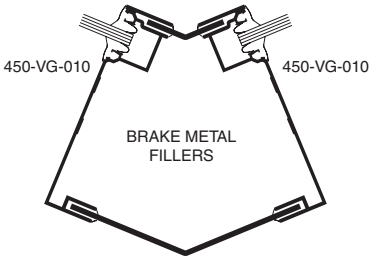
**ONE POCKET
CORNER**



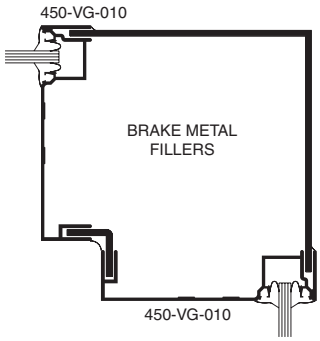
**90° OUTSIDE
BRAKE METAL CORNER**



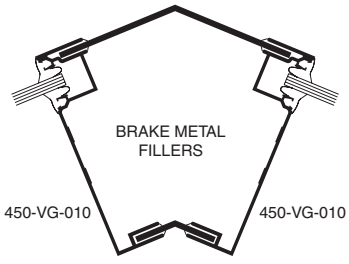
**TWO POCKET
BRAKE METAL POST**



**VARIABLE DEGREE
BRAKE METAL
OUTSIDE CORNER**



**90° INSIDE
BRAKE METAL CORNER**



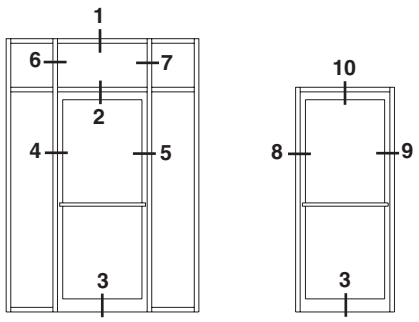
**VARIABLE DEGREE
BRAKE METAL
INSIDE CORNER**

SCALE 3" = 1'-0"

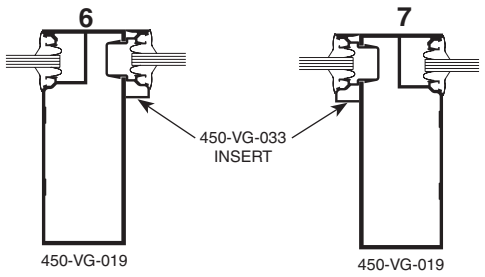
CAD Details **ENTRANCE** = TF_VG_450-Entrance-Back--CAD.zip

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

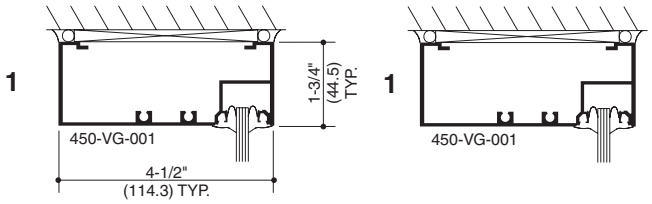
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



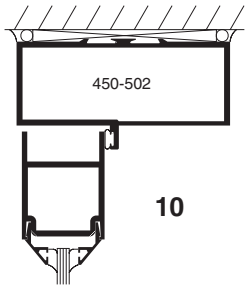
ELEVATIONS ARE NUMBER KEYED TO DETAILS



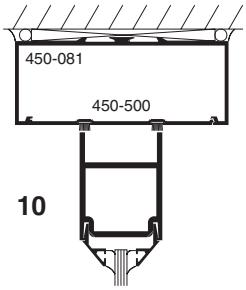
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.

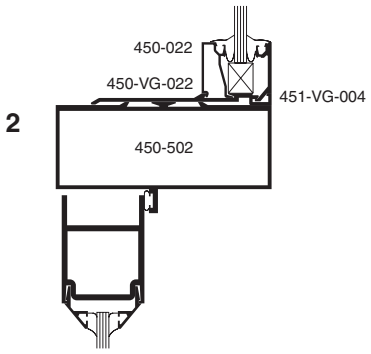


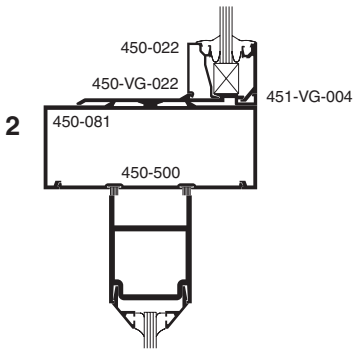
SINGLE ACTING

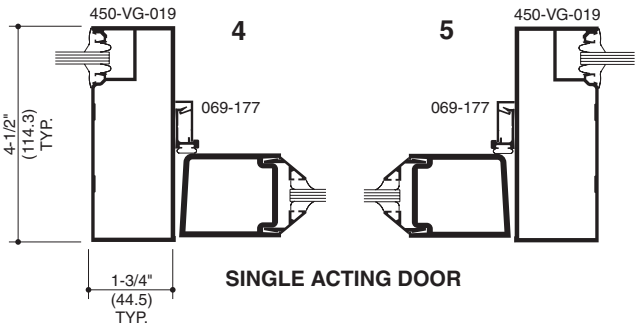


DOUBLE ACTING

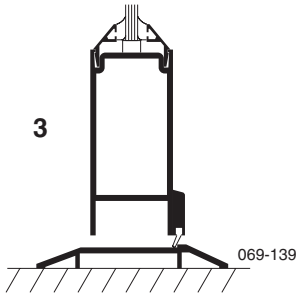




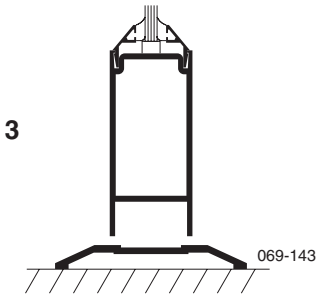




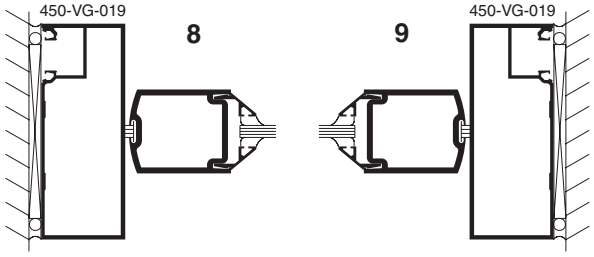
SINGLE ACTING DOOR



SINGLE ACTING DOOR WITH TRANSOM



DOUBLE ACTING DOOR WITH TRANSOM

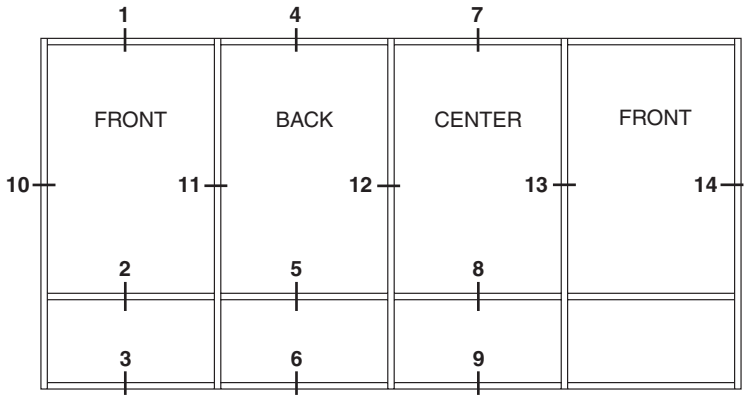


DOUBLE ACTING DOOR

BASIC FRAMING DETAILS..... 48-53
(See appropriate Center, Front or Back Section for Miscellaneous Details.)

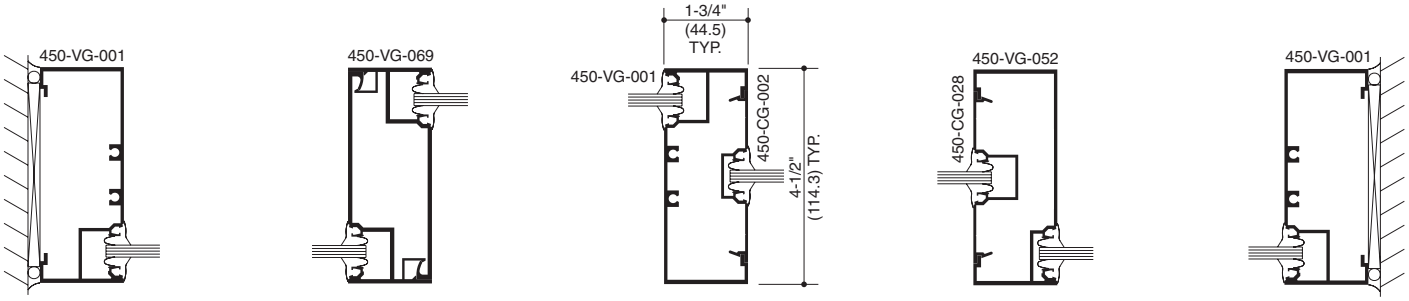
SCREW SPLINE ASSEMBLY

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (SCREW SPLINE)**
= TF_VG_450-SS+SB-MULTI--CAD.zip

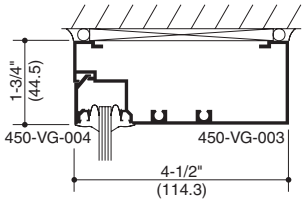


10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **13 VERTICAL** | **14 JAMB**

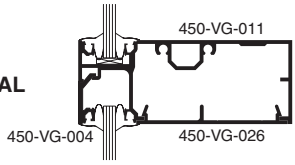
FRONT

See Pages 24 thru 37 for all FRONT details.

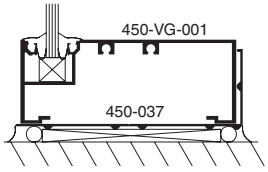
1 HEAD



2 HORIZONTAL



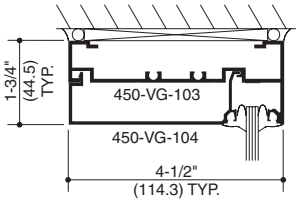
3 SILL



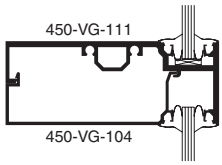
BACK

See Pages 40 thru 45 for all BACK details.

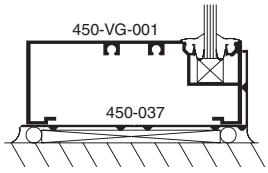
4 HEAD



5 HORIZONTAL



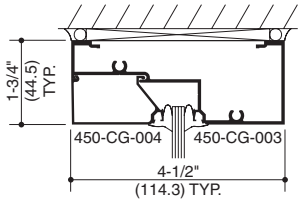
6 SILL



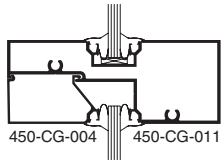
CENTER

See Pages 12 thru 22 for all CENTER details.

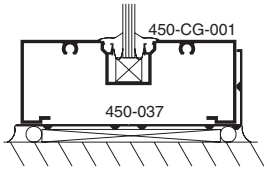
7 HEAD



8 HORIZONTAL

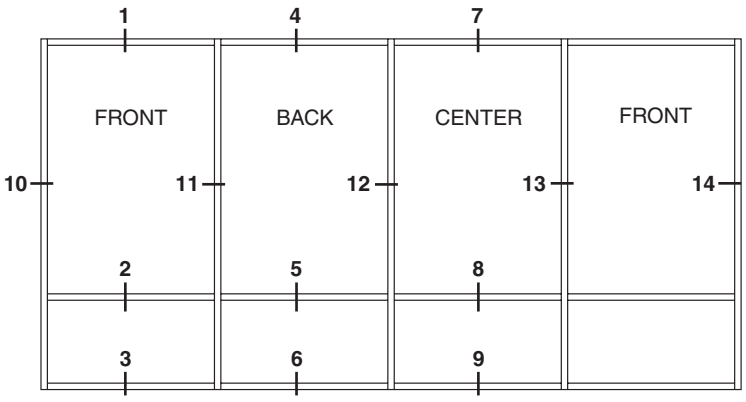


9 SILL



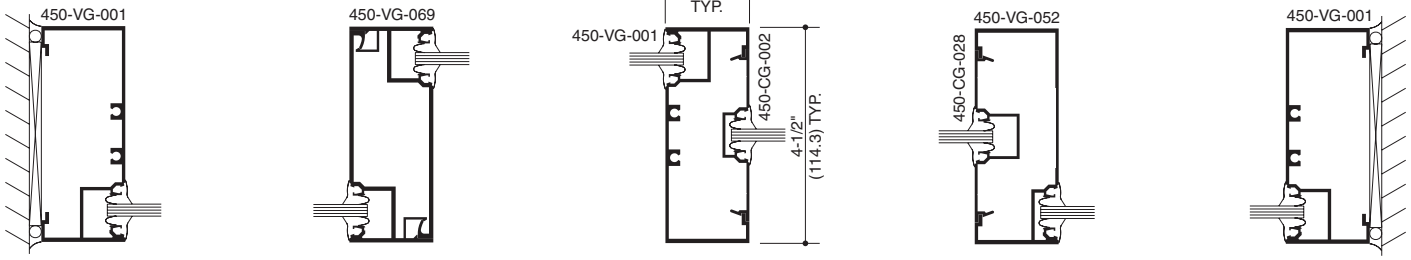
SCREW SPLINE ASSEMBLY

SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (SCREW SPLINE)**
= TF_VG_450-SS+SB-MULTI--CAD.zip

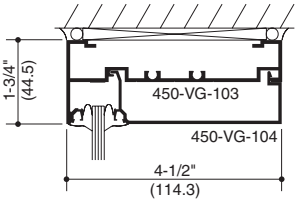


10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **13 VERTICAL** | **14 JAMB**

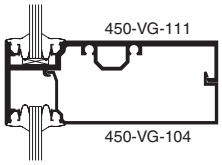
FRONT

See Pages 24 thru 37 for all FRONT details.

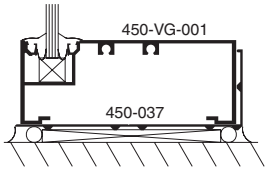
1 HEAD



2 HORIZONTAL



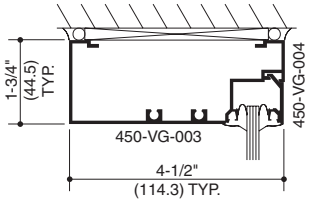
3 SILL



BACK

See Pages 40 thru 45 for all BACK details.

4 HEAD



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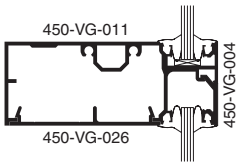
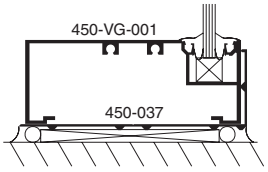


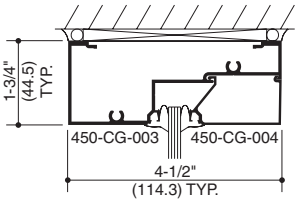
6 SILL



CENTER

See Pages 12 thru 22 for all CENTER details.

7 HEAD



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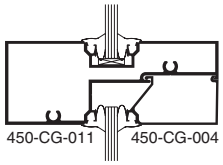

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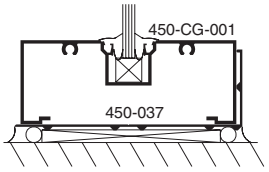
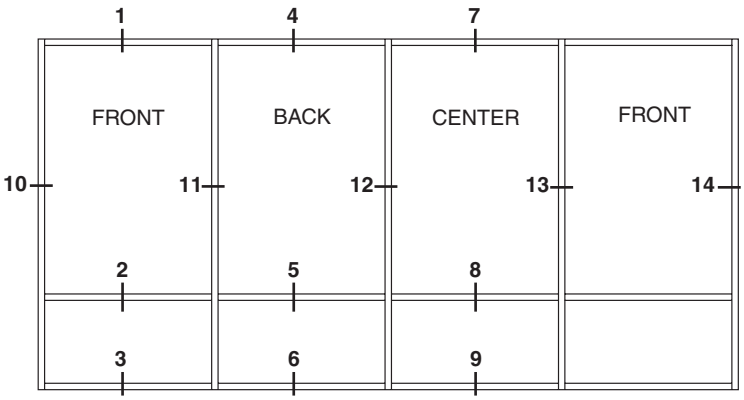


SHEAR BLOCK ASSEMBLY

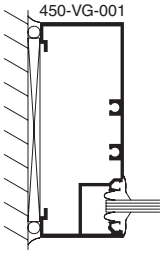
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (SHEAR BLOCK)**
= TF_VG_450-SS+SB-MULTI--CAD.zip

Note: Transition verticals are required to be two piece.



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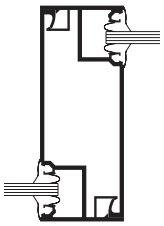
JAMB



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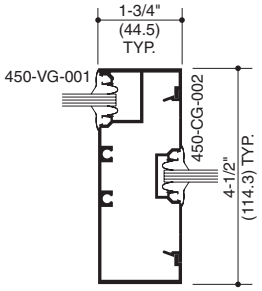
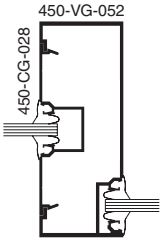


12
VERTICAL



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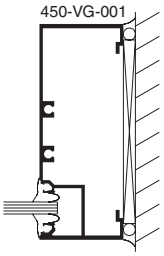
VERTICAL

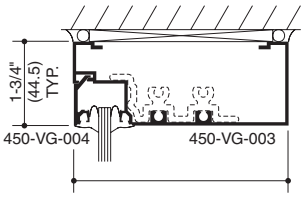


14
JAMB

FRONT

See Pages 24 thru 37 for all FRONT details.

1
HEAD



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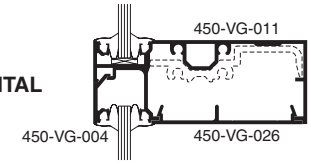
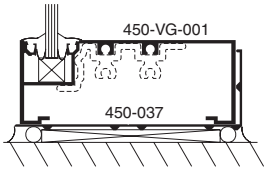


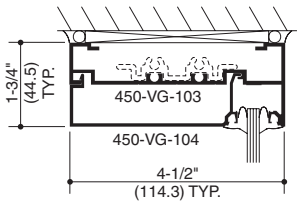
3
SILL



BACK

See Pages 40 thru 45 for all BACK details.

4
HEAD



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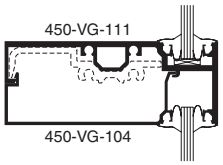

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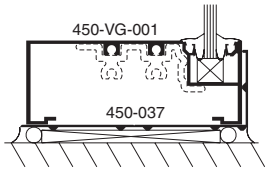
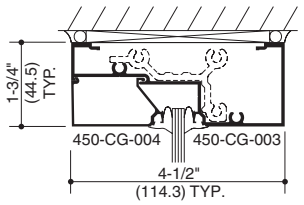
SILL



CENTER

See Pages 12 thru 22 for all CENTER details.

7
HEAD



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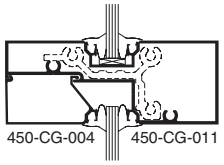
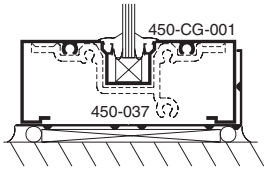
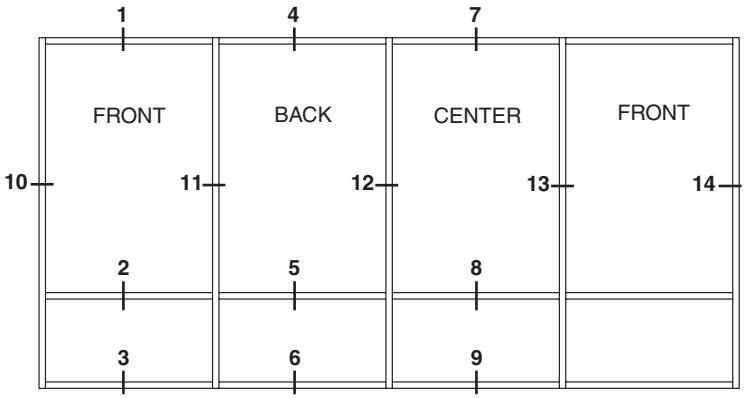


9
SILL



SHEAR BLOCK ASSEMBLY

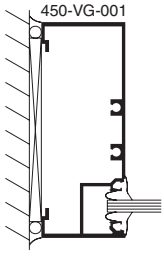
SCALE 3" = 1'-0"



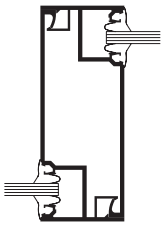
ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (SHEAR BLOCK)**
= TF_VG_450-SS+SB-MULTI--CAD.zip

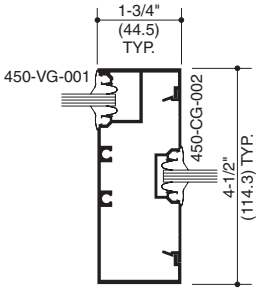
Note: Transition verticals are required to be two piece



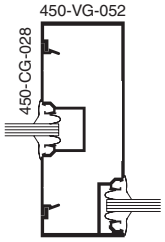
10 JAMB



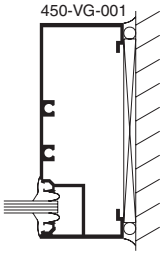
11 VERTICAL



12 VERTICAL



13 VERTICAL

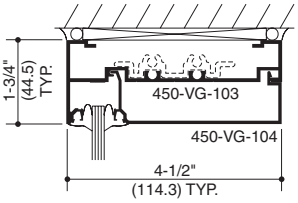


14 JAMB

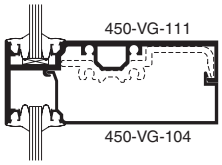
FRONT

See Pages 24 thru 37 for all FRONT details.

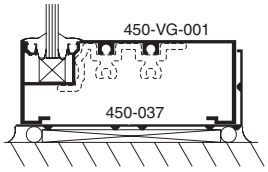
1 HEAD



2 HORIZONTAL



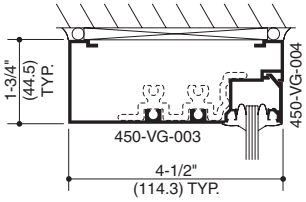
3 SILL



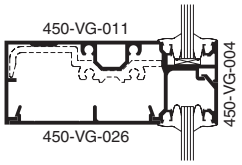
BACK

See Pages 40 thru 45 for all BACK details.

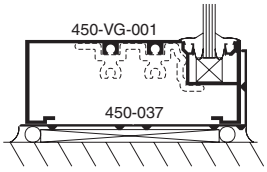
4 HEAD



5 HORIZONTAL



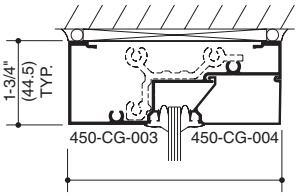
6 SILL



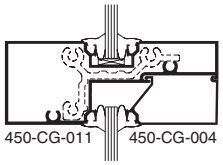
CENTER

See Pages 12 thru 22 for all CENTER details.

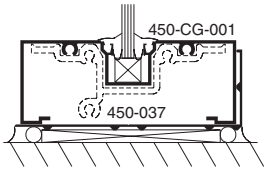
7 HEAD



8 HORIZONTAL

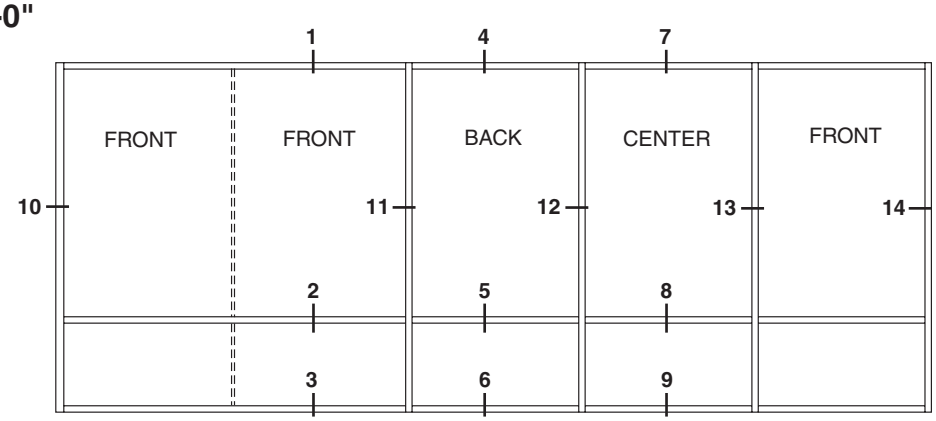


9 SILL



STICK ASSEMBLY

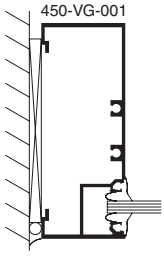
SCALE 3" = 1'-0"



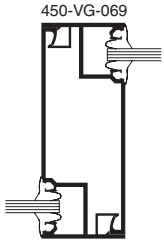
ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (STICK)**
= TF_VG_450-Stick-MULTI--CAD.zip

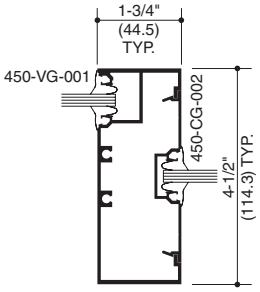
Note: Transition verticals are required to be two piece.



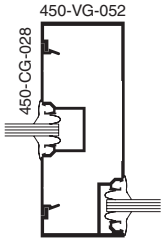
10
JAMB



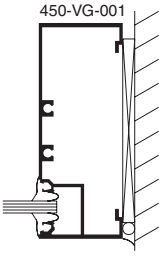
11
VERTICAL



12
VERTICAL



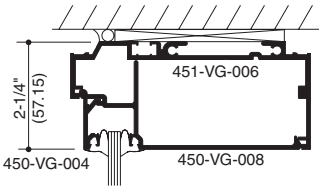
13
VERTICAL



14
JAMB

FRONT

See Pages 24 thru 37 for all FRONT details.



1
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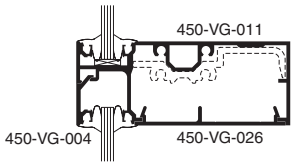
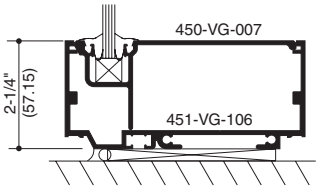


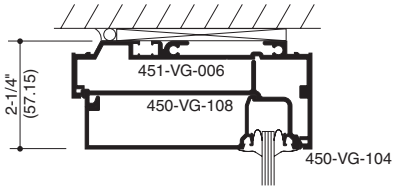
2
HORIZONTAL



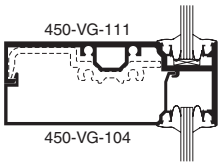
3
SILL

BACK

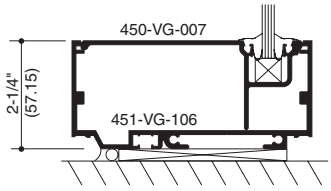
See Pages 40 thru 45 for all BACK details.



4
HEAD



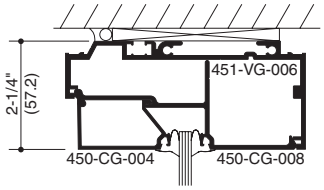
5
HORIZONTAL



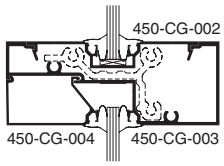
6
SILL

CENTER

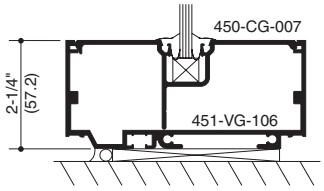
See Pages 12 thru 22 for all CENTER details.



7
HEAD



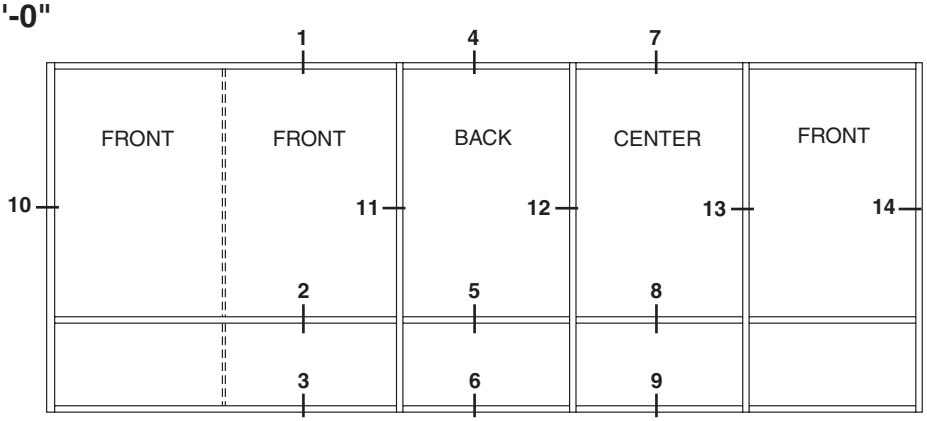
8
HORIZONTAL



9
SILL

STICK ASSEMBLY

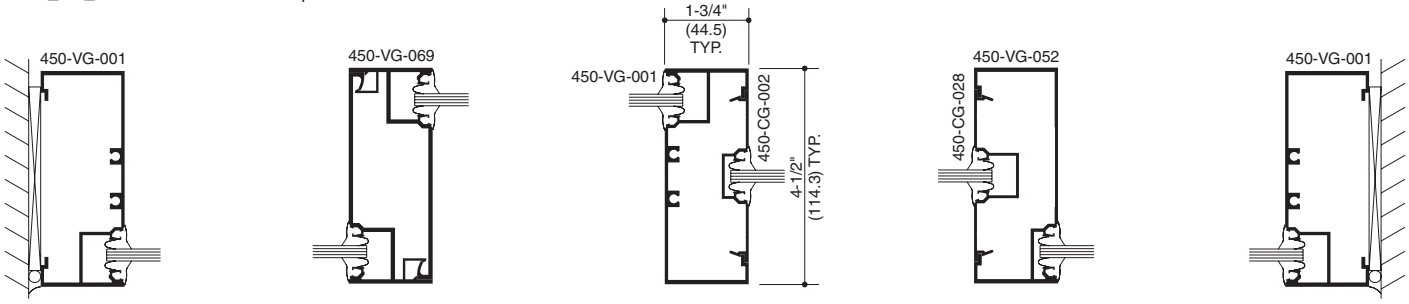
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details **MULTI-PLANE (STICK)**
= TF_VG_450-Stick-MULTI--CAD.zip

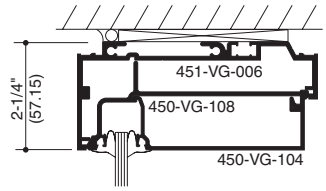
Note: Transition verticals are required to be two piece



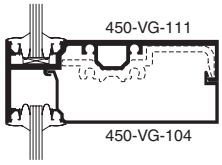
10 JAMB | **11 VERTICAL** | **12 VERTICAL** | **13 VERTICAL** | **14 JAMB**

FRONT

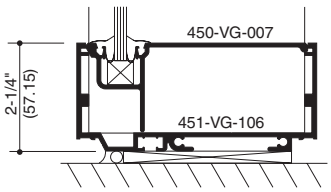
See Pages 24 thru 37 for all FRONT details.



1 HEAD



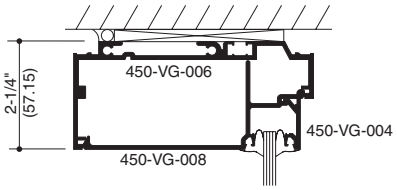
2 HORIZONTAL



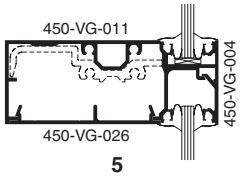
3 SILL

BACK

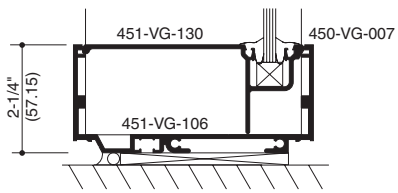
See Pages 40 thru 45 for all BACK details.



4 HEAD



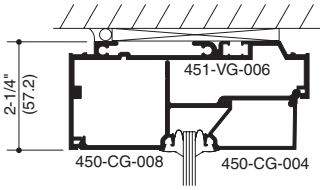
5 HORIZONTAL



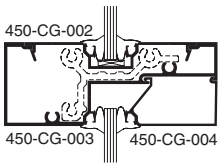
6 SILL

CENTER

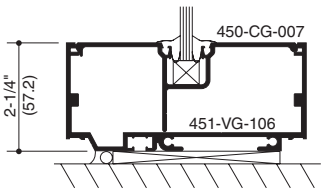
See Pages 12 thru 22 for all CENTER details.



7 HEAD



8 HORIZONTAL



9 SILL

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.

WINDLOAD CHARTS
- **CENTER 56-58**
- **FRONT or BACK 59,60**
- **FRONT (SSG/WEATHERSEAL) 61**
- **MULTI-PLANE 62**
- **EXPANSION MULLIONS 63**
- **ENTRANCE FRAMING 64-66**

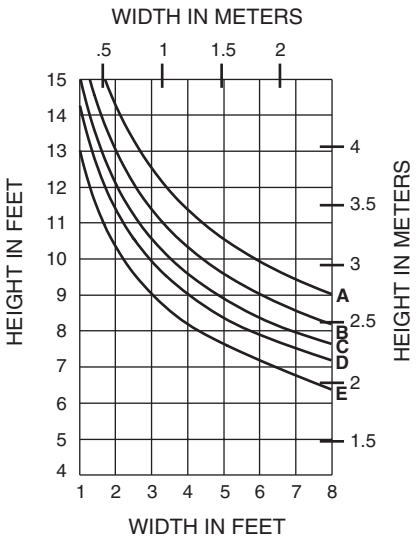
DEADLOAD CHARTS 67,68
END REACTION CHARTS 69
THERMAL CHARTS 70,73

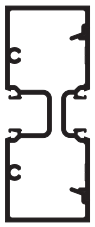
Mullions are designed for deflection limitations in accordance with AAMA TIR-A11 of L\175 up to 13'-6" and L\240 + 1/4" above 13'-6".
These curves are for mullions WITH and WITHOUT HORIZONTALS and are based on precise engineering calculations for stress and deflection. Allowable windload stress for ALUMINUM 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

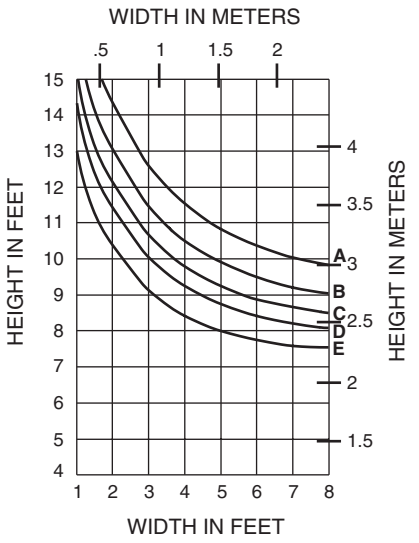




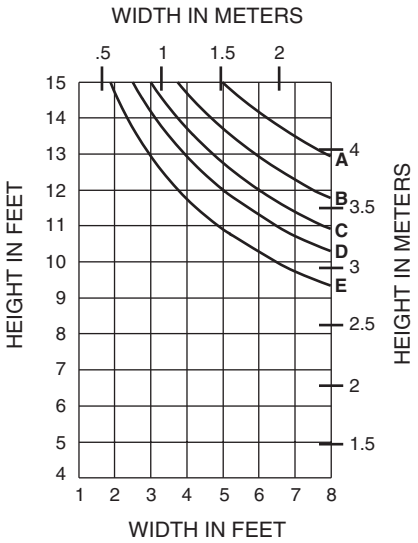
450-CG-001
450-CG-002

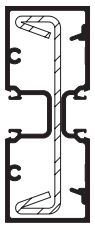
$I = 2.899 (120.67 \times 10^4)$
$S = 1.288 (21.11 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



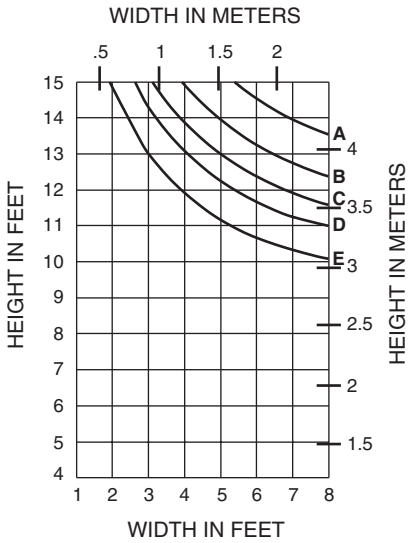


450-CG-001
450-CG-002
WITH 450-110 STEEL

$I_A = 2.899 (120.67 \times 10^4)$
$S_A = 1.288 (21.11 \times 10^3)$

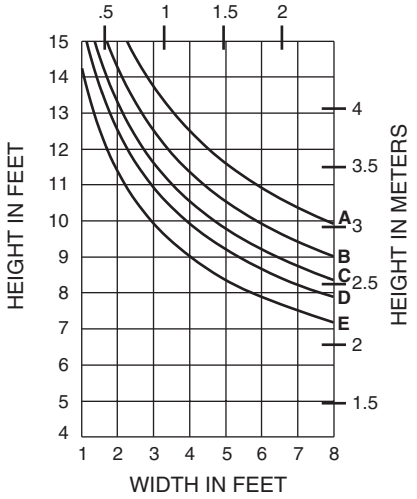
$I_S = 1.935 (80.54 \times 10^4)$
$S_S = 0.938 (15.37 \times 10^3)$

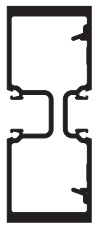
WITHOUT HORIZONTALS



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

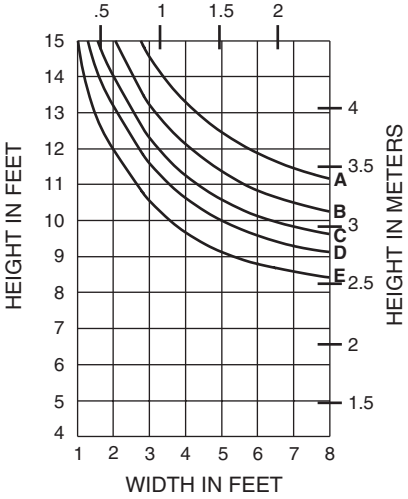




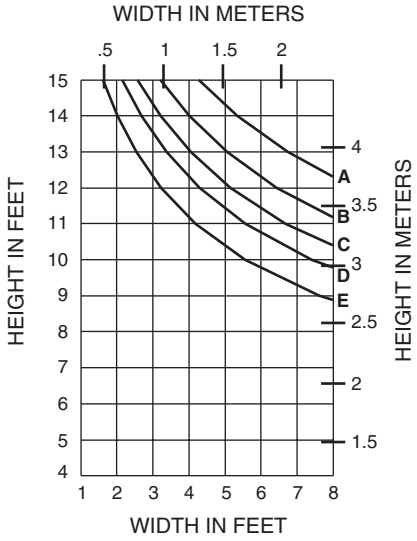
450-CG-013
450-CG-002

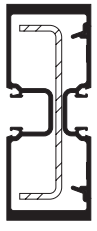
$I = 4.481 (186.51 \times 10^4)$
$S = 1.991 (32.63 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



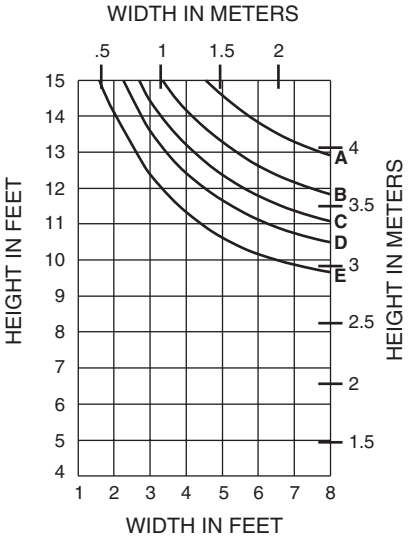


450-CG-013
450-CG-002
with 400-110 STEEL

$I_A = 4.481 (186.51 \times 10^4)$
$S_A = 1.991 (32.63 \times 10^3)$

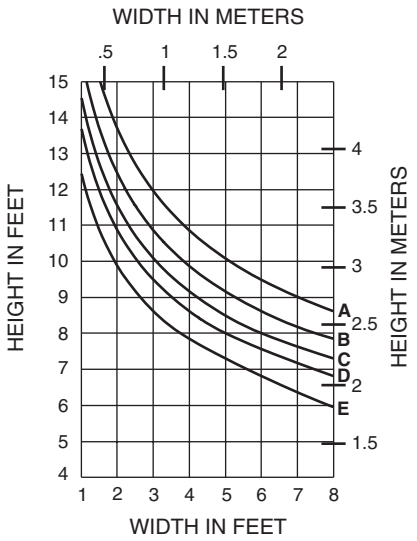
$I_S = 0.970 (40.37 \times 10^4)$
$S_S = 0.535 (8.76 \times 10^3)$

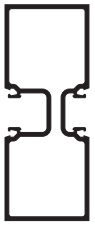
WITHOUT HORIZONTALS



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

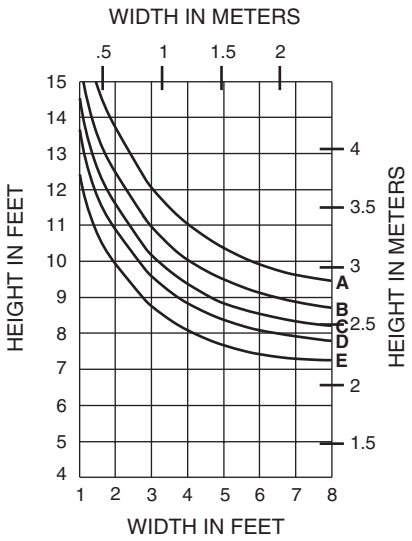




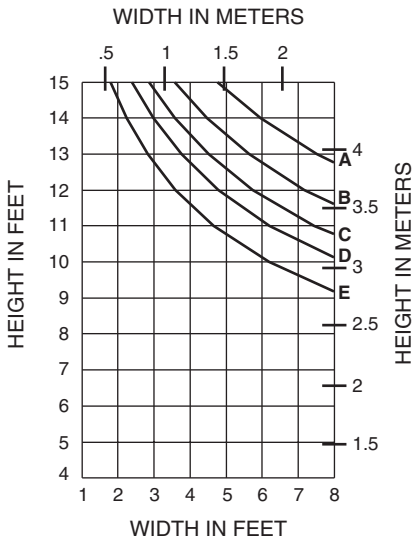
450-CG-005

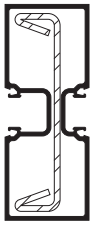
$I = 2.523 (105.01 \times 10^4)$
$S = 1.121 (18.37 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



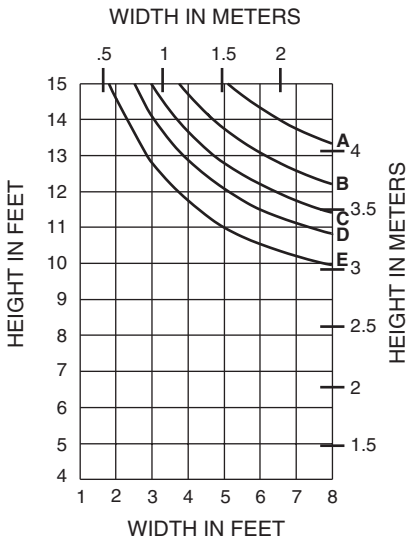


450-CG-005
with 450-110 STEEL

$I_A = 2.523 (105.01 \times 10^4)$
$S_A = 1.121 (18.37 \times 10^3)$

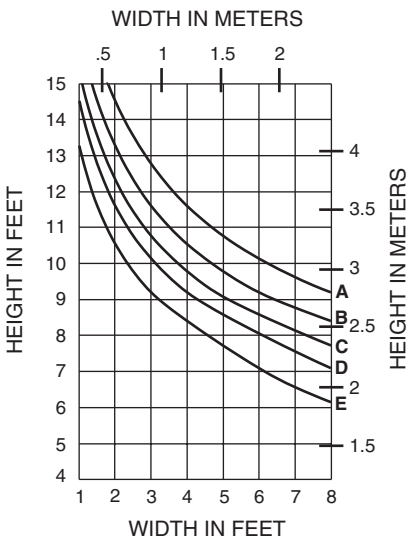
$I_S = 1.935 (80.54 \times 10^4)$
$S_S = 0.938 (15.37 \times 10^3)$

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)

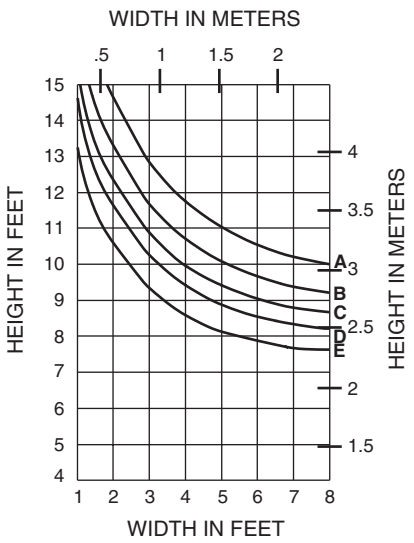
WITH HORIZONTALS



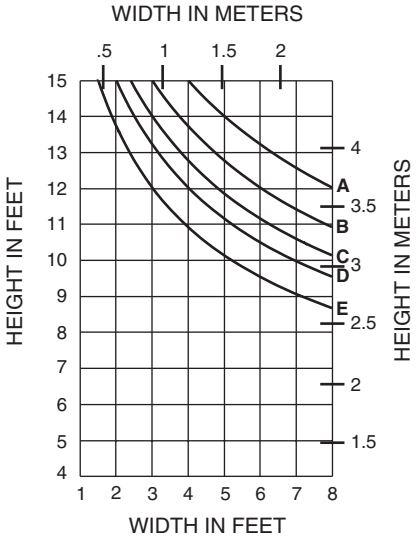
450-VG-012
450-VG-026

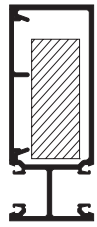
$I = 3.074 (127.95 \times 10^4)$
$S = 1.192 (19.53 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



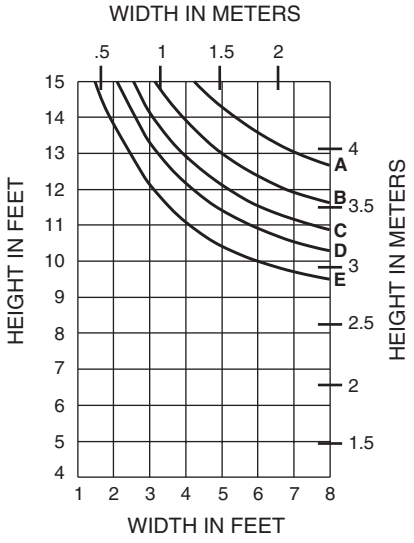


450-VG-012
450-VG-026
with 1" x 2-1/2" STEEL BAR

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

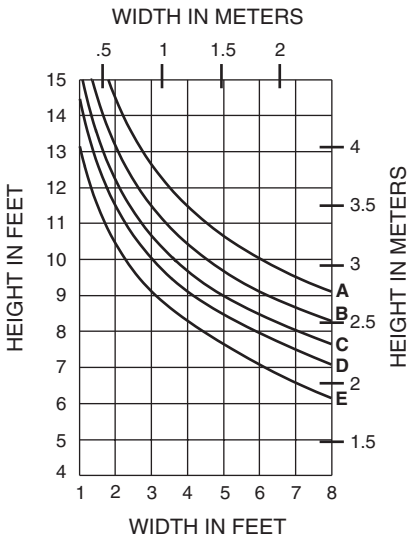
$I_S = 1.302 (54.19 \times 10^4)$
$S_S = 1.042 (17.08 \times 10^3)$

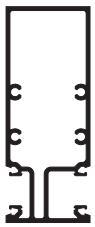
WITHOUT HORIZONTALS



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

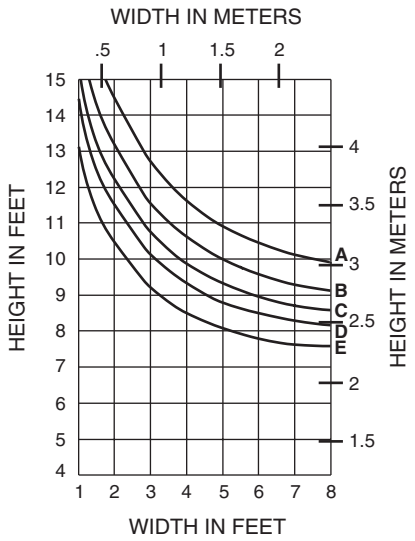




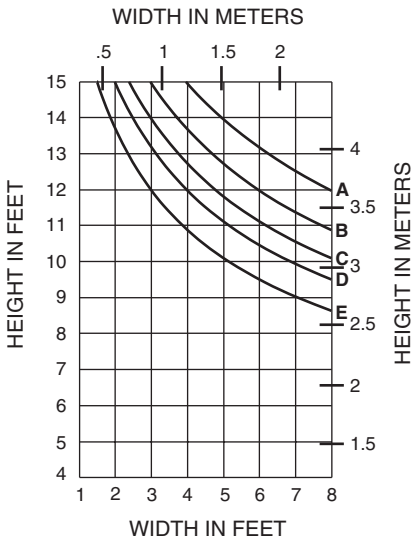
450-VG-005

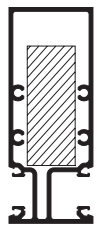
I = 2.978 (123.95 x 10^4)
S = 1.192 (19.53 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



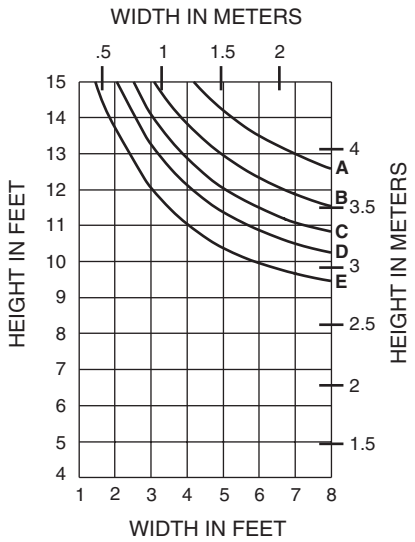


450-VG-005
with 1" x 2-1/2" STEEL BAR

I_A = 2.978 (123.95 x 10^4)
S_A = 1.192 (19.53 x 10^3)

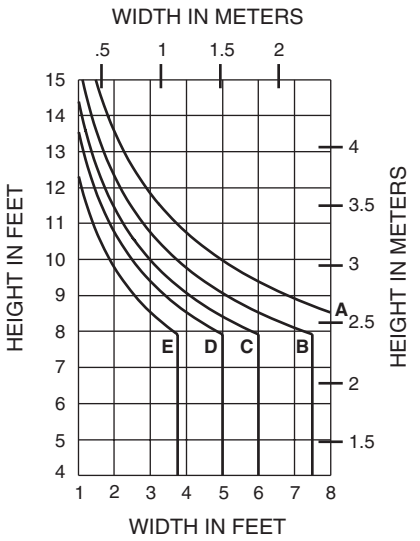
I_S = 1.302 (54.19 x 10^4)
S_S = 1.042 (17.08 x 10^3)

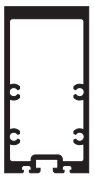
WITHOUT HORIZONTALS



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

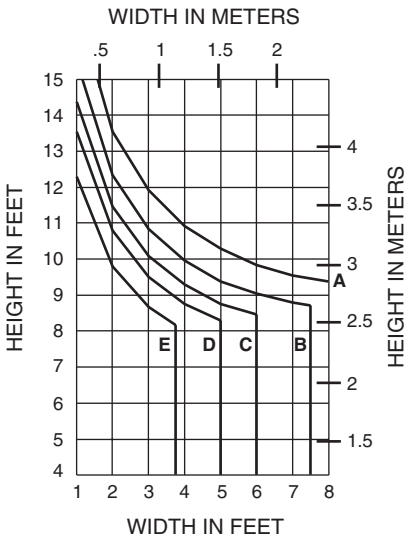




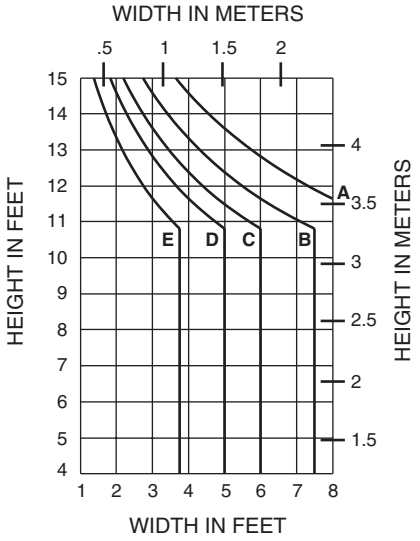
450-SSG-005

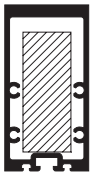
I = 2.445 (101.76 x 10^4)
S = 1.352 (22.15 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS



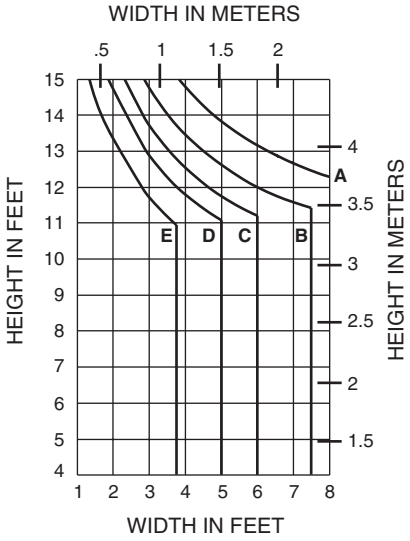


450-SSG-005
with 1" x 2-1/2" STEEL BAR

I_A = 2.445 (101.76 x 10^4)
S_A = 1.352 (22.15 x 10^3)

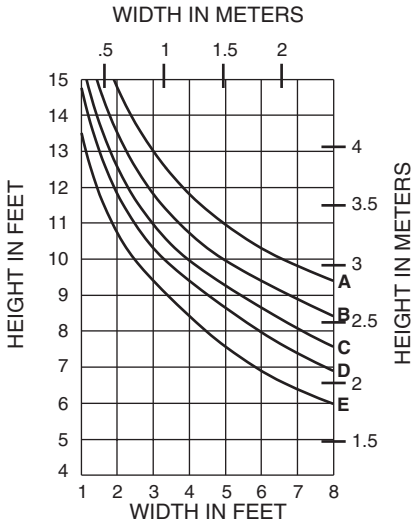
I_S = 1.302 (54.19 x 10^4)
S_S = 1.042 (17.08 x 10^3)

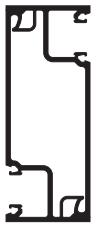
WITHOUT HORIZONTALS



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

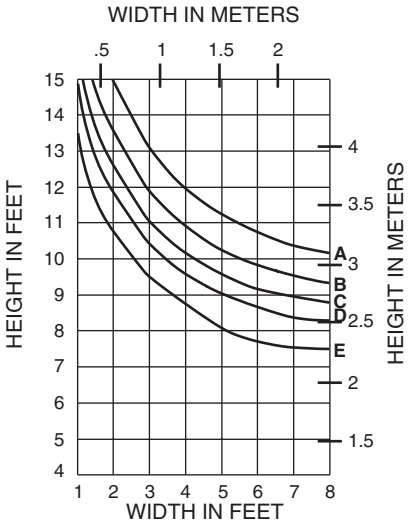




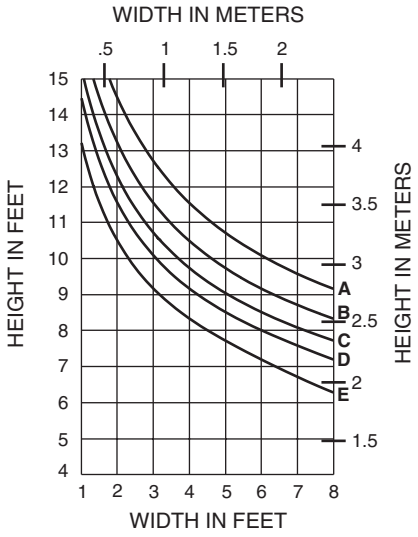
450-VG-069
450-VG-069

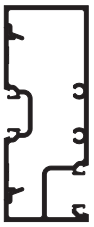
I = 3.246 (135.10 x 10^4)
S = 1.132 (18.55 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

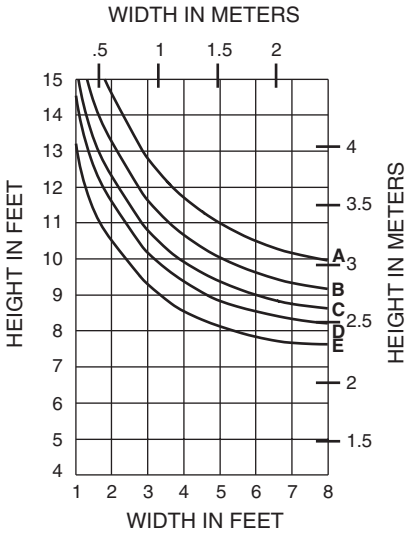




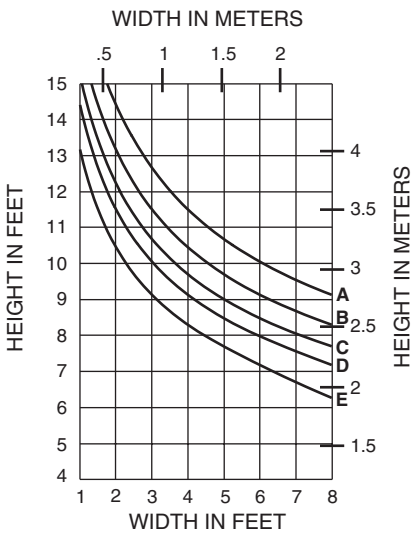
450-VG-001
450-CG-002

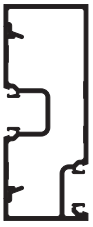
I = 3.031 (126.15 x 10^4)
S = 1.239 (23.30 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS

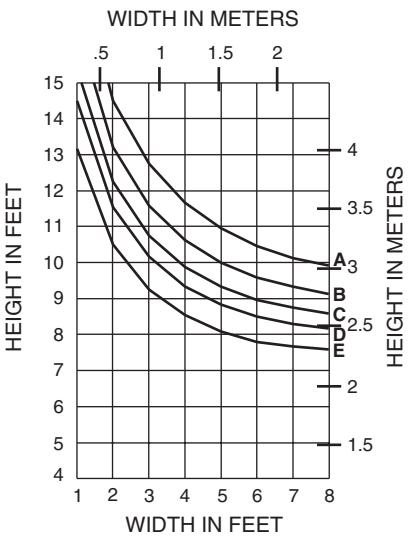




450-VG-052
450-CG-028

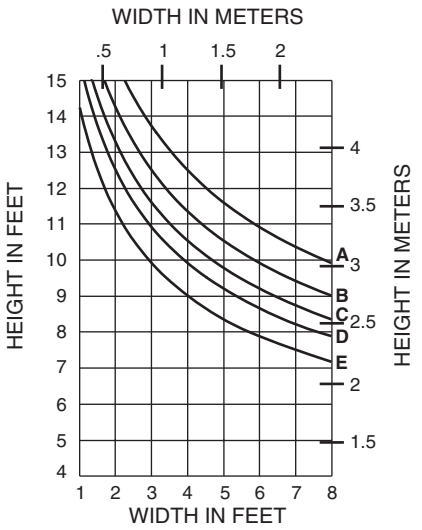
I = 2.998 (124.79 x 10^4)
S = 1.235 (20.24 x 10^3)

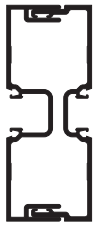
WITHOUT HORIZONTALS



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

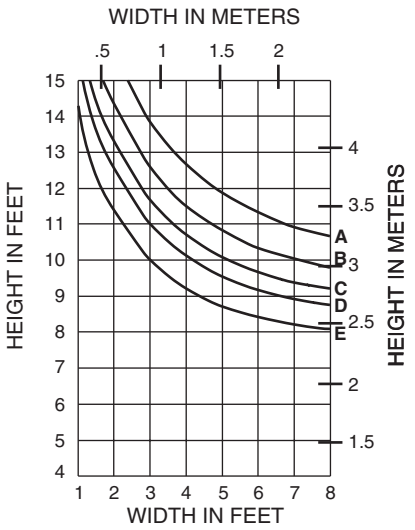




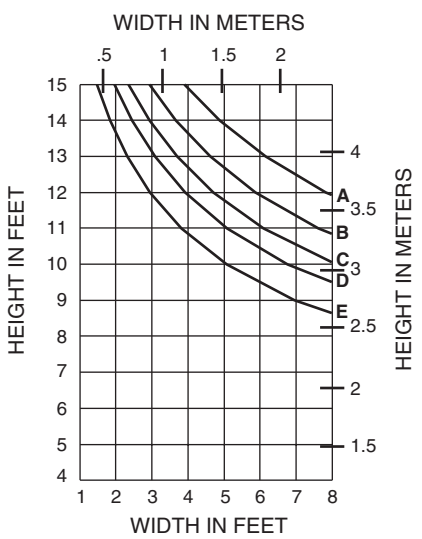
450-CG-540
450-CG-010

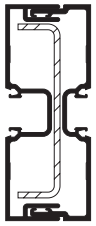
$I = 3.846\ (160.08 \times 10^4)$
$S = 1.710\ (28.02 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



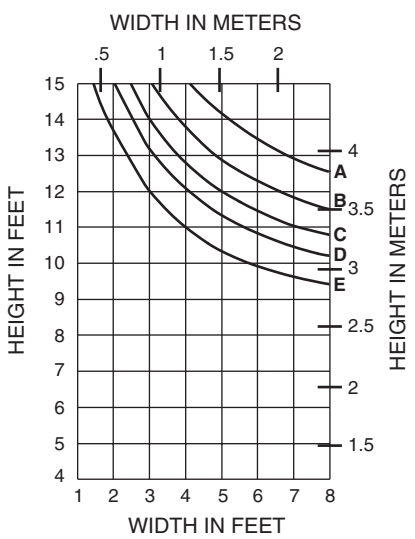


450-CG-540
450-CG-010
WITH 400-110 STEEL

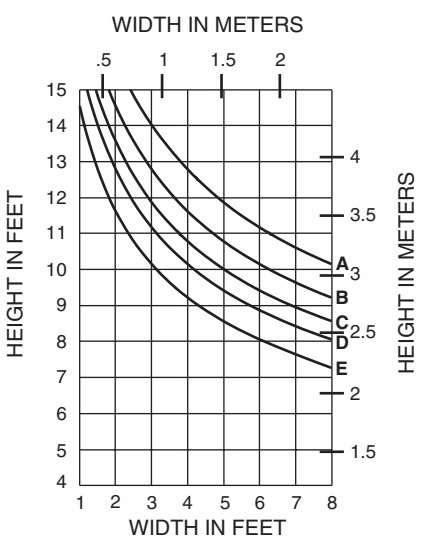
$I = 3.846\ (160.08 \times 10^4)$
$S = 1.710\ (28.02 \times 10^3)$

$I_S = 0.970\ (40.37 \times 10^4)$
$S_S = 0.535\ (8.76 \times 10^3)$

WITHOUT HORIZONTALS



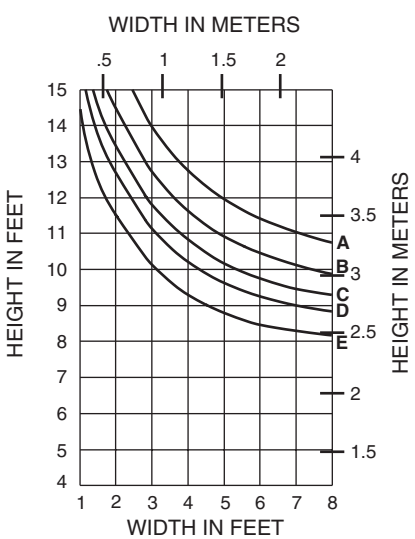
WITH HORIZONTALS



450-VG-540
450-VG-010

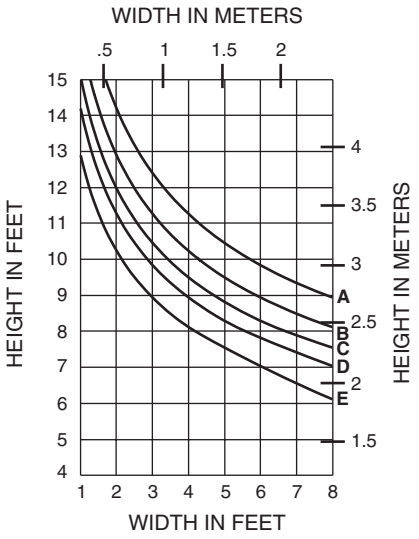
$I = 4.117\ (171.36 \times 10^4)$
$S = 1.704\ (27.92 \times 10^3)$

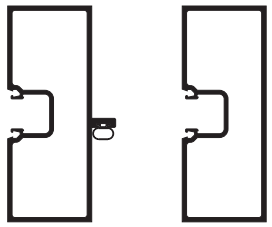
WITHOUT HORIZONTALS



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

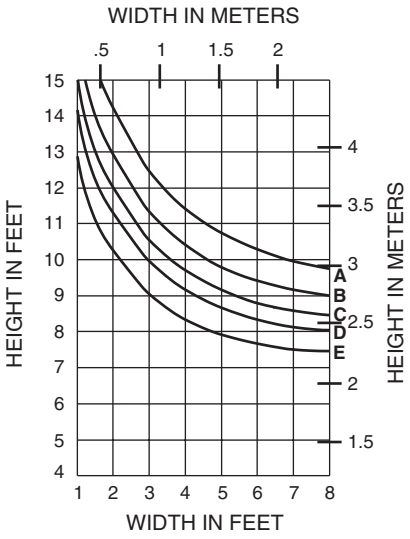




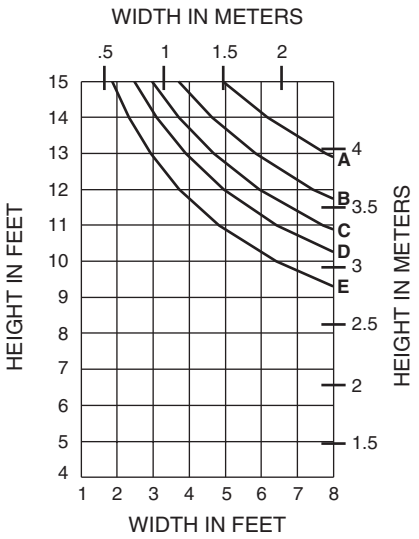
450-501 **450-019**

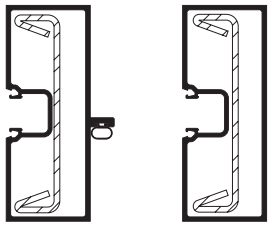
$I = 2.813 (117.08 \times 10^4)$
$S = 1.250 (20.48 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS





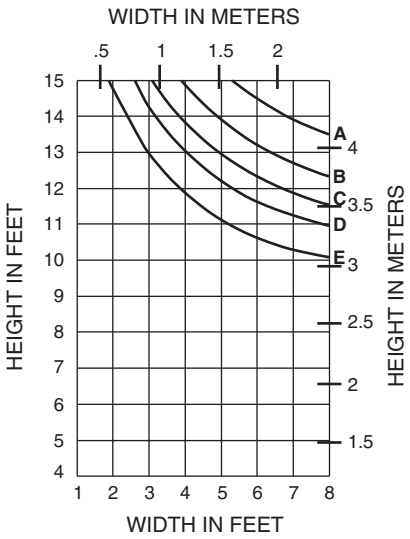
450-501 **450-019**

WITH 450-110 STEEL

$I_A = 2.813 (117.08 \times 10^4)$
$S_A = 1.250 (20.48 \times 10^3)$

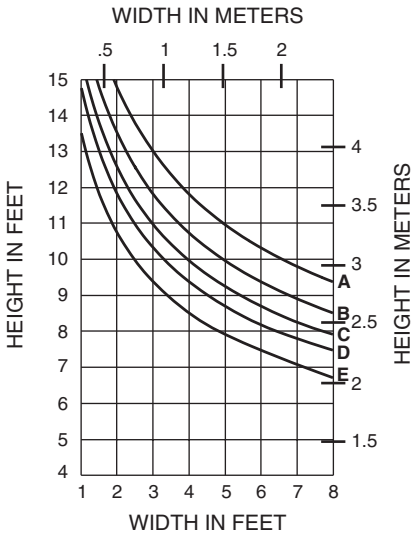
$I_S = 1.935 (80.57 \times 10^4)$
$S_S = 0.938 (15.37 \times 10^3)$

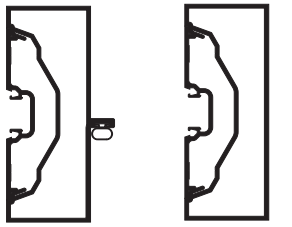
WITHOUT HORIZONTALS



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



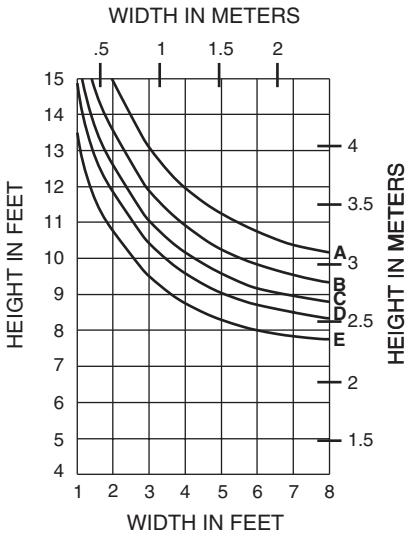


450-599
450-CG-002

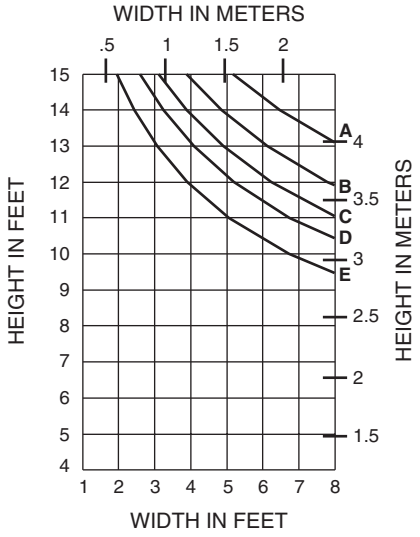
450-064
450-CG-002

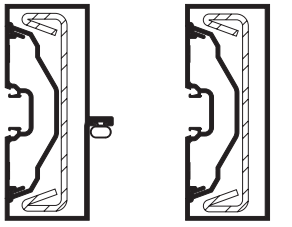
I = 3.226 (134.28 x 10^4)
S = 1.467 (24.04 x 10^3)

WITHOUT HORIZONTALS



WITH HORIZONTALS





450-599
450-CG-002

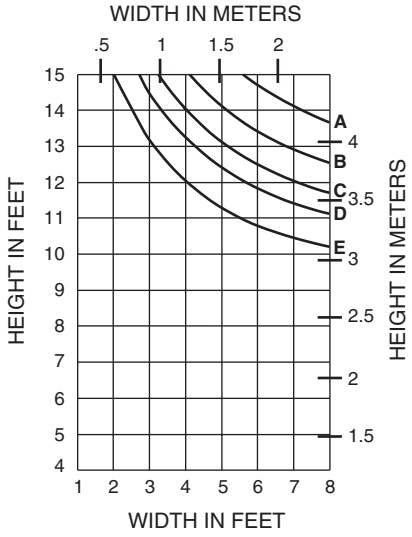
450-064
450-CG-002

WITH 450-110 STEEL

I_A = 3.226 (134.28 x 10^4)
S_A = 1.467 (24.04 x 10^3)

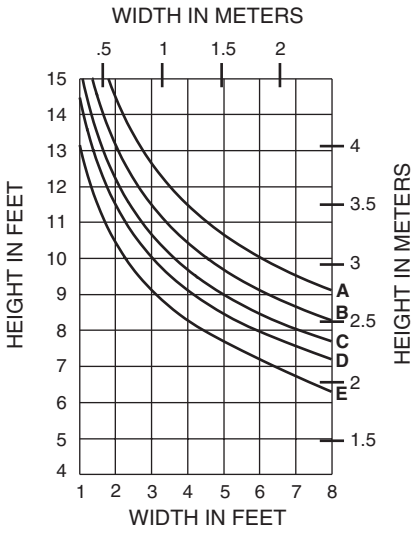
I_S = 1.935 (80.57 x 10^4)
S_S = 0.938 (15.37 x 10^3)

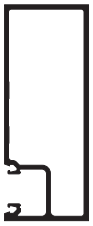
WITHOUT HORIZONTALS



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

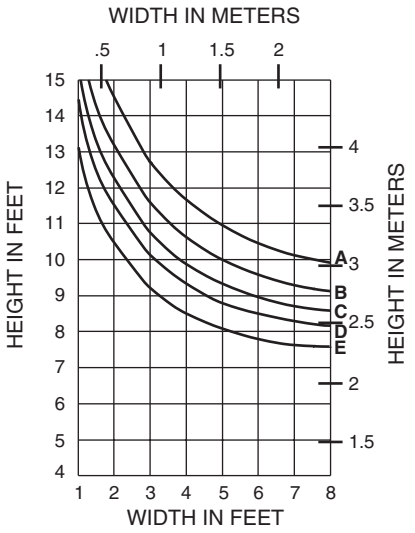




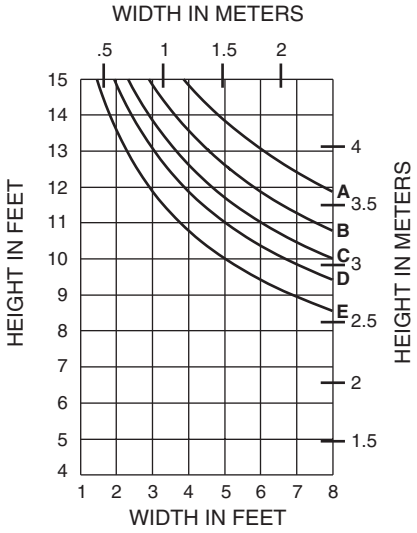
450-VG-019

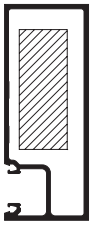
$I = 2.985 (124.24 \times 10^4)$
$S = 1.244 (20.38 \times 10^3)$

WITHOUT HORIZONTALS



WITH HORIZONTALS



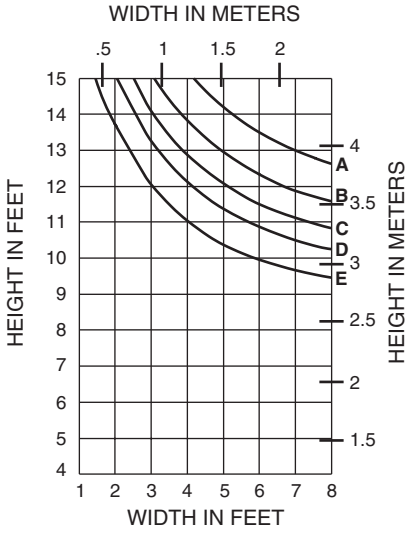


450-VG-019
WITH 1" x 2-1/2" STEEL BAR

$I_A = 2.985 (124.24 \times 10^4)$
$S_A = 1.244 (20.38 \times 10^3)$

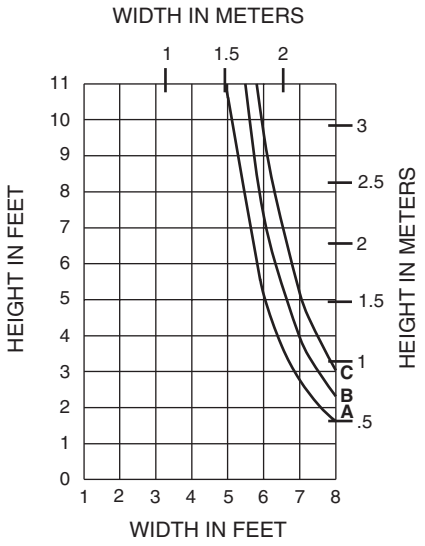
$I_S = 1.302 (54.19 \times 10^4)$
$S_S = 1.042 (17.08 \times 10^3)$

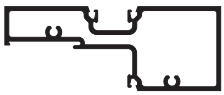
WITHOUT HORIZONTALS



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

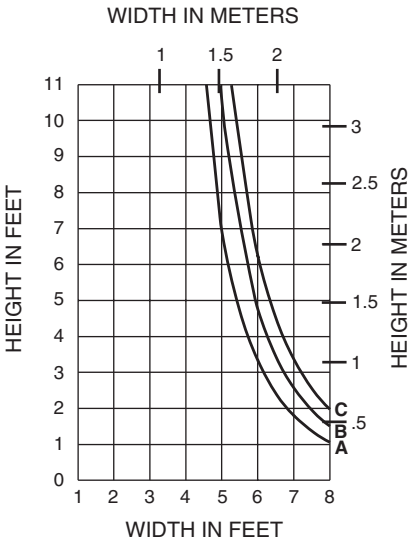
A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)

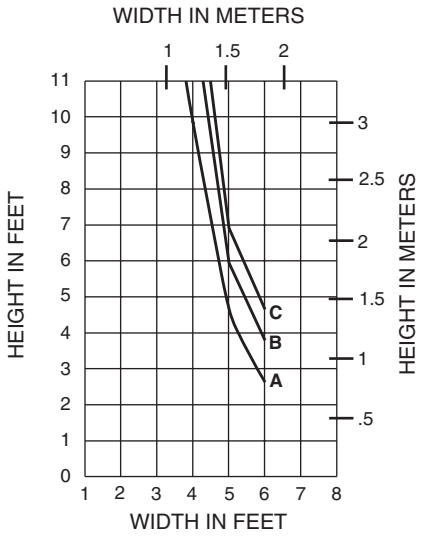




450-CG-011

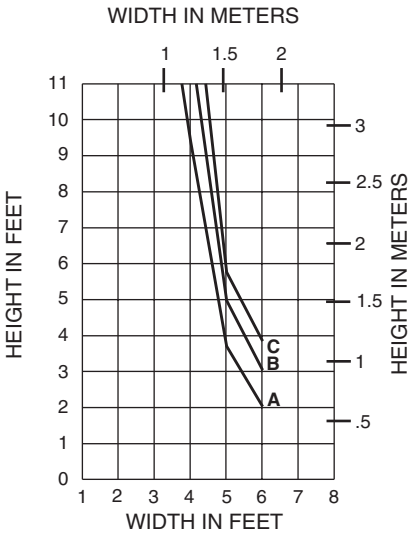
450-CG-003





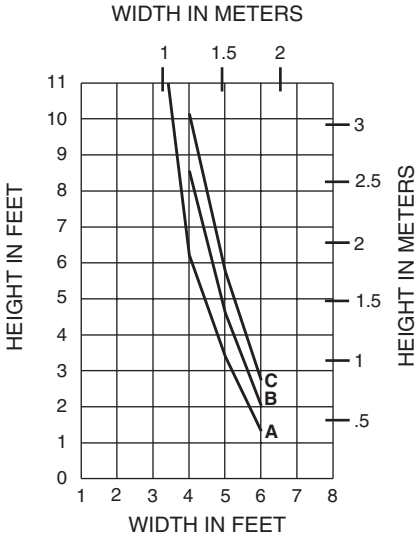
450-VG-011

450-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 1/4" (6.4) thick glass supported on two setting blocks at the loading points shown.

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

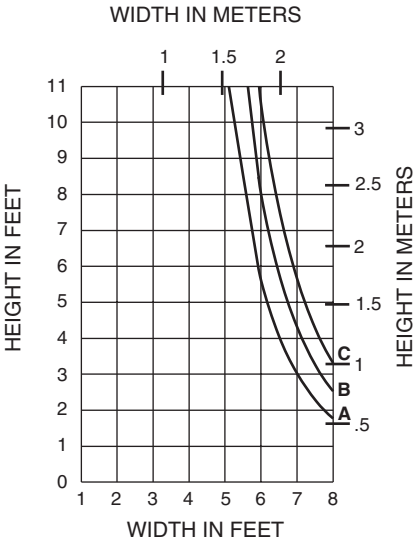


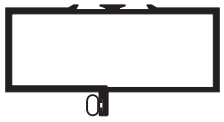
450-SSG-011

DEADLOADS ON ENTRANCE TRANSOM BARS

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

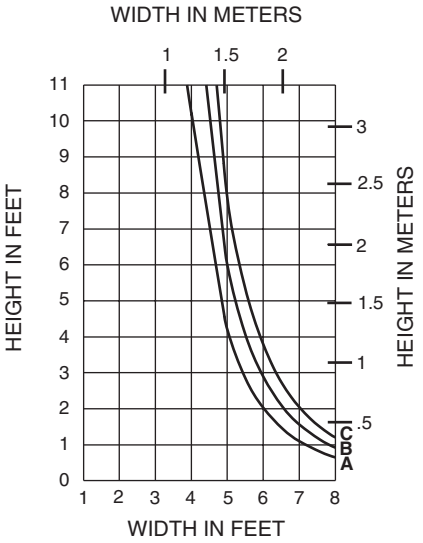
A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)





450-502
SINGLE ACTING
T-BAR

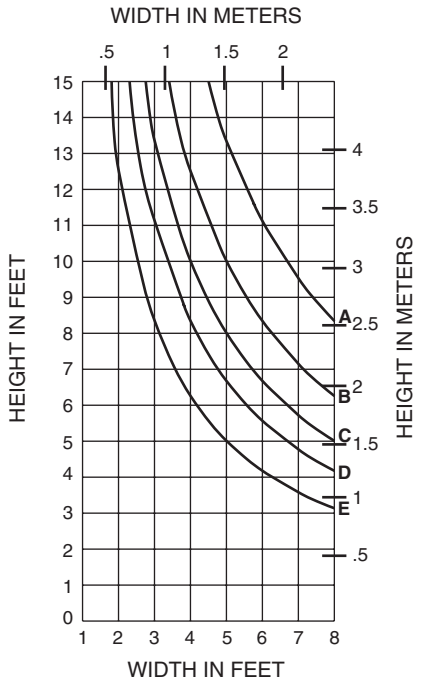
450-081
DOUBLE ACTING
T-BAR

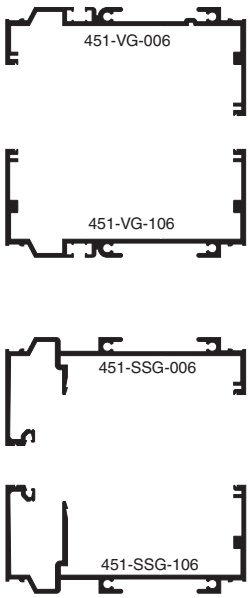


For each application, end reactions MUST be checked. These charts are used to verify that the end reactions at the head and sill receptors are 500 lbs. (2224N) or less and will meet the specified windload.

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)

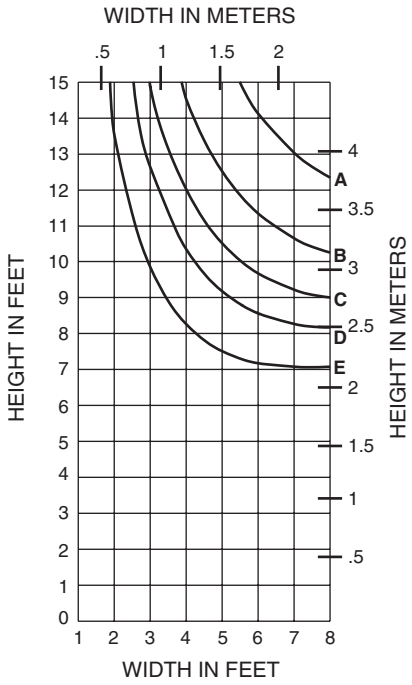
WITH HORIZONTALS



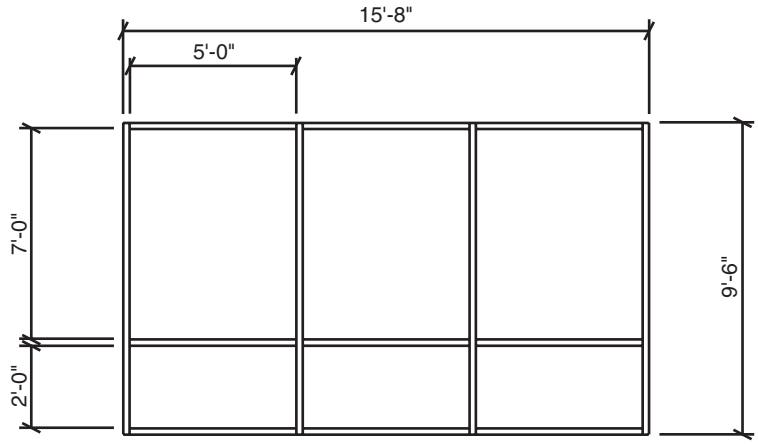


500lbs. Max. End Reaction

WITHOUT HORIZONTALS



Project Specific U-factor Example Calculation



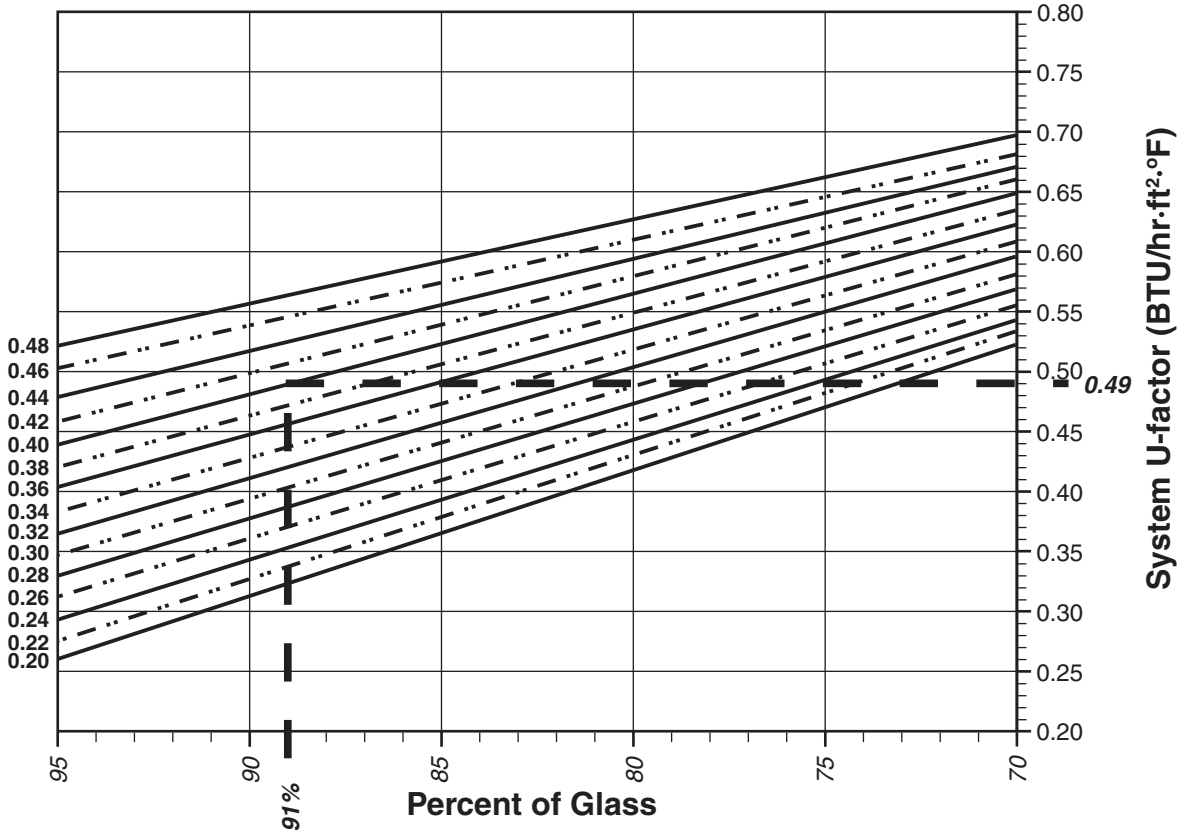
Example Glass U-factor = 0.42 Btu/hr·ft²·°F

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%

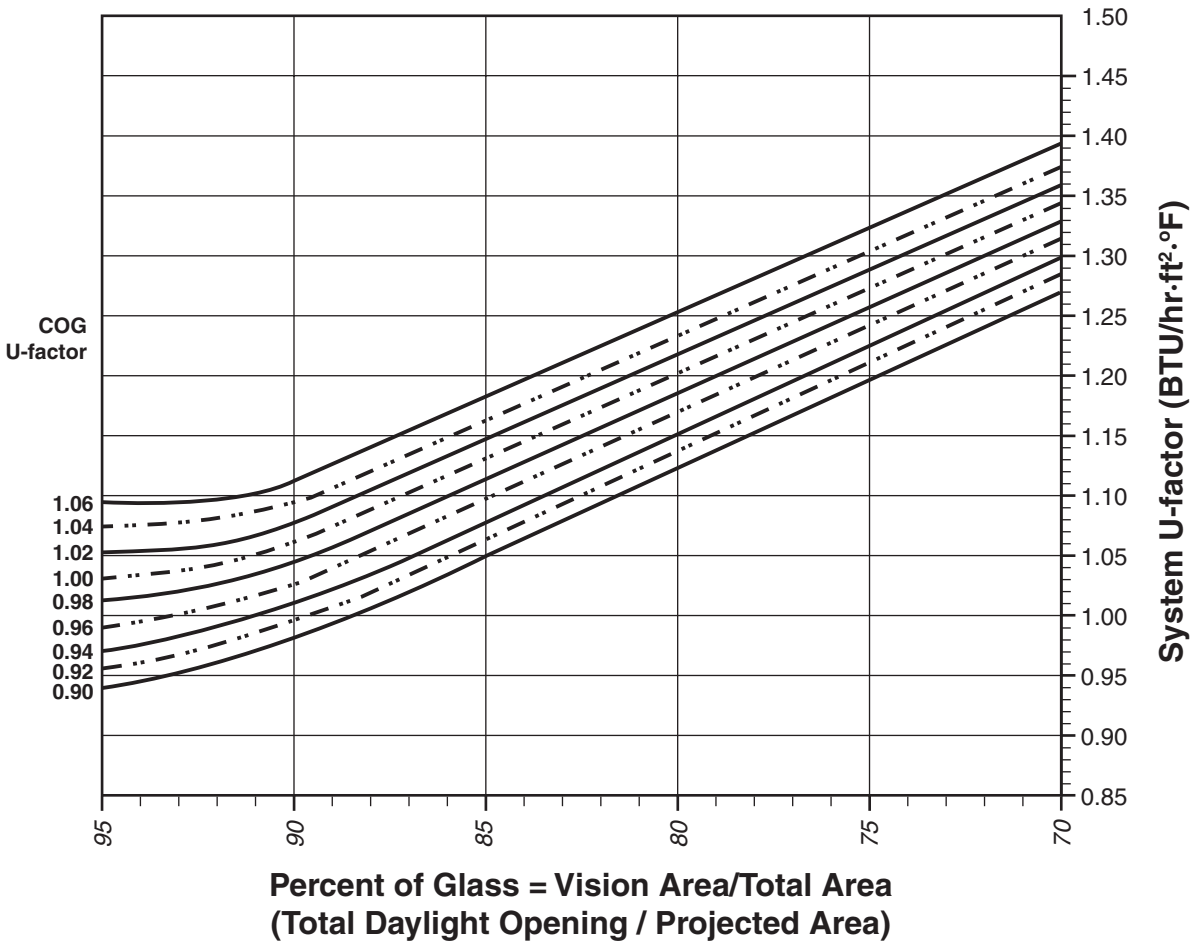
System U-factor vs Percent of Glass Area



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

TRIFAB® VG 450 (CENTER)

System U-factor vs Percent of Glass Area



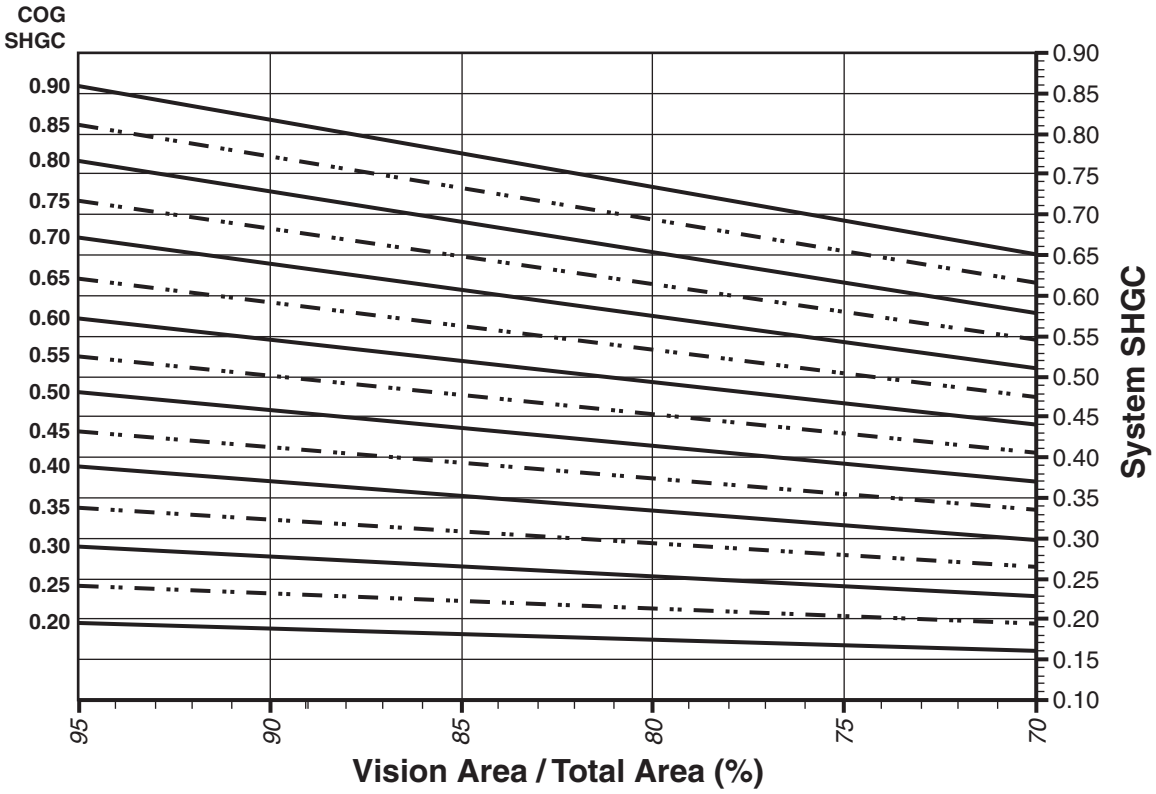
Notes for System U-Factor, SHGC and VT charts:

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

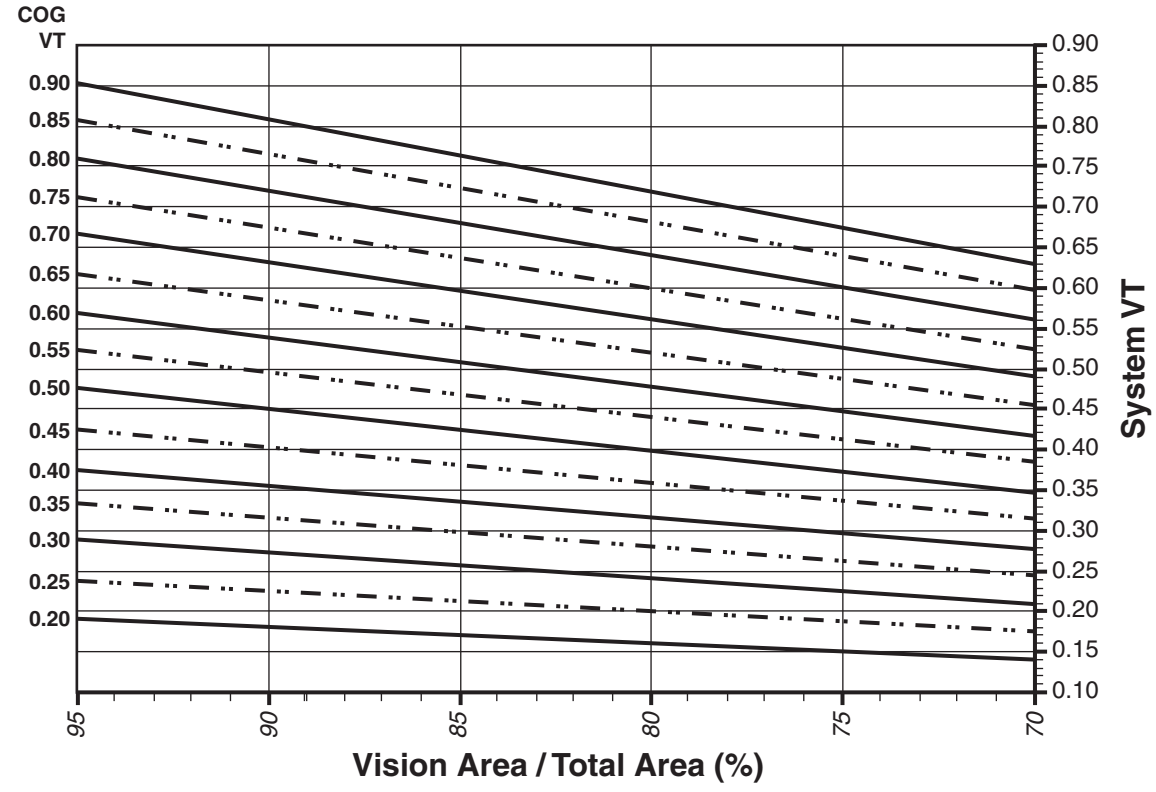
Glass properties are based on center of glass values and are obtained from your glass supplier.

TRIFAB® VG 450 (CENTER)

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



System Visible Transmittance (VT) vs Percent of Vision Area



TRIFAB® VG 450 (CENTER)

Thermal Transmittance [1]

Glass U-Factor [3]	Overall U-Factor [4]
0.90	0.99
0.92	1.00
0.94	1.02
0.96	1.03
0.98	1.05
1.00	1.07
1.02	1.08
1.04	1.10
1.06	1.11

SHGC Matrix [2]

Glass SHGC [3]	Overall Glass U-Factor [4]
0.90	0.81
0.85	0.77
0.80	0.72
0.75	0.68
0.70	0.63
0.65	0.59
0.60	0.54
0.55	0.50
0.50	0.45
0.45	0.41
0.40	0.37
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19

Visible Transmittance [2]

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

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").