

STAFF REPORT: NOVEMBER 10, 2021 MEETING

PREPARED BY: A. DYE

APPLICATION NUMBER: 21-7584

ADDRESS: 1315 BROADWAY

HISTORIC DISTRICT: BROADWAY AVENUE

APPLICANT: ROCKY LALA, MAP BROADWAY, LLC

PROPERTY OWNER: ROCKY LALA, MAP BROADWAY, LLC

DATE OF PROVISIONALLY COMPLETE APPLICATION: OCTOBER 18, 2021

DATE OF STAFF SITE VISIT: OCTOBER 29, 2021

SCOPE: REHABILITATE BUILDING, INCLUDING STOREFRONT REPLACEMENT, WINDOW REPAIR AND ALTERATION OF REAR FIRE ESCAPE

EXISTING CONDITIONS

The architectural description is taken from the November 14, 2018 staff report:

Erected in 1912, the building at 1315 Broadway is a 4-story, masonry commercial building which is located within the Broadway Avenue Historic District. Smith, Hinchman & Grylls served as the building's architect, 1912 (Detroit building permit #69, Jan. 15, 1912). This terra cotta clad building began its life as a two-story building in 1912 and grew to four stories in 1915 (alteration permit 2002-A, March 5, 1915). The storefronts were remodeled in 1927 (Alt. permit #13562-A, 10/1/1927). The first story, front elevation displays a metal storefront which is topped with a decorative metal transom. Each floor at stories 2-4 displays a broad horizontal ribbon of wood windows, each of which consists of a large single pane pivoting unit which is topped with a fixed transom. Windows at the rear elevation are wood 1/1 units, as per the applicant. A metal fire escape is also located at the rear elevation. The flat roof includes a number of skylights and displays a low gabled parapet with central raised pedestal crown/1 wood units.



HDC staff photo, October 29, 2021

PROPOSAL

The applicant has submitted a proposal to undertake an extensive rehabilitation of the building. As per the submitted drawings, the proposed work includes the following:

Front Elevation:

Exterior – Floors 2 – 4

- Restore terra cotta
- Repair and paint (black) existing sash; change operation of pivoting windows (large sash below transoms) to fixed sash

Exterior – Floor 1

- Yellow Band / Awning
 - Remove existing aluminum band
 - Install new awning (30' wide x 4' deep) clad in black brake metal
 - Install flat black brake metal between awning and historic decorative grill trim
 - Lighting – Install (LT-01) Thomas O'Brian, Pelham 10" Wall Sconce, finish: hand-rubbed antique bronze (three shown on elevation); Install up and down lights – not specified
- Decorative Grill
 - Remove wood panel behind grill, restore glass transom
 - Retain and repair grillwork; fabricate new components of grill where currently missing
 - Paint grill frame (black) and decorative leaves (metallic brass)
- Storefront
 - Remove existing storefront system; install new glazed aluminum storefront system – Kawneer, TriFab Versaglaze 451T, front-glass setting (meaning glass is only slightly setback from framing)
 - Replace missing exterior facing with new granite as needed (base of street-facing storefront, left and right-side columns/pilasters)
- Central Alcove
 - Restore granite panels at base of storefront
 - Remove existing wood door, frame and transom; install glazed aluminum entrance door and transom – Kawneer, model 350 standard entrance (350 medium stile- 3-1/2" vertical stile, 3-1/2" top rail, 10" bottom rail)
 - Door handle: exterior pull (HW-01) – Emtek Hardware, 18" Jasper concealed pull, finish: satin brass, exterior deadbolt (HW-02) – Emtek Hardware, modern disk, finish: satin brass
 - Repair and repaint existing ceiling
 - Retain and repair existing granite floor tiles, place new matching granite tiles where tiles are missing
 - Lighting - Remove hanging pendant fixture; install semi-flush fixture (LT-02) Barn Light Electric Co., Acorn Schoolhouse, Semi-flush
- Side Alcove
 - Rebuild recessed entrance per remnants of historic entry (intact tile floor, ghost lines of storefront, cut exterior trim)
 - Restore tile floor
 - Install black brake metal on new walls and ceiling
 - Install new flush aluminum entrance door
 - Door handle: Baldwin Hardware, Detroit Escutcheon Entrance Set, finish: vintage brass
 - Lighting – (LT-03) WAC Lighting, York 12-inch-wide LED Drum Ceiling Fixture, finish: aged brass

Rear Elevation:

- Roof Ladder
 - Retain and repair
- Fire Escape
 - Remove steps and landings; retain and utilize existing mounting brackets, install new (steel, powder coated, black) fire escape – match profiles, dimensions, and configuration of existing fire escape
- Floors 2 – 4
 - Windows - restore steel frames; replace wire glass with clear new safety/fire-rated clear glass
 - Single Entrances - remove non-historic doors; install new wood doors fabricated to match existing historic double-doors
 - Double Entrance - retain, repair, refinish doors – replace existing glass with tempered glass, change doors from operable to fixed; repair/reopen transom – remove plywood and replace with 1/4-inch tempered glass
- Floor 1
 - Door to south (right entrance on elevation) – install new hollow metal door (black)

- Above door – remove wood panel and install round aluminum louver (prefinished/painted PVDF coating, black) within existing round opening
- Door to north (left entrance on elevation) – install glass door (full light)
 - Above door – remove wood panel and install aluminum-frame round window (prefinished/painted PVDF coating, black) with 1-inch clear insulating glass within existing round opening
- New glass-front garage door - Overhead Door, Aluminum door system, model 521, color: black, clear double-strength glass.
- Electrical meter bank
- New graffiti art to be repainted in area of existing graffiti

STAFF OBSERVATIONS AND RESEARCH

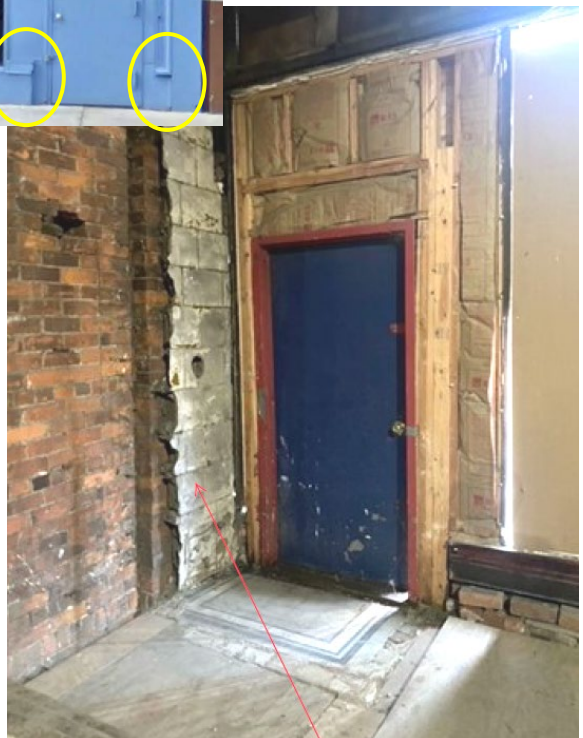
- The Broadway Avenue Historic District was established in 2005.
- The front elevation’s floors 2 – 4 (including parapet) retain the historic materials and design and therefore, its character-defining features.
- The first floor’s exterior walls, storefronts, and entrances have been heavily altered. The two entrance alcoves were closed off (likely prior to district designation) and exterior doors installed at the sidewalk.
- It is not clear to staff if the existing storefront framing is historic age. During staff’s recent visit no character-defining features of the framing were noticed.



Left: The light color in this 2013 Google street view image clearly shows how the historic storefront, entrances, and side walls were altered. The circles identify where the original walls/trim were cut.

Below: This applicant photo shows evidence of the original alcove tile floor and locations of exterior walls.

- Based on Google street view images, the central alcove was reopened between July 2017 and August 2018. The built-out frame for the doors remains in place, however.
- This proposal will re-establish the historic footprint by reopening and rebuilding the side alcove and restoring the historic tile floor, as well as reopening the full expanse of the central alcove. The building will regain character-defining details.



- It is staff’s opinion that the granite facing the storefront system, and the granite floor tiles, are likely not original due to the building’s 1915 construction date. The granite could possibly have been installed as part of the 1927 storefront remodeling, or as part of a later not-documented mid-20th century “modernization”.
- The front door is a replacement unit, however the larger door surround, including the wood threshold and wood transom, are likely original.
- The majority of the rear elevation’s openings will be retained, and the historic windows and doors (double door entrance) will be restored, keeping the majority of the rear elevation intact. A garage roll-up door is proposed for the first floor and would not affect any character-defining features.
- Installing a louver on the rear, alley-facing wall is not atypical for a commercial building.

ISSUES

- Staff remains concerned about the two-tone color scheme proposed for the front elevation. As the glass within the storefront, transom, and central alcove door will be clear, the appearance of, and approach to, the central alcove entrance will not be as monolithic as presented on the elevations. However, the chroma of black is very intense and removes the shadow play that can highlight architectural details and darken recessed spaces even on a sunny day (as evidenced by staff photos and Google street view images). Staff believes using a paint and metal with a slight sheen (one step above matte) may offer some light reflection that could make the front elevation brighter and recessed entrances more inviting. Or, the applicant could consider a dark charcoal gray, rather than black.



Applicant Elevation

- The proposal states brake metal of an unspecified type will be applied to the side alcove walls and ceiling. Staff wonders about the long-term viability/maintenance (i.e., can it be easily dented and scratched?) of this flexible material on such wide expanses of surfaces. Staff emailed the applicant on 11/3 asking for additional information on the type of metal and why it was selected, and details/section on how the brake metal will be installed, including the distance between, and dimensions of, any seams that would be required.
- The applicant expressed interest in creating continuity between the storefront and front door. The proposal includes the removal of the existing door/transom and installation of a glazed aluminum door and transom unit (Kawneer) in a design and material to match the proposed storefront system (as shown above).

The design of the recessed central alcove purposely draws your eye to the building's entrance. The existing door opening (not the door itself) retains the historic wood threshold and transom. The angular detail on the ceiling, and hanging pendant light, further accentuates your eye's visual line to the door, creating a stronger connection between the entrance and alcove ceiling, than the entrance and adjacent storefronts. It is staff's opinion the entry can allow for discontinuity with the storefront and the existing relationship and historic materials between the alcove ceiling, pendant light and entrance be retained.



Above left: Google street view image, August 2018.
Remaining photos: HDC staff, October 2021.

RECOMMENDATION

Section 21-2-78, Determination of Historic District Commission

It is staff's opinion the project as proposed will not alter the features and spaces that characterize the property, but rather improve the building's front and rear elevations as well as the Broadway Avenue streetscape. Staff therefore recommends the Commission issue a Certificate of Appropriateness for the work as proposed because it meets the Secretary of the Interior Standards for Rehabilitation and the Elements of Design for the district.

Staff recommends the Certificate of Appropriateness be issued with the following conditions:

- Retain existing front entrance door surround (transom and threshold); install a wood door with full glass panel.
- Retain existing alcove pendant light. If the existing fixture is beyond repair, a similar fixture and finish will be selected and submitted for staff review.
- Catalog cuts for the front elevation's side alcove flush door and the rear elevation's hollow metal door (both black) will be submitted for staff review.
- Catalog cut of the selected metal with respect to the type, durability and design will be submitted to HDC staff.
- An elevation and section confirming how the metal will be installed will be submitted.
- The catalog cut for the up-down lights within the awning (including placement identification) will be submitted for staff review.

**1315 Broadway
Concept Design
September 27, 2021**

MIDWEST COMMON

1315 BROADWAY – SCOPE OF WORK



SCOPE OF WORK - BROADWAY

- Repair historic windows
- Repair terra cotta
- Repair/restore black granite base
- Restore the secondary entrance door alcove layout to historic configuration
- Restore grillework and transom behind grillework
- Install new canopy
- Install new light fixtures
- Install new black storefront system in same configuration

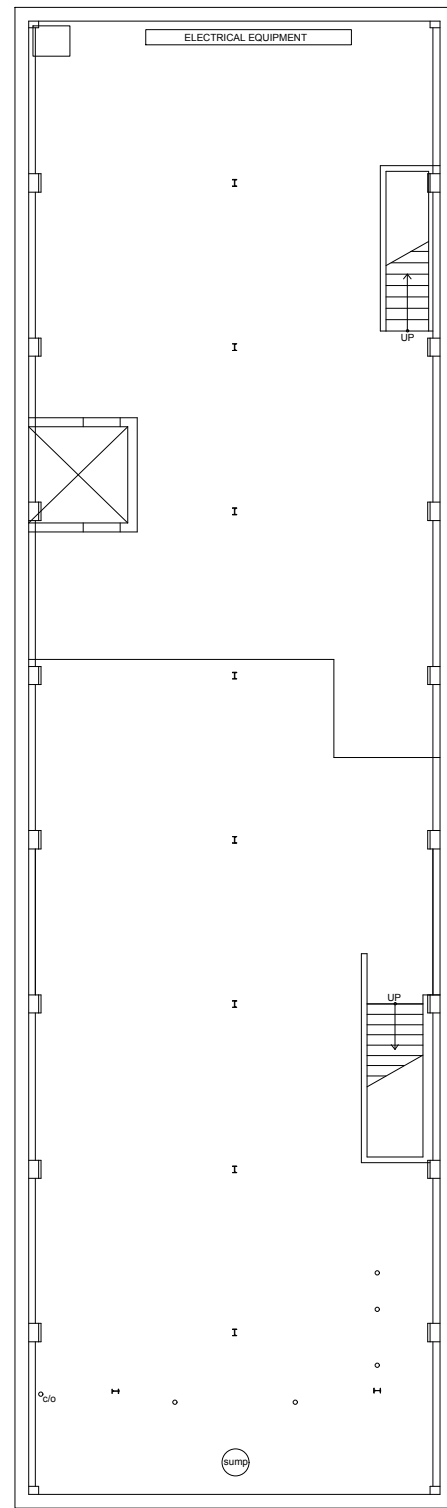
SCOPE OF WORK - ALLEY

- Replace fire escape in kind utilizing existing brackets (see engineering report)
- Restore frames of double-hung windows and replace translucent wire glass and replace with new, fire rated and safety/impact rated clear glass.
- Install new glass garage door for access to activated alley
- Restore round openings above exit doors at grade
- Restore historic double doors and pattern new doors for replacement for all other fire escape doors
- Repaint graffiti art. Upper limit of art to match existing line of graffiti.

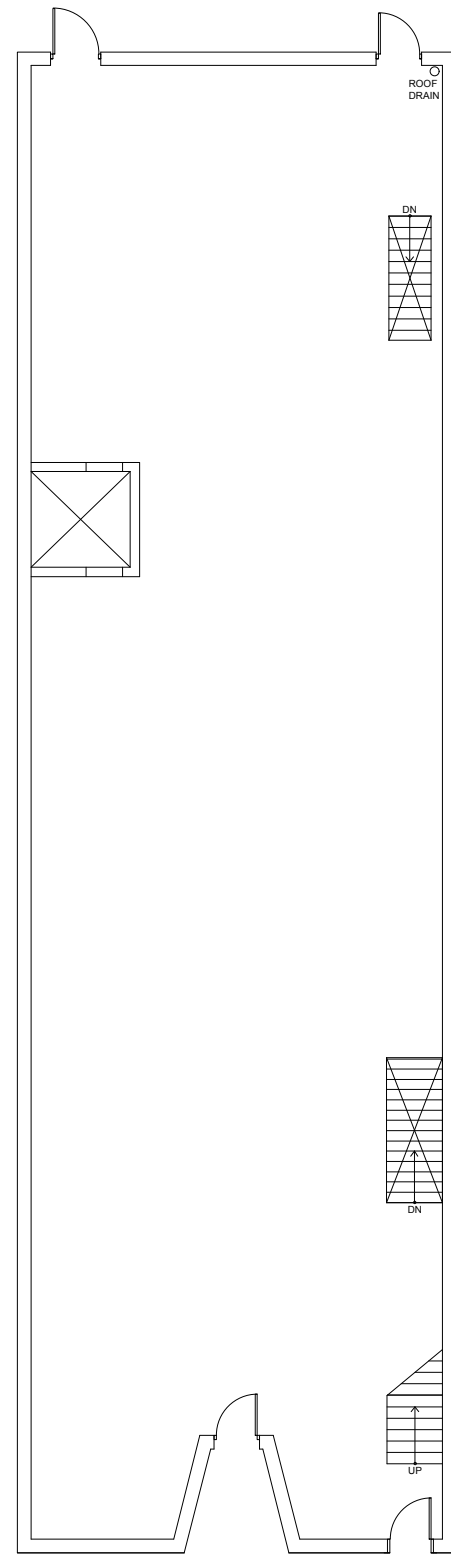


Floor Plans

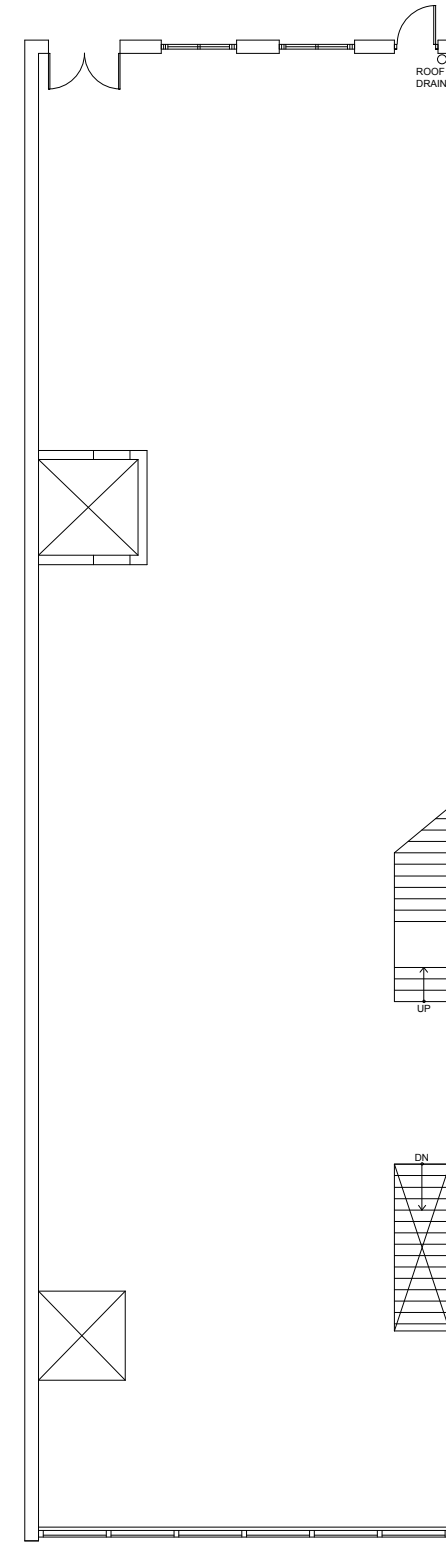
1315 BROADWAY – EXISTING FLOOR PLANS



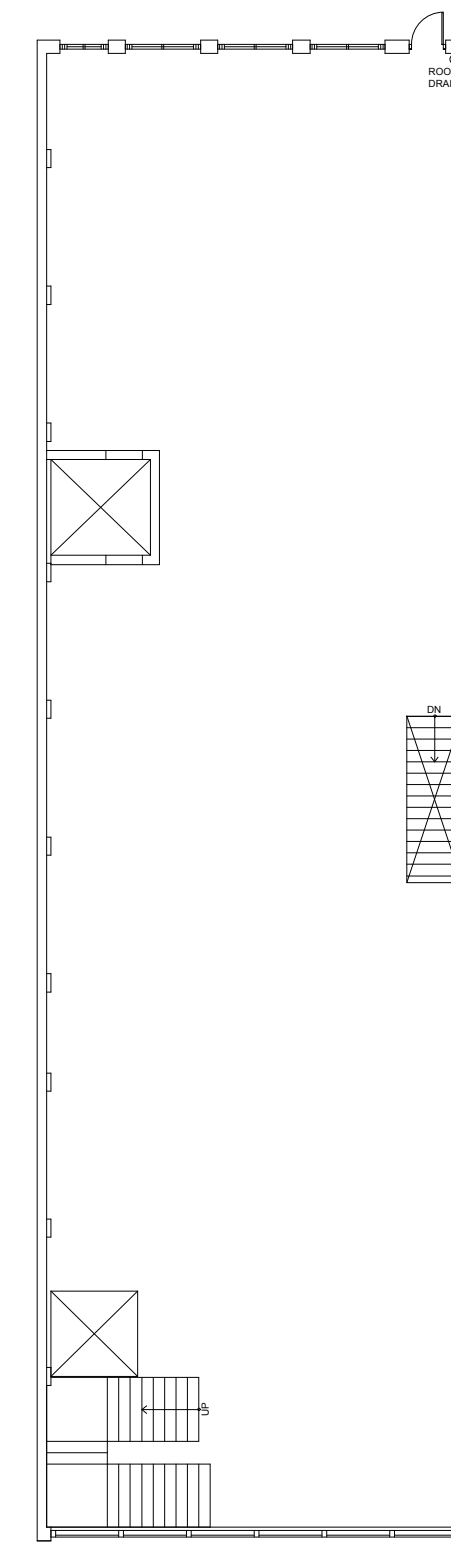
BASEMENT



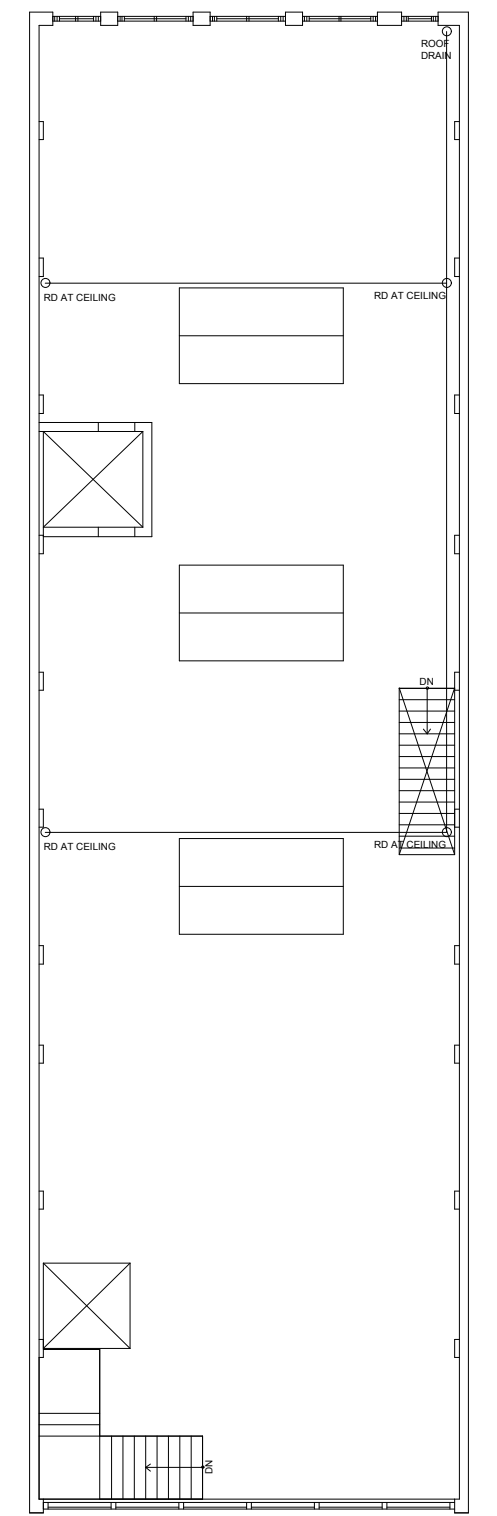
FLOOR 1



FLOOR 2



FLOOR 3



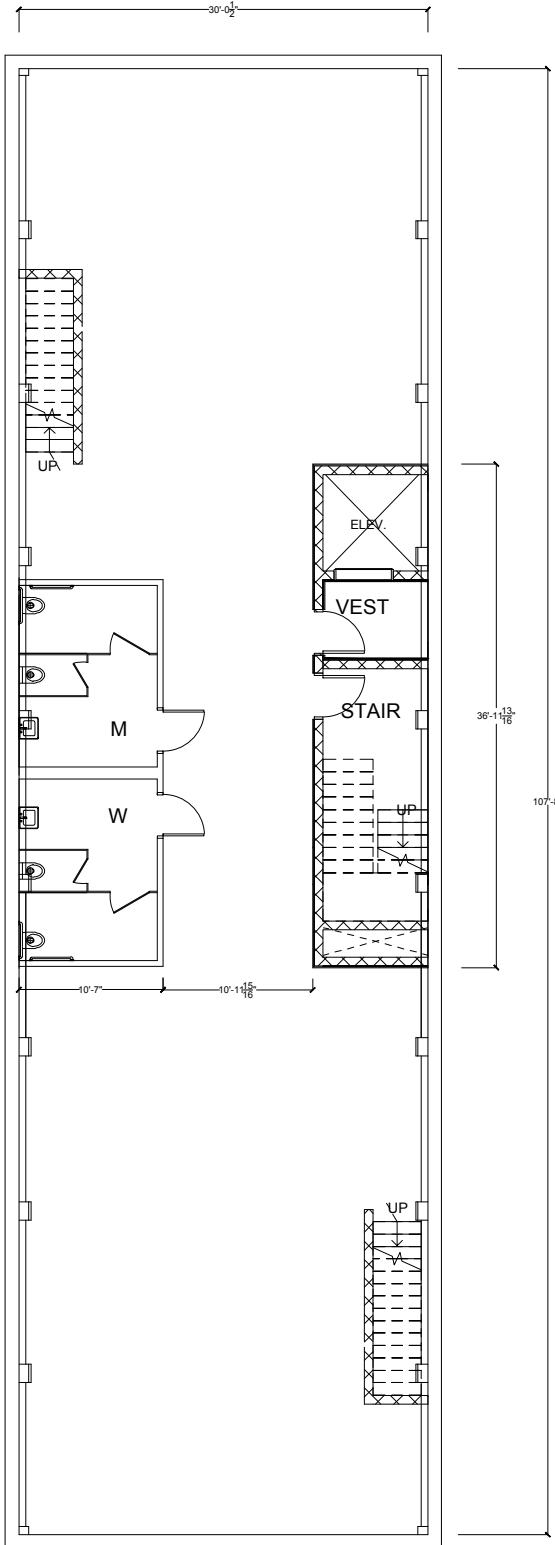
FLOOR 4

1315 BROADWAY – SUGGESTED FLOOR PLANS

KEYNOTES

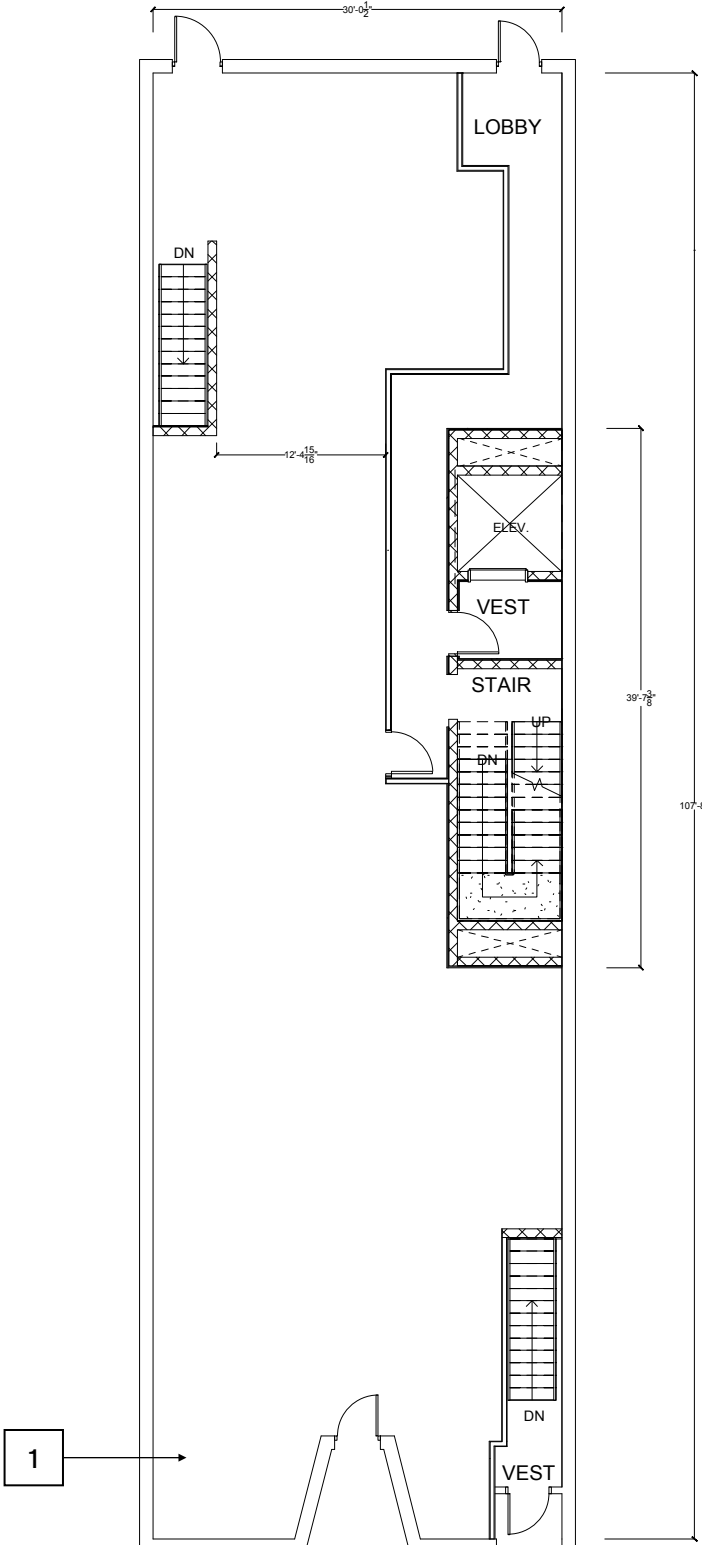
1 WOOD FLOOR RESTORED/REPAIRED

2 HISTORIC STAIR RESTORED/REPAIRED



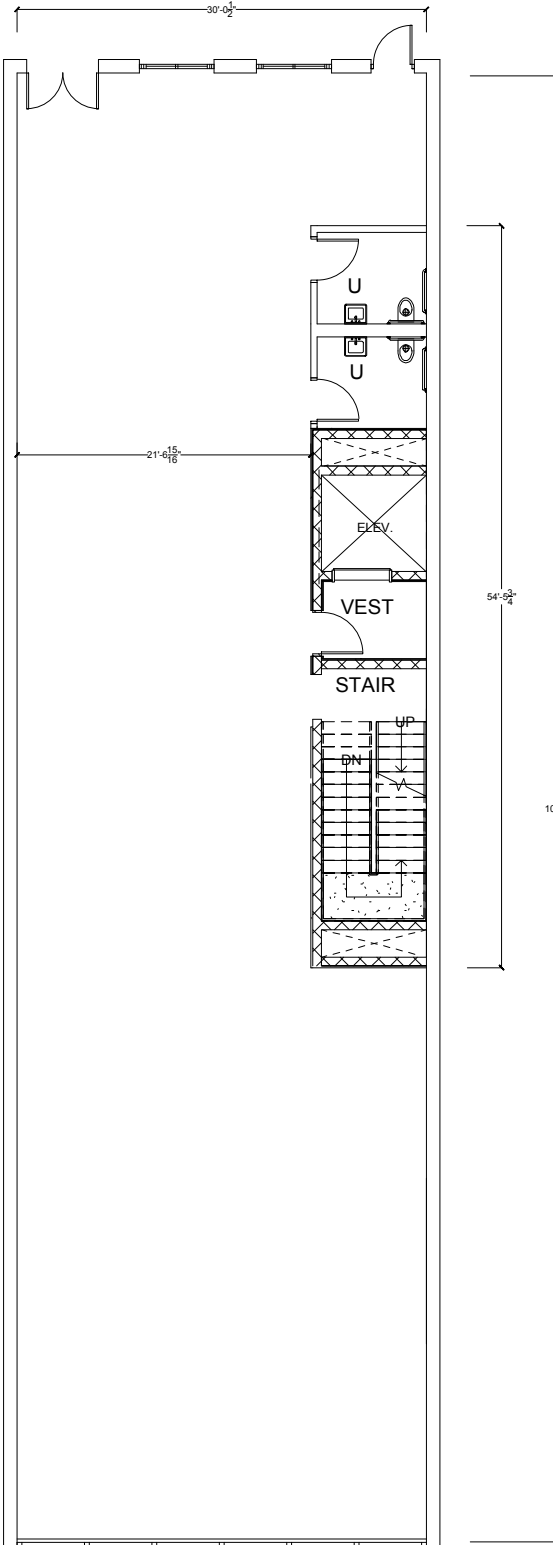
BASEMENT

**LEASABLE
SQ. FT. ~2490**



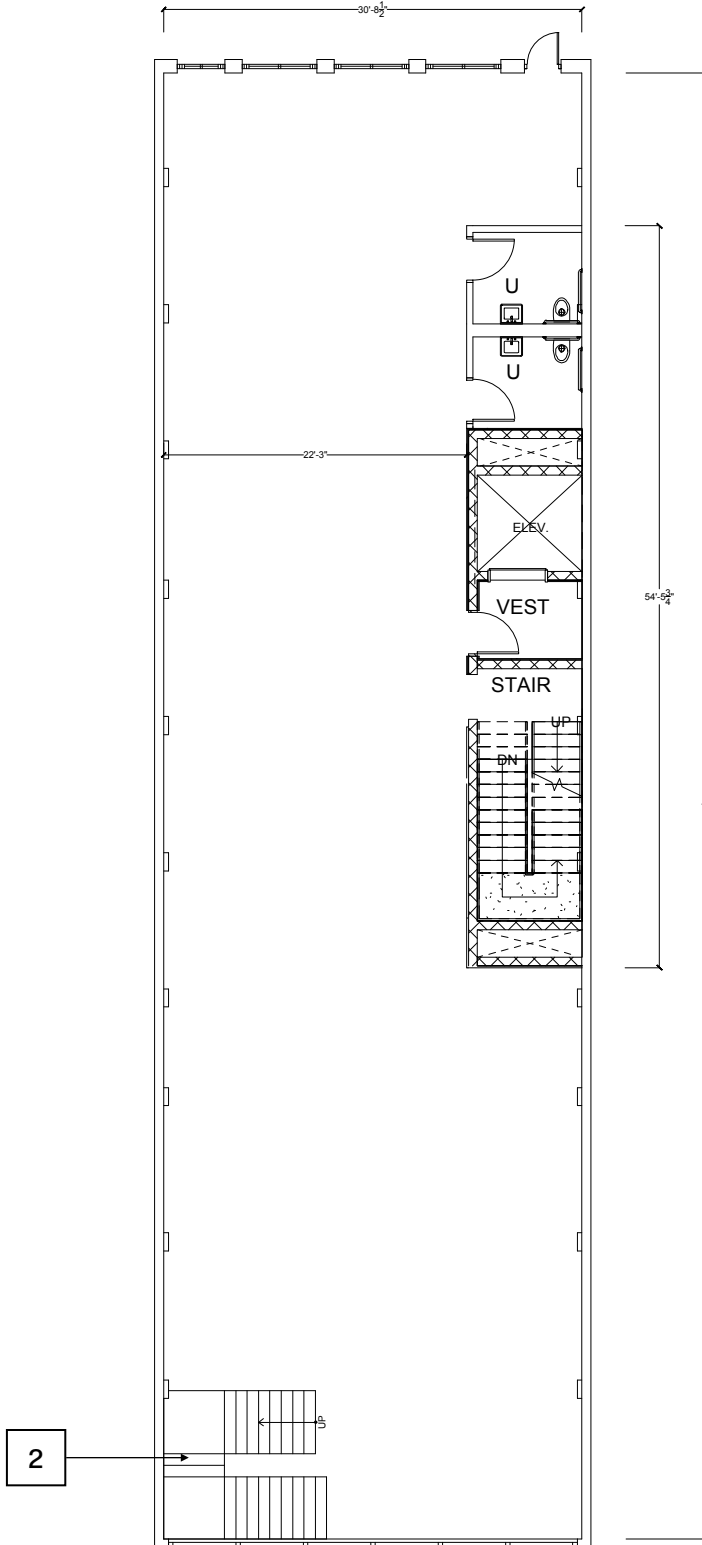
FLOOR 1

**LEASABLE
SQ. FT. ~2682**



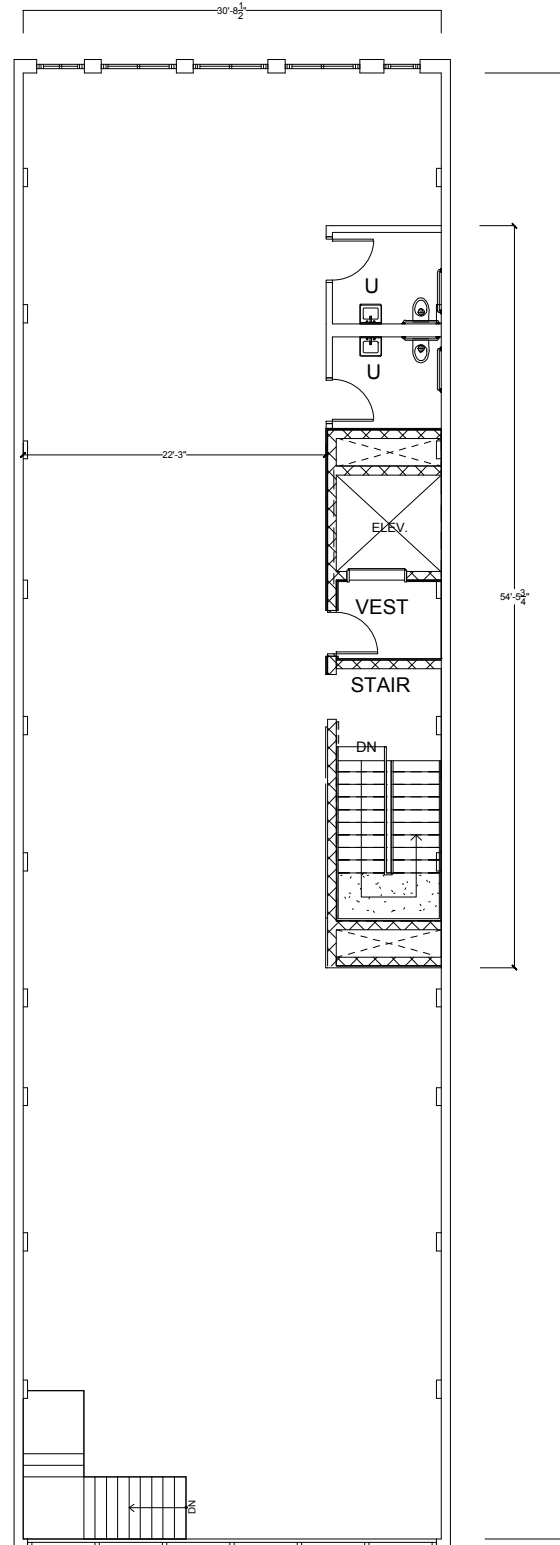
FLOOR 2

**LEASABLE
SQ. FT. ~2910**



FLOOR 3

**LEASABLE
SQ. FT. ~2835**



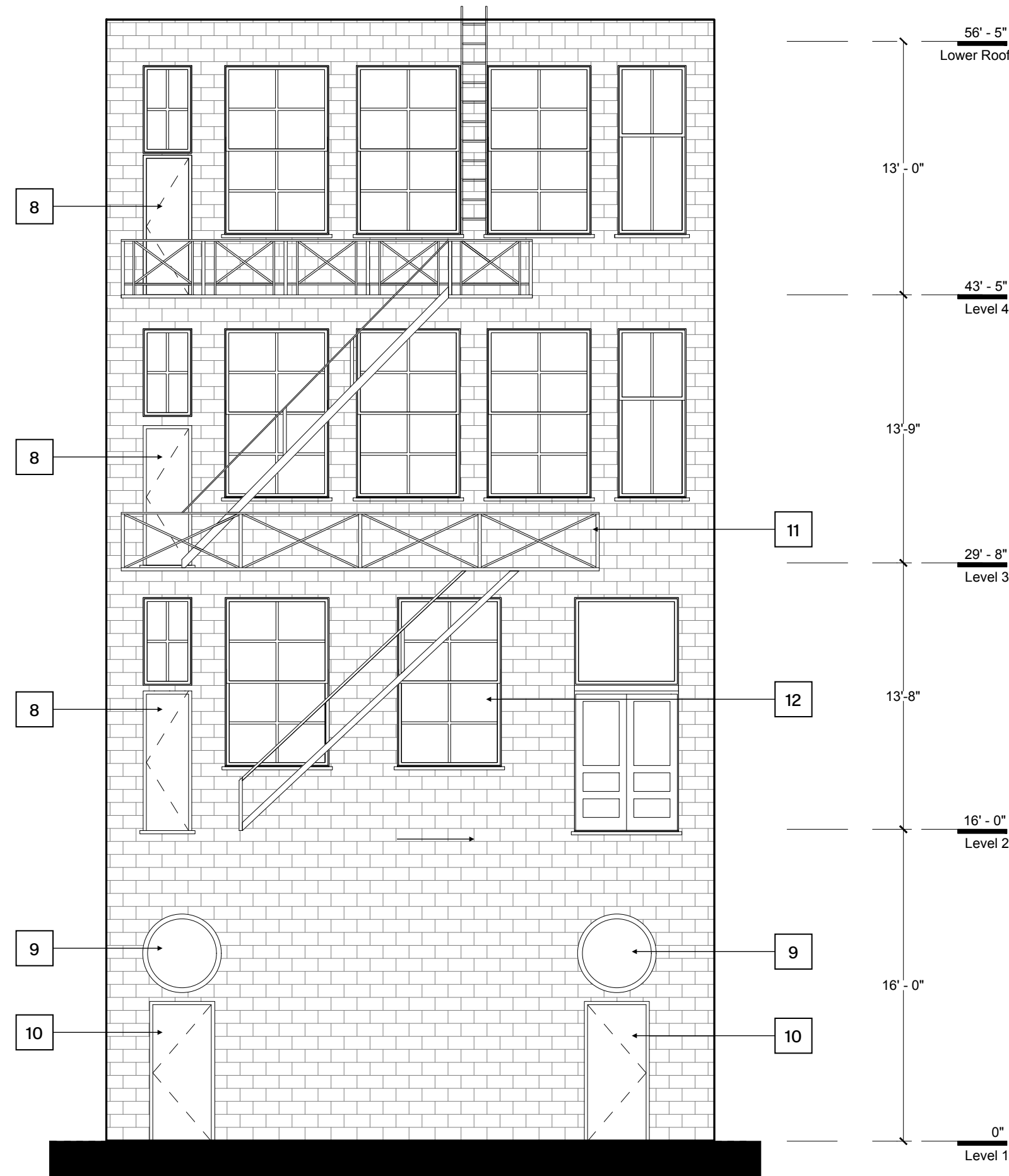
FLOOR 4

**LEASABLE
SQ. FT. ~2890**

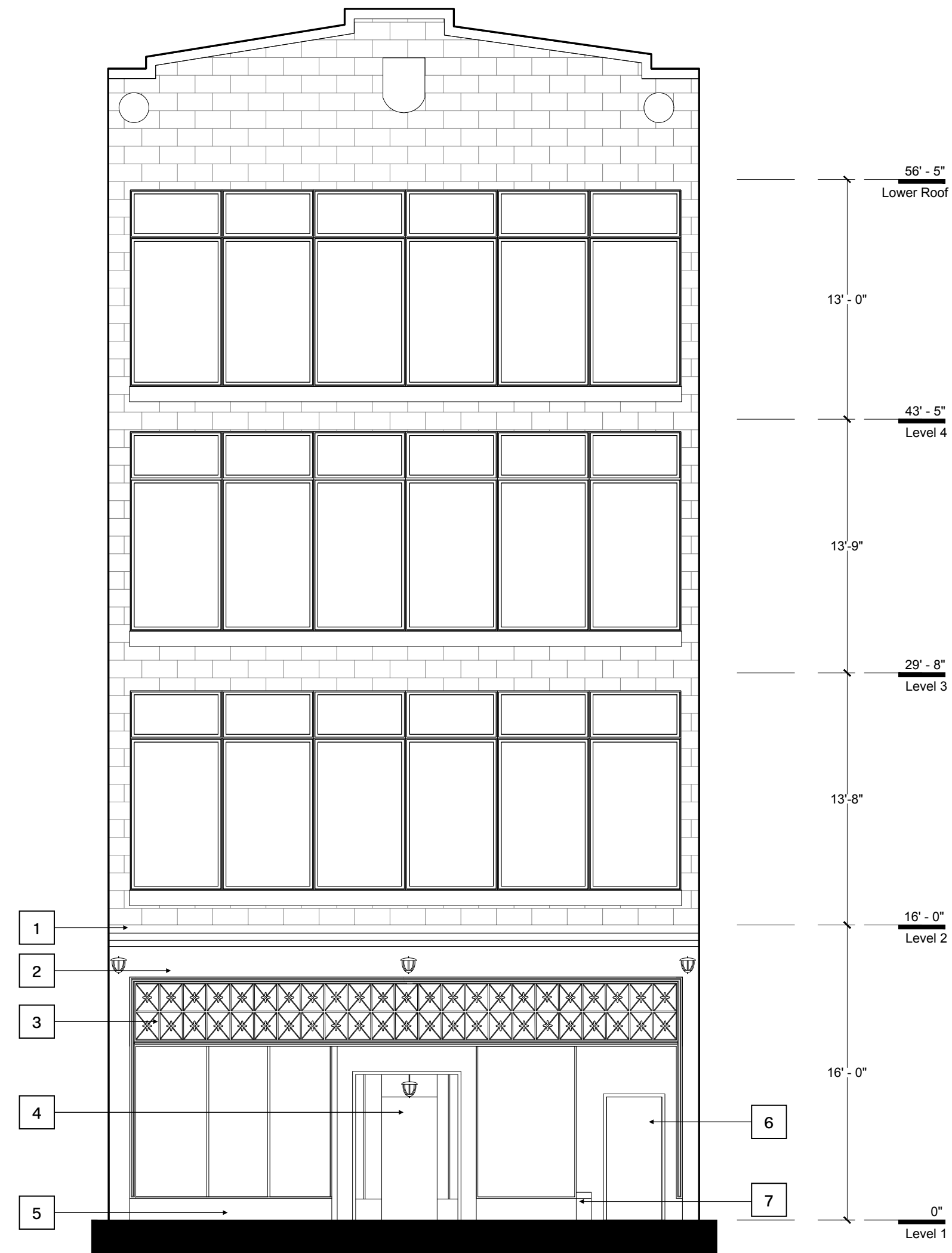
Exterior

1315 BROADWAY – EXISTING EXTERIOR ELEVATIONS

KEYNOTES



REAR ELEVATION

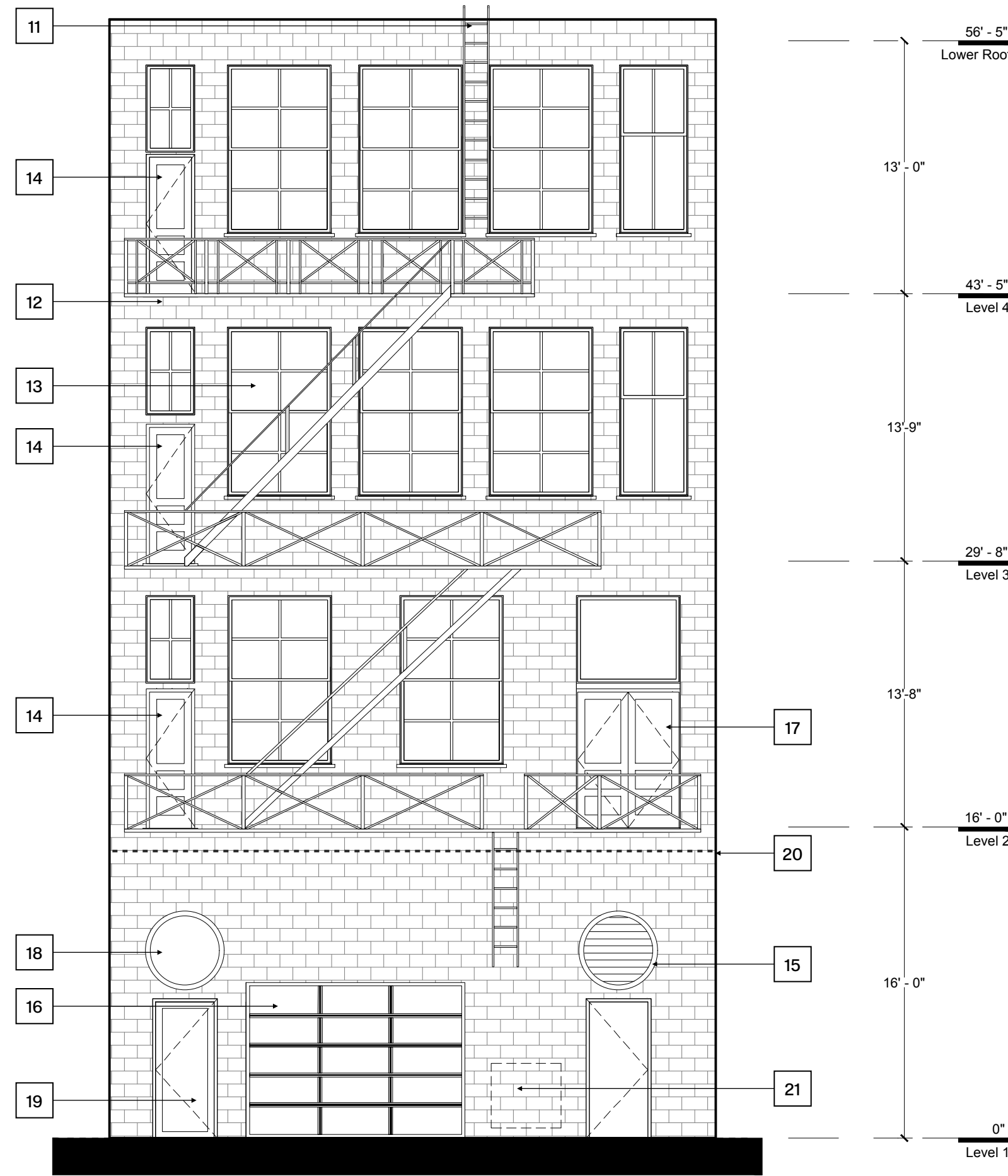


FRONT ELEVATION

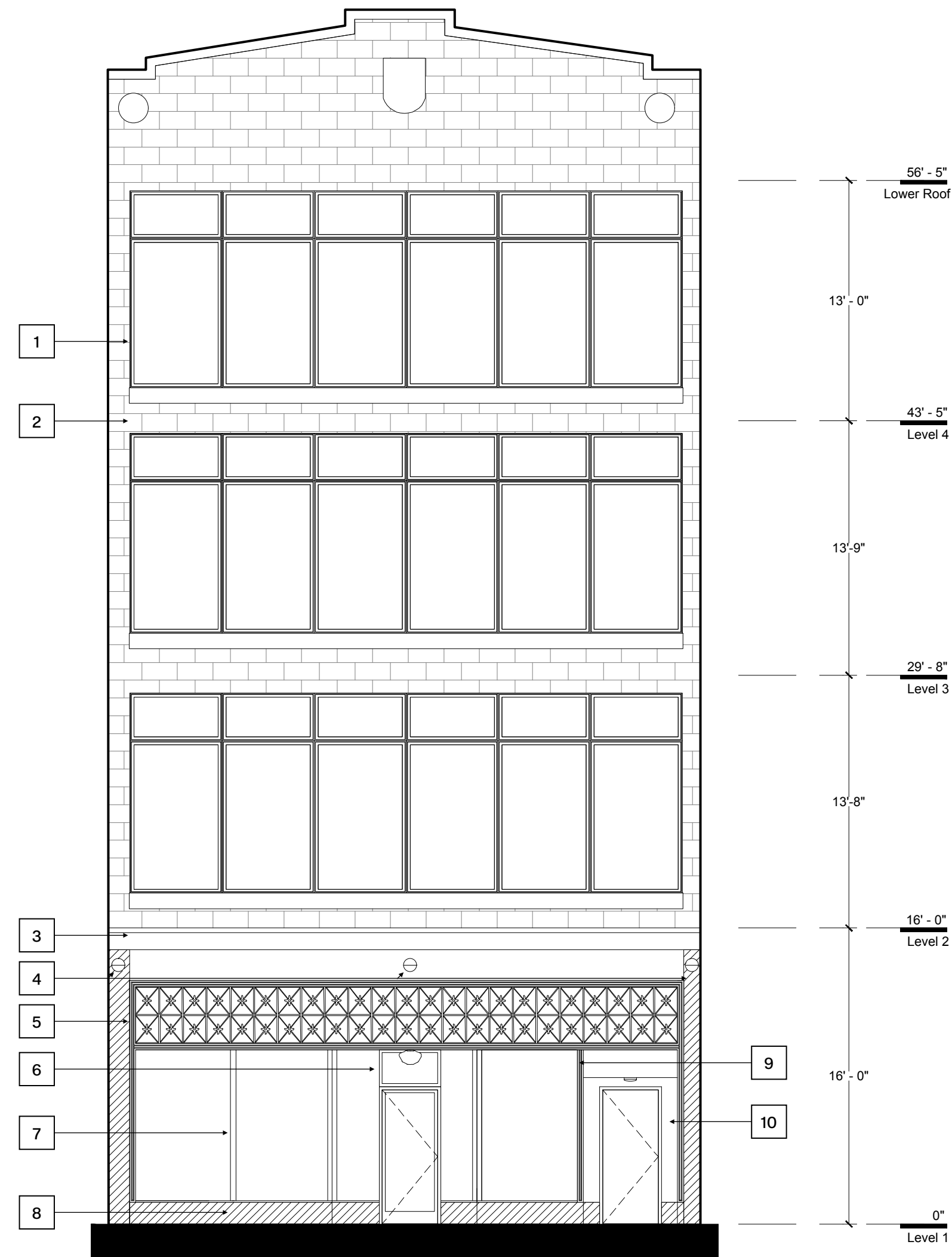
- 1 REMOVE YELLOW METAL BAND ELEMENT
- 2 REMOVE PLYWOOD
- 3 REMOVE PLYWOOD BEHIND HISTORIC GRILLE WORK AND PREP FOR NEW GLAZING SYSTEM BEHIND. REMOVE AND COMPLETELY RESTORE GRILLE WORK FOR REINSTALLATION.
- 4 REMOVE NON-HISTORIC ENTRANCE DOOR AND STOREFRONT SYSTEM
- 5 REMOVE PLYWOOD COVERING HISTORIC GRANITE BASE
- 6 REMOVE EXISTING HOLLOW METAL DOOR THAT IS FLUSH WITH FRONT FACADE. THE ORIGINAL CONFIGURATION FOR THIS DOOR WAS IN AN ALCOVE, WHICH WILL BE RESTORED IN THE NEW WORK.
- 7 BASED ON FIELD OBSERVATIONS, THE EXISTING GRANITE STOPS AT THIS LOCATION. INSIDE THE BUILDING, THERE ARE REMNANTS OF TILED FLOOR AND TERRACOTTA ON THE SIDE WALL ADJACENT TO THE NEIGHBORING BUILDING, WHICH SUGGEST THAT THIS WAS ORIGINALLY AN ALCOVE
- 8 REMOVE HOLLOW METAL DOOR
- 9 REMOVE PLYWOOD AND EXHAUST COVERING ROUND OPENING
- 10 REMOVE HOLLOW METAL DOOR
- 11 STRUCTURAL ENGINEERING EVALUATION HAS RECOMMENDED THAT THE BRACKETS SUPPORTING THE EXISTING FIRE ESCAPE ARE STRUCTURALLY SOUND AND CAN BE REUSED, BUT THE FIRE ESCAPE ITSELF NEEDS TO BE REPLACED. SEE ATTACHED REPORT FOR REFERENCE.
- 12 MUCH OF EXISTING WIRE GLASS IS COVERED IN GRAFFITI AND CRACKED. WIRE GLASS CANNOT BE REPAIRED, AND IS NOT SAFETY RATED. REMOVE GLASS, RESTORE AND PREP FRAMES TO BE REGLAZED.

1315 BROADWAY – SUGGESTED EXTERIOR ELEVATIONS

KEYNOTES



REAR ELEVATION



FRONT ELEVATION

- 1 EXISTING WINDOWS TO BE RESTORED, REPAIRED, PAINTED AND PINNED SHUT.
- 2 EXISTING TERRA-COTTA TO BE RESTORED/REPAIRED.
- 3 NEW METAL AWNING TO REPLACE ALUMINUM BAND.
- 4 NEW SCONCES W/ HISTORIC PROFILE, SEE SPEC.
- 5 GRILLWORK TO BE SALVAGED AND PAINTED BLACK. MISSING DECORATIVE LEAVES TO BE PATTERNED AND REPLACED. DECORATIVE LEAVES TO BE PAINTED METALLIC BRASS COLOR. GLASS TRANSOM RESTORED BEHIND GRILLWORK.
- 6 NEW STOREFRONT SYSTEM, GLAZED ALUMINUM ENTRANCE DOOR, AND TRANSOM IN RECESSED CONFIGURATION.
- 7 NEW STOREFRONT. BASIS OF DESIGN: KAWNEER 451T.
- 8 BLACK GRANITE BASE AND SIDE COLUMNS TO BE RESTORED, REPAIRED, OR INFILLED WITH MATCHING GRANITE (WHERE MISSING).
- 9 FLUTED TRIM TO BE RESTORED AND REPAINTED.
- 10 RECESS NEW DOOR IN ALCOVE TO MATCH HISTORIC ALCOVE DIMENSIONS. SIDE WALLS AND ALCOVE WALL TO BE CLAD WITH BLACK BREAK METAL. INSTALL NEW FLUSH ALUMINUM DOOR.
- 11 ROOF LADDER TO BE RESTORED/REPAIRED.
- 12 NEW FIRE ESCAPE TO BE INSTALLED TO MATCH PROFILES, DIMENSIONS, AND CONFIGURATION OF EXISTING FIRE ESCAPE, UTILIZING EXISTING MOUNTING BRACKETS.
- 13 THE EXISTING WIRED GLASS IS NOT SAFETY RATED. REMOVE EXISTING GLASS, RESTORE STEEL FRAMES (SEE WINDOW REPORT) AND PROVIDE NEW SAFETY AND 45 MINUTE FIRE RATED CLEAR GLASS TO COMPLY WITH CODE REQUIREMENTS. PAINT COLOR: BLACK.
- 14 PATTERN OF EXISTING WOOD DOUBLE-DOOR REPLICATED FOR ALL REAR FIRE ESCAPE DOORS.
- 15 LOUVRE VENT TO BE INSTALLED FOR FUTURE F&B TENANT.
- 16 NEW GLASS-FRONT GARAGE DOOR.
- 17 DOUBLE-DOOR TO BE RESTORED & SEALED SHUT.
- 18 ROUND WINDOW TO BE RESTORED & REPLACED.
- 19 NEW GLASS DOOR FOR OFFICE TENANT ENTRYWAY.
- 20 NEW GRAFFITI ART TO BE REPAINTED. TOP OF GRAFFITI SHALL NOT EXTEND BEYOND UPPER LIMIT OF EXISTING GRAFFITI.
- 21 ELECTRICAL METER BANK LOCATION

1315 BROADWAY - VIEW 1

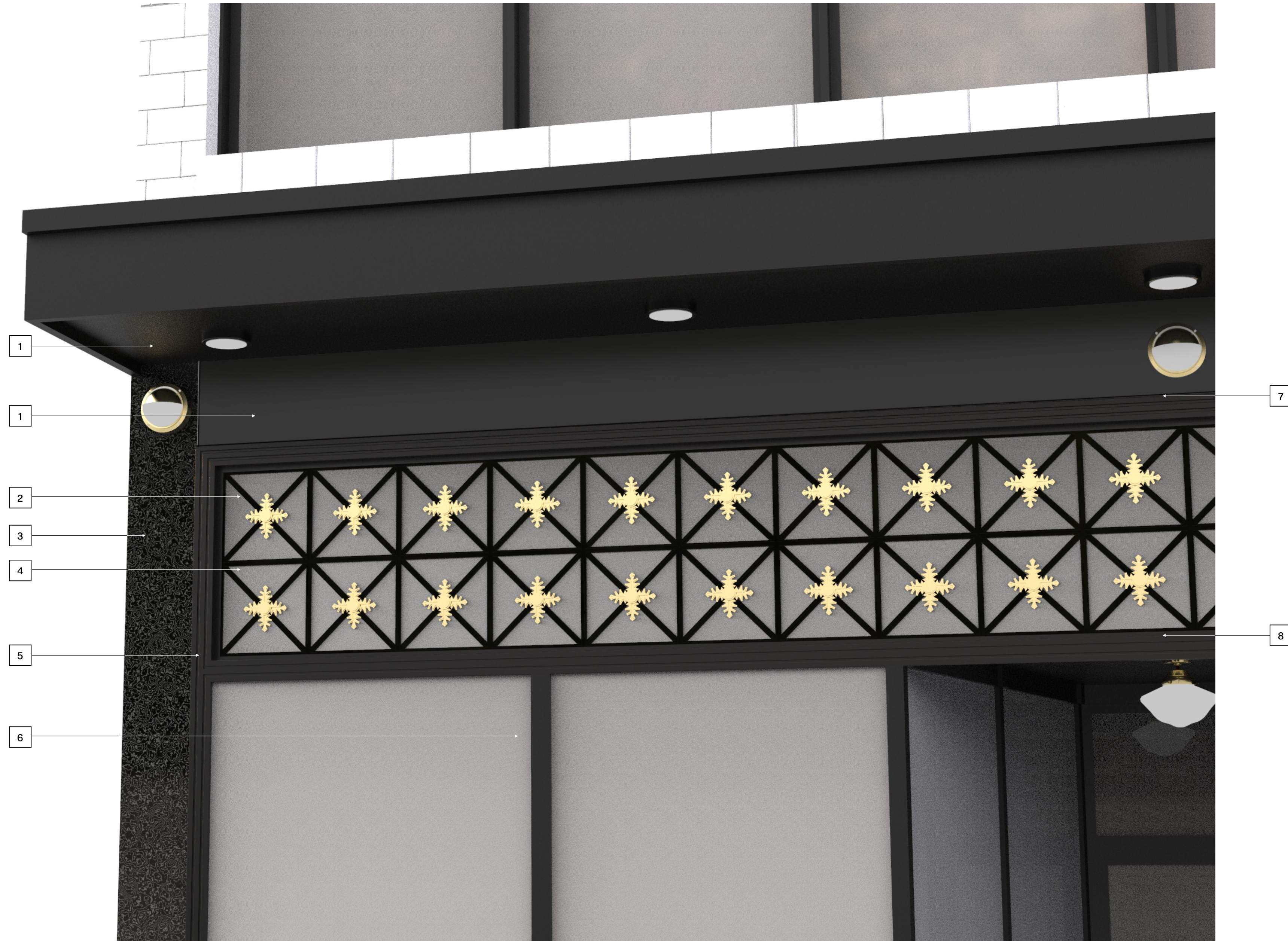


KEYNOTES

- 1 EXISTING WINDOWS TO BE RESTORED, REPAIRED, PAINTED BLACK AND PINNED SHUT
- 2 EXISTING TERRA-COTTA TO BE RESTORED/REPAIRED
- 3 NEW METAL AWNING TO REPLACE ALUMINUM BAND
- 4 LT-01 THOMAS O'BRIAN PELHAM 10" WALL SCONE IN HAND-RUBBED ANTIQUE BRONZE
- 5 GRILLWORK TO BE SALVAGED AND PAINTED BLACK. MISSING DECORATIVE LEAVES TO BE PATTERNED AND REPLACED. DECORATIVE LEAVES TO BE PAINTED METALLIC BRASS COLOR. GLASS TRANSOM RESTORED BEHIND GRILLWORK.
- 6 HW-01 EMTEK 18" CENTERS JASPER CONCEALED PULL
- 7 HW-02 EMTEK MODERN DISC SINGLE CYLINDER DEADBOLT
- 8 TYPICAL UP LIGHTING AND DOWN LIGHTING ON AWNING
- 9 AWNING CLAD WITH BLACK BRAKE METAL
- 10 FACADE TOP PANEL CLAD WITH BLACK BRAKE METAL.
- 11 LT-02 BARN LIGHT ELECTRIC CO. ACORN SCHOOLHOUSE SEMI-FLUSH.
- 12 LT-03 WAC LIGHTING YORK 12" WIDE LED DRUM CEILING FIXTURE.
- 13 GRANITE FACADE TO BE RESTORED & REPLACED AT BASE AND LEFT AND RIGHT SIDE COLUMNS
- 14 FLUSH ALUMINUM ENTRANCE DOOR, BLACK. HW-03 DETROIT ESCUTCHEON ENTRANCE SET
- 15 ST-01 NEW STOREFRONT SYSTEM, GLAZED ALUMINUM ENTRANCE DOOR, AND TRANSOM IN RECESSED CONFIGURATION.
- 16 ALCOVE WALLS AND CEILING CLAD WITH BLACK BREAK METAL

KEYNOTES

- 1 BLACK BRASS METAL
- 2 RESTORE GRILLE WORK AND REPLACE MISSING LEAVES WITH NEW. PAINT LEAVES WITH SATIN BRASS METALLIC PAINT
- 3 BLACK GRANITE ON LEFT AND RIGHT COLUMNS
- 4 NEW TRANSLUCENT GLAZING SYSTEM BEHIND GRILLEWORK
- 5 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)
- 6 NEW STOREFRONT SYSTEM WITH CLEAR GLASS
- 7 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)
- 8 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)





KEYNOTES

- 1 BLACK BRAKE METAL
- 2 RESTORE GRILLE WORK AND REPLACE MISSING LEAVES WITH NEW. PAINT LEAVES WITH SATIN BRASS METALLIC PAINT
- 3 BLACK GRANITE ON LEFT AND RIGHT COLUMNS
- 4 NEW TRANSLUCENT GLAZING SYSTEM BEHIND GRILLEWORK
- 5 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)
- 6 NEW STOREFRONT SYSTEM WITH CLEAR GLASS
- 7 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)
- 8 EXISTING HISTORIC TRIM TO REMAIN. REPAINT (BLACK)
- 9 INTERIOR ALCOVE TO BE BLACK BREAK METAL WITH GRANITE BASE

1315 BROADWAY – EXTERIOR SPECS



LT-01

EXTERIOR SCONCE
BRAND: THOMAS O'BRIEN
STYLE: PELHAM 10" WALL SCONCE
FINISH: HAND-RUBBED ANTIQUE BRASS
#9010656



LT-02

EXTERIOR SEMI-FLUSH FIXTURE
BRAND: BARN LIGHT ELECTRIC CO.
STYLE: ACORN SCHOOLHOUSE SEMI-FLUSH
FINISH: OPAQUE GLASS / RAW BRASS
#BLE-FSF-ACN



LT-03

EXTERIOR FLUSH MOUNT
BRAND: WAC LIGHTING
STYLE: YORK 12" WIDE LED DRUM CEILING FIXTURE
FINISH: AGED BRASS
#FM-45012-AB



HW-01

EXTERIOR DOOR PULL
BRAND: EMTEK HARDWARE
STYLE: 18" CENTERS JASPER
CONCEALED PULL
FINISH: SATIN BRASS
#EMT-345973



HW-02

EXTERIOR DOOR DEADBOLT
BRAND: EMTEK HARDWARE
STYLE: MODERN DISC SINGLE CYLINDER DEADBOLT
FINISH: SATIN BRASS
#EMT-361489



HW-03

EXTERIOR DOOR HARDWARE
BRAND: BALDWIN HARDWARE
STYLE: DETROIT ESCUTCHEON ENTRANCE SET
FINISH: VINTAGE BRASS
#EDE01.033.ENTR



ST-01

STOREFRONT PROFILE FRAMING SYSTEM
BRAND: KAWNEER
STYLE: TRIFAB FRAMING SYSTEM
FINISH: BLACK ANODIZED
SYSTEM 451T

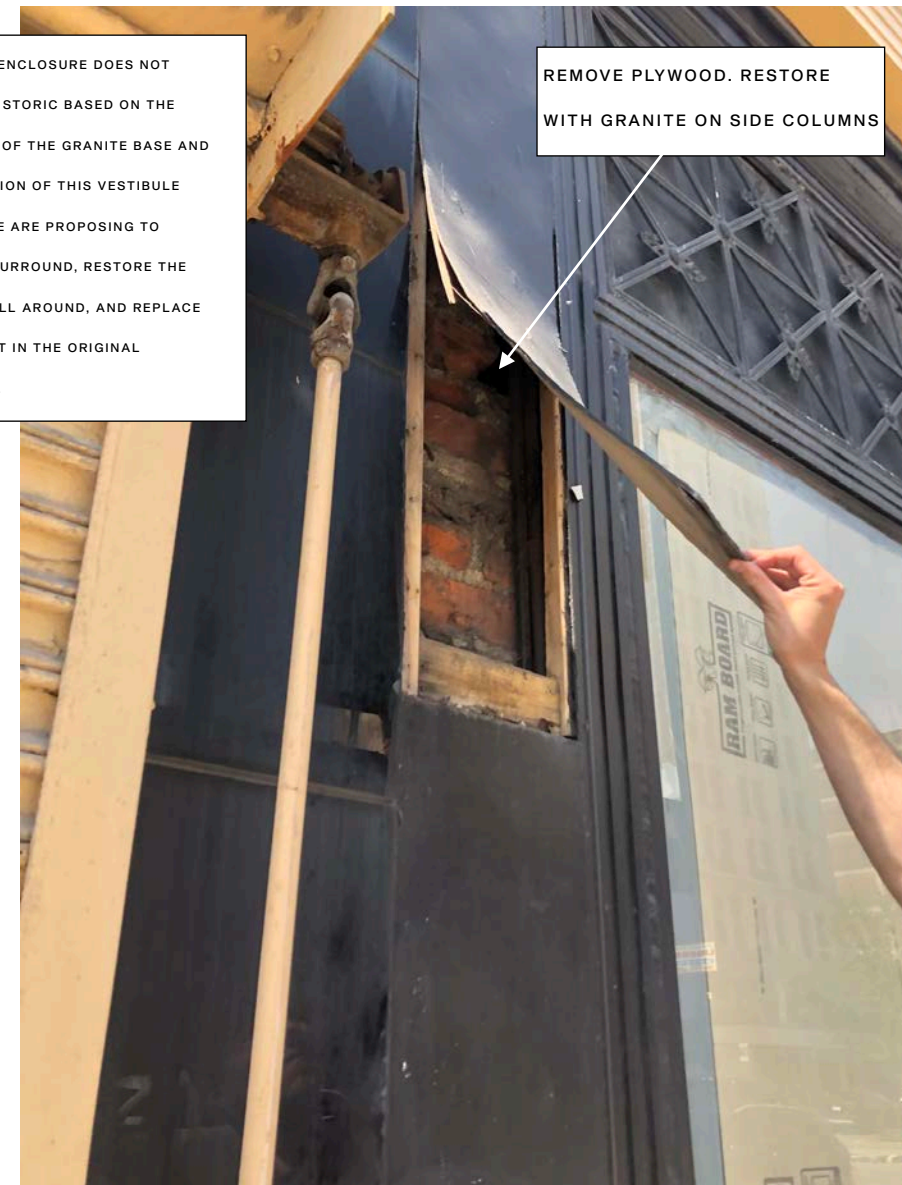
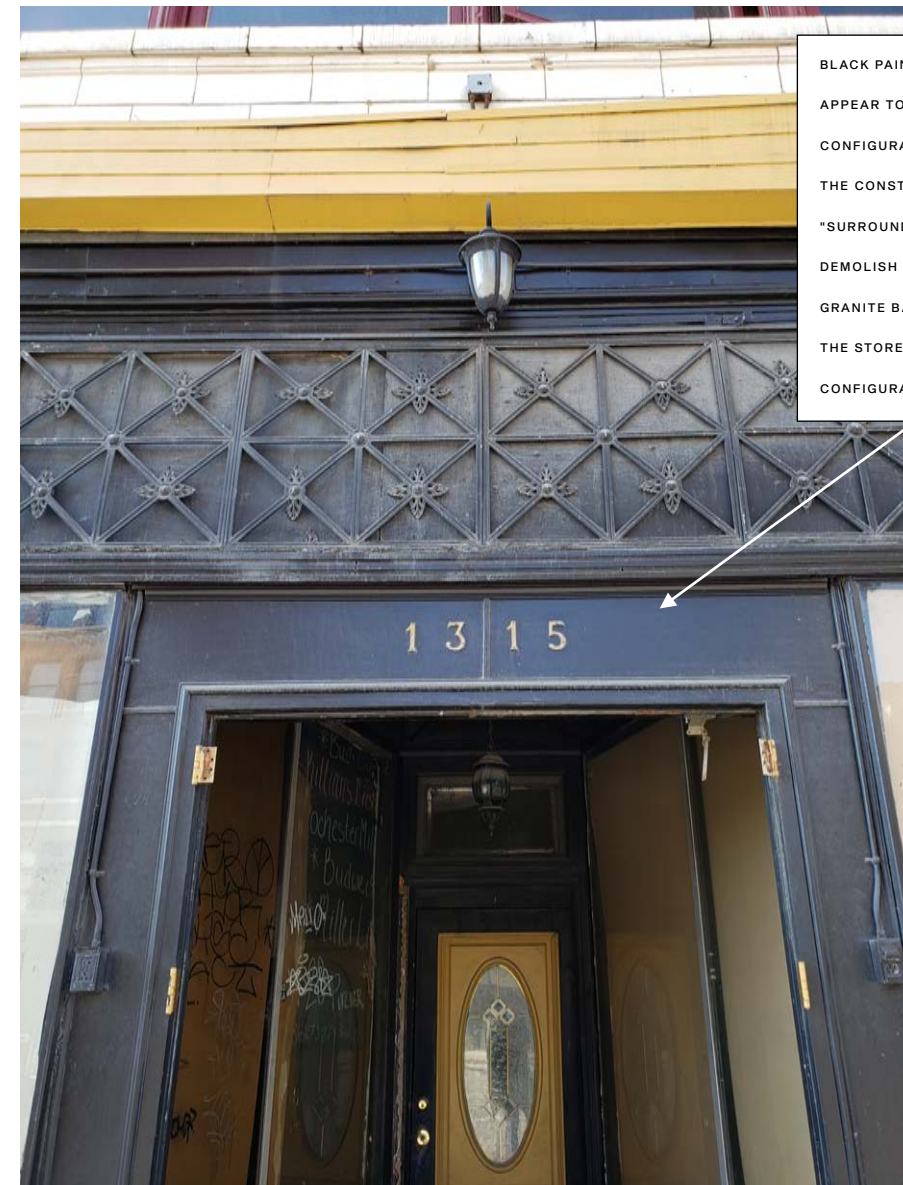
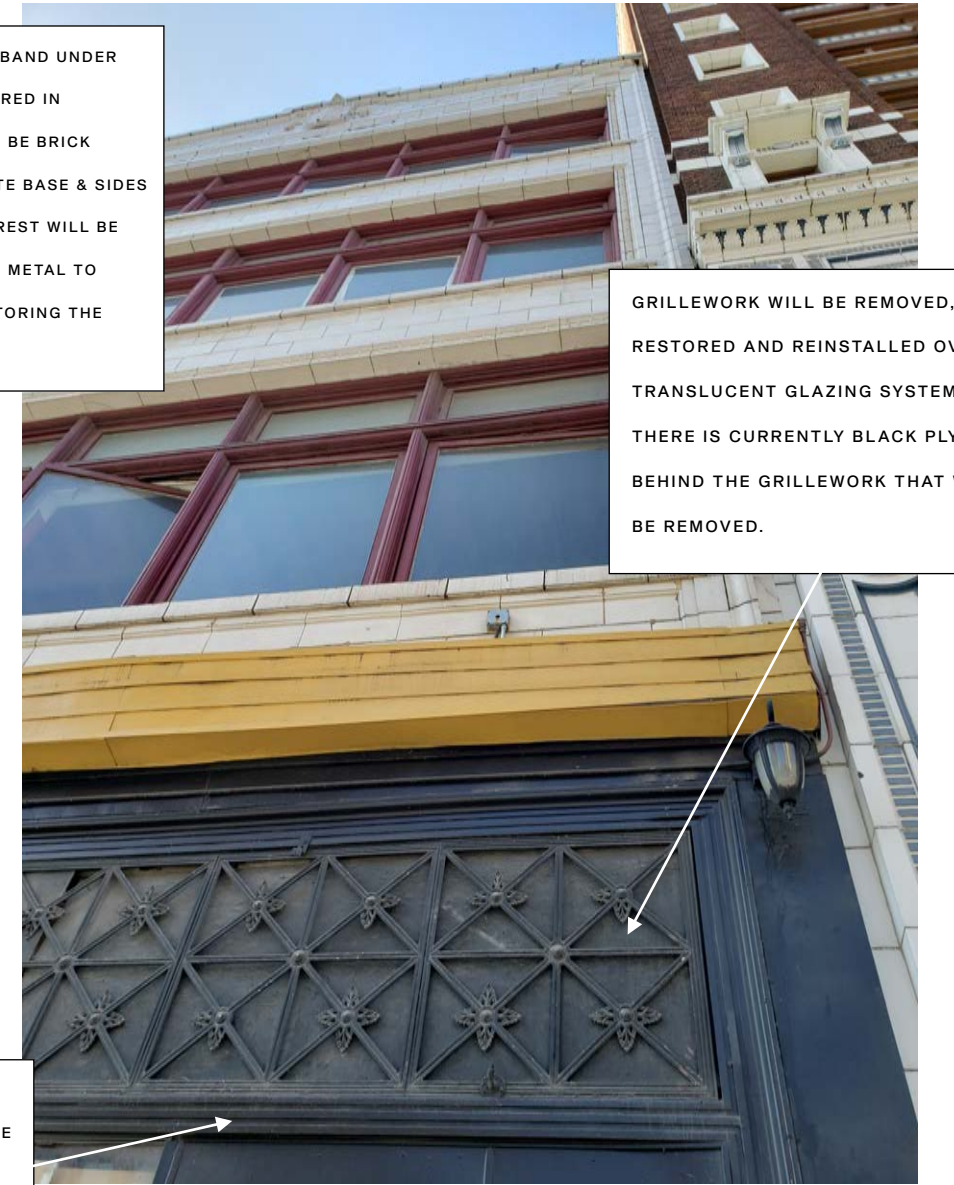
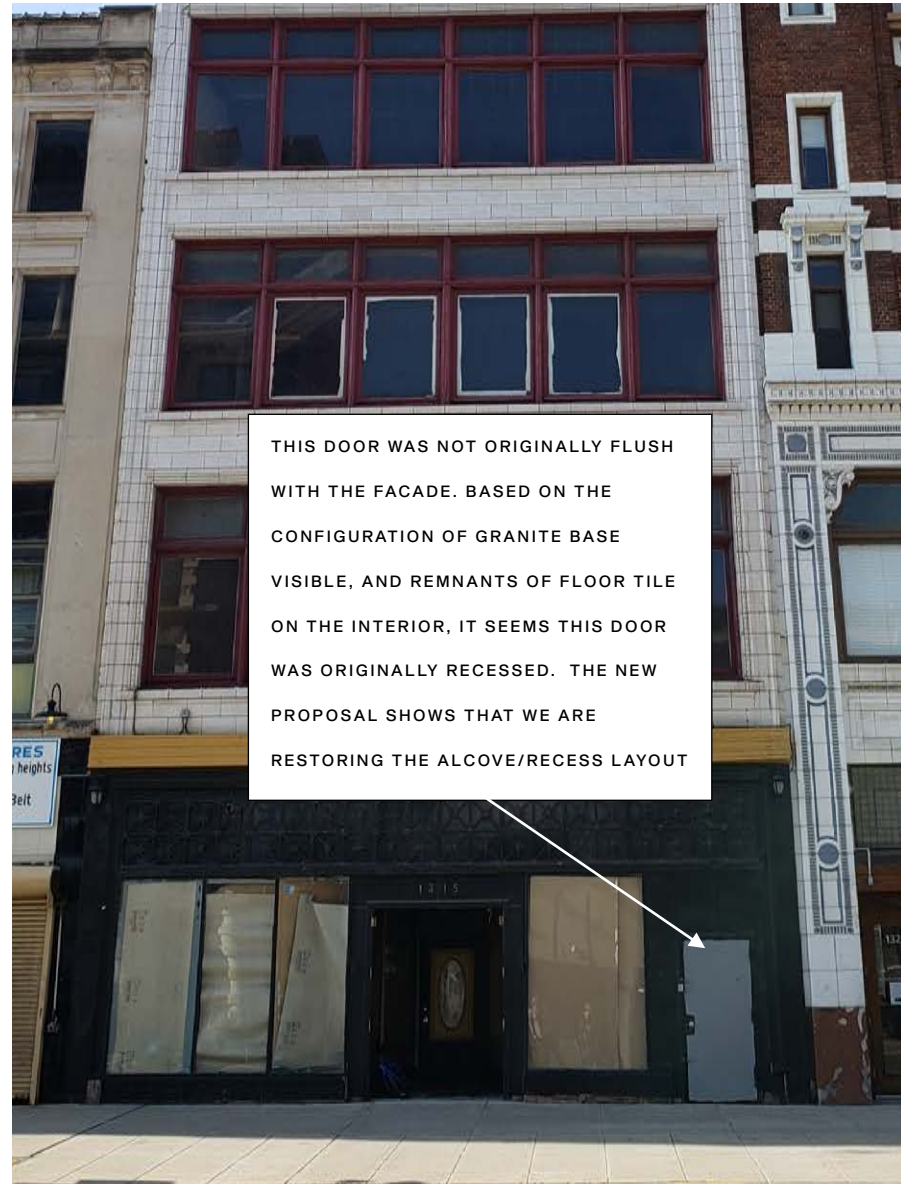


ST-01

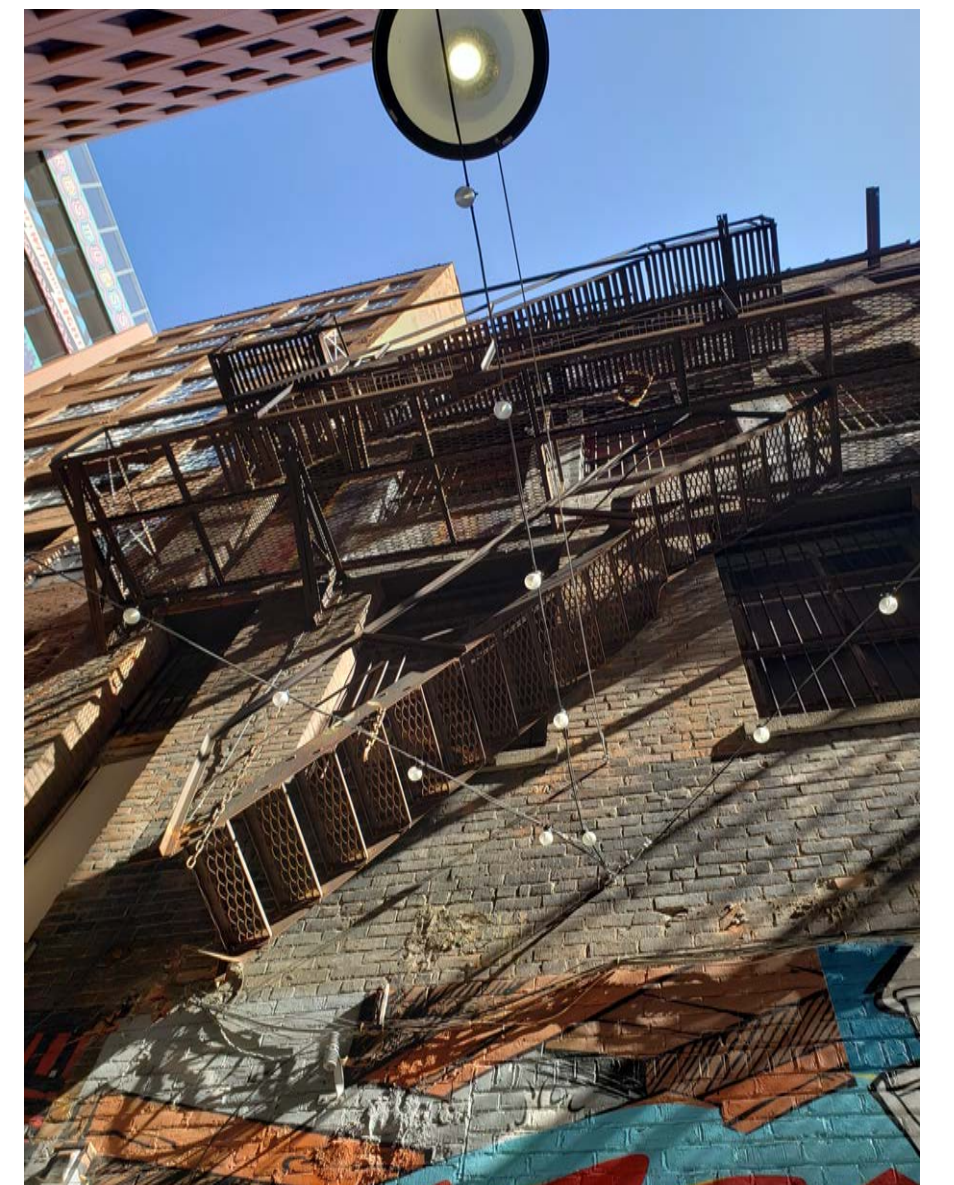
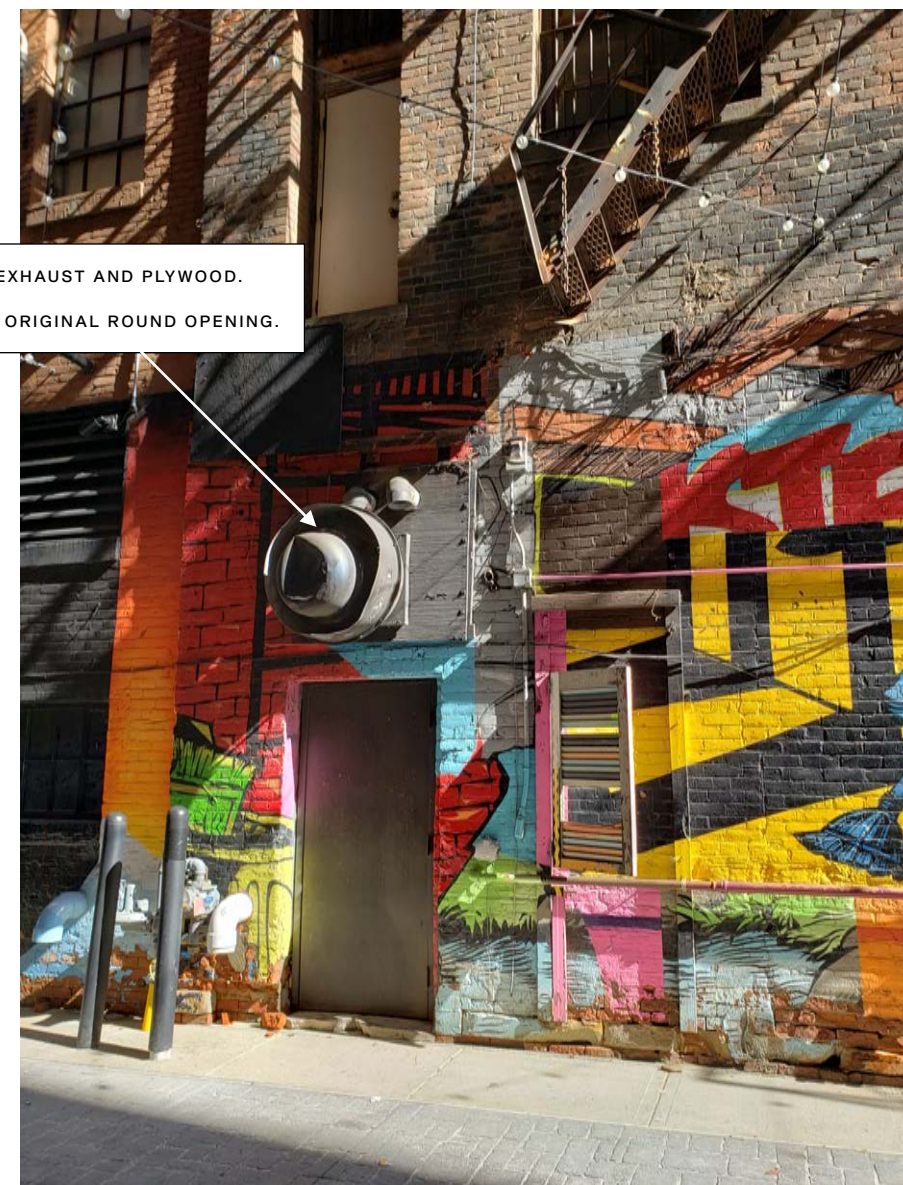
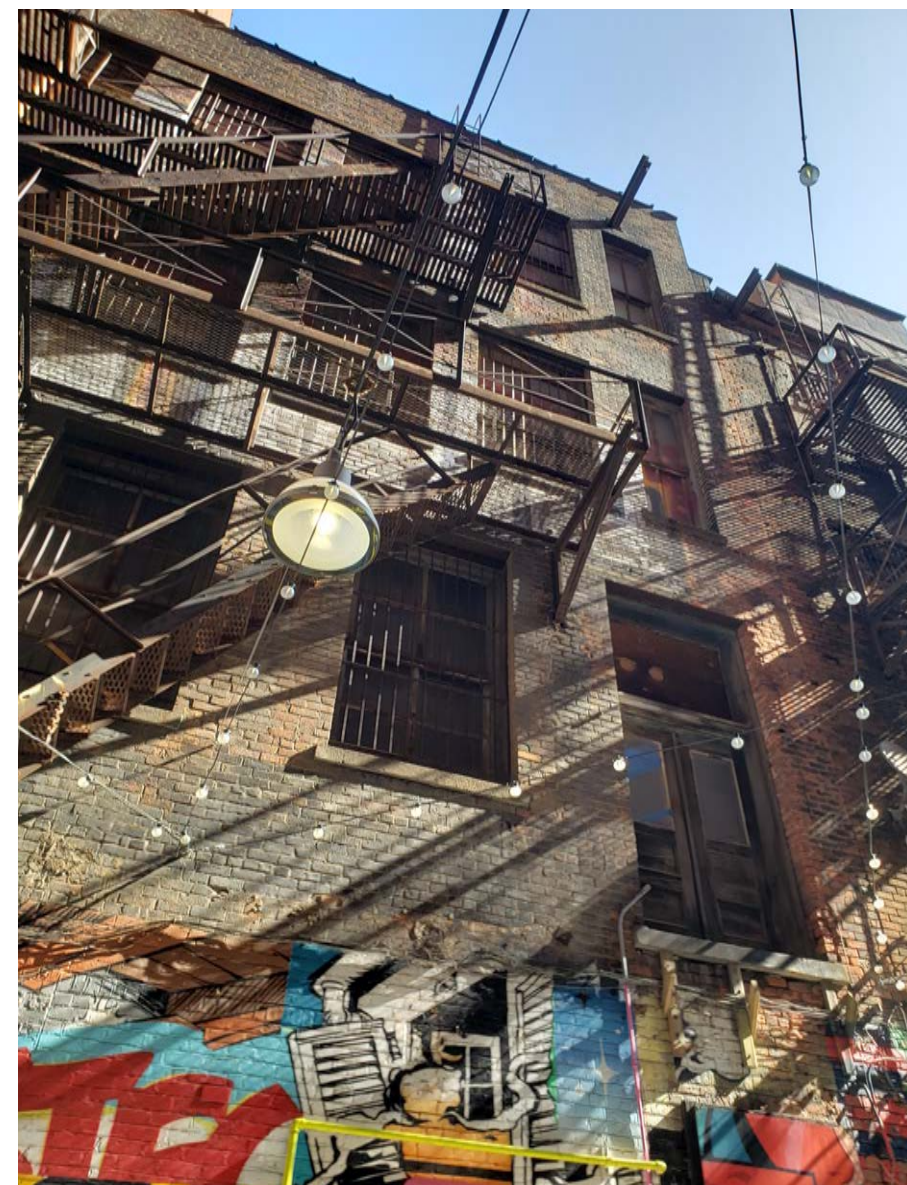
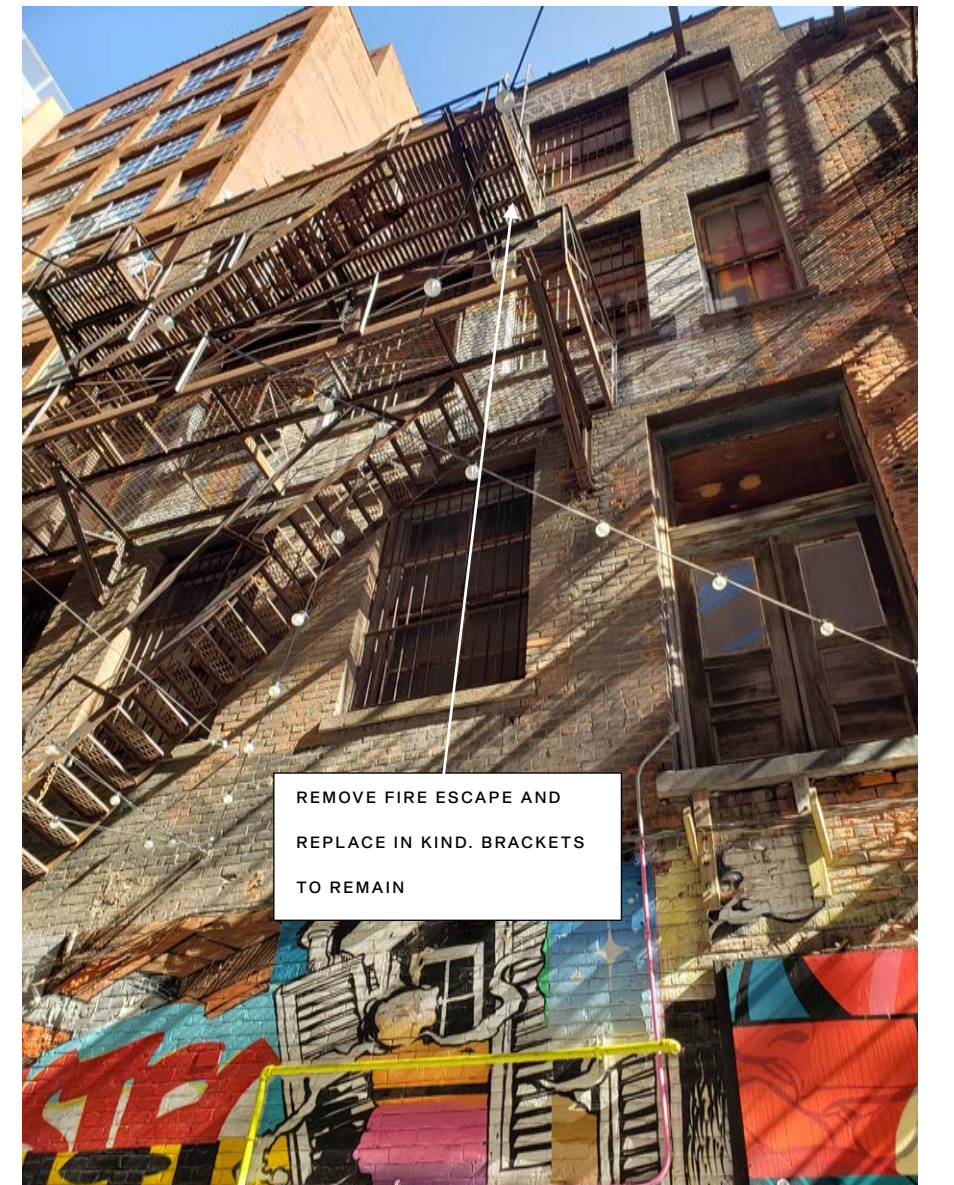
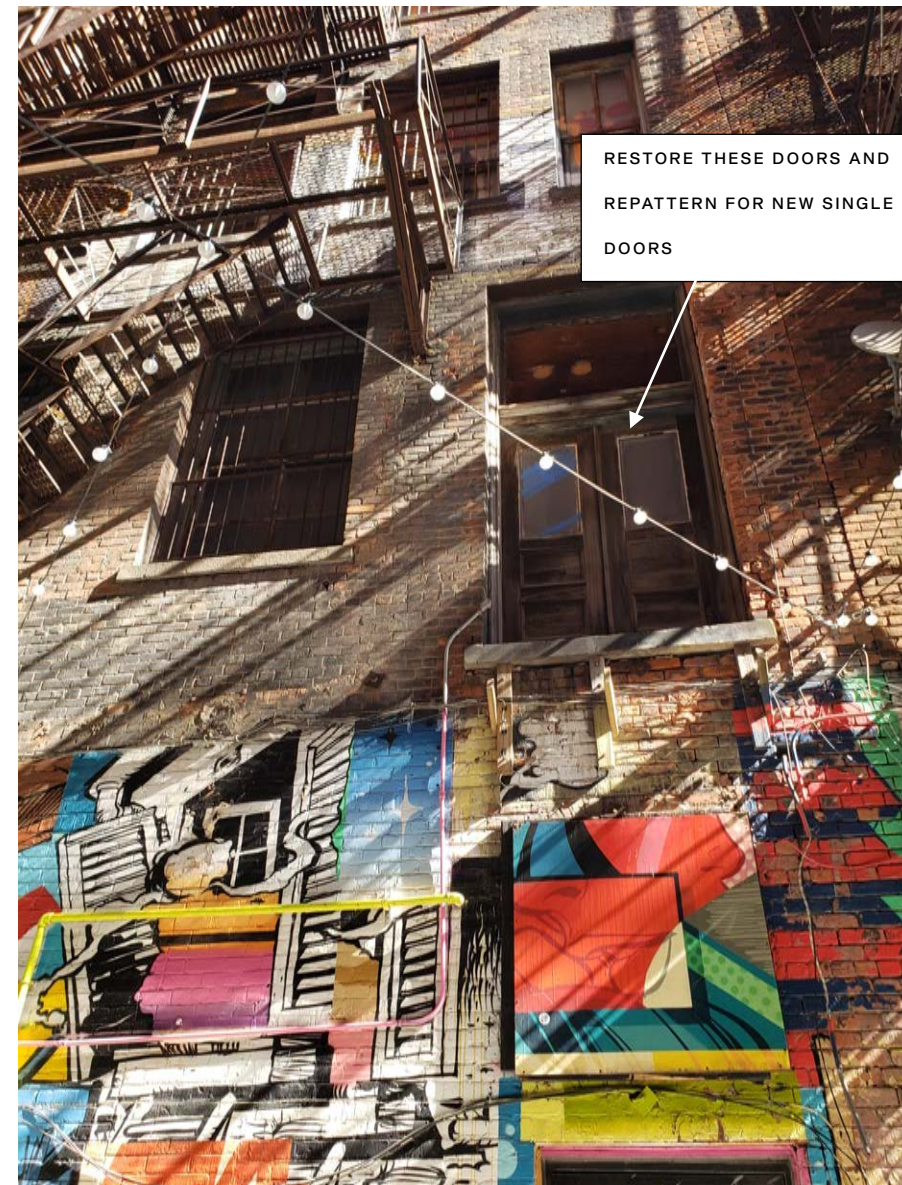
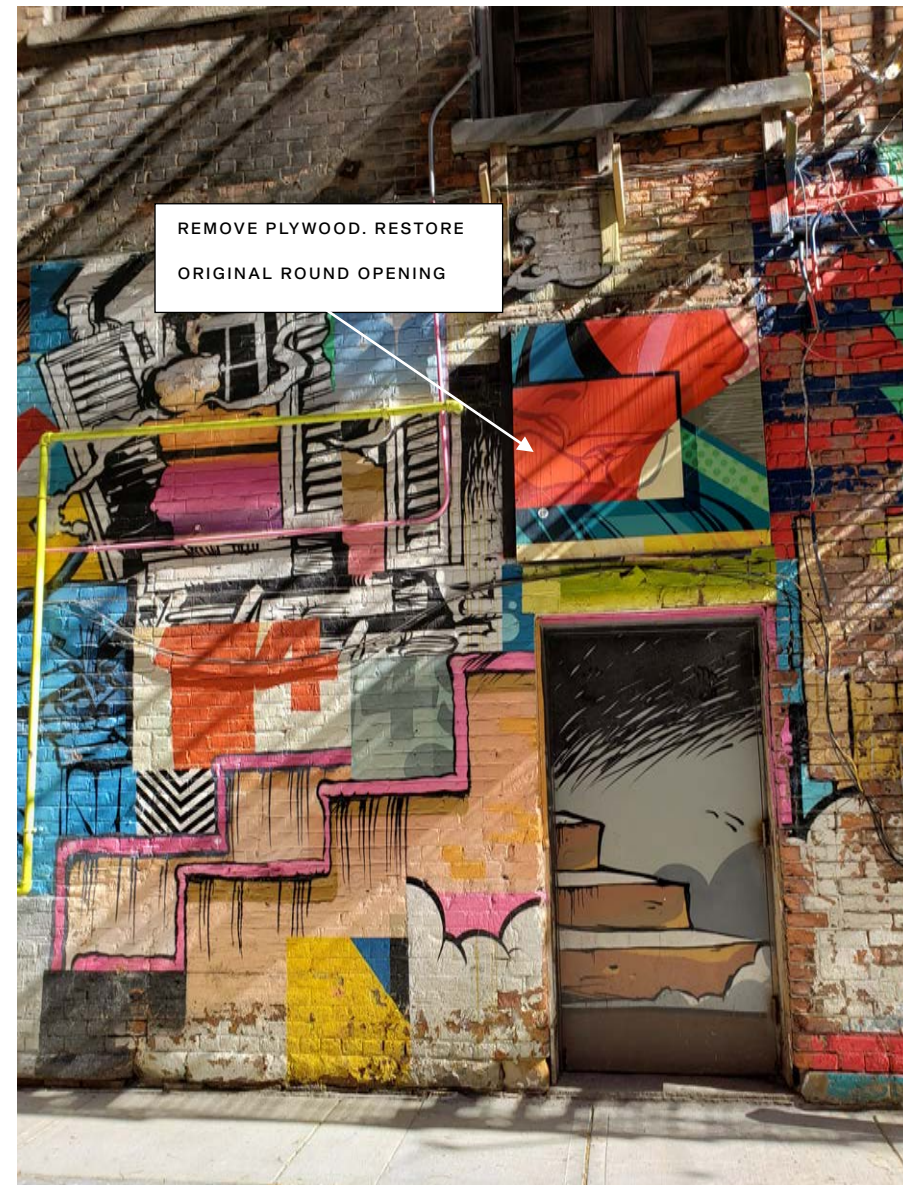
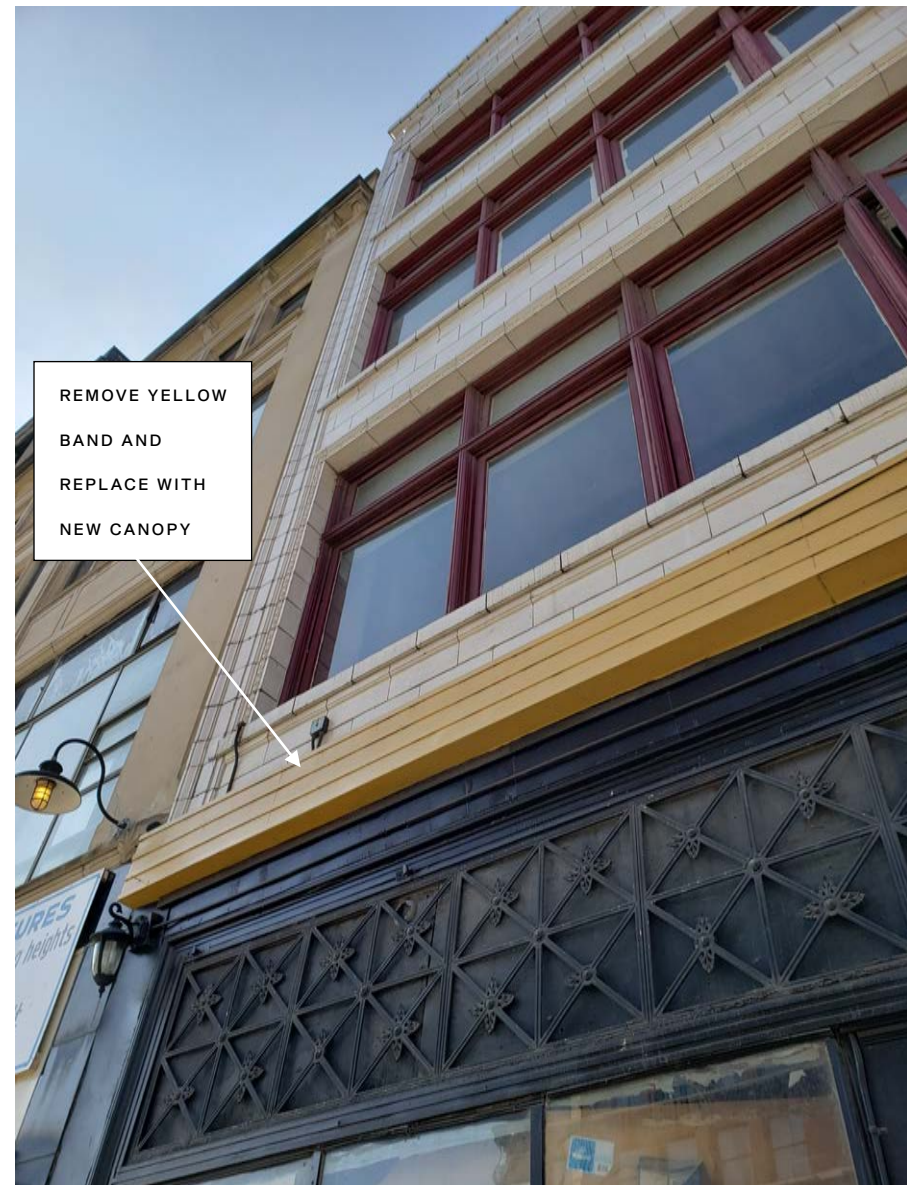
STOREFRONT PROFILE FRAMING SYSTEM
BRAND: KAWNEER
STYLE: 350 STANDARD ENTRANCE
FINISH: BLACK ANODIZED
#350

Existing Conditions

1315 BROADWAY – EXISTING CONDITIONS



1315 BROADWAY – EXISTING CONDITIONS



MAIN ENTRANCE LIGHT FIXTURE





REPAIR/RESTORE
SIDE WALL.



REFURBISH FLOOR
TILE.



REBUILD ALCOVE IN
(WHAT IS ASSUMED
TO BE) THE
ORIGINAL LOCATION





Kidorf Preservation Consulting

451 E. Ferry Street, Detroit, Michigan 48202 313-300-9376

September 22, 2021

TO: Amelia Zamir, Method Development

FR: Kristine Kidorf, Kidorf Preservation Consulting

RE: 1315 Broadway, history

Per the *Proposed Broadway Historic District Final Report* prepared by the City of Detroit Historic Designation Advisory Board the building at 1315 Broadway (aka 1313-1319 Broadway) was constructed as a two-story building in 1912 and designed by Smith, Hinchman & Grylls. In 1915 the building was expanded to its current four-stories tall. The storefronts were remodeled in 1927 and have subsequently been altered.

According to various years of *Polk's Detroit City Directories* and *The Detroit Free Press* the building has had a variety of uses over its lifetime.

The building's address before 1920 was 27-29 Broadway. D. Levy and Sons, a purveyor of fish, oysters, and game occupied the building from at least 1915 until 1922. Additionally, between at least 1922 and 1926 the building also contained the Broadway Bowling and Billiard Hall.

BOWLERS
Make Your League Reservations
Now
Reduced Prices
Bowling — 15c per line
Billiards—50c per hour
10 Alleys — 13 Tables
Centrally Located
**Broadway Bowling
and Billiard Hall**
1319 Broadway Cherry 4314

Detroit Free Press, September 2, 1922

As early as 1926 a movie theater was located in the building, a 1933 *Detroit Free Press* article refers to a fire in the Republic Theater in the building.

Movie Patrons Flee Fire

Movie-goers fled to the street Monday noon when film caught fire in the projection booth of the Republic Theater, 1315 Broadway. The projection room was ablaze when fire apparatus arrived but the fire was extinguished quickly. The fire attracted a large crowd.

Detroit Free Press, June 13, 1933

In 1936 R. M. Hansen Inc. opened in the building selling floor coverings.

R. M. Hansen, Inc., Opens New Store

A new floor-covering specialty store, R. M. Hansen, Inc., has been opened at 1315 Broadway, according to an announcement made Saturday by R. M. Hansen, owner and manager. The new store is presenting complete lines of carpets, rugs, linoleum, Oriental rugs and other floor coverings. Mr. Hansen has been associated with the floor-covering business for the past 10 years and was a member of McGuire & Hansen, Inc.

Detroit Free Press, December 20, 1936

In the late 1940s Broadway Furniture was located in the building.

A REPOSSESSED 3 ROOMS of furniture; can be bought cheap; includes 5-pc. blue mohair living room set, 9x12 rug, 2 tables and lamps, 3-pc. blond bedroom set with springs and mattress, 5-pc. chrome dinette, GAS RANGE and REFRIGERATOR.
\$100 Takes It Home
BROADWAY FURNITURE
1315 BROADWAY

A 1948 NEW electric range can be bought reasonable. **BROADWAY FURNITURE, 1315 BROADWAY.**

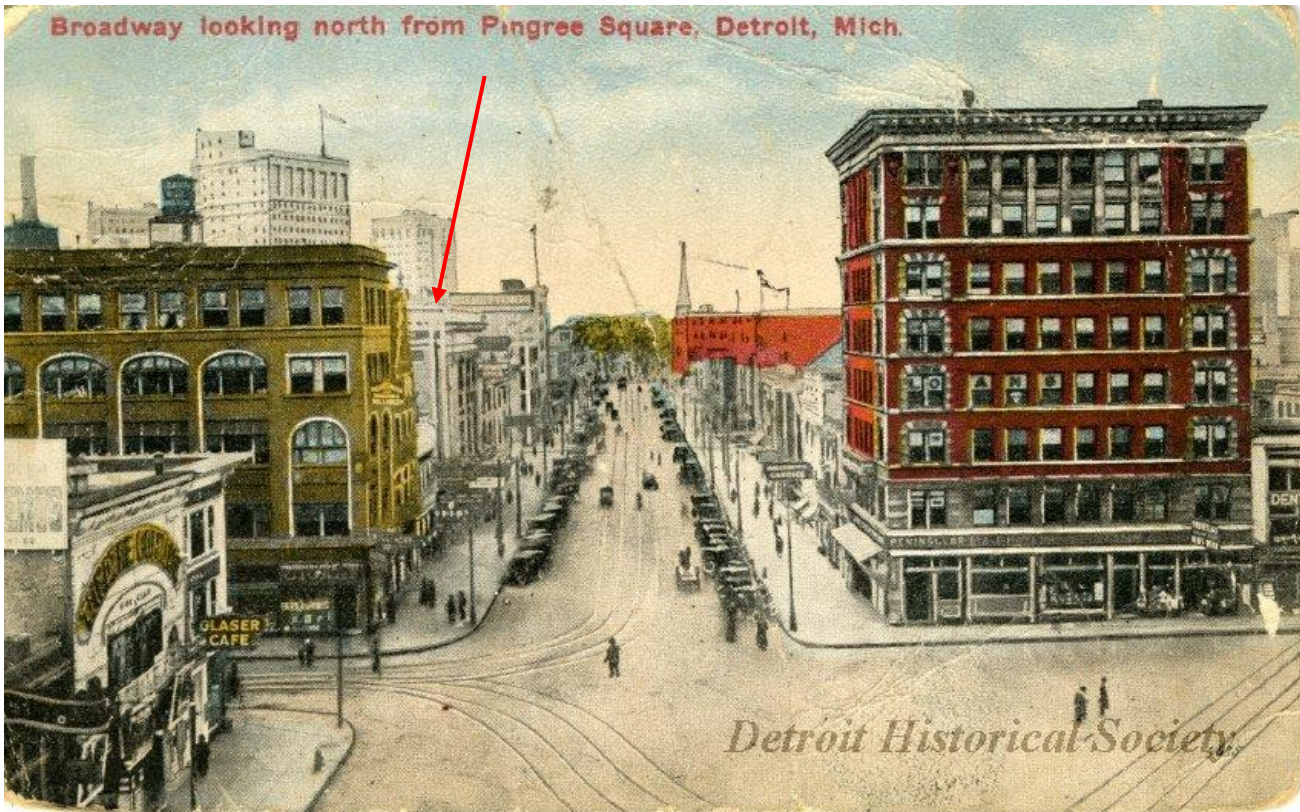
Detroit Free Press, June 20, 1949

Richard's Shoes occupied the building from 1954 until 1980.

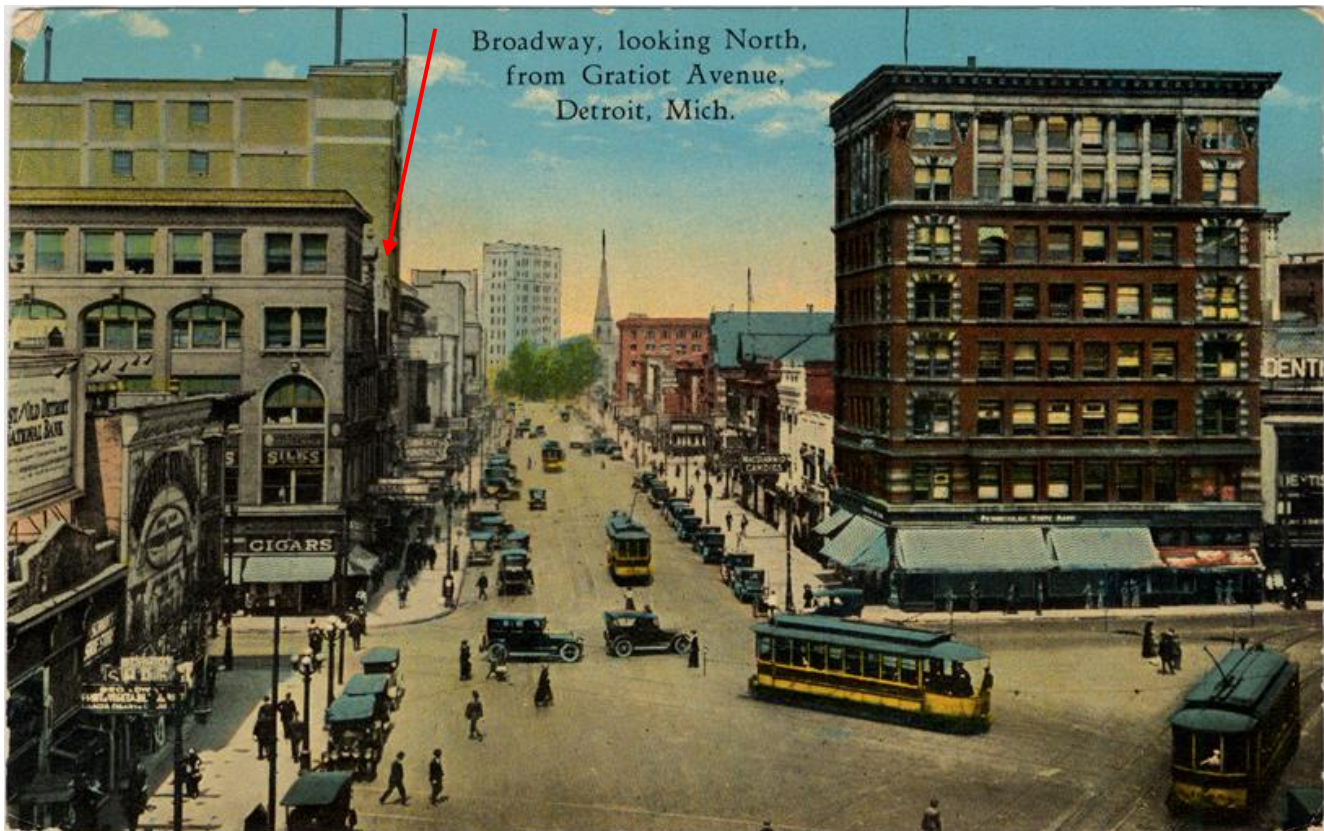


1976 Detroit Survey photograph

Since 1980 the building has been a night club and a private club. It is currently vacant.



1916 postcard showing the building soon after stories added. Property *Detroit Historical Society*.



1924 postcard showing possible marquis above storefront. Property *Detroit Public Library*.



1957 photo, property Detroit Public Library

RESURGET ENGINEERING

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Garrett Ross
Method Development
6540 St. Antoine Street
Detroit, MI 48226

October 15, 2021

Dear Garrett,

1315 Broadway/Fire Escape Condition Assessment/RE#21209

On October 6, 2021, we met with you at 1315 Broadway, Detroit to perform a condition assessment of the existing exterior fire escape. The fire escape in its current condition is deteriorated and unsafe, but it can be rehabilitated. Repairs must be made before the fire escape can be used as an egress. Our on-site observations are limited because we were unable to walk on the fire escape due to its condition.



Figure 1: 1315 Broadway Fire Escape

1315 Broadway is constructed of four-story building with structural brick exterior walls. The fire escape is located in the alley at the rear of the building [Figure 1]. It is mounted to the brick wall with through-bolted brackets [Figure 2]. The second-floor landing and stairs to ground level were removed at an unknown prior date. The fire escape begins as second floor stairs and runs to the fourth floor. Ladder access is present from the fire escape to the roof. The ladder is not part of Resurget's scope.

Overall, the fire escape shows signs of moderate to severe deterioration. There are areas on the second-floor stairs where the railing is warped out of plane. Railing sections are thin rusted steel [Figure 3]. Some stair treads have rusted out and fallen to the level below [Figure 4]. The open bar grating is rusted and does not appear to be securely attached to the supporting steel beams. At the fourth floor, the metal slats at the landing are rusted and warped [Figure 5]. Railing welds appear to be deteriorated and failing. The brackets are rusted and may need rehabilitation. The brick supporting the fire escape did not have apparent signs of damage, but a more detailed assessment of the masonry using a lift should be made as part of the rehabilitation design [Figure 6].

We recommend engaging a steel contractor as a partner in the rehabilitation work. Stair treads and bar grating should be removed and replaced. The landing beams should be cleaned of rust. The dimensions of those beams should be used for a structural capacity check. The connection brackets should be cleaned. Any warped or severely rusted pieces should be replaced. Existing bracket welds should be assessed for deterioration.

Repair details are outside the scope of this investigation. We would be happy to provide a proposal for the repair work.

Yours sincerely



Stacey Brown
Senior Structural Engineer



Figure 2: Bracket Support



Figure 3: Rusted Rail



Figure 4: Fallen Stair Tread

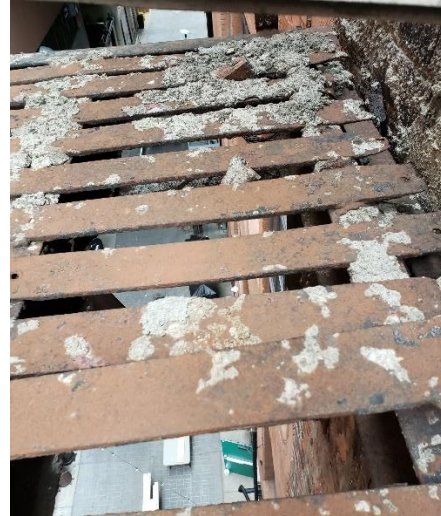


Figure 5: Warped Metal Slats

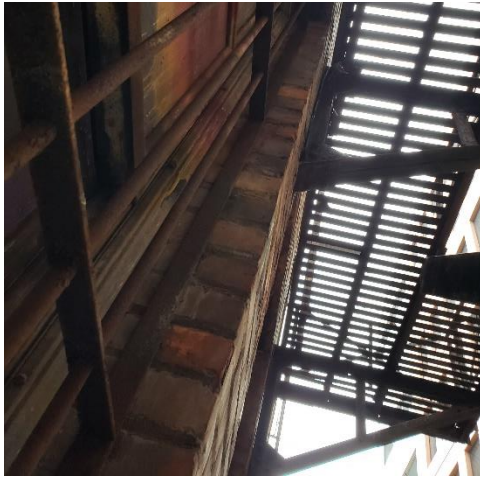


Figure 6: Brick at Bracket



Artisan Renovations LLC

Historic • Restoration • Solutions

www.artisan-renovationsllc.com

ASSESSMENT

Project Address:

7 October 2021

**1315 Broadway
Detroit, MI**

Units Assessed:

East Elevation: (Qty. 18) Full-Lite Pivot windows, (Qty. 18) Full-Lite Hopper Windows

West Elevation: (Qty. 8) Steel SH 4/4 Windows, (Qty. 2) Steel SH 2/2 Windows, (Qty. 3) Steel 4-Lite Fixed Windows, (Qty. 1) Fixed Transom - Glass is missing

EAST ELEVATION DISCOVERY

- (18) Outswing pivot windows and (18) hopper windows to be fully restored (Photo #1)
- Sills and frames are in very good condition. No “wood rot” evident on any unit. Wood sills and entire window frames to be restored and repainted (Photo #2)
- Several units have damaged or missing glazing stop. All damaged glazing trim on sash to be restored and/or replaced with exact replica as needed (Photo #3)
- Some units have damaged or missing inner stop and mullion trim. All existing inner stop to be restored or new will be fabricated where missing or damaged beyond restoration (Photos #4, 5 & 6)

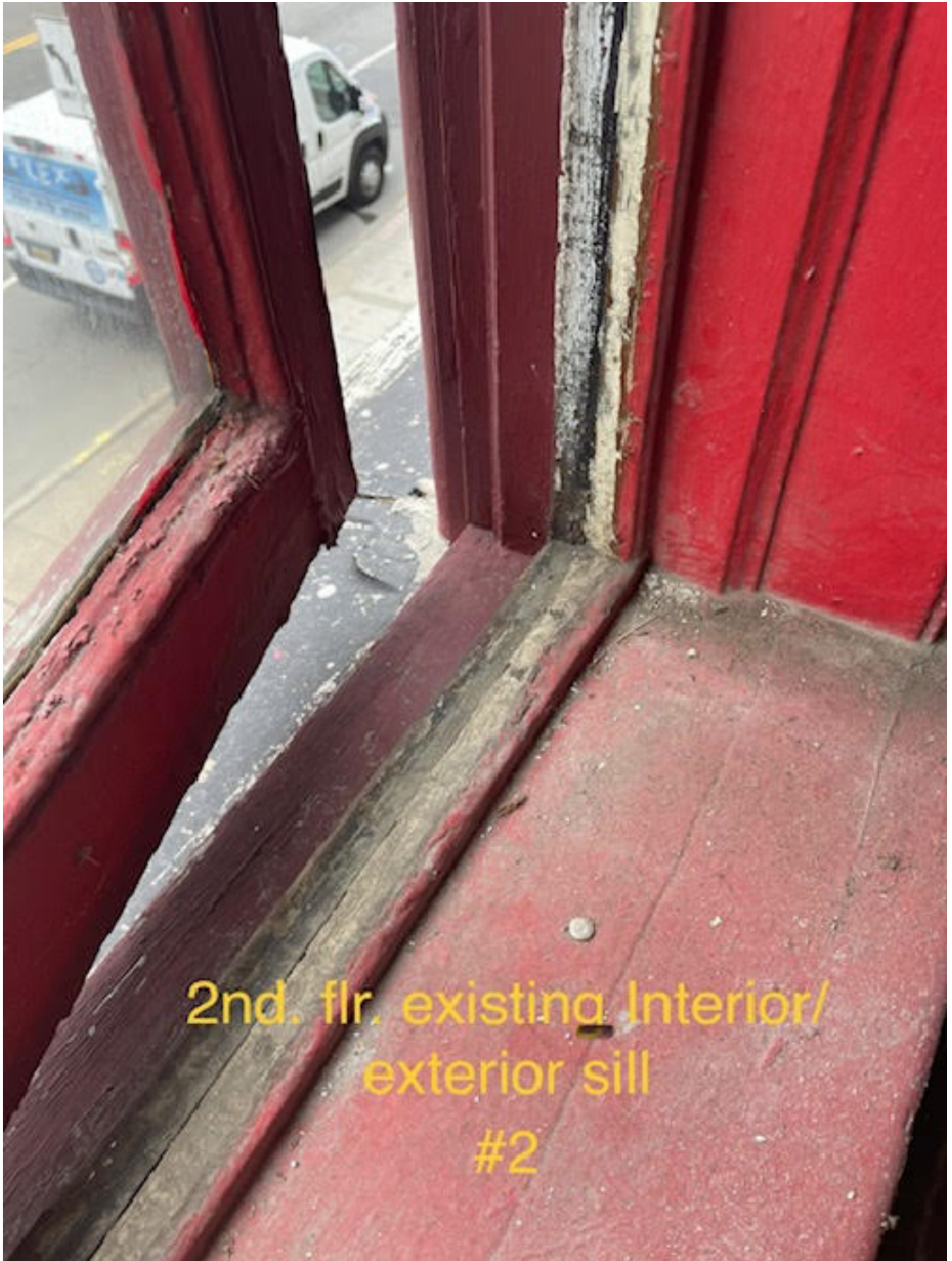
- Several units are missing locking hardware and have damaged pivot hardware, making them unsafe to open in current condition (Photos #7, 7a, 8 & 9)
NOTE: It is suggested that all pivot windows and hopper windows be secured and non-functioning at the end of restoration
- No broken glass discovered on this elevation (1/4" plate). It is suggested existing glass be replaced with tempered or laminated safety glass of the same thickness as per code

WEST ELEVATION DISCOVERY

- All steel units should be restored inside and out (need existing finish removed from steel on interior and exterior surfaces)
NOTE: Frames and sash are in good condition
- Steel SH units are "weight & pulley" units, but currently do not open (Photos #10, 11 & 12)
NOTE: Units should be secure and non-functioning
- All units on this elevation have obscure glass containing chicken wire. (Photo #13)
NOTE: All glass in steel units should be removed and replaced with clear safety/fire safe glass
- Exterior of all units contain iron security grates (Photo #14 & 15)
NOTE: These should be removed and recycled

#1





2nd. flr. existing Interior/
exterior sill

#2

A close-up photograph of a window's interior glazing trim. The trim is painted a vibrant red color, but it is in a state of significant disrepair. Large sections of the red paint are missing, peeling away to reveal a dark, possibly black or dark brown, substrate underneath. The damage is most prominent along the vertical edge of the trim where it meets the window frame. The window glass is visible on the right side, showing a blurred view of an outdoor area with what appears to be a parking lot or street. The overall appearance is one of neglect and the need for renovation.

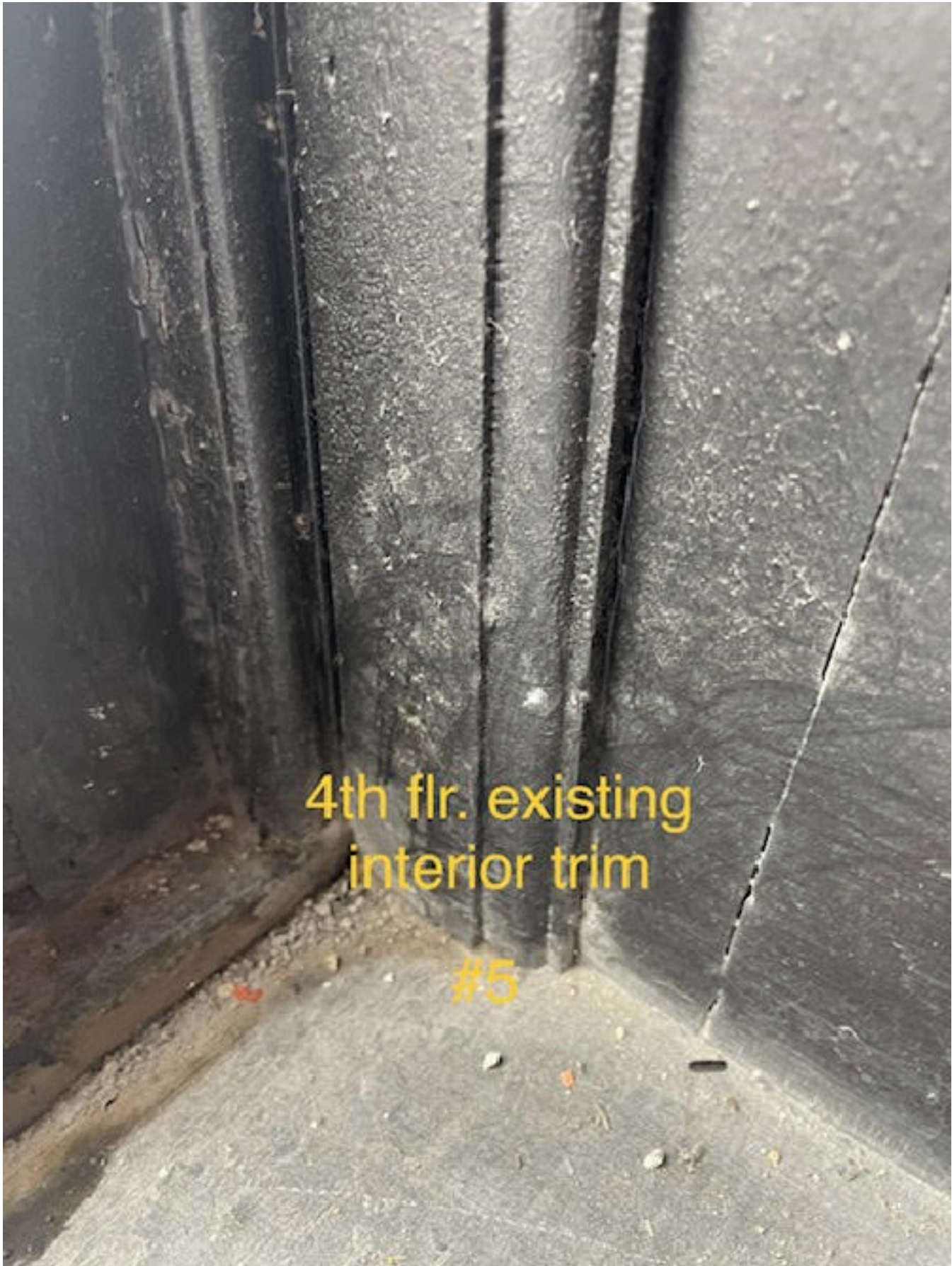
2nd flr. existing interior
glazing trim detail

#3



2nd flr. existing
interior trim

#4



4th flr. existing
interior trim

#5

A close-up photograph of a window's interior mullion trim. The trim is dark and appears to be made of wood or a similar material. The image is slightly out of focus, showing the texture of the trim and the window frame. A yellow text overlay is present in the lower center of the image. The background shows a blurred view of a building with many windows, suggesting an urban setting.

Existing interior
mullion trim

#6



Missing pivot
hardware

#7



damaged hopper
hardware

#7a-



Existing pivot hardware

#8



Damaged pivot hardware

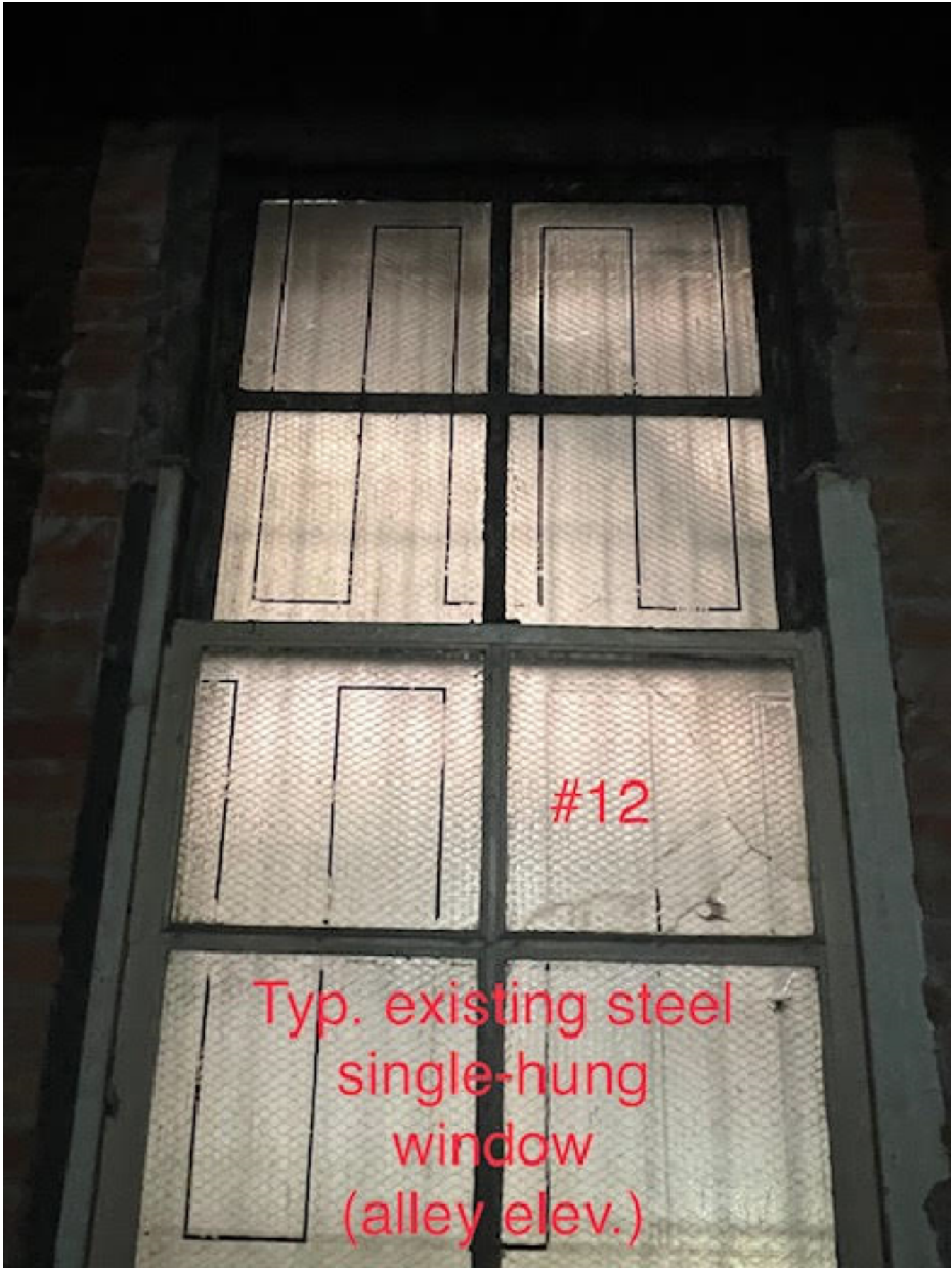
#9



#10

Typ. existing steel
single-hung windows
(alley elev.)





#12

Typ. existing steel
single-hung
window
(alley elev.)

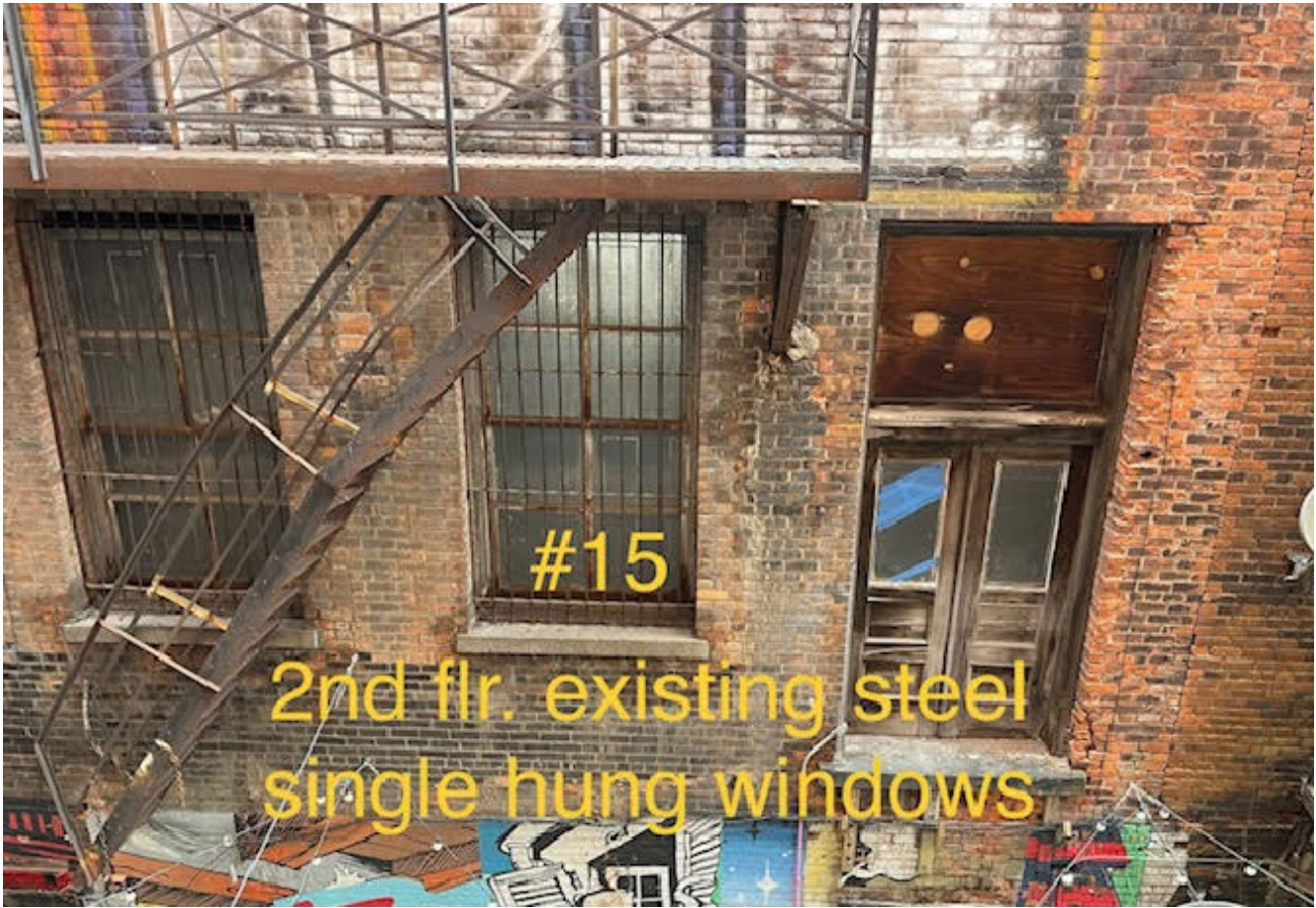


#13

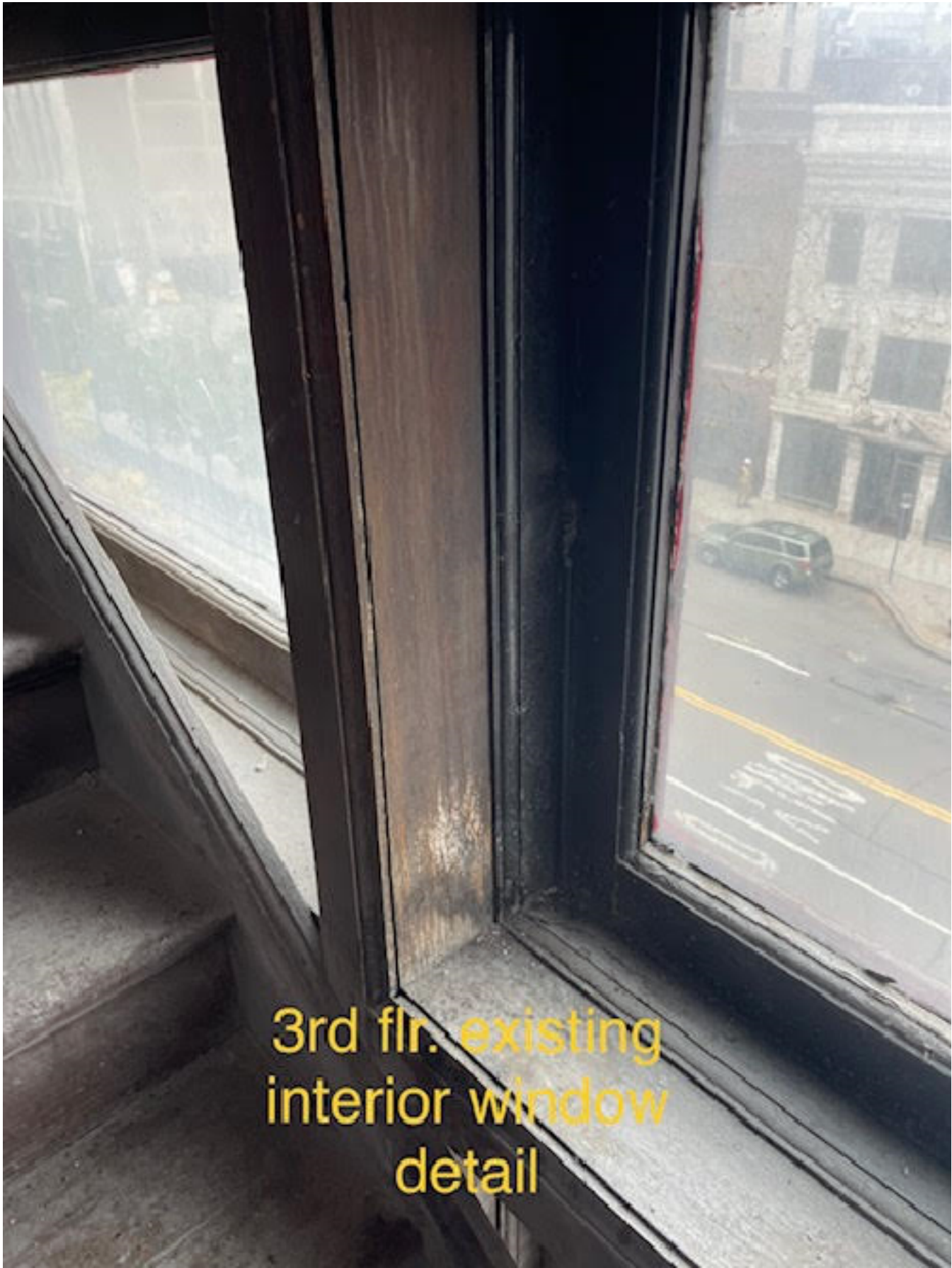
Typ. existing muntin bar
and glass detail for steel
single-hung units (alley
elev.)



Exterior elev. of
steel windows
#14



#15
2nd flr. existing steel
single hung windows



3rd flr. existing
interior window
detail



4th flr. existing interior
glazing trim detail



511/521/522

ALUMINUM DOOR SYSTEMS



ALUMINUM SECTIONAL DOORS

GARAGE DOOR
MODEL 521/ BLACK

VISUAL ACCESS.
LIGHT INFILTRATION.
CONTEMPORARY LOOK.



INDUSTRY LEADING
COMMERCIAL & INDUSTRIAL SOLUTIONS



Model 511, Brown powder coat finish, Clear glass

General features and benefits – Models 511/521

- 1 3/4" (45 mm) thick, corrosion-resistant 6063-T6 aluminum sections with galvanized fixtures and hinges promotes durability and trouble-free operation
- 1/4" (6 mm) diameter through-rods on all stiles and rails enhances strength and sturdiness
- Top-quality materials, excellent field service and optional maintenance program contribute to extended door life, low maintenance costs and maximum productivity
- Glazing choices include DSB glass, acrylic, tempered glass, clear polycarbonate, multi-wall polycarbonate, wire glass, Low E, Lexan and laminate
- Standard clear anodized finish for low-maintenance and corrosion-resistance
- Optional finishes include a wide range of powder coat colors offering an attractive and durable finish
- Manual pull rope operation with optional chain hoist or electric motor operator
- Available in approximately 200 RAL powder coat colors to match the aesthetic and design of your project. This color optional upgrade includes a hardening additive that provides an attractive and durable finish and easy-to-clean surface.

Cover image: Model 521, Clear anodized finish with Clear glass.



Model 522, Mirrored Gray glass

General features and benefits – Model 522

- **Frameless design** – the ultimate sleek and modern aluminum full-view door
- **Vinyl seals** between the sections and the flexible bottom seal help to minimize air flow
- **Large glass panels**, mounted to the front of the door, allow maximum light and visibility
- **1 3/8" thick aluminum section** with patent pending design for long life and durability
- **2 1/4" integrated reinforcing rib** on upper intermediate rail for doors 10'3" wide and over
- **Meets ASHRAE 90.1 and IECC® air infiltration requirements** with a third-party tested value of less than 0.4 cfm/ft²
- **Meets California Code of Regulation, Title 24 air infiltration requirements** with a third-party tested value of less than 0.3 cfm/ft²



ALUMINUM DOOR SYSTEMS

MODELS 511/521/522 offer an attractive solution for commercial and industrial applications where visual access, light infiltration and aesthetics are key design considerations.

Model 521, Clear anodized finish with Clear glass



Glass options for Models 511/521

Specialty Glass

- Laminated White – privacy
- Low E Glass** – thermal efficiency
- Tempered Glass – enhanced safety
- Tinted Glass** – color options:
Green, Gray, Bronze

Glass alternatives

- Clear Lexan® Polycarbonate** – shatter resistant
- Multi Wall Polycarbonate – superior strength with UV protection; color options: Clear, White, Bronze
- Plexiglas® Acrylic** – shatter resistant
- Impact Clear and Frosted Polycarbonate - 0.250" minimum



Double Strength DSB** (Standard)

Obscure

Satin Etched

Gray Tint

Green Tint

Bronze Tint

Impact Frosted Polycarbonate

Actual glass may vary from brochure photos due to fluctuations in the printing process. Check with your Overhead Door™ Distributor to view a glass sample.

** Insulated options available.



Model 511, Clear Anodized finish with Clear glass

ALUMINUM DOOR SYSTEMS MODEL 511

doors are designed in sizes up to 16'2" wide and 16'1" high (4928 mm and 4902 mm). Featuring a narrow center stile width of 21/32" (17 mm), these doors are sleek, attractive and permit maximum visibility. An array of glazing choices, top and bottom rail widths, finishes and special options customizes the 511 Model to satisfy nearly any project requirement.

Model 511, Black powder coat finish, Clear glass.



Standard features at a glance

Panel thickness	1 3/4" (45 mm)
Maximum standard height	16'1" (4902 mm)
Maximum standard width	16'2" (6147 mm)
Material	6063-T6 aluminum
Standard finish	204R-1 clear anodized
Center stile width	2 1/32" (17 mm)
End stile width	2 3/4" (70 mm)
Top rail width	2 3/8" (60 mm) or 3 3/4" (95 mm)
Top intermediate rail width	3/4" (19 mm)
Bottom intermediate rail width	5/8" (16 mm)
Bottom rail width	2 3/8" (60 mm) or 3 3/4" (95 mm) or 4 1/2" (114 mm)
Weatherseals	Bottom, flexible PVC
Standard springs	10,000 cycle
Track	2" (51 mm)
Mounting	Angle
Operation	Manual pull rope
Hinges and fixtures	Galvanized steel
Lock	Galvanized, interior-mounted single unit
Warranty	1-Year Limited; 3-Year Limited powder coat finish

Options

Glazing options*:
 1/8" (3 mm) DSB;
 1/8" (3 mm) or 1/4" (6 mm) acrylic;
 1/8" (3 mm) or 1/4" (6 mm) tempered;
 1/8" (3 mm) or 1/4" (6 mm) clear polycarbonate;
 1/4" (6mm) and 3/8" twin-wall polycarbonate, 5/8" triple-wall polycarbonate;
 1/4" (6 mm) 3/8" (10 mm) and 5/8" (16 mm) twin-wall polycarbonate, triple-wall polycarbonate 1/4" (6 mm) wire glass;
 1/2" (12 mm) insulated glass

Electric operator or chain hoist

Bottom sensing edge

3" track

Bracket mounting (not available on full vertical door tracks)

Higher-cycle springs in 25k, 50k, 75k, 100k cycles

Chain hoist

Posi-tension drums

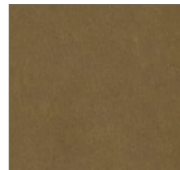
*Contact your local Overhead Door™ Distributor for special glazing requirements. Verify 1/4" (6 mm) glass applications with factory.

Structure options

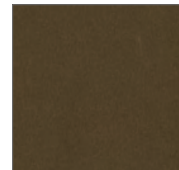
Anodized finishes



Clear (standard)



Light Bronze



Medium Bronze



Dark Bronze

Powder coat finishes

Select from approximately 200 RAL powder coat color options to best match your home.



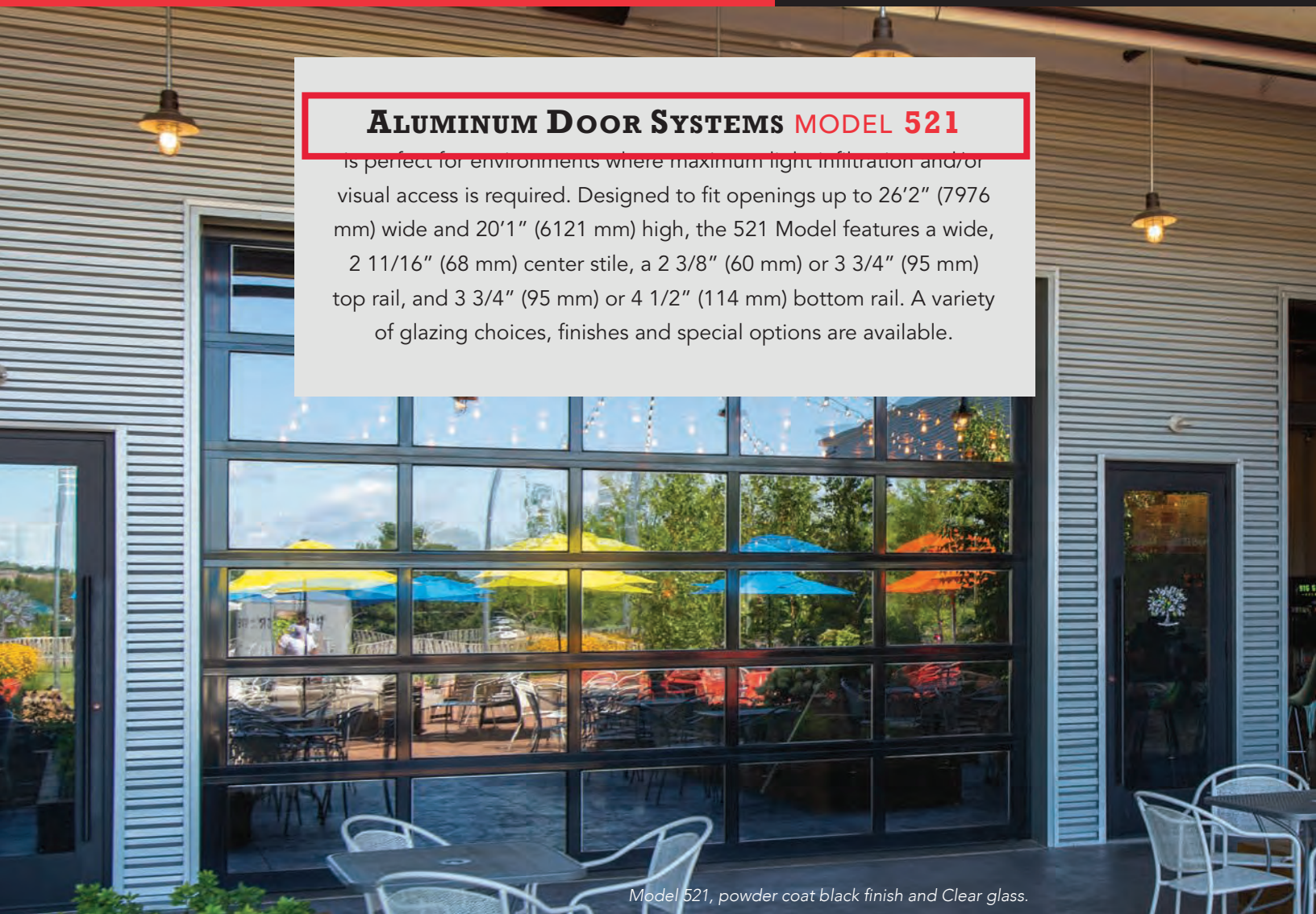
Actual door colors may vary from brochure photos due to fluctuations in the printing process. Always request a color sample from your Overhead Door™ Distributor for accurate color matching.

Panel layout	
Door width	Number of panels
to 11'11" (3632 mm)	3
12'0" to 14'11" (3658 mm to 4547 mm)	4
15'0" to 16'2" (4572 mm to 4928 mm)	5

Section stack	
Door height	Number of sections
to 8'6" (2591 mm)	4
8'7" to 10'1" (2616 mm to 3073 mm)	5
10'2" to 12'1" (3099 mm to 3683 mm)	6
12'2" to 14'1" (3708 mm to 4293 mm)	7
14'2" to 16'1" (4318 mm to 4902 mm)	8

ALUMINUM DOOR SYSTEMS MODEL 521

is perfect for environments where maximum light infiltration and/or visual access is required. Designed to fit openings up to 26'2" (7976 mm) wide and 20'1" (6121 mm) high, the 521 Model features a wide, 2 11/16" (68 mm) center stile, a 2 3/8" (60 mm) or 3 3/4" (95 mm) top rail, and 3 3/4" (95 mm) or 4 1/2" (114 mm) bottom rail. A variety of glazing choices, finishes and special options are available.



Model 521, powder coat black finish and Clear glass.

Optional polyurethane insulation for stiles and rails up to 18'2" wide

1/2" insulated glazing unit	Door R-value (K m²/W)
DSB- clear, tempered, obscure	2.87
Clear polycarbonate	2.93
DSB - Solar Bronze	3.17
DSB - Low E coating	3.43
SolarBan 70XL argon filled	4.09
Multi-wall polycarbonate	Door R-value (K m²/W)
1/4" thick unit	2.75
3/8" thick unit	3.21
5/8" thick unit	3.48
Insulated panels	Door R-value (K m²/W)
3/8" EPS solid panels	2.60



Polyurethane filled rails and stiles

*R-value: Overhead Door Corporation uses a calculated door section R-value for our insulated doors.



Standard features at a glance

Section thickness	1 3/4" (45 mm)
Maximum standard height	20'1" (6121 mm)
Maximum standard width	26'2" (7976 mm)
Material	Extruded 6061-T6 aluminum
Standard finish	204R-1 clear anodized (painted white at no charge)
Center stile width	2 11/16" (68 mm)
End stile width	3 5/16" (85 mm)
Top rail width	2 3/8" (60 mm) or 3 3/4" (95 mm)
Top intermediate rail width	2 1/8" (54 mm)
Bottom intermediate rail width	1 19/32" (40 mm)
Bottom rail width	3 3/4" (95 mm) or 4 1/2" (114 mm)
Weatherseals	Bottom, flexible PVC
Standard springs	10,000 cycle
Track	2" (51 mm)
Mounting	Angle
Operation	Manual pull rope
Hinges and fixtures	Galvanized steel
Lock	Galvanized, interior-mounted single unit
Warranty	1-Year Limited; 3-Year Limited on powder coat finish

Options

Glazing options[†]: 1/8" (3 mm) DSB; 1/8" (3 mm) or 1/4" (6 mm) acrylic; 1/8" (3 mm) or 1/4" (6 mm) tempered; 1/8" (3 mm) or 1/4" (6 mm) clear polycarbonate; 1/4" (6mm) and 3/8" twin-wall polycarbonate, 5/8" triple-wall polycarbonate; 1/4" (6 mm) 3/8" (10 mm) and 5/8" (16 mm) twin-wall polycarbonate, triple-wall polycarbonate 1/4" (6 mm) wire glass; 1/2" (12 mm) insulated glass

Electric operator or chain hoist

Bottom sensing edge

3" track

Bracket mounting (not available on full vertical door tracks)

Higher-cycle springs in 25k, 50k, 75k, 100k cycles

Exhaust ports

Four-section pass door

Wind load and impact rated door available

Posi-tension drums

Bronze anodization

Powder coat finish

Pass door

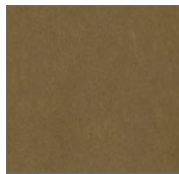
[†]Contact your local Overhead Door™ Distributor for special glazing requirements. Verify 1/4" (6 mm) glass applications with factory.

Structure options

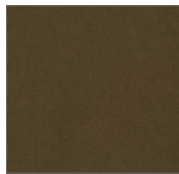
Anodized finishes



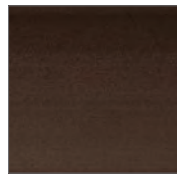
Clear (standard)



Light Bronze



Medium Bronze



Dark Bronze

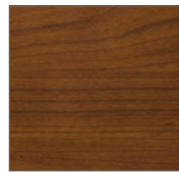
Wood grain powder coat finishes*



Knotty Pine



Cherry



Cherry with Flame



Dark Walnut

Powder coat finishes

Select from approximately 200 RAL powder coat color options to best match your home.



BLACK FINISH

*Wood grain availability dependent upon location.

Actual door colors may vary from brochure photos due to fluctuations in the printing process. Always request a color sample from your Overhead Door™ Distributor for accurate color matching.

Panel layout

Door width	Number of panels
to 9'2" (to 2794 mm)	2 or 3 (standard)
9'3" to 12'2" (2819 mm to 3708 mm)	3
12'3" to 16'2" (3734 mm to 4953 mm)	4
16'3" to 18'2" (4978 mm to 5537 mm)	4 or 5 (standard)
18'3" to 19'2" (5562 mm to 5842 mm)	5
19'3" to 20'11" (5867 mm to 6375 mm)	6**
21'0" to 23'11" (6401 mm to 7290 mm)	8**
24'0" to 26'2" (7315 mm to 7976 mm)	10**

Section stack

Door height	Number of sections
to 8'6" (2591 mm)	4
8'7" to 10'1" (2616 mm to 3073 mm)	5
10'2" to 12'1" (3099 mm to 3683 mm)	6
12'2" to 14'1" (3708 mm to 4293 mm)	7
14'2" to 16'1" (4318 mm to 4902 mm)	8
16'2" to 18'1" (4928 mm to 5512 mm)	9
18'2" to 20'1" (5537 mm to 6121 mm)	10

**Special construction. Consult your local Overhead™ Door Distributor for additional information.

ALUMINUM DOOR SYSTEMS MODEL 522

This aluminum full-view door is ideal for restaurants, auto dealerships and any application where the door needs to integrate seamlessly with the aesthetics of the building.



Model 522, Mirrored Bronze glass



Standard features at a glance

Section thickness	1 3/8" (35 mm)
Maximum standard height	14'1" (4318 mm)
Maximum standard width	18'2" (5486 mm)
Material	6063-T6 aluminum
Standard finish	White, Black or Bronze Powder Coat
Center stile width	3" (76 mm)
End stile width	3 1/2" (89 mm)
Top rail width	3 1/2" (89 mm)
Top intermediate rail width	1 5/8" (41 mm)
Bottom intermediate rail width	1 3/8" (35 mm)
Bottom rail width	3 1/2" (89 mm)
Standard springs	10,000 cycle
Track	Provide track as recommended by manufacturer to suit loading required and clearances available
Mounting	Angle
Operation	Manual pull rope
Hinges and fixtures	Galvanized steel
Lock	Galvanized, interior-mounted single unit
Warranty	1-Year Limited

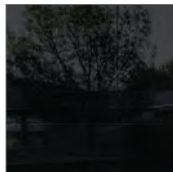
Options

- Springs: 25,000, 50,000, 75,000 or 100,000 cycles
- Weather stripping: jamb and header seals
- White or Black powder coat track

Glass options



Opaque White



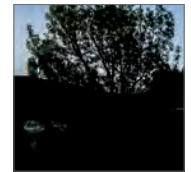
Opaque Black



Mirrored Gray



Mirrored Bronze



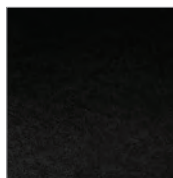
Translucent Black

Structure options

Powder Coat Finishes



White



Black



Bronze

Anodized Finishes



Black



Bronze

Actual colors may vary from brochure due to fluctuations in the printing process. Always request a color sample from your Overhead Door™ Distributor for accurate color matching.

Aluminum and glass pairing

Aluminum options

White Powder Coat

Black Powder Coat / Bronze Powder Coat /
Black Anodized / Bronze Anodized

Glass color

Opaque White

Opaque Black / Mirrored Gray / Mirrored Bronze /
Translucent Black

Each door is unique and built to order, therefore a slight deviation in glass alignment is possible. These doors may become hot to the touch in sustained hot weather. See website for door sizes, section selection and other details.

Track detail

Any of the following track configurations can be selected for 511, 521 and 522 Aluminum door models.

O.H.=Opening height L.C.=Lift clearance D.H.=Door height

Standard lift track			Lift clearance track Standard			Full vertical track		
2" (51 mm) Track [15" (381 mm) radius]			2" (51 mm) Track [15" (381 mm) radius]			2" (51 mm) Track [15" (381 mm) radius]		
Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom
Thru 12'0" (3658 mm)	O.H. + 11 5/8" (295 mm)	14 1/4" (362 mm)	Thru 12'0" (3658 mm)	O.H. + L.C. + 5 5/8" (143 mm)	L.C. + 8 3/4" (222 mm)	Thru 11'0" (3353 mm)	O.H. + O.H. + 3/8" (10 mm)	O.H. + 10 1/4" (260 mm)
Thru 16'0" (4877 mm)	O.H. + 12 5/8" (321 mm)	20 1/2" (521 mm)	Thru 16'0" (4877 mm)	O.H. + L.C. + 5 5/8" (143 mm)	L.C. + 11 1/4" (286 mm)	Thru 16'0" (4877 mm)	O.H. + O.H. + 3/8" (10 mm)	O.H. + 10 1/4" (260 mm)
3" (76 mm) Track [15" (381 mm) radius]			3" (76 mm) Track [15" (381 mm) radius]			3" (76 mm) Track [15" (381 mm) radius]		
Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom
Thru 18'0" (5486 mm)	O.H. + 14 5/8" (372 mm)	18" (457 mm)	Thru 22'0" (6706 mm)	O.H. + L.C. + 6 5/8" (168 mm)	L.C. + 11 1/2" (292 mm)	Thru 18'0" (5486 mm)	O.H. + O.H. + 3/8" (10 mm)	O.H. + 10 1/4" (260 mm)
Thru 32'0" (9754 mm)	O.H. + 16 7/8" (429 mm)	21 1/2" (546 mm)	Thru 32'0" (9754 mm)	O.H. + L.C. + 6 5/8" (168 mm)	L.C. + 12 1/4" (311 mm)			

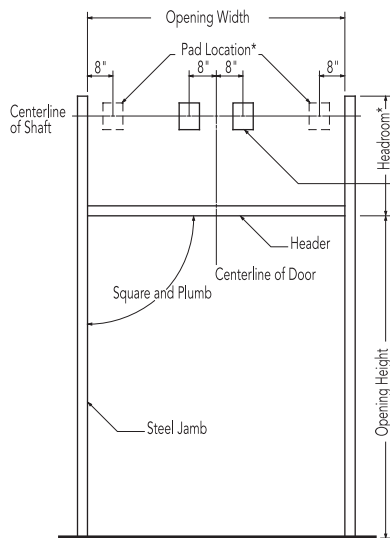
Low headroom track Springs to front			Low headroom track Springs to rear		
2" (51 mm) Track [15" (381 mm) radius]			2" (51 mm) Track [15" (381 mm) radius]		
Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom
Thru 12'0" (3658 mm)	D.H. + 8" (203 mm)	11 3/4" (299 mm)	Thru 12'0" (3658 mm)	O.H. + 2" (51 mm)	7 1/2" (191 mm)
Thru 16'0" (4877 mm)	D.H. + 8" (203 mm)	12 1/2" (318 mm)	Thru 16'0" (4866 mm)	O.H. 2" (51 mm)	8" (203 mm)
3" (76 mm) Track [15" (381 mm) radius]			3" (76 mm) Track [15" (381 mm) radius]		
Door height	Centerline of shaft	Minimum headroom	Door height	Centerline of shaft	Minimum headroom
Thru 12'0" (3658 mm)	D.H. + 9" (229 mm)	13" (330 mm)	Thru 18'0" (5486 mm)	O.H. 6 3/4" (171 mm)	9 3/4" (248 mm)
Thru 32'0" (5486 mm)	D.H. + 9" (229 mm)	13 3/4" (349 mm)			



Framing and pad detail

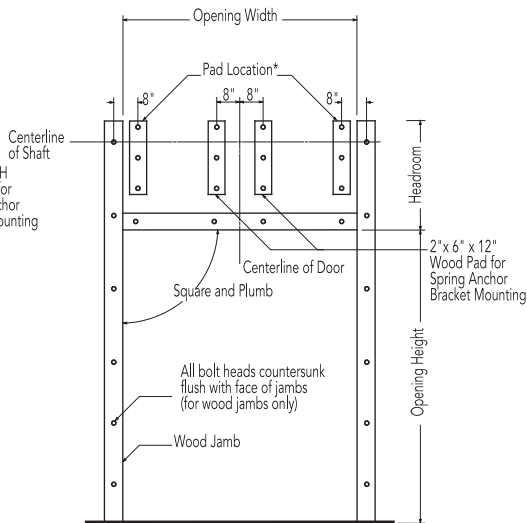
Framing and pad details for common installation of Aluminum doors in steel, wood, concrete and masonry jambs are provided here. If you require additional information or have special project requirements, refer to the Architectural Design Manual, (www.overheaddoor.com/ADM/base.html) or consult with the Applications Engineering Group or your local Overhead Door™ Distributor.

Steel jambs



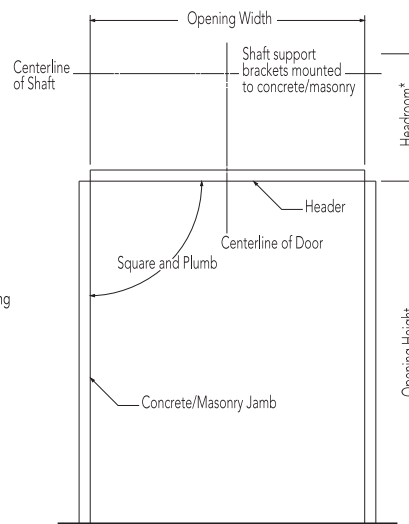
* Pad Location for additional shaft support brackets for doors over 18'3" wide

Wood jambs

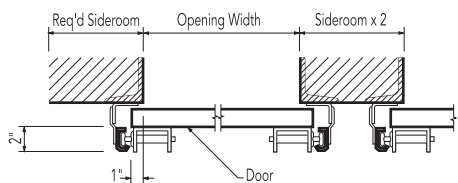


* Pad Location for additional shaft support brackets for doors over 18'3" wide

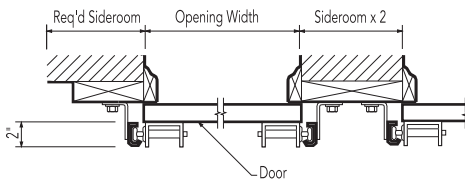
Concrete/masonry jambs



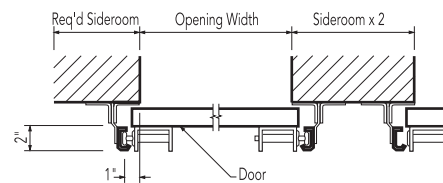
2" (51 mm) track



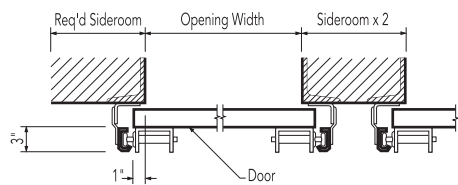
2" (51 mm) track



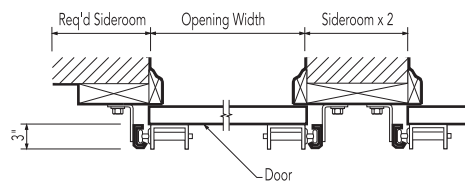
2" (51 mm) track



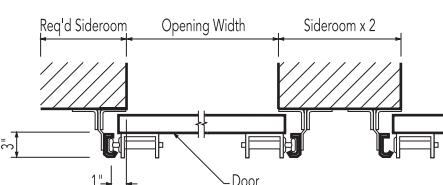
3" (76 mm) track



3" (76 mm) track



3" (76 mm) track



Minimum required sideroom

Track type	2" Track (51 mm)	3" Track (76 mm)
Standard lift	4 1/2" (114 mm)	6 1/2" (165 mm)
Low headroom	9" (229 mm)	10" (254 mm)
Lift clearance	4 1/2" (114 mm)	6 1/2" (165 mm)
Full vertical	4 1/2" (114 mm)	6 1/2" (165 mm)

Minimum required sideroom

Track type	2" Track (51 mm)	3" Track (76 mm)
Standard lift	3 1/2" (89 mm)	5 1/2" (140 mm)
Low headroom	8" (203 mm)	9" (229 mm)
Lift clearance	3 1/2" (89 mm)	5 1/2" (140 mm)
Full vertical	3 1/2" (89 mm)	5 1/2" (140 mm)

Minimum required sideroom

Track type	2" Track (51 mm)	3" Track (76 mm)
Standard lift	4 1/2" (114 mm)	6 1/2" (165 mm)
Low headroom	9" (229 mm)	10" (254 mm)
Lift clearance	4 1/2" (114 mm)	5 1/2" (140 mm)
Full vertical	4 1/2" (114 mm)	5 1/2" (140 mm)

Electric operators

We offer a broad line of electric operators to suit new construction and retrofit applications, as well as unusual or special requirements. In order to improve safety and enhance door and motor life, industry quality assurance guidelines recommend the choice of a single manufacturer for both door and operator applications.

We are one of the only national manufacturers to offer a full line of commercial and industrial doors and operators specifically designed for integral applications.

Model RHX®

Model RHX® is a heavy duty commercial operator designed to operate doors up to 24' (7315 mm) in height and 3696 pounds (1676 kg). Available as either a trolley, sidemount or centermount.



Model RMX®

Model RMX® is our most advanced medium-duty operator. It is designed for quicker installation and hassle-free operation and operates doors up to 14' (4267 mm) in height and 620 pounds (282 kg). It is available as a trolley-type or side-mounted unit.



Model RSX®

Model RSX® is a standard duty commercial operator designed to operate doors up to 24' (7315 mm) in height and 1620 pounds (735 kg). It offers unique features like LimitLock®, SuperBelt™ and 16 digit menu setup.



Operator control options

- Push-button, key or combination stations; surface- or flush-mounted for interior and/or exterior locations
- Vehicle detectors, key card reader, photocell and door timer controls
- Treadle or pull switch stations
- Telephone entry and coded keyboard stations
- Universal programmable door timer
- Radio control systems (24 VAC or 120 VAC)
- Explosion and dust ignition-proof systems

Electric operator selection guide										
	Horsepower/ Newtons	Max. height of door	Max. weight of door	Super Belt™/ Polybelt	Worm gear	Adjustable clutch	Totally enclosed	Continuous duty	Explosion proof	Mounting type
RHX®	1/2 HP, 3/4 HP 1 HP, 3 HP	24' (7315 mm)	3696 lbs (1676 kg)		•	•		•	•	T, S, C
RSX®	1/2 HP, 3/4 HP 1 HP	24' (7315 mm)	1620 (735 kg)	•		•	•	•		T, S, C
RMX®	1/2 HP	14' (4267 mm)	620 (281 kg)	•						T, S

Mounting options:
T=Trolley S=Side mount C= Center mount

Safety recommendations

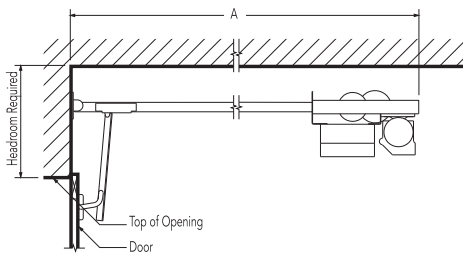
We strongly recommend the use of a primary safety device as defined by UL325 2010. A primary safety device can be approved monitored photo-eyes or an approved monitored sensing edge. If a primary safety device is not installed, a constant contact control switch must be used to close the door. Contact your Overhead Door™ Distributor for more information.



Mounting details

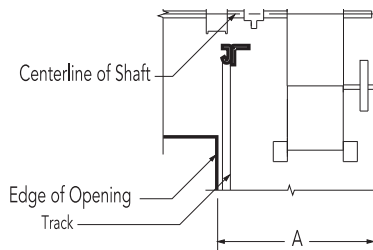
Trolley-type (Drawbar) RMX®, RSX®, RHX®

Trolley-type (Drawbar) operators feature a power unit mounted between, above and to the rear of the horizontal tracks. The drawbar drive provides positive control of the door at all times, making this operator the preferred choice whenever possible. Maximum door width is 20' per drawbar. Door width over 20' requires dual drawbar installation. Available on Models RMX®, RSX® and RHX®.



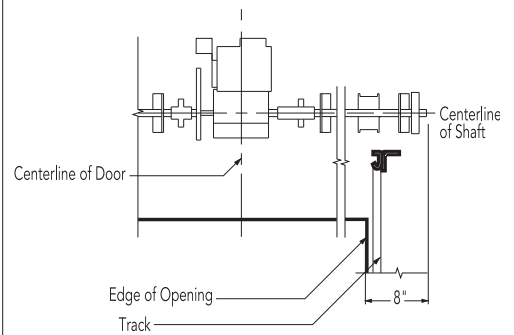
Side mount type (Jackshaft) RMX®, RSX®, RHX®

Side-mounted (Jackshaft) RMX®, RSX®, and RHX® operators feature a power unit mounted on the inside front wall and connected to the crosshead shaft, with an adjustable coupling or drive chain and sprockets.



Center mount type/Jackshaft RSX®, RHX®

Center-mounted (Jackshaft) operators feature a power unit on the front wall above the door opening. No additional backroom is required. Available on models RSX® and RHX®.



Minimum headroom requirements		"A" dimension - minimum (sideroom)		Minimum headroom requirements	
RMX®	Track requirements +4 1/2" (114 mm)	2" track (51 mm)	3" track (76 mm)	RSX®	Track requirements +14" (356 mm)
RSX®	Track requirements +5" (127 mm)	RMX®	18 1/2" (470 mm) 19 1/2" (495 mm)	RHX®	Track requirements +23 5/8" (600 mm)
RHX®	Track requirements +5" (127 mm)	RSX®	21" (533 mm) 22" (559 mm)		
		RHX®	21" (533 mm) 22" (559 mm)		
Depth requirements - "A" dimension (backroom)					
RMX®	Door height +4' 0" (1219 mm)				
RSX®	Door height +4' 0" (1219 mm)				
RHX®	Door height +4' 10" (1219 mm)				



Model 521, solid panel, custom powder coat finish



Tools to help you
get the job done.

Architect's Corner

A resource for architects, containing comprehensive technical and resource materials to support your project, including drawings and specifications for commercial doors.

www.overhaddoor.com

The original, innovative choice for unequalled quality and service.

Overhead Door Corporation pioneered the sectional garage door industry, inventing the first sectional garage door in 1921 and the first electric door operator in 1926. Today, we continue to be the industry leader through the strength of our product innovation, superior craftsmanship and outstanding customer support, underscoring a legacy of quality, expertise and integrity. That's why design and construction professionals specify Overhead Door™ products more often than any other brand. Our family of over 400 Overhead Door™ Distributors across the U.S. and Canada not only share our name and logo, but also our commitment to excellence.



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COMMERCIAL & INDUSTRIAL SOLUTIONS

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TRIFAB® VG (VERSAGLAZE®)
TRIFAB® VG 450, 451 & 451T (THERMAL) FRAMING SYSTEMS &
TRIFAB® 451UT (ULTRA THERMAL) FRAMING SYSTEM



Design + Performance

Versatility with Unmatched Fabrication Flexibility

KAWNEER SYSTEM
451T FRONT SET,
BLACK



Geisinger Professional Building
Jenkins Township, Pennsylvania
ARCHITECT
Mericle Commercial Real Estate Services
Wilkes-Barre, Pennsylvania
GLAZING CONTRACTOR
Sterling Glass, Inc., Scranton, Pennsylvania
PHOTOGRAPHER
© Perzel Photography Group

Trifab® VersaGlaze® is built on the proven and successful Trifab® platform – with all the versatility its name implies. There are enough framing system choices, fabrication methods, design options and performance levels to please the most discerning building owner, architect and installer. The 4.5" depth Trifab® VersaGlaze® Framing System family is available with non-thermal, thermal and ultra-thermal performance levels. The ultra-thermal Trifab® 451UT Framing System, is designed for the most demanding thermal performance and employs a dual Isolock® thermal break.

AESTHETICS

Trifab® VersaGlaze® Framing Systems offer designers a choice of front-, center-, back- or multi-plane glass applications. Structural silicone

glazing (SSG) and weatherseal glazing options further expand designers' choices, allowing for a greater range of possibilities for specific project requirements and architectural styles. All systems have a 4-1/2" frame depth; Trifab® VersaGlaze® 450 has 1-3/4" sightlines, while Trifab® VersaGlaze® 451/451T and Trifab® 451UT have 2" sightlines.

With seamless incorporation of Kawneer entrances or windows, including GLASSvent® visually frameless ventilators, Trifab® framing can be used on almost any project. These framing systems can also be packaged with Kawneer curtain walls and overhead glazing, thereby providing a full range of proven, and tested, quality products for the owner, architect and installer from a single-source supplier.

ECONOMY

Trifab® VersaGlaze® 450/451/451T/451UT Framing Systems offer a variety of fabrication choices to suit your project:

- **Screw Spline** – for economical continuous runs utilizing two-piece vertical members that provide the option to pre-assemble units with controlled shop labor costs and smaller field crews for handling and installation. (available for all systems)
- **Shear Block** – for punched openings or continuous runs using tubular moldings with shear block clips that provide tight joints for transporting large pre-assembled multi-lite units. (available for 450/451/451T systems)
- **Stick** – for fast, easy field fabrication. Field measurements and material cuts can be done when metal is on the jobsite. (available for 450/451/451T systems)
- **Pre-glazed** – The combination of screw spline construction with pre-glazing in the shop accelerates installation and reduces field labor time while minimizing disruption to the surrounding area or existing tenants. Making it an exceptional choice for new or retrofit applications, particularly in urban areas or where space is limited. (available for 451/451T/451UT framing)



Brighton Landing
Cambridge, Massachusetts
 ARCHITECT
ADD Inc., Cambridge, Massachusetts
 GLAZING CONTRACTOR
Ipswich Bay Glass Company, Inc., Rowley, Massachusetts
 PHOTOGRAPHER
 © Gordon Schenck, Jr.

All systems can be flush glazed from either the inside or outside. The weatherseal option provides an alternative to SSG vertical mullions for Trifab® VersaGlaze® 450/451/451T. This ABS/ASA rigid polymer extrusion allows complete inside glazing and creates a flush glass appearance on the building exterior without the added labor of scaffolding or swing stages. Additionally, high-performance flashing options are engineered to eliminate perimeter sill fasteners and associated blind seals.

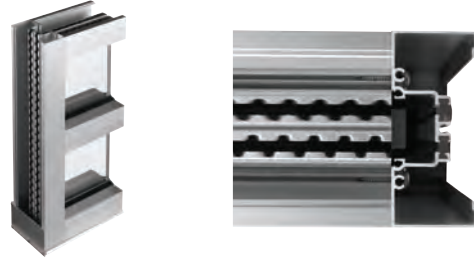
FOR THE FINISHING TOUCH

Architectural Class I anodized aluminum and painted finishes in fluoropolymer (AAMA 2605) and solvent-free powder coatings (AAMA 2604) offer a variety of color choices.



PERFORMANCE

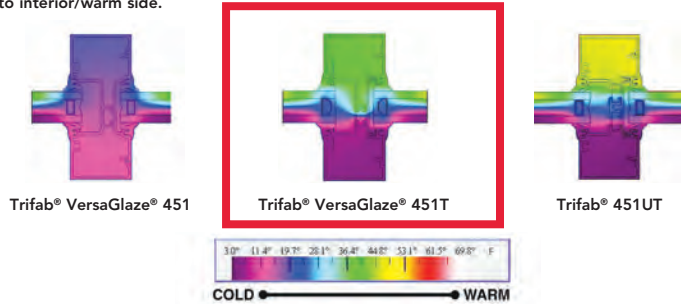
Kawneer’s IsoLock® thermal break technology creates a composite section, prevents dry shrinkage and is available on Trifab® VersaGlaze® 451T. For even greater thermal performance, a dual IsoLock® thermal break is used on Trifab® 451UT.



Trifab® 451UT uses a dual IsoLock® thermal break (right) and features a new high-performance sill design, which incorporates a screw-applied end dam (left), ensuring positive engagement and tight joints between the sill flashing and end dam.

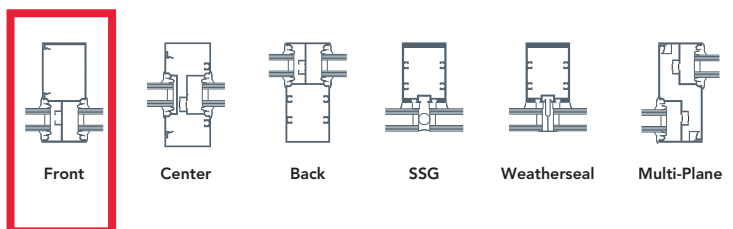
U-factor, CRF values and STC ratings for Trifab® framing systems vary depending upon the glass plane application. Project-specific U-factors can be determined for each individual project. (See the Kawneer Architectural Manual or Kawneer.com for additional information.)

Thermal simulations showing temperature variations from exterior/cold side to interior/warm side.



PERFORMANCE TEST STANDARDS

Air Infiltration	ASTM E283
Water	AAMA 501, ASTM E331
Structural	ASTM E330
Thermal	AAMA 1503
Thermal Break	AAMA 505, AAMA TIR-A8
Acoustical	AAMA 1801, ASTM E1425



Features

- 190 narrow stile has 2-1/8" (54) vertical stile, 2-1/4" (57.2) top and 3-7/8" (98.4) bottom rail
- 350 medium stile has 3-1/2" (88.9) vertical stile, 3-1/2" (88.9) top and 6-1/2" (165.1) bottom rail
- 500 wide stile has 5" (127) vertical stile, 5" (127) top and 6-1/2" (165.1) bottom rail
- Door is 1-3/4" (44.5) deep
- Dual moment welded corner construction
- Single or double acting
- Infills range from 1/4" (6.4) to 1" (25.4)
- Offset pivots, butt hinges, continuous geared hinge or center pivots
- MS locks or panic hardware
- Surface mounted or concealed closers
- Architects Classic push/pulls
- Adjustable astragal utilizing pile weathering with polymeric fin at meeting stiles
- Polymeric bulb weatherstripping in door frames
- Permanodic™ anodized finishes in seven choices
- Painted finishes in standard and custom choices

10" BOTTOM
RAIL FOR ADA
COMPLIANCE

Optional Features

- Paneline™ exit device or Paneline™ MEL exit device
- Wide variety of bottom rail and cross rail

Product Applications

- 190 narrow stile - engineered for moderate traffic in applications such as offices and stores
- 350 medium stile - provides extra strength for schools, institutions and other high traffic applications
- 500 wide stile - creates a monumental visual statement for banks, libraries or buildings that experience heavy traffic conditions

For specific product applications,
consult your Kawneer representative.

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.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
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Metric (SI) conversion figures are included throughout these details for reference. Numbers in parentheses () are millimeters unless otherwise noted.

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

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

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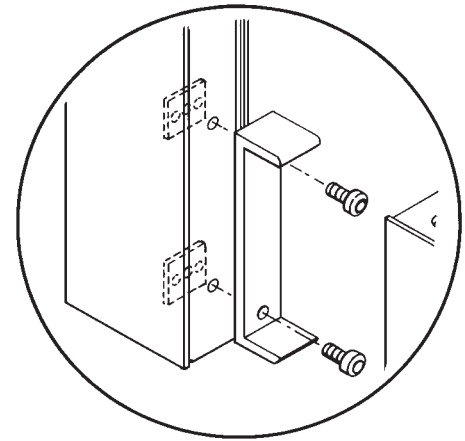
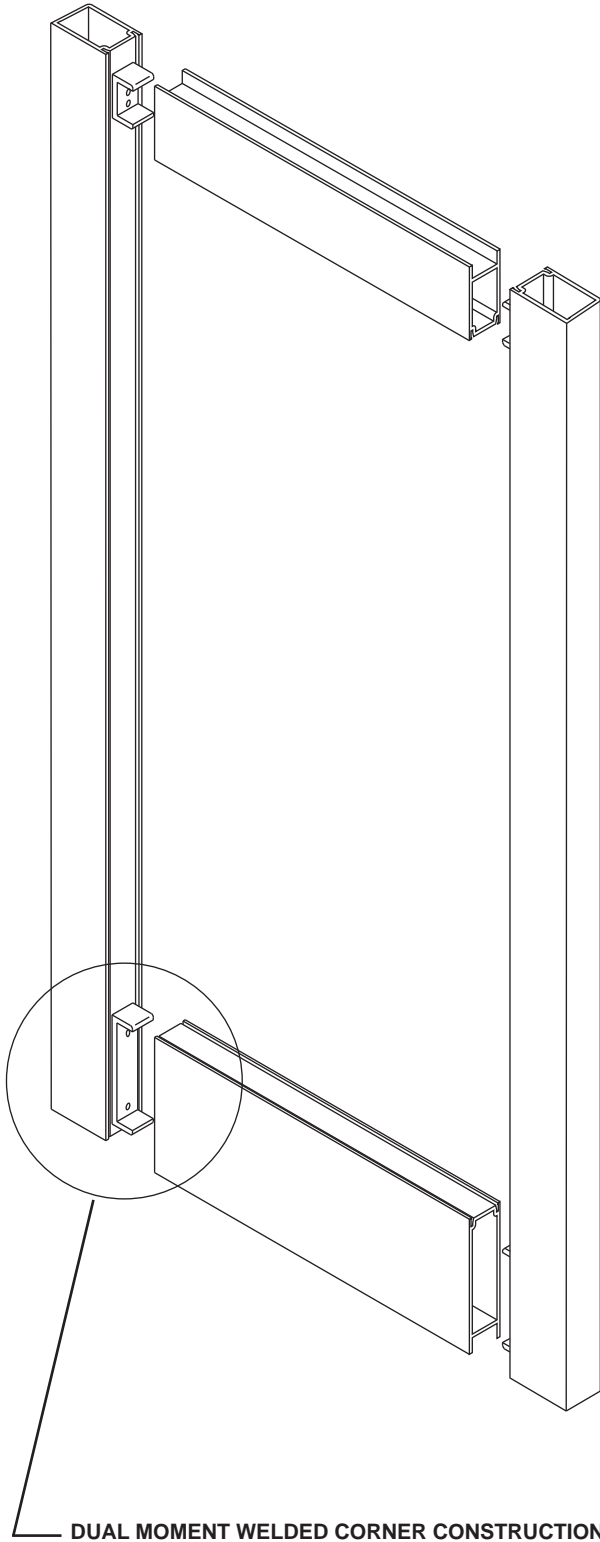
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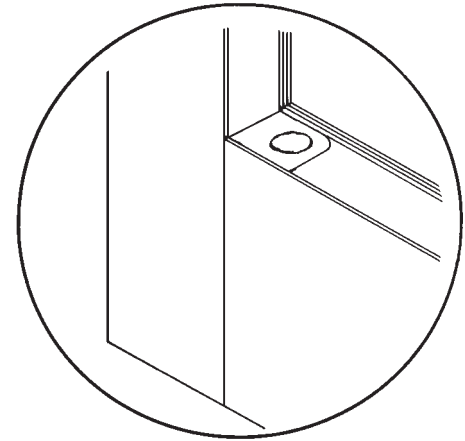
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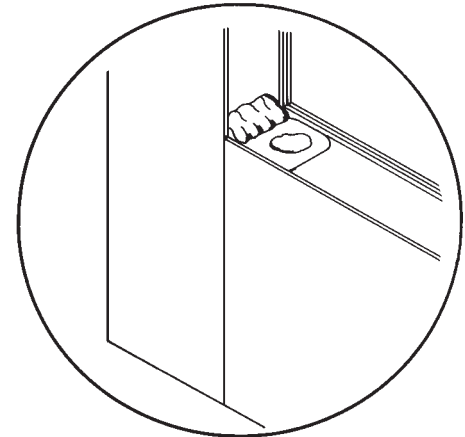
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#1 MECHANICAL FASTENING is accomplished by attaching a 5/16" (7.9) thick extruded aluminum channel clip to the vertical stile with 1/4"-20 heat strengthened bolts and 3/16" thick steel nut plates for a high strength welding base for attachment horizontal member.



#2 SIGMA* DEEP PENETRATION PLUG WELDS are made top and bottom after the horizontal is properly positioned over the channel clip to help provide the strongest door corner joint currently available.



#3 SIGMA* FILLET WELDS along both top and bottom webs of the rail extrusion complete the welded corner construction.

* An arc welding process known as Shielded Inert Gas Metal Arc (SIGMA) or also known as Metal Inert Gas (MIG).

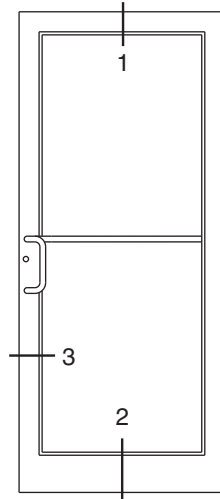
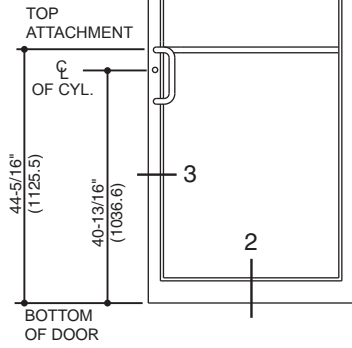
Additional information and CAD details are available at www.kawneer.com

190 NARROW STILE

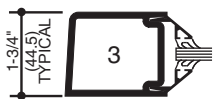
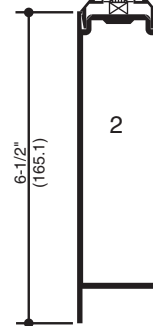
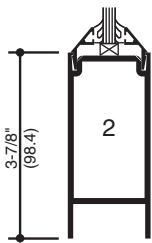
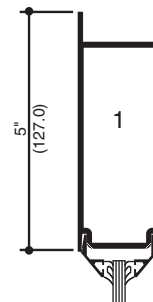
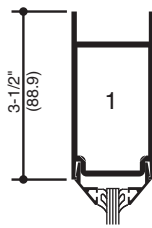
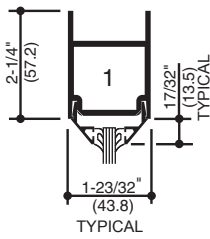
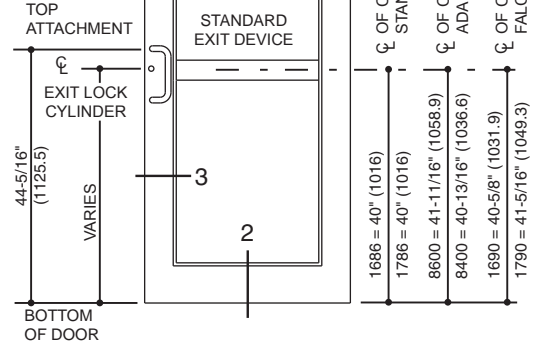
350 MEDIUM STILE

500 WIDE STILE

STANDARD LOCATIONS



STANDARD LOCATIONS



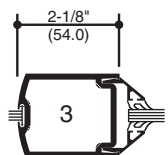
SINGLE ACTING



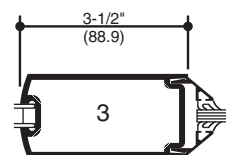
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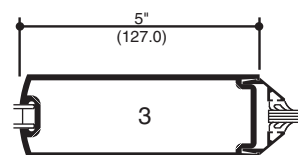
SINGLE ACTING



DOUBLE ACTING



DOUBLE ACTING



DOUBLE ACTING

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.

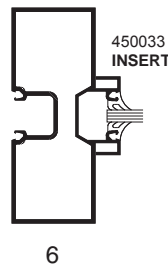
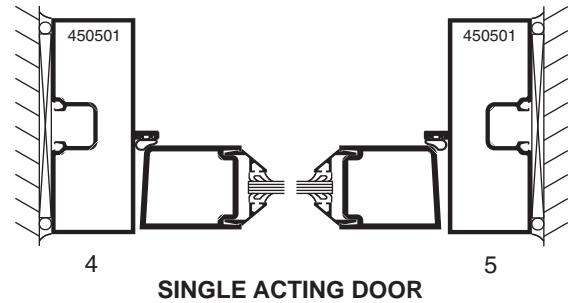
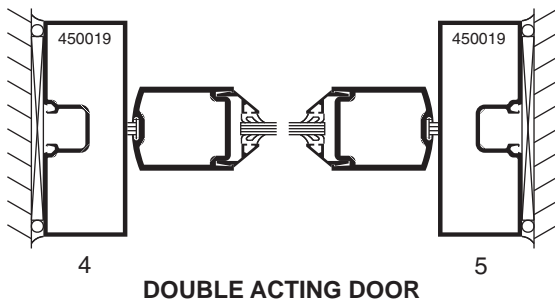
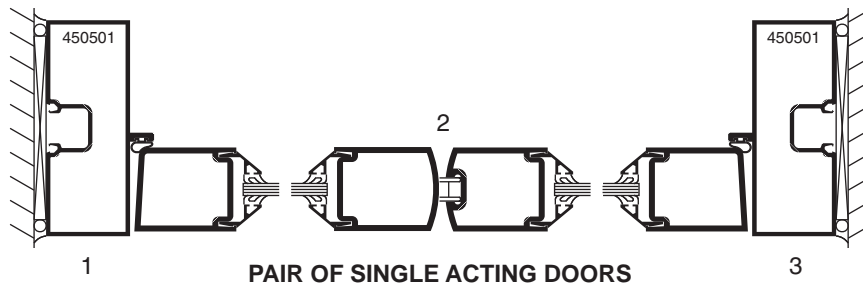
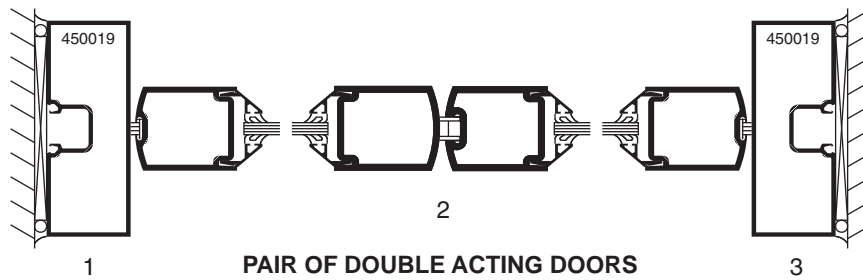
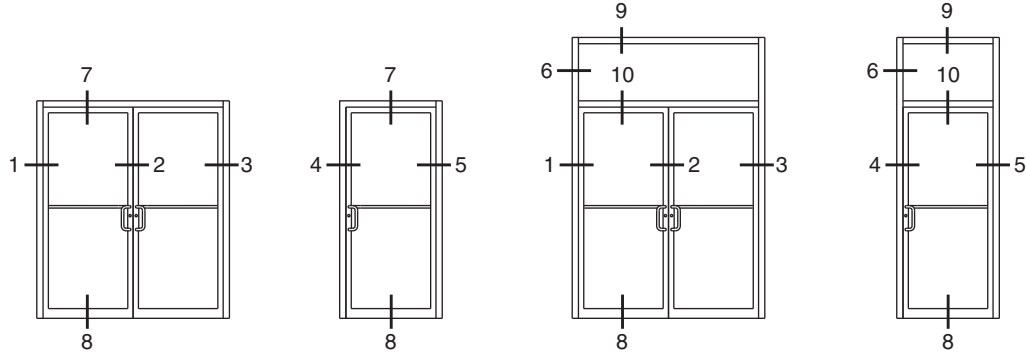
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Additional information and CAD details are available at www.kawneer.com

NOTE:

- 1. SERIES 190 NARROW STILE DOORS ARE DETAILED, MEDIUM STILE 350 DOORS AND WIDE STILE 500 DOORS ALSO MAY BE USED.
- 2. TRIFAB™ VG 450 CENTER, 1-3/4" X 4-1/2" (44.5 X 114.3) FRAMING IS DETAILED WITH THE DOORS FOR REFERENCE. OTHER KAWNEER FRAMING SERIES OR CURTAIN WALL SYSTEMS MAY BE USED. REFER TO THE CATALOG INDEX FOR THE APPROPRIATE DETAIL SECTION.

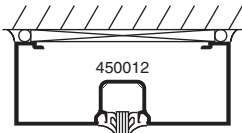


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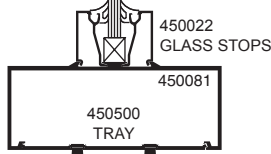
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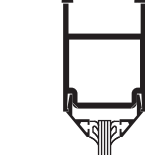
DOUBLE ACTING DOORS



9



10

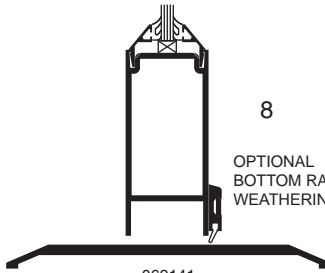


8

OPTIONAL
BOTTOM RAIL
WEATHERING

069143

OVERHEAD CLOSER

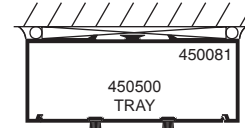


8

OPTIONAL
BOTTOM RAIL
WEATHERING

069141

FLOOR CLOSER



7



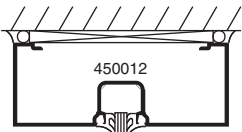
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OPTIONAL
BOTTOM RAIL
WEATHERING

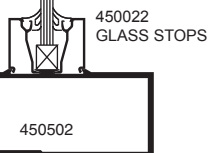
069143

OVERHEAD CLOSER

SINGLE ACTING DOORS



9



10

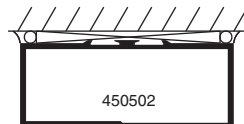


8

OPTIONAL
BOTTOM RAIL
WEATHERING

069139

OVERHEAD CLOSER



7



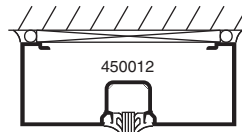
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OPTIONAL
BOTTOM RAIL
WEATHERING

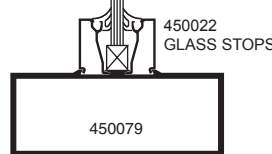
069139

OVERHEAD CLOSER

COC WITH SINGLE ACTING OFFSET ARM



9



10



8

OPTIONAL
BOTTOM RAIL
WEATHERING

069139

OVERHEAD CLOSER



7



8

OPTIONAL
BOTTOM RAIL
WEATHERING

069139

OVERHEAD CLOSER

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.

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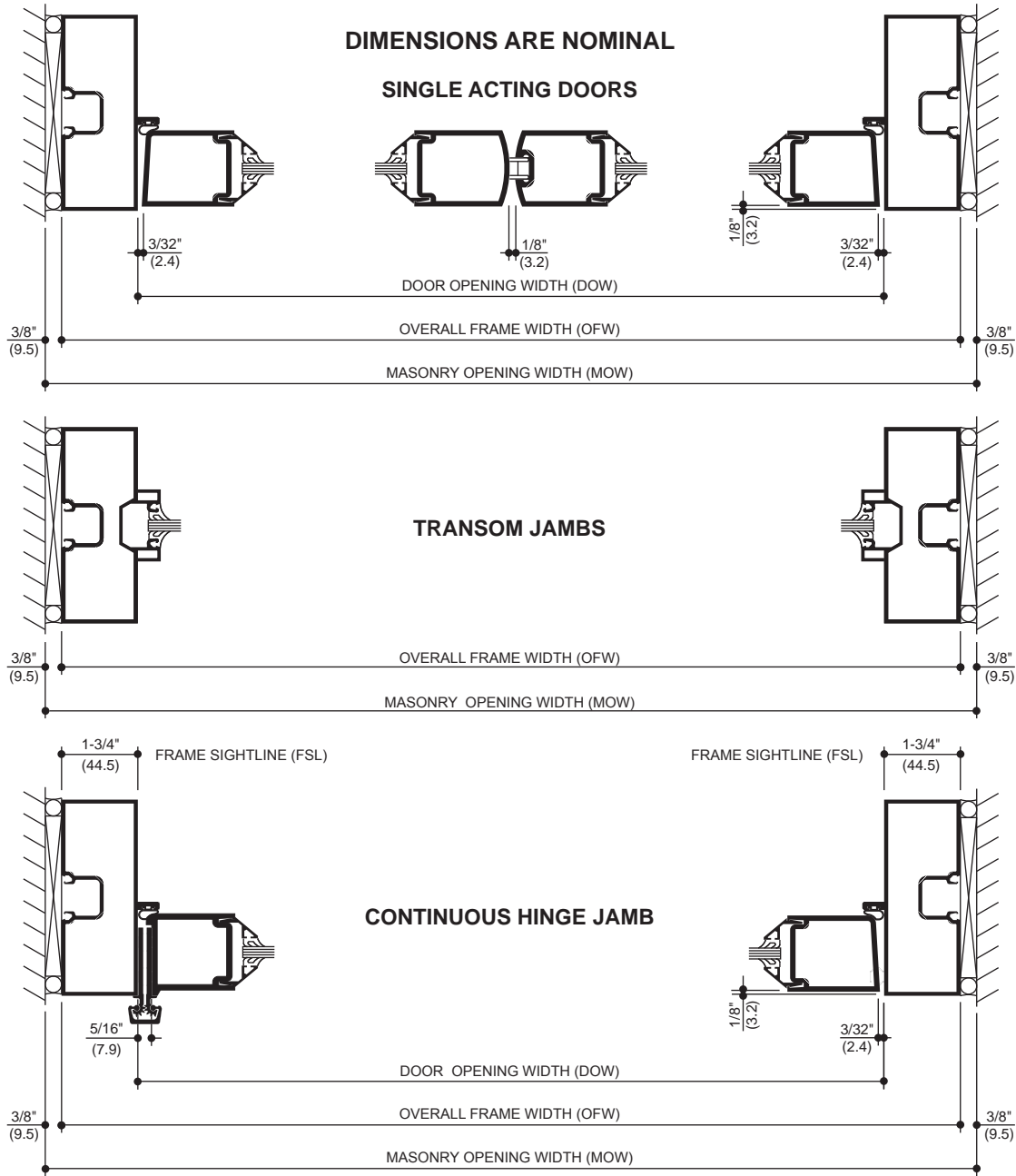
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

**LEFT BLANK
INTENTIONALLY**

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Trifab™ VG 450 center door frames shown, Trifab™ VG 451 center door frames similar.



STANDARD SIZES (TRIFAB™ 400 & TRIFAB™ VG 450 CENTER FRAMES)

WITH AND WITHOUT TRANSOM

Door Opening Dimension (DOW)	Overall Frame Dimension (OFW)	Masonry Opening Dimension (MOW)
3' 0" (914)	3' 3-1/2" (1,003)	3' 4-1/4" (1,022)
3' 6" (1,067)	3' 9-1/2" (1,156)	3' 10-1/4" (1,175)
6' 0" (1,829)	6' 3-3/4" (1,924)	6' 4-1/4" (1,937)

STANDARD SIZES (TRIFAB™ VG 451 CENTER FRAMES)

WITH AND WITHOUT TRANSOM

Door Opening Dimension (DOW)	Overall Frame Dimension (OFW)	Masonry Opening Dimension (MOW)
3' 0" (914)	3' 4" (1,016)	3' 4-3/4" (1,035)
3' 6" (1,067)	3' 10" (1,168)	3' 10-3/4" (1,187)
6' 0" (1,829)	6' 4" (1,930)	6' 4-3/4" (1,949)

WITH AND WITHOUT TRANSOM

OFW = DOW + 2 FSL

MOW = OFW + 3/4"

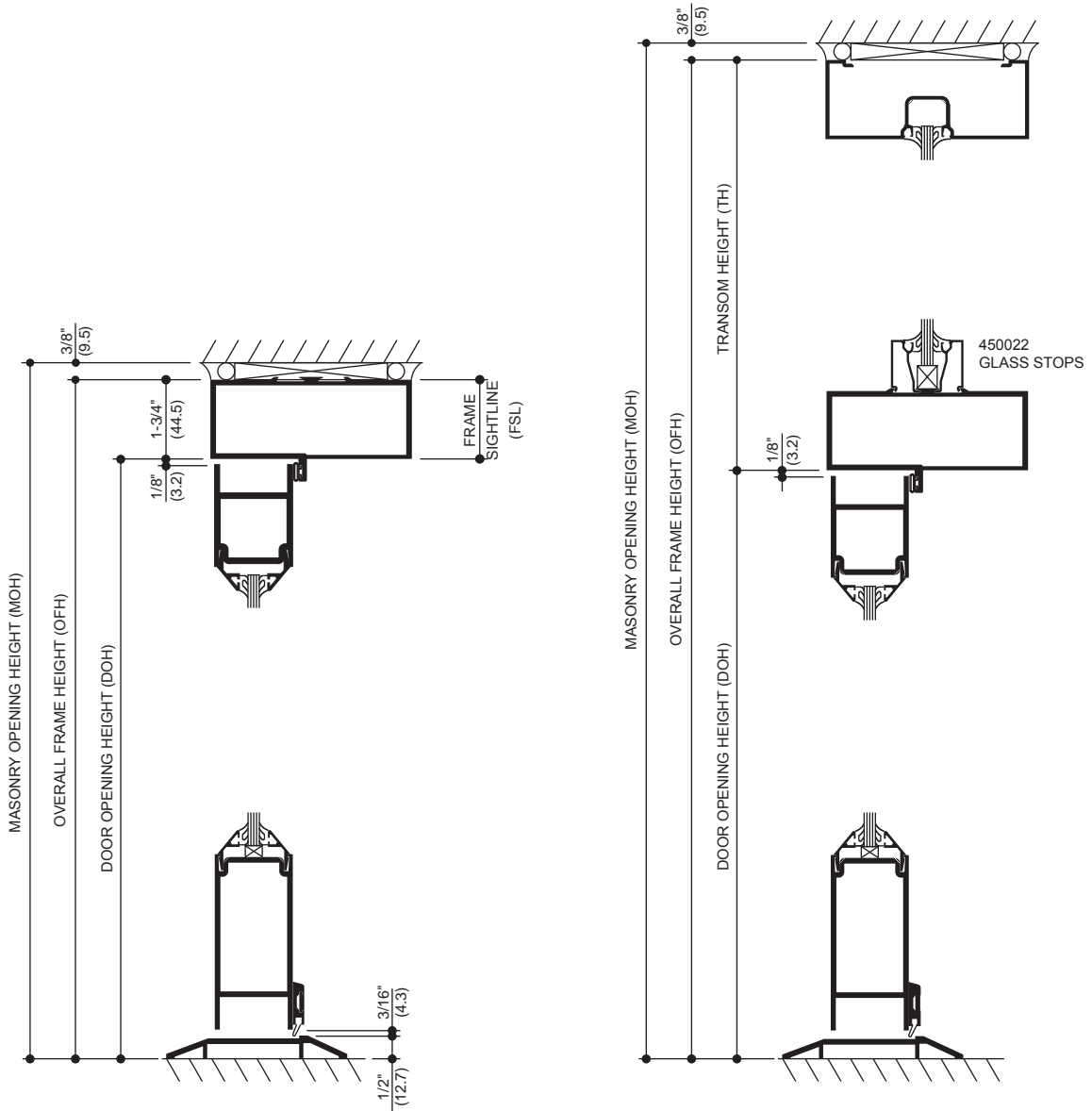
Note: Dimensions shown above reflect A1 Price Book standard stock door frame height with transom at 10' 3-1/2" (3,137).

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.

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STANDARD SIZES (TRIFAB™ 400 & TRIFAB™ VG 450 CENTER FRAMES)

WITHOUT TRANSOM

Door Opening Dimension (DOH)	Overall Frame Dimension (OFH)	Masonry Opening Dimension (MOH)
7' 0" (2,134)	7' 1-3/4" (2,178)	7' 2-1/8" (2,188)
7' 0" (2,134)	7' 1-3/4" (2,178)	7' 2-1/8" (2,188)
7' 0" (2,134)	7' 1-3/4" (2,178)	7' 2-1/8" (2,188)

STANDARD SIZES (TRIFAB™ VG 451 CENTER FRAMES)

WITHOUT TRANSOM

Door Opening Dimension (DOH)	Overall Frame Dimension (OFH)	Masonry Opening Dimension (MOH)
7' 0" (2,134)	7' 2" (2,184)	7' 2-3/8" (2,194)
7' 0" (2,134)	7' 2" (2,184)	7' 2-3/8" (2,194)
7' 0" (2,134)	7' 2" (2,184)	7' 2-3/8" (2,194)

WITHOUT TRANSOM

OFH = DOH + FSL
 MOH = OFH + 3/8"

WITH TRANSOM

OFH = DOH + TH
 MOH = OFH + 3/8"

Note: Dimensions shown above reflect A1 Price Book standard stock door frame height with transom at 10' 3-1/2" (3,137).

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	STANDARD	OPTIONAL
Doors	Narrow stile 190 doors prepared for attachment hardware.	Medium stile 350 or wide stile 500.
Door Sizes Std.	Standard sizes shown on pages 10 and 11.	Any size up to 4'-0" x 8'-0" (1,219 x 2,438).
Glass Stops	Beveled glass stops for 1/4" (6.4) or 3/16" (4.0) infill.	Square glass stops for 3/16" (4.0) or 1/4" (6.4) infill. Also 1" (25.4) stops.
Door Frames	Trifab™ 400 - 1-3/4" x 4" (44.5 x 101.6) for single glazing. Trifab™ VG 450 Center - 1-3/4" x 4-1/2" (44.5 x 114.3) for single glazing or Trifab™ VG 451 Center - 2" x 4-1/2" (50.8 x 114.3) for double glazing.	Any Kawneer framing system suitable for door frames may be selected, but manufactured per order.
Push-Pulls	Single Acting: Architects Classic Hardware CO-9 Pull and CP-II Push Bar. Architects Classic Hardware CO-9 Pull and CP Push Bar. Double Acting: Architects Classic Hardware CP Push Bars.	Single Acting: Architects Classic Hardware CO-12 and CP-II push bar. Architects Classic Hardware CO-12 and CP push bar. Architects Classic Hardware CO-9/CO-9 Pulls. Architects Classic Hardware CO-12/CO-12 Pulls. Double Acting: Architects Classic Hardware CO-9/CO-9 Pulls. Architects Classic Hardware CO-12/CO-12 Pulls.
Door Closers	Single Acting: Norton 1601 adjustable or 1601 BF adjustable surface closer with back-check and with or without adjustable hold-open. Standard concealed overhead closer with single acting offset arm. Double Acting: Standard concealed overhead closer with 90 degree or 105 degree hold-open or without hold open. For heavy traffic & high wind applications, a supplemental door stop is recommended.	Single Acting: LCN 4040 surface closer with or without adjustable hold-open. LCN 2010, 2030 or 5010 concealed overhead closers with or without hold-open. LCN 1260 adjustable surface closer. Norton 8100 surface closer with a 50% spring power adjustment (for opening forces of less than 8 pounds). Closer is available with standard back-checks and with or without the hold-open feature. International single acting concealed overhead closer. Falcon SC 60 Surface closer. Double Acting: International overhead concealed closer.
Hinging	Single Acting: Kawneer top and bottom offset pivots (or) Kawneer top and bottom 4 1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP) (or) Kawneer continuous gear hinge. Double Acting: Kawneer bottom center pivots for use with concealed overhead closer.	Double Acting: Kawneer top center (walking beam) pivot for use with floor closers.
Intermediate Pivots/Butts	Single Acting: Kawneer intermediate offset pivot (or) Kawneer 4-1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP).	Single Acting: Rixson M-19 or IVES #7215-INT intermediate offset pivot.
Power Transfers	Single Acting: Kawneer EL intermediate offset pivot (or) Kawneer EL 4 1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with wire transfer (or) EPT (Electric Power Transfer).	
Power Supply	SP-1000X Power Supply: For use with Paneline™ EL exit devices. For use with Falcon EL 1690 and EL 1790 exit devices. SP-2000 Power Supply: For use with Paneline™ MEL exit devices.	NP1 Power Supply: For use with Kawneer 1686 MEL and 1786 MEL exit devices only.
Locks - Active Leaf	Adams-Rite MS 1850A deadlock with two 1-5/32" (29.4) diameter 5 pin cylinders.	Adams-Rite #4510 latch lock. Adams-Rite #1850A-500 short throw deadlock. Adams-Rite #1850A-505 hookbolt lock. Adams-Rite #4015 two-point Lock. Adams-Rite #4085 three-point Lock. Adams-Rite #4089 exit indicator. Kawneer cylinder guard. Kawneer thumbturn (in lieu of cylinder).

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	STANDARD	OPTIONAL
Locks - Inactive Leaf	One pair of Kawneer flush bolts in the inactive leaf of a pair of doors.	Controller™ is a 3-point locking system consisting of a two point locking device in the inactive leaf in lieu of flush bolts, working in conjunction with the MS 1850A deadlock in the active leaf. This combination provides for greater security than possible with flush bolts and complies with the life safety considerations of building codes which prohibit the use of flush bolts.
Thresholds	A 1/2" x 4" (12.7 x 101.6) aluminum mill finish threshold.	A 1/2" x 6-3/4" (12.7 x 171.5) aluminum mill finish threshold.
Weathering	<p>Single Acting: Weathering system in the door and frame consisting of a dense, bulb polymeric material, which remains resilient and retains its weathering ability under temperature extremes. (The system is complete with an optional EPDM blade gasket sweep strip applied to the bottom door rail with concealed fasteners).</p> <p>Double Acting: Pile cloth weathering in the door and frame.</p>	Bottom Door Sweep
Exit Device	<p>Kawneer 1686 Concealed Rod Exit Device with or without a mortised type cylinder.</p> <p>Kawneer 1786 Rim Exit Device is a rim type exit device with or without a rim type cylinder. Pairs of doors require a Kawneer RM-86 removable mullion.</p> <p>Paneline™ exit device is a concealed rod exit device applicable to single or pairs of doors. It features an activating panel contained within the door cross rail.</p>	<p>Kawneer 1686 MEL Concealed Rod Exit Device electric modification is available.</p> <p>Kawneer 1786 MEL Rim Exit Device electric modification is available.</p> <p>Kawneer 1686 CD Concealed Rod Exit Device available with cylinder dogging.</p> <p>Kawneer 1786 CD Rim Exit Device available with cylinder dogging.</p> <p>Kawneer 1686 Lever Handle is available for the Kawneer 1686 concealed rod exit device.</p> <p>Kawneer 1786 Lever Handle is available for the Kawneer 1786 rim type exit device.</p> <p>Falcon 1690 Concealed Rod Exit Device with or without a mortised type cylinder.</p> <p>Falcon 1790 Rim Exit Device is a rim type exit device with or without a rim type cylinder.</p> <p>Falcon EL 1690 electric modification is also available.</p> <p>Falcon EL 1790 electric modification is also available</p> <p>Paneline™ MEL electric modification is also available.</p> <p>Falcon 1990 is a concealed rod exit device with or without a rim type cylinder.</p> <p>Falcon 2090 is a rim type exit device with or without a rim type cylinder. Pairs of doors require a removable aluminum mullion. RM-70 with the Falcon 2090 exit device.</p>
	<p>Exit Device Pulls: Architects Classic CO-9 Pull with Kawneer 1686 and 1786 exit devices. Architects Classic CPN Pull for Paneline™ and Paneline™ MEL exit devices.</p>	<p>Optional Exit Device Pulls: Architects Classic CO-12 Pull with Kawneer 1686 and 1786 exit devices.</p>

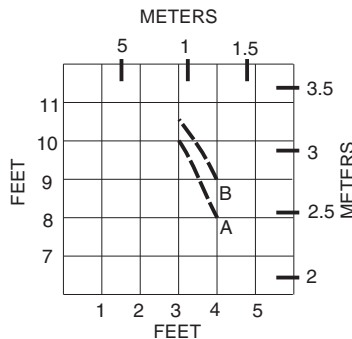
APPLICATION CRITERIA

As indicated on Page 10, the standard sizes of swing doors are 3'-0" x 7'-0" (914.4 x 2,133.6) or 3'-6" x 7'-0" (1,067 x 2,134) for single doors and 6'-0" x 7'-0" (1,828.8 x 2,133.6) for pairs of doors. When these sizes are exceeded the following criteria should be administered.

1. Larger doors should not be subject to heavy traffic or strong prevailing wind conditions.
2. Larger doors should use a door closer with a good back check action.
3. When a door exceeds 9'-0" (2,743.2) in height, a cross rail or push bar is recommended to reinforce the vertical stiles.
4. When an offset hung door exceeds 7'-6" (2,286.0) in height, an intermediate butt or offset pivot should be used.
5. Tall doors should be prevented from racking by proper utilization of hardware, including door closers, door holders and door stops.

NOTE:

SOME OF THESE CRITERIA ARE OF A SUBJECTIVE NATURE, CONTACT YOUR FACTORY REPRESENTATIVE FOR APPLICATION ASSISTANCE.



A = NARROW STILE 190
B = MEDIUM STILE 350
OR
WIDE STILE 500

MAXIMUM DOOR HEIGHT FOR PANELINE™ MEL = 8'-0"

MAXIMUM SIZE DOOR LEAFS GLAZED WITH 1/4" (6.4) GLASS

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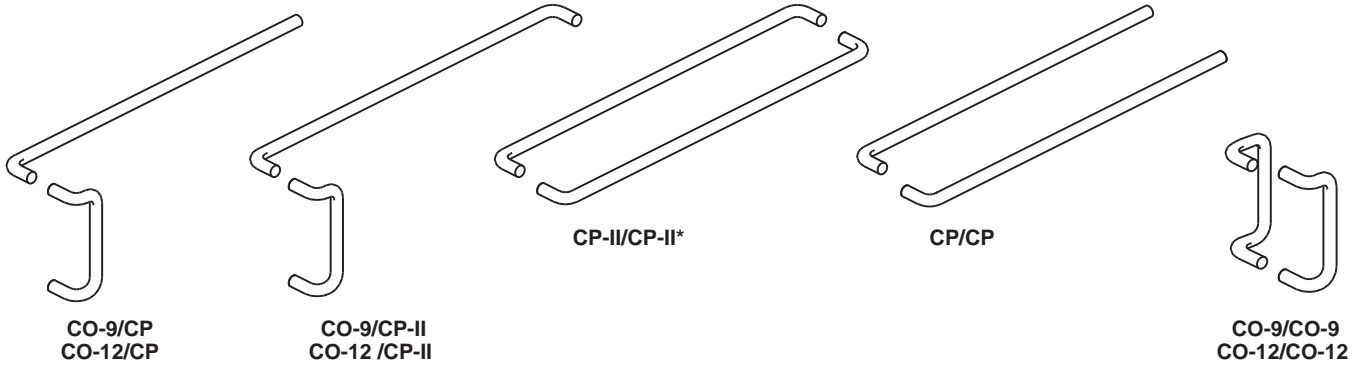
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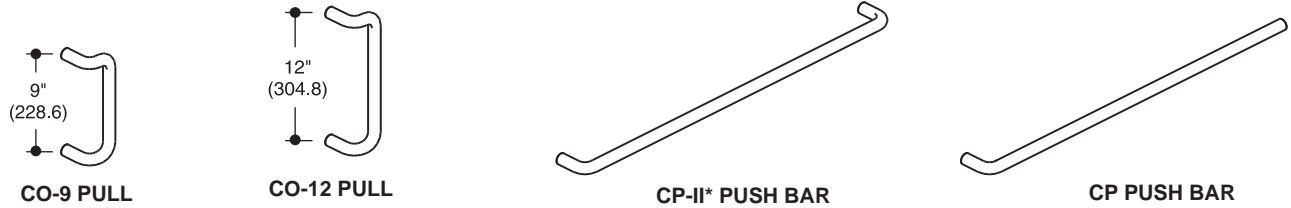
REFER TO HARDWARE SECTION FOR COMPLETE HARDWARE INFORMATION.

ARCHITECTS CLASSIC (PUSH PULL SETS)

SINGLE ACTING DOORS USE A PULL HANDLE AND PUSH BAR AS STANDARD
 DOUBLE ACTING DOORS USE CP PUSH BARS BACK TO BACK AS STANDARD.



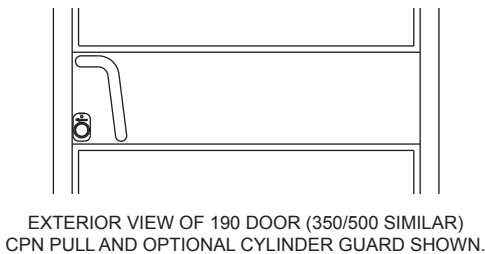
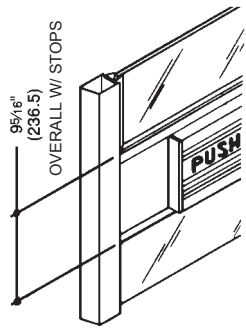
ARCHITECTS CLASSIC (COMPONENTS)



* CP-II PUSH BAR IS NOT TO BE USED FOR BACK TO BACK MOUNTING ON D/A DOORS.

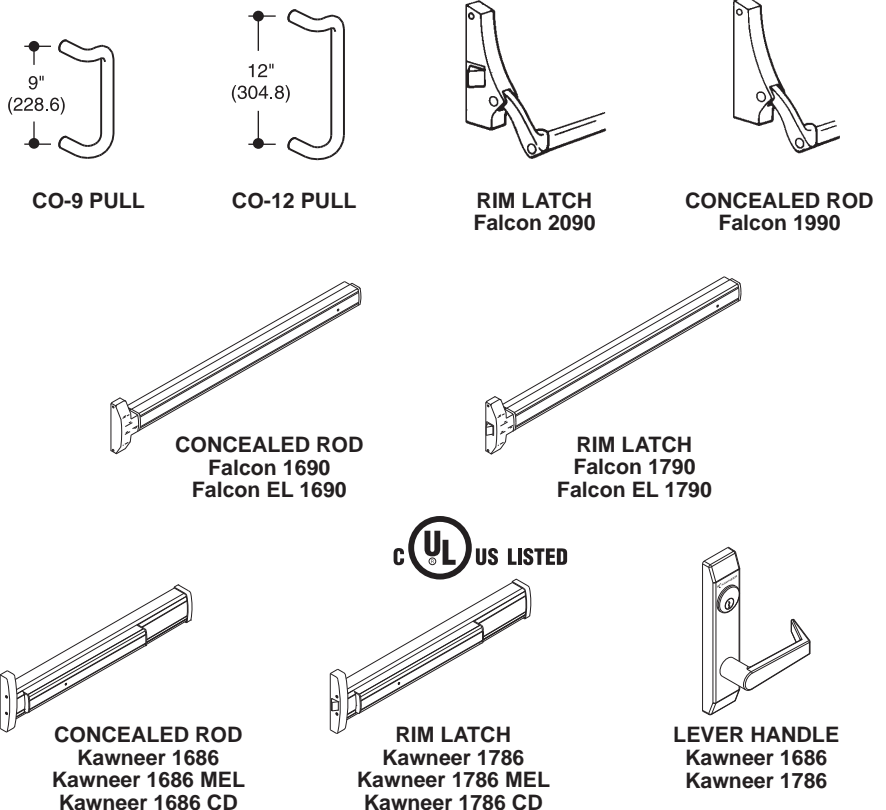
EXIT DEVICES

KAWNEER PANELINE™ / PANELINE™ MEL



SEE PAGE 15 AND 16 FOR COMPLETE PANELINE™ INFORMATION

EXIT DEVICES AND PULLS



The Paneline™ concealed rod exit device for 190, 350 and 500 doors will accommodate variations in stile width and door width as shown in the following illustrations. Sidelites adjacent to Paneline™ equipped doors not requiring exit devices may be fitted with fixed panels as detailed below to match the general appearance of the Paneline™ cross rail.



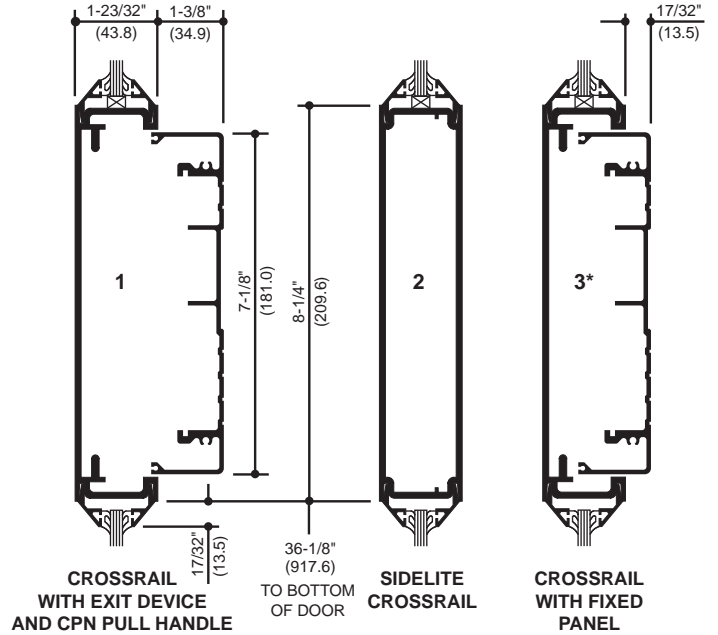
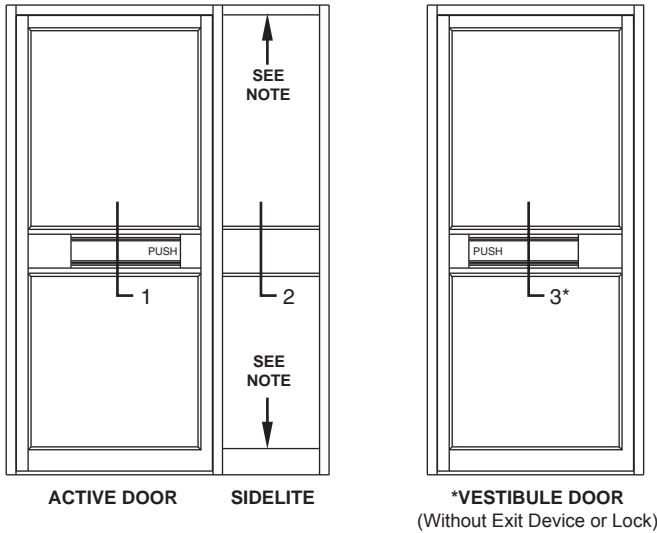
The Optional Paneline™ MEL device is designed for electrified access control and is compatible with most key pad and card reader systems.

See **Hardware Section** for complete description of Paneline™ hardware, including finish of units.

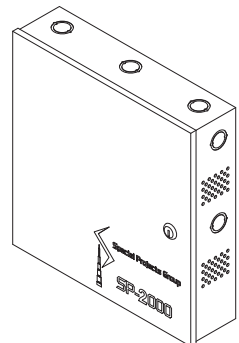
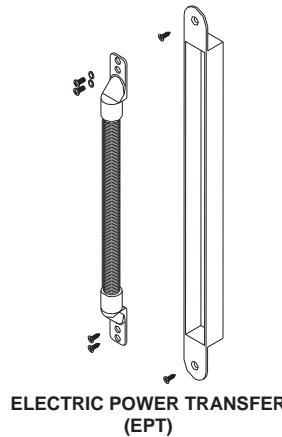
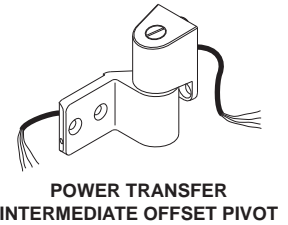
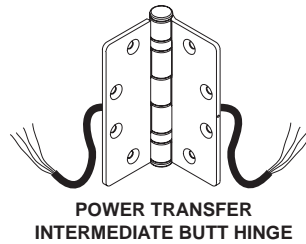
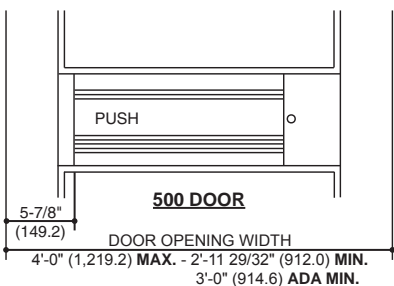
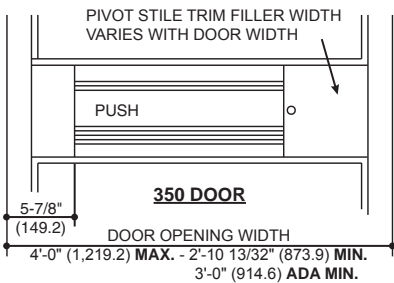
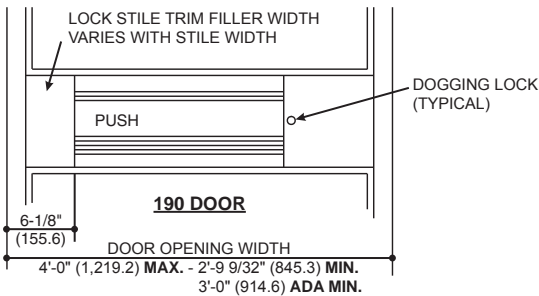
Paneline™ uses mortise cylinder in lieu of the normal rim-type. Dummy Paneline™ units are not for use with any type of lock.

INTERIOR ELEVATIONS

NOTE: Sidelites must be stop glazed above and below rail.



PANELINE™ MEL COMPONENTS



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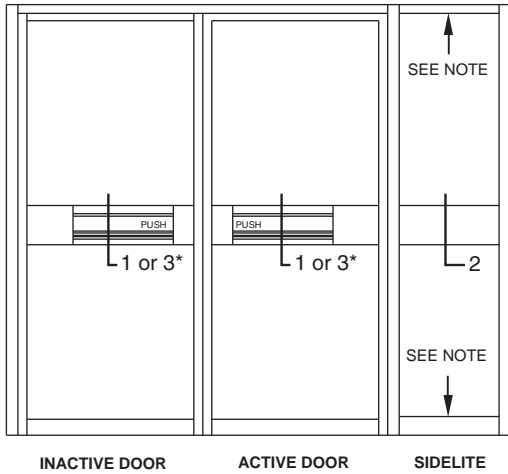
Sidelites adjacent to Paneline™ equipped doors not requiring exit devices may be fitted with fixed panels as detailed below to match the general appearance of the Paneline™ cross rail.

See **Hardware Section** for complete description of Paneline™ hardware, including finish of units.

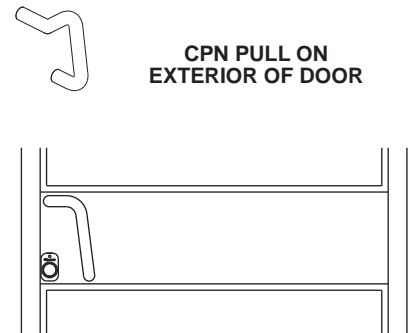
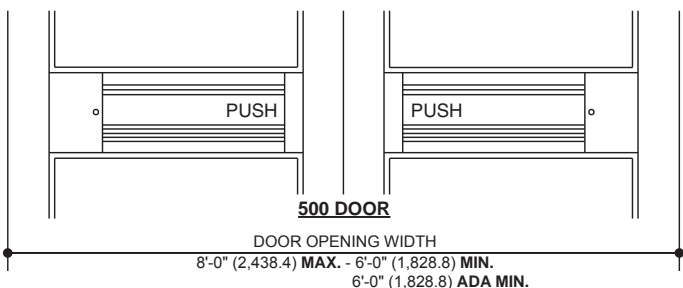
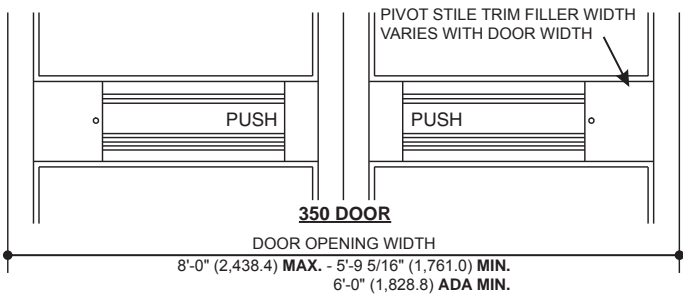
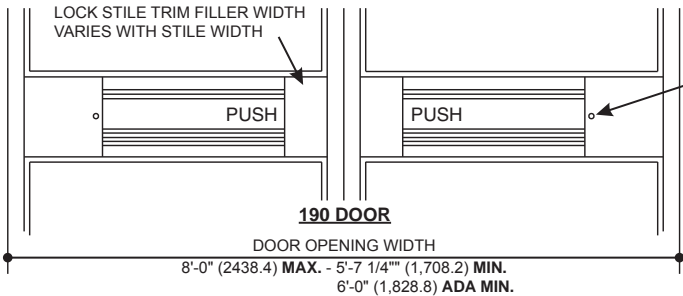
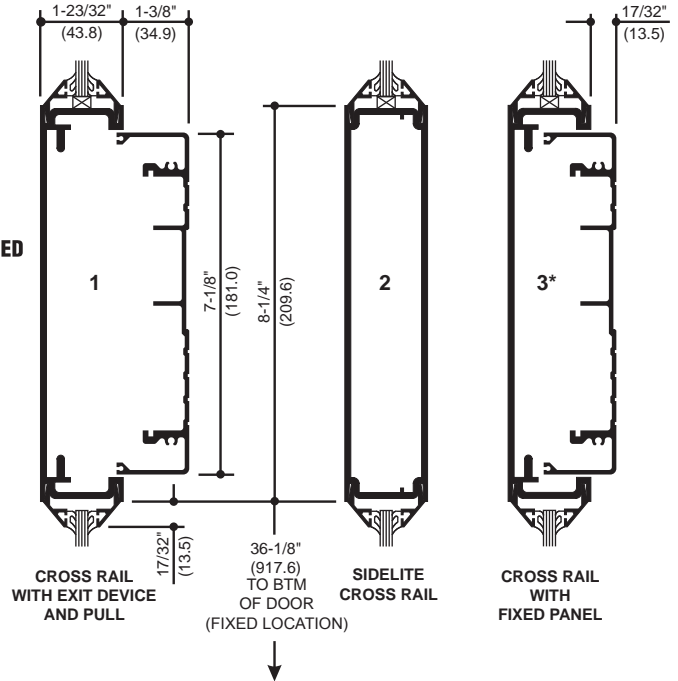
Paneline™ uses mortise cylinder in lieu of the normal rim-type. Dummy Paneline™ units should not use any type of lock.

INTERIOR ELEVATION

NOTE: Sidelites must be stop glazed above and below rail.



*** ALTERNATE CROSSRAIL FOR VESTIBULE DOORS (Without Exit Device or Lock)**



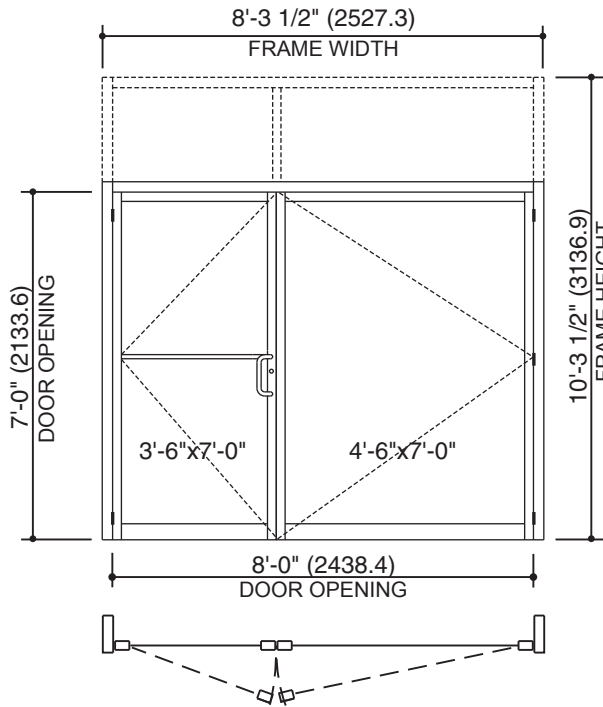
EXTERIOR VIEW OF 190 DOOR (350-500 SIMILAR) WITH CPN PULL AND STANDARD CYLINDER GUARD SHOWN

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.

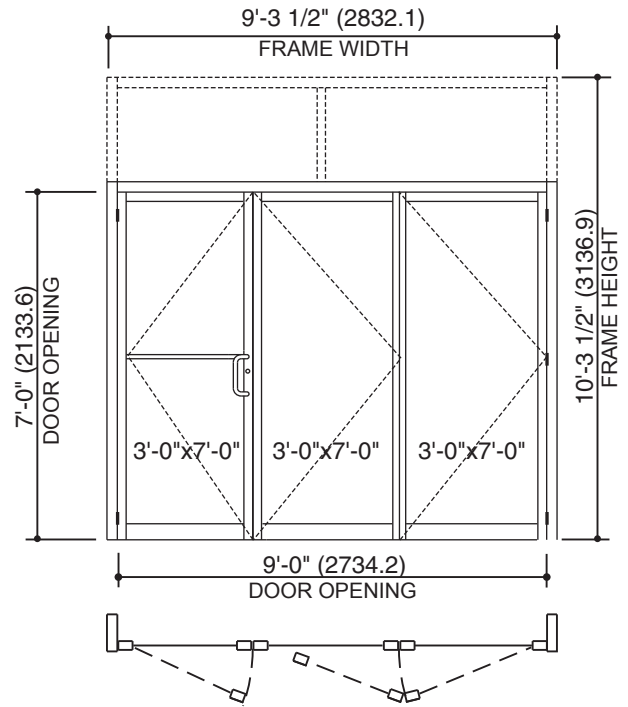
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NOTE: 1/4" GLAZING INFILL ONLY

SWING TYPE



BIFOLD TYPE



MAXIMUM ALLOWABLE SIZES

- DOOR OPENING WIDTH TO 9'-0" (2,743.2)
- DOOR OPENING HEIGHT TO 8'-0" (2,438.4)
- OVERALL FRAME HEIGHT TO 8'-1 3/4" (2,482.9) W/O TRANSOM
- OVERALL FRAME HEIGHT TO 12'-0" (3,657.6) WITH TRANSOM

AUTO SHOWROOM PACKAGE

DOORS 190 NARROW STILE, 350 MEDIUM STILE AND 500 WIDE STILE DOORS.

FRAME..... TRIFAB™ VG 450 CENTER.

CLOSER..... NORTON 1601 ADJUSTABLE OR 1601 BF ADJUSTABLE SURFACE CLOSER (ACTIVE LEAF ONLY).

BUTT HINGES ONE PAIR 4-1/2" x 4" (114.3 x 101.6) BALL BEARING BUTTS ON ACTIVE LEAF, ONE AND ONE HALF PAIR ON INACTIVE LEAVES AT HINGE JAMB. CONTINUOUS HINGE ON INACTIVE LEAVES.

LOCKS..... ADAMS-RITE MS1850A WITH (2) CYLINDERS ON ACTIVE LEAF.

FLUSHBOLTS..... ONE PAIR EDGE MOUNTED FOR INACTIVE LEAVES (FACE MOUNTED ON #2 INACTIVE LEAF OF BIFOLD TYPE).

THRESHOLD 1/2" x 4" (12.7 x 101.6) ALUMINUM.

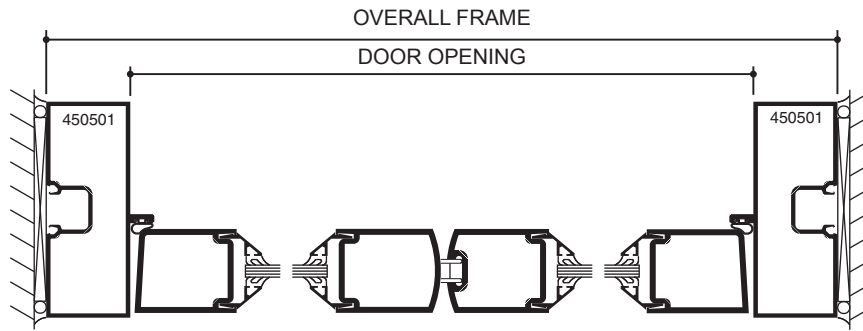
RISER BLOCK..... EXTRUDED ALUMINUM BLOCK APPLIED TO BOTTOM RAIL OF EACH INACTIVE LEAF.

OPTIONAL CASTER IN LIEU OF RISER BLOCK, FACE APPLIED CASTER TO LEADING STILE OF INACTIVE LEAF.

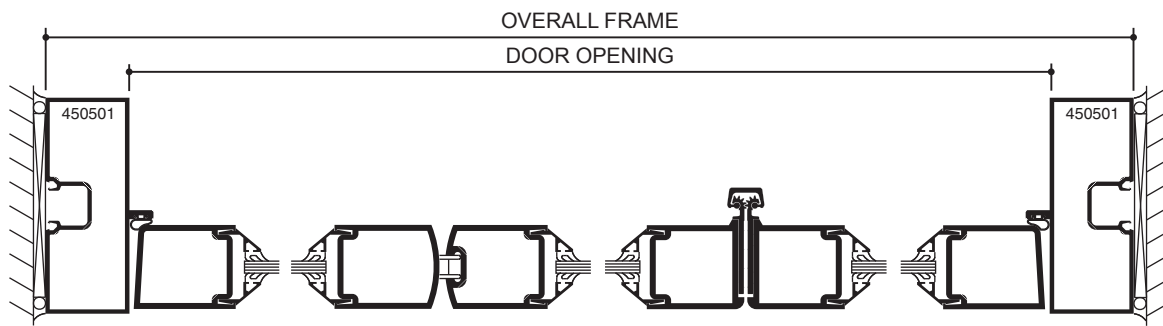
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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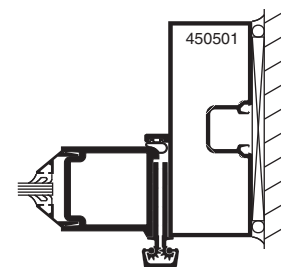
Additional information and CAD details are available at www.kawneer.com



SWING TYPE



BIFOLD TYPE



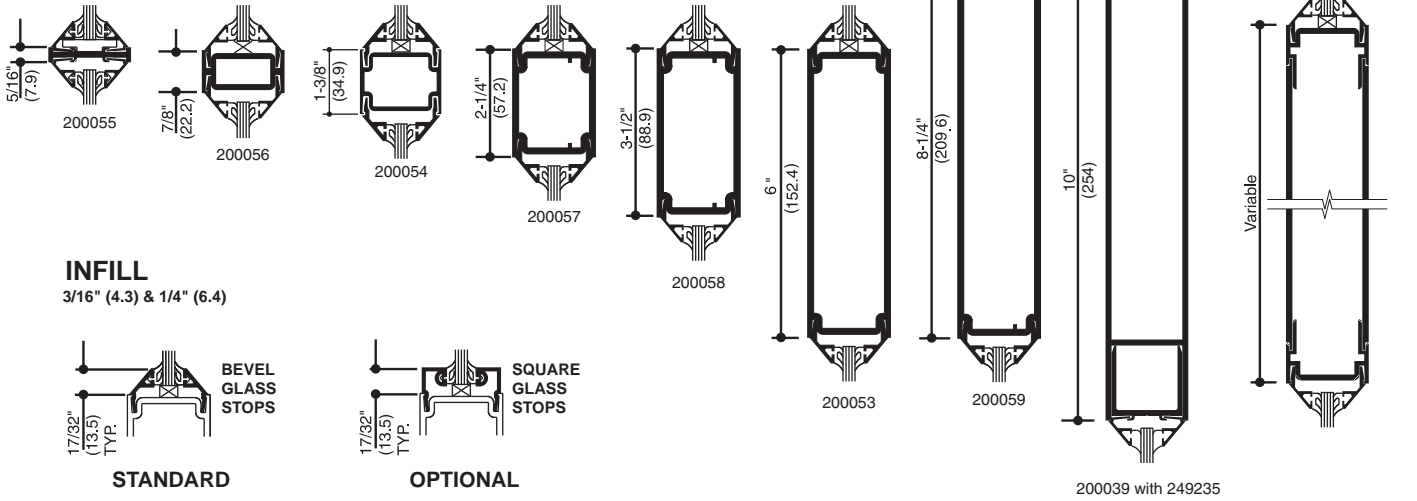
**OPTIONAL
CONTINUOUS HINGE
JAMB**

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.

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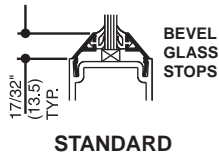
Additional information and CAD details are available at www.kawneer.com

HORIZONTAL / VERTICAL CROSS RAILS

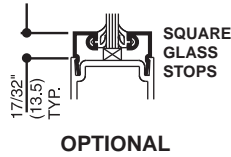


INFILL

3/16" (4.3) & 1/4" (6.4)



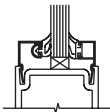
STANDARD



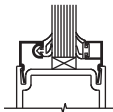
OPTIONAL

INFILL OPTIONS

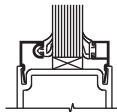
5/16" (7.9) & 3/8" (9.5)



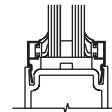
7/16" (11.1) & 1/2" (12.7)



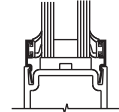
9/16" (14.3) & 5/8" (15.9)



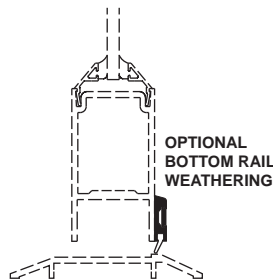
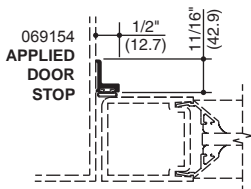
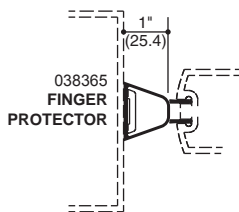
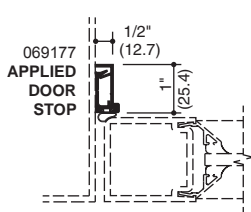
11/16" (17.5) & 3/4" (19.0)



15/16" (23.8) & 1" (25.4)



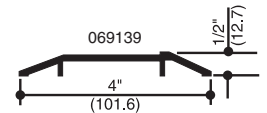
ACCESSORY ITEMS



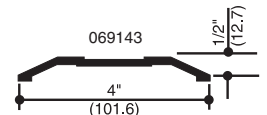
THRESHOLDS

APPLICATION

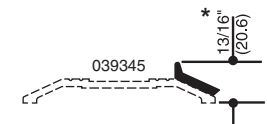
FOR SINGLE ACTING DOOR



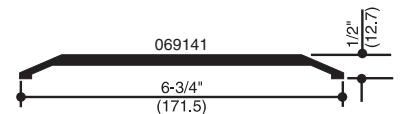
FOR CENTER HUNG CONCEALED CLOSER



APPLIED STOP FOR SINGLE ACTING DOOR



FOR CENTER HUNG FLOOR CLOSERS

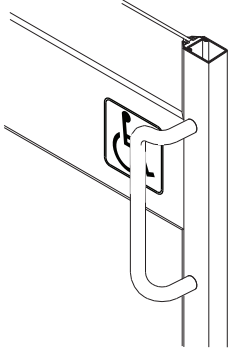
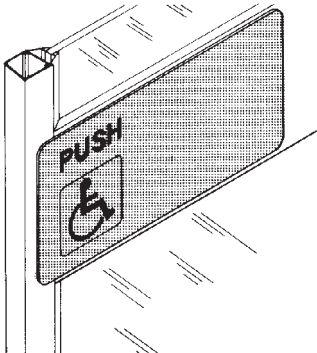


*SOME BUILDING CODES LIMIT THRESHOLD HEIGHT TO 1/2" (12.7) MAX.

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.

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PUSH-PULLS

		
Description	Architects Classic CO-12 Pull	BF3 Push Shield with symbol
Application	Door with or without exit device	Door cross rail (omit w/exit device)
Length/Size	12" OC Pull attachment	15-7/8" x 7-7/8" (403.2 x 200.0) 1/8" (3.2) Thick
Height Location	44-5/16" from Top Mounting Hole to Btm. of Door	
Total Projection	3-1/4" (82.6)	1/8" (3.2)
Material / Finish	See Hardware Section	Black Plastic Pebble Finish

Note: The symbol of access is an adhesive backed decal applied to the surface of the optional cross rail. Letters and symbols on plastic push shield are engraved and filled with white epoxy enamel.

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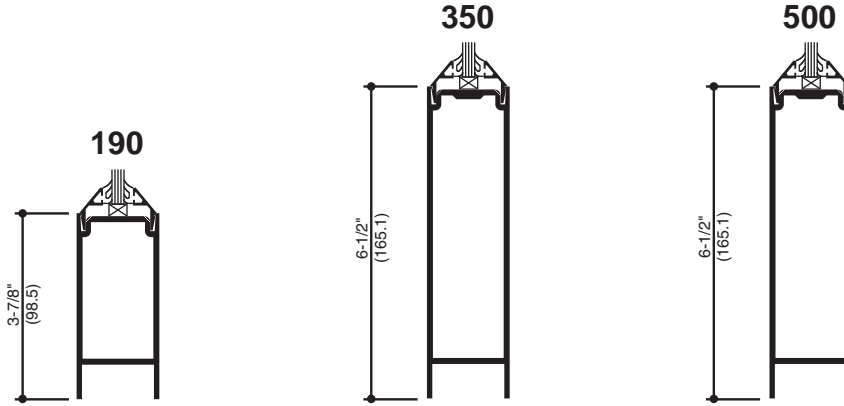
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STANDARD BOTTOM RAILS

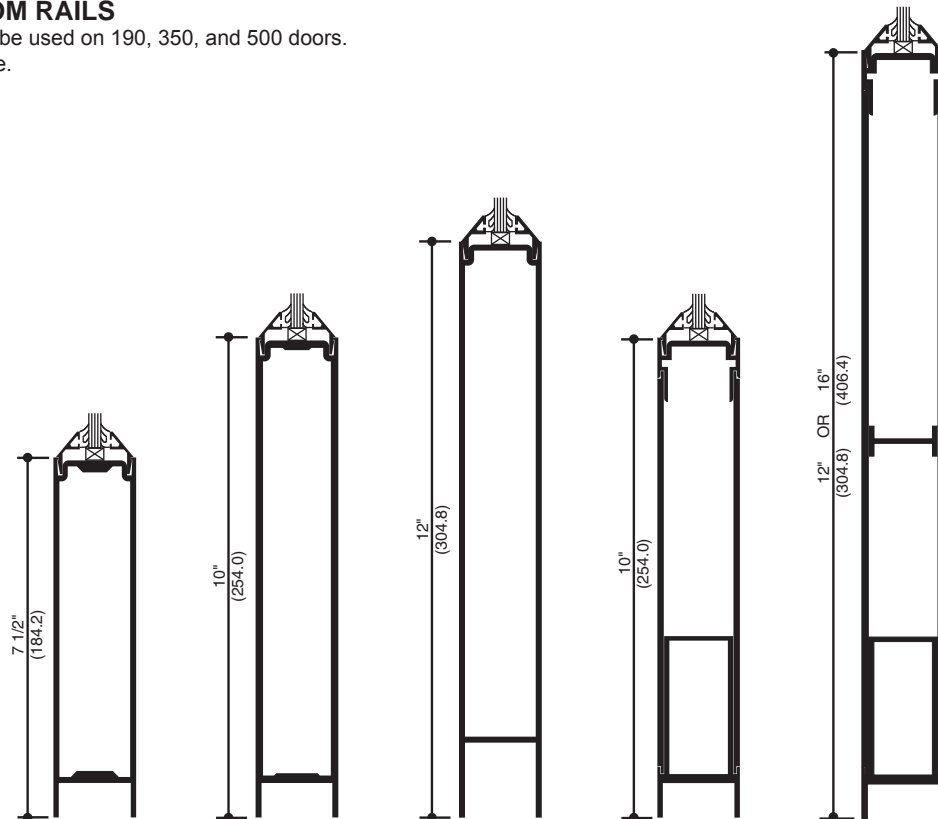
Rail heights shown may be used on 190, 350, and 500 doors.

NOTE:
See Page 19 for available
Horizontal Intermediate Members.



OPTIONAL BOTTOM RAILS

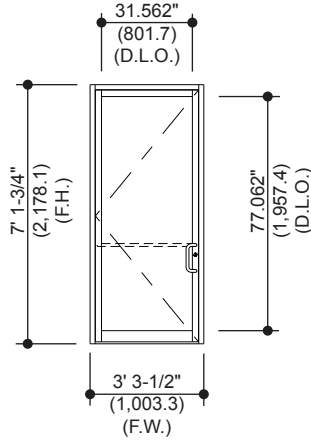
Rail heights shown may be used on 190, 350, and 500 doors.
Custom heights available.



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



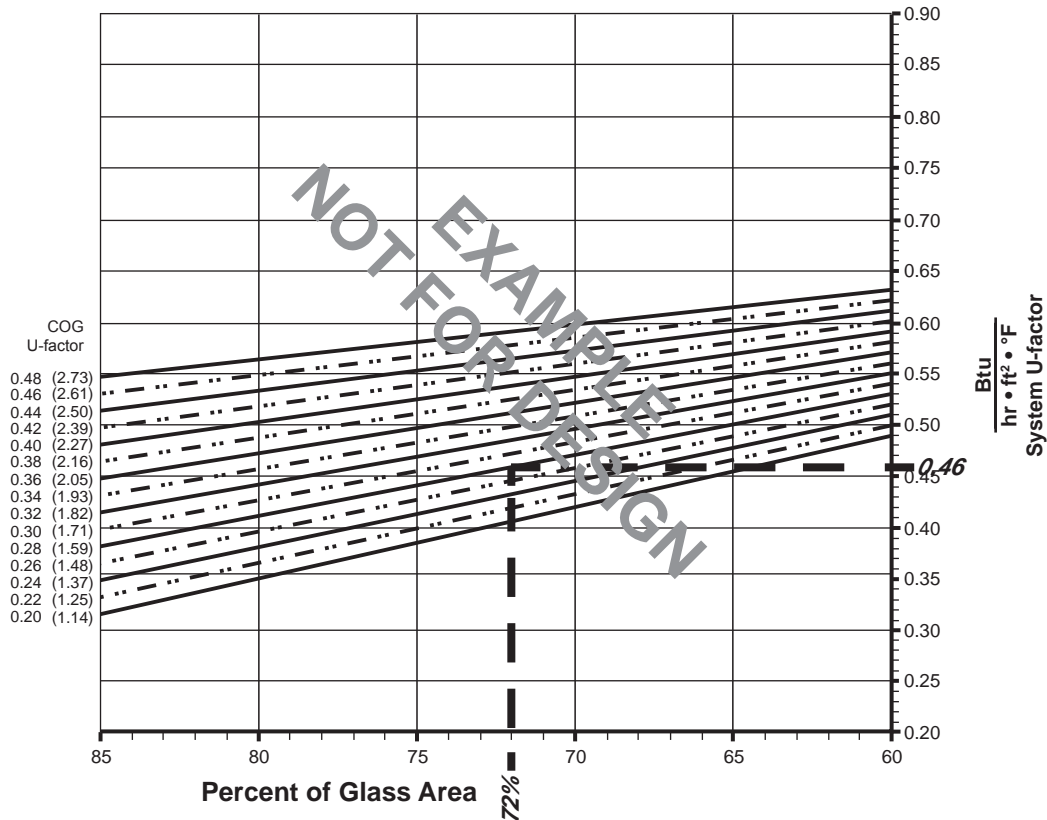
Example Glass U-Factor = 0.28 Btu/hr • ft² • °F

Total Daylight Opening = 31.562" x 77.062" = 16.89 ft²

Total Projected Area = 3' 3-1/2" x 7' 1-3/4" = 23.52 ft²

Percent of Glass = (Total Daylight Opening ÷ Total Projected Area)100
 = (16.89 ÷ 23.52)100 = 72%

System U-factor vs Percent of Glass Area



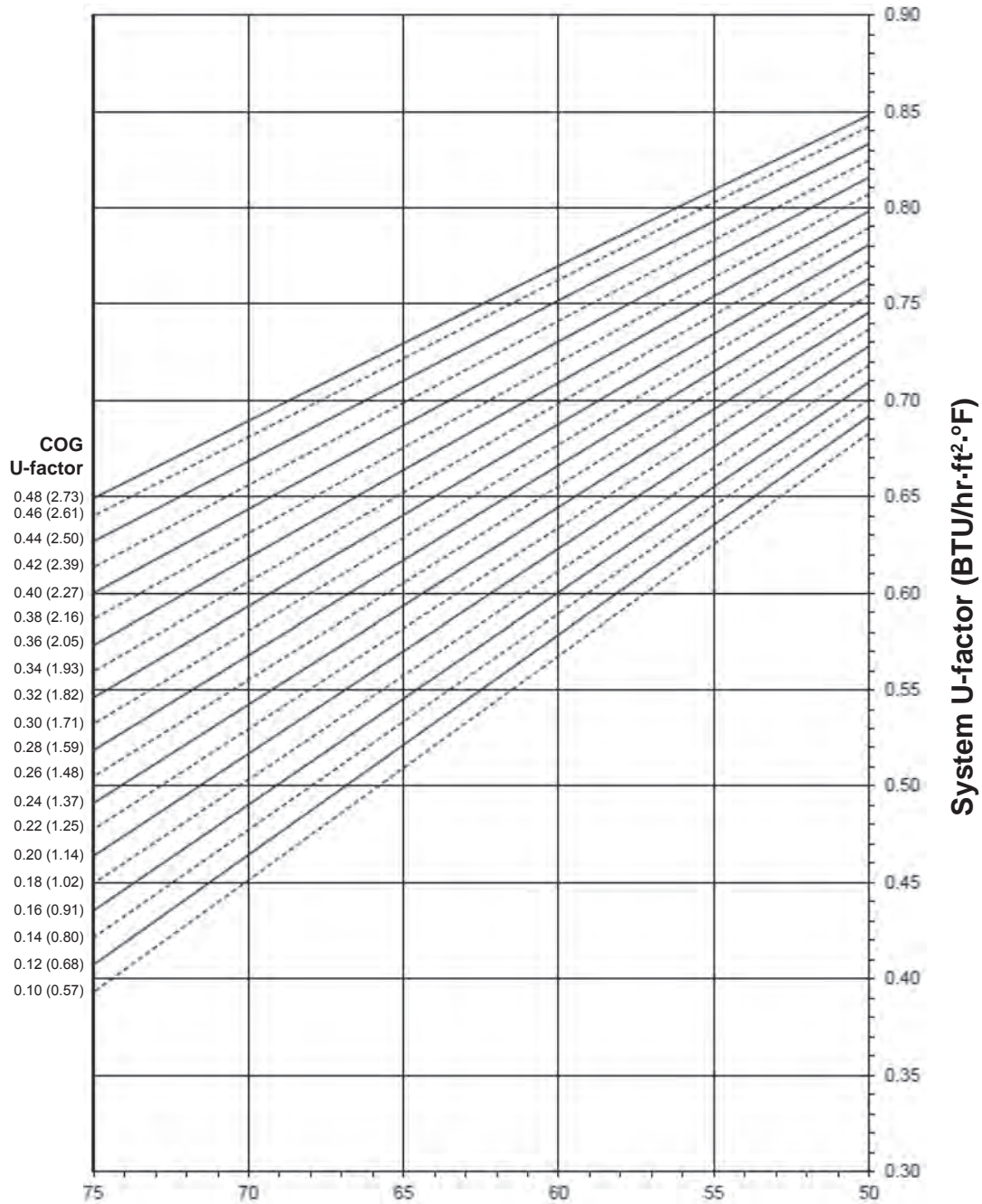
Based on 72% glass and center of glass (COG) U-factor of 0.28
 System U-factor is equal to 0.46 Btu/hr • ft² • °F

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.

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190 (SINGLE DOOR)

System U-factor vs Percent of Glass Area



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

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

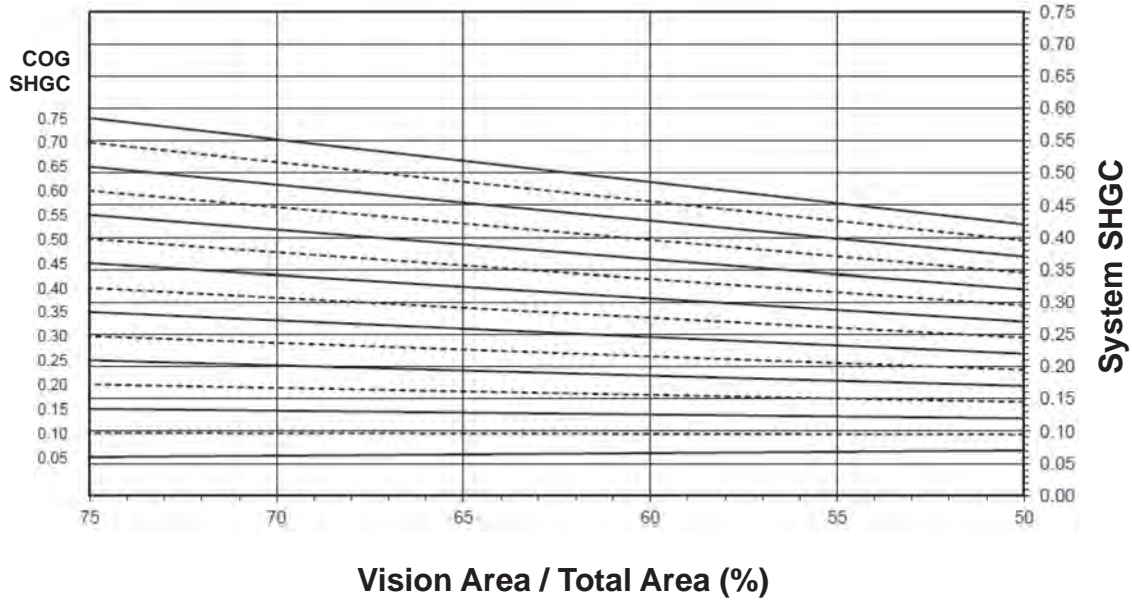
- For glass values that are not listed, linear interpolation is permitted.
- Glass properties are based on center of glass values (winter conditions) and are obtained from your glass supplier.

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.

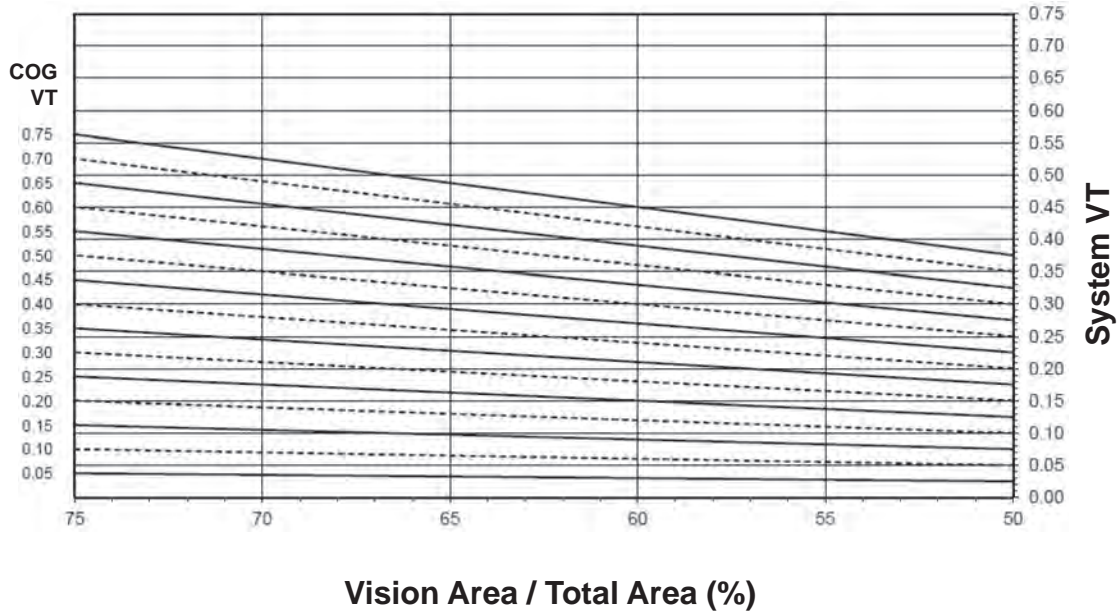
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190 (SINGLE DOOR)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

190 (SINGLE DOOR)

Glass U-Factor ³	Overall U-Factor ⁴
0.48	0.78
0.46	0.77
0.44	0.76
0.42	0.75
0.40	0.74
0.38	0.73
0.36	0.72
0.34	0.71
0.32	0.70
0.30	0.69
0.28	0.68
0.26	0.67
0.24	0.66
0.22	0.65
0.20	0.65
0.18	0.63
0.16	0.61
0.14	0.60
0.12	0.59
0.10	0.58

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 960 mm wide by 2,090 mm high (37-3/4" by 82-3/8").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.48
0.70	0.45
0.65	0.42
0.60	0.39
0.55	0.36
0.50	0.33
0.45	0.30
0.40	0.27
0.35	0.24
0.30	0.21
0.25	0.18
0.20	0.15
0.15	0.13
0.10	0.10
0.05	0.07

Visible Transmittance ²

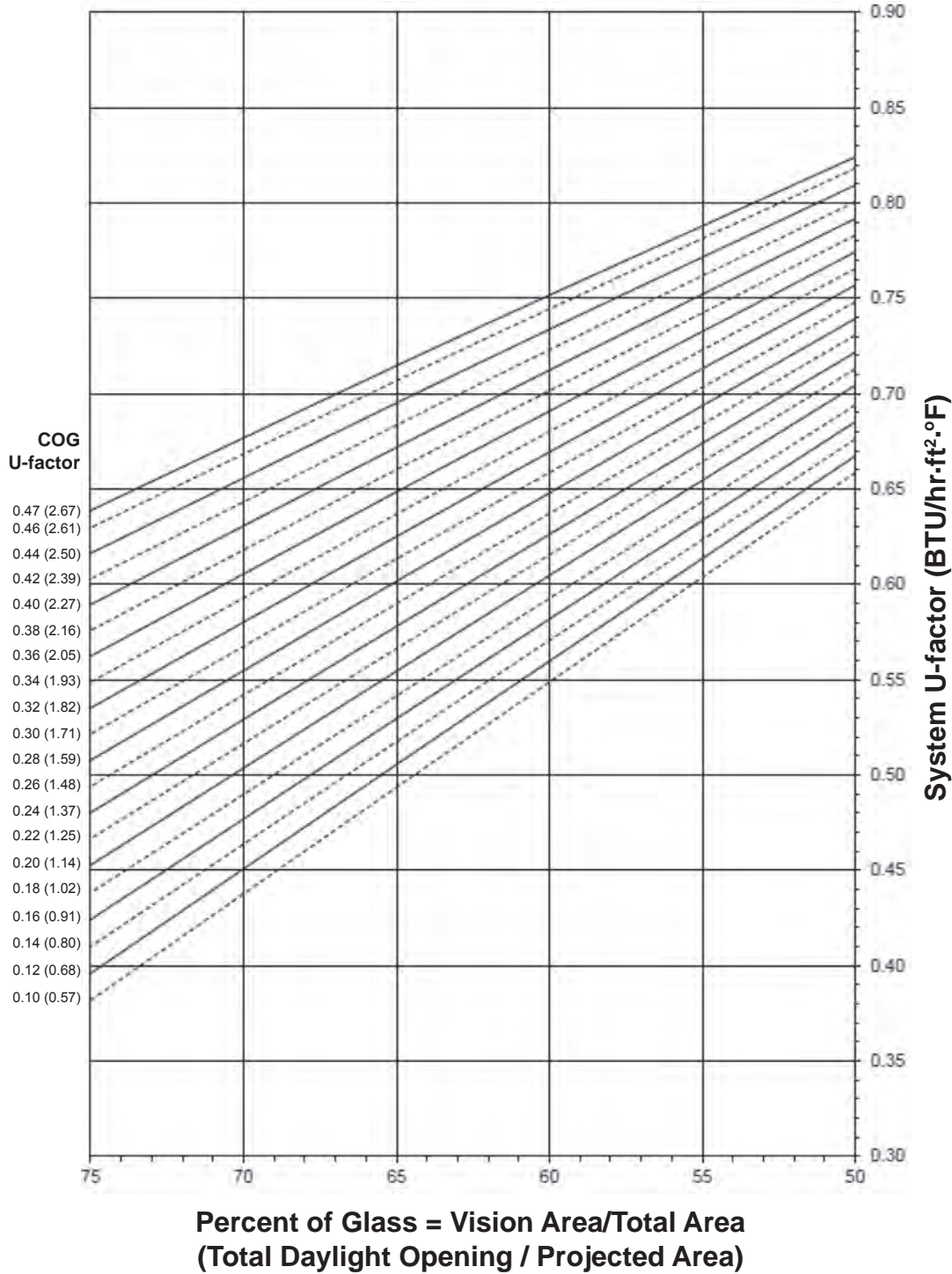
Glass VT ³	Overall VT ⁴
0.75	0.44
0.70	0.41
0.65	0.38
0.60	0.35
0.55	0.32
0.50	0.29
0.45	0.26
0.40	0.23
0.35	0.21
0.30	0.18
0.25	0.15
0.20	0.12
0.15	0.09
0.10	0.06
0.05	0.03

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.

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190 (PAIR OF DOORS)

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 (winter conditions) and are obtained from your glass supplier.

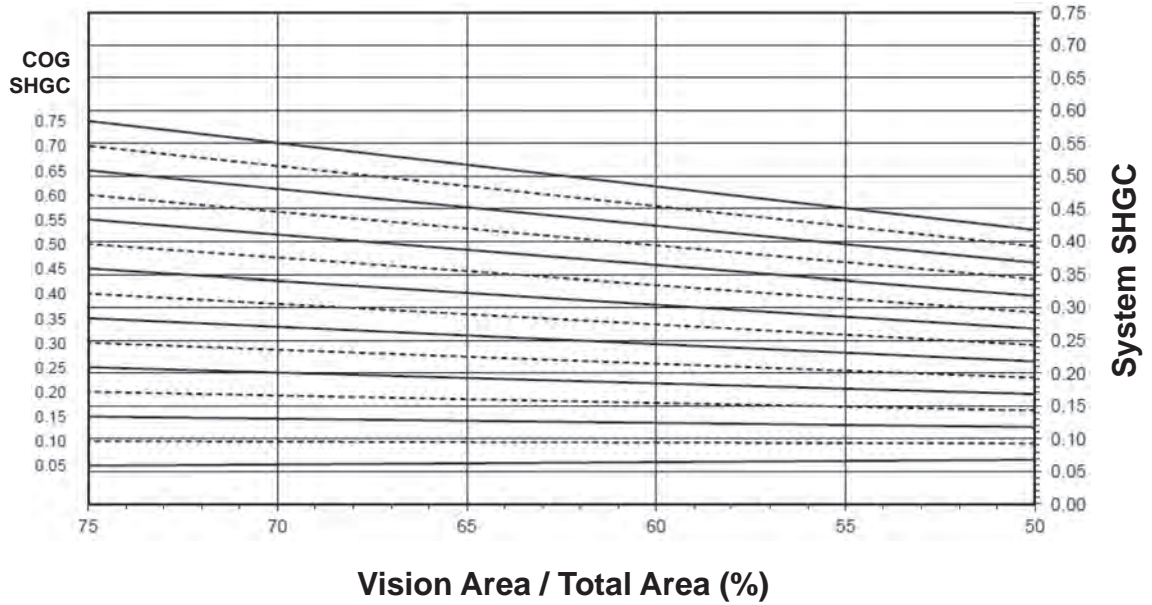
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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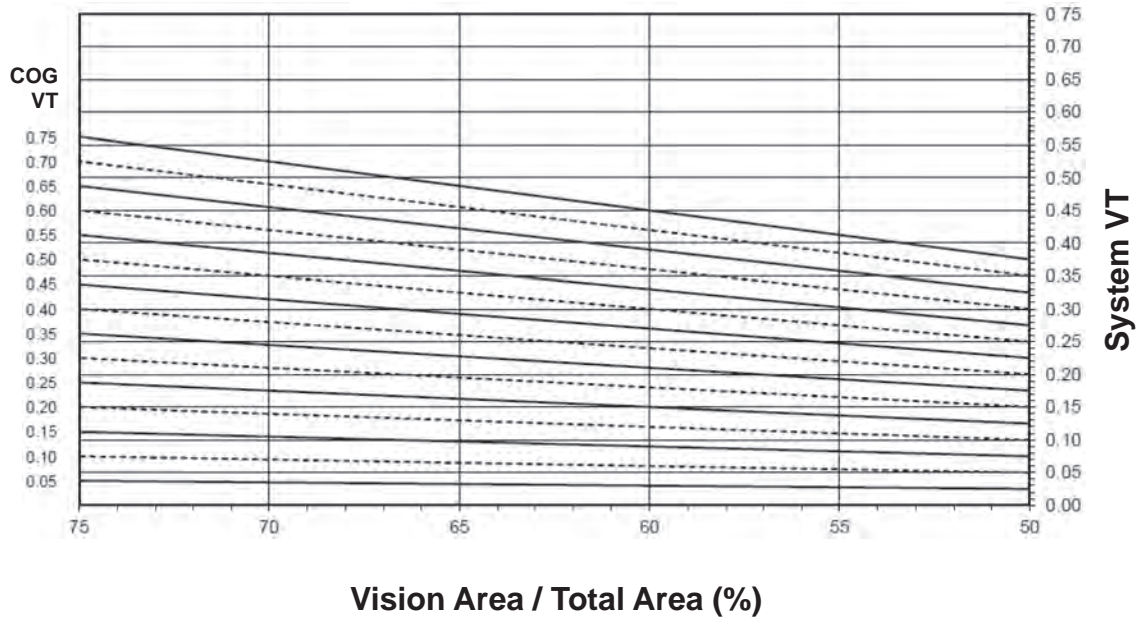
© Kawneer Company, Inc., 2015

190 (PAIR OF DOORS)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

Glass U-Factor ³	Overall U-Factor ⁴
0.47	0.73
0.46	0.72
0.44	0.71
0.42	0.70
0.40	0.69
0.38	0.68
0.36	0.67
0.34	0.66
0.32	0.64
0.30	0.63
0.28	0.62
0.26	0.61
0.24	0.60
0.22	0.59
0.20	0.58
0.18	0.56
0.16	0.55
0.14	0.54
0.12	0.53
0.10	0.52

190 (PAIR OF DOORS)

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 1,920 mm wide by 2,090 mm high (75-1/2" by 82-3/8").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.50
0.70	0.47
0.65	0.44
0.60	0.41
0.55	0.38
0.50	0.35
0.45	0.31
0.40	0.28
0.35	0.25
0.30	0.22
0.25	0.19
0.20	0.16
0.15	0.13
0.10	0.09
0.05	0.06

Visible Transmittance ²

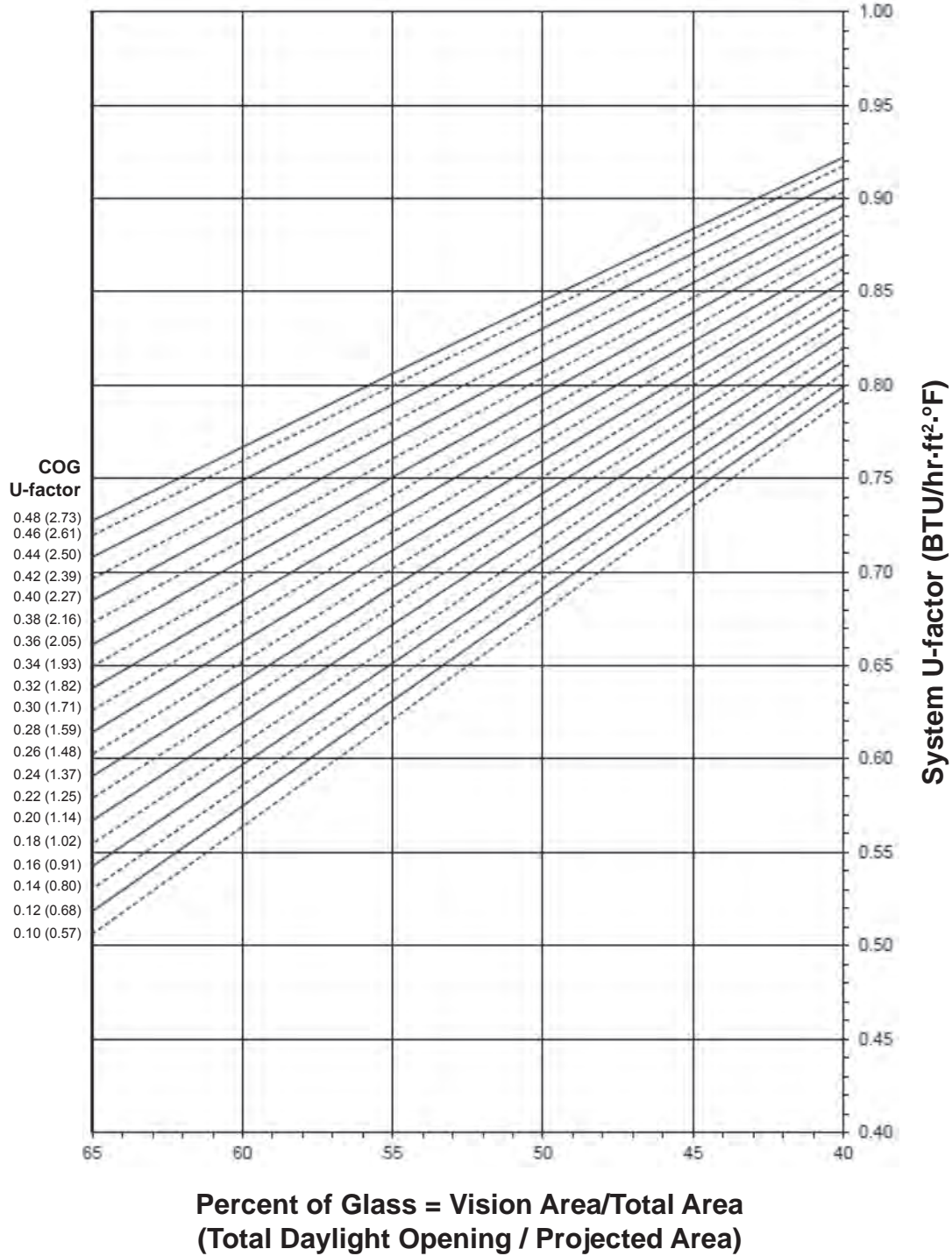
Glass VT ³	Overall VT ⁴
0.75	0.47
0.70	0.44
0.65	0.41
0.60	0.38
0.55	0.35
0.50	0.31
0.45	0.28
0.40	0.25
0.35	0.22
0.30	0.19
0.25	0.16
0.20	0.13
0.15	0.09
0.10	0.06
0.05	0.03

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.

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350 (SINGLE DOOR)

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.

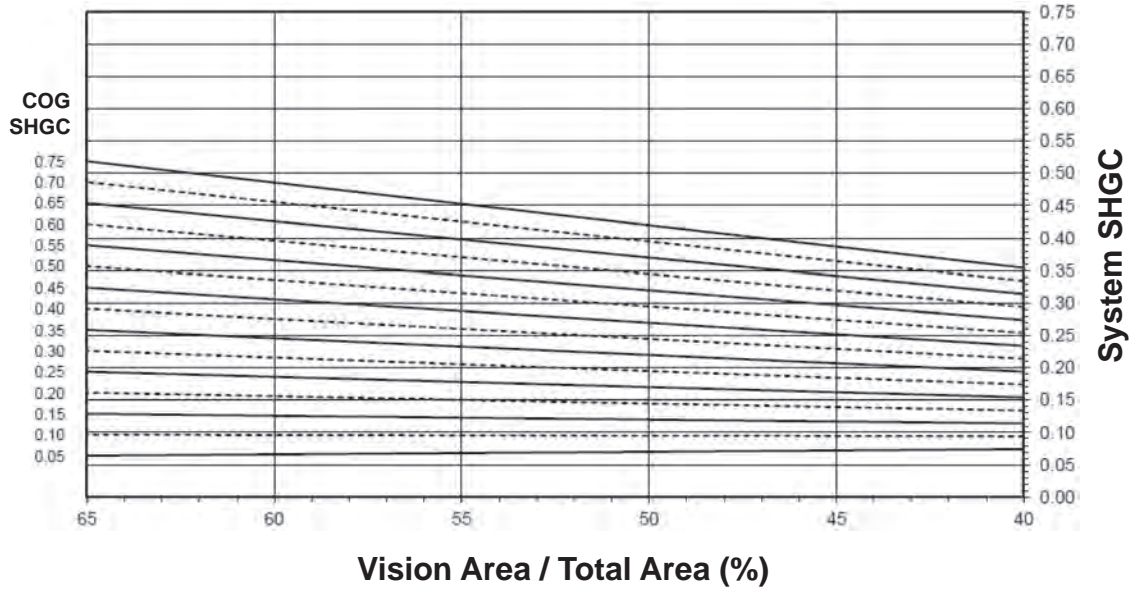
Glass properties are based on center of glass values (winter conditions) and are obtained from your glass supplier.

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.

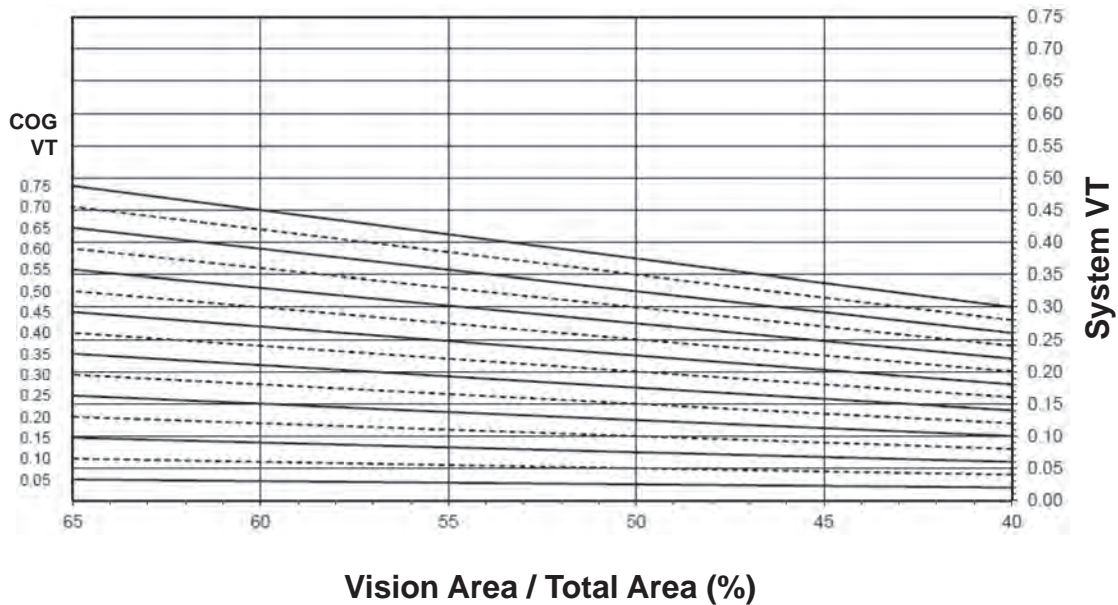
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350 (SINGLE DOOR)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

350 (SINGLE DOOR)

Glass U-Factor ³	Overall U-Factor ⁴
0.48	0.83
0.46	0.82
0.44	0.81
0.42	0.81
0.40	0.80
0.38	0.79
0.36	0.78
0.34	0.77
0.32	0.76
0.30	0.75
0.28	0.74
0.26	0.73
0.24	0.72
0.22	0.71
0.20	0.70
0.18	0.69
0.16	0.68
0.14	0.68
0.12	0.67
0.10	0.66

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 960 mm wide by 2,090 mm high (37-3/4" by 82-3/8").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.43
0.70	0.41
0.65	0.38
0.60	0.36
0.55	0.33
0.50	0.30
0.45	0.28
0.40	0.25
0.35	0.23
0.30	0.20
0.25	0.17
0.20	0.15
0.15	0.12
0.10	0.10
0.05	0.07

Visible Transmittance ²

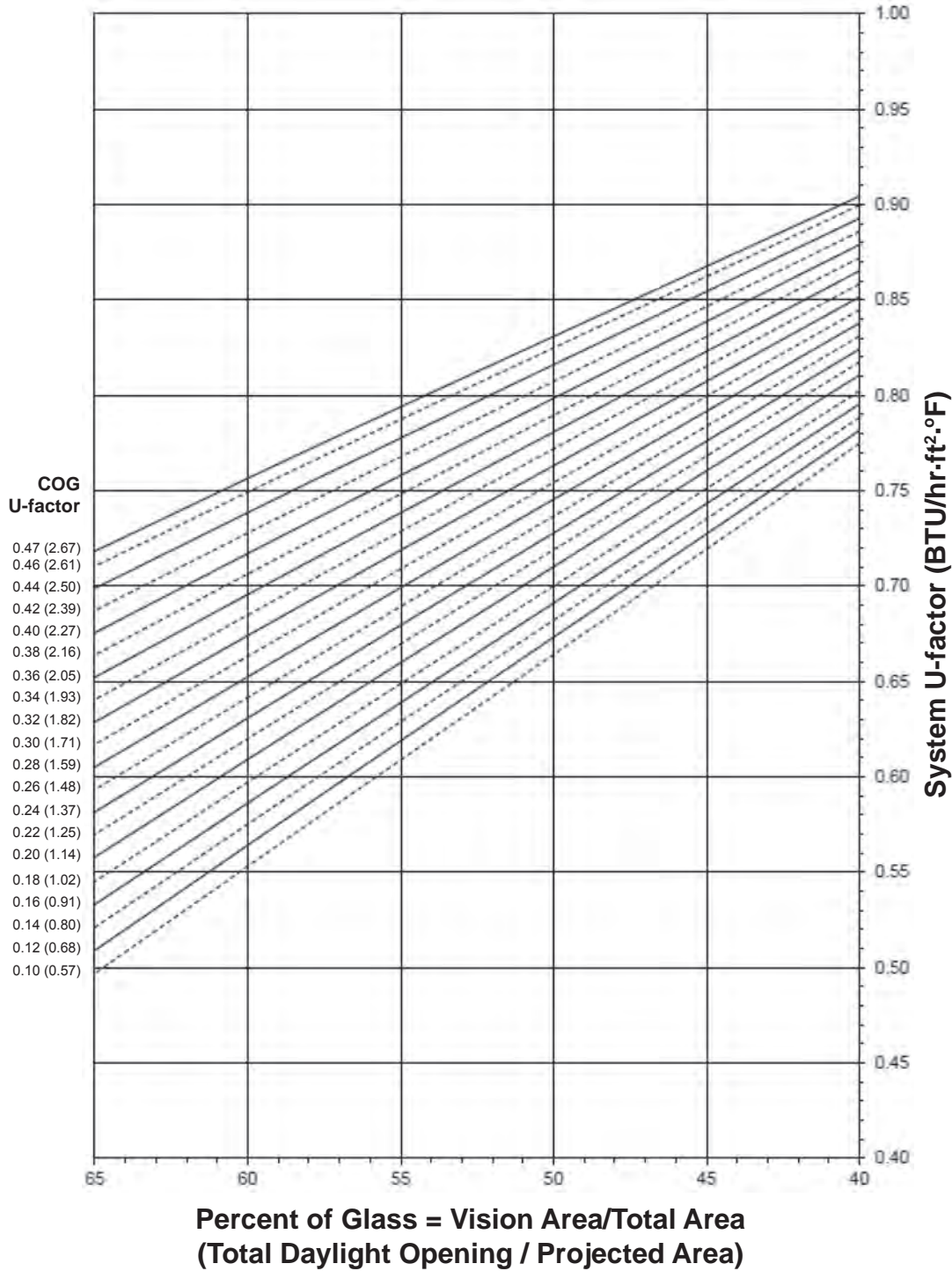
Glass VT ³	Overall VT ⁴
0.75	0.39
0.70	0.36
0.65	0.34
0.60	0.31
0.55	0.29
0.50	0.26
0.45	0.23
0.40	0.21
0.35	0.18
0.30	0.16
0.25	0.13
0.20	0.10
0.15	0.08
0.10	0.05
0.05	0.03

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.

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350 (PAIR OF DOORS)

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 (winter conditions) and are obtained from your glass supplier.

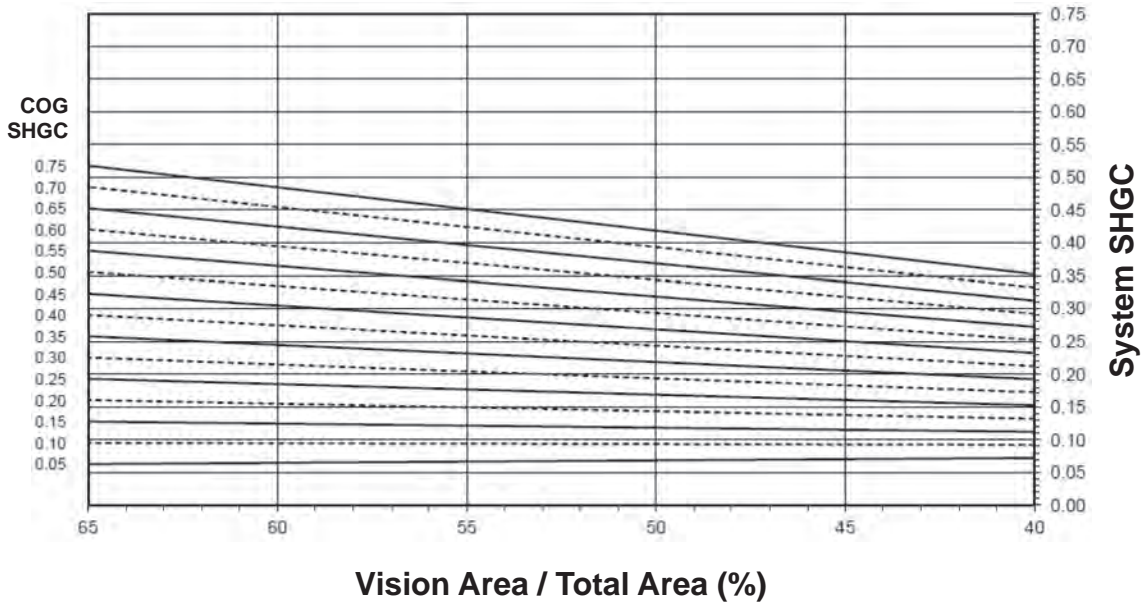
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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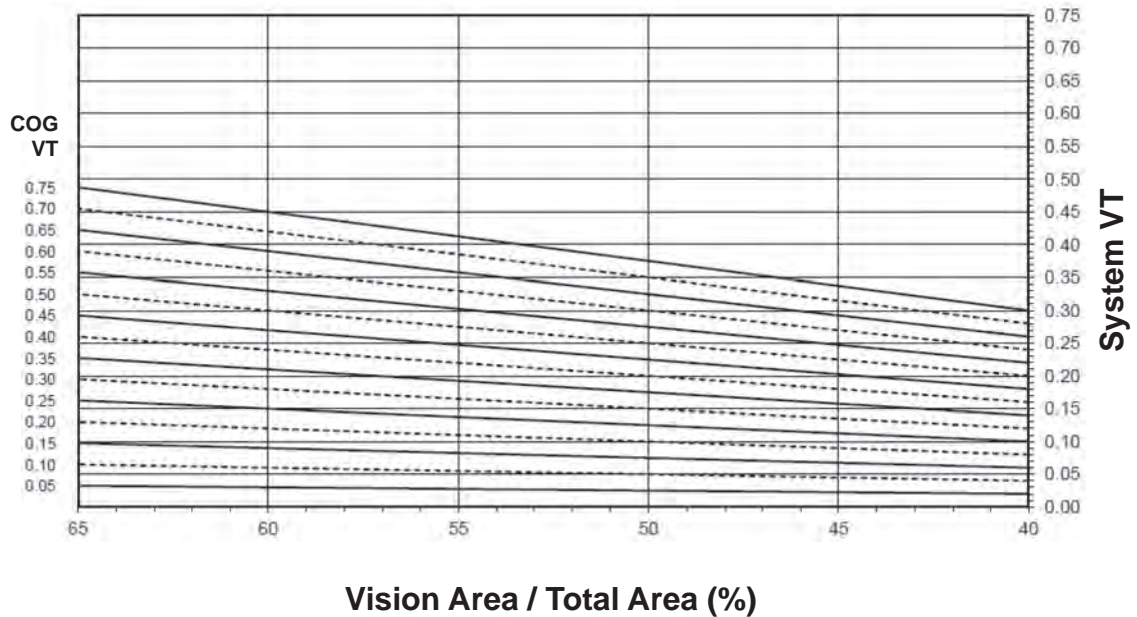
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350 (PAIR OF DOORS)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

Glass U-Factor ³	Overall U-Factor ⁴
0.47	0.79
0.46	0.78
0.44	0.77
0.42	0.76
0.40	0.75
0.38	0.74
0.36	0.73
0.34	0.72
0.32	0.71
0.30	0.70
0.28	0.69
0.26	0.68
0.24	0.67
0.22	0.66
0.20	0.65
0.18	0.64
0.16	0.63
0.14	0.62
0.12	0.61
0.10	0.60

350 (PAIR OF DOORS)

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 1,920 mm wide by 2,090 mm high (75-1/2" by 82-3/8").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.46
0.70	0.43
0.65	0.40
0.60	0.37
0.55	0.35
0.50	0.32
0.45	0.29
0.40	0.26
0.35	0.23
0.30	0.21
0.25	0.18
0.20	0.15
0.15	0.12
0.10	0.09
0.05	0.07

Visible Transmittance ²

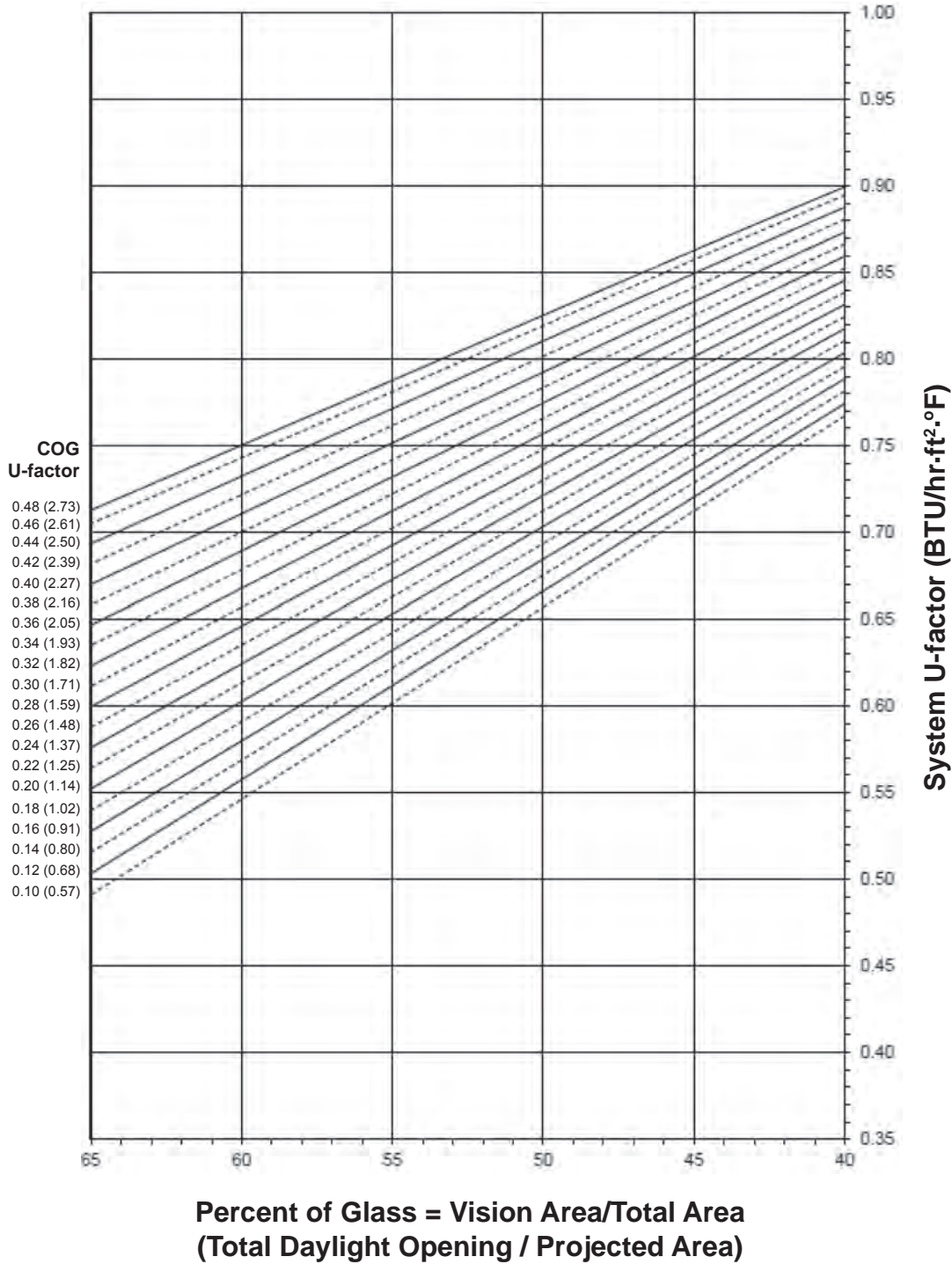
Glass VT ³	Overall VT ⁴
0.75	0.42
0.70	0.39
0.65	0.36
0.60	0.34
0.55	0.31
0.50	0.28
0.45	0.25
0.40	0.22
0.35	0.20
0.30	0.17
0.25	0.14
0.20	0.11
0.15	0.08
0.10	0.06
0.05	0.03

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.

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500 (SINGLE DOOR)

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.

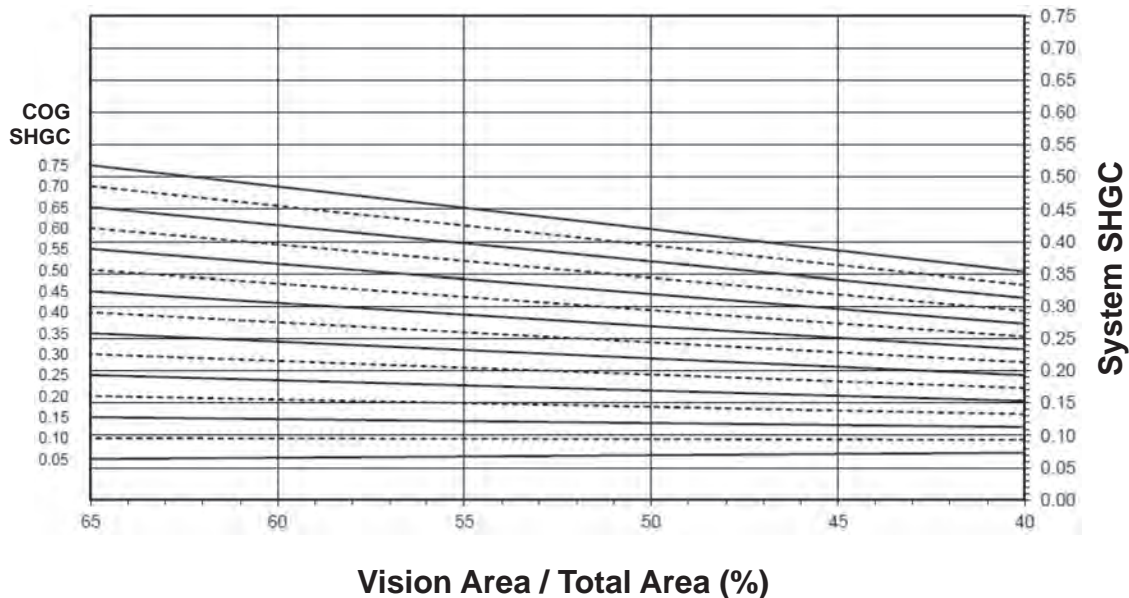
Glass properties are based on center of glass values (winter conditions) and are obtained from your glass supplier.

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.

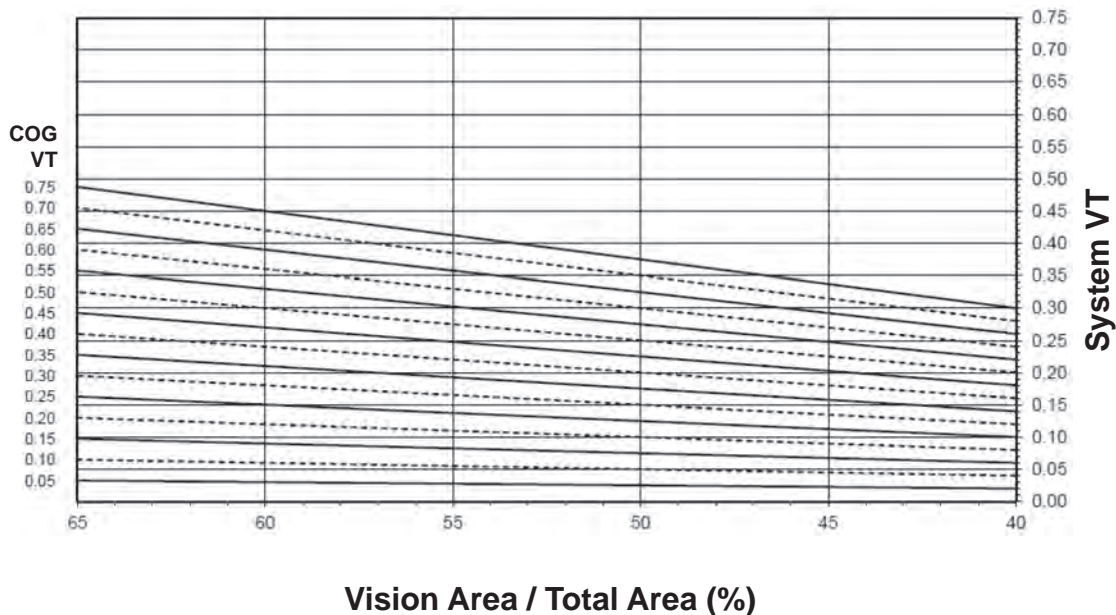
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500 (SINGLE DOOR)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

500 (SINGLE DOOR)

Glass U-Factor ³	Overall U-Factor ⁴
0.48	0.87
0.46	0.86
0.44	0.85
0.42	0.84
0.40	0.84
0.38	0.83
0.36	0.82
0.34	0.81
0.32	0.81
0.30	0.80
0.28	0.79
0.26	0.78
0.24	0.77
0.22	0.77
0.20	0.76
0.18	0.75
0.16	0.74
0.14	0.73
0.12	0.73
0.10	0.72

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 960 mm wide by 2,090 mm high (37-3/4" by 82-3/8").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.38
0.70	0.36
0.65	0.34
0.60	0.32
0.55	0.29
0.50	0.27
0.45	0.25
0.40	0.23
0.35	0.21
0.30	0.18
0.25	0.16
0.20	0.14
0.15	0.12
0.10	0.09
0.05	0.07

Visible Transmittance ²

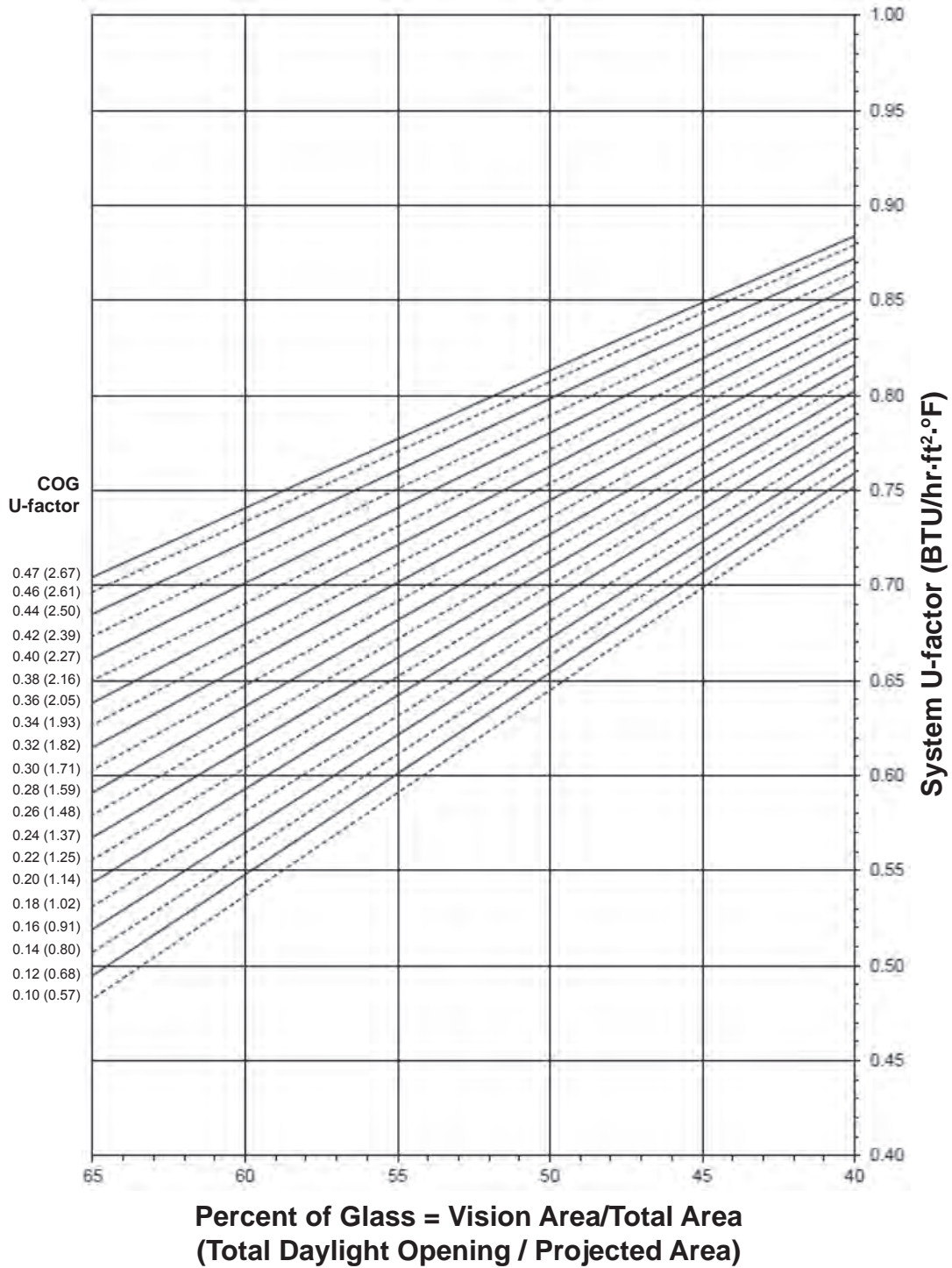
Glass VT ³	Overall VT ⁴
0.75	0.33
0.70	0.31
0.65	0.29
0.60	0.27
0.55	0.25
0.50	0.22
0.45	0.20
0.40	0.18
0.35	0.16
0.30	0.13
0.25	0.11
0.20	0.09
0.15	0.07
0.10	0.04
0.05	0.02

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.

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500 (PAIR OF DOORS)

System U-factor vs Percent of Glass Area



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

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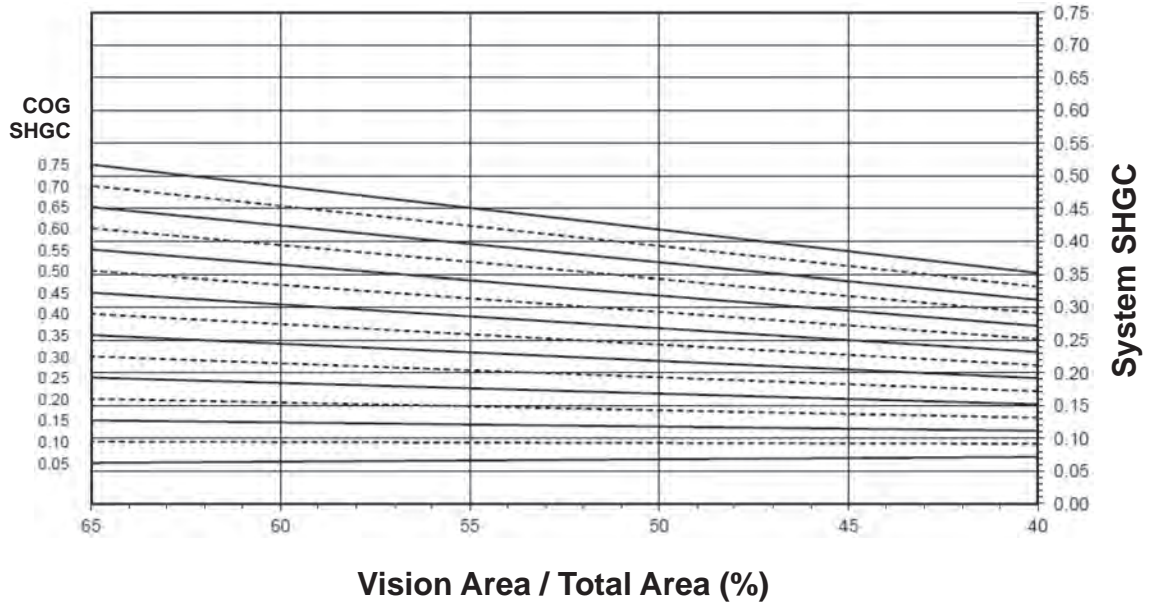
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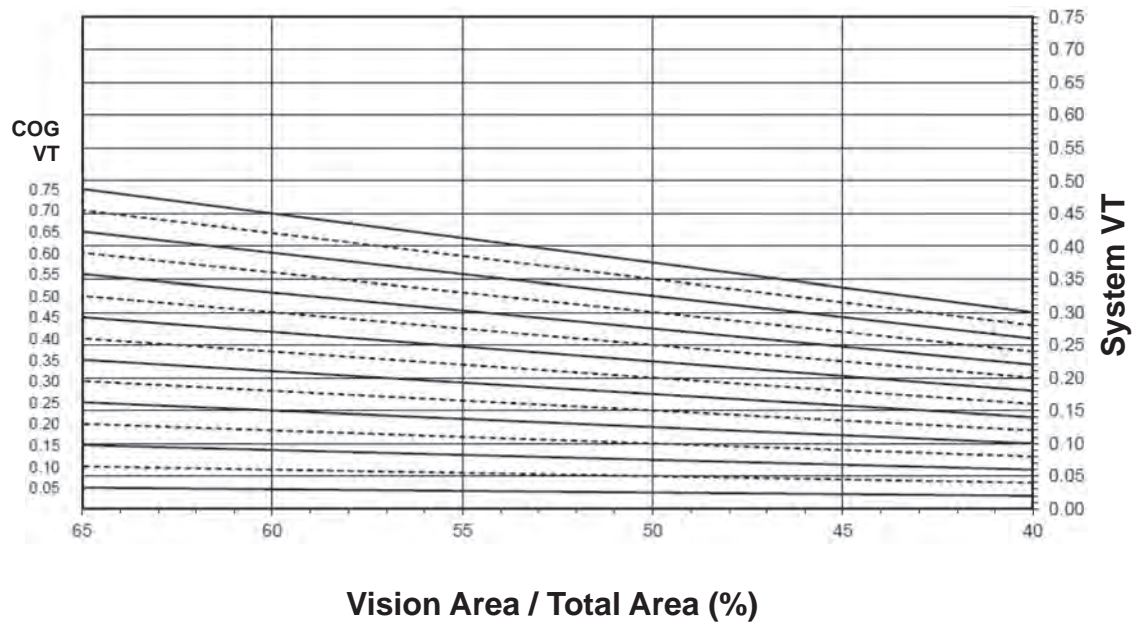
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500 (PAIR OF DOORS)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

Glass U-Factor ³	Overall U-Factor ⁴
0.47	0.82
0.46	0.82
0.44	0.81
0.42	0.80
0.40	0.79
0.38	0.78
0.36	0.77
0.34	0.77
0.32	0.76
0.30	0.75
0.28	0.74
0.26	0.73
0.24	0.72
0.22	0.71
0.20	0.70
0.18	0.70
0.16	0.69
0.14	0.68
0.12	0.67
0.10	0.66

500 (PAIR OF DOORS)

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

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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.
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SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.41
0.70	0.38
0.65	0.36
0.60	0.34
0.55	0.31
0.50	0.29
0.45	0.26
0.40	0.24
0.35	0.21
0.30	0.19
0.25	0.17
0.20	0.14
0.15	0.12
0.10	0.09
0.05	0.07

Visible Transmittance ²

Glass VT ³	Overall VT ⁴
0.75	0.36
0.70	0.34
0.65	0.32
0.60	0.29
0.55	0.27
0.50	0.24
0.45	0.22
0.40	0.19
0.35	0.17
0.30	0.15
0.25	0.12
0.20	0.10
0.15	0.07
0.10	0.05
0.05	0.02

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.

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Features

- Trifab® VersaGlaze® 451/451T is 4-1/2" (114.3) deep with a 2" (50.8) sightline
- Front, Center, Back or Multi-Plane glass applications
- Flush glazed from either the inside or outside
- Screw Spline, Shear Block, Stick or Continuous Head and Sill fabrication
- Screw Spline Pre-Glazed option
- SSG / Weatherseal option
- IsoLock® lanced and debridged thermal break option with Trifab® VersaGlaze® 451T
- Infill options up to 1-1/8" (28.6) thickness
- Permanodic® anodized finishes in seven choices
- Painted finishes in standard and custom choices

Optional Features

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

Product Applications

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

For specific product applications,
consult your Kawneer representative.

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

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

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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

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

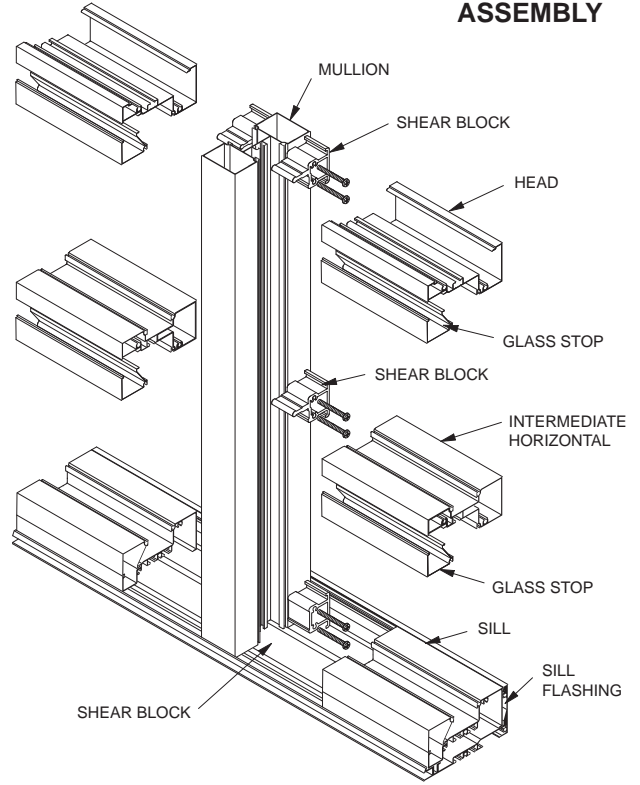
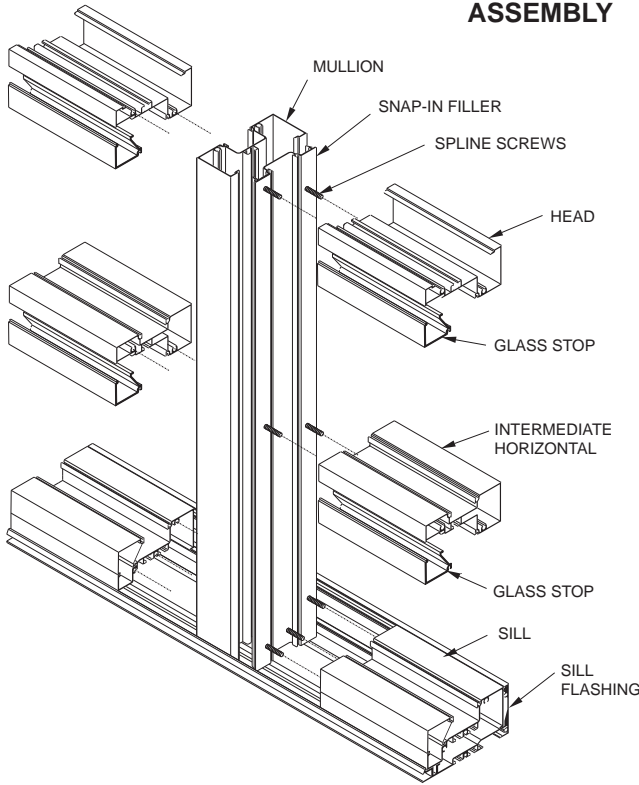
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The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The individual units are then snapped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

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

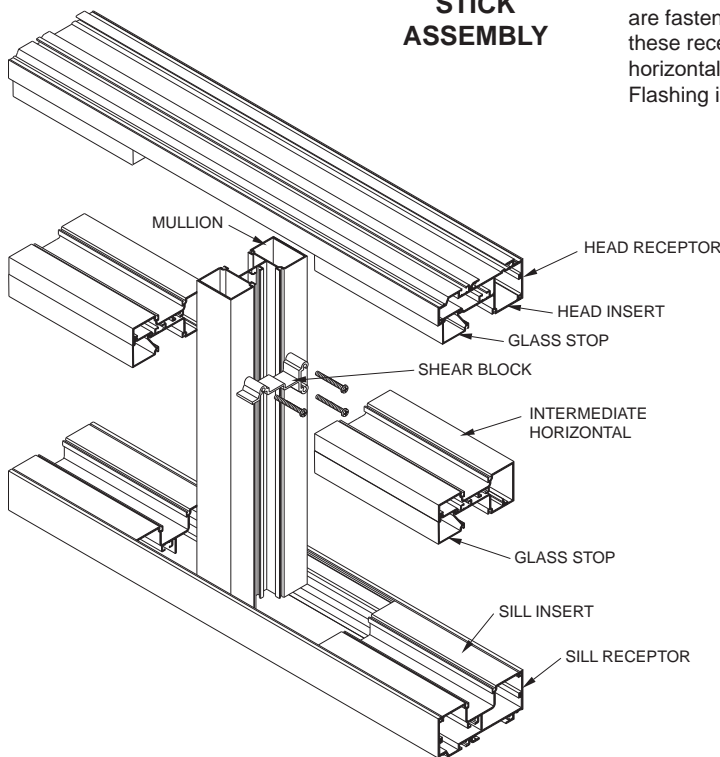
SCREW SPLINE ASSEMBLY

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY

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



NOTE:

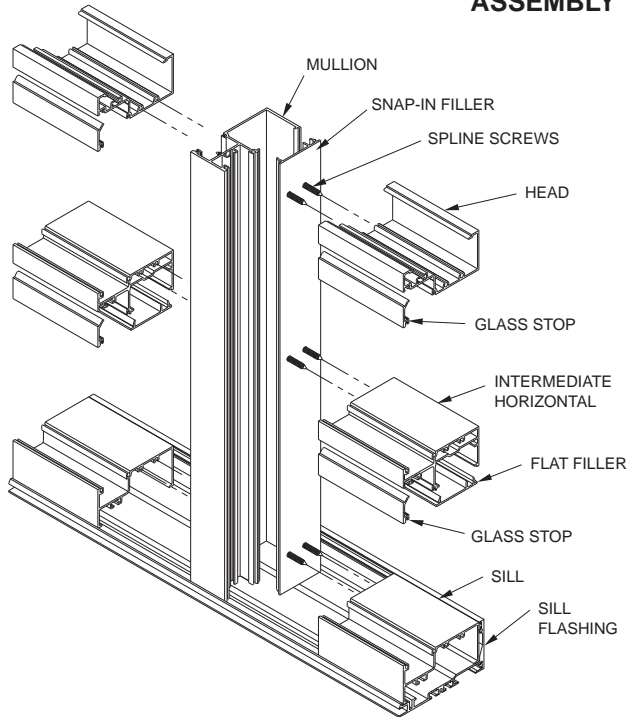
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 16)

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

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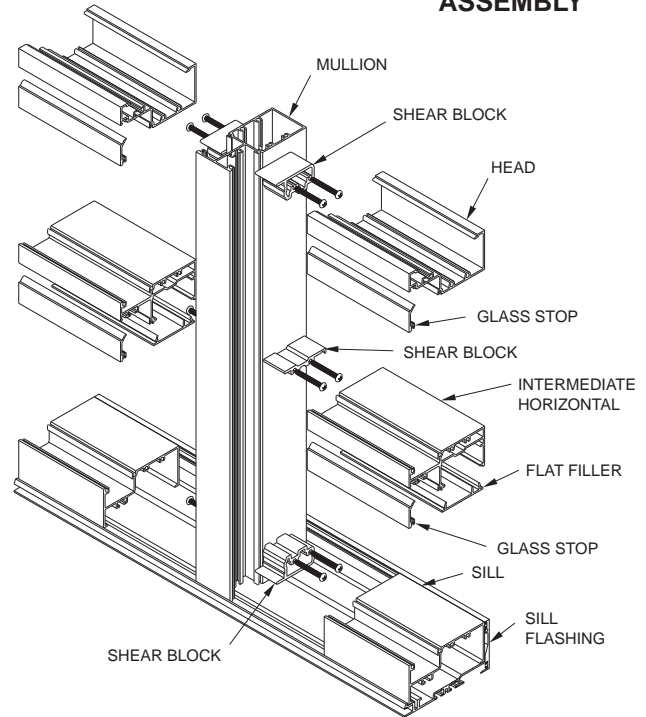
The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

SCREW SPLINE ASSEMBLY

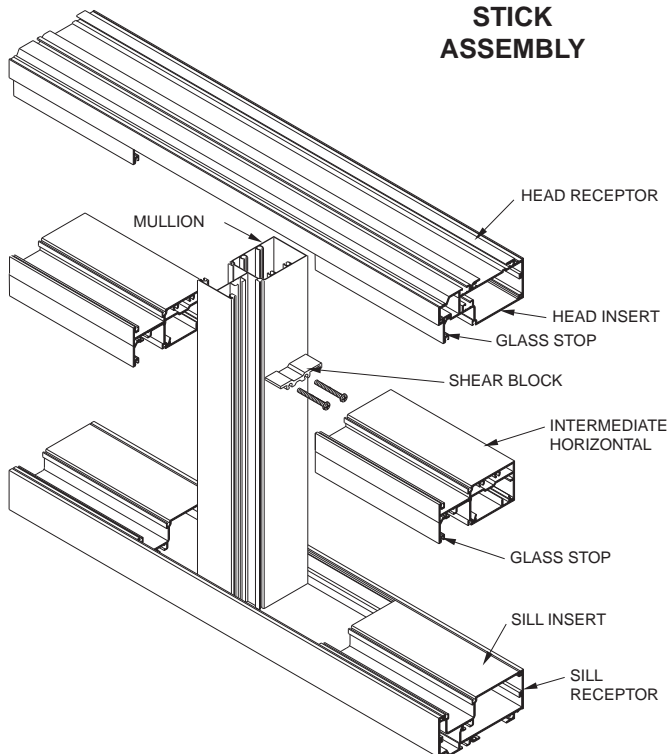


The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



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

NOTE:

If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 38)

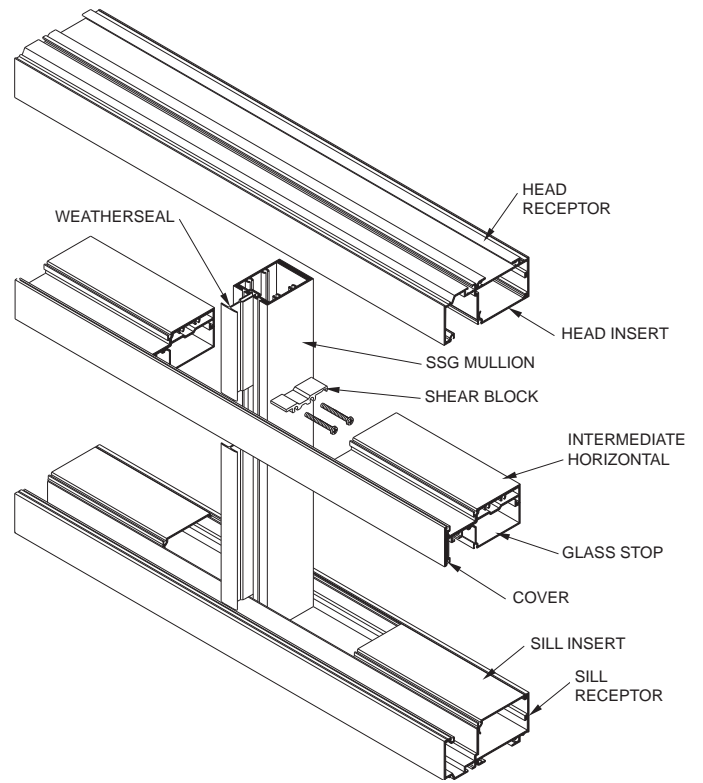
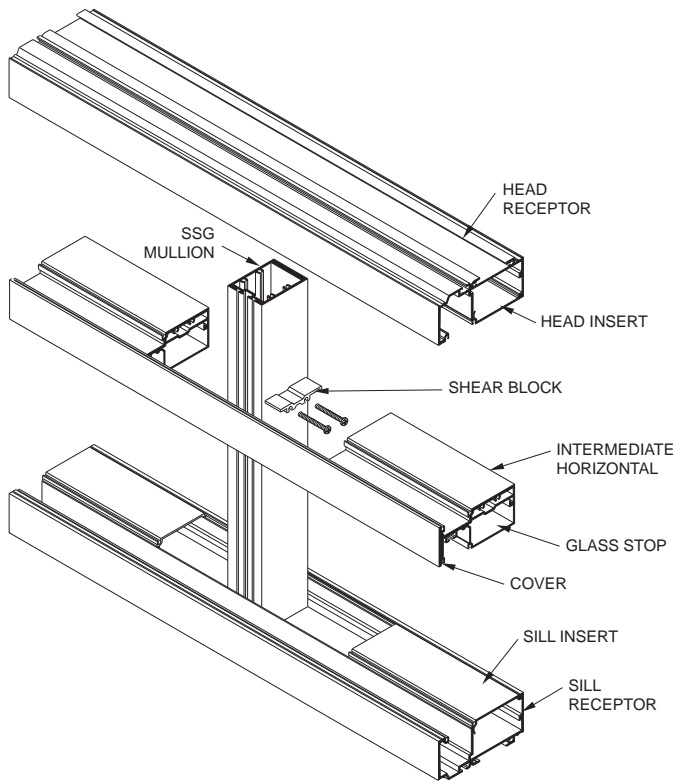
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The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to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

STICK ASSEMBLY (SSG)

STICK ASSEMBLY (WEATHERSEAL)



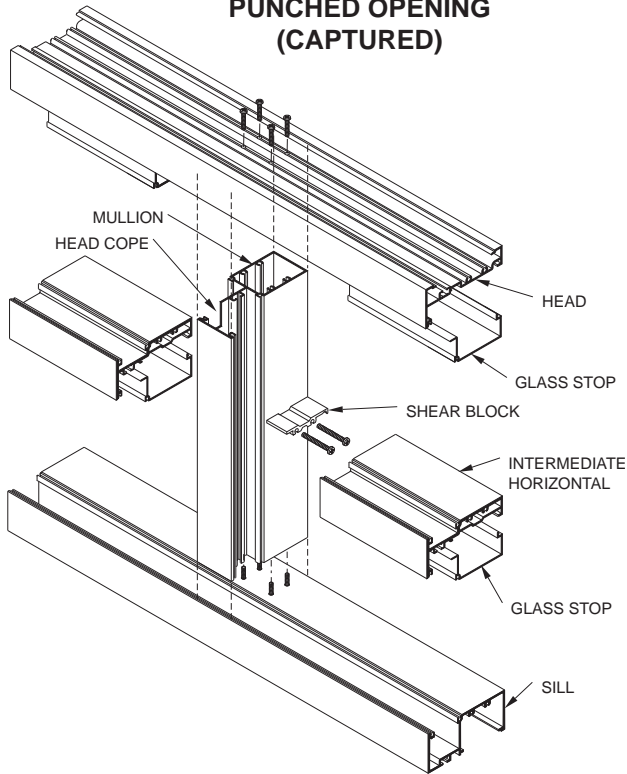
NOTE:
 If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 38)

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

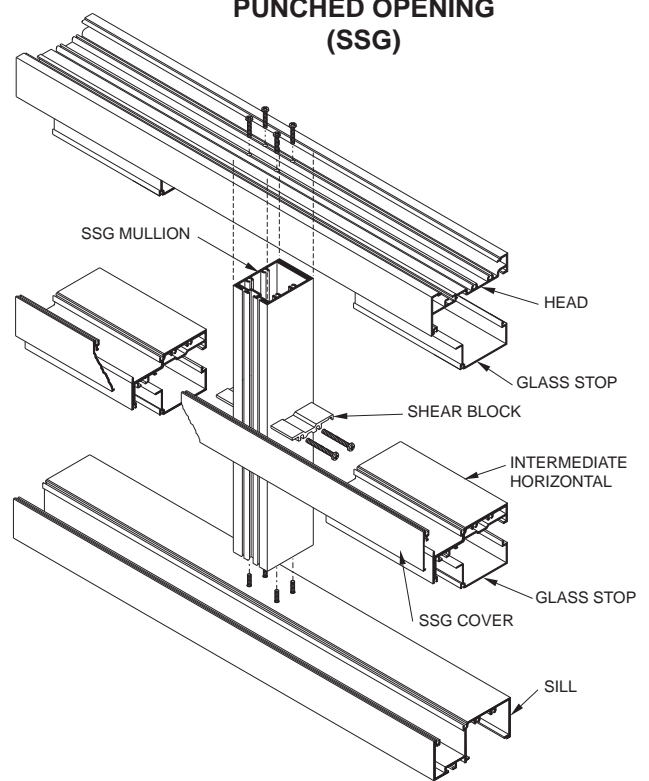
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The **CONTINUOUS HEAD AND SILL** punched opening fabrication allows a frame to be pre-assembled and installed as a single unit. Screws are driven through the back of the head and sill members into splines extruded in the vertical framing members. Intermediate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

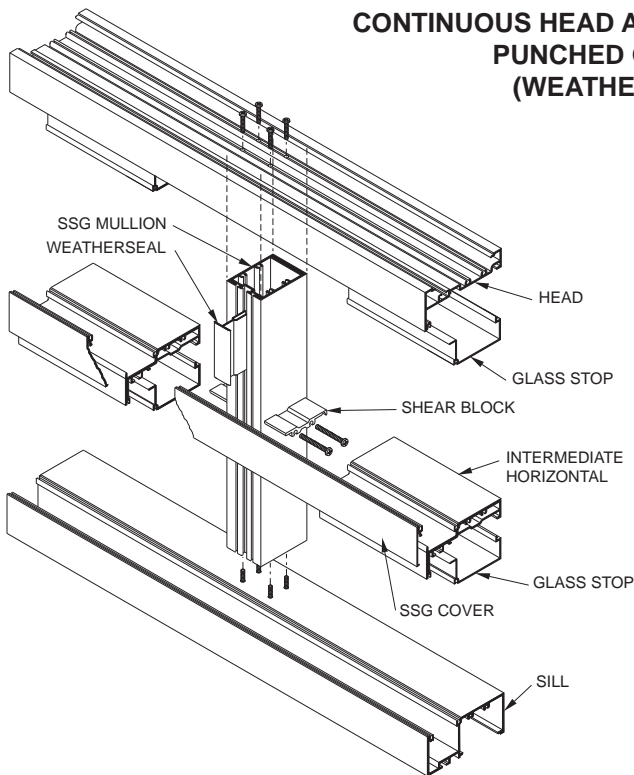
**CONTINUOUS HEAD AND SILL ASSEMBLY
PUNCHED OPENING
(CAPTURED)**



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



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



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

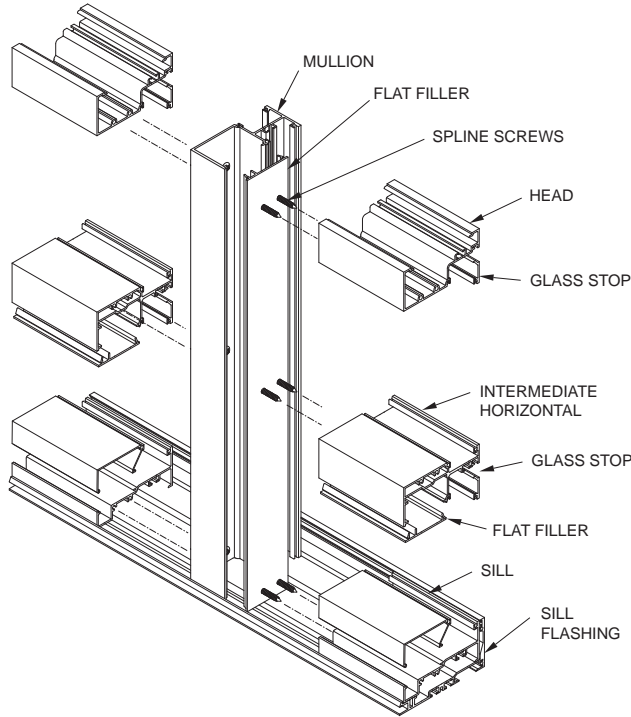
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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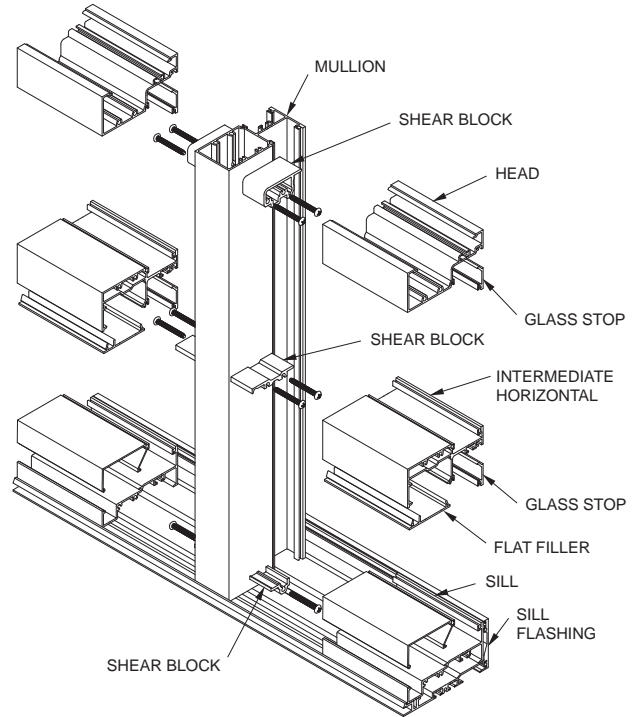
The split vertical in the **Screw Spine** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

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

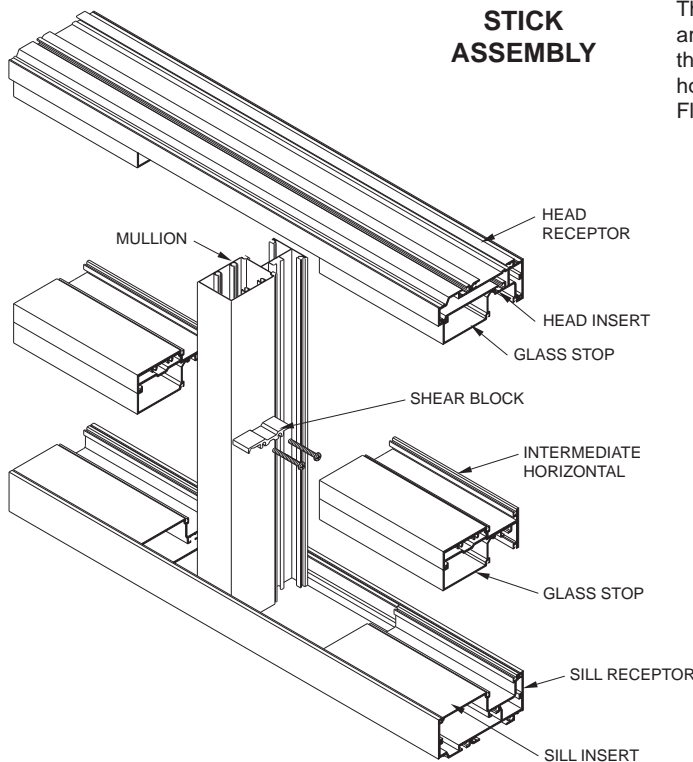
SCREW SPLINE ASSEMBLY



SHEAR BLOCK ASSEMBLY



STICK ASSEMBLY



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

NOTE:

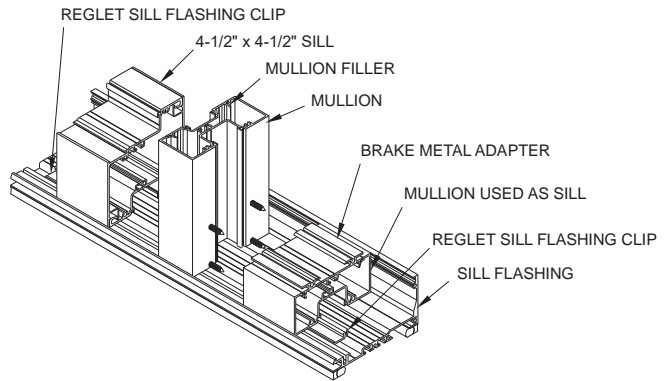
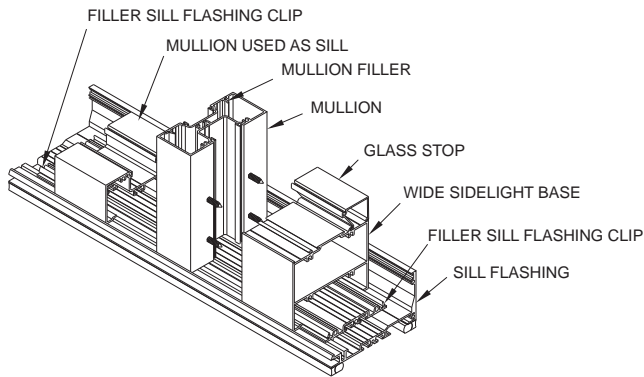
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 49)

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

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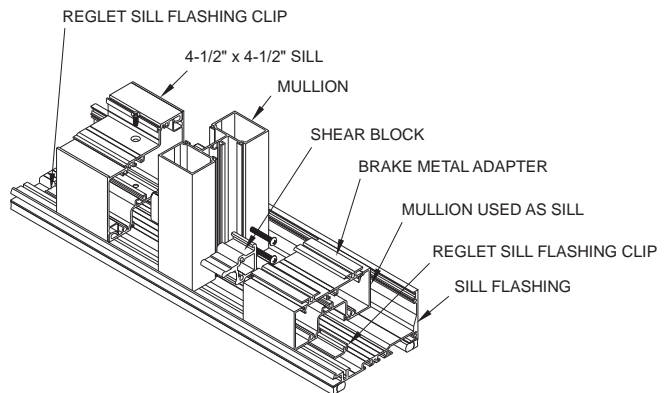
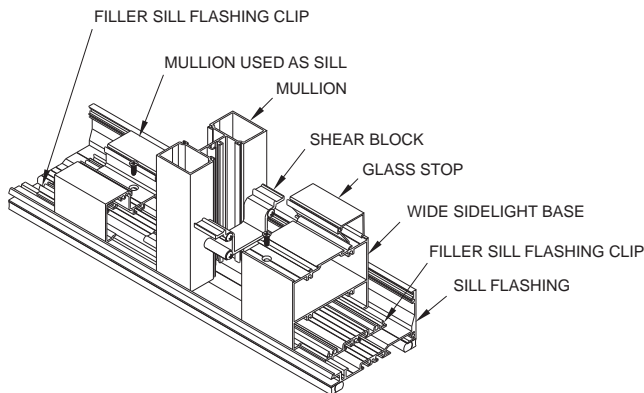
SCREW SPLINE ASSEMBLY

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



SHEAR BLOCK ASSEMBLY

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



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BASIC FRAMING DETAILS

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

PRE-GLAZED FRAMING DETAILS

 (CENTER - Outside Glazed - Stops Up).....14

 (CENTER - Inside Glazed - Stops Down).....15

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ENTRANCE FRAMING20

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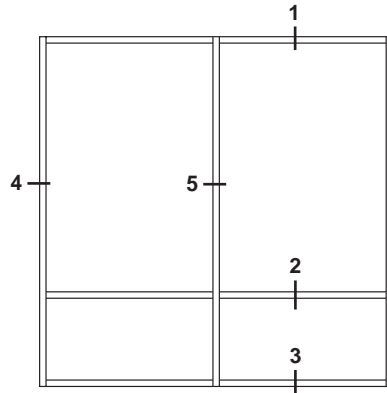
250T/350T/500T INSULPOUR® THERMAL ENTRANCES 22-23

GLASSvent® WINDOW for STOREFRONT FRAMING24

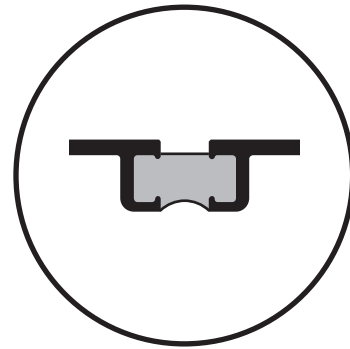
8225TL THERMAL WINDOW DETAILS.....25

LARGE MISSILE IMPACT 26-28

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

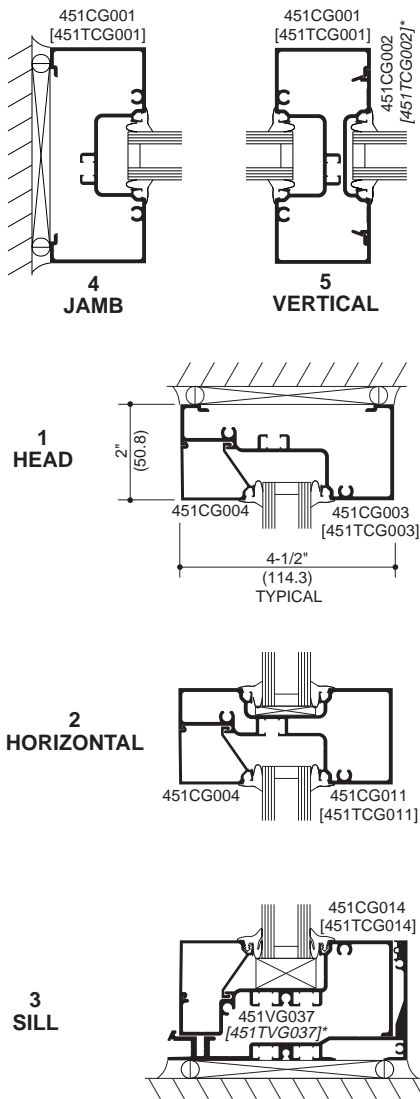


ELEVATION IS NUMBER KEYED TO DETAILS

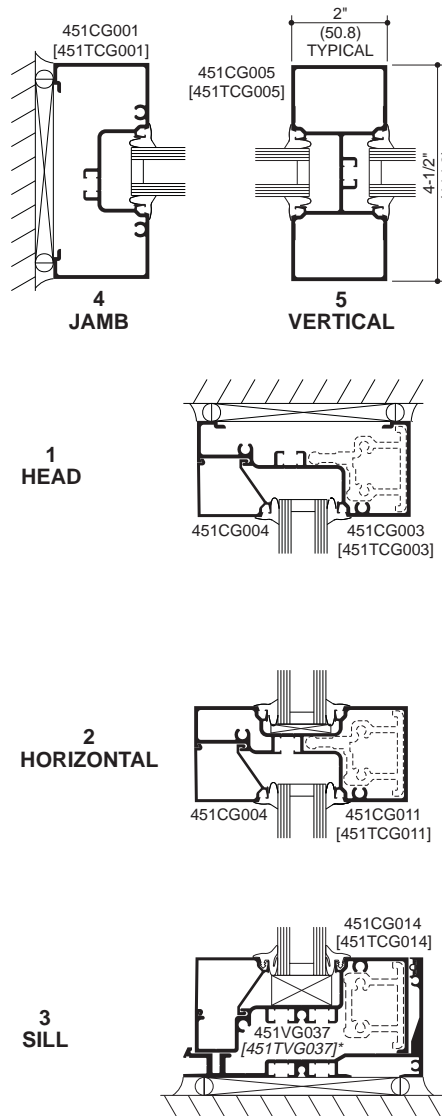


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

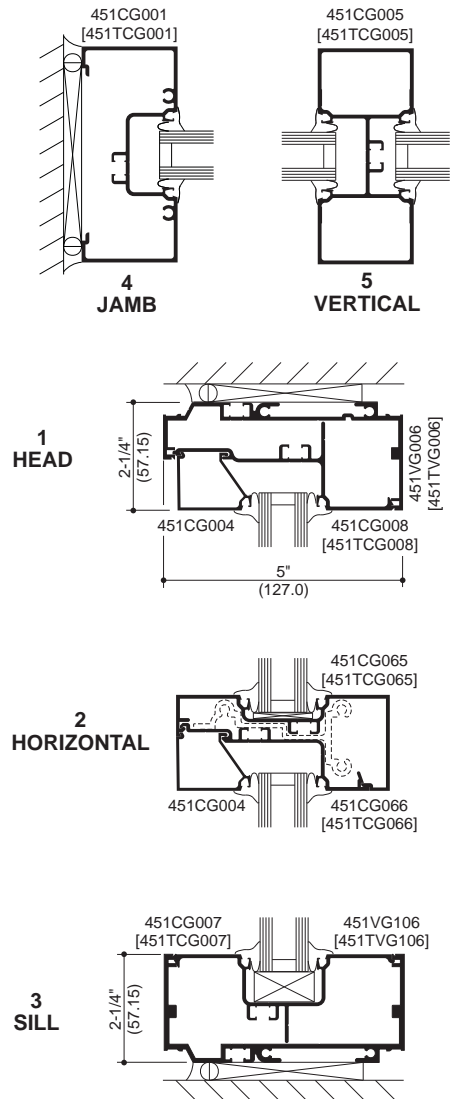
SCREW SPLINE



SHEAR BLOCK



STICK



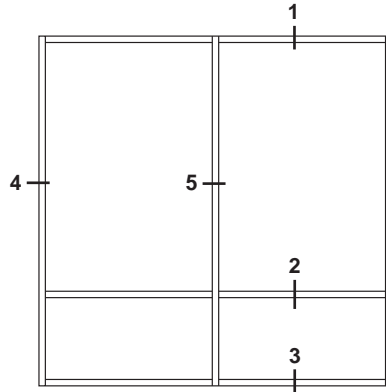
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

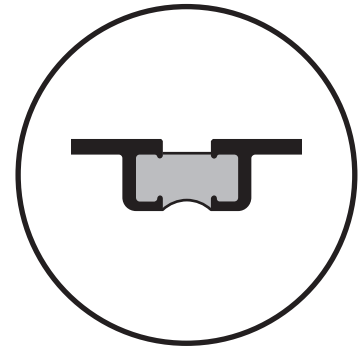
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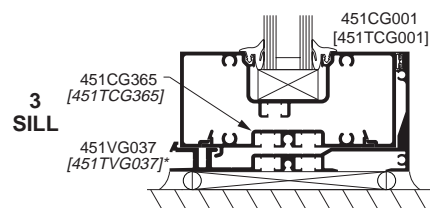
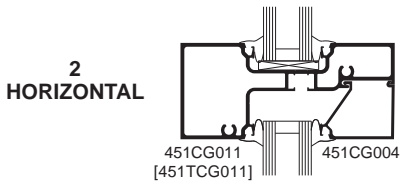
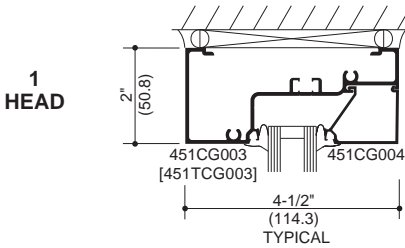
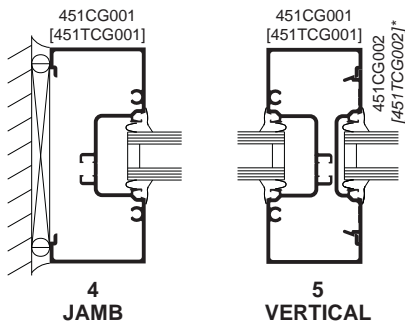


ELEVATION IS NUMBER KEYED TO DETAILS



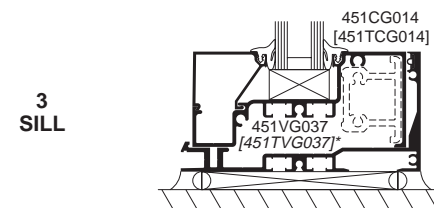
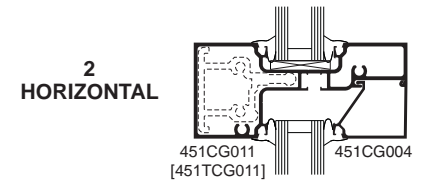
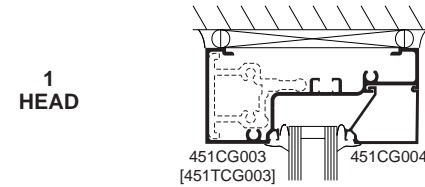
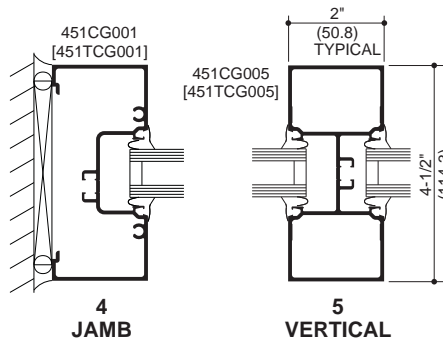
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



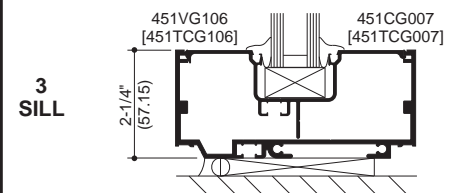
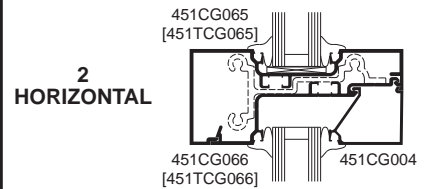
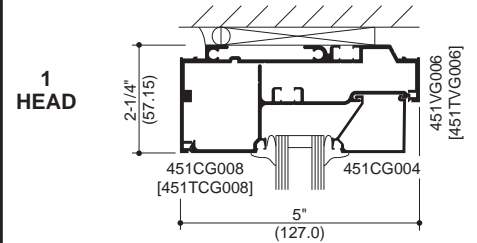
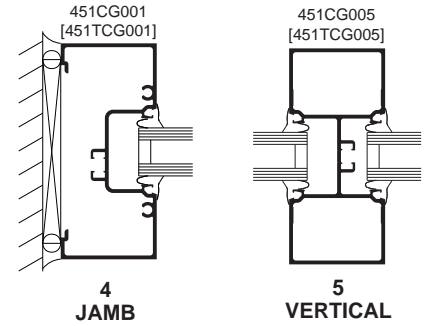
* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



* HP Sill Flashing shown with optional gasket.

STICK

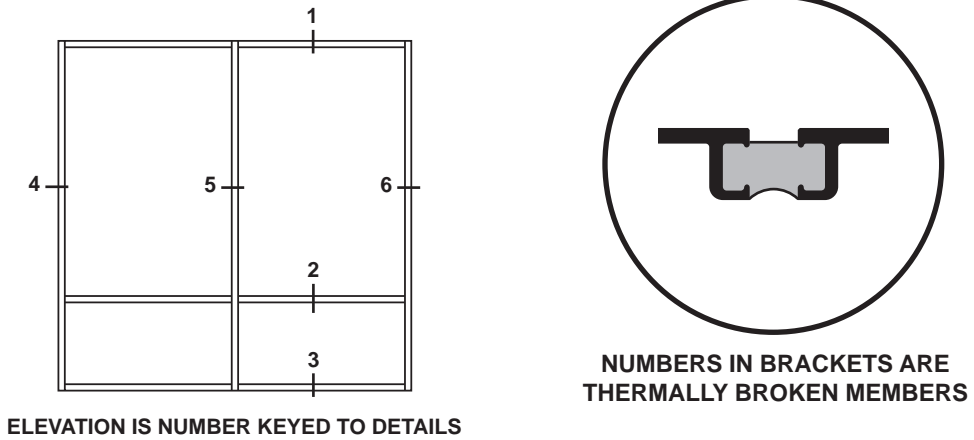


* HP Sill Flashing shown with optional gasket.

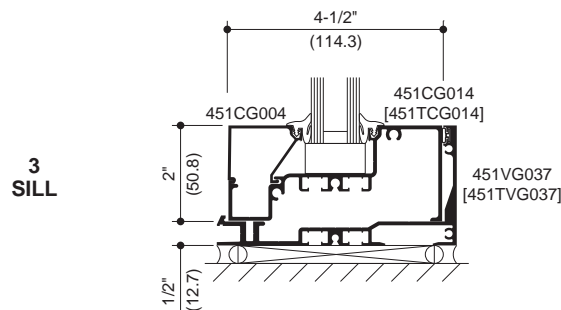
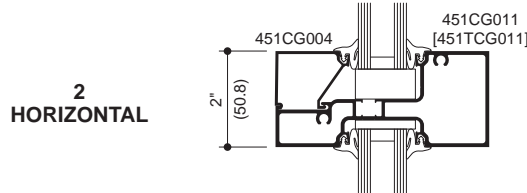
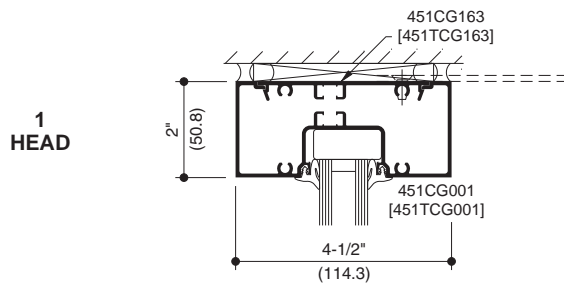
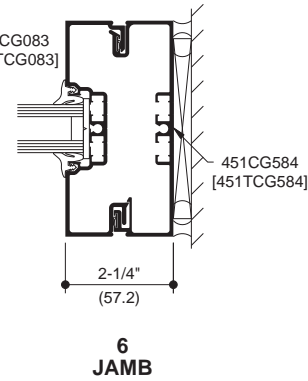
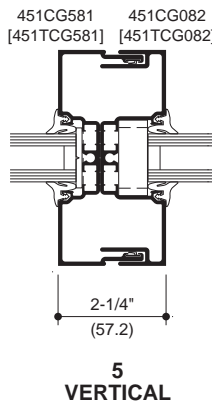
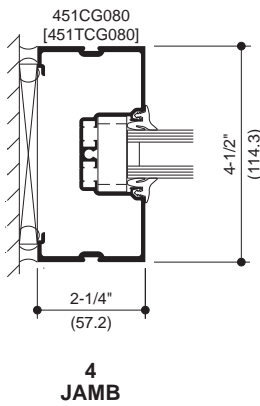
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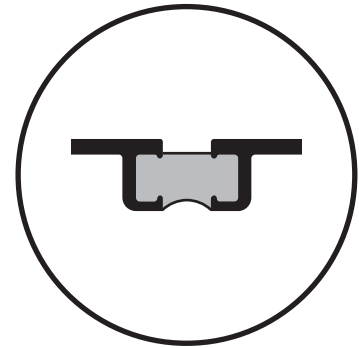
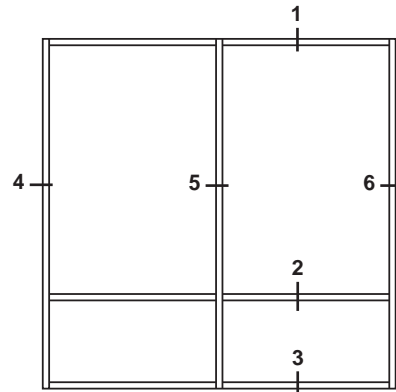
SCREW SPLINE



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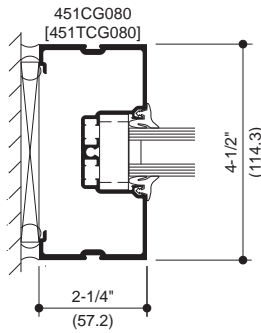
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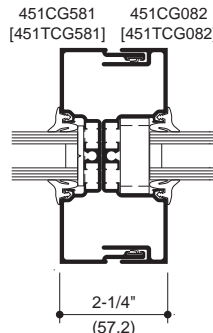
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

ELEVATION IS NUMBER KEYED TO DETAILS

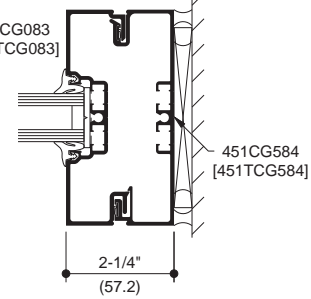
SCREW SPLINE



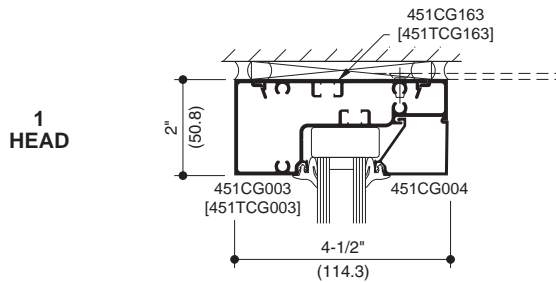
4 JAMB



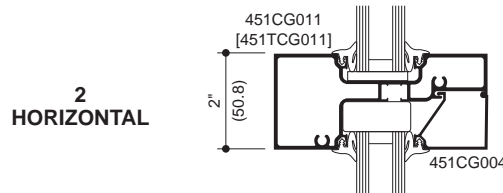
5 VERTICAL



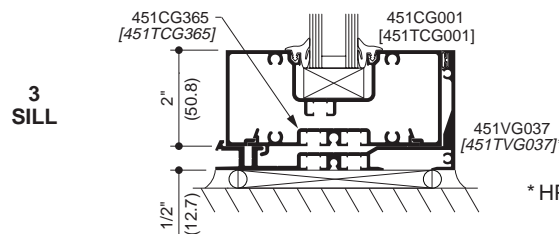
6 JAMB



1 HEAD



2 HORIZONTAL



3 SILL

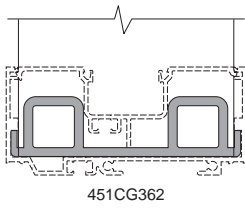
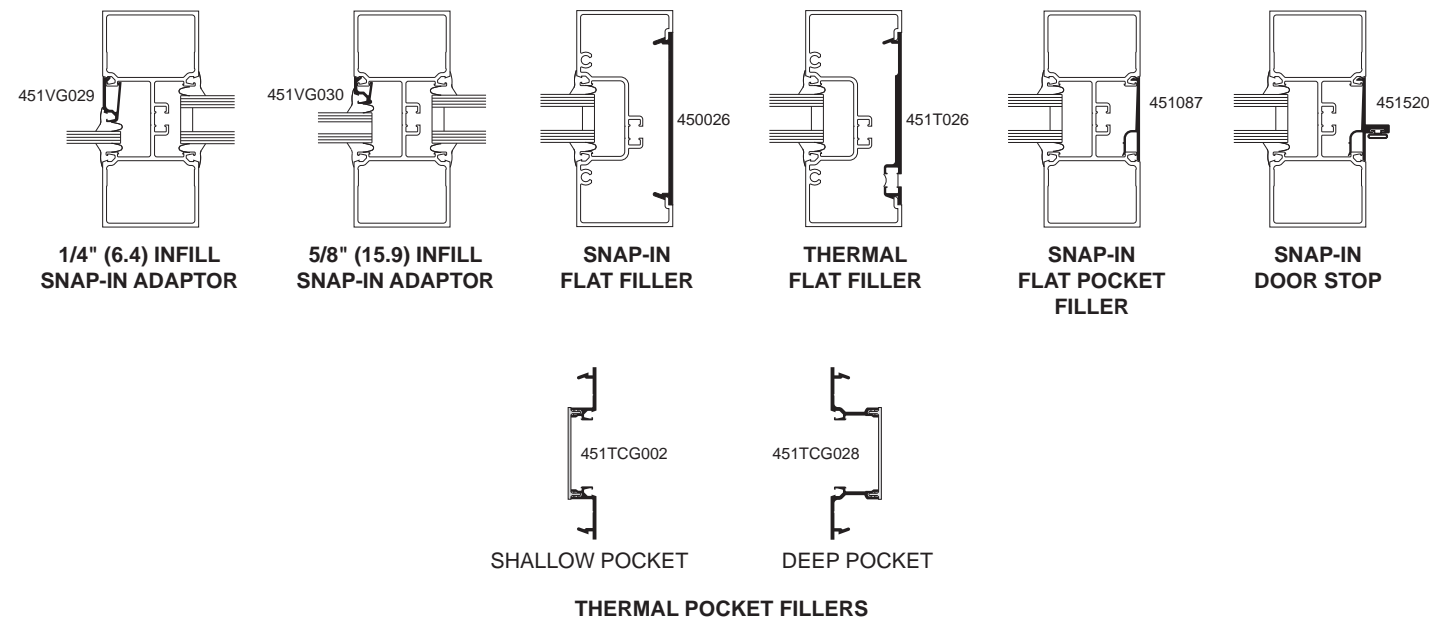
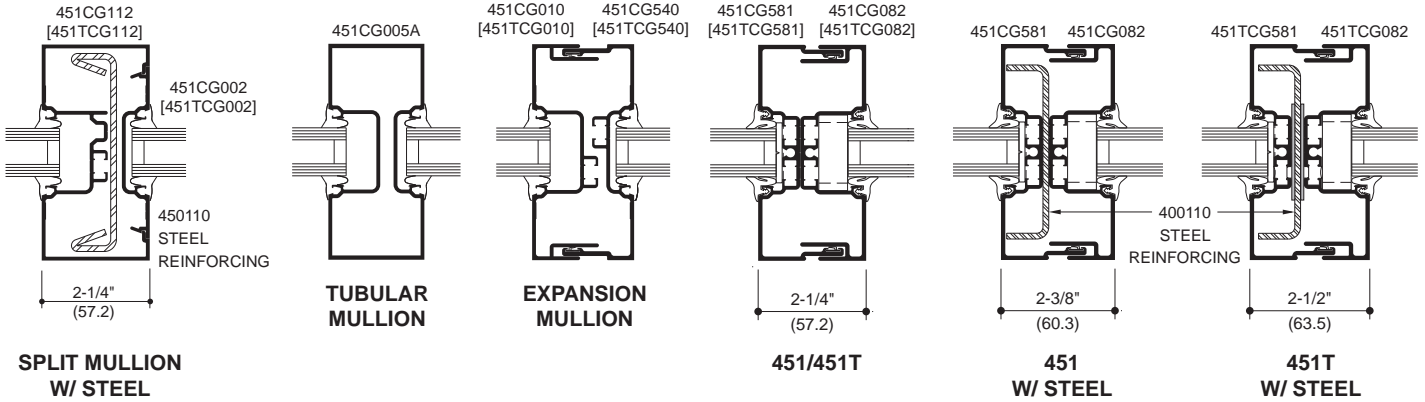
* HP Sill Flashing shown with optional gasket.

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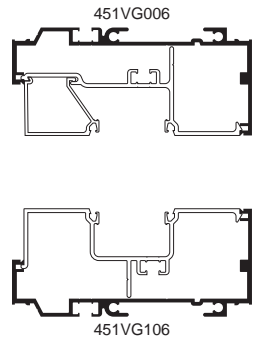
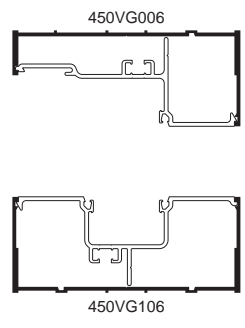
Additional information and CAD details are available at www.kawneer.com

PRE-GLAZED EXPANSION MULLIONS



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

NOTE:
Mullion Anchor not used with Lightweight Receptor.



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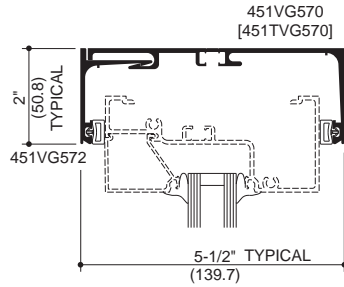
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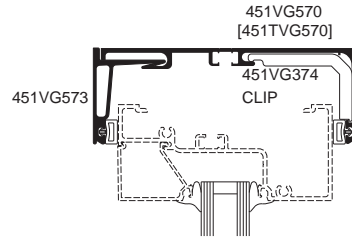
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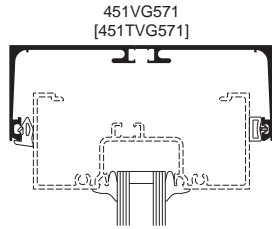
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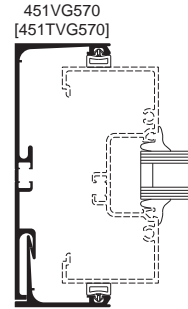
STANDARD HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



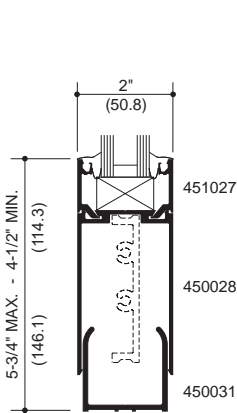
HEAVY WEIGHT HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



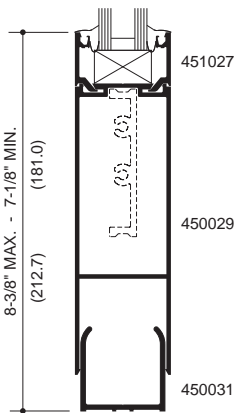
ONE PIECE HEAD COMPENSATING RECEPTOR



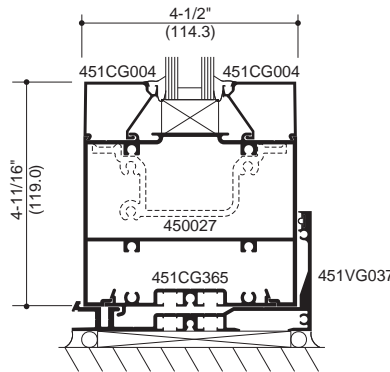
JAMB COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



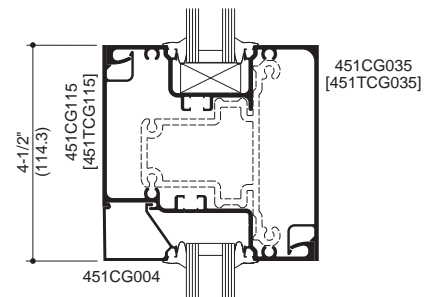
***NARROW SIDELITE BASE**



***NARROW SIDELITE BASE**



SIDELITE BASE



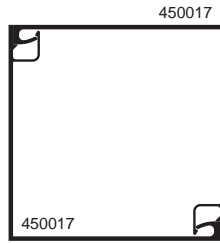
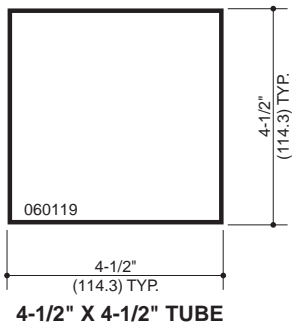
4-1/2" (114.3) x 4-1/2" (114.3) HORIZONTAL

SIDELITE BASES ARE NON-THERMAL APPLICATIONS

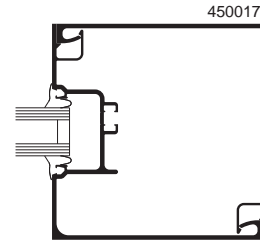
*NARROW SIDELITE BASES REQUIRE THE USE OF NON-THERMAL 2-PIECE VERTICALS ONLY.

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

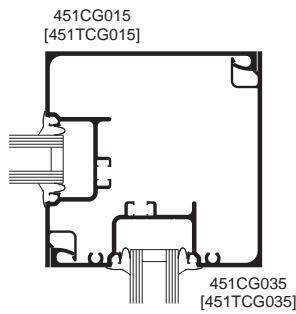
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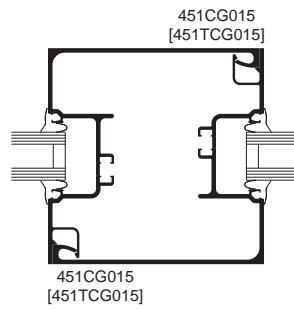
TWO PIECE NO POCKET CORNER



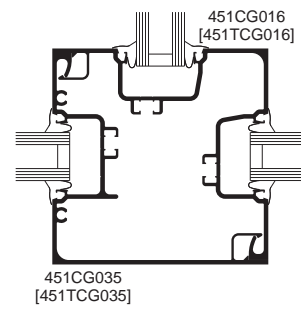
ONE POCKET CORNER



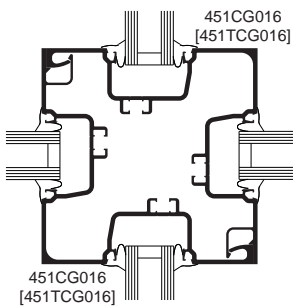
TWO POCKET 90° CORNER



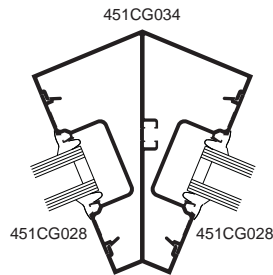
TWO POCKET CORNER POST



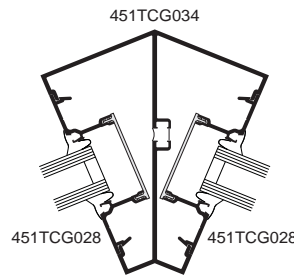
THREE POCKET 90° CORNER



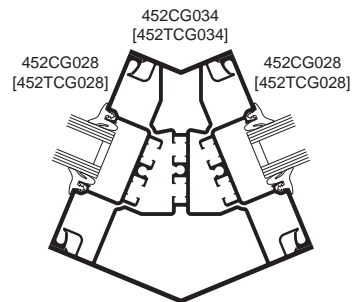
FOUR POCKET 90° CORNER



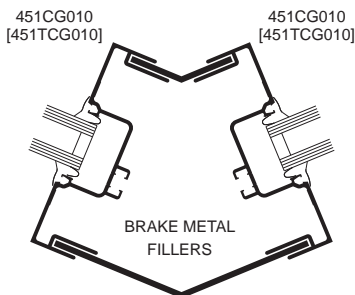
135° CORNER (NON-THERMAL)



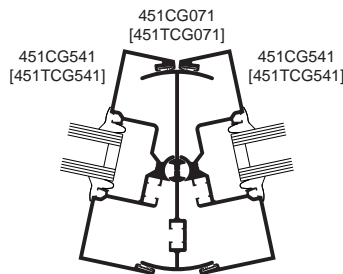
135° CORNER (THERMAL)



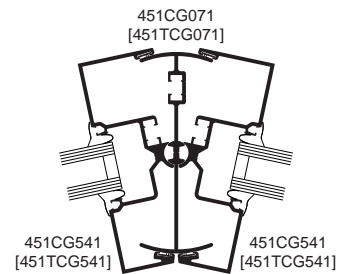
135° CORNER



VARIABLE DEGREE BRAKE METAL CORNER



155° TO 180° PIVOT MULLION (OUTSIDE CORNER)

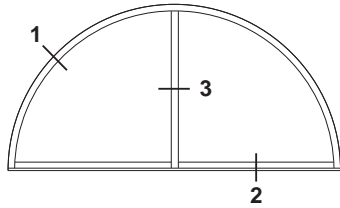


155° TO 180° PIVOT MULLION (INSIDE CORNER)

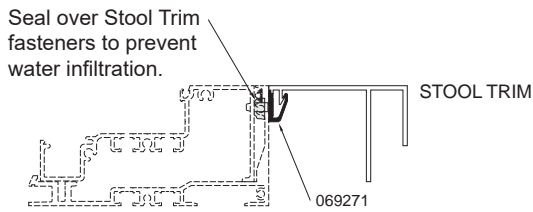
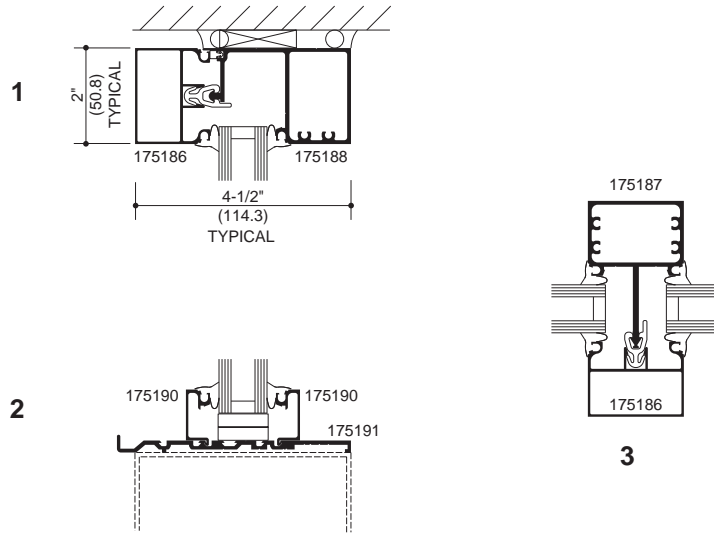
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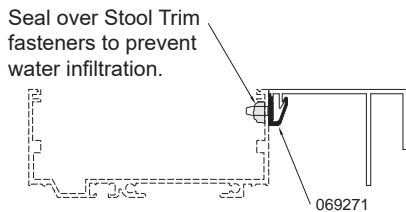
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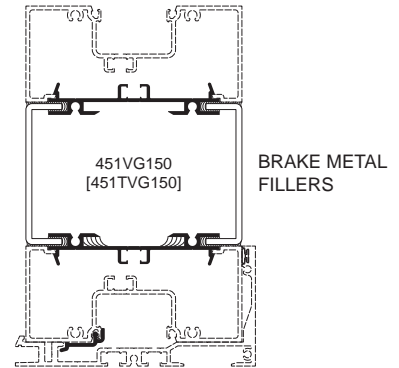
CURVING DETAILS
(Center Plane Only)



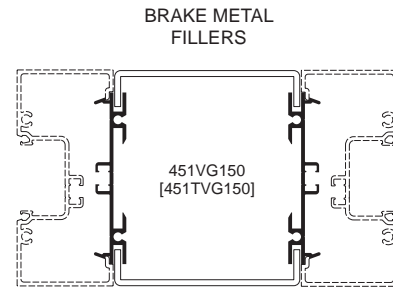
STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING



STOOL TRIM CLIP FOR STICK ASSEMBLY



BRAKE METAL ADAPTOR AT HORIZONTAL



BRAKE METAL ADAPTOR AT VERTICAL

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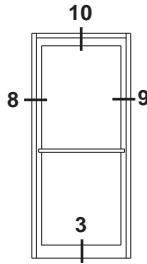
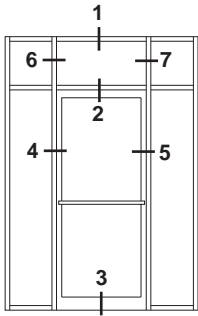
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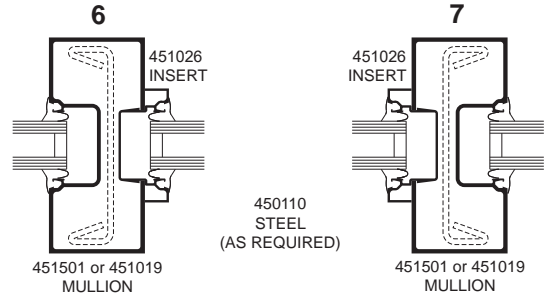
Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

DOOR FRAMING NON-THERMAL ONLY

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

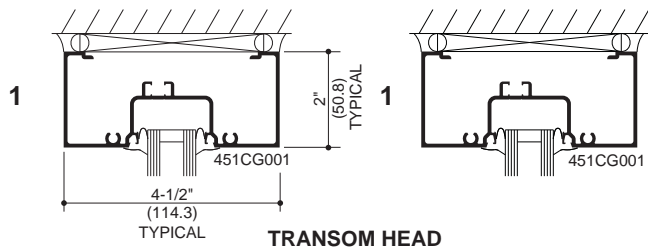


ELEVATIONS ARE NUMBER KEYED TO DETAILS

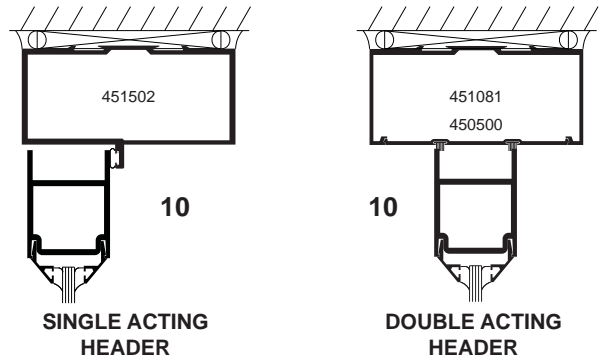


TRANSOM JAMBS

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

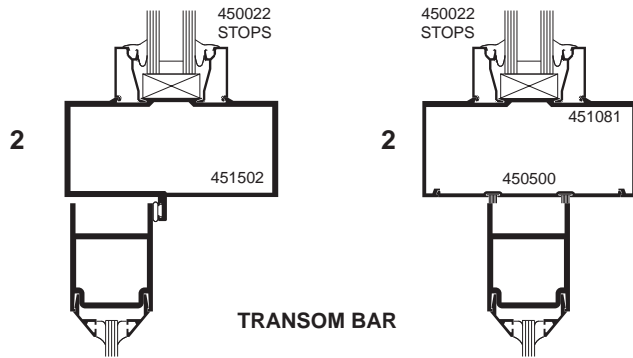


TRANSOM HEAD

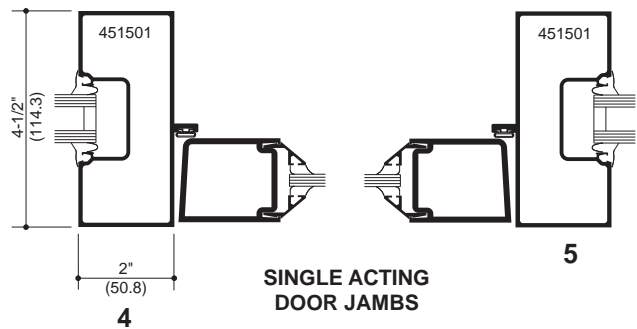


SINGLE ACTING HEADER

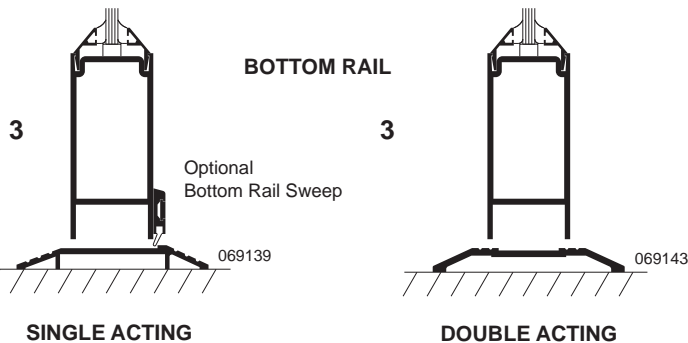
DOUBLE ACTING HEADER



TRANSOM BAR

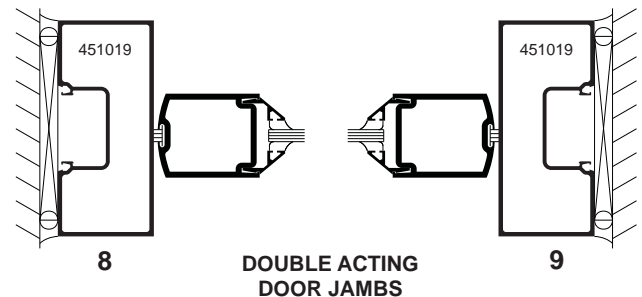


SINGLE ACTING DOOR JAMBS



SINGLE ACTING

DOUBLE ACTING



DOUBLE ACTING DOOR JAMBS

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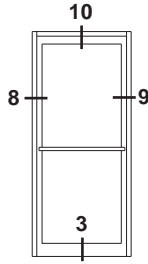
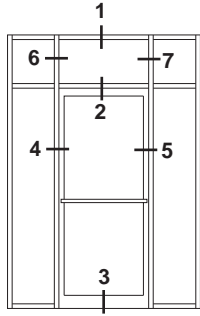
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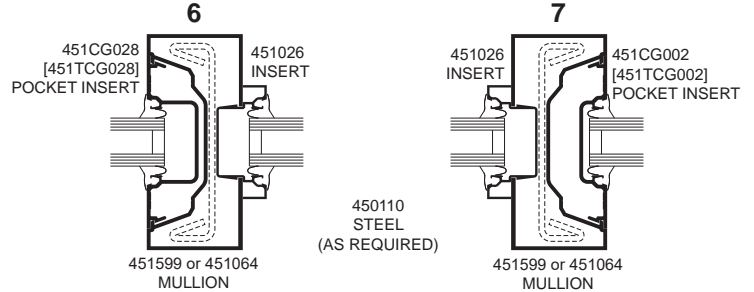
Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

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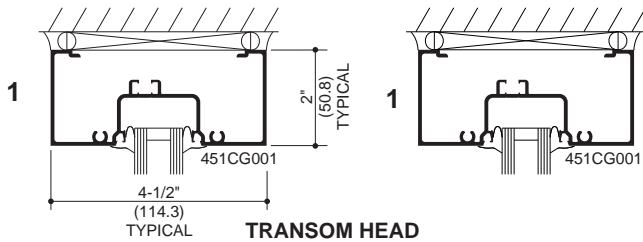


ELEVATIONS ARE NUMBER KEYED TO DETAILS

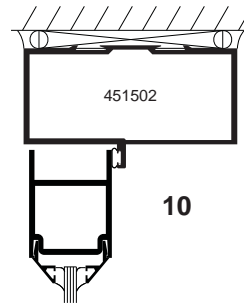


TRANSOM JAMBS

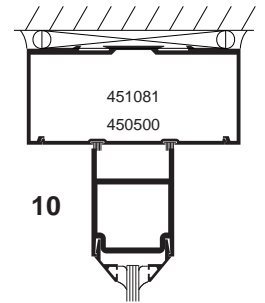
Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.



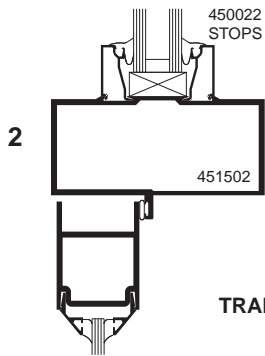
TRANSOM HEAD



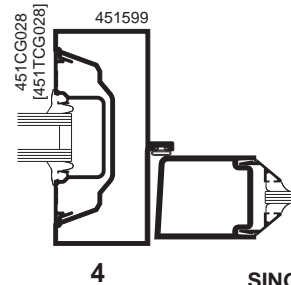
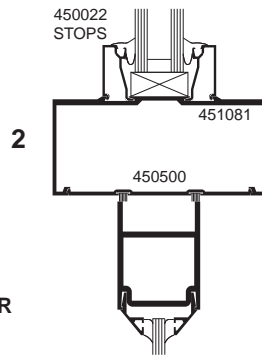
SINGLE ACTING HEADER



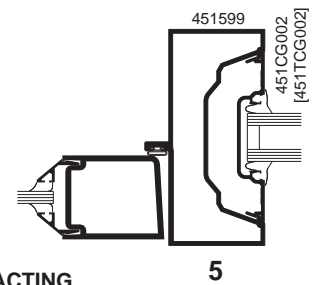
DOUBLE ACTING HEADER



TRANSOM BAR

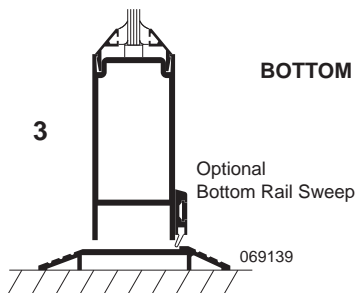


SINGLE ACTING DOOR JAMBS

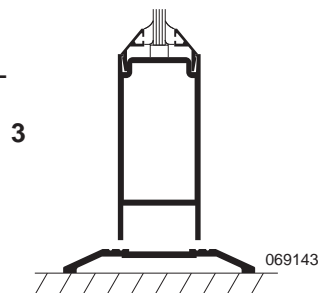


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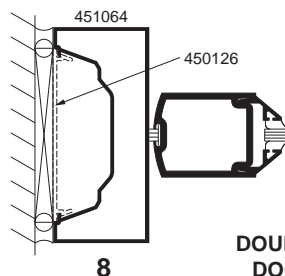
NOTE: Sidelite mullions must be oriented to provide at least one (1) deep vertical pocket per lite to facilitate glazing.



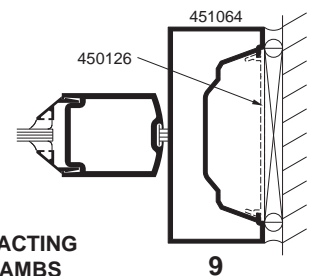
SINGLE ACTING



DOUBLE ACTING



DOUBLE ACTING DOOR JAMBS



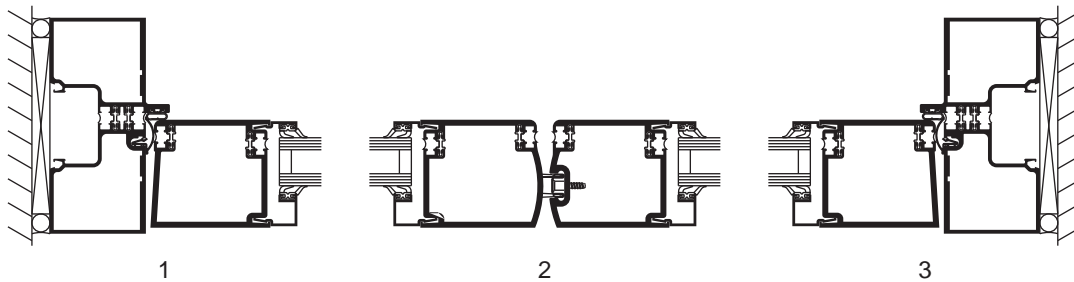
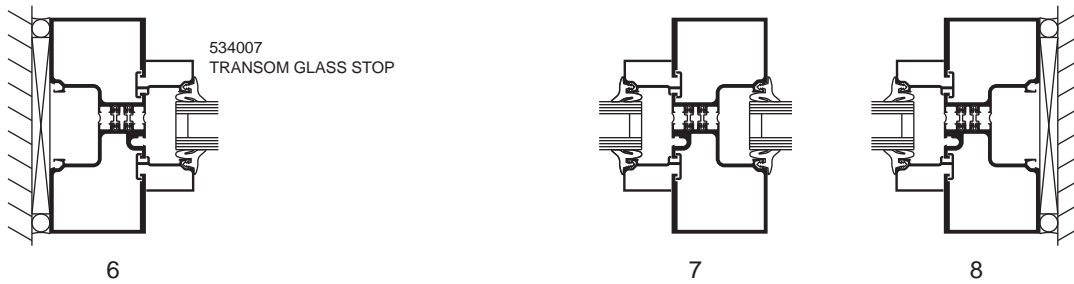
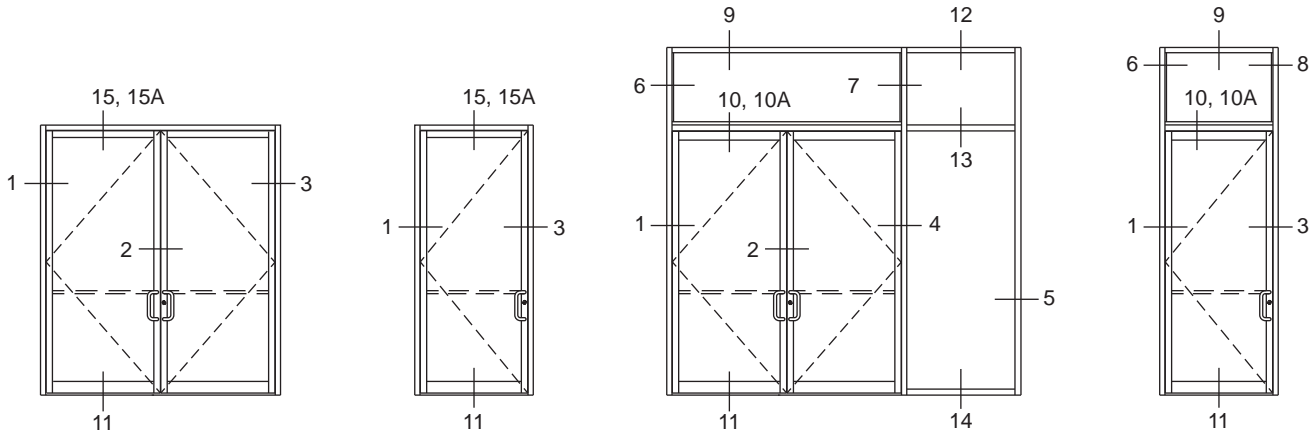
9

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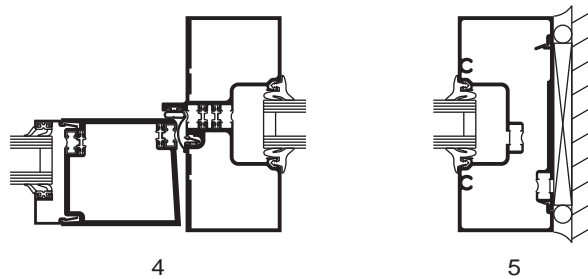
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- NOTE:**
1. SERIES 250T NARROW STILE DOORS ARE DETAILED, MEDIUM STILE 350T DOORS AND WIDE STILE 500T DOORS ALSO MAY BE USED.
 2. TRIFAB® VERSAGLAZE® 451T CENTER, 2" x 4-1/2" (50.8 x 114.3) FRAMING IS DETAILED WITH THE DOORS FOR REFERENCE. OTHER KAWNEER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



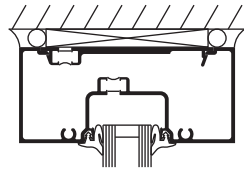
SINGLE ACTING DOORS



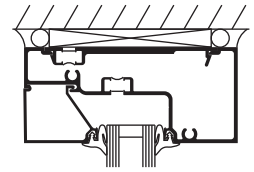
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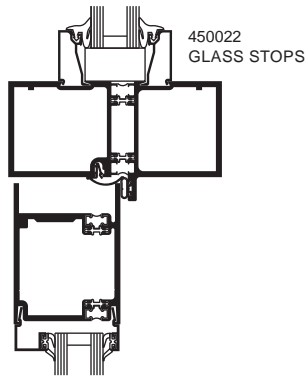
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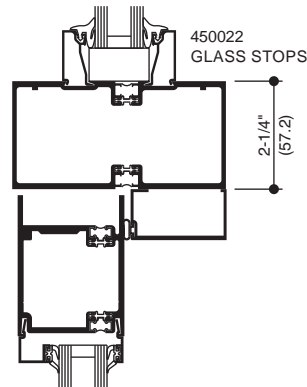
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SINGLE ACTING DOORS

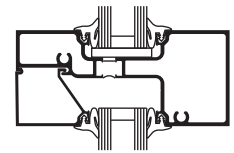
COC WITH SINGLE ACTING OFFSET ARM



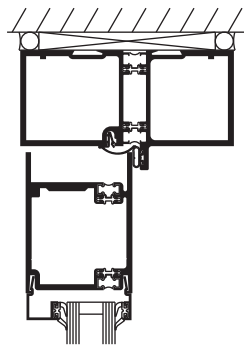
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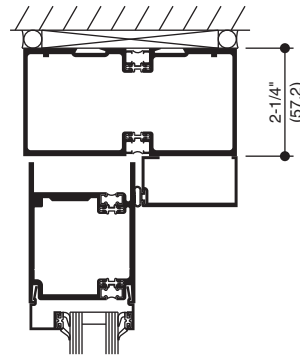
10A



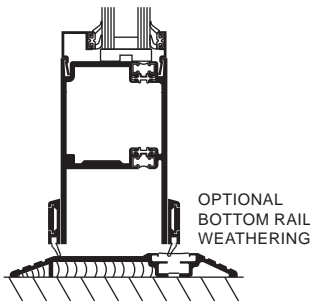
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15

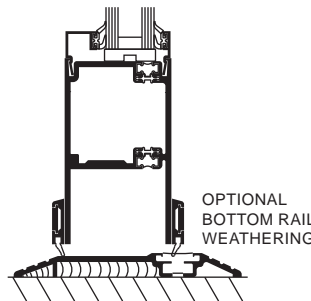


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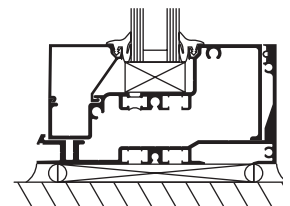
11

SURFACE OVERHEAD CLOSER



11

CONSEALED OVERHEAD CLOSER



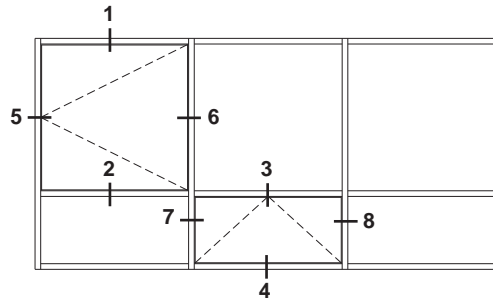
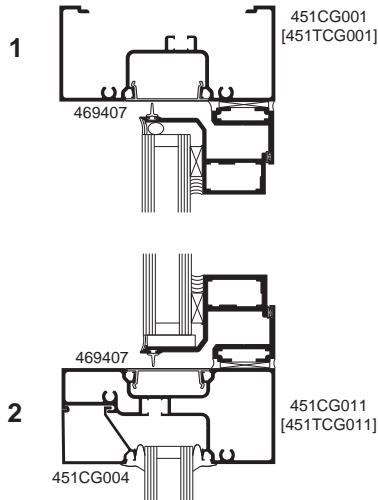
14

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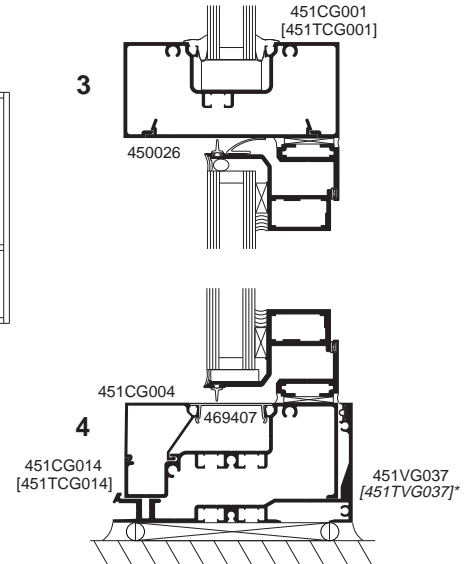
Additional information and CAD details are available at www.kawneer.com

**OUTSWING CASEMENT
VERTICAL SECTION**

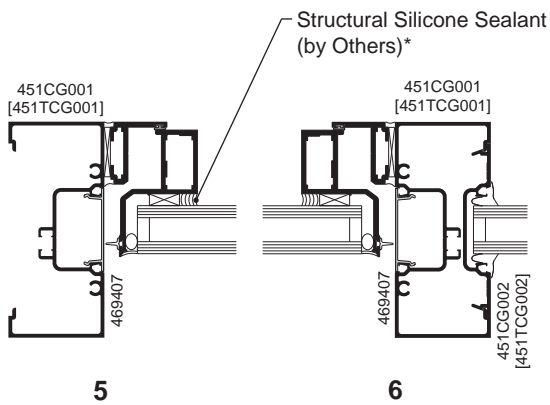


ELEVATION IS NUMBER KEYED TO DETAILS

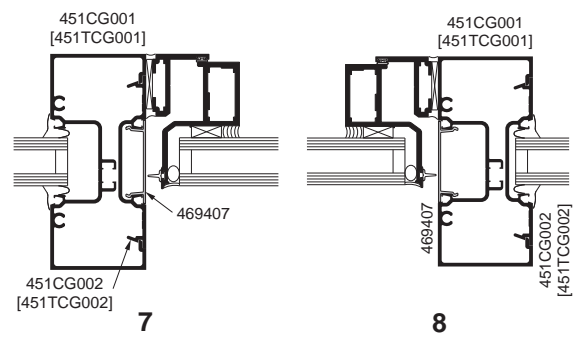
**PROJECT-OUT
VERTICAL SECTION**



**OUTSWING CASEMENT
HORIZONTAL SECTION**



**PROJECT-OUT
HORIZONTAL SECTION**



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

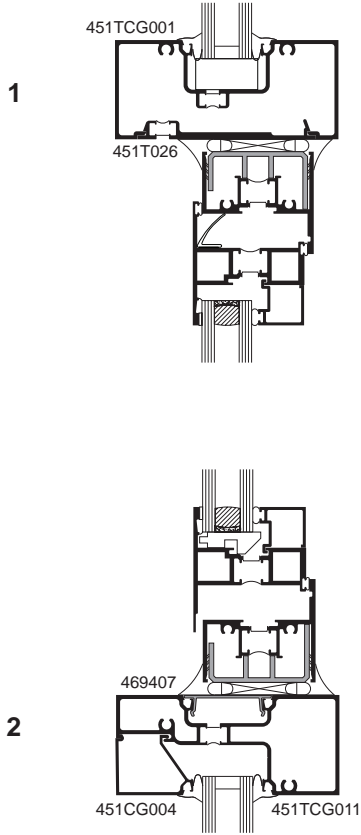
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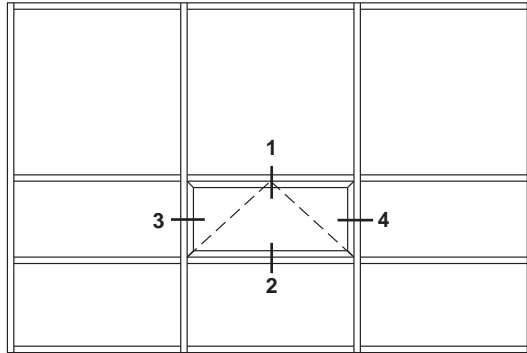
* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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

PROJECT-OUT VERTICAL SECTION

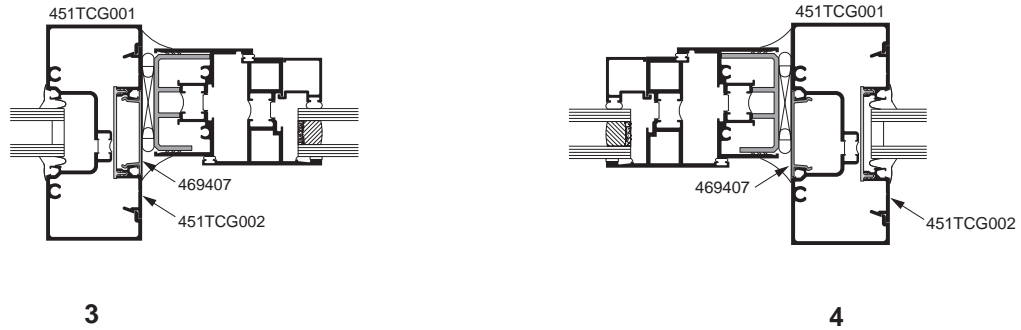


8225TL THERMAL WINDOWS SHOWN
NOTE: OTHER VENT TYPES CAN BE
ACCOMMODATED, CONSULT YOUR KAWNEER
REPRESENTATIVE FOR OTHER OPTIONS



ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT HORIZONTAL SECTION

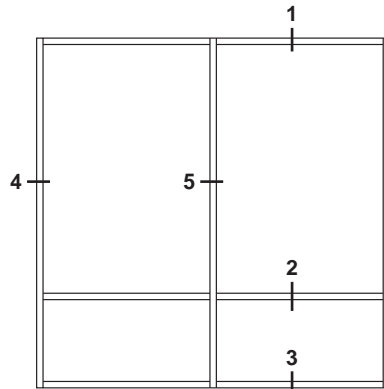


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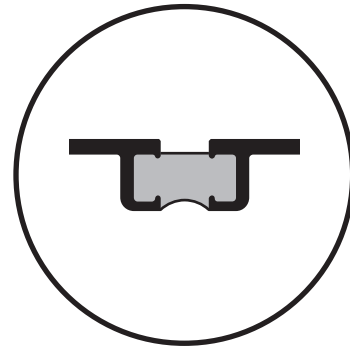
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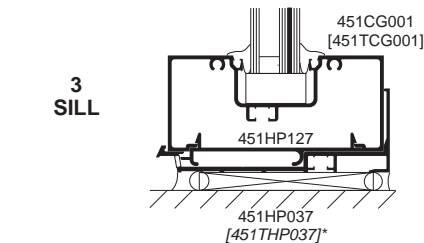
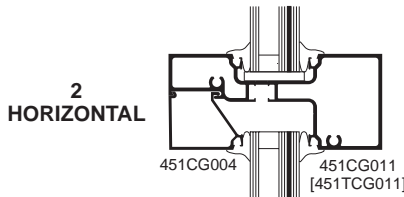
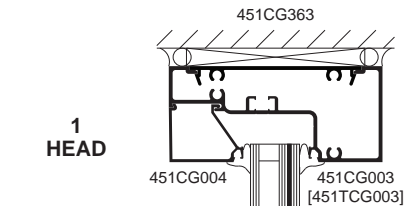
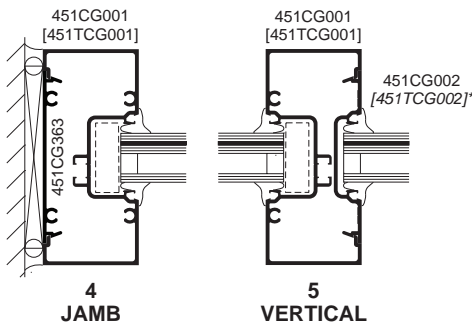


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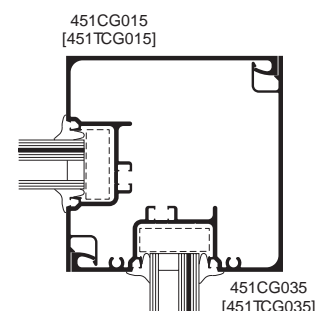
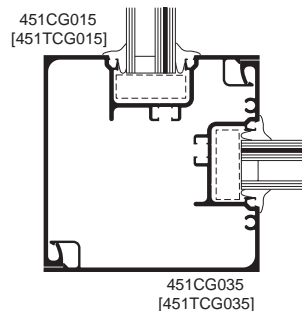
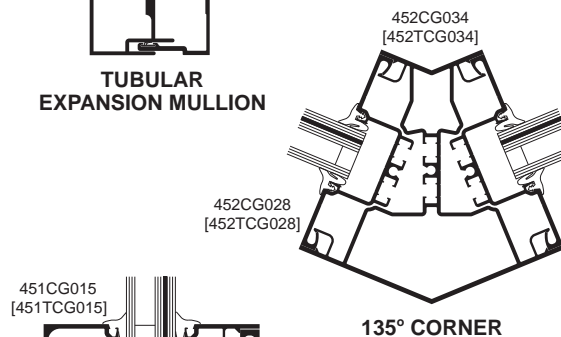
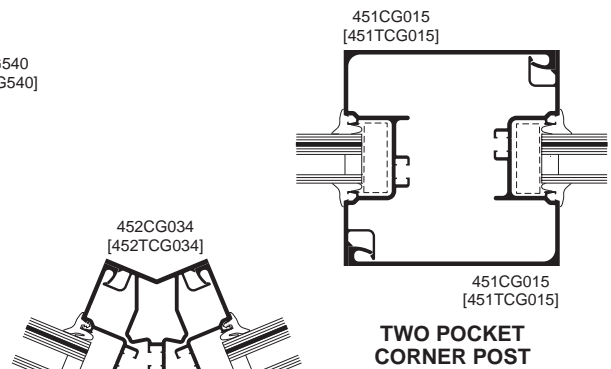
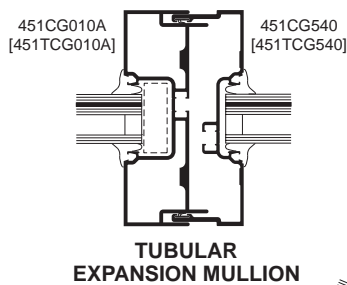
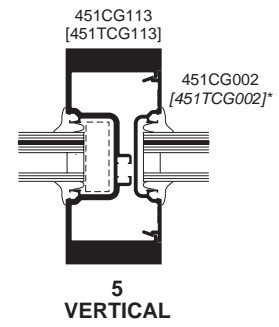
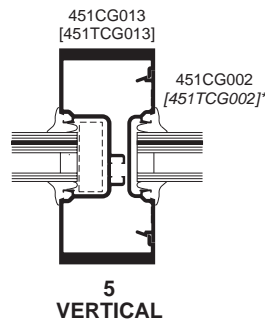
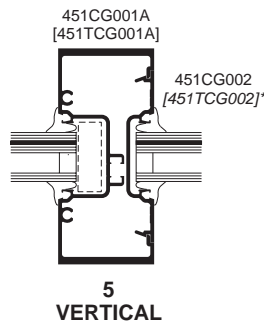


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



OPTIONAL FRAMING (CENTER)



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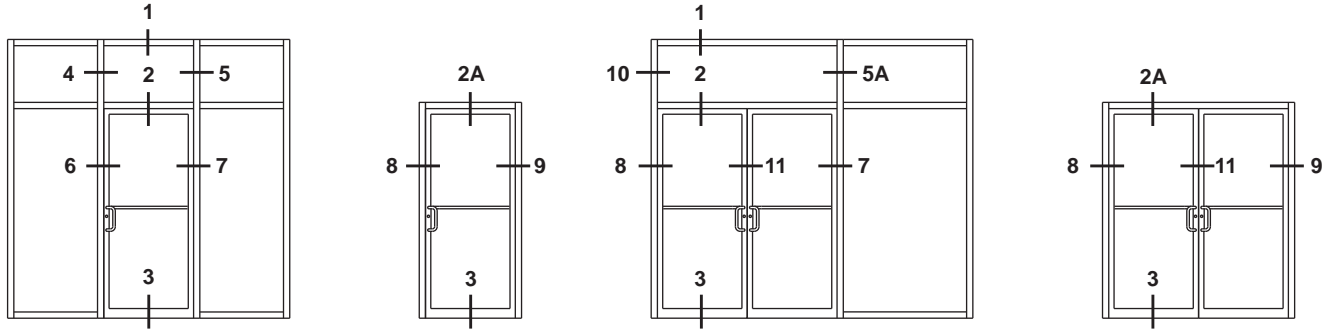
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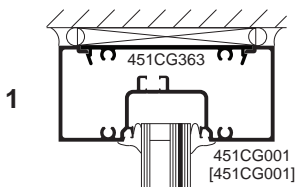
Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER® “350/500 IR” DOORS (DRY GLAZED).

DOOR FRAMING NON-THERMAL ONLY

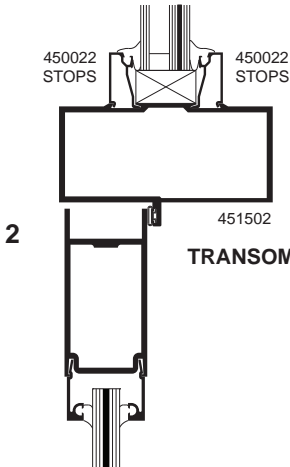
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



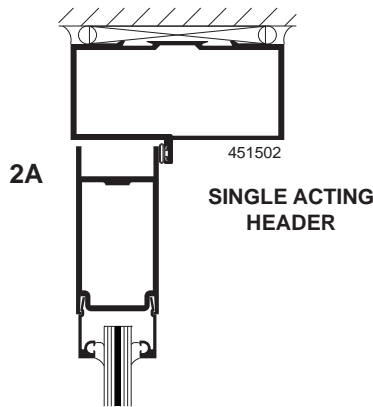
ELEVATIONS ARE NUMBER KEYED TO DETAILS



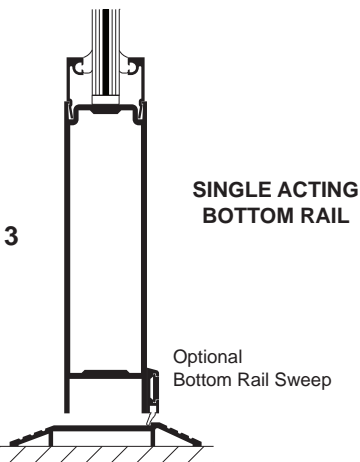
TRANSOM HEAD



TRANSOM BAR

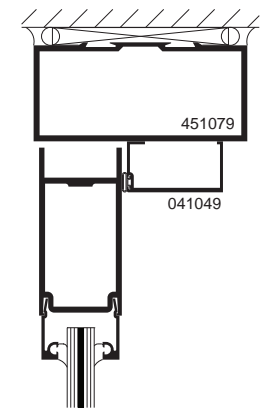
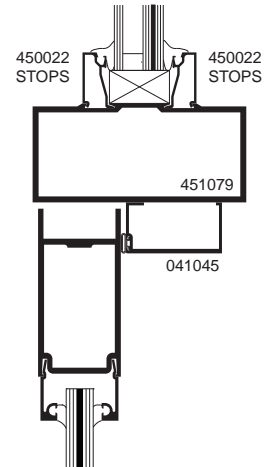


SINGLE ACTING HEADER



SINGLE ACTING BOTTOM RAIL

CONCEALED OVERHEAD CLOSERS



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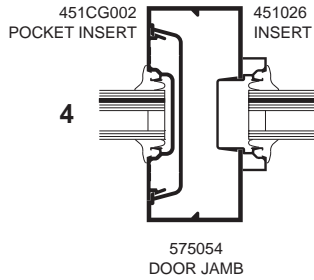
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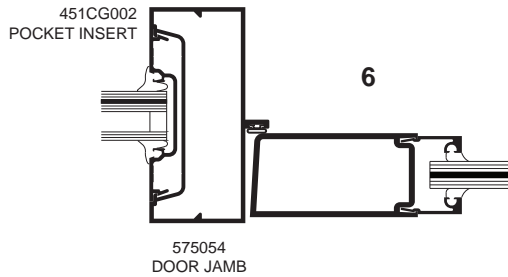
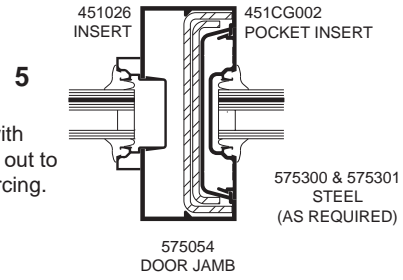
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NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

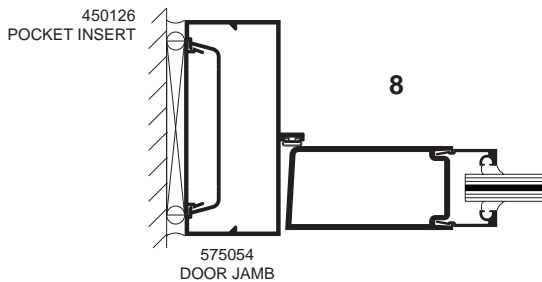
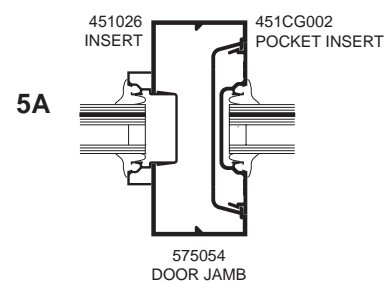
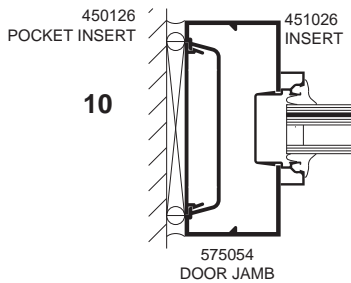
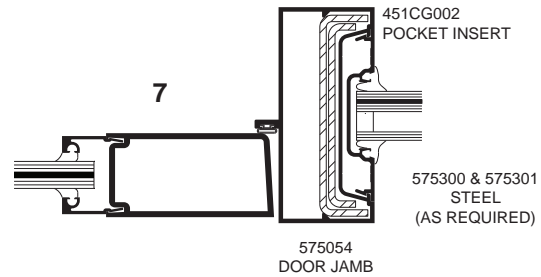


TRANSOM JAMBS

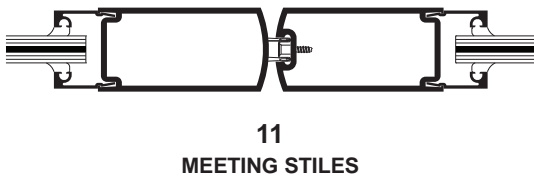
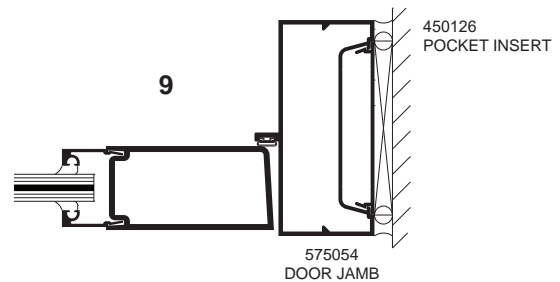
Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.



SINGLE ACTING DOOR JAMBS



SINGLE ACTING DOOR JAMBS



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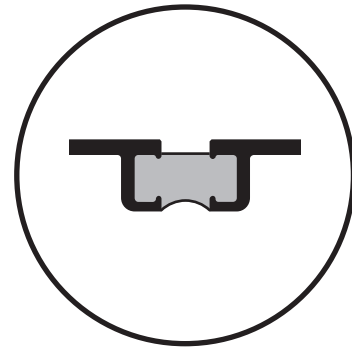
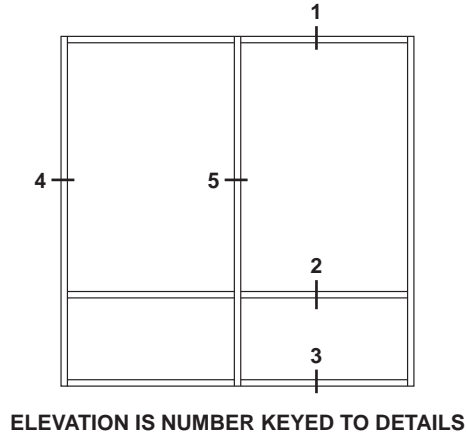
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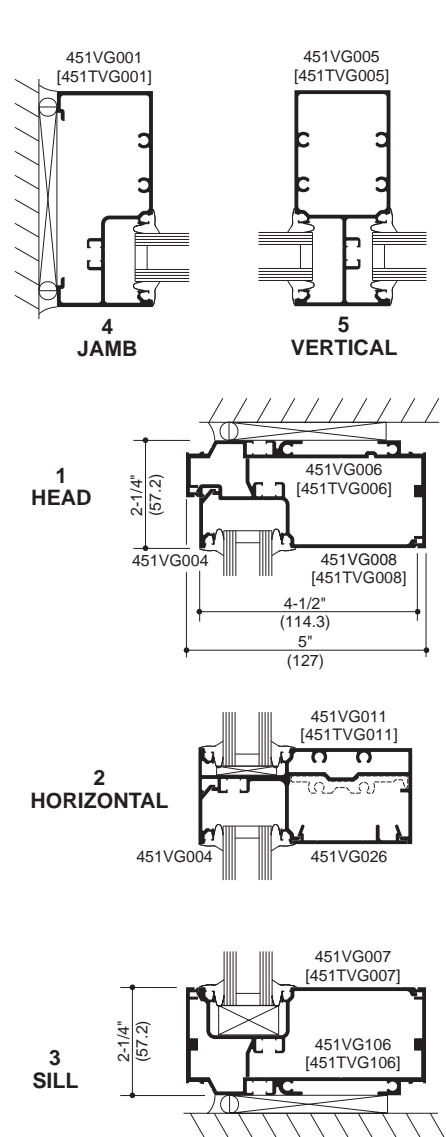
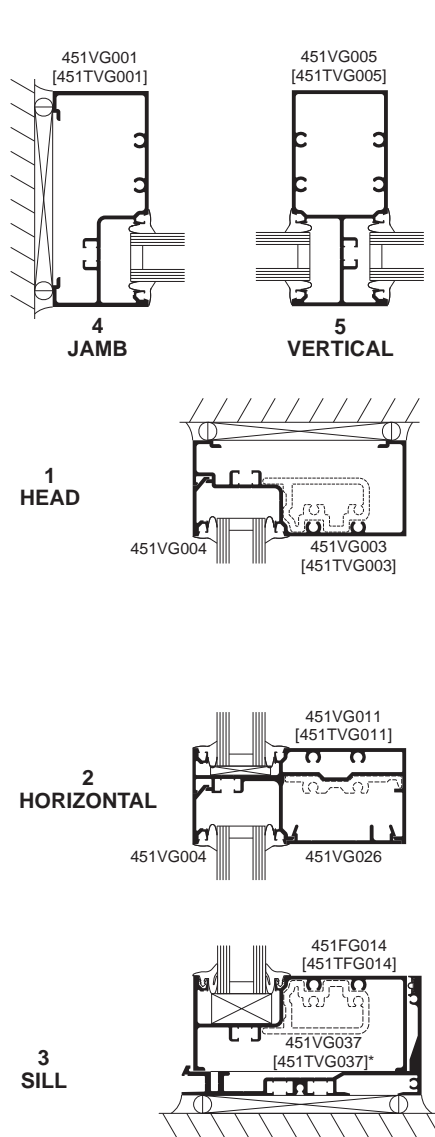
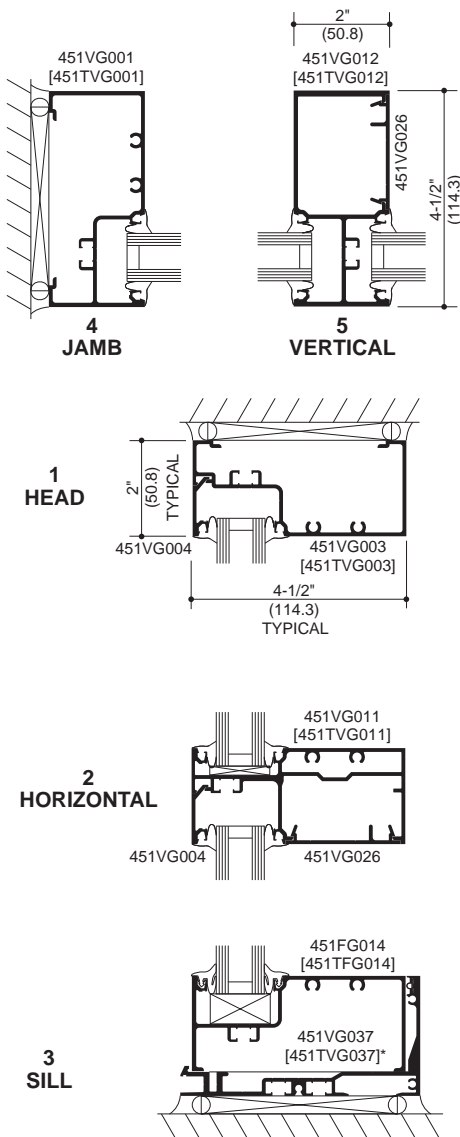


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK



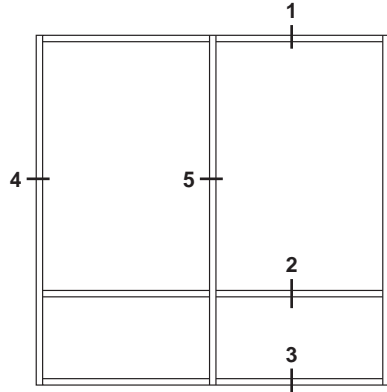
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

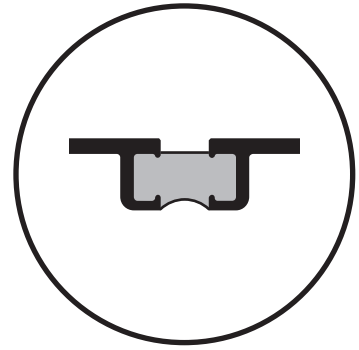
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ELEVATION IS NUMBER KEYED TO DETAILS

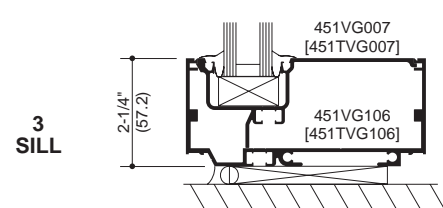
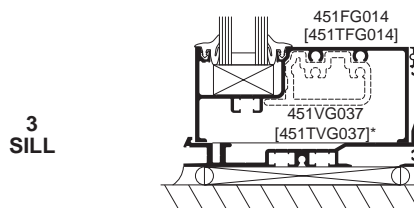
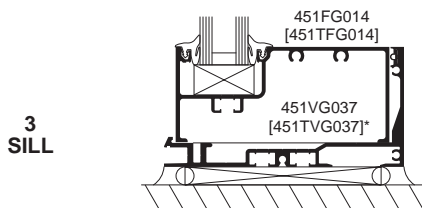
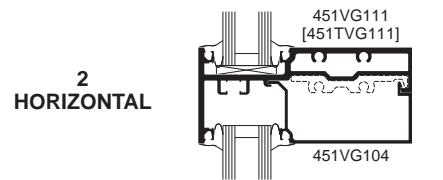
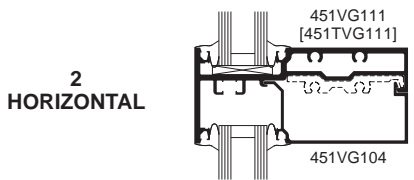
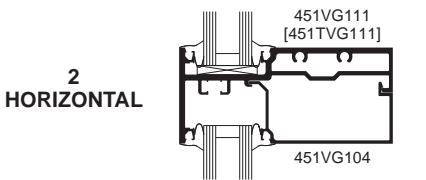
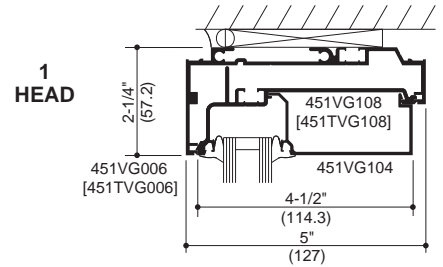
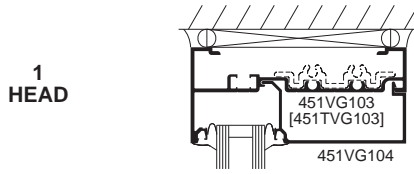
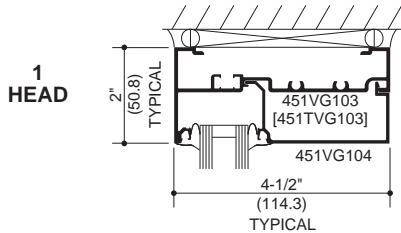
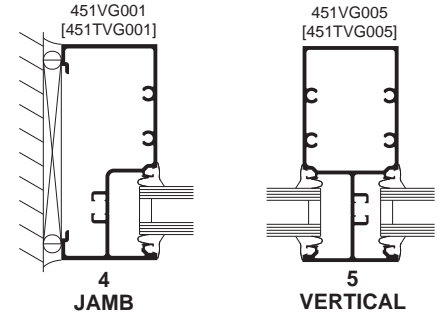
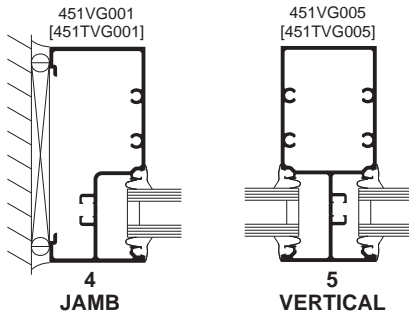
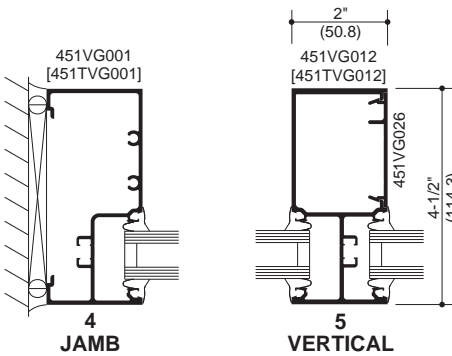


NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK



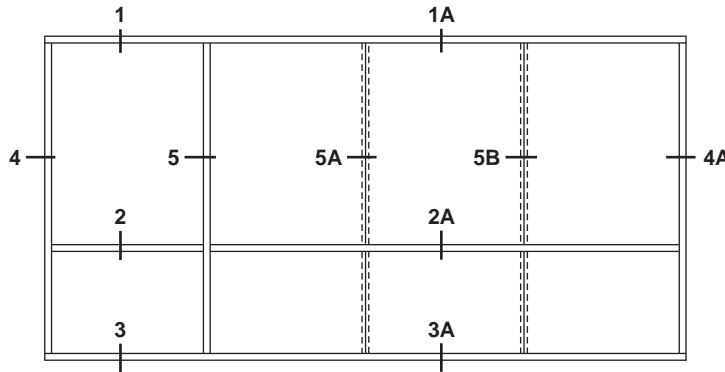
* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

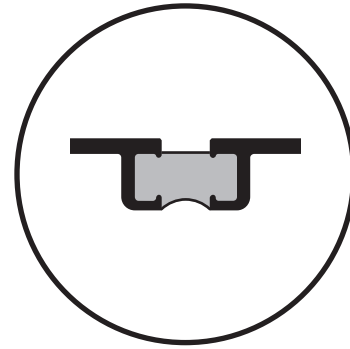
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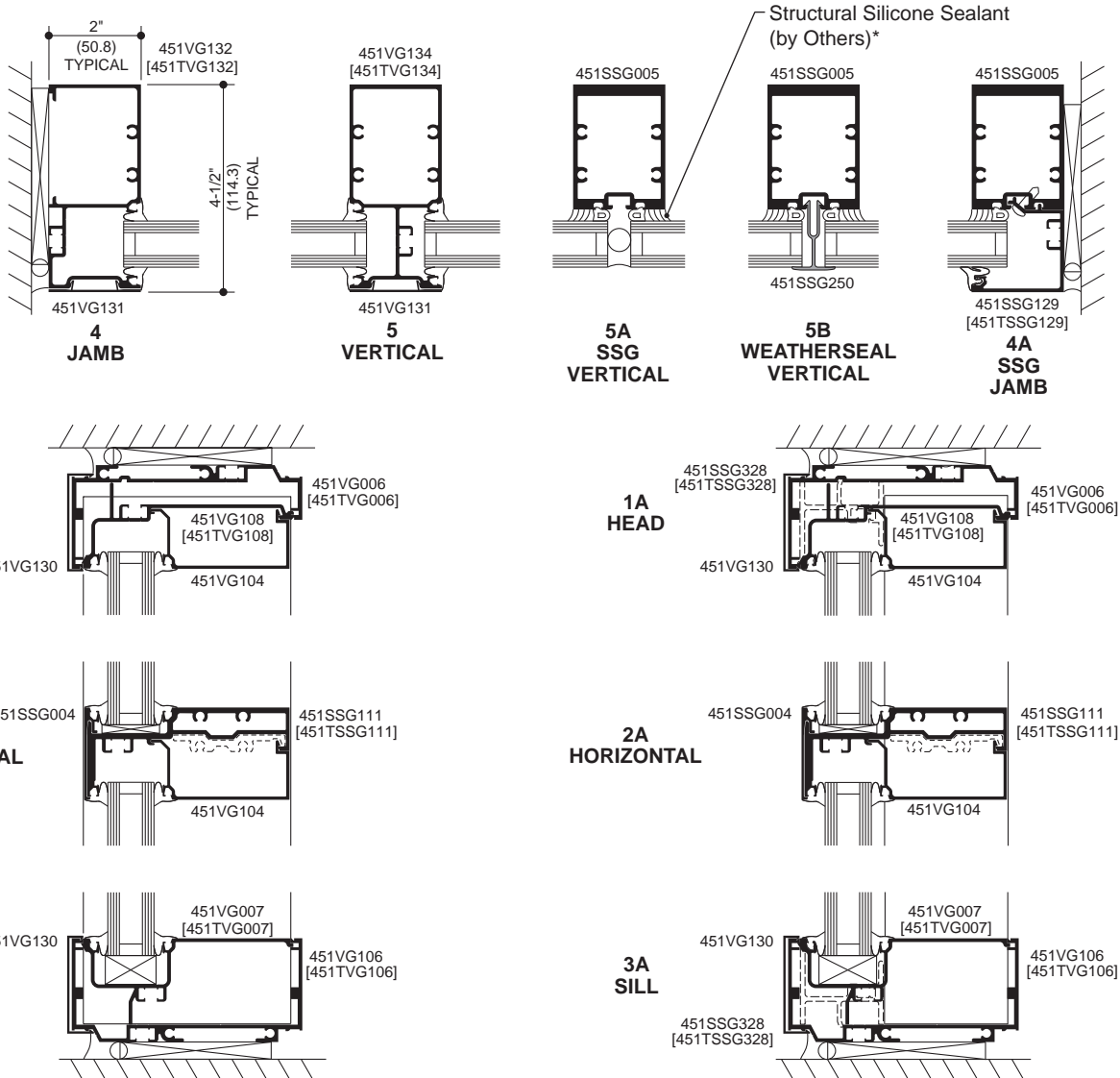
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

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

STANDARD RECEPTOR with SSG ADAPTOR



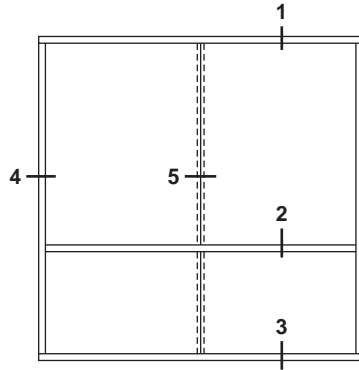
* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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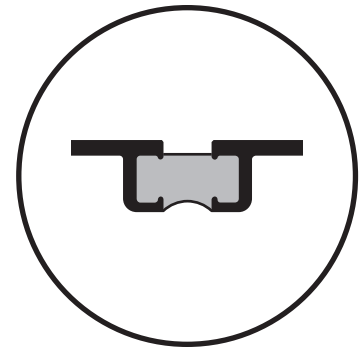
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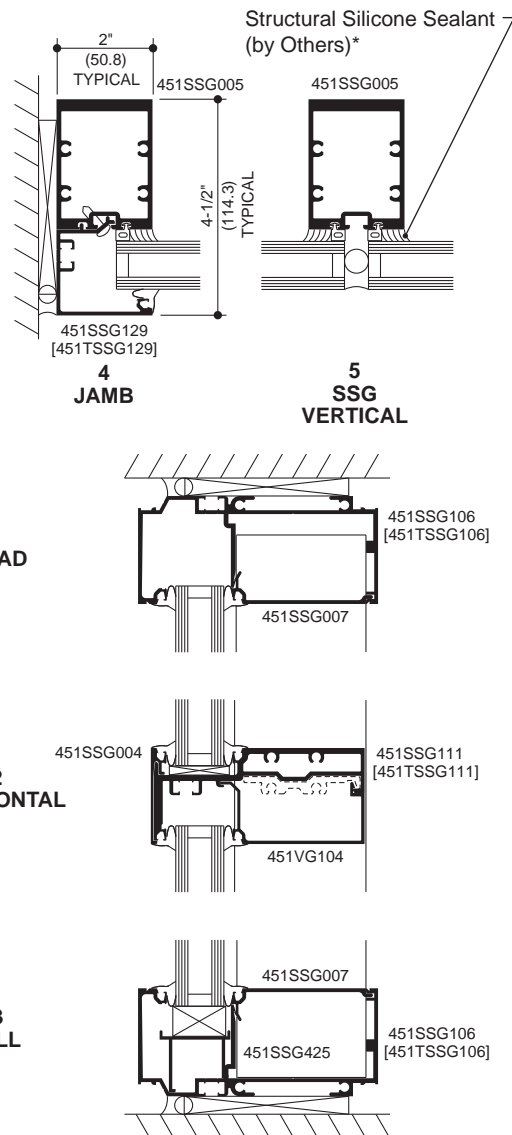
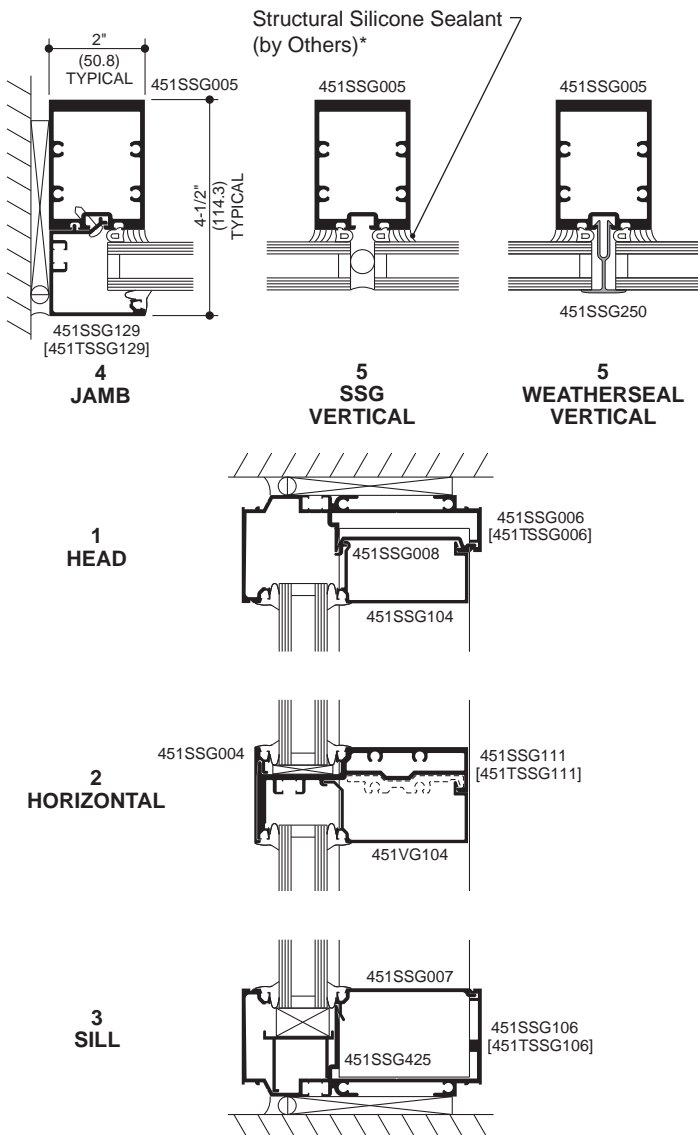
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

**STICK (INSIDE GLAZED)
SSG RECEPTOR**

**STICK (OUTSIDE GLAZED)
SSG RECEPTOR**

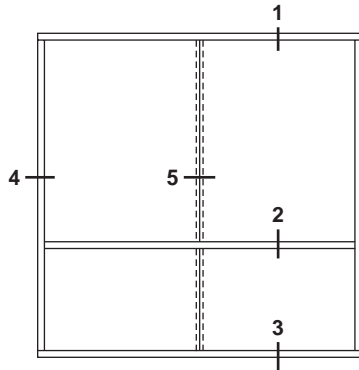


* **INSTALLER NOTE:** Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

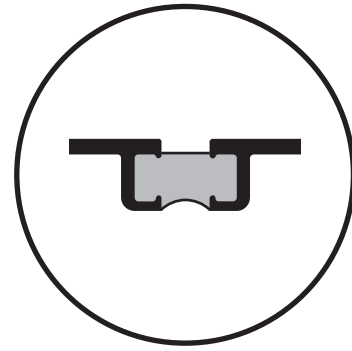
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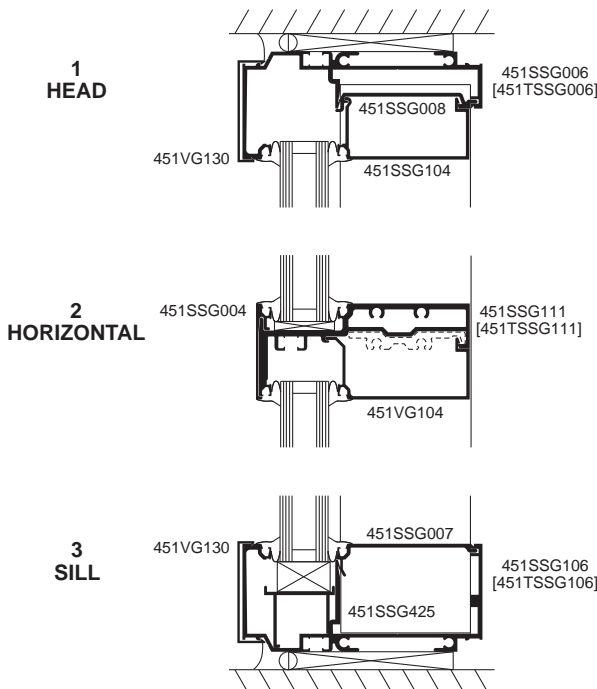
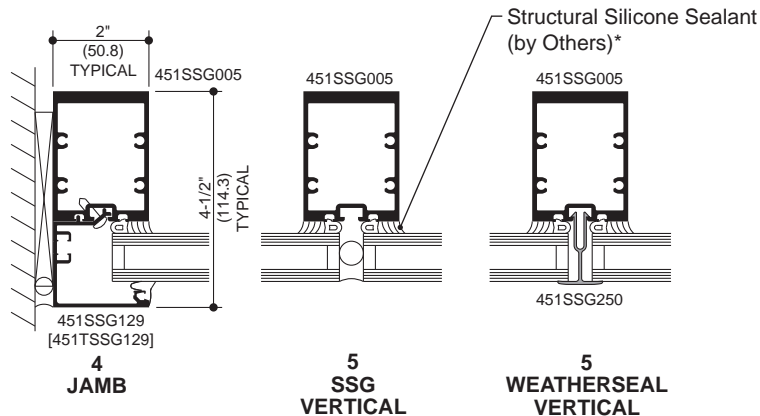
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

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

SSG RECEPTOR



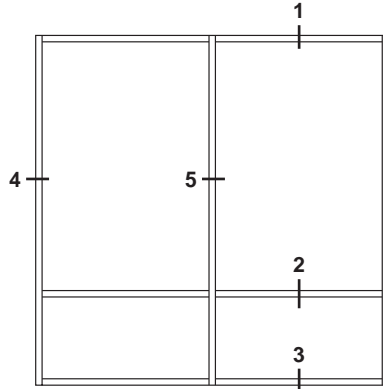
* INSTALLER NOTE: Installer is responsible for all required compatibility review and approvals with the Structural Silicone Manufacturer and the Insulating Glass Unit Manufacturer.

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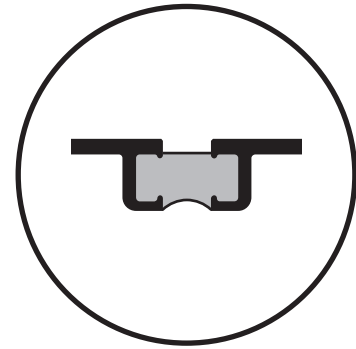
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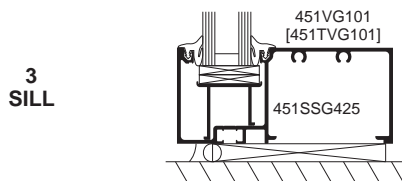
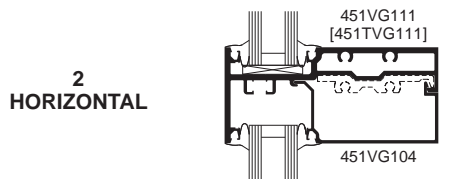
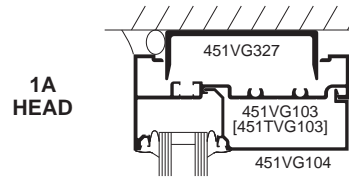
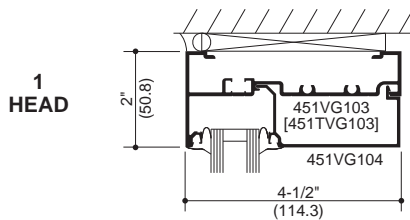
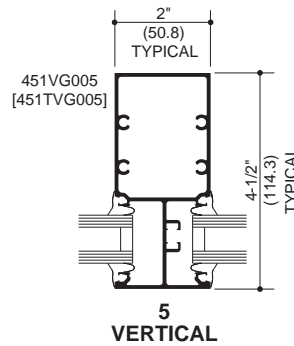
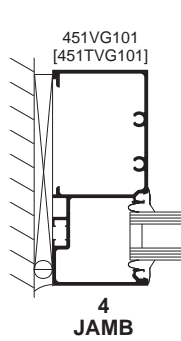
ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

CONTINUOUS HEAD AND SILL (INSIDE GLAZED)

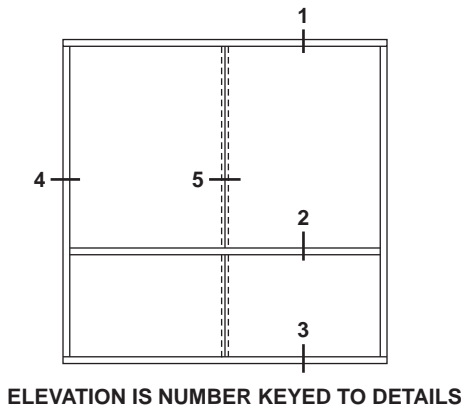
PUNCHED OPENING



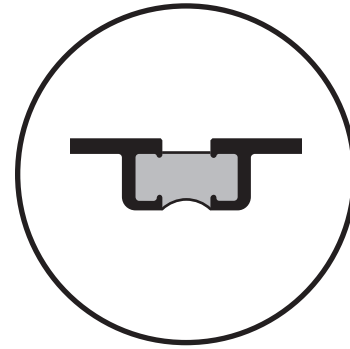
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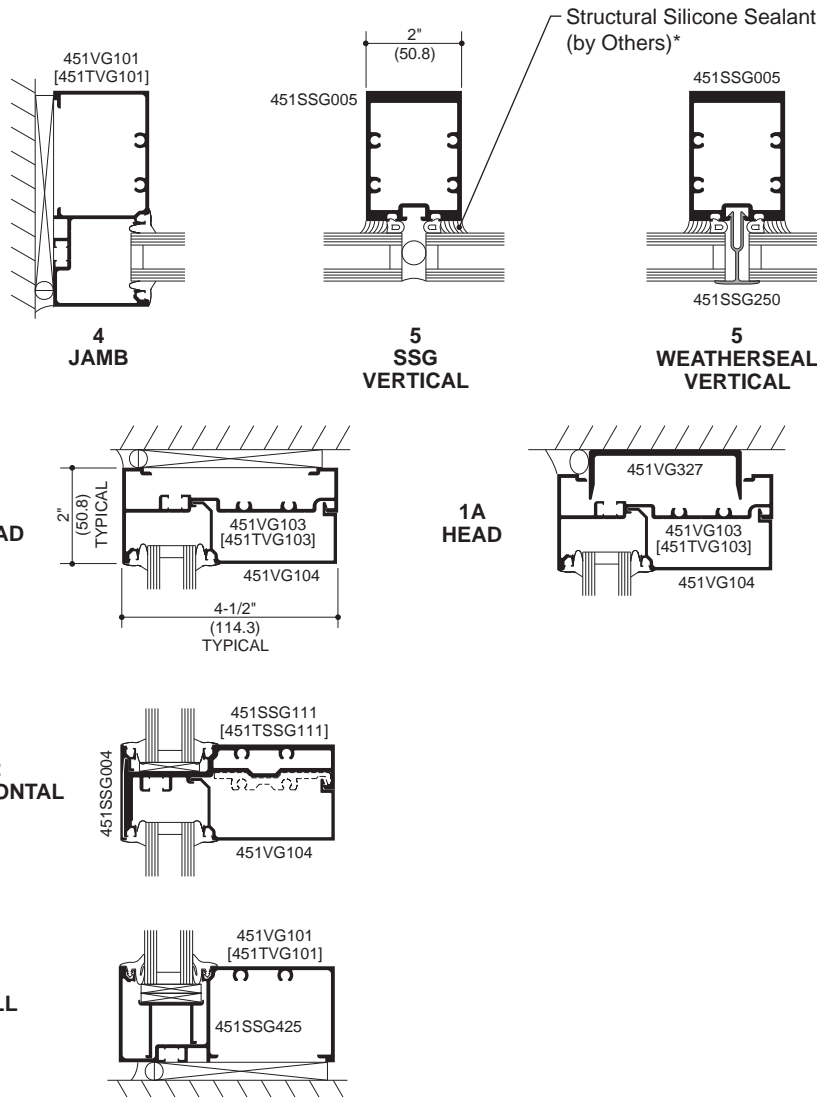


ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

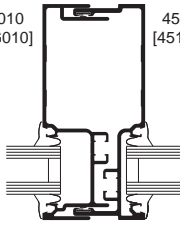
**CONTINUOUS HEAD AND SILL (INSIDE GLAZED)
SSG \ WEATHERSEAL
PUNCHED OPENING**



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

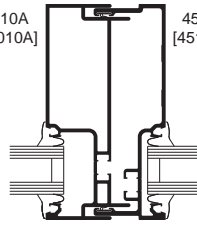
Additional information and CAD details are available at www.kawneer.com

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



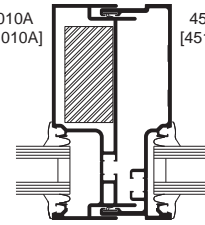
EXPANSION MULLION

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

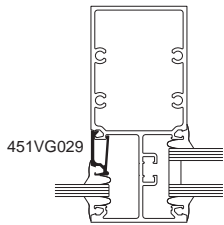


**TUBULAR
EXPANSION MULLION**

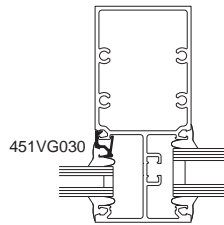
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[451TVG010A] 451VG540
[451TVG540]



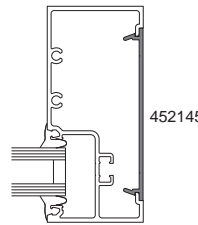
**TUBULAR
EXPANSION MULLION
WITH STEEL**



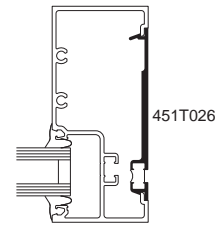
**1/4" (6.4) INFILL
SNAP-IN ADAPTOR**



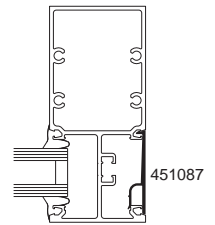
**5/8" (15.9) INFILL
SNAP-IN ADAPTOR**



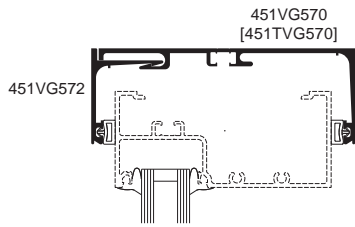
**PVC FLAT FILLER
(NON STRUCTURAL)**



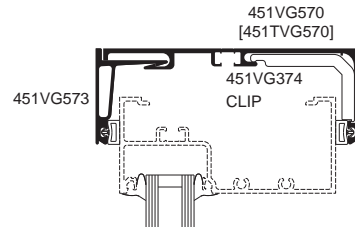
**THERMAL
FLAT FILLER**



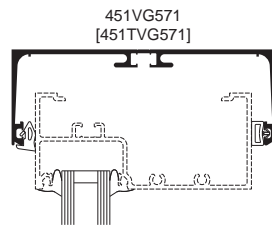
**SNAP-IN
FLAT FILLER**



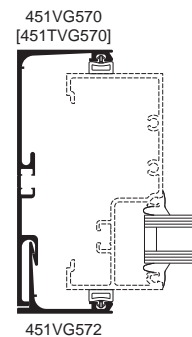
**STANDARD - HEAD
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**



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



**ONE PIECE - HEAD
COMPENSATING RECEPTOR**

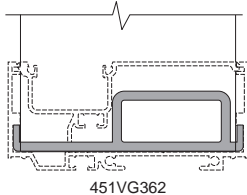


**JAMB
COMPENSATING RECEPTOR
(EXTERIOR INSTALLED)**

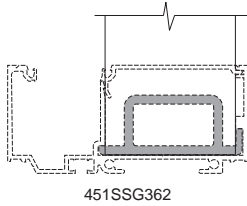
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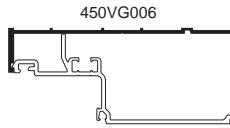
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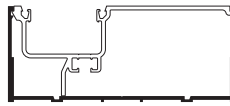
451VG362
MULLION ANCHOR



451SSG362
SSG MULLION ANCHOR

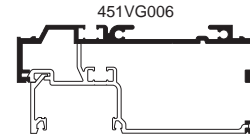


450VG006

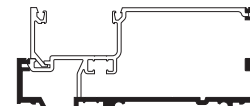


450VG106

**OPTIONAL LIGHTWEIGHT
CAN RECEPTORS**



451VG006



451VG106

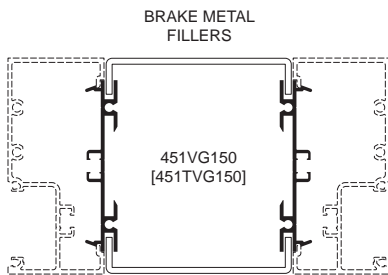
**OPTIONAL UNEQUAL LEG
CAN RECEPTORS**

NOTE:

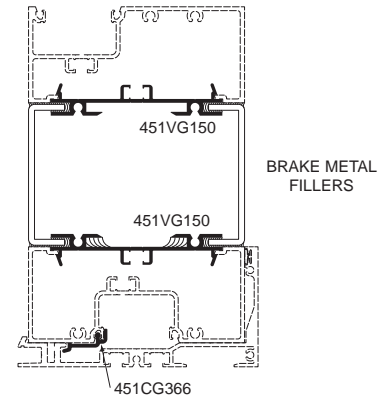
If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified wind load (psf), divided by two) is more than 500 LBS., the optional Mullion Anchor must be used. Consult Application Engineering.

NOTE:

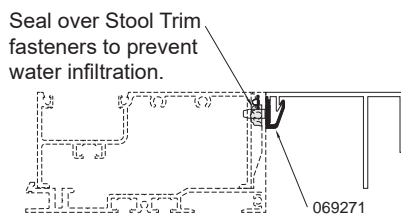
Mullion Anchor not used with Lightweight Receptor.



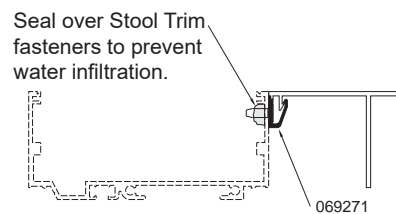
**BRAKE METAL
ADAPTOR**



**BRAKE METAL ADAPTOR
AT HORIZONTAL**



**STOOL TRIM CLIP
with HP FLASHING**

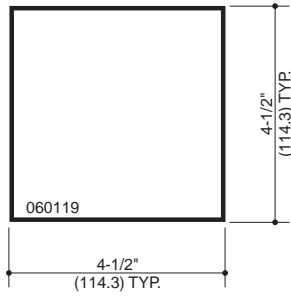


**STOOL TRIM CLIP
FOR STICK ASSEMBLY**

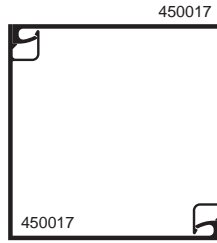
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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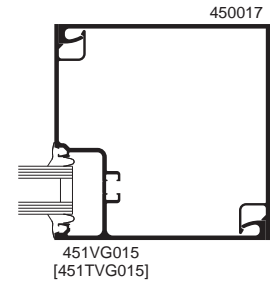
Additional information and CAD details are available at www.kawneer.com



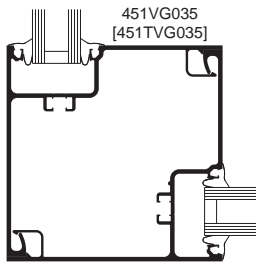
4-1/2" X 4-1/2" TUBE



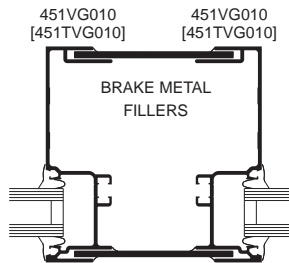
TWO PIECE NO POCKET CORNER



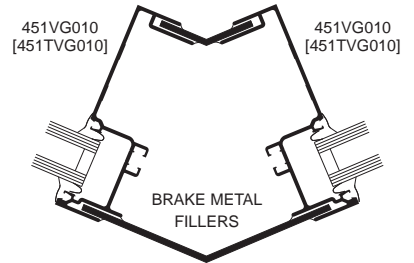
ONE POCKET CORNER



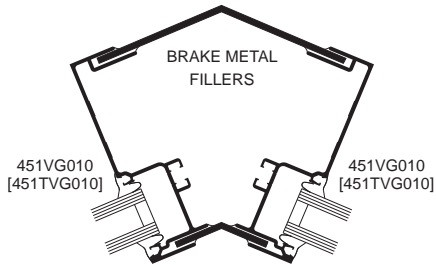
TWO POCKET 90° CORNER



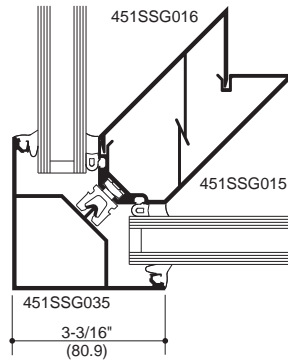
TWO POCKET CORNER POST



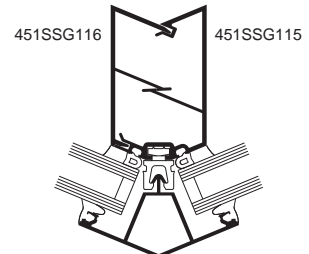
VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER



VARIABLE DEGREE BRAKE METAL INSIDE CORNER



90° CORNER



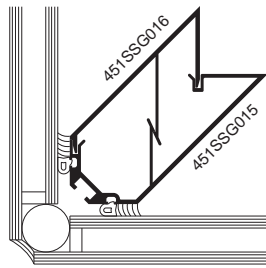
135° CORNER

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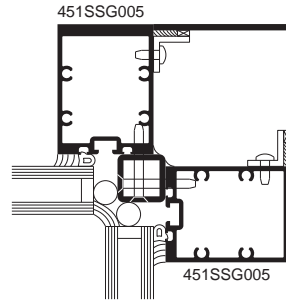
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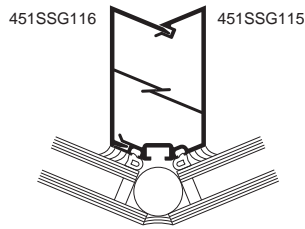
INSIDE GLAZED



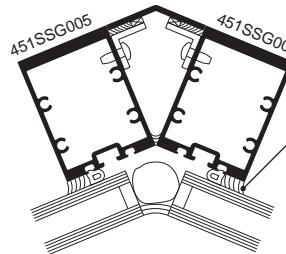
90° OUTSIDE CORNER



90° INSIDE CORNER

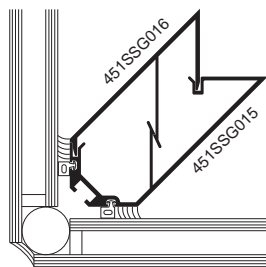


135° OUTSIDE CORNER

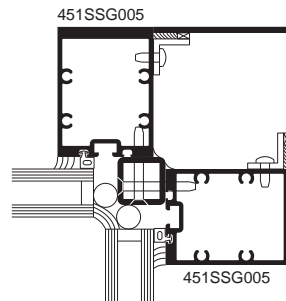


135° INSIDE CORNER

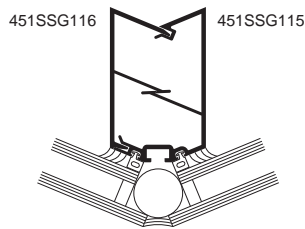
OUTSIDE GLAZED



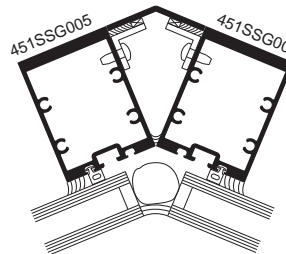
90° OUTSIDE CORNER



90° INSIDE CORNER



135° OUTSIDE CORNER



135° INSIDE CORNER

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

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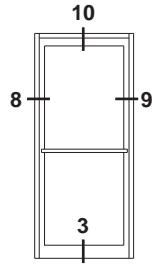
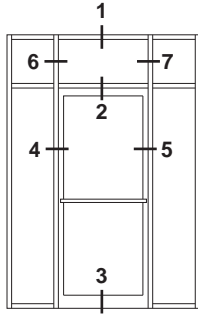
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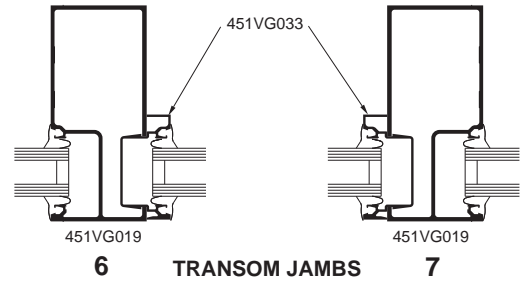
Trifab® VersaGlaze® 451 FRAMING INCORPORATING KAWNEER "190" DOORS.

DOOR FRAMING NON-THERMAL ONLY

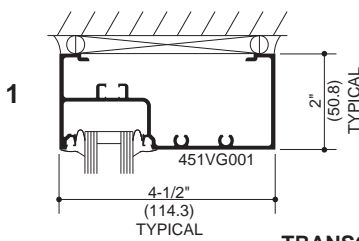
NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



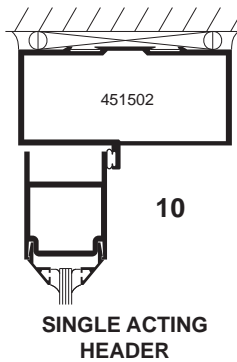
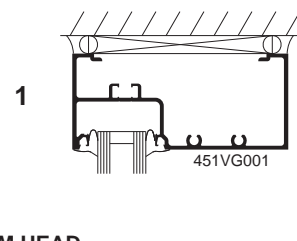
ELEVATIONS ARE NUMBER KEYED TO DETAILS



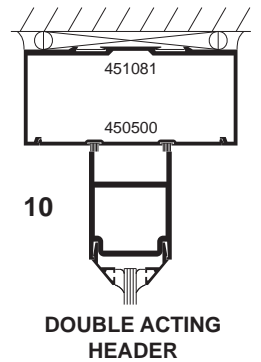
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.



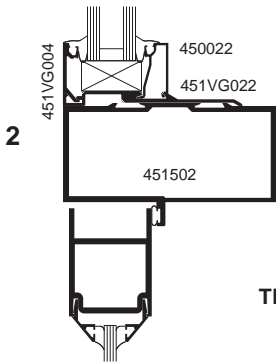
TRANSOM HEAD



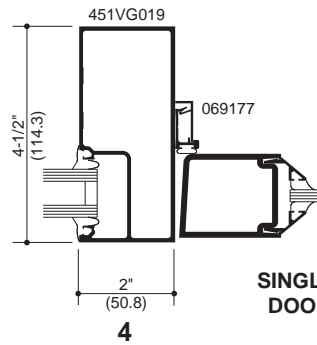
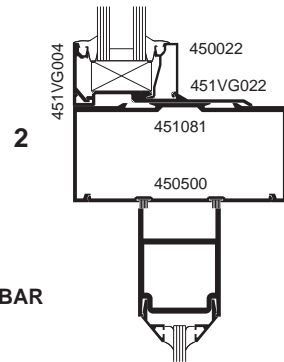
SINGLE ACTING HEADER



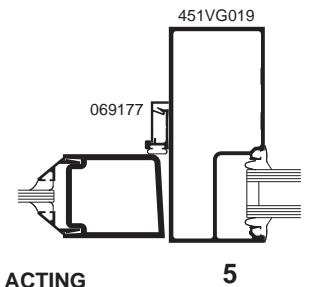
DOUBLE ACTING HEADER



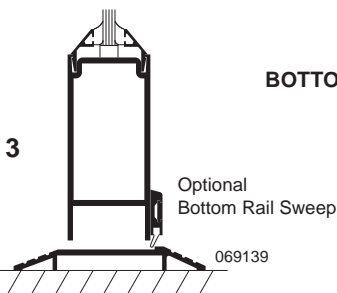
TRANSOM BAR



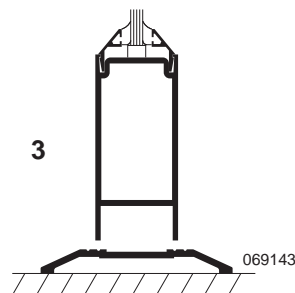
SINGLE ACTING DOOR JAMBS



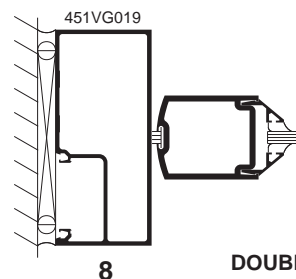
5



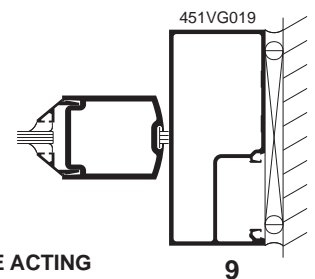
SINGLE ACTING



DOUBLE ACTING



DOUBLE ACTING DOOR JAMBS



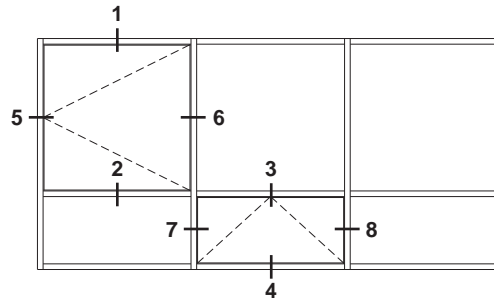
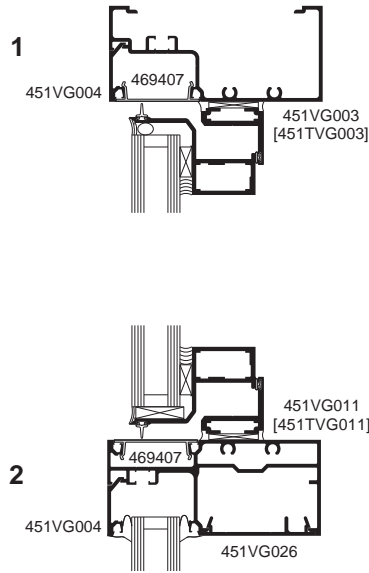
9

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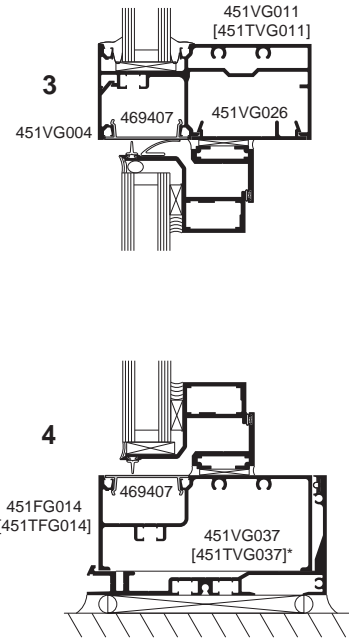
Additional information and CAD details are available at www.kawneer.com

**OUTSWING CASEMENT
VERTICAL SECTION**

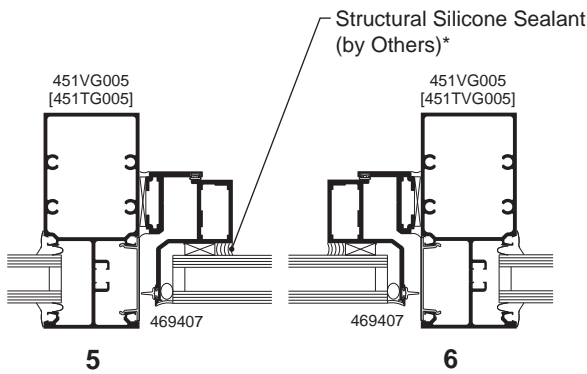


ELEVATION IS NUMBER KEYED TO DETAILS

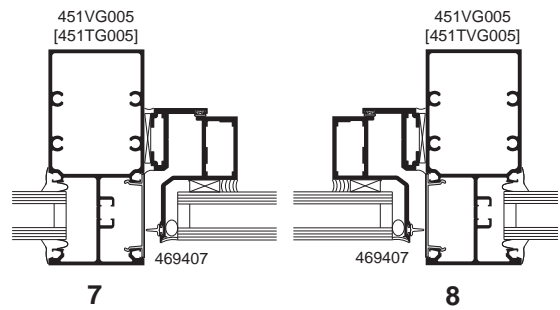
**PROJECT-OUT
VERTICAL SECTION**



**OUTSWING CASEMENT
HORIZONTAL SECTION**



**PROJECT-OUT
HORIZONTAL SECTION**



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

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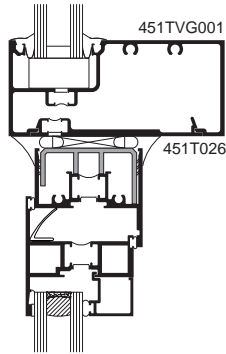
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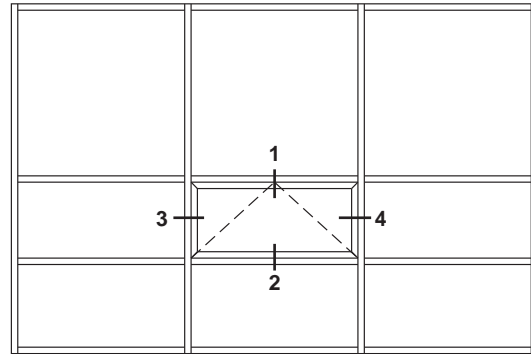
Additional information and CAD details are available at www.kawneer.com

PROJECT-OUT VERTICAL SECTION

1

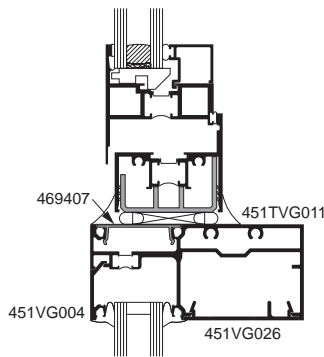


8225TL THERMAL WINDOWS SHOWN
NOTE: OTHER VENT TYPES CAN BE
ACCOMMODATED, CONSULT YOUR KAWNEER
REPRESENTATIVE FOR OTHER OPTIONS

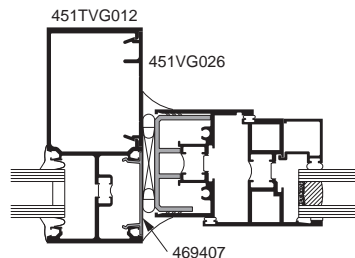


ELEVATION IS NUMBER KEYED TO DETAILS

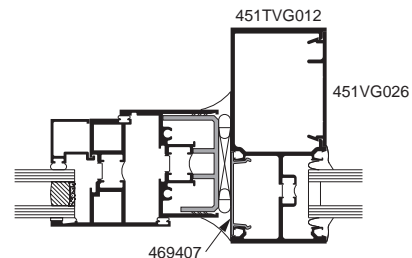
2



PROJECT-OUT HORIZONTAL SECTION



3



4

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BASIC FRAMING DETAILS 46-47

MISCELLANEOUS FRAMING..... 48-49

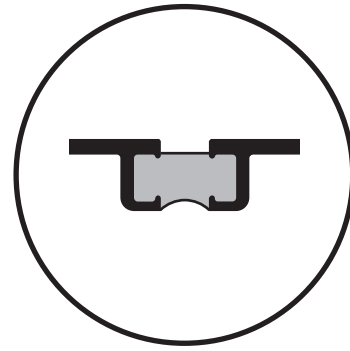
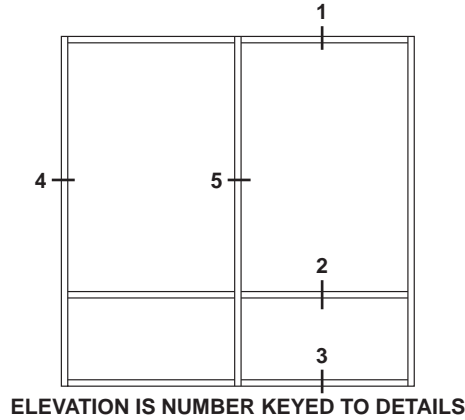
CORNERS.....50

ENTRANCE FRAMING.....51

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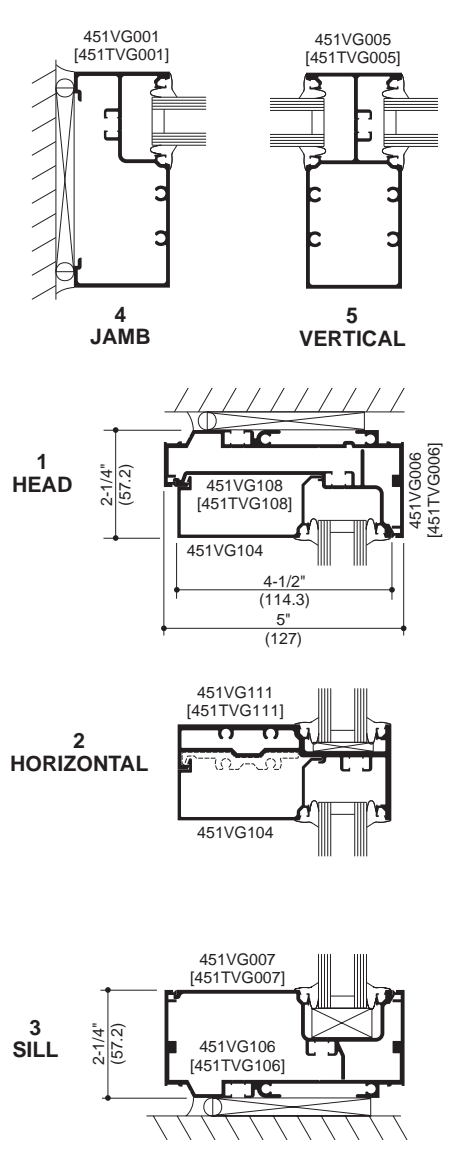
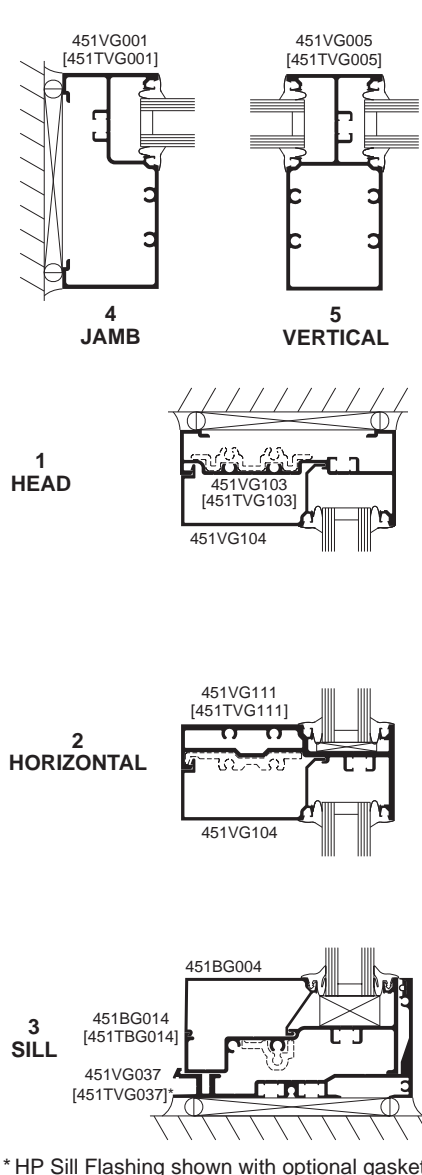
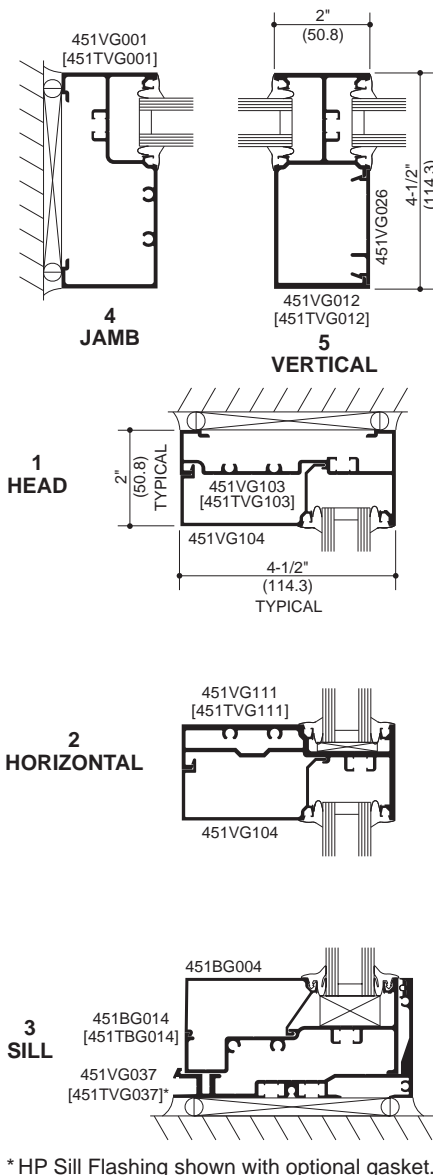
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SCREW SPLINE

SHEAR BLOCK

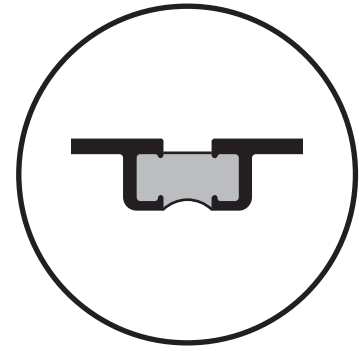
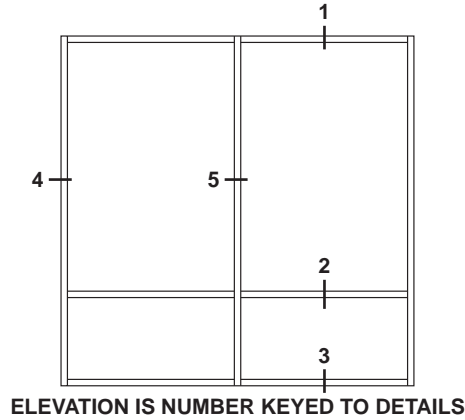
STICK



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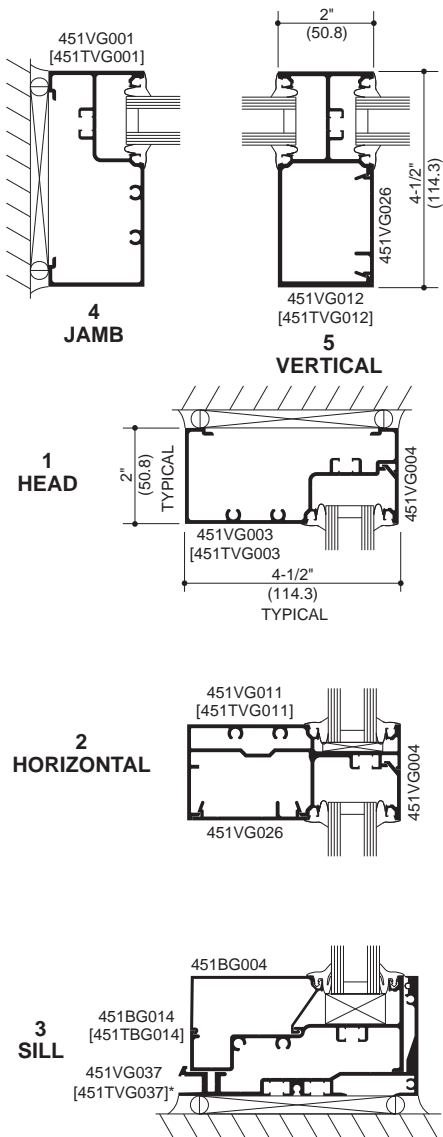
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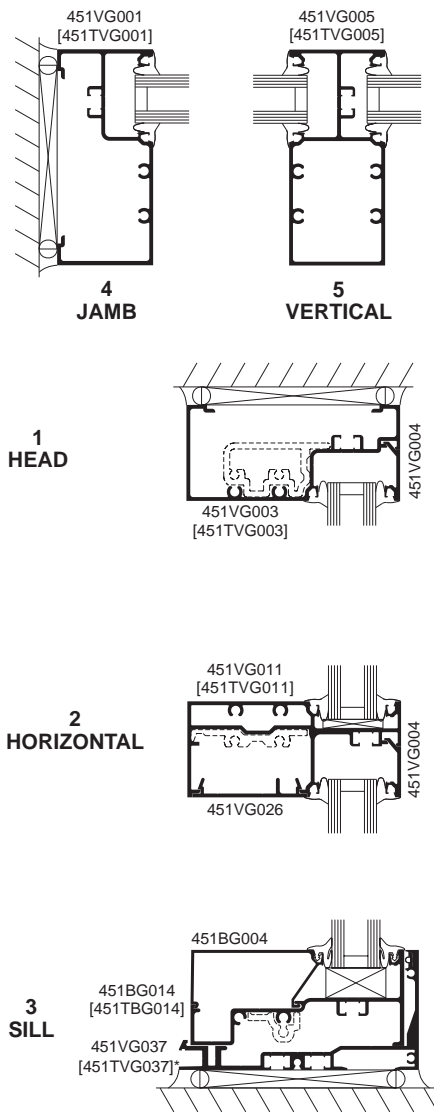
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE



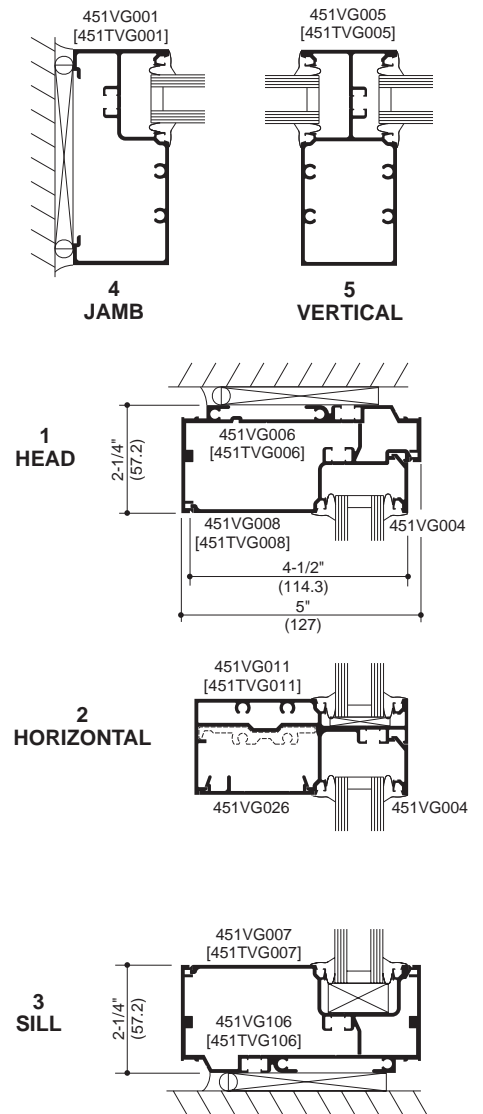
* HP Sill Flashing shown with optional gasket.

SHEAR BLOCK



* HP Sill Flashing shown with optional gasket.

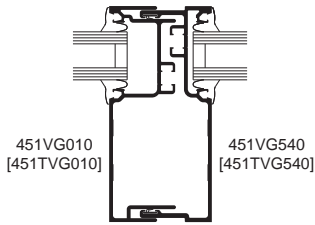
STICK



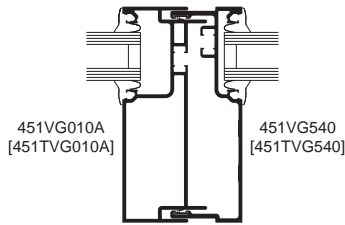
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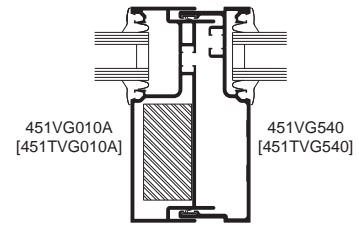
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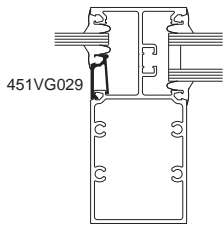
EXPANSION MULLION



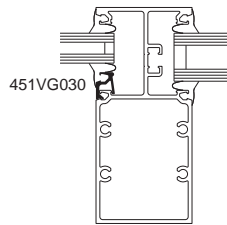
TUBULAR EXPANSION MULLION



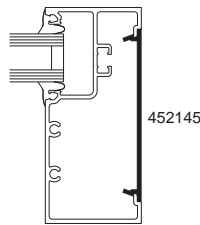
TUBULAR EXPANSION MULLION WITH STEEL



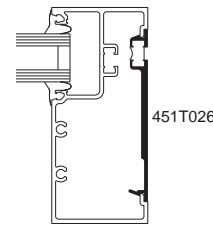
1/4" (6.4) INFILL SNAP-IN ADAPTOR



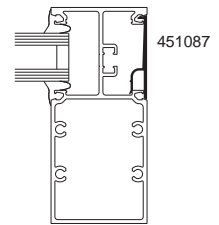
5/8" (15.9) INFILL SNAP-IN ADAPTOR



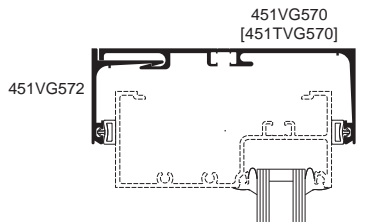
PVC FLAT FILLER (NON STRUCTURAL)



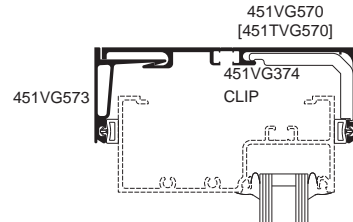
THERMAL FLAT FILLER



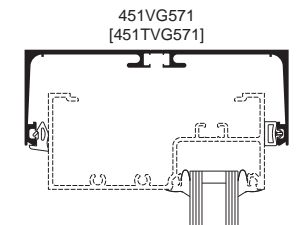
SNAP-IN FLAT FILLER



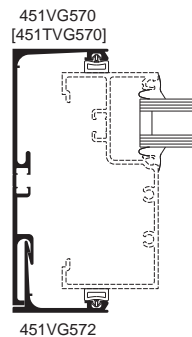
STANDARD - HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR (EXTERIOR INSTALLED)



STANDARD - HEAD COMPENSATING RECEPTOR

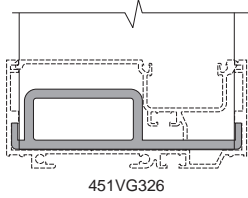


JAMB COMPENSATING RECEPTOR (EXTERIOR INSTALLED)

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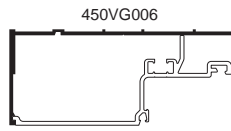
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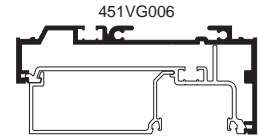
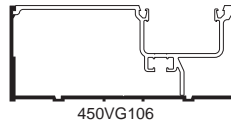
MULLION ANCHOR

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

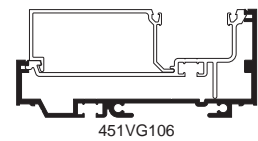
NOTE:
Mullion Anchor not used with Lightweight Receptor.



OPTIONAL LIGHTWEIGHT CAN RECEPTORS

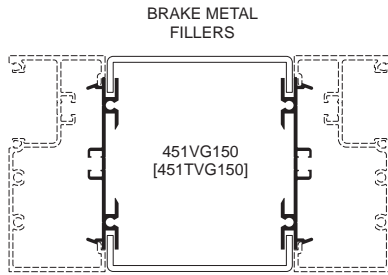


OPTIONAL UNEQUAL LEG CAN RECEPTORS

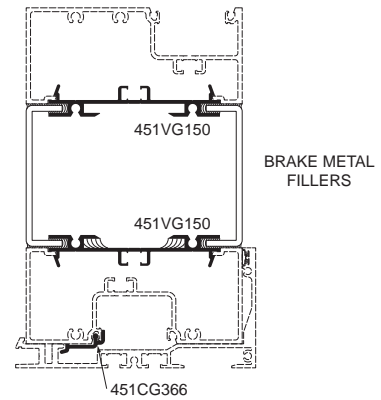


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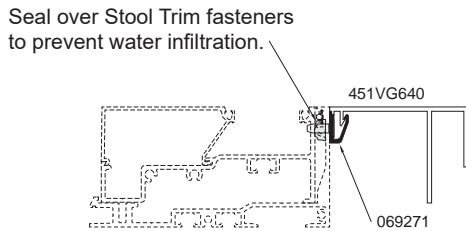
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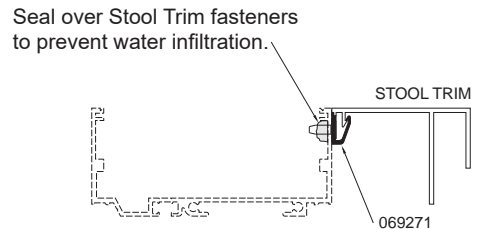
BRAKE METAL ADAPTOR



BRAKE METAL ADAPTOR AT HORIZONTAL

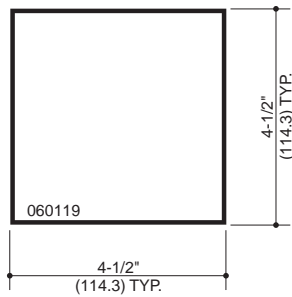


STOOL TRIM CLIP with HP FLASHING

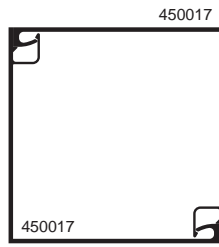


STOOL TRIM CLIP FOR STICK ASSEMBLY

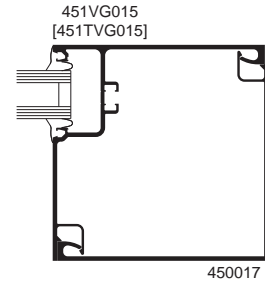
Additional information and CAD details are available at www.kawneer.com



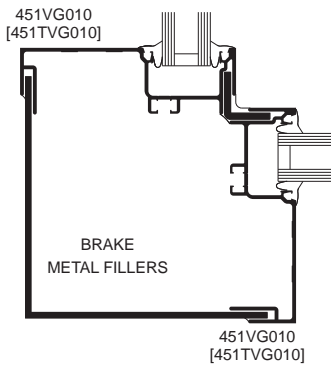
4-1/2" X 4-1/2" TUBE



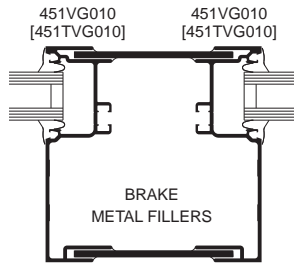
TWO PIECE NO POCKET CORNER



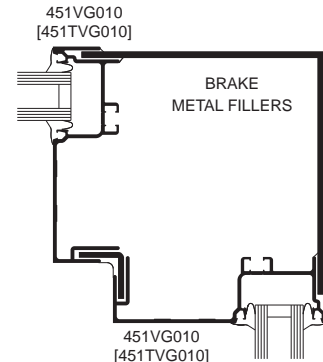
ONE POCKET CORNER



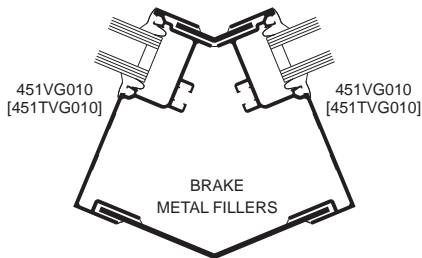
OUTSIDE 90° CORNER



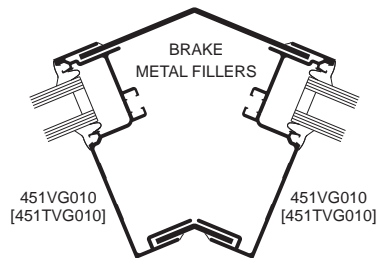
TWO POCKET CORNER POST



INSIDE 90° CORNER



135° OUTSIDE CORNER



135° INSIDE CORNER

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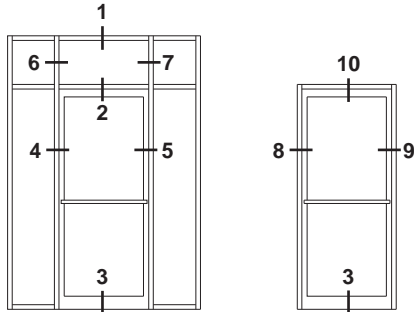
Additional information and CAD details are available at www.kawneer.com

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

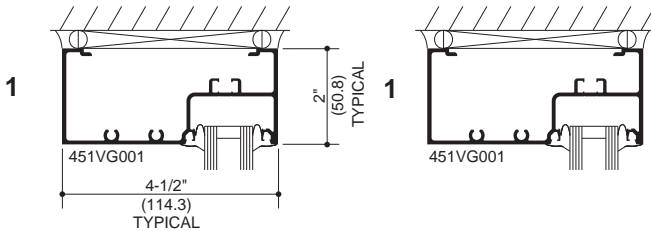
DOOR FRAMING NON-THERMAL ONLY

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

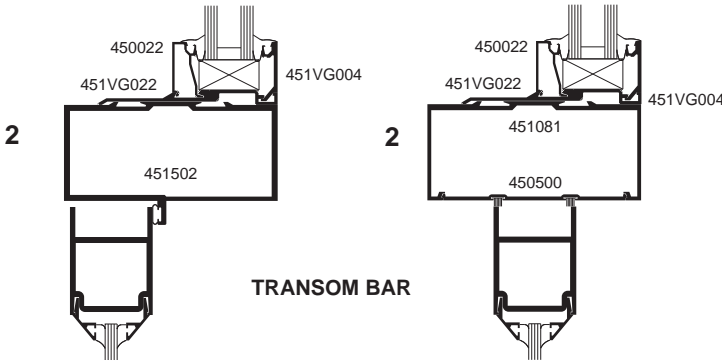
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.



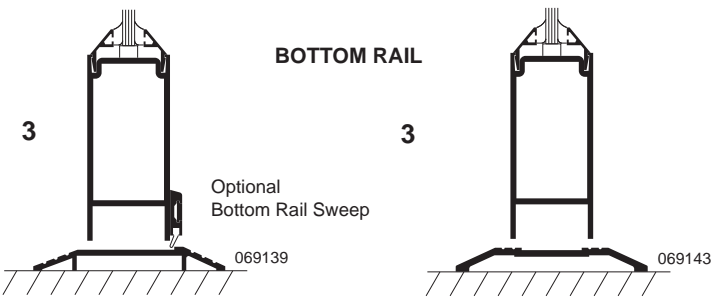
ELEVATIONS ARE NUMBER KEYED TO DETAILS



TRANSOM HEAD

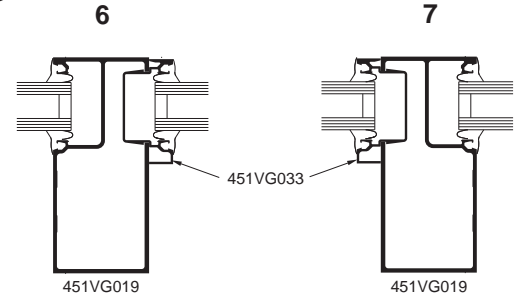


TRANSOM BAR



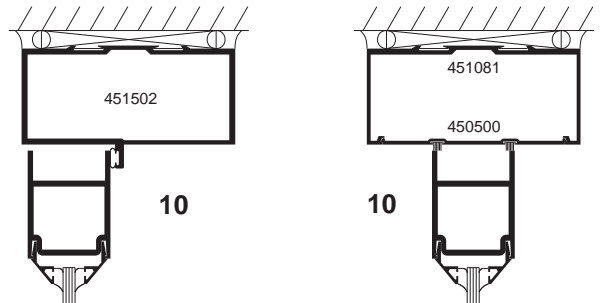
SINGLE ACTING

DOUBLE ACTING



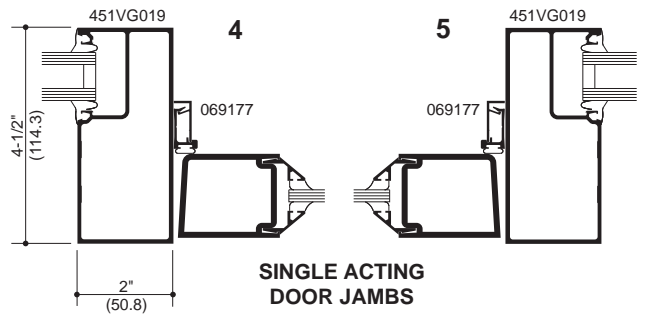
TRANSOM JAMBS

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

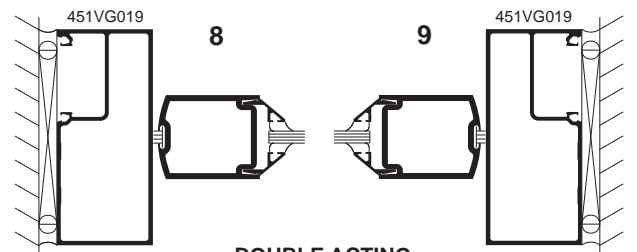


SINGLE ACTING HEADER

DOUBLE ACTING HEADER



SINGLE ACTING DOOR JAMBS



DOUBLE ACTING DOOR JAMBS

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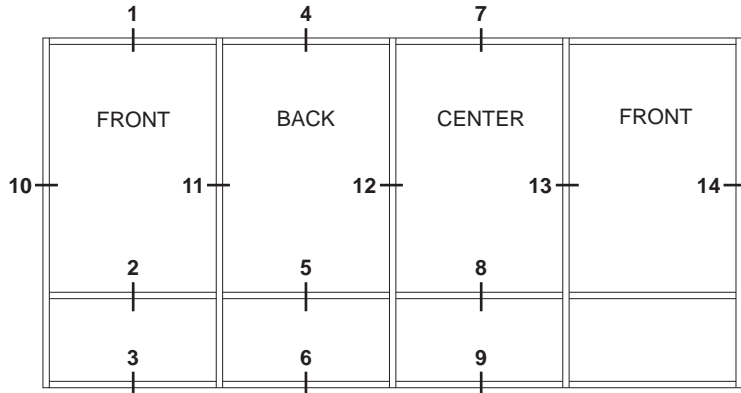
BASIC FRAMING DETAILS 54-59
(See appropriate Center, Front or Back Section
for Miscellaneous Details.)

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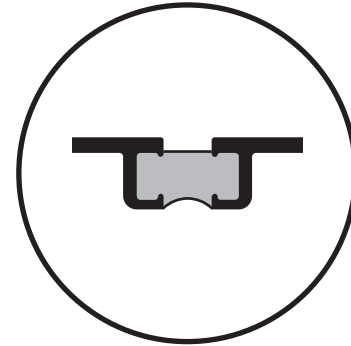
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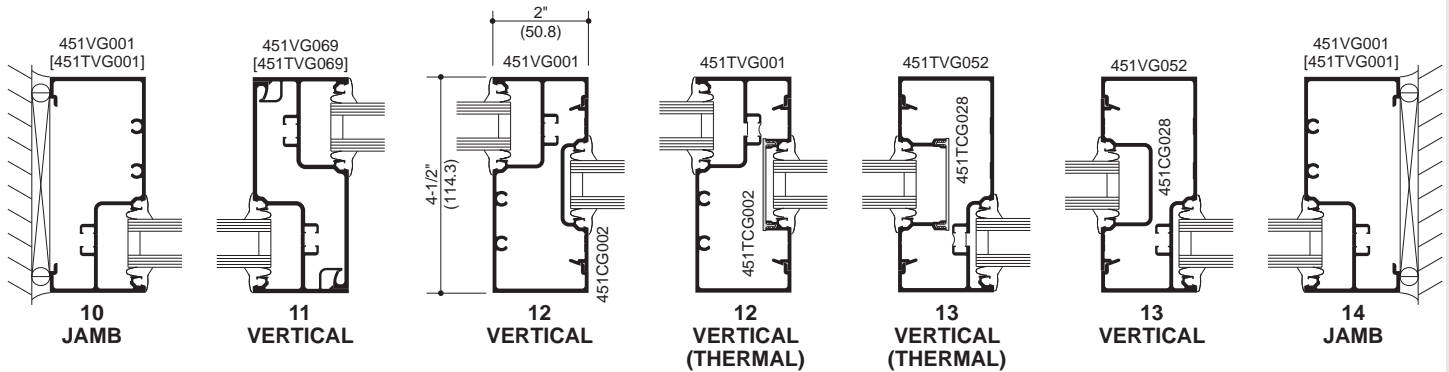
SCREW SPLINE ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS



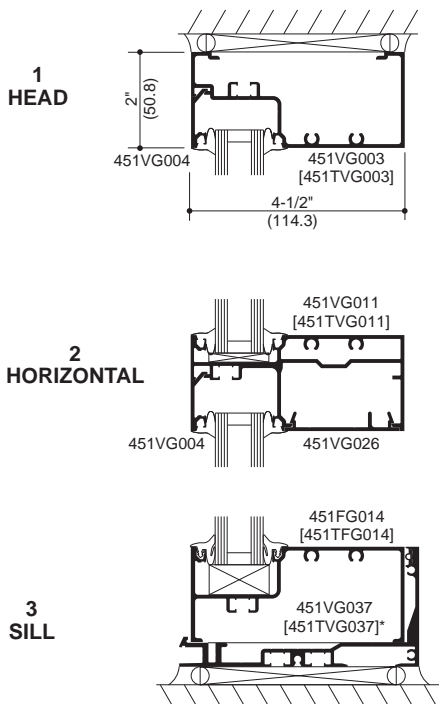
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS



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FRONT

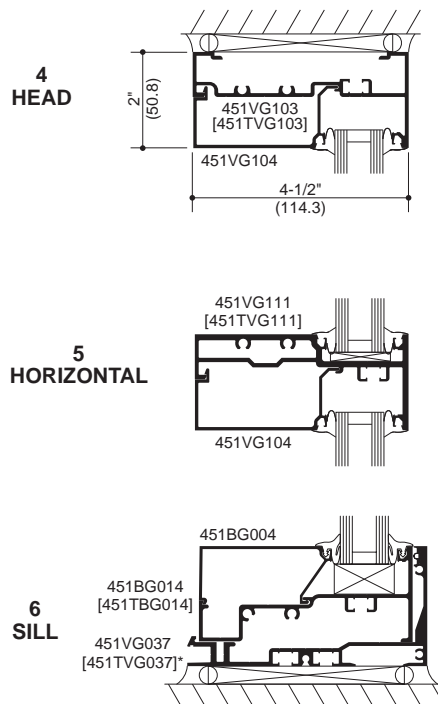
See Pages 30 thru 43 for all FRONT details.



* HP Sill Flashing shown with optional gasket.

BACK

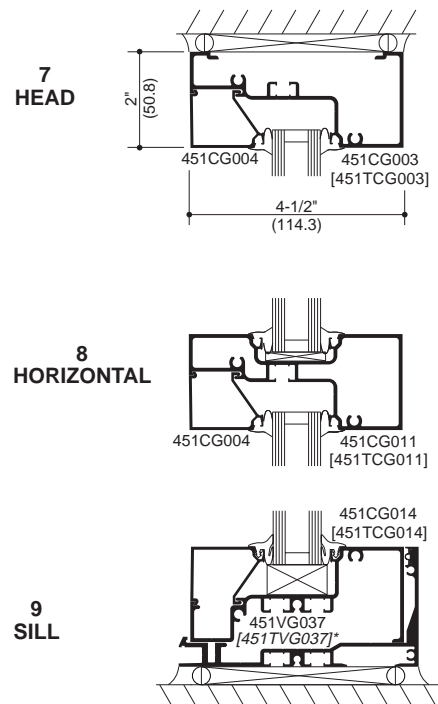
See Pages 46 thru 51 for all BACK details.



* HP Sill Flashing shown with optional gasket.

CENTER

See Pages 12 thru 27 for all CENTER details.

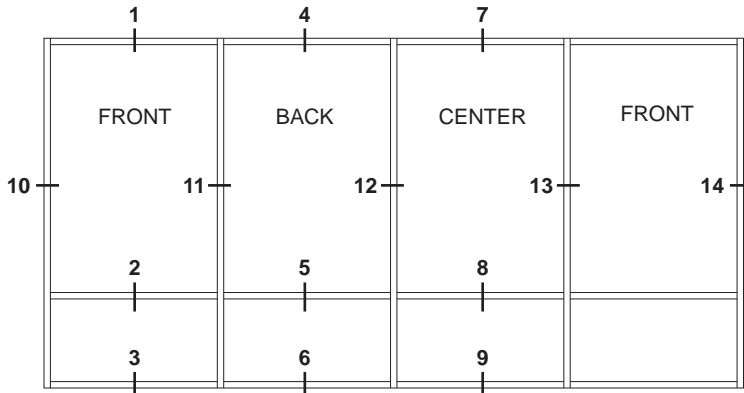


* HP Sill Flashing shown with optional gasket.

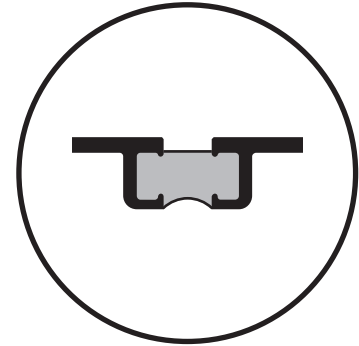
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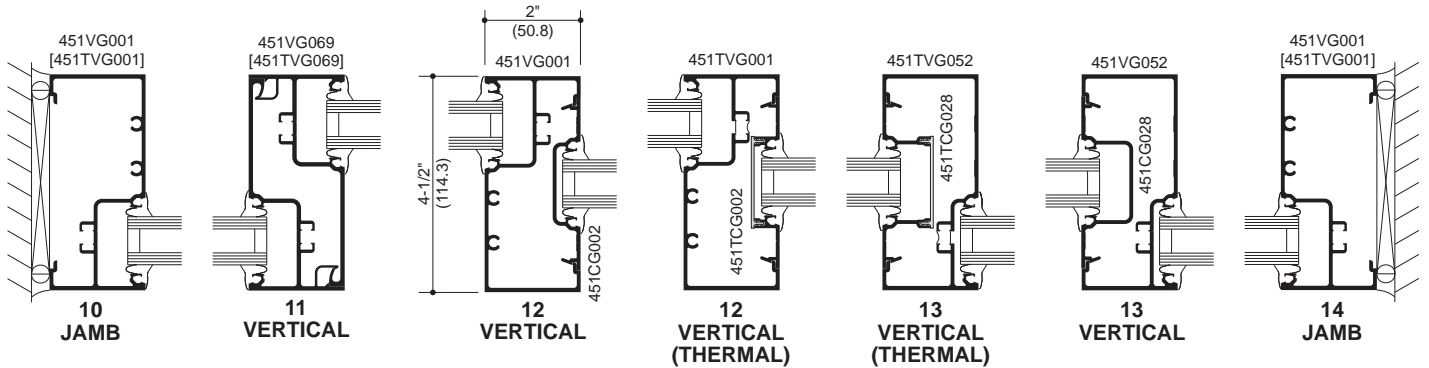
SCREW SPLINE ASSEMBLY



ELEVATION IS NUMBER KEYED TO DETAILS



NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

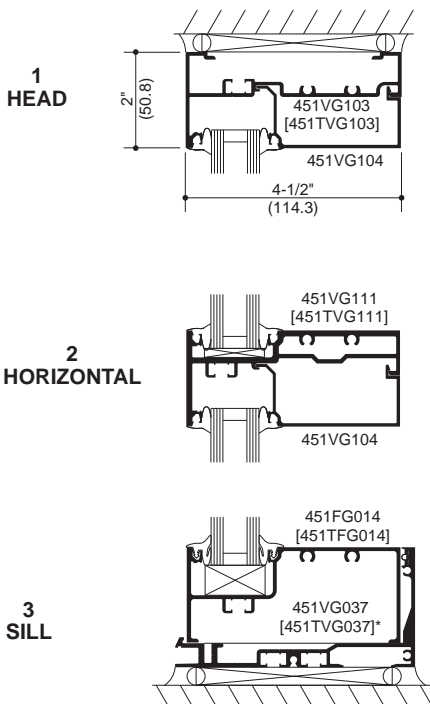


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FRONT

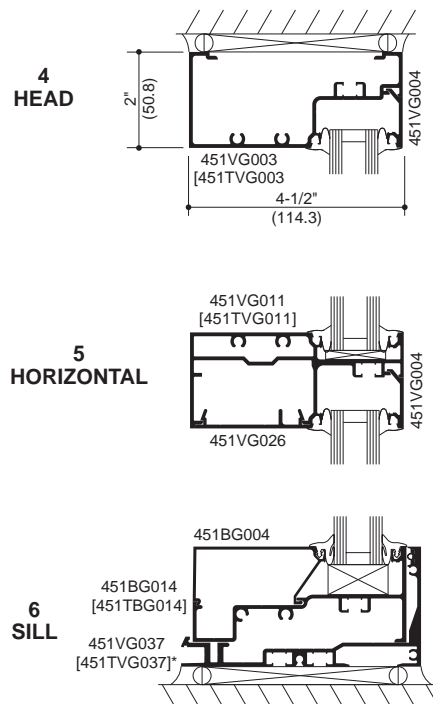
See Pages 30 thru 43 for all FRONT details.



* HP Sill Flashing shown with optional gasket.

BACK

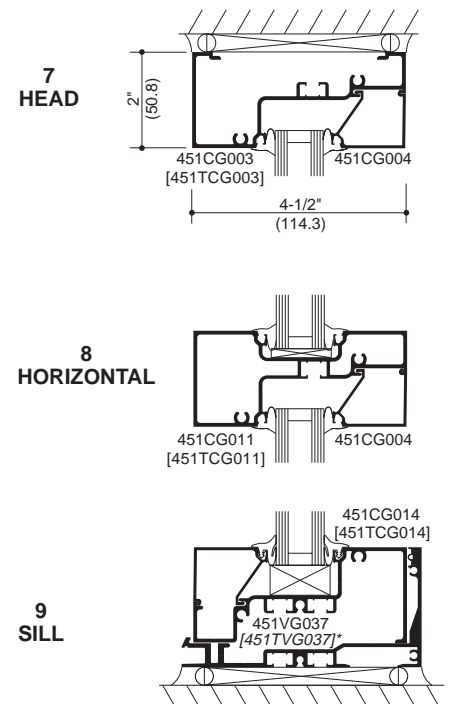
See Pages 46 thru 51 for all BACK details.



* HP Sill Flashing shown with optional gasket.

CENTER

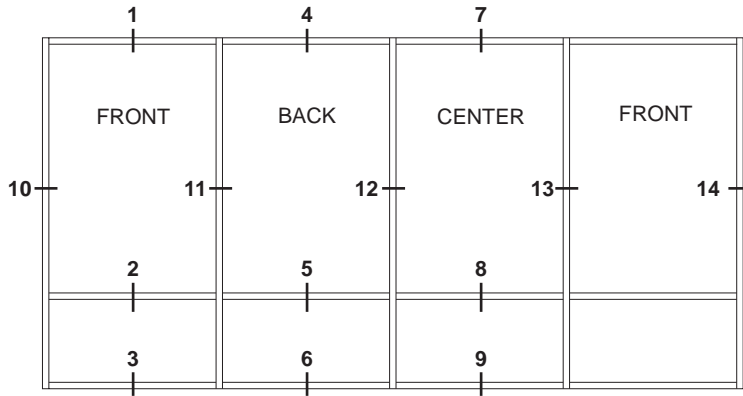
See Pages 12 thru 27 for all CENTER details.



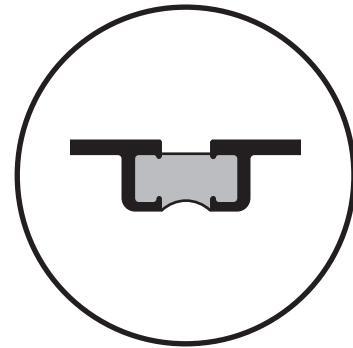
* HP Sill Flashing shown with optional gasket.

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

SHEAR BLOCK ASSEMBLY

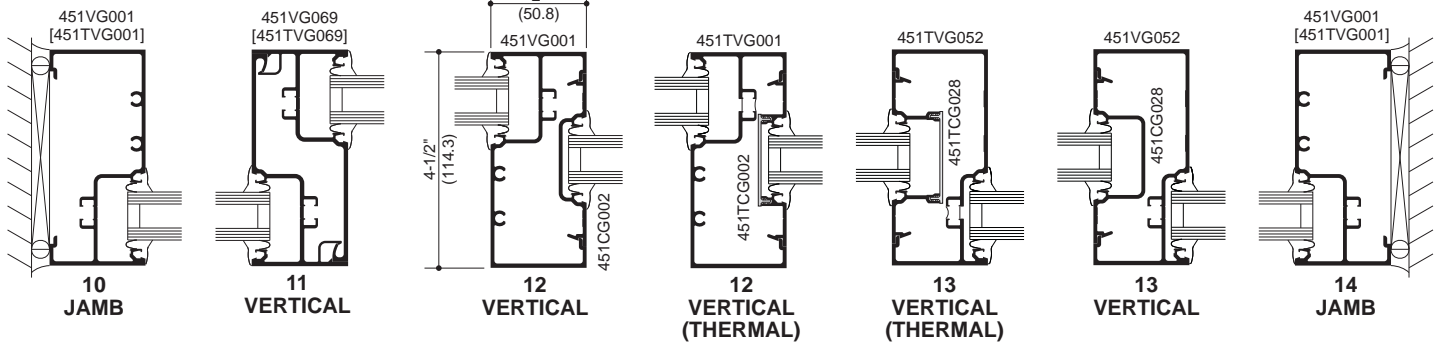


ELEVATION IS NUMBER KEYED TO DETAILS



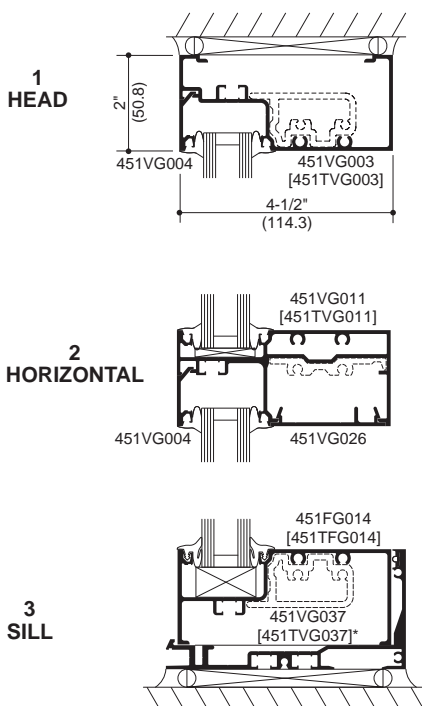
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.



FRONT

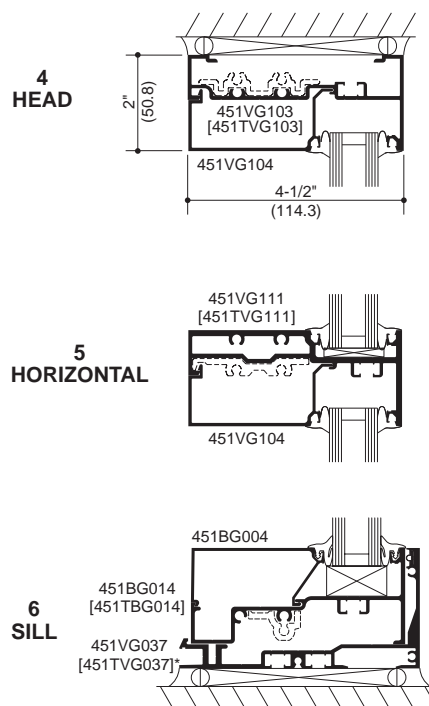
See Pages 30 thru 43 for all FRONT details.



* HP Sill Flashing shown with optional gasket.

BACK

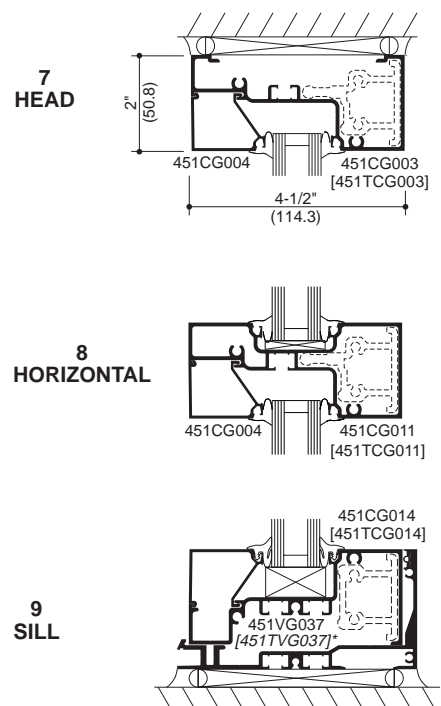
See Pages 46 thru 51 for all BACK details.



* HP Sill Flashing shown with optional gasket.

CENTER

See Pages 12 thru 27 for all CENTER details.



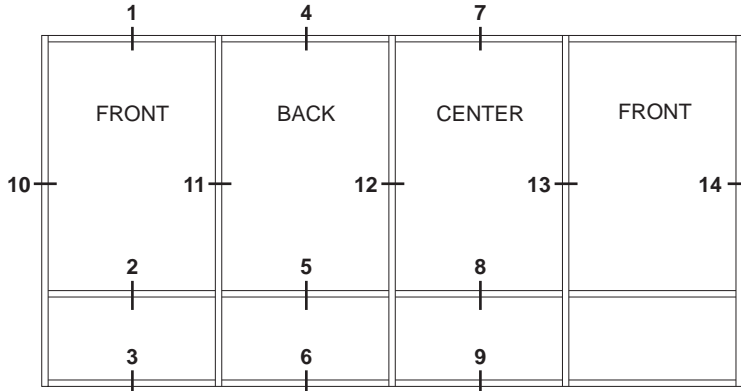
* HP Sill Flashing shown with optional gasket.

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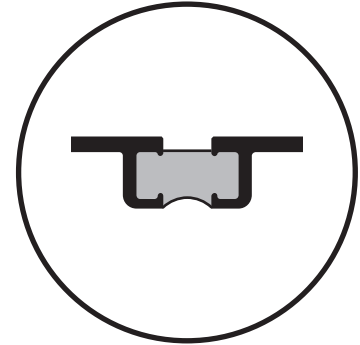
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SHEAR BLOCK ASSEMBLY

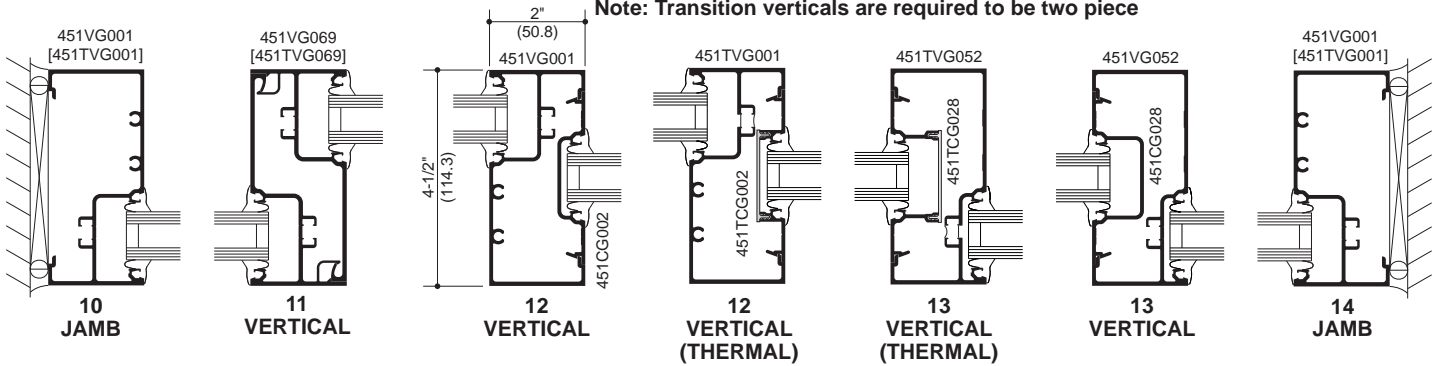


ELEVATION IS NUMBER KEYED TO DETAILS



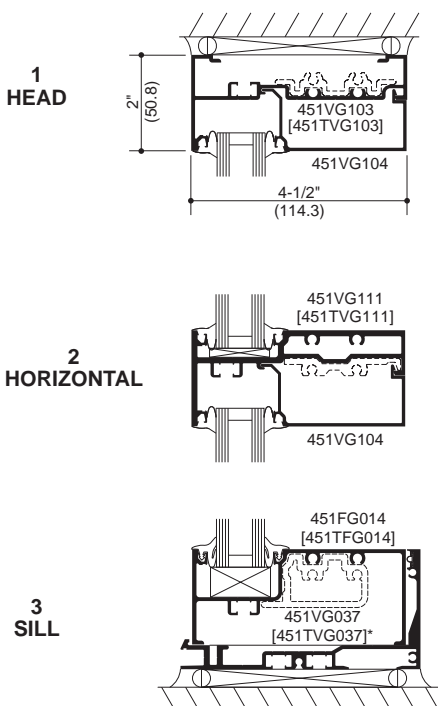
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece



FRONT

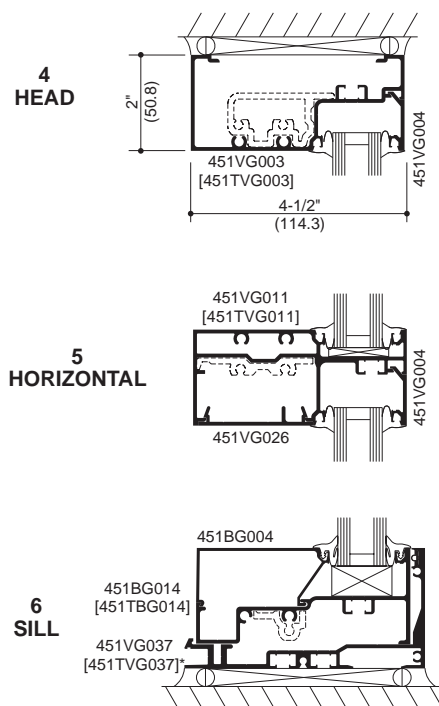
See Pages 30 thru 43 for all FRONT details.



* HP Sill Flashing shown with optional gasket.

BACK

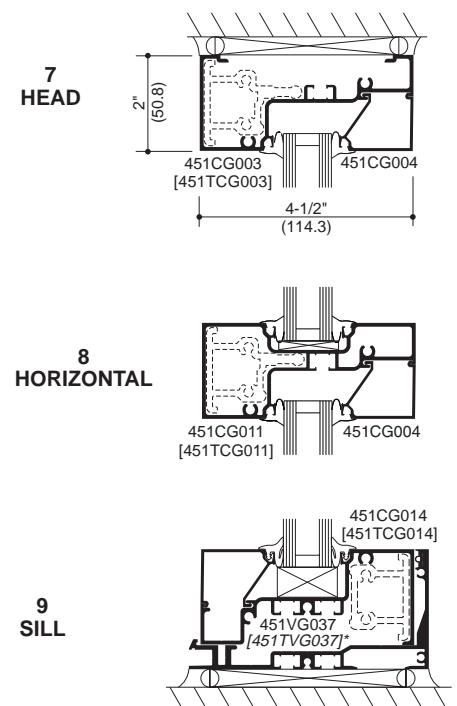
See Pages 46 thru 51 for all BACK details.



* HP Sill Flashing shown with optional gasket.

CENTER

See Pages 12 thru 27 for all CENTER details.



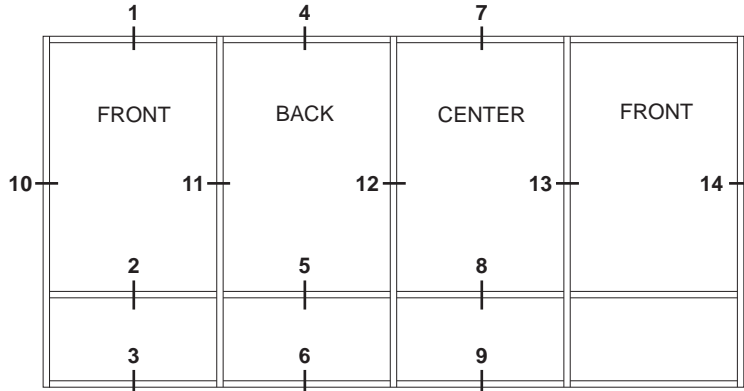
* HP Sill Flashing shown with optional gasket.

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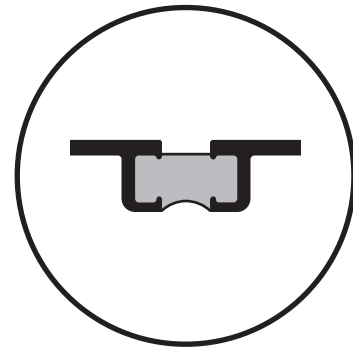
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STICK ASSEMBLY

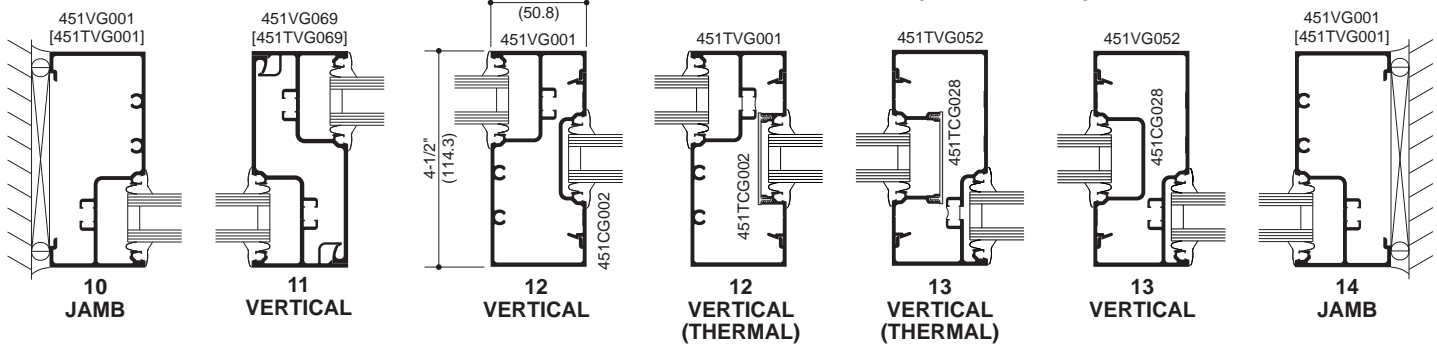


ELEVATION IS NUMBER KEYED TO DETAILS



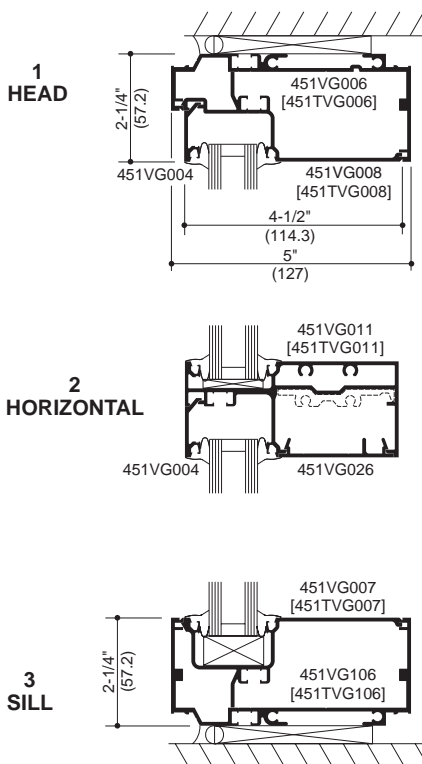
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece.



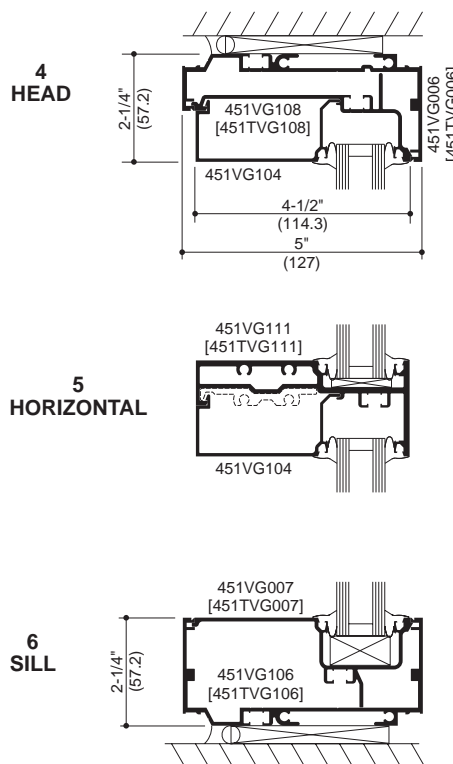
FRONT

See Pages 30 thru 43 for all FRONT details.



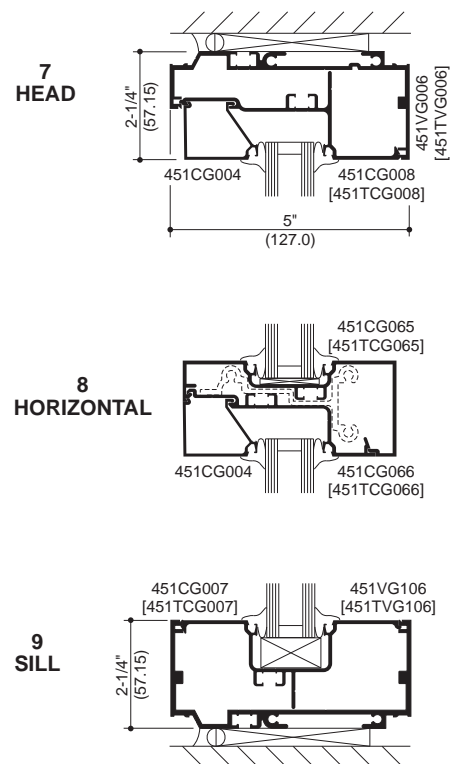
BACK

See Pages 46 thru 51 for all BACK details.



CENTER

See Pages 12 thru 27 for all CENTER details.

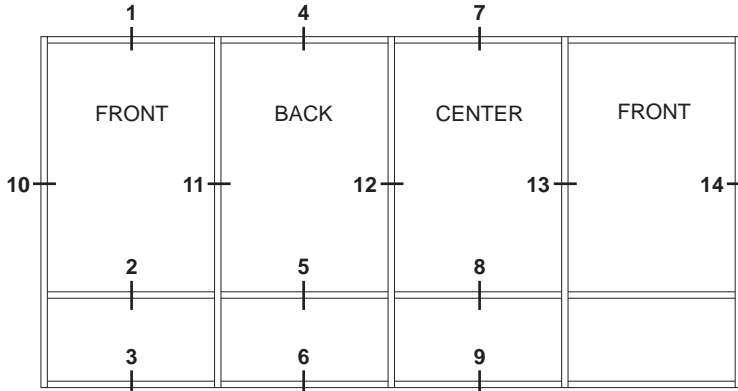


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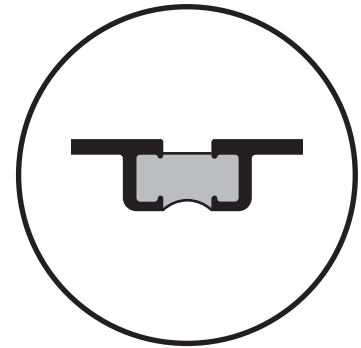
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STICK ASSEMBLY

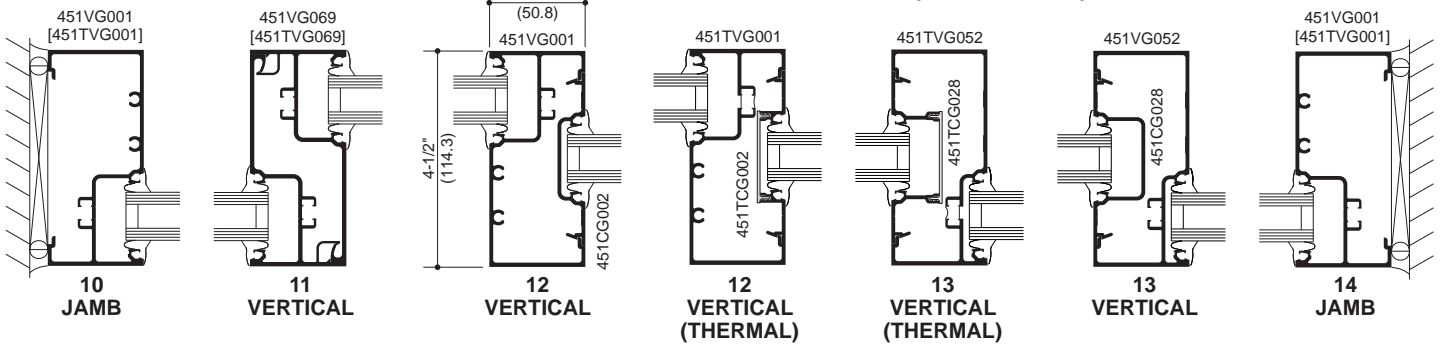


ELEVATION IS NUMBER KEYED TO DETAILS



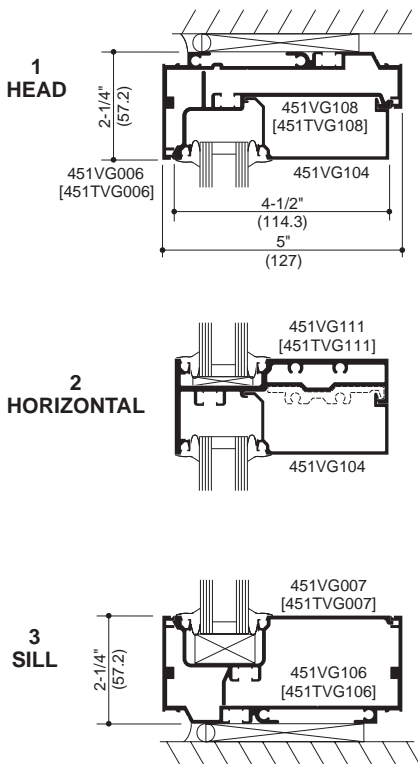
NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

Note: Transition verticals are required to be two piece



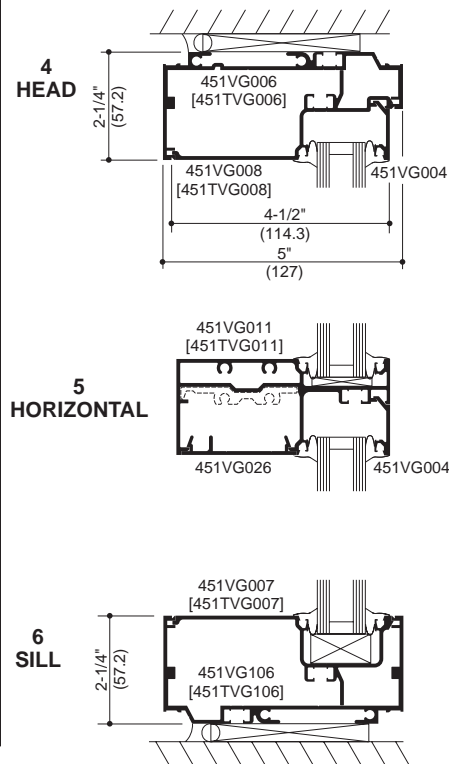
FRONT

See Pages 30 thru 43 for all FRONT details.



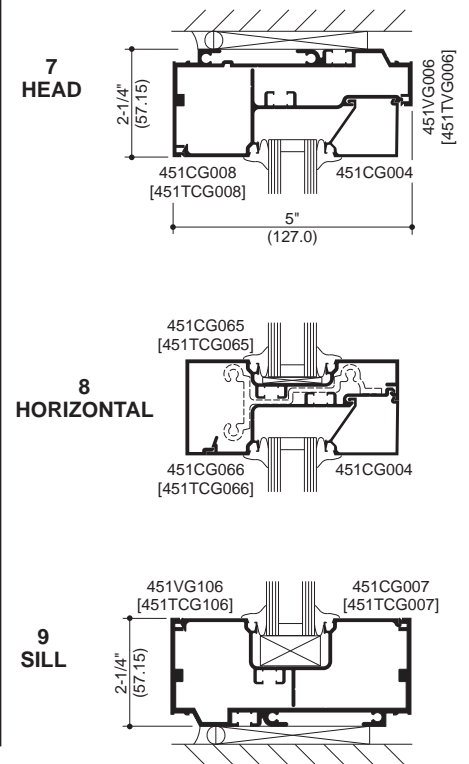
BACK

See Pages 46 thru 51 for all BACK details.



CENTER

See Pages 12 thru 27 for all CENTER details.



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

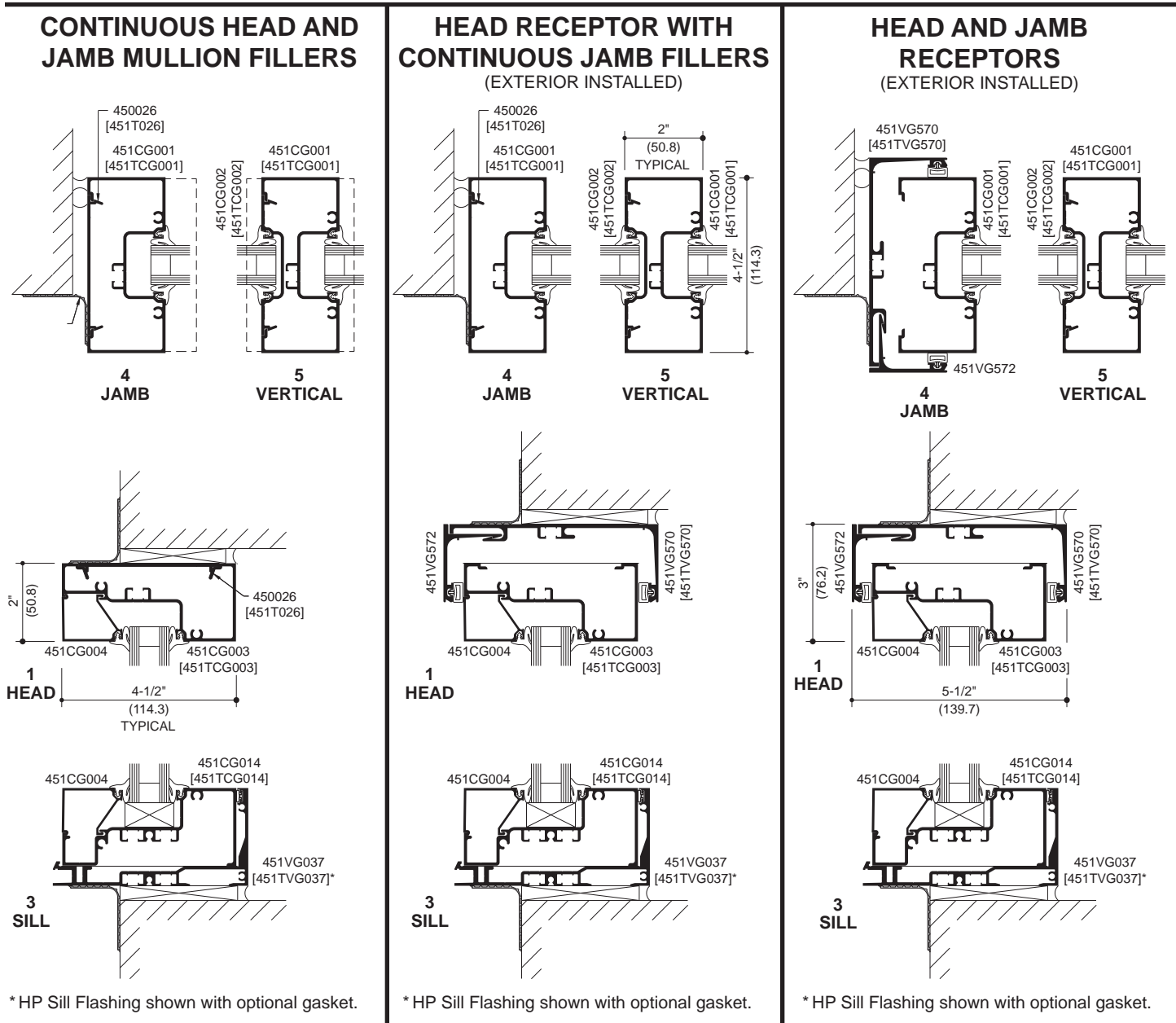
For integration of a silicone engineered transition assembly, the Trifab® storefront system must use continuous head and jamb mullion fillers, a head receptor with continuous jamb fillers or a head receptor with jamb receptors.

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

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

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

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



* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

* HP Sill Flashing shown with optional gasket.

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WIND LOAD CHARTS (CENTER)
TF VG 451 (Non-Thermal)..... 63-67
TF VG 451T (Thermal)..... 68-72

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TF VG 451 (Non-Thermal)..... 73-76
TF VG 451T (Thermal)..... 77-79

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TF VG 451T (CENTER – Thermal)..... 95-97
TF VG 451T Pre-Glazed (CENTER – Thermal)..... 98-100
TF VG 451T (FRONT – Thermal) 101-103
TF VG 451T (BACK – Thermal) 104-106
TF VG 451T with Steel (CENTER)..... 107-109

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WIND LOAD CHARTS

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

If the end reaction of the mullion [mullion spacing (ft.) times height (ft.) times specified wind load (psf) divided by two] is more than 500 lbs., the optional Heavyweight Compensating Receptor Face/Reinforcing Clip (Screw Spline/Shear Block systems) or Mullion Anchors (Stick system) must be used. Consult Application Engineering. (*Mullion Anchor not used with Standard Receptor.*)

DEADLOAD CHARTS

Horizontal or deadload limitations are based upon 1/8" (3.2), maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1" (25.4) thick insulating glass or 1/4" (6.4) thick glass supported on two setting blocks placed at the loading points shown.

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

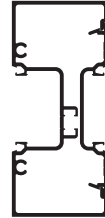
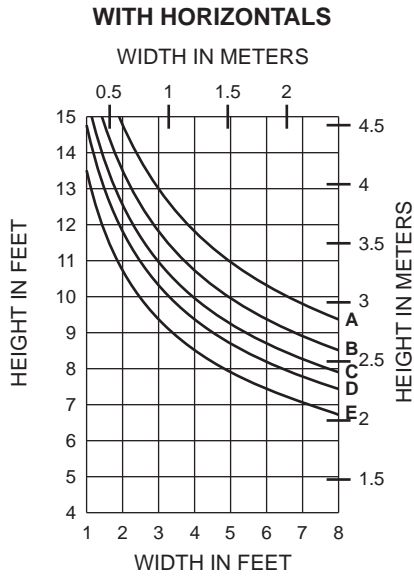
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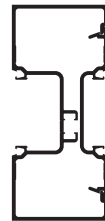
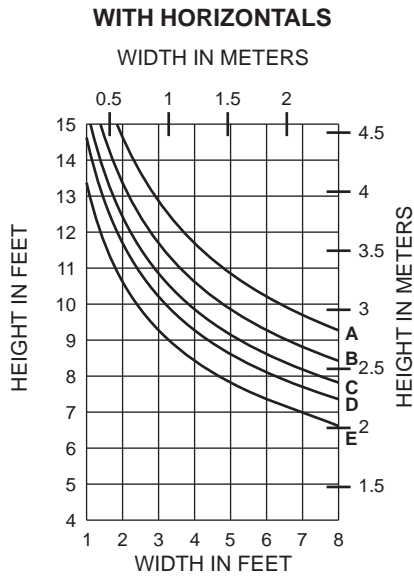
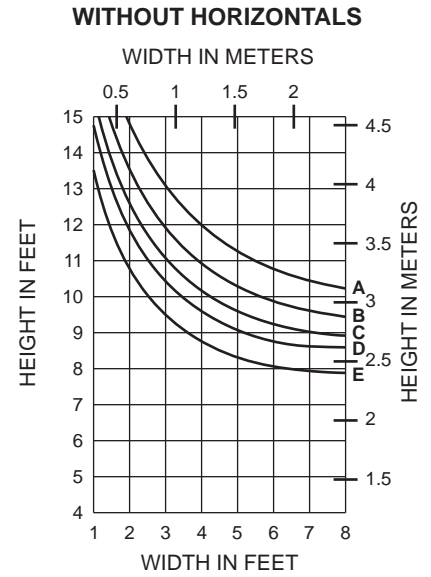
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



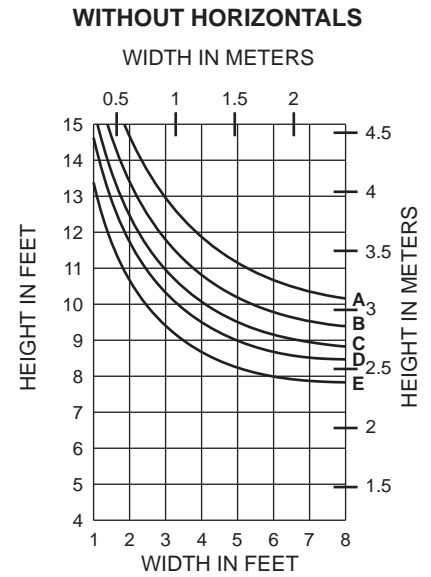
451CG001
451CG002

$I = 3.237 (134.73 \times 10^4)$
 $S = 1.431 (23.45 \times 10^3)$

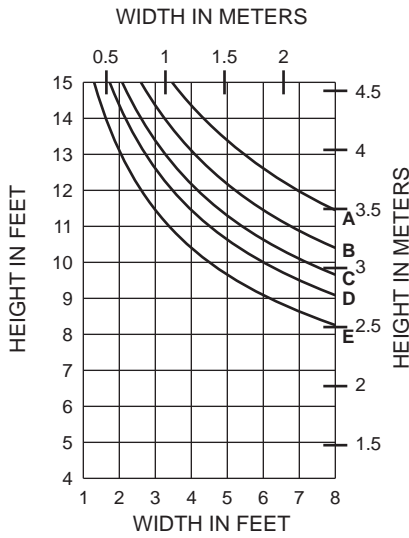


451CG012
451CG002

$I = 3.137 (130.57 \times 10^4)$
 $S = 1.384 (22.68 \times 10^3)$



WITH HORIZONTALS



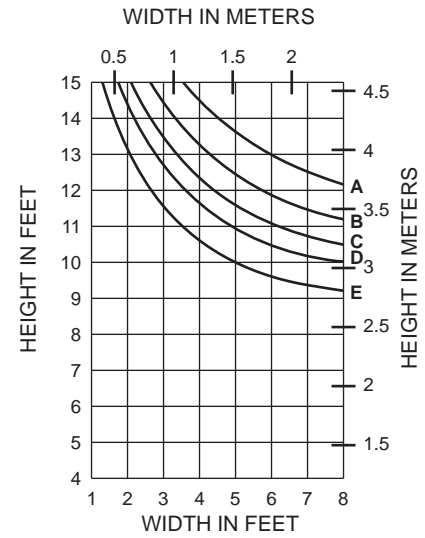
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



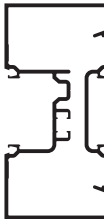
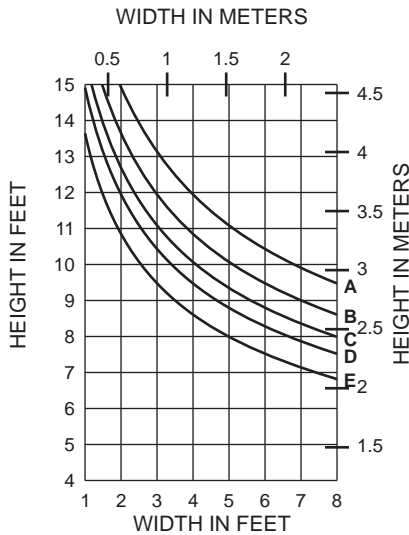
451CG013
451CG002

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

WITHOUT HORIZONTALS



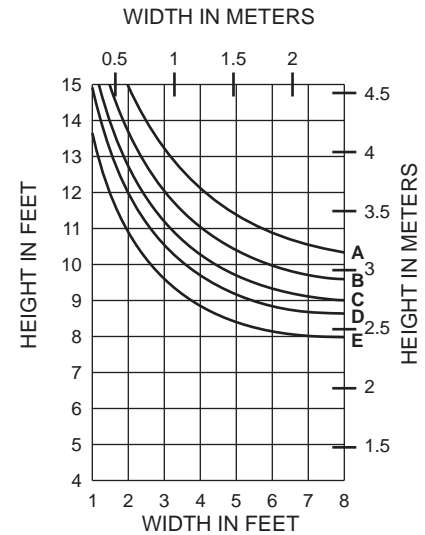
WITH HORIZONTALS



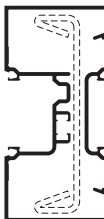
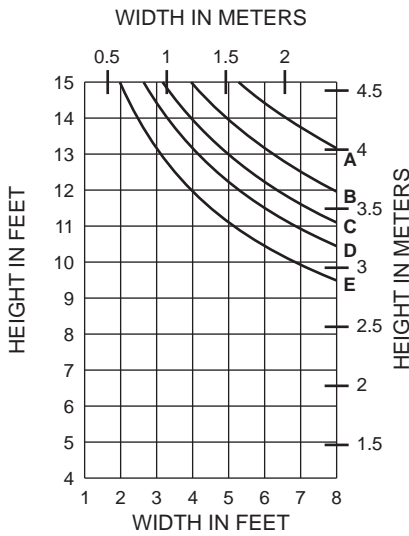
451CG112
451CG002

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

WITHOUT HORIZONTALS



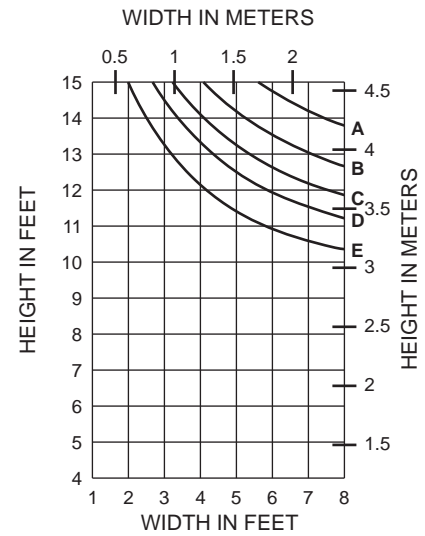
WITH HORIZONTALS



451CG112
451CG002
with 450110 STEEL

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

WITHOUT HORIZONTALS

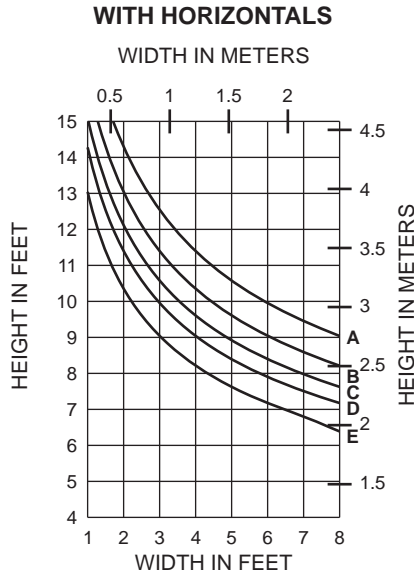


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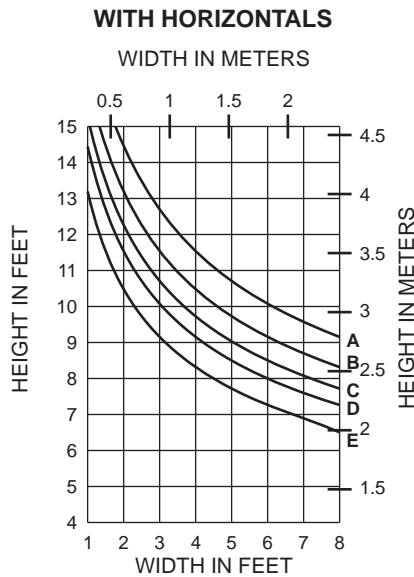
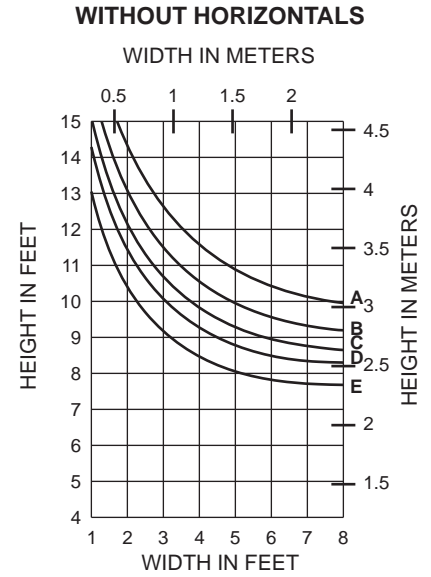


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



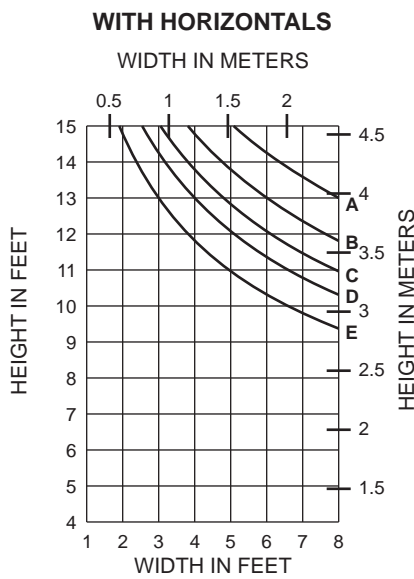
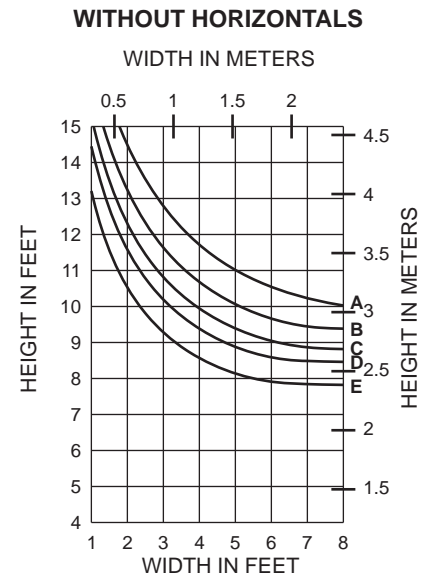
451CG005

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



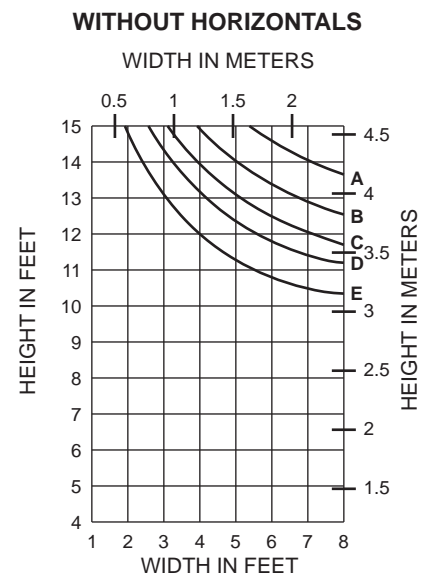
451CG005A

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

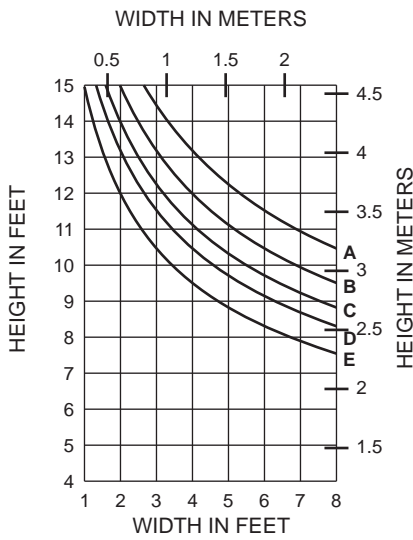


451CG005A with 450110 STEEL

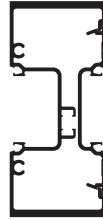
$I_A = 3.016 (125.53 \times 10^4)$
 $S_A = 1.340 (21.96 \times 10^3)$
 $I_S = 1.935 (80.54 \times 10^4)$
 $S_S = 0.938 (15.37 \times 10^3)$



WITH HORIZONTALS



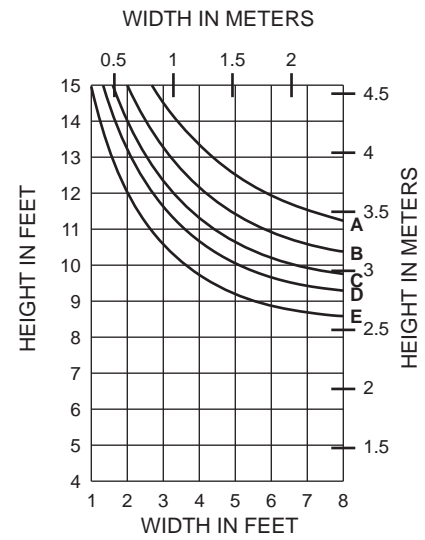
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



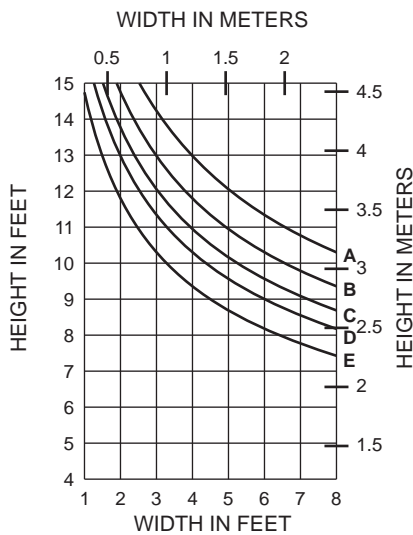
451CG001A
451CG002

$I = 4.507 (187.59 \times 10^4)$
 $S = 1.993 (32.66 \times 10^3)$

WITHOUT HORIZONTALS



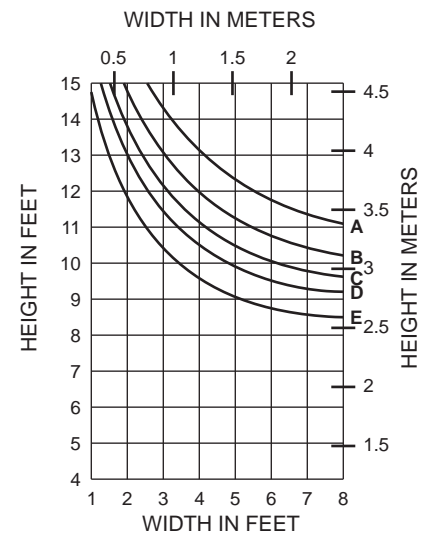
WITH HORIZONTALS



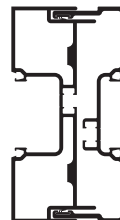
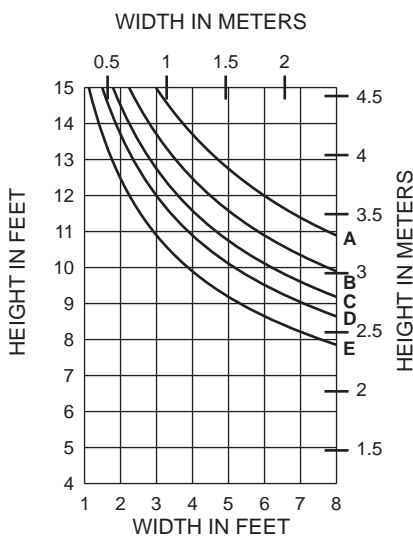
451CG010
451CG540

$I = 4.301 (179.02 \times 10^4)$
 $S = 1.886 (30.91 \times 10^3)$

WITHOUT HORIZONTALS



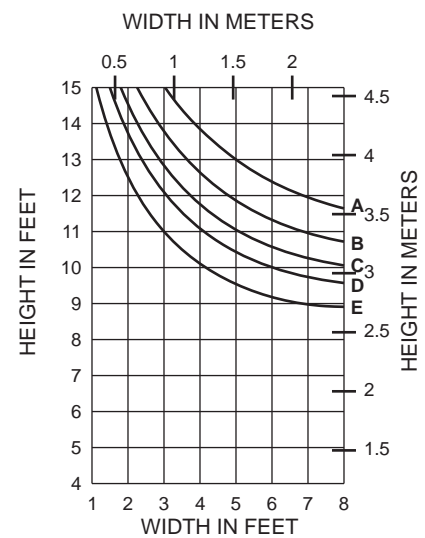
WITH HORIZONTALS



451CG010A
451CG540

$I = 5.083 (211.57 \times 10^4)$
 $S = 2.259 (37.02 \times 10^3)$

WITHOUT HORIZONTALS

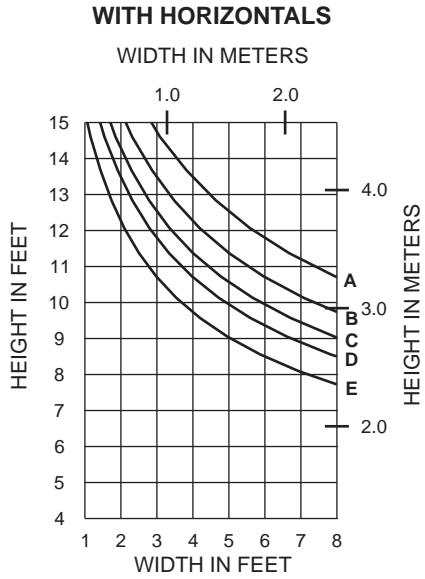


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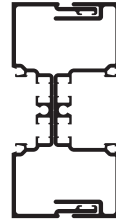
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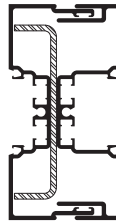
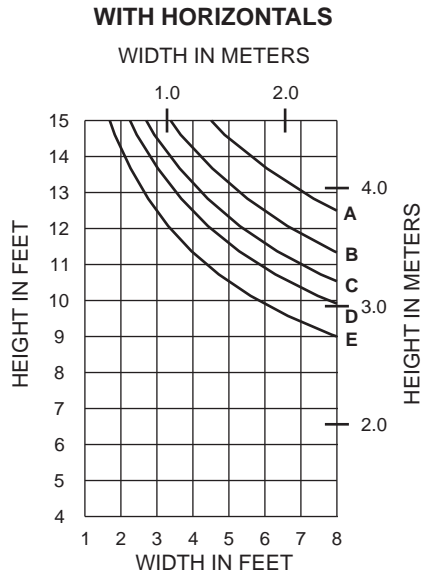
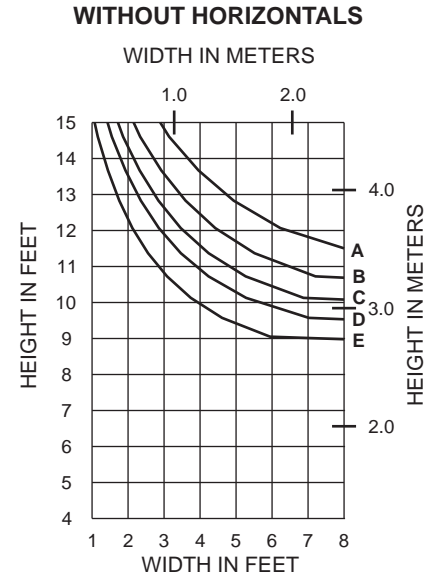


	Allowable Stress Design Load	LRF Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



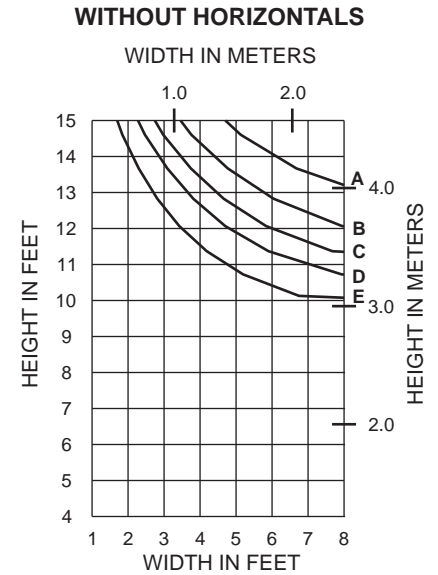
451CG081 / 451CG082

I = 4.829 (201.00 x 10⁴)
S = 2.146 (35.17 x 10³)

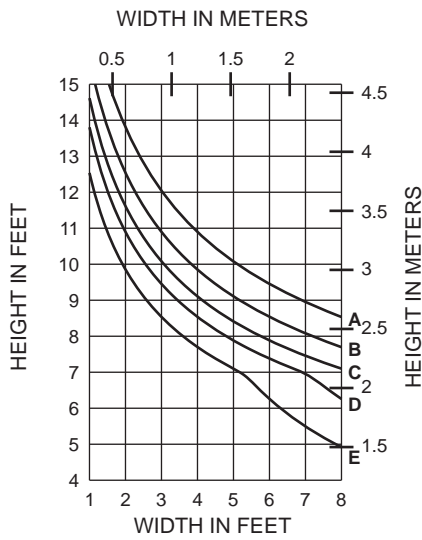


451CG081 / 451CG082 with 400110 STEEL

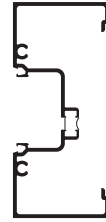
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



WITH HORIZONTALS



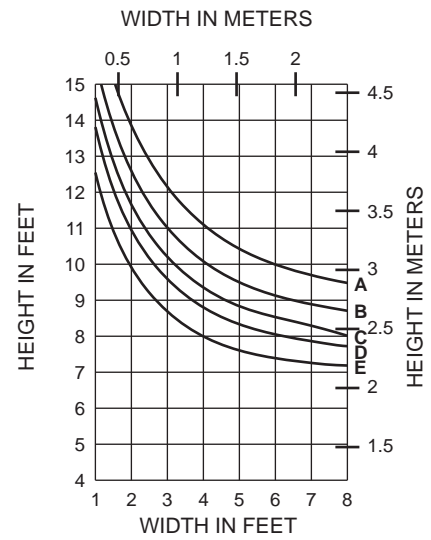
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
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E =	40 PSF (1920)	67 PSF (3200)



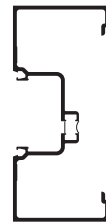
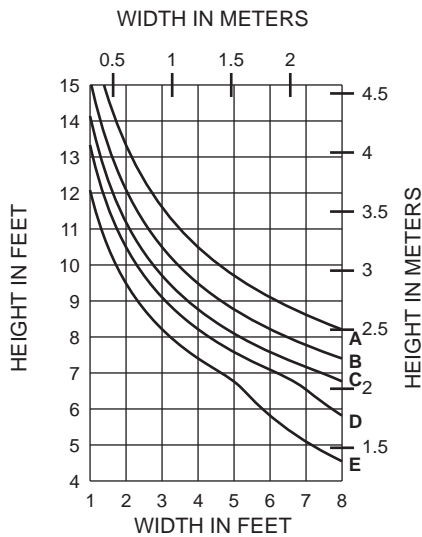
451TCG001

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

WITHOUT HORIZONTALS



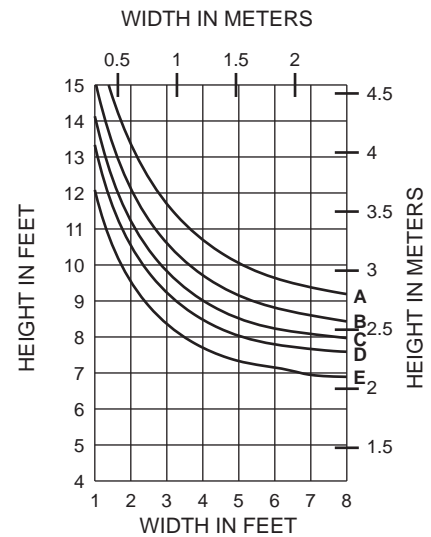
WITH HORIZONTALS



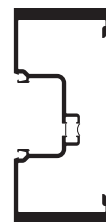
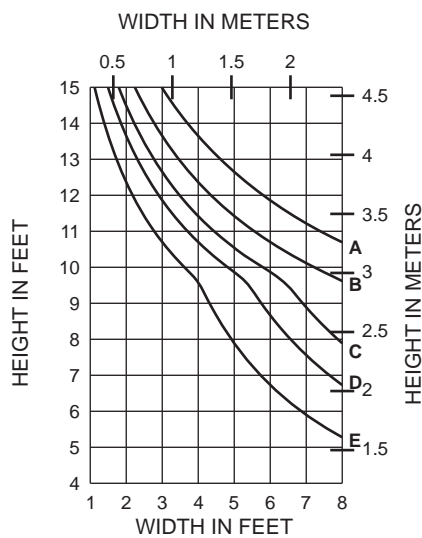
451TCG012

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

WITHOUT HORIZONTALS



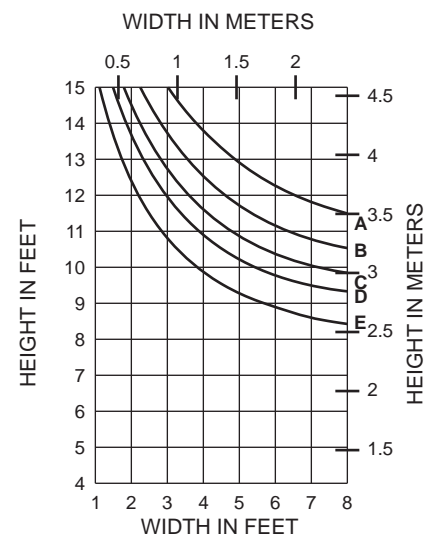
WITH HORIZONTALS



451TCG013

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

WITHOUT HORIZONTALS

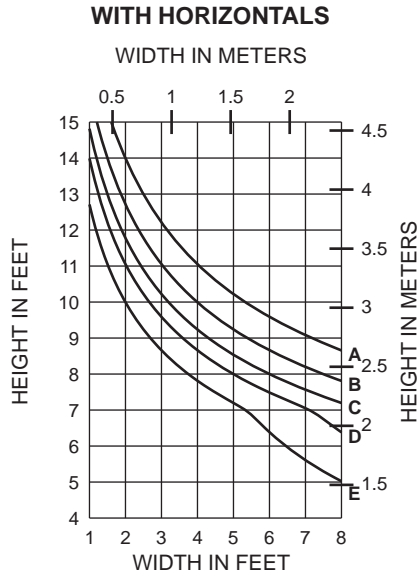


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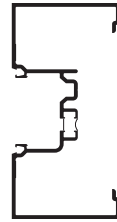
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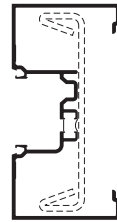
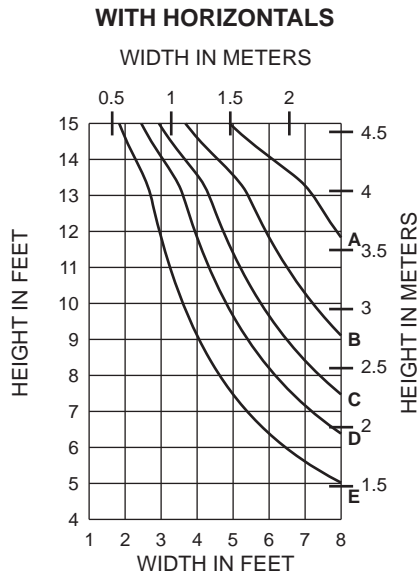
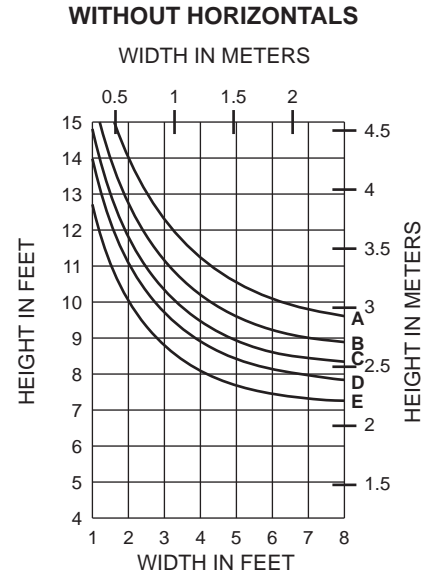


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
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E =	40 PSF (1920)	67 PSF (3200)



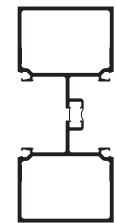
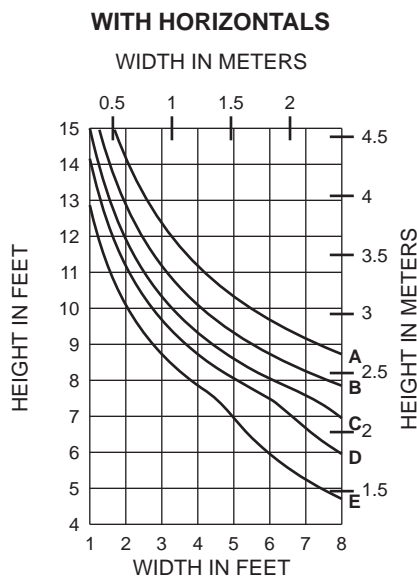
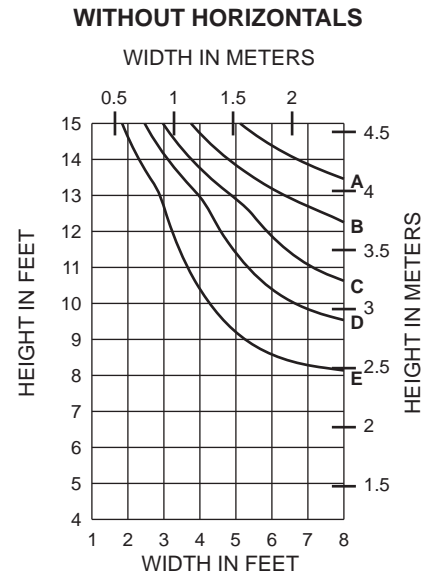
451TCG112

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



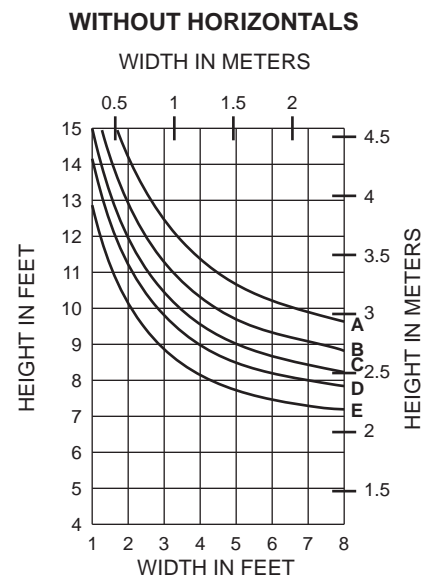
451TCG112 with 450110 STEEL

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

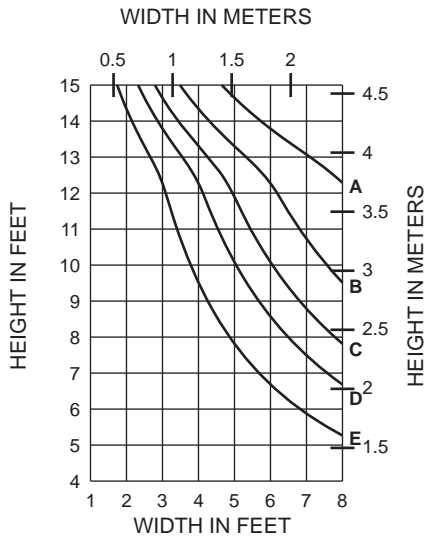


451TCG005

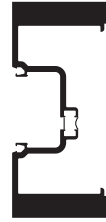
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



WITH HORIZONTALS



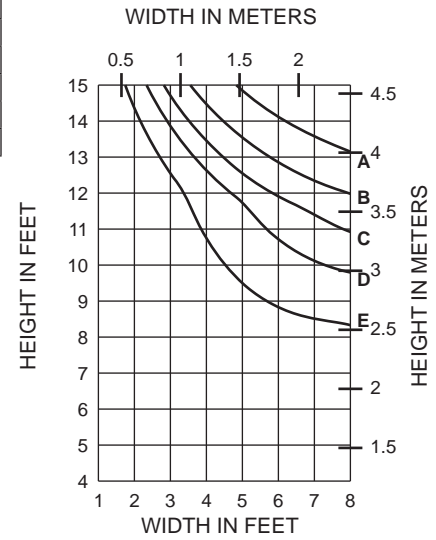
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
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D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



451TCG113

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

WITHOUT HORIZONTALS

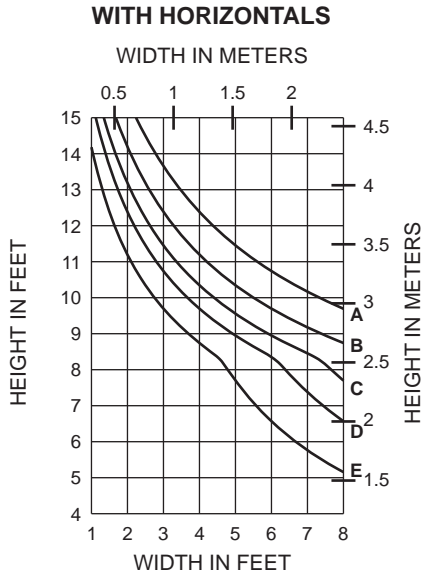


Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

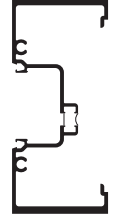
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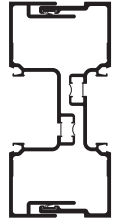
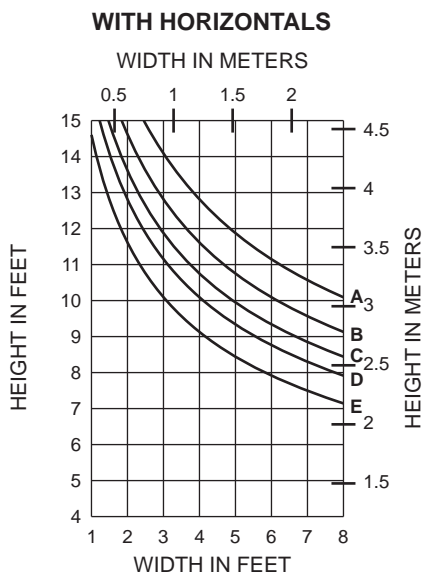
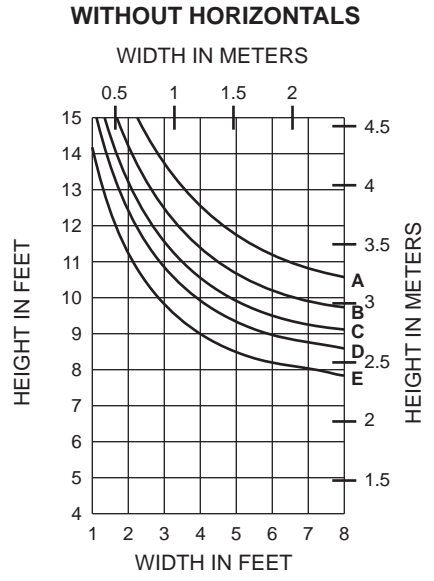


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



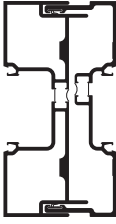
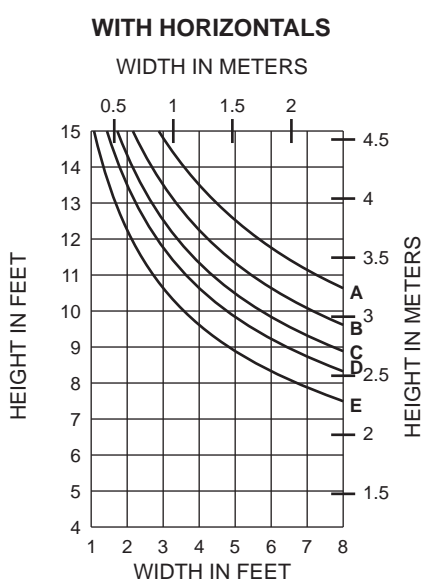
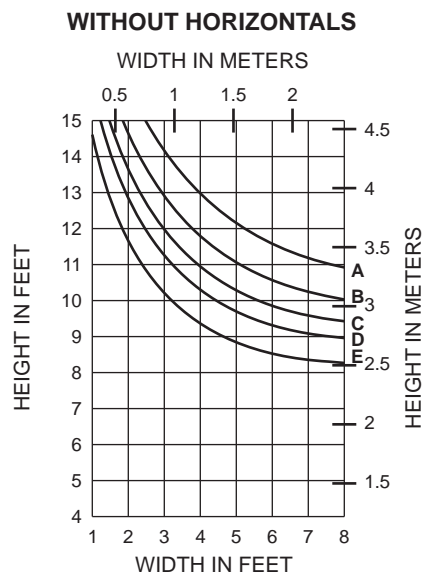
451TCG001A

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



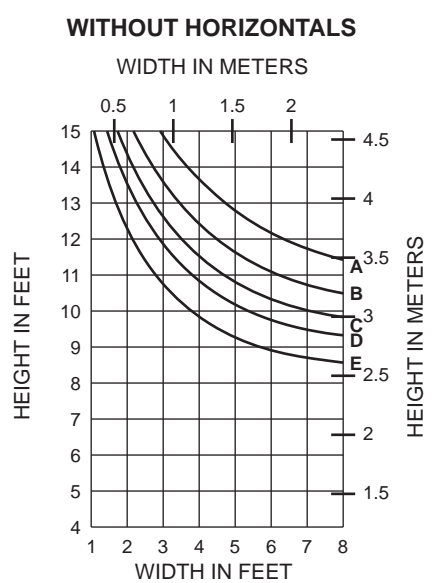
**451TCG540
451TCG010**

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

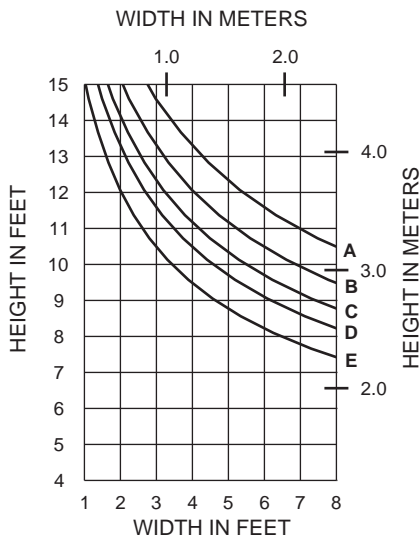


**451TCG540
451TCG010A**

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



WITH HORIZONTALS



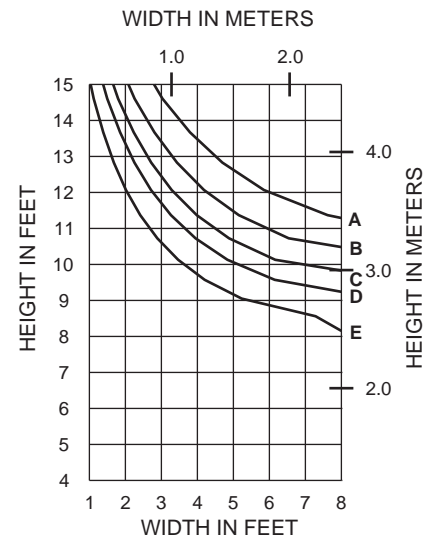
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



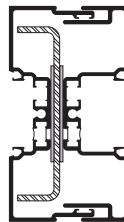
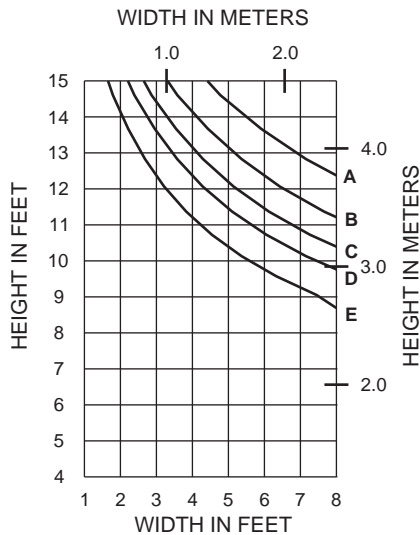
451TCG081 / 451TCG082

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

WITHOUT HORIZONTALS



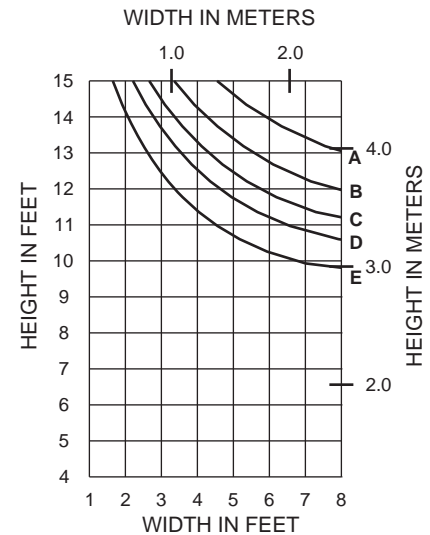
WITH HORIZONTALS



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

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

WITHOUT HORIZONTALS

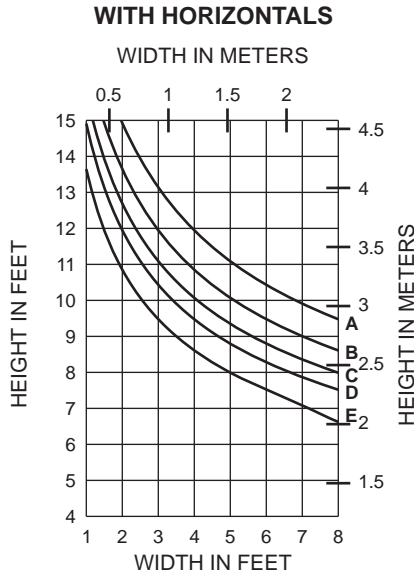


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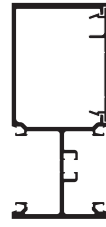
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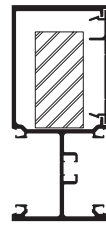
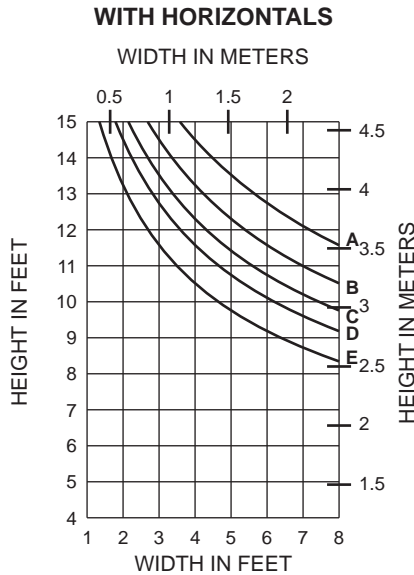
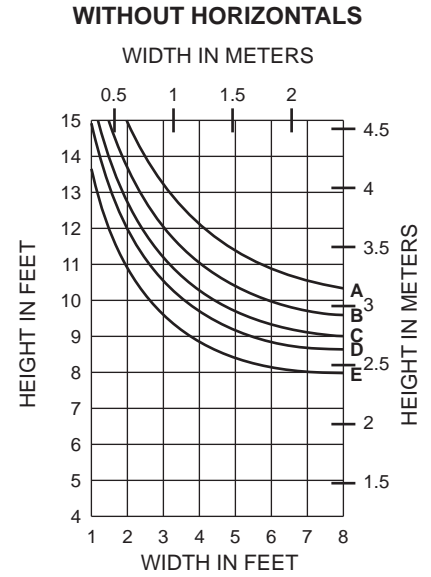


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



451VG012
451VG026

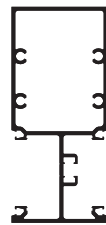
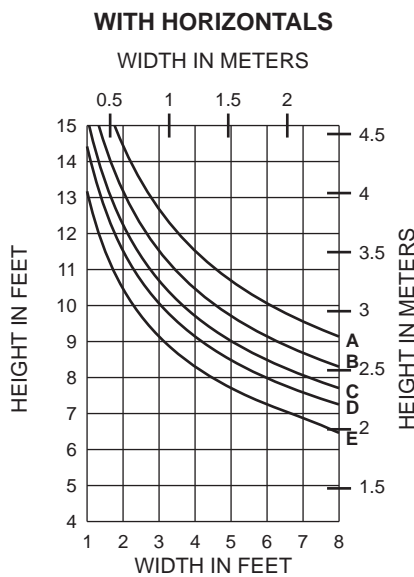
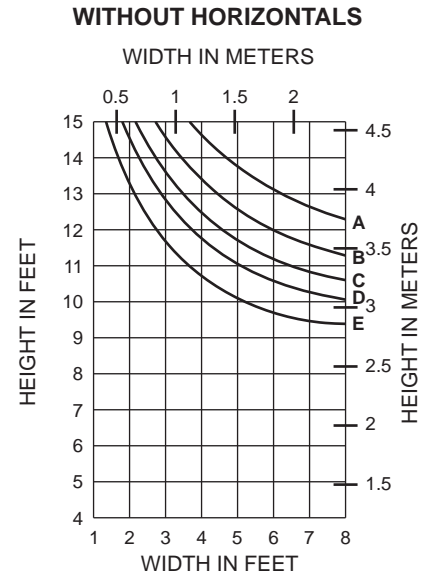
$I = 3.346 (139.27 \times 10^4)$
 $S = 1.447 (23.71 \times 10^3)$



451VG012
451VG026

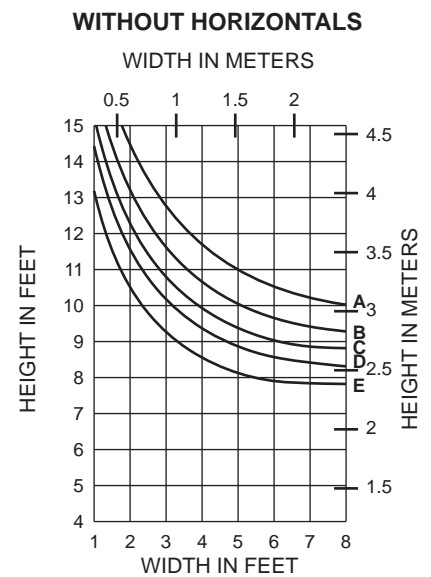
with 1" x 2-1/4" STEEL BAR

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

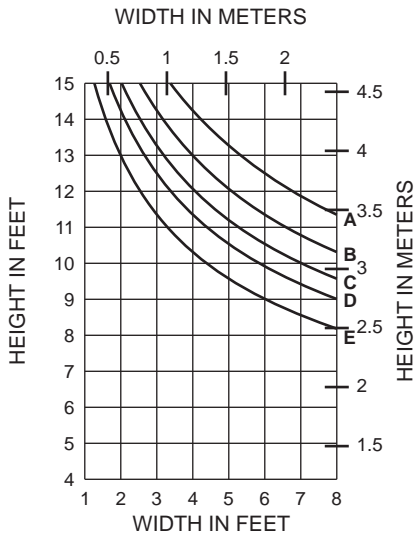


451VG005

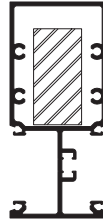
$I = 3.001 (124.91 \times 10^4)$
 $S = 1.323 (21.68 \times 10^3)$



WITH HORIZONTALS



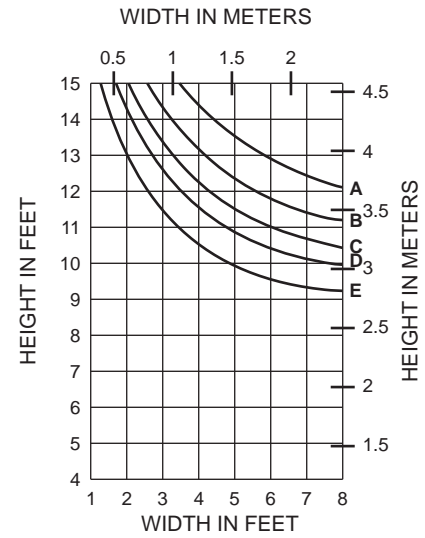
	Allowable Stress Design Load	LFRD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



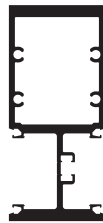
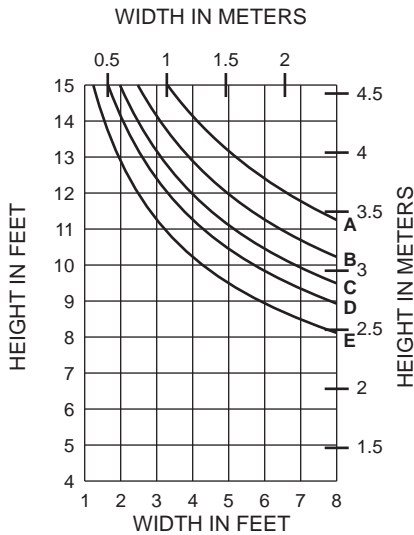
451VG005
with 1" x 2-1/4" STEEL BAR

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

WITHOUT HORIZONTALS



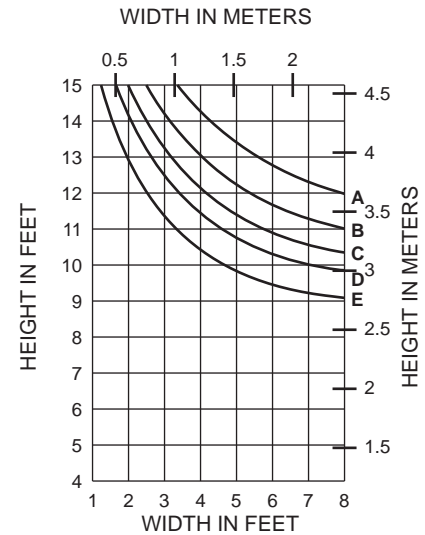
WITH HORIZONTALS



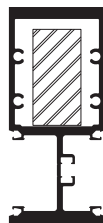
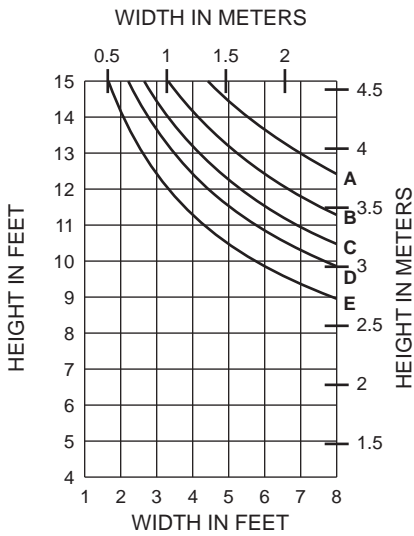
451VG014

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

WITHOUT HORIZONTALS



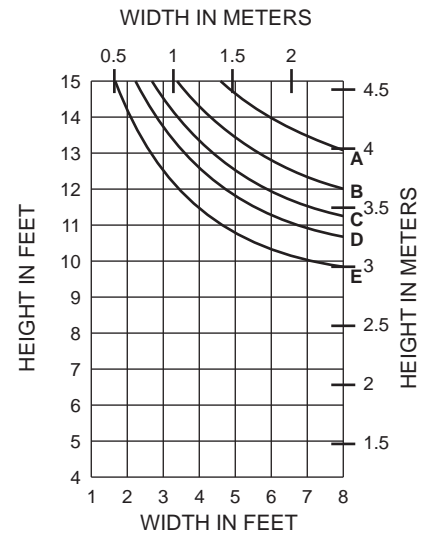
WITH HORIZONTALS



451VG014
with 1" x 2" STEEL BAR

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

WITHOUT HORIZONTALS

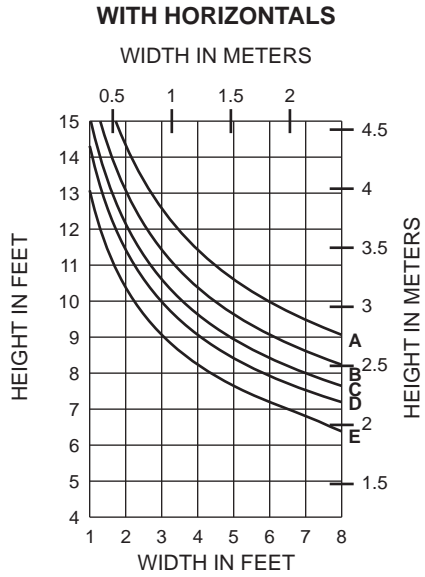


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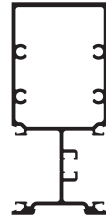
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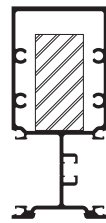
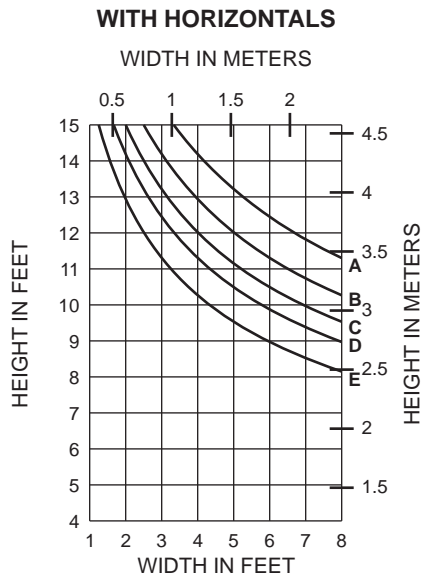
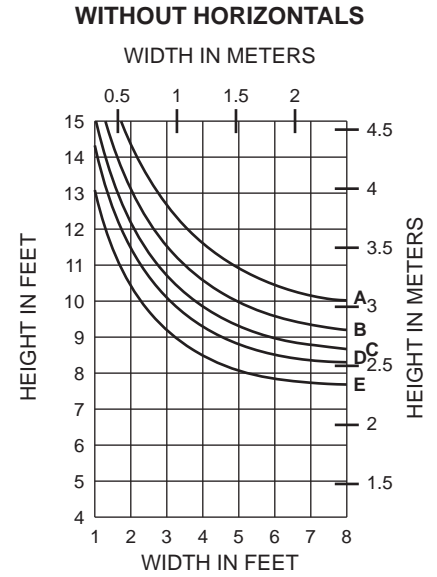


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



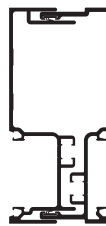
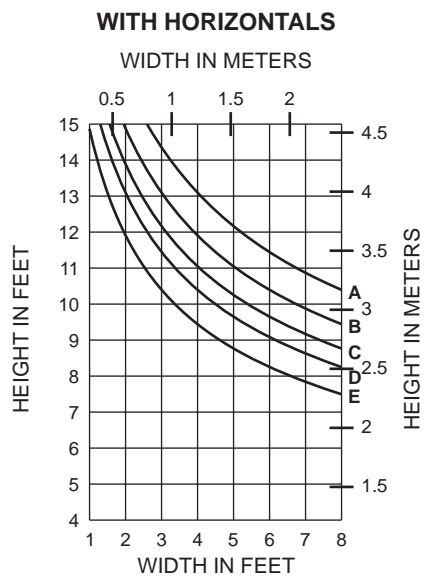
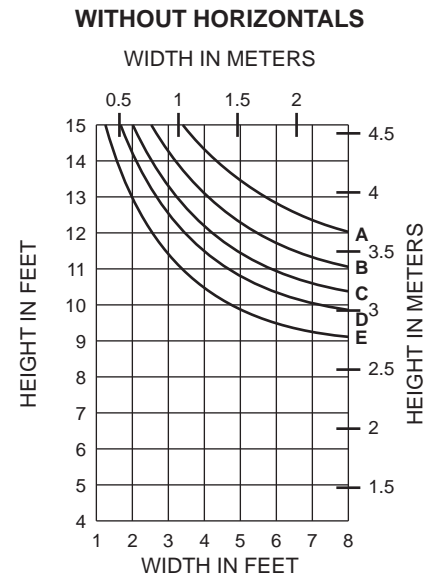
451VG134

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



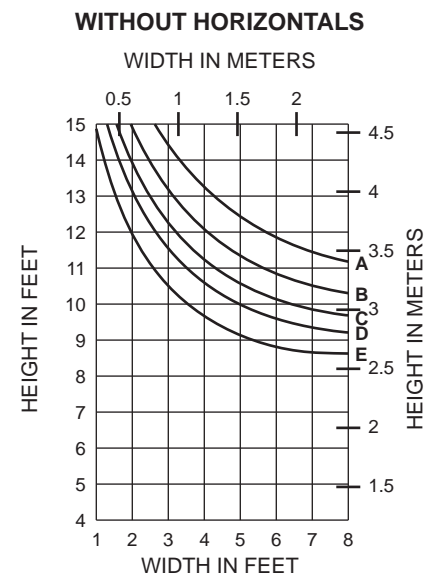
451VG134
with 1" x 2-1/4" STEEL BAR

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

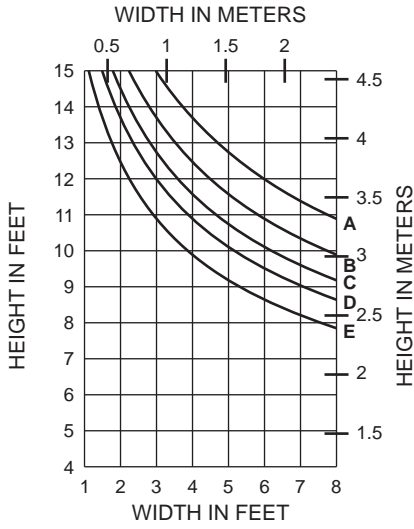


451VG010
451VG540

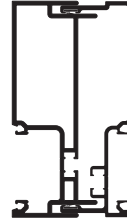
$I = 4.418 (183.89 \times 10^4)$
 $S = 1.798 (29.46 \times 10^3)$



WITH HORIZONTALS



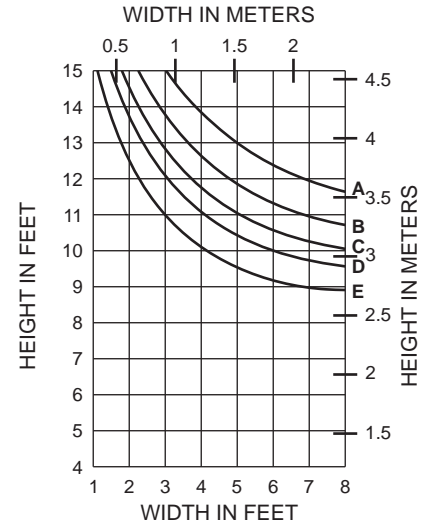
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



451VG010A
451VG009

I = 5.076 (211.27 x 10⁴)
S = 2.066 (33.86 x 10³)

WITHOUT HORIZONTALS



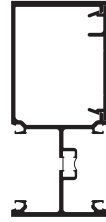
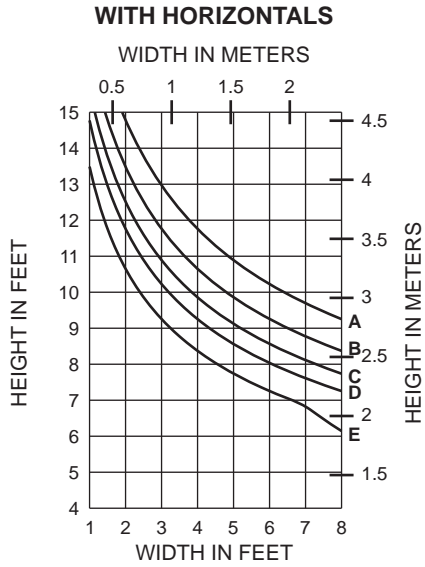
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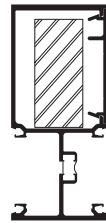
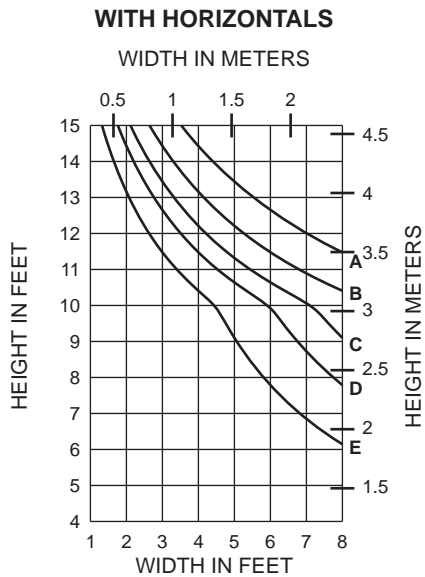
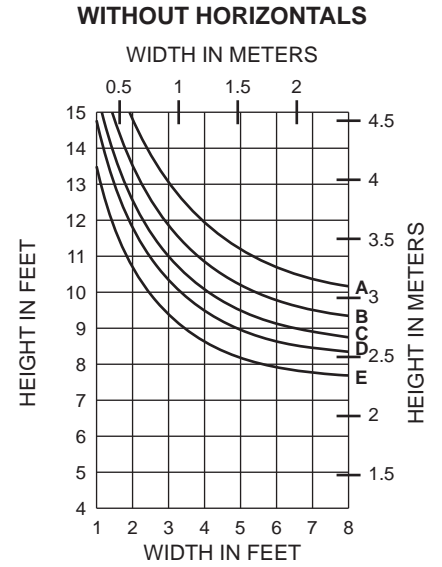
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	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



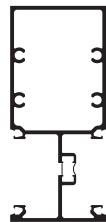
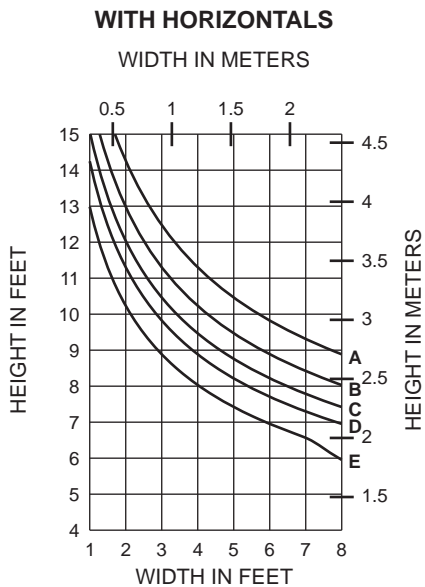
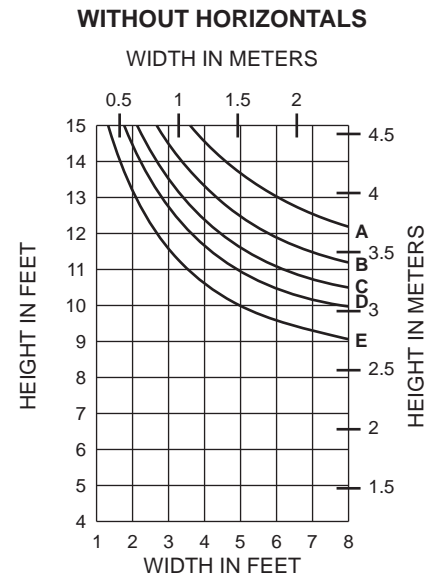
451TVG012
451VG026

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



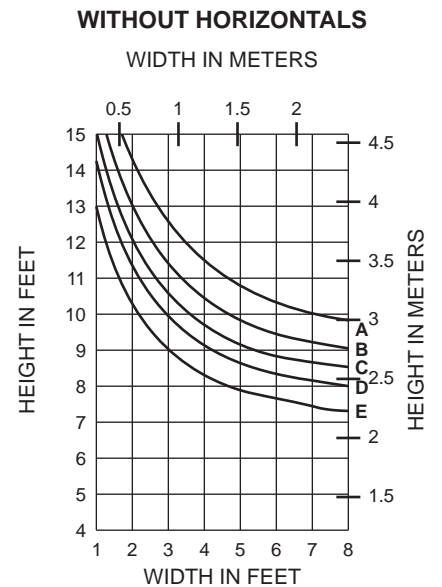
451TVG012
451VG026
with 1" x 2-1/4" STEEL BAR

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

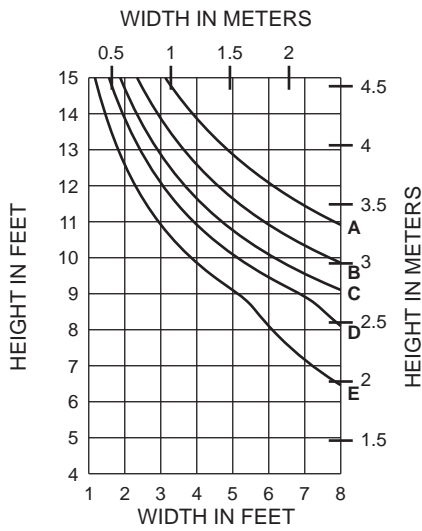


451TVG005

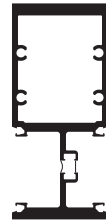
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



WITH HORIZONTALS



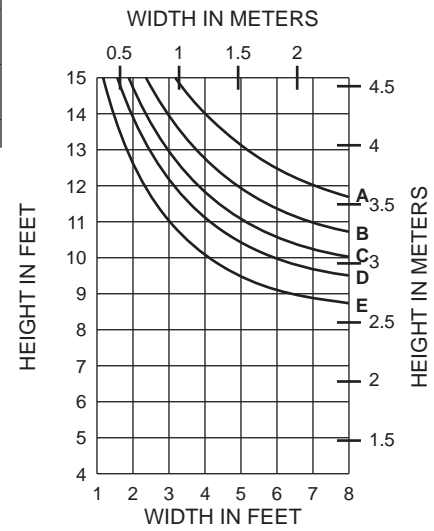
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



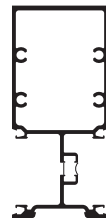
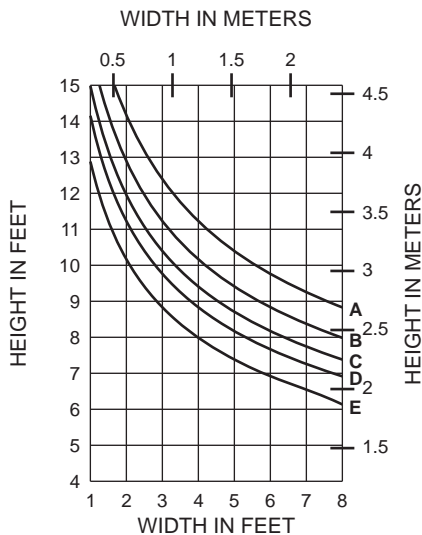
451TVG014

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

WITHOUT HORIZONTALS



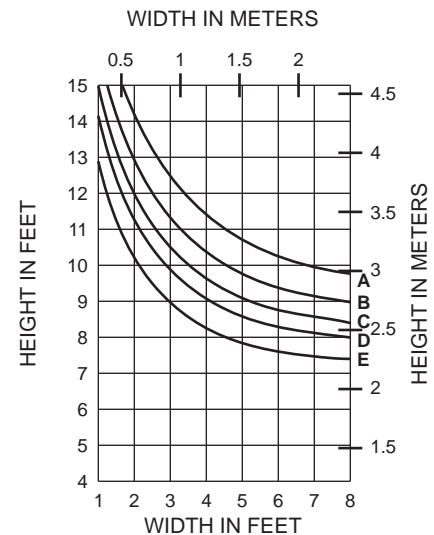
WITH HORIZONTALS



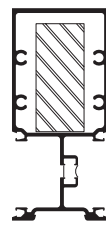
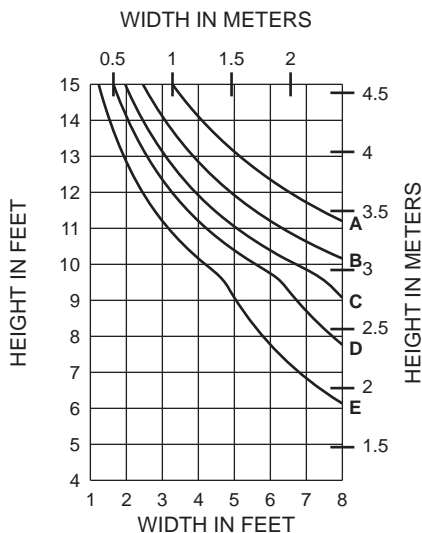
451TVG134

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

WITHOUT HORIZONTALS



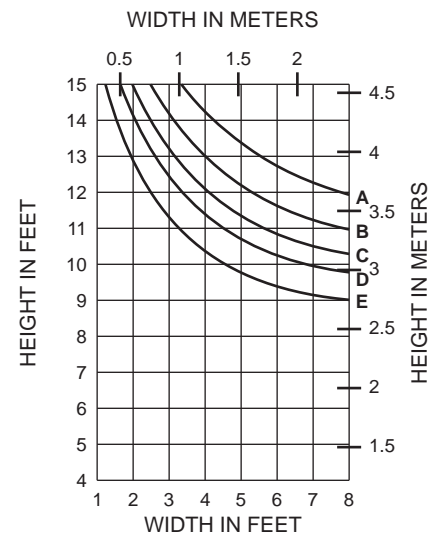
WITH HORIZONTALS



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

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

WITHOUT HORIZONTALS

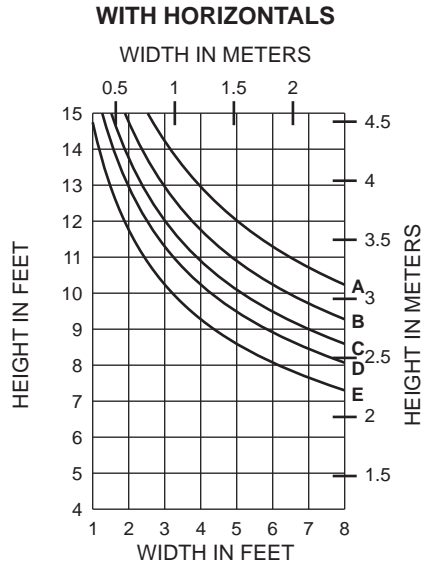


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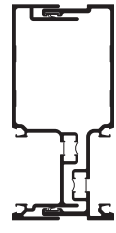
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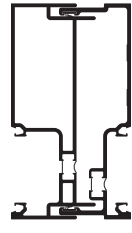
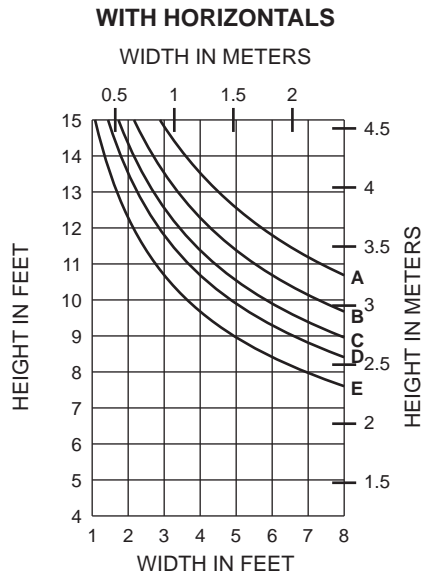
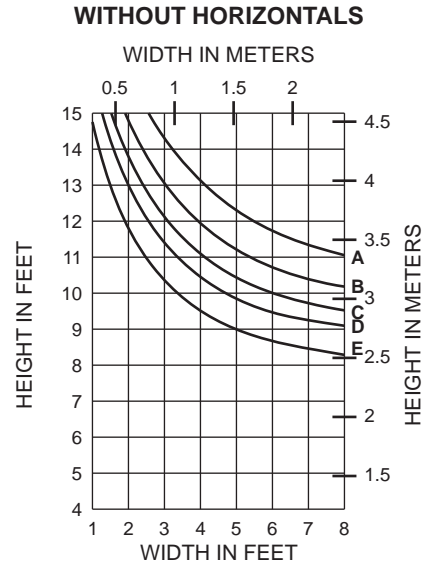


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



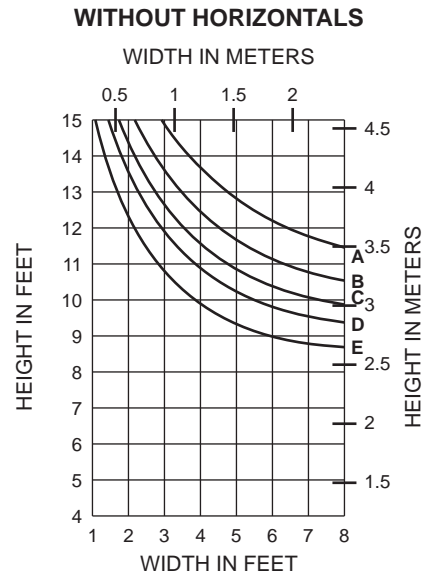
451TVG540
451TVG010

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

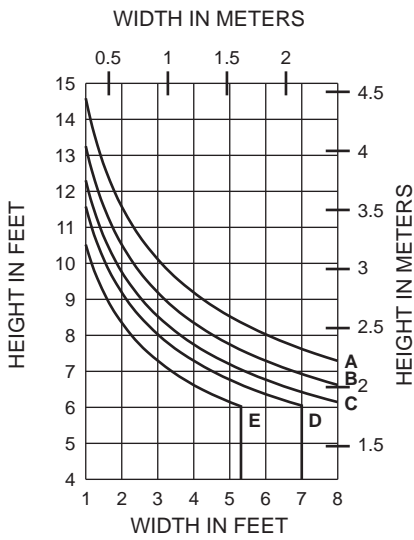


451TVG540
451TVG010A

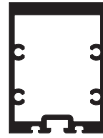
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505



WITH HORIZONTALS



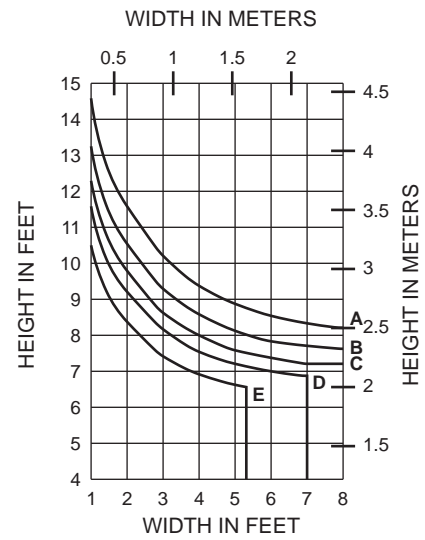
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



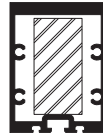
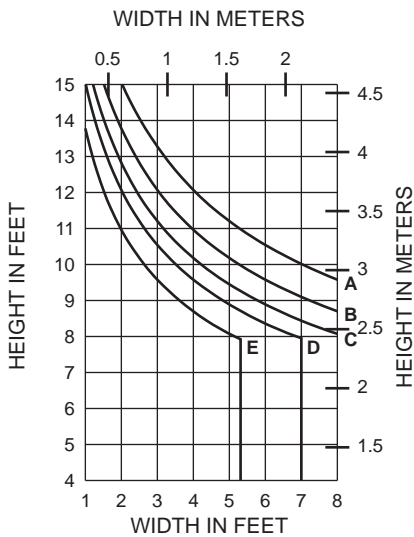
451SSG005

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

WITHOUT HORIZONTALS



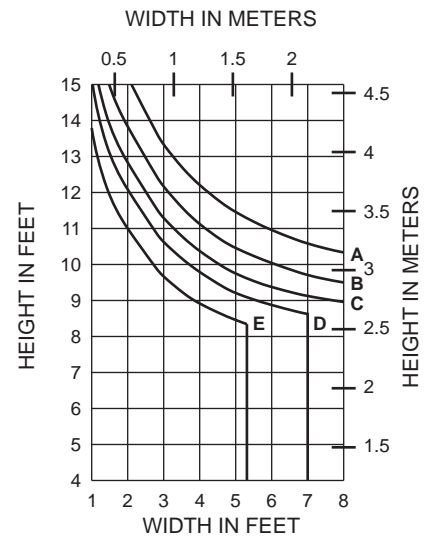
WITH HORIZONTALS



451SSG005
with 1" x 2" STEEL BAR

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

WITHOUT HORIZONTALS

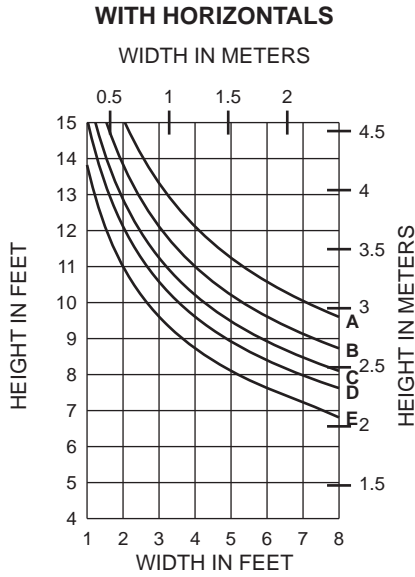


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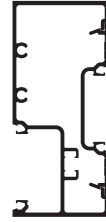
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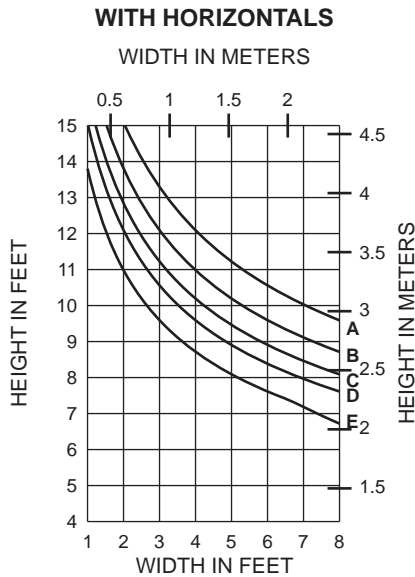
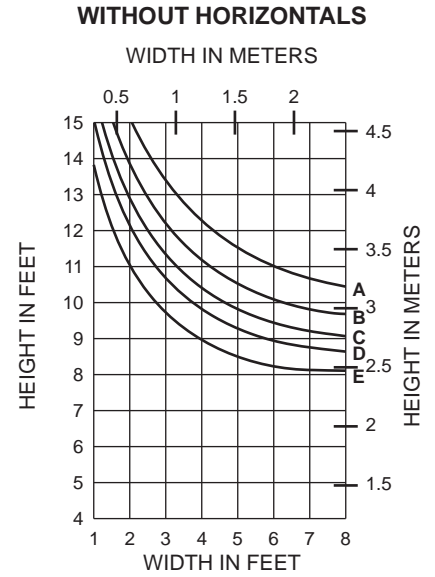


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



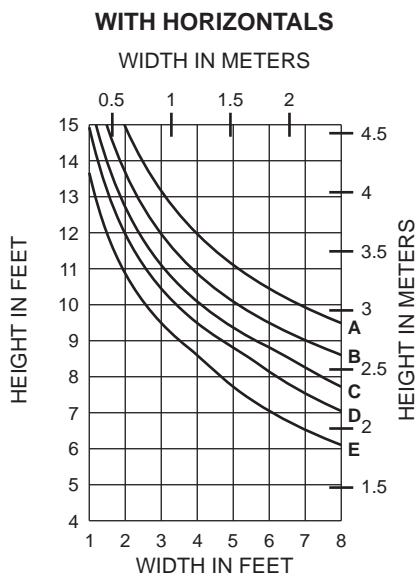
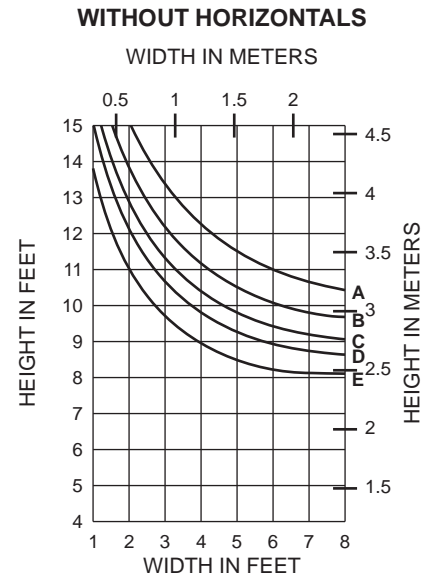
451VG001
451CG002

I = 3.485 (145.05 x 10⁴)
S = 1.468 (24.06 x 10³)



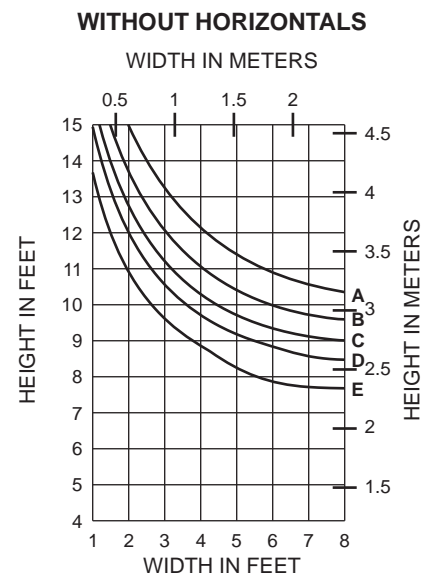
451VG052
451CG028

I = 3.470 (144.43 x 10⁴)
S = 1.431 (23.45 x 10³)

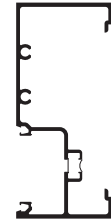
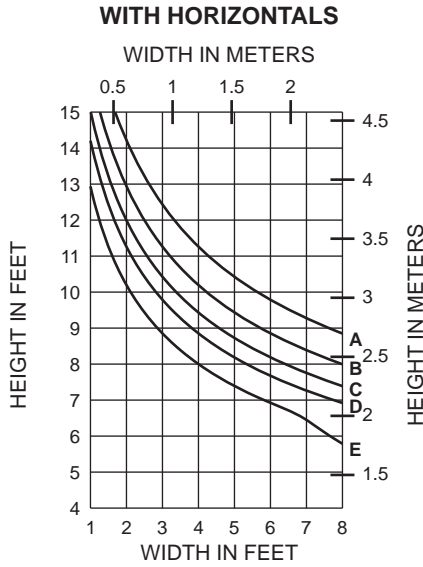


451VG069
451VG069

I = 3.362 (139.94 x 10⁴)
S = 1.181 (19.35 x 10³)

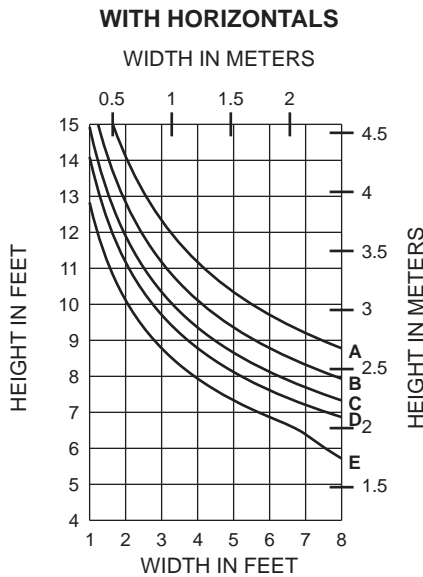
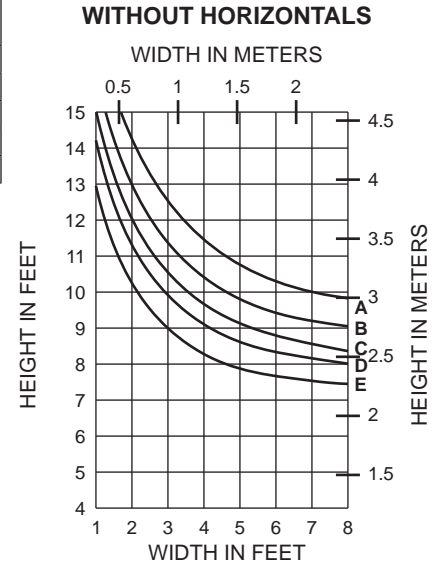


	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



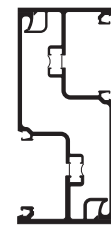
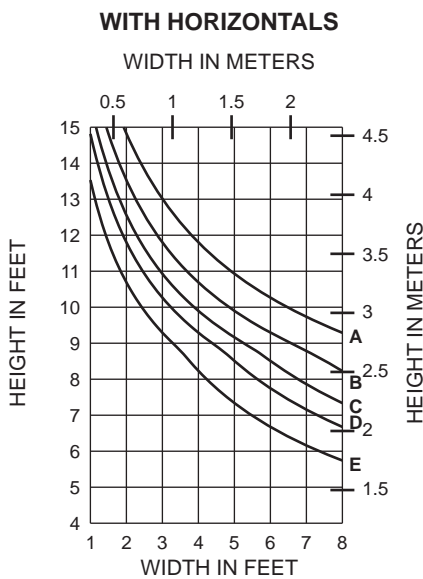
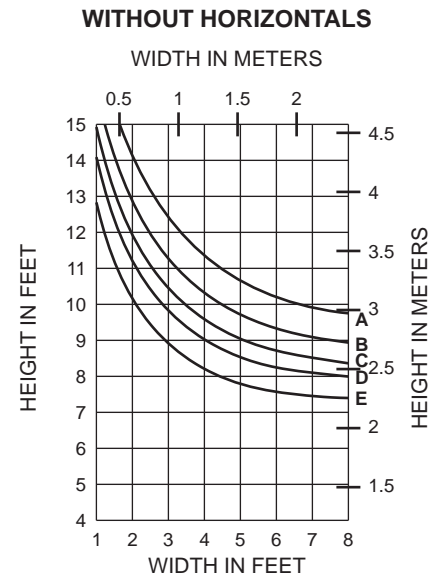
451TVG001

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



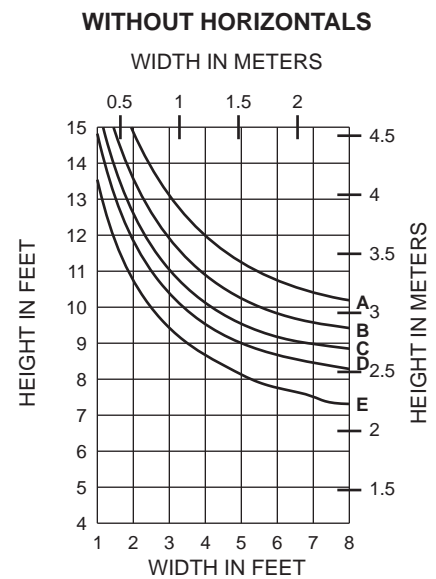
451TVG052

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



451TVG069
451TVG069

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

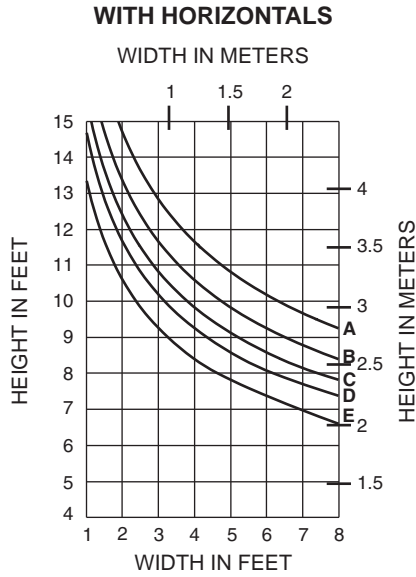


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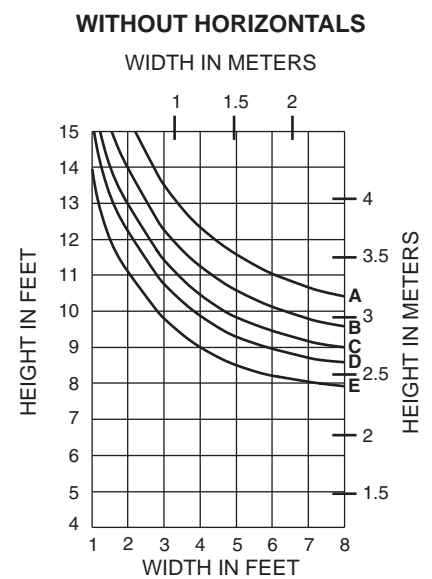
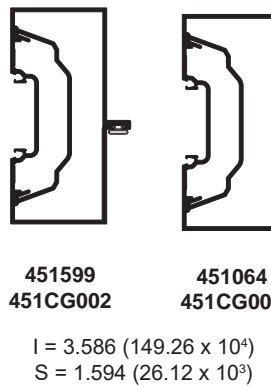
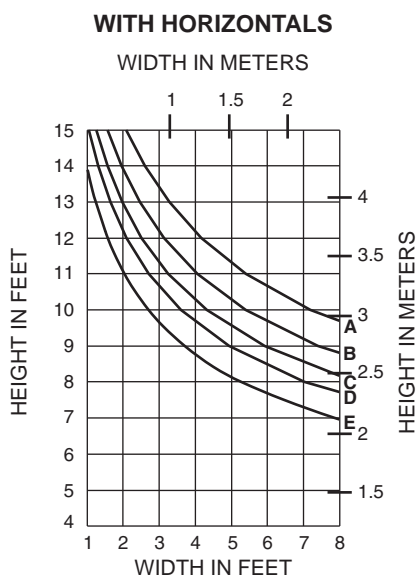
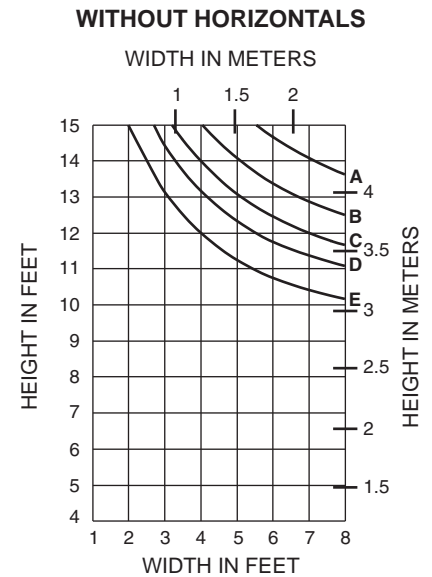
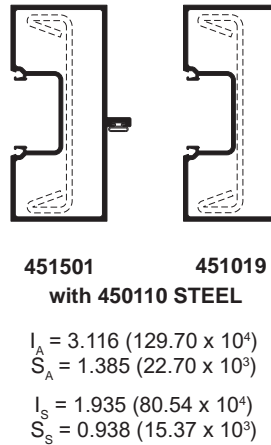
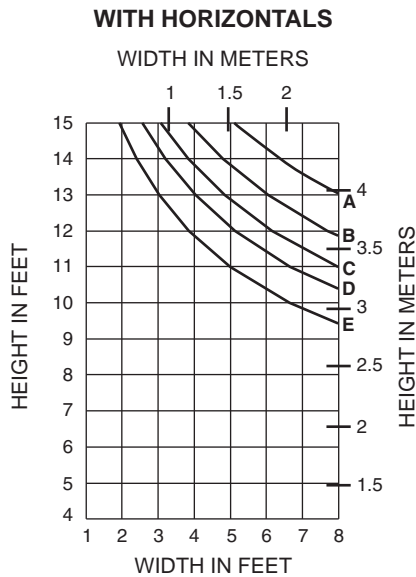
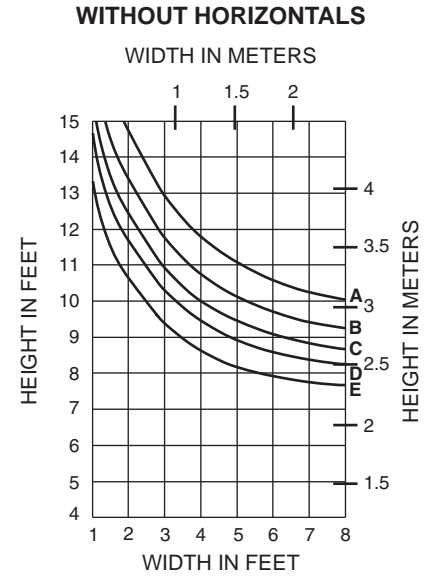
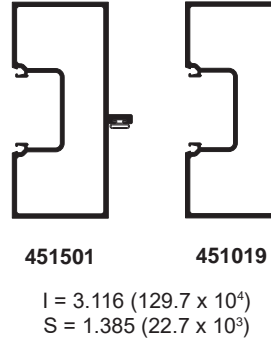
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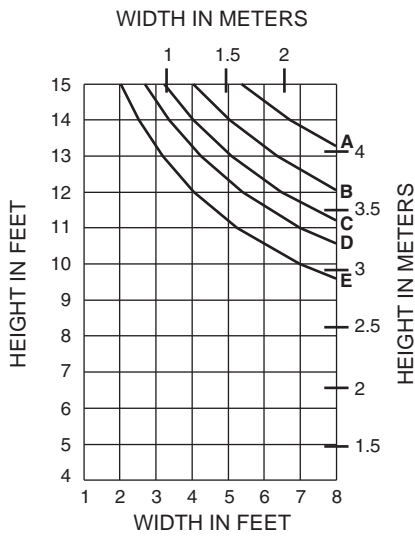
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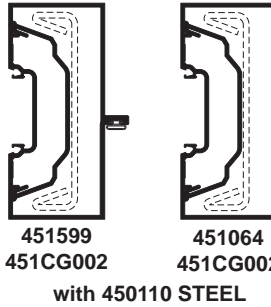
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



WITH HORIZONTALS



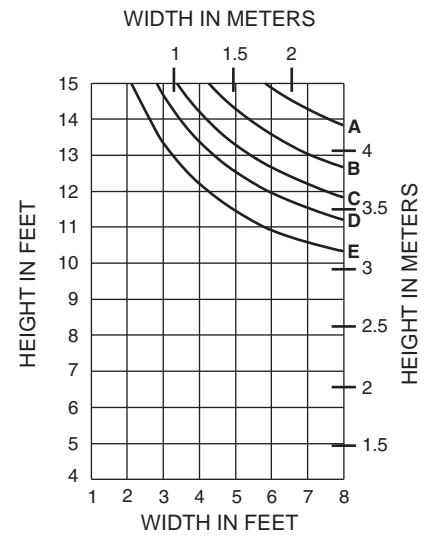
	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)



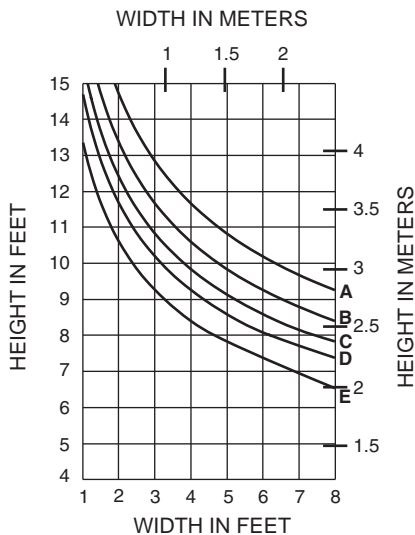
$I = 3.565 (148.39 \times 10^4)$
 $S = 1.622 (26.58 \times 10^3)$

$I_s = 1.935 (80.54 \times 10^4)$
 $S_s = 0.938 (15.37 \times 10^3)$

WITHOUT HORIZONTALS



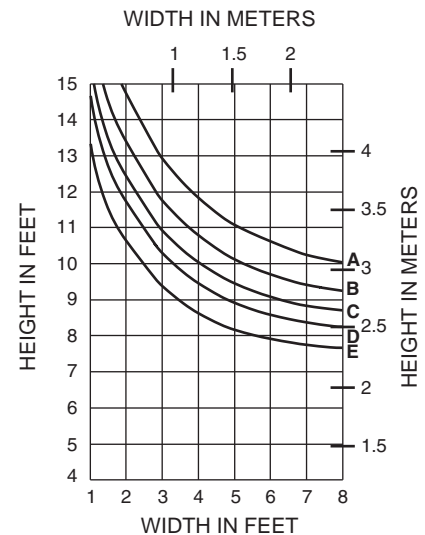
WITH HORIZONTALS



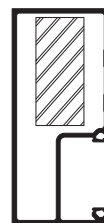
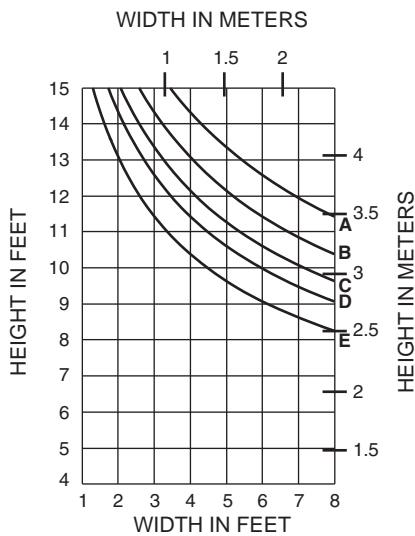
451VG019

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

WITHOUT HORIZONTALS



WITH HORIZONTALS

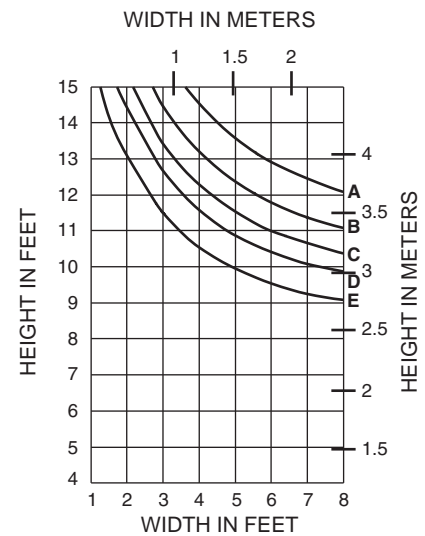


451VG019
with 1" x 2-1/4" STEEL BAR

$I_A = 3.124 (130.03 \times 10^4)$
 $S_A = 1.333 (21.84 \times 10^3)$

$I_s = 0.949 (39.50 \times 10^4)$
 $S_s = 0.844 (13.83 \times 10^3)$

WITHOUT HORIZONTALS



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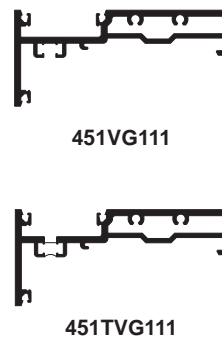
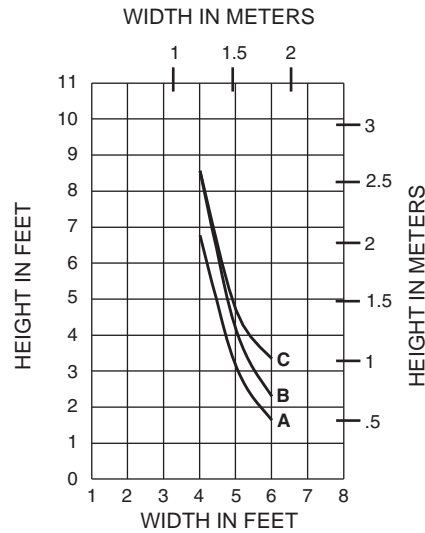
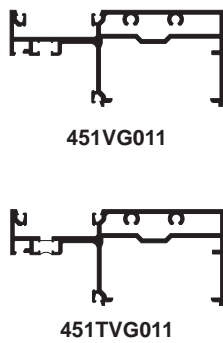
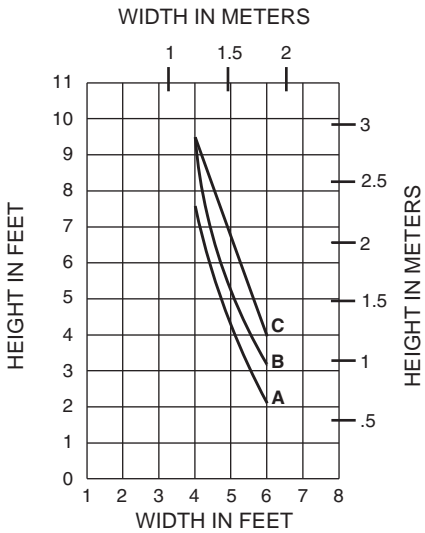
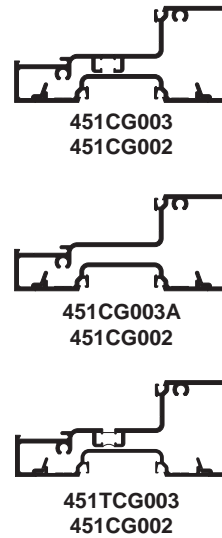
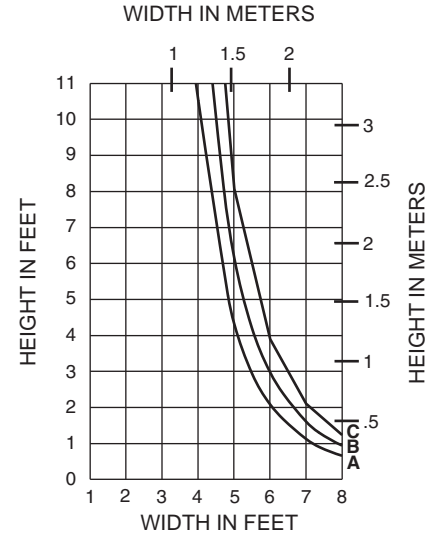
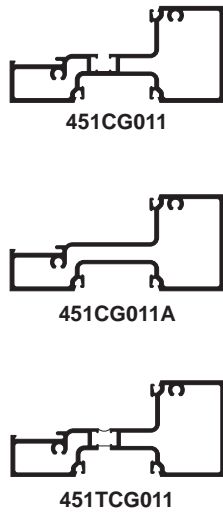
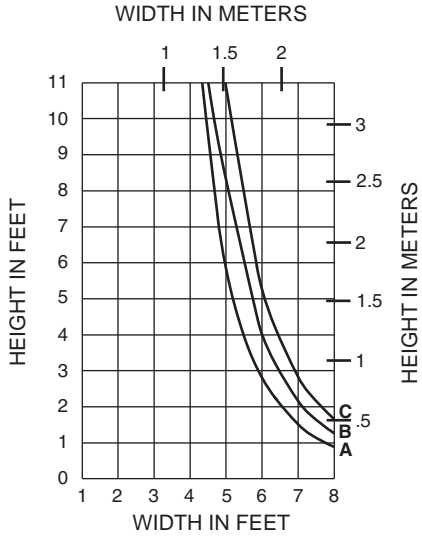
Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks at the loading points shown.

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

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

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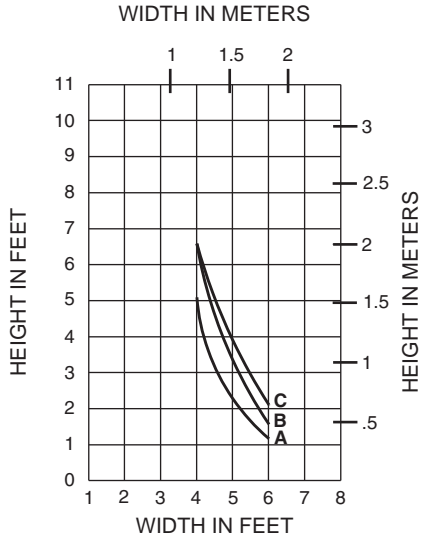
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NOTE: Charts are for THERMAL and NON-THERMAL members.

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



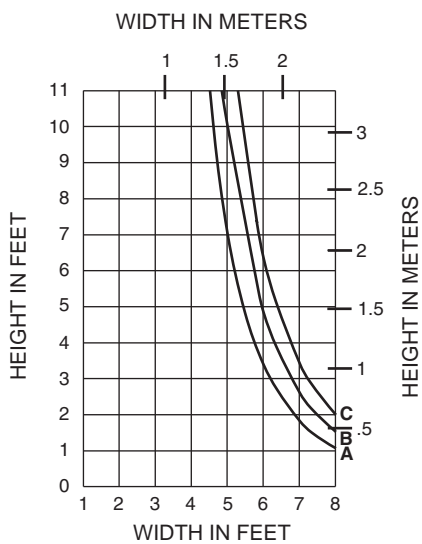
451SSG111



451TSSG111

Height limitations for transom glass over a doorway are based upon a 1/16" (1.6) maximum allowable deflection at the center of a transom bar. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks placed at the loading points shown.

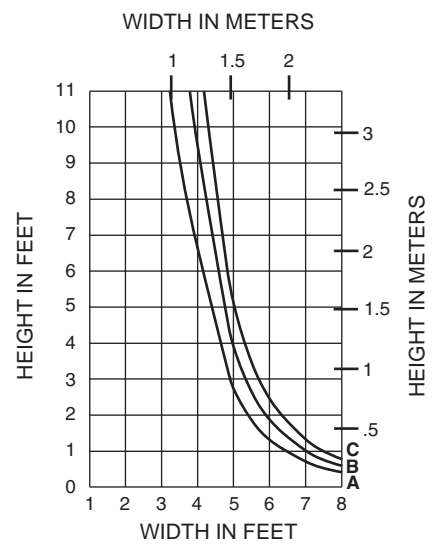
- A = (1/4 POINT LOADING)
- B = (1/6 POINT LOADING)
- C = (1/8 POINT LOADING)



451502
SINGLE ACTING
T-BAR



451081
DOUBLE ACTING
T-BAR

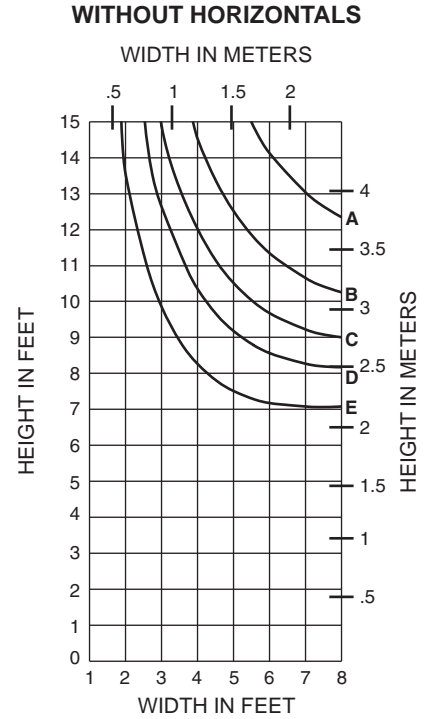
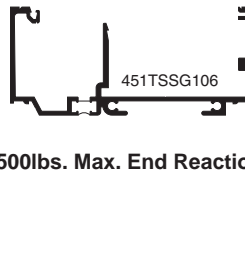
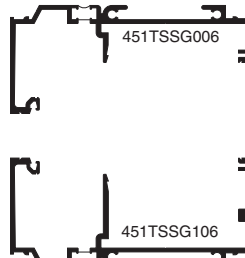
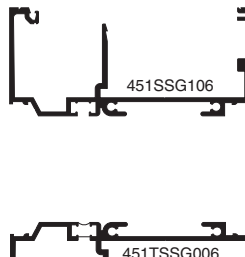
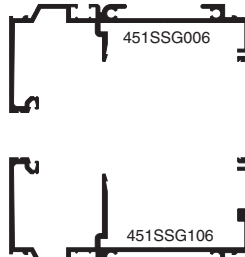
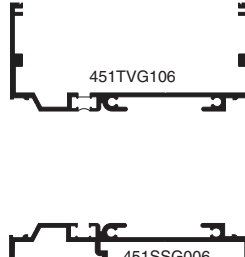
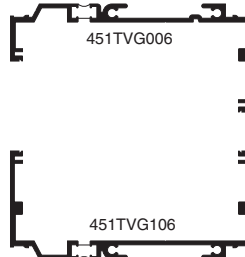
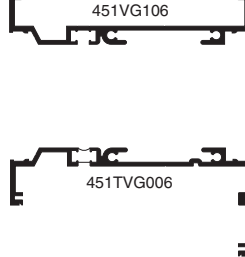
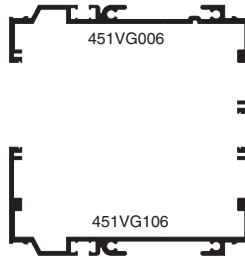
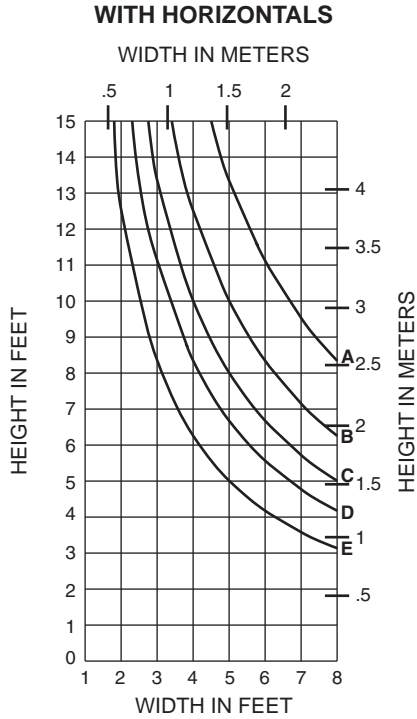


Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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

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

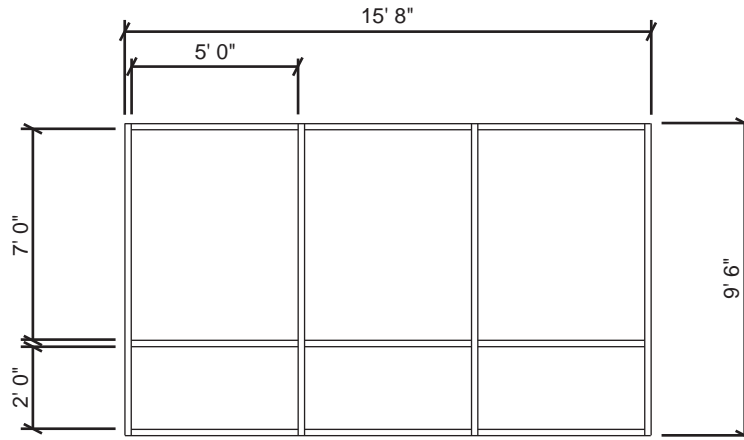


500lbs. Max. End Reaction

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



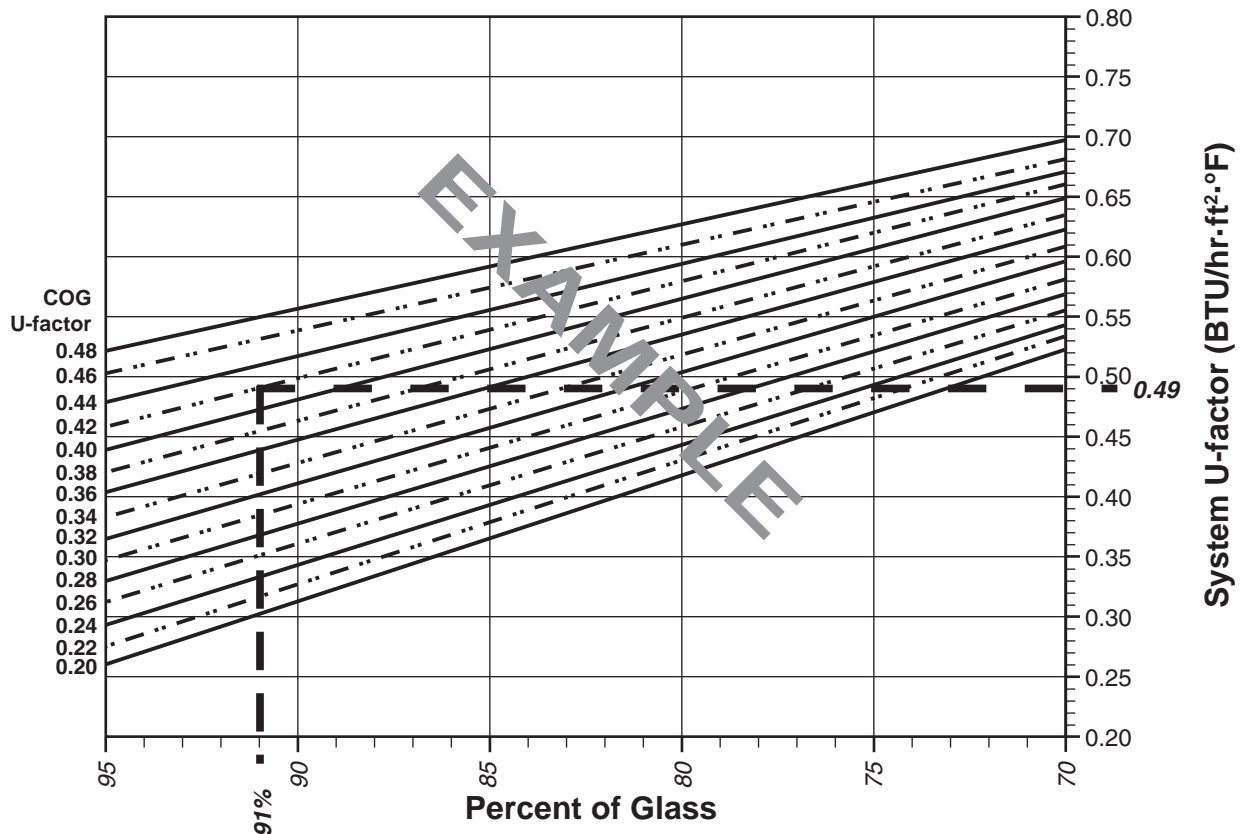
Example Glass U-factor = 0.42 Btu/hr·ft²·°F

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

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

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

System U-factor vs Percent of Glass Area



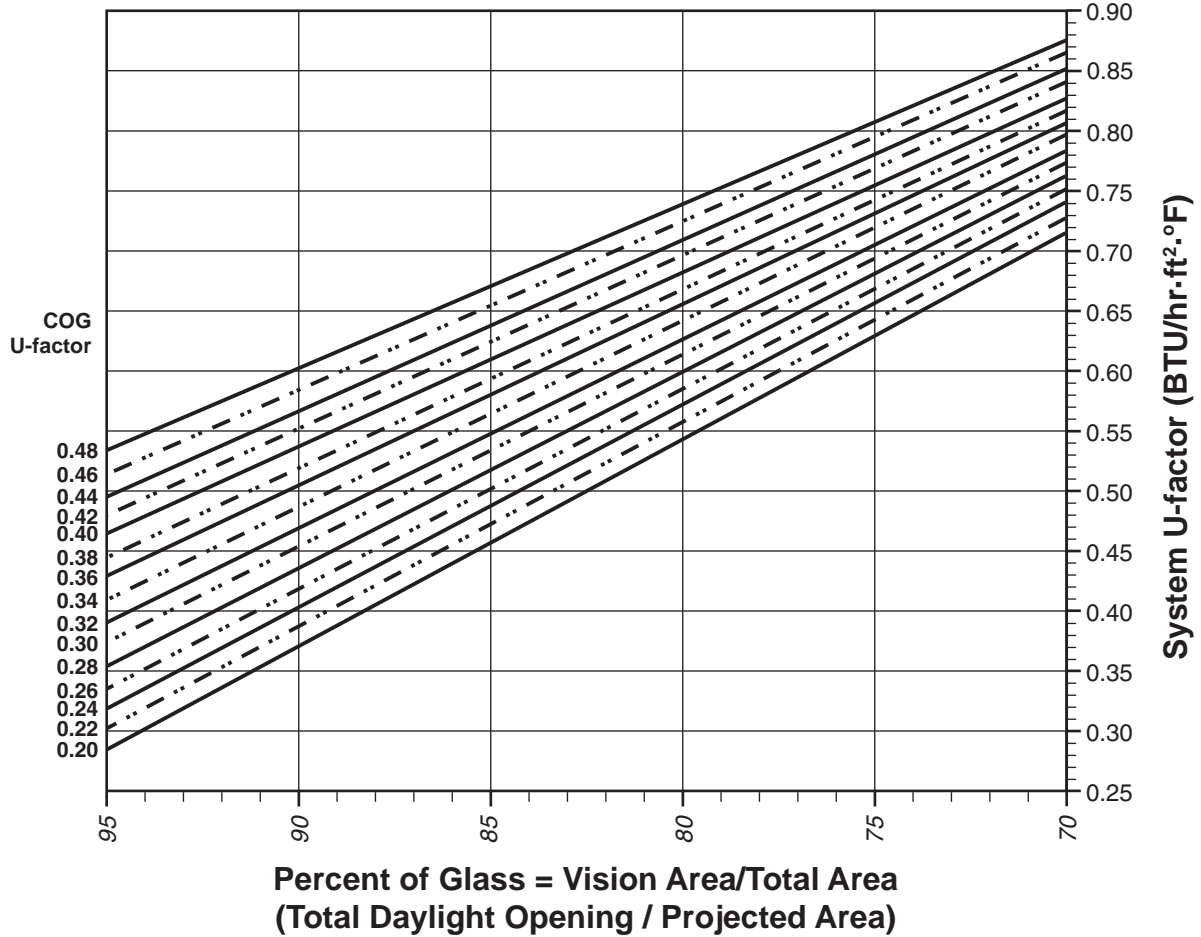
Based on 91% glass and center of glass (COG) U-factor of 0.42
System U-factor is equal to 0.49 Btu/hr x ft² x °F

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

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

System U-factor vs Percent of Glass Area



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

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

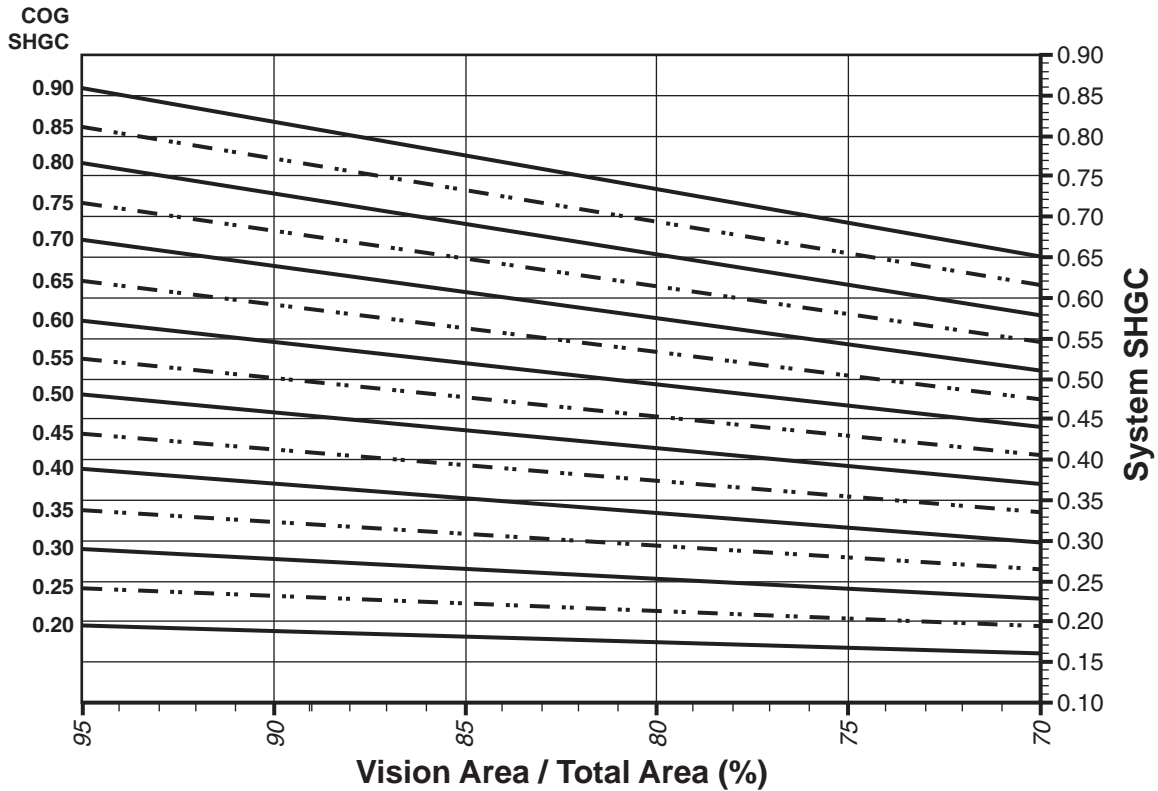
Glass properties are based on center of glass values and are obtained from your glass supplier.

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

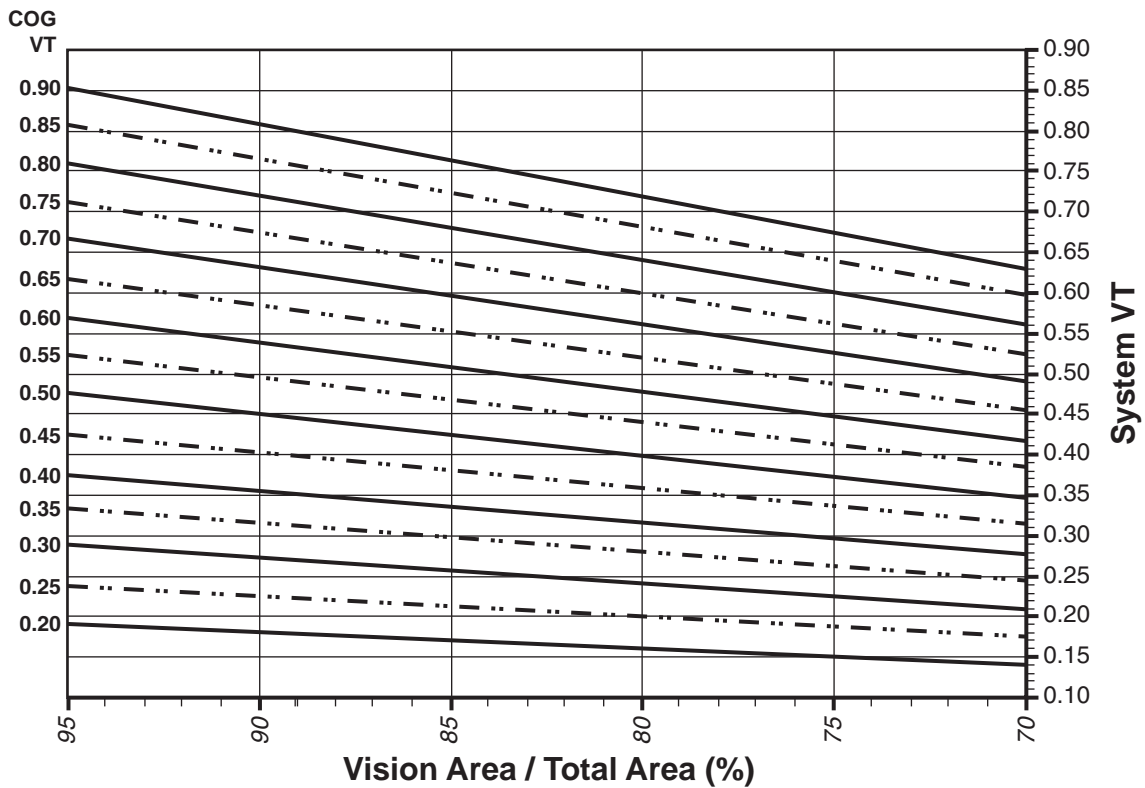
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Trifab® VersaGlaze® 451 (CENTER – Non-Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

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

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

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

Visible Transmittance ²

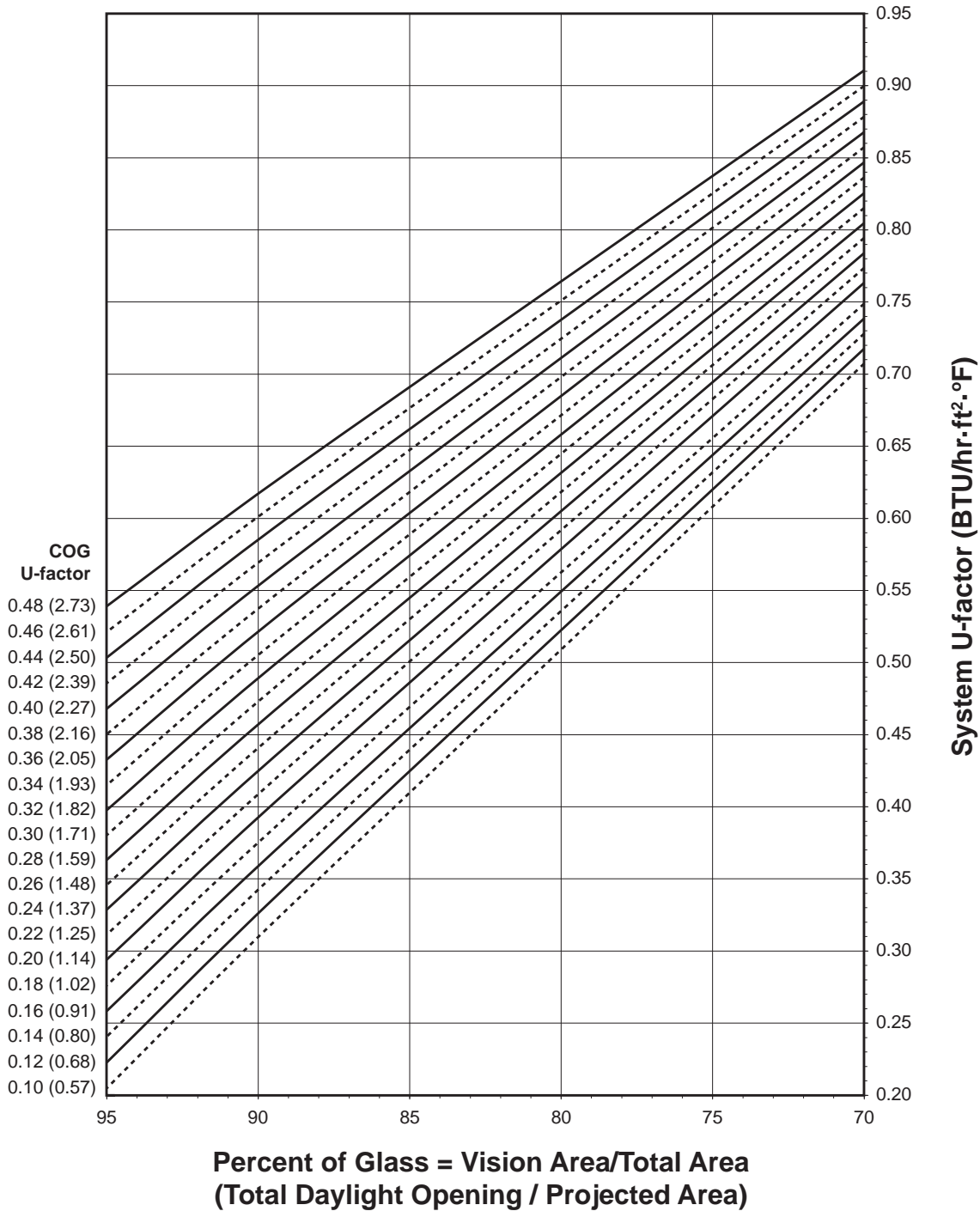
Glass VT ³	Overall VT ⁴
0.90	0.79
0.85	0.75
0.80	0.71
0.75	0.66
0.70	0.62
0.65	0.57
0.60	0.53
0.55	0.49
0.50	0.44
0.45	0.40
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18

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

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

System U-factor vs Percent of Glass Area



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

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

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

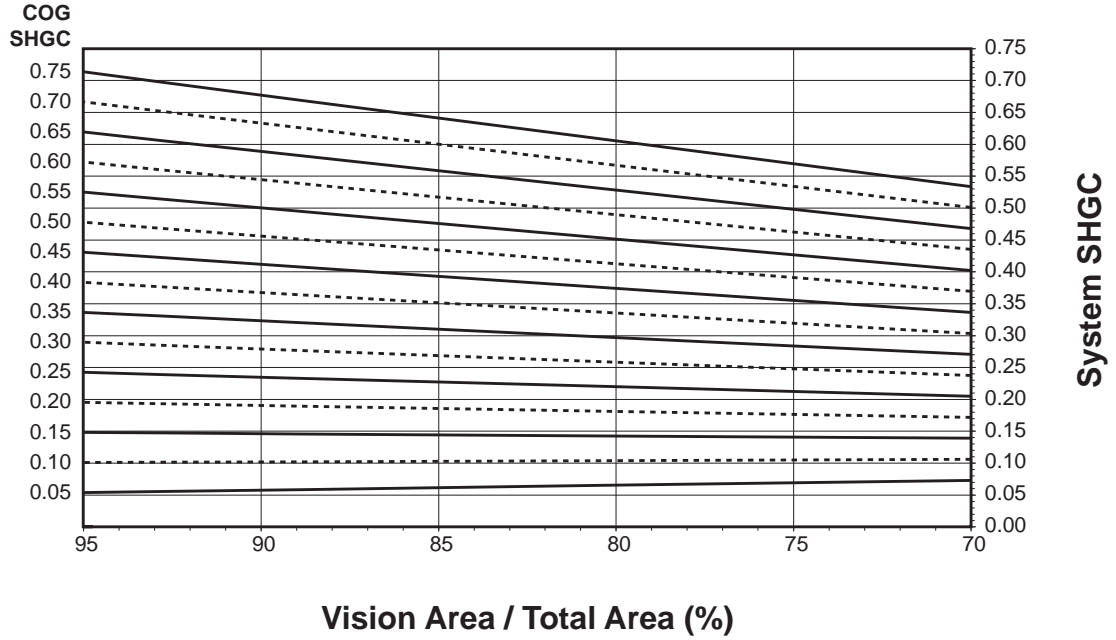
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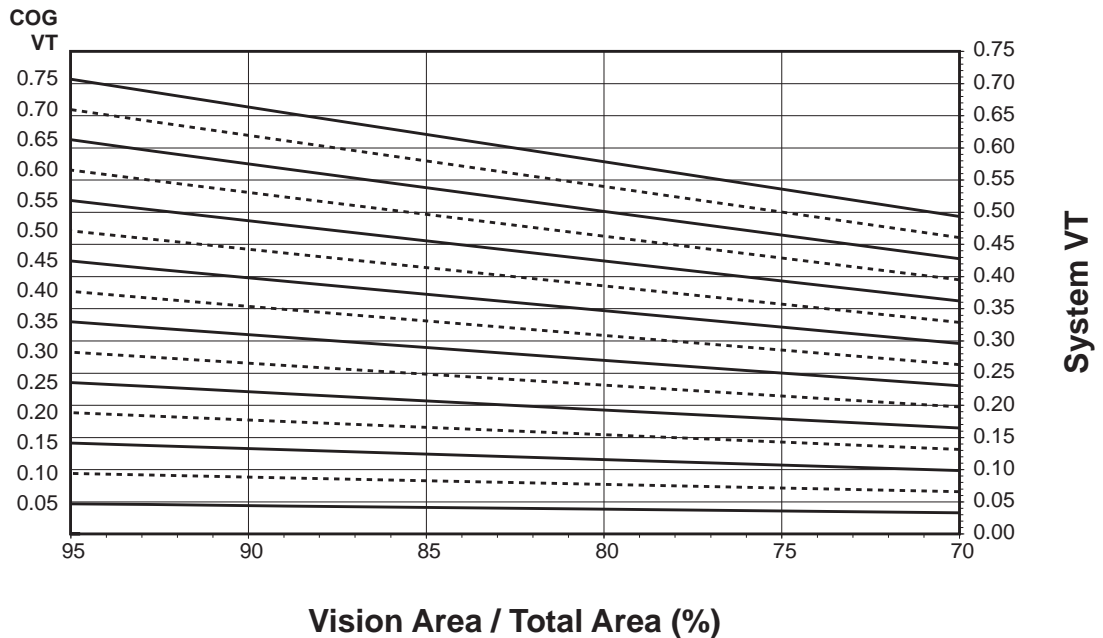
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Trifab® VersaGlaze® 451 Pre-Glazed (CENTER – Non-Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

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

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

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.67
0.70	0.63
0.65	0.58
0.60	0.54
0.55	0.49
0.50	0.45
0.45	0.41
0.40	0.36
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19
0.15	0.15
0.10	0.10
0.05	0.06

Visible Transmittance ²

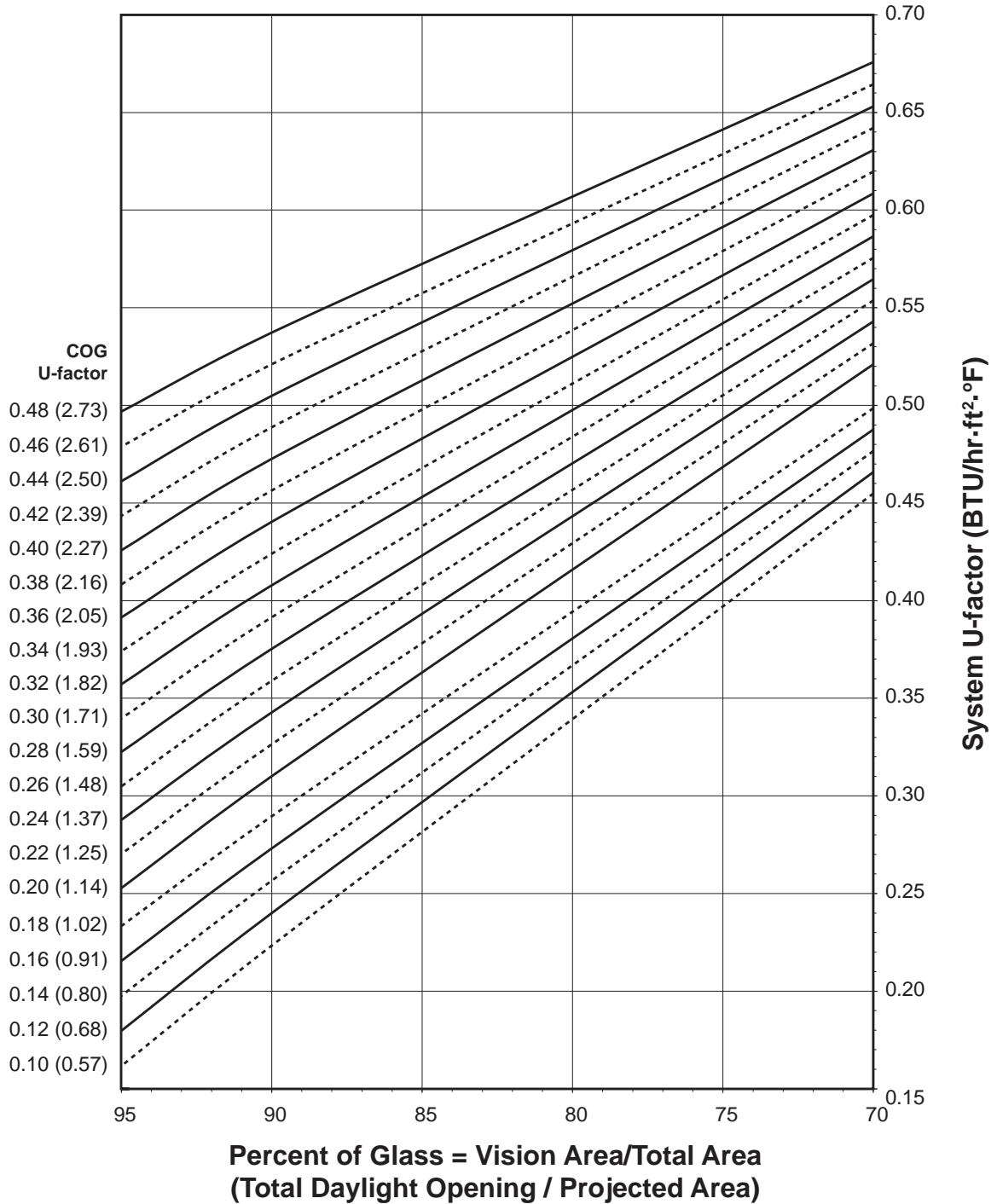
Glass VT ³	Overall VT ⁴
0.75	0.65
0.70	0.61
0.65	0.57
0.60	0.52
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.17
0.15	0.13
0.10	0.09
0.05	0.04

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

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Trifab® VersaGlaze® 451T (CENTER – Thermal)

System U-factor vs Percent of Glass Area



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

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

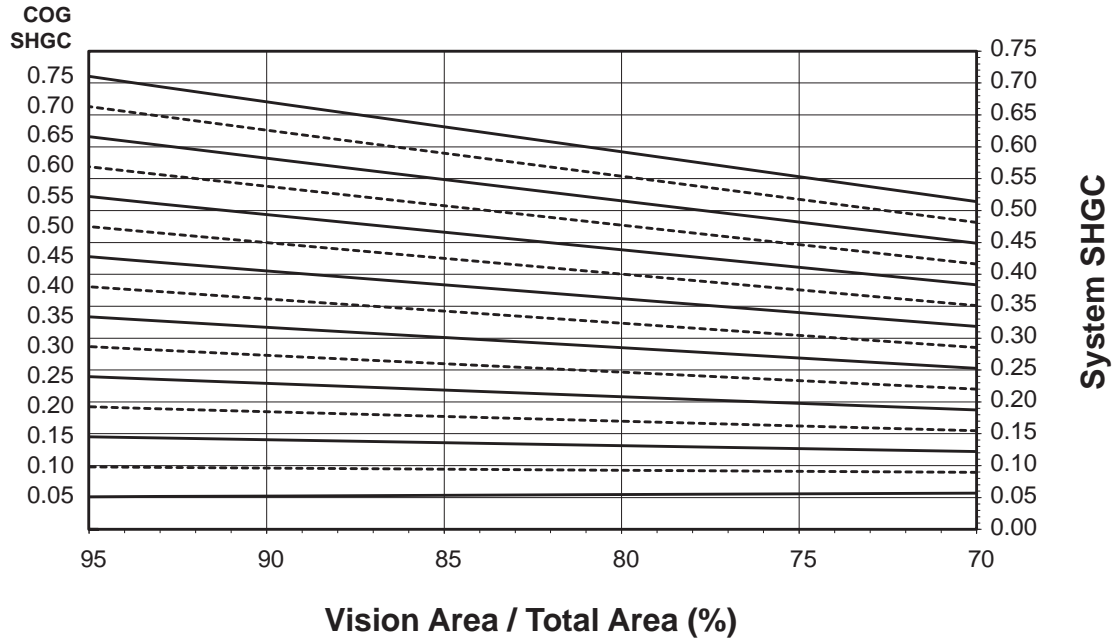
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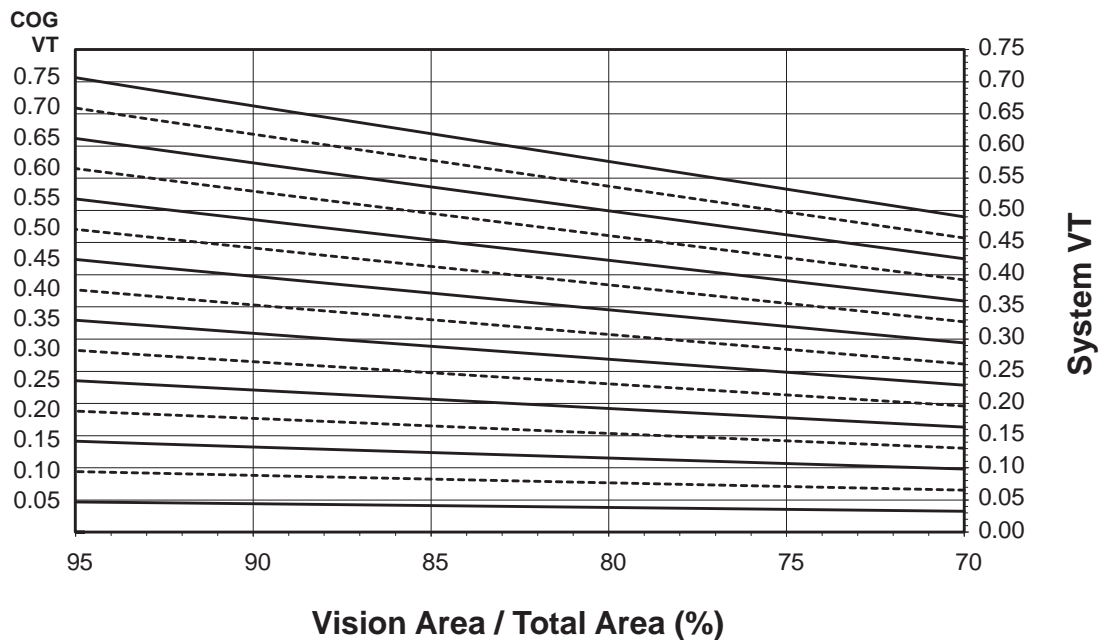
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Trifab® VersaGlaze® 451T (CENTER – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

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

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

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

Visible Transmittance ²

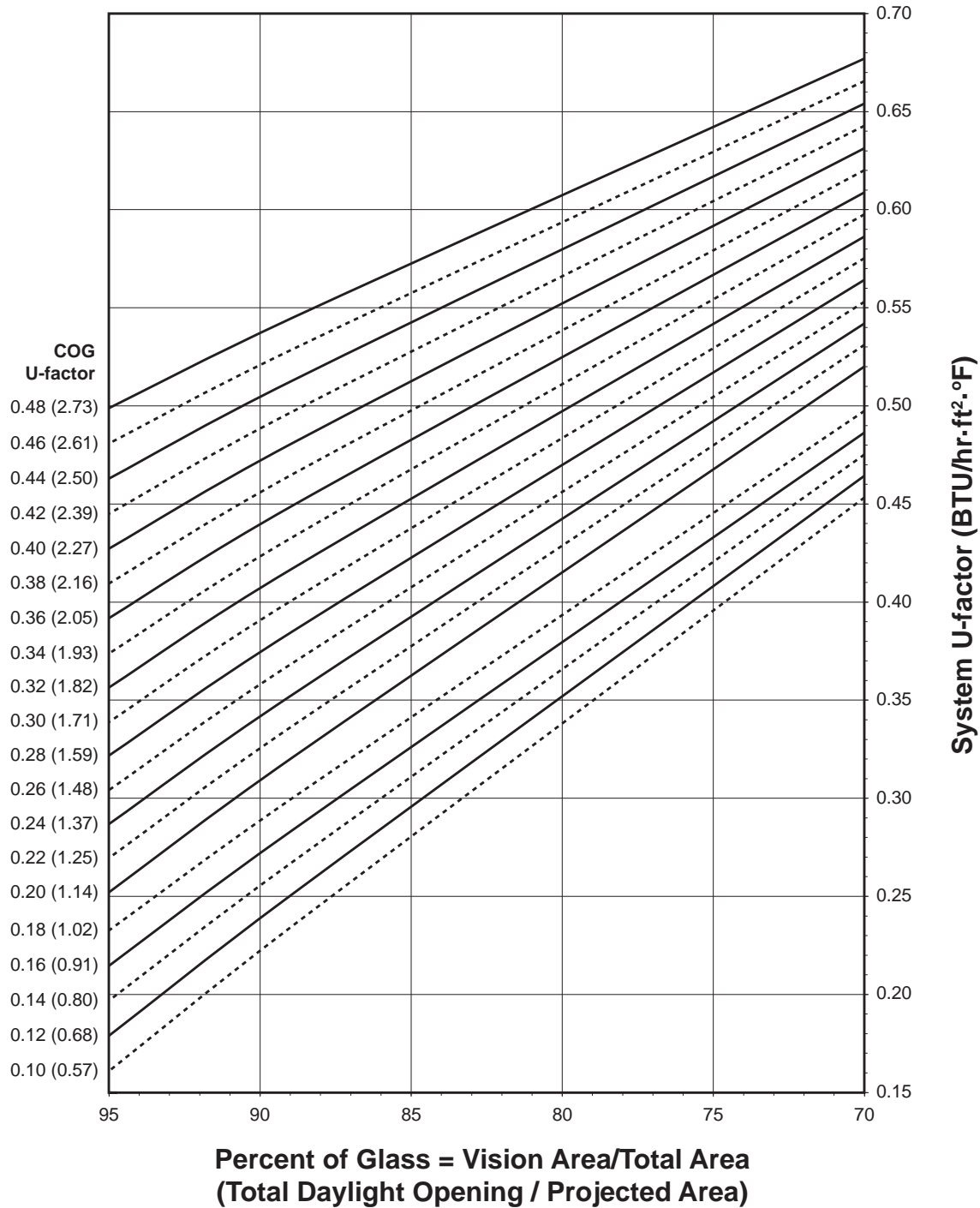
Glass VT ³	Overall VT ⁴
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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

System U-factor vs Percent of Glass Area



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

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

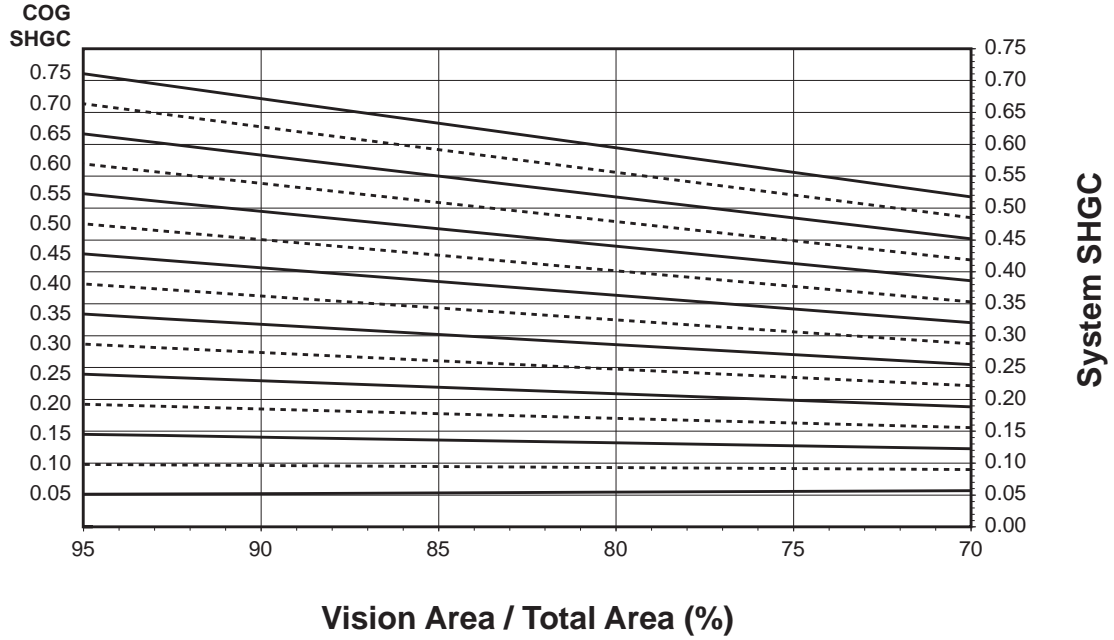
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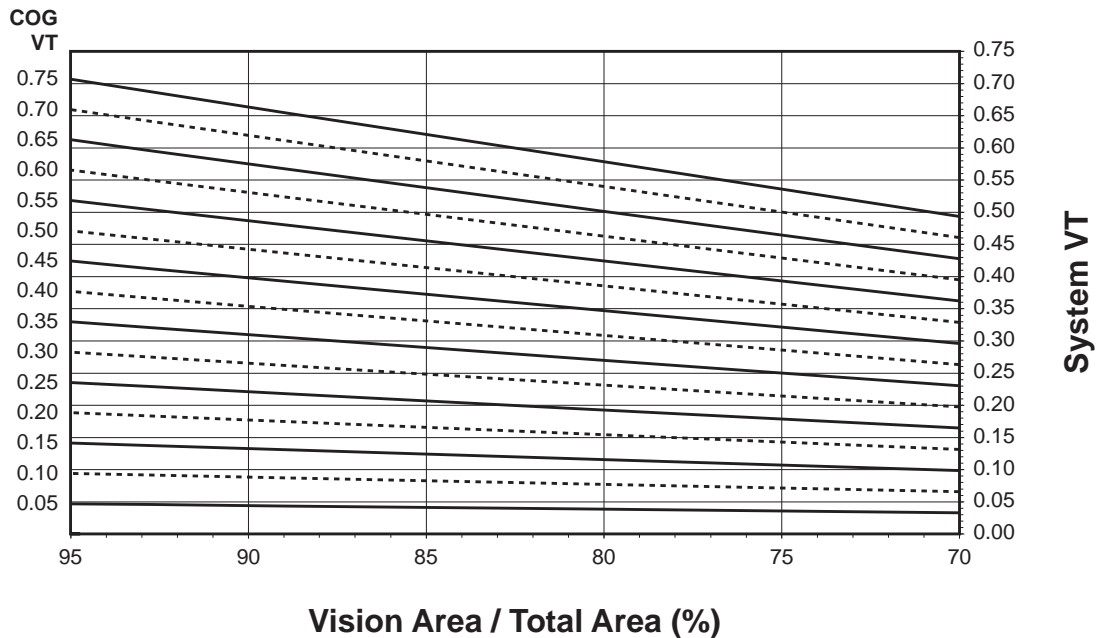
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Trifab® VersaGlaze® 451T Pre-Glazed (CENTER – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

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

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.66
0.70	0.62
0.65	0.58
0.60	0.53
0.55	0.49
0.50	0.45
0.45	0.40
0.40	0.36
0.35	0.31
0.30	0.27
0.25	0.23
0.20	0.18
0.15	0.14
0.10	0.10
0.05	0.05

Visible Transmittance ²

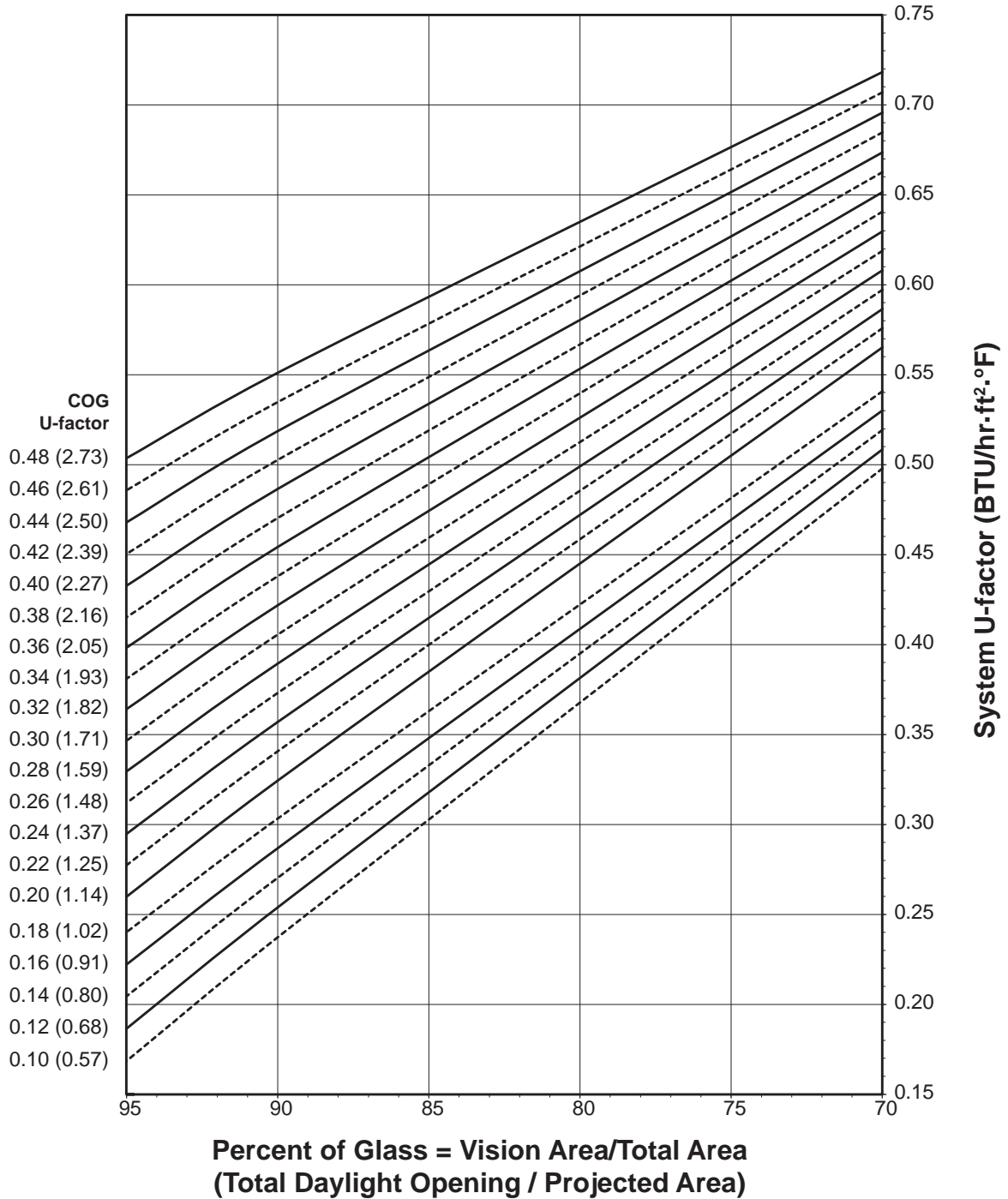
Glass VT ³	Overall VT ⁴
0.75	0.65
0.70	0.61
0.65	0.57
0.60	0.52
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.17
0.15	0.13
0.10	0.09
0.05	0.04

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Trifab® VersaGlaze® 451T (FRONT – Thermal)

System U-factor vs Percent of Glass Area



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

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

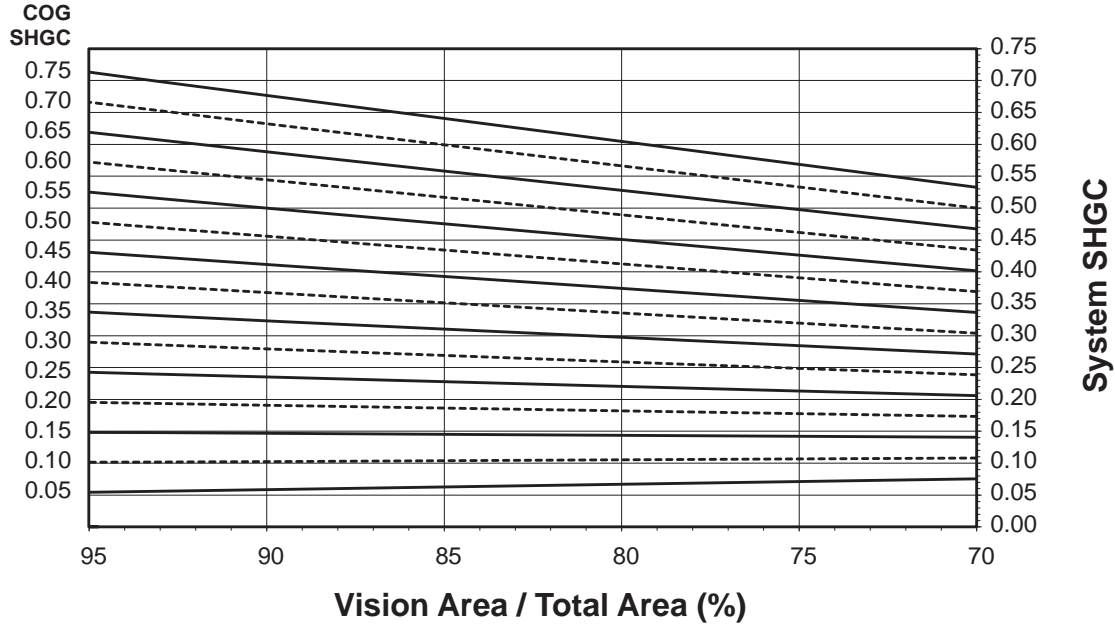
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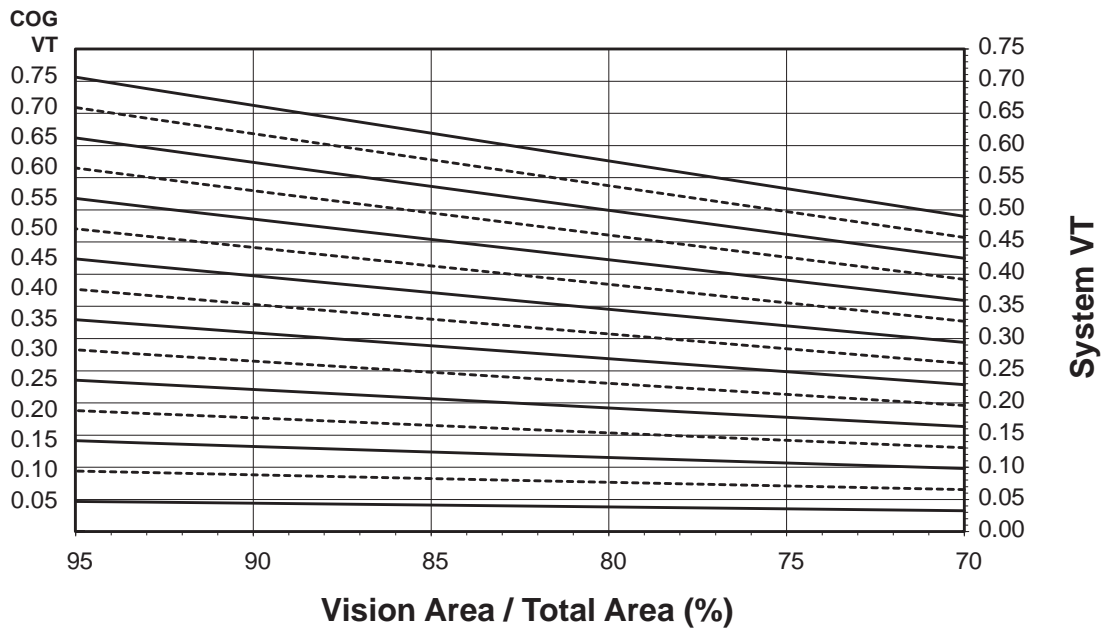
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Trifab® VersaGlaze® 451T (FRONT – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

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

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

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

Glass SHGC ³	Overall SHGC ⁴
0.75	0.67
0.70	0.63
0.65	0.59
0.60	0.54
0.55	0.50
0.50	0.45
0.45	0.41
0.40	0.37
0.35	0.32
0.30	0.28
0.25	0.23
0.20	0.19
0.15	0.15
0.10	0.10
0.05	0.06

Visible Transmittance ²

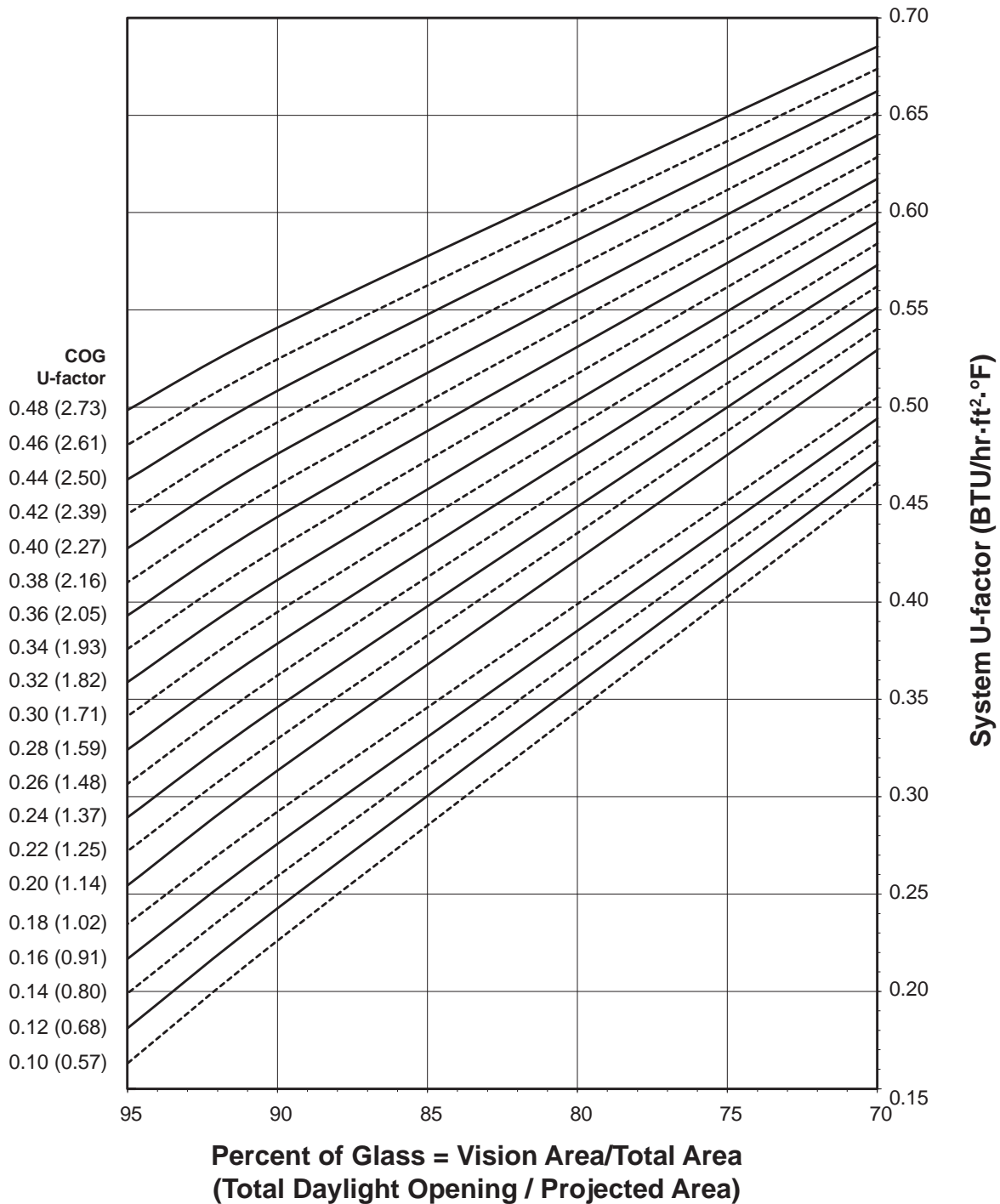
Glass VT ³	Overall VT ⁴
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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

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Trifab® VersaGlaze® 451T (BACK – Thermal)

System U-factor vs Percent of Glass Area



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

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

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

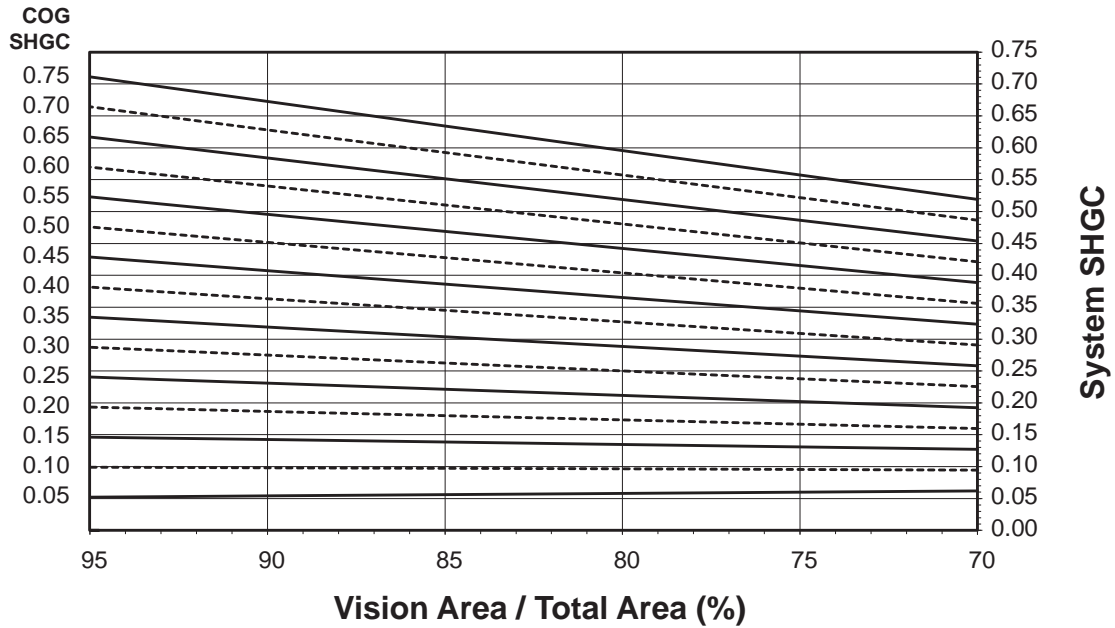
Laws and building and safety codes governing the design and use of Kawneer products, such as glazed entrance, window, and curtain wall products, vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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

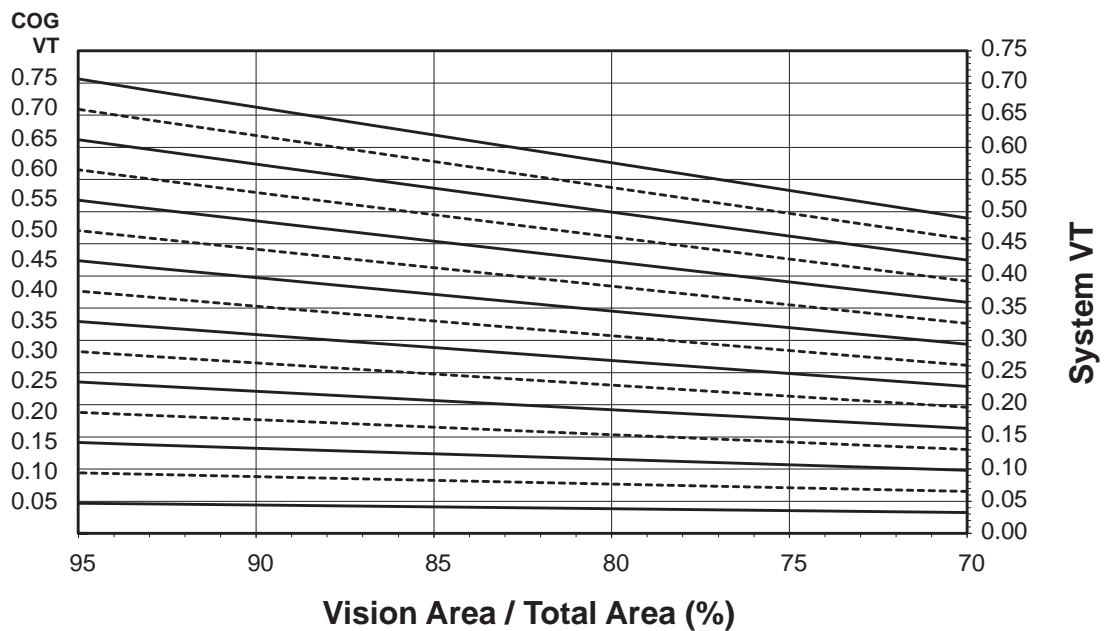
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Trifab® VersaGlaze® 451T (BACK – Thermal)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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

Trifab® VersaGlaze® 451T
(BACK – Thermal)

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

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matricies are based on the standard NFRC specimen size of 2,000 mm wide by 2,000 mm high (78-3/4" by 78-3/4").

SHGC Matrix ²

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

Visible Transmittance ²

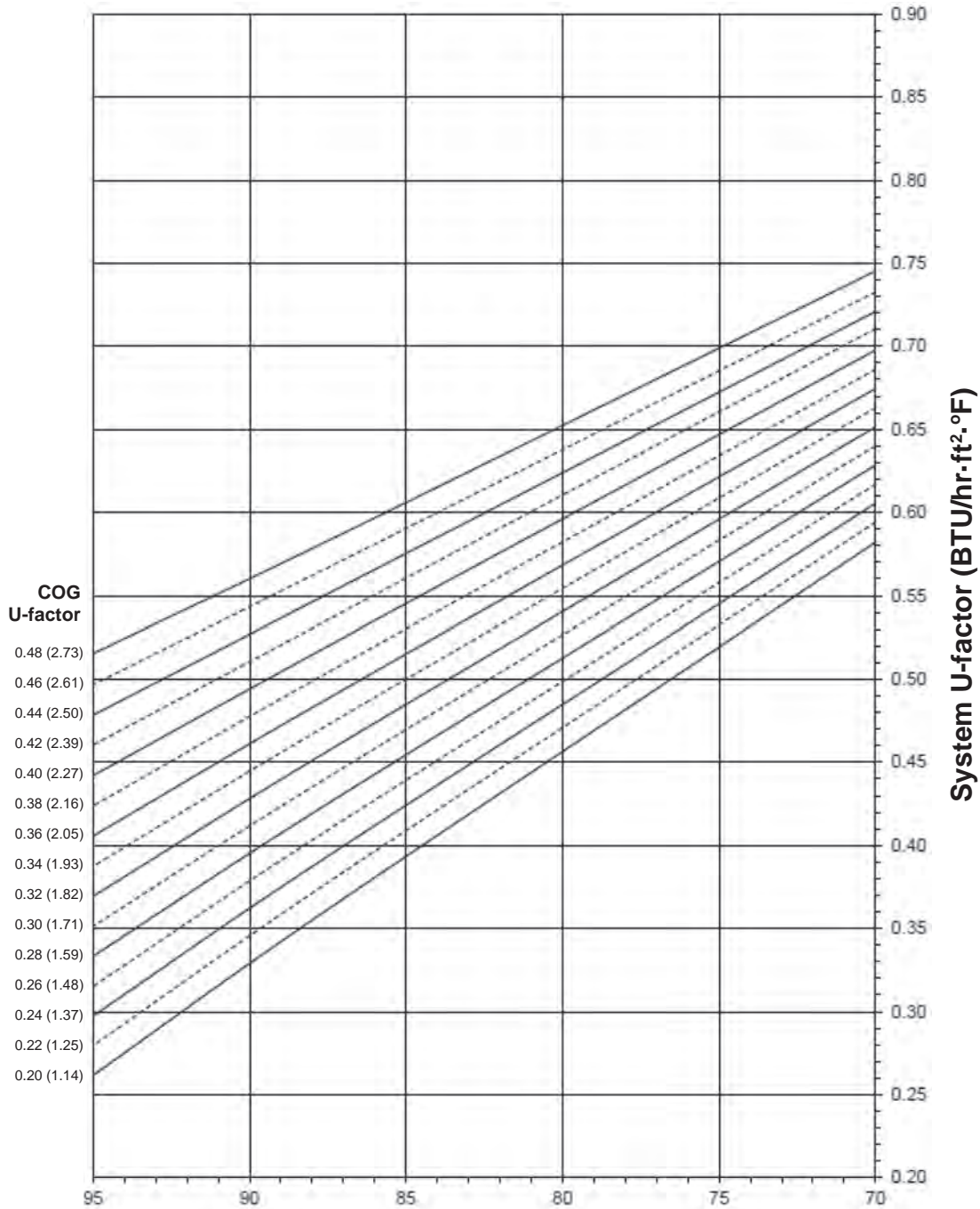
Glass VT ³	Overall VT ⁴
0.75	0.66
0.70	0.61
0.65	0.57
0.60	0.53
0.55	0.48
0.50	0.44
0.45	0.39
0.40	0.35
0.35	0.31
0.30	0.26
0.25	0.22
0.20	0.18
0.15	0.13
0.10	0.09
0.05	0.04

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Trifab® VersaGlaze® 451T with Steel (CENTER)

System U-factor vs Percent of Glass Area



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

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

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

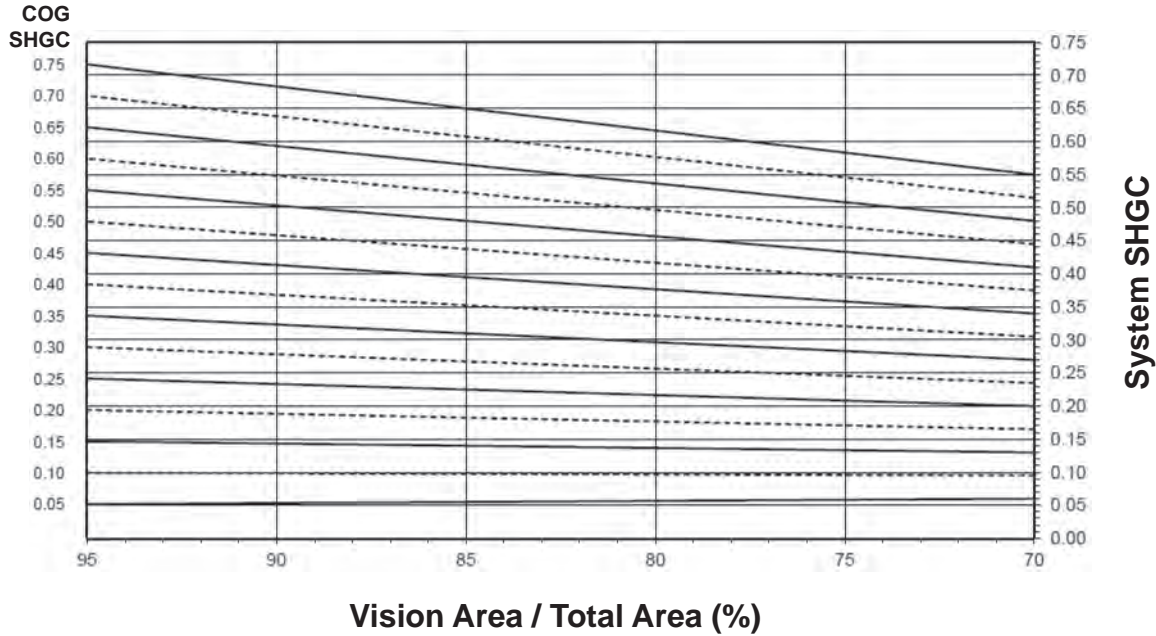
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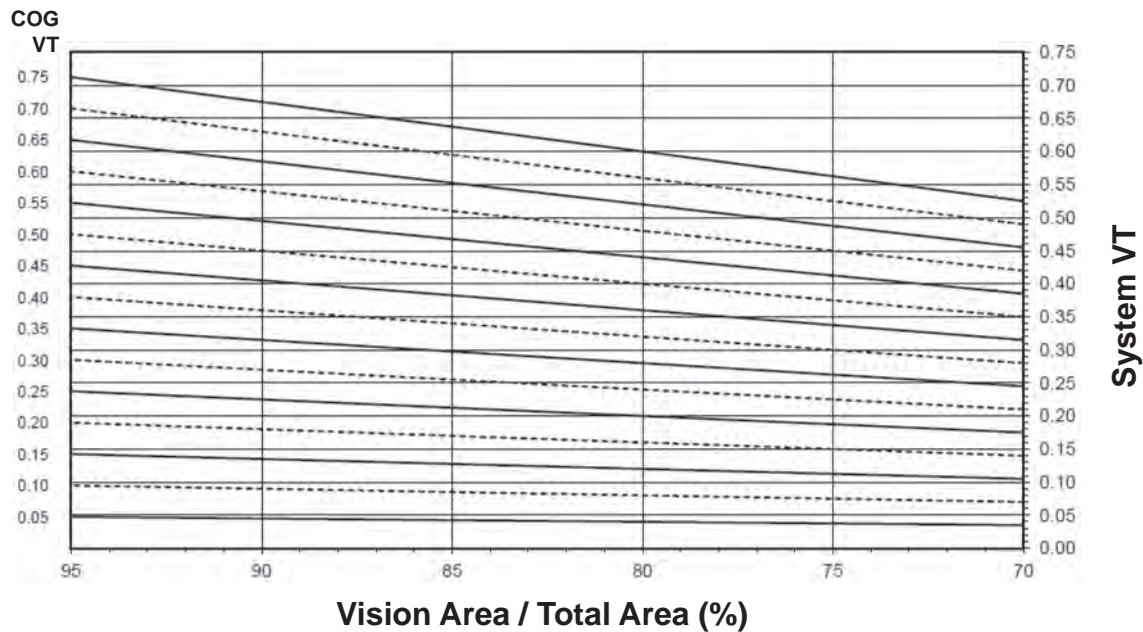
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Trifab® VersaGlaze® 451T with Steel (CENTER)

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



System Visible Transmittance (VT) vs Percent of Vision Area



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

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Trifab® VersaGlaze® 451T with Steel (CENTER)

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

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0.25	0.23
0.20	0.19
0.15	0.14
0.10	0.10
0.05	0.05

Visible Transmittance ²

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

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