



B

STOREFRONTS

- Series 400/450
Center Glaze
 - Series 451/IT451
Center Glaze
 - Flush Front™
 - Accessory Hardware
-

Toll Free Phone Service
(800) 262-5151

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U.S. and Canada

GRL[®]
U.S. ALUMINUM

usalum.com



Round Rock Premium Outlets
Round Rock, TX

U.S. Aluminum knows that fabrication and installation labor costs have always been a decisive factor in selecting framing systems for storefront projects. We offer cost efficient and versatile systems with clean lines and superb performance characteristics. All series may be glazed from the interior or exterior using a top load E.P.D.M. glazing gasket, and all series are compatible with most U.S. Aluminum Entrance Doors.

U.S. Aluminum Storefront Systems can be custom modified to the specific requirements of your project. Our product specialists will work with you to ensure the storefront system you order from us will meet your needs and the approval of your clients.

SYSTEM

PAGES

- **Series 400/450 Center Glaze**01-B1 thru 29-B1
- **Series 451/IT451 Center Glaze**30-B1 thru 56-B1
- **Flush Front™**01-B2 thru 44-B2
- **Accessory Hardware**01-B3 thru 04-B3

For information or other assistance, use our toll free phone
or fax service numbers from anywhere in the U.S. or Canada

Toll Free Phone (800) 262-5151

Toll Free Fax (866) 262-3299

Contact us through our web site at usalum.com

STOREFRONTS

Specifications

Center Glazed

- Series 400
- Series 450
- Series 451

SECTION 08 41 13 ALUMINUM STOREFRONTS

SERIES	FACE WIDTH	DEPTH	GLAZING INFILLS	GLAZING METHOD
400	1-3/4" (44.5)	4" (101.6)	1/4" (6) or 3/8" (10)	Exterior/Interior
450	1-3/4" (44.5)	4-1/2" (114.3)	1/4" (6) or 3/8" (10)	
451	2" (50.8)	4-1/2" (114.3)	1" (25)	

I. GENERAL DESCRIPTION

Work Included: Furnish all necessary materials, labor, and equipment for the complete installation of aluminum framing as shown on the drawings and specified herein. *(Specifier Note: It is suggested that related items such as aluminum entrance doors, glass, and sealants be included whenever possible).*

Work Not Included: Structural support of the framing system, interior closures, trim. *(Specifier list other exclusions).*

Related Work Specified Elsewhere: *(Specifier list).*

QUALITY ASSURANCE

Drawings and specifications are based on the Series *(Specify)* Center Glazed System as manufactured by U.S. Aluminum. Whenever substitute products are to be considered, supporting technical literature, samples, drawings, and performance data must be submitted 10 days prior to bid in order to make a valid comparison of the products involved. Test reports certified by an independent test laboratory must be made available upon request.

PERFORMANCE REQUIREMENTS

Air Infiltration: shall be tested in accordance with ASTM E 283. Infiltration shall not exceed .06 cfm per square foot (.0003m³/sm²) of fixed area when tested at 6.24 psf (300 Pa).

Water Infiltration: shall be tested in accordance with ASTM E 331. No water penetration at test pressure of

8 psf (384 Pa). When tested with the high performance subsill.

Structural Performance: shall be tested in accordance with ASTM E 330 and based on:

- Maximum deflection of L/175 of the span
- Allowable stress with a safety factor of 1.65

The system shall perform to this criteria under a windload of *(Specify)* psf.

Testing Procedures -

ASTM 283, E 331, and E 330 - Laboratory performance testing. AAMA 503-08 - Newly installed storefronts. AAMA 511-08 - Installed storefronts after six months.

II. PRODUCTS MATERIALS

Extrusions shall be 6063-T5 alloy and temper (ASTM B221 alloy T5 temper). Fasteners, where exposed, shall be aluminum, stainless steel or zinc plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Glazing gaskets shall be E.P.D.M. elastomeric extrusions.

FINISH

All exposed framing surfaces shall be free of scratches and other serious blemishes. Aluminum extrusions shall be given a caustic etch followed by an anodic oxide treatment to obtain... *(Specify one of the following):*

- _____ #11 Clear anodic coating
- _____ #22 Dark Bronze anodic coating
- _____ #33 Black anodic coating

A Fluoropolymer paint coating conforming with the requirements of AAMA 2605. Color shall be *(Specify a U.S. Aluminum standard color).*

FABRICATION

The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of *(Specify)*. Overall depth shall be *(Specify)*. Entrance framing members shall be compatible with glass framing in appearance. Provide for internal drainage of infiltrated water into an extruded aluminum subsill channel where it is drained to the exterior through weep slots.

III. EXECUTION INSTALLATION

All glass framing shall be set in correct locations as shown in the details and shall be level, square, plumb, and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings. All joints between framing and the building structure shall be sealed in order to secure a watertight installation.

PROTECTION AND CLEANING

After installation the General Contractor shall adequately protect exposed portions of aluminum surfaces from damage by grinding and polishing compounds, plaster, lime, acid, cement or other contaminants. The General Contractor shall be responsible for final cleaning.

Specifications

Center Glazed Stacking

- Series 400-S
- Series 450-S
- Series 451-S

SECTION 08 41 13 ALUMINUM STOREFRONTS

SERIES	FACE WIDTH	HEAD/SILL DEPTH	GLAZING INFILLS	GLAZING METHOD
400-S	1-3/4" (44.5)	4-1/4" (108)	1/4" (6) or 3/8" (10)	Exterior/Interior
450-S	1-3/4" (44.5)	4-3/4" (120.7)	1/4" (6) or 3/8" (10)	
451-S	2" (50.8)	4-3/4" (120.7)	1" (25)	

I. GENERAL DESCRIPTION

Work Included: Furnish all necessary materials, labor, and equipment for the complete installation of aluminum framing as shown on the drawings and specified herein. (*Specifier Note: It is suggested that related items such as aluminum entrance doors, glass, and sealants be included whenever possible.*)

Work Not Included: Structural support of the framing system, interior closures, trim. (*Specifier list other exclusions.*)

Related Work Specified Elsewhere: (*Specifier list.*)

QUALITY ASSURANCE

Drawings and specifications are based on the Series (*Specify*) Center Glazed Stacking System as manufactured by U.S. Aluminum. Whenever substitute products are to be considered, supporting technical literature, samples, drawings, and performance data must be submitted 10 days prior to bid in order to make a valid comparison of the products involved. Test reports certified by an independent test laboratory must be made available upon request.

PERFORMANCE REQUIREMENTS

Air Infiltration: shall be tested in accordance with ASTM E 283. Infiltration shall not exceed .06 cfm per square foot (.0003m³/sm²) of fixed area when tested at 6.24 psf (300 Pa).

Water Infiltration: shall be tested in accordance with ASTM E 331. No water penetration at test pressure of 8 psf (384 Pa). When tested with the high performance subsill.

Structural Performance: shall be tested in accordance with ASTM E 330 and based on:

- Maximum deflection of L/175 of the span
- Allowable stress with a safety factor of 1.65

The system shall perform to this criteria under a windload of (*Specify*) psf. Testing Procedures- ASTM 283, E 331, and E 330 - Laboratory performance testing. AAMA 503-08 - Newly installed storefronts. AAMA 511-08 - Installed storefronts after six months.

II. PRODUCTS MATERIALS

Extrusions shall be 6063-T5 alloy and temper (ASTM B221 alloy T5 temper). Fasteners, where exposed, shall be aluminum, stainless steel or zinc plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Glazing gaskets shall be E.P.D.M. elastomeric extrusions.

FINISH

All exposed framing surfaces shall be free of scratches and other serious blemishes. Aluminum extrusions shall be given a caustic etch followed by an anodic oxide treatment to obtain... (*Specify one of the following*):

- ____ #11 Clear anodic coating
- ____ #22 Dark Bronze anodic coating
- ____ #33 Black anodic coating

A Fluoropolymer paint coating conforming with the requirements of AAMA 2605. Color shall be (*Specify a U.S. Aluminum standard color*).

FABRICATION

The framing system shall provide continuous head and sill channels spliced together with formed brake metal sleeves at center of vertical mullions as required for thermal expansion and to ensure a continuous sill gutter to handle infiltrated water. The sill channel shall provide for exterior weepage through 1/4" (6.4) diameter weep holes located at approximately 6" (152.4) on each side of vertical mullions. The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of (*Specify*). Overall depth shall be (*Specify*). Entrance framing members shall be compatible with glass framing in appearance.

III. EXECUTION INSTALLATION

All glass framing shall be set in correct locations as shown in the details and shall be level, square, plumb, and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings. All joints between framing and the building structure shall be sealed in order to secure a watertight installation.

PROTECTION AND CLEANING

After installation the General Contractor shall adequately protect exposed portions of aluminum surfaces from damage by grinding and polishing compounds, plaster, lime, acid, cement or other contaminants. The General Contractor shall be responsible for final cleaning.

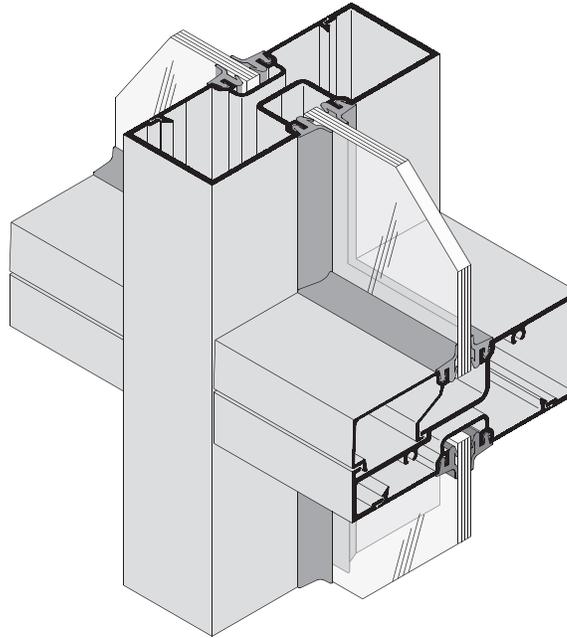
STOREFRONTS

Technical Data

Center Glazed

- Series 400 & 400-S
- Series 450 & 450-S
- Series 451 & 451-S

Fabrication and installation labor costs have always been a decisive factor in selecting framing systems for storefront projects. U.S. Aluminum offers cost efficient versatile Center Glazed Systems with clean lines and superb performance. Series 400, 450, and 451 offer simple panel type installation. Series 400-S, 450-S, and 451-S feature stacking type installation. All series may be interior or exterior glazed. A top load E.P.D.M. gasket is used to position and weatherseal the glass in the aluminum pocket. Center Glazed Systems are compatible with most U.S. Aluminum Entrance Doors. See page 01-B3 for E.P.D.M. gasket options.



SERIES	WIDTH	DEPTH	GLAZING INFILLS	APPLICATION
400 or 400-S	1-3/4" (44.5)	4" (101.6)	1/4" (6) or 3/8" (10)	Retail Shopping Centers, Schools, Post Offices, Clinics or Any Ground Floor Application
450 or 450-S	1-3/4" (44.5)	4-1/2" (114.3)	1/4" (6) or 3/8" (10)	
451 or 451-S	2" (50.8)	4-1/2" (114.3)	1" (25)	

GLASS SIZES*	
For Series 400 and 450 Glass Width and Glass Height	= Daylight Opening + 5/8" (15.9)
For Series 451 Glass Width and Glass Height	= Daylight Opening + 7/8" (22.2)

* These formulae do not take into account glass tolerances. Consult glass manufacturer before ordering glass.

Technical Data

EXPANSION MULLIONS

Center Glazed

- Series 400 & 400-S
- Series 450 & 450-S
- Series 451 & 451-S
- Series IT451



• In large openings locate expansion mullions approximately every 20' (6.1 m) or as required per job conditions and project specifications.

• Maximum distance between expansion members should be:

$$\text{In feet: } = \frac{2422.5}{\text{temperature difference } ^\circ\text{F}} \qquad \text{In meters: } = \frac{410.21}{\text{temperature difference } ^\circ\text{C}}$$

- Two piece mullions allow for 3/8" (9.5 mm) maximum movement.
- Gap between half members should be based on the temperature at the time of installation.

NOTE: Expansion mullions are not required for Series 400-S, 450-S, and 451-S elevations without intermediate horizontals.

EXAMPLE

	Units		Units	
Temperature difference	°F	120° (from 30° to 150°)	°C	66.7° (from - 1.1° to 65.6°)
Intermediate vertical spacing	feet	4'	meters	1.22 m
Maximum distance between expansion mullions	feet	$\frac{2422.5}{120} = \mathbf{20.18'}$	meters	$\frac{410.21}{66.7} = \mathbf{6.15 m}$

USE ONE EXPANSION MULLION EVERY FIVE BAYS.

GAP AT THE TIME OF INSTALLATION SHOULD BE BASED ON THE FOLLOWING RATIO:

$$\frac{\text{Maximum temperature} - \text{Actual temperature}}{\text{Maximum temperature} - \text{Minimum temperature}}$$

	°F		°C	
If installed at		70°		21.11°
Gap at time of installation	inches	$\left(\frac{150^\circ - 70^\circ}{150^\circ - 30^\circ}\right) \times 3/8''$	mm.	$\left(\frac{65.6^\circ - 21.1^\circ}{65.6^\circ + 1.1^\circ}\right) \times 9.5 \text{ mm}$
		= 1/4"		= 6.4 mm

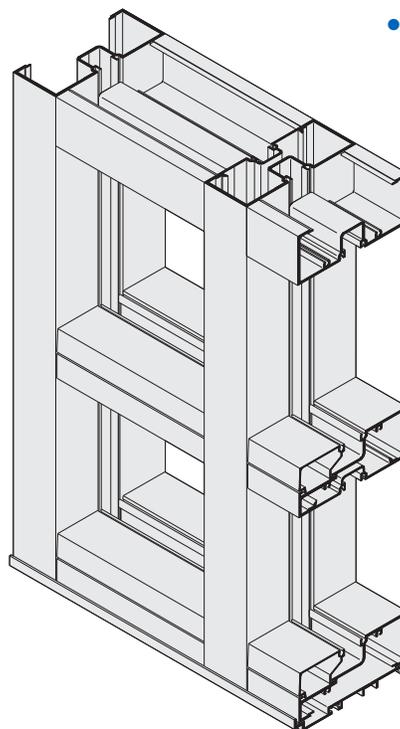
STOREFRONTS

Special Features

Panel type installations feature screw race joinery which may be shop fabricated and shipped to the job site partially or totally assembled into panels. The assembled panel units are then snapped together into long runs. AF100, AF400 or FF400 subsill should always be used with this type installation. AF400 or FF400 subsill is required if optional head anchor clips are used.

Center Glazed

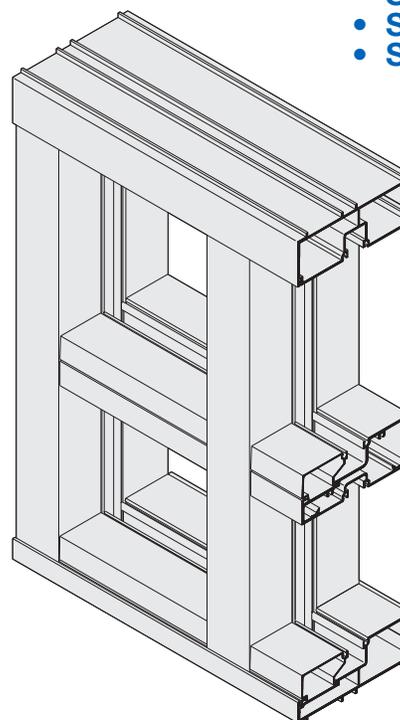
- Series 400
- Series 450
- Series 451



Center Glazed Stacking

- Series 400-S
- Series 450-S
- Series 451-S

The Stacking System has continuous head and sill channels spliced together with extruded aluminum splice sleeves as required for thermal expansion. Vertical mullions are stacked into the head and sill channels without mechanical fastening to provide for metal expansion and building deflection. Infiltrated water is weeped to the exterior through weep holes located approximately 6" (152.4) on each side of vertical mullions. System may be exterior/interior glazed.

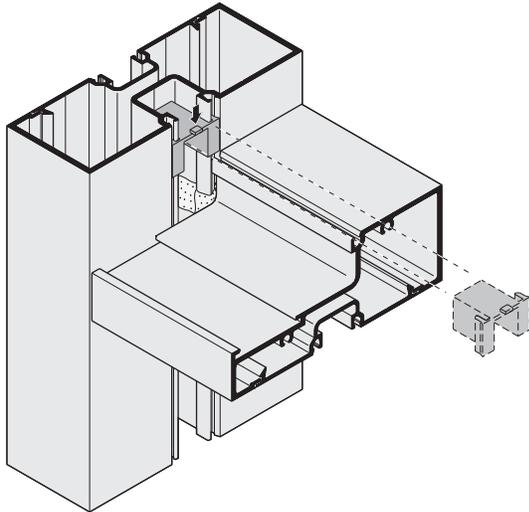


Special Features

Center Glazed

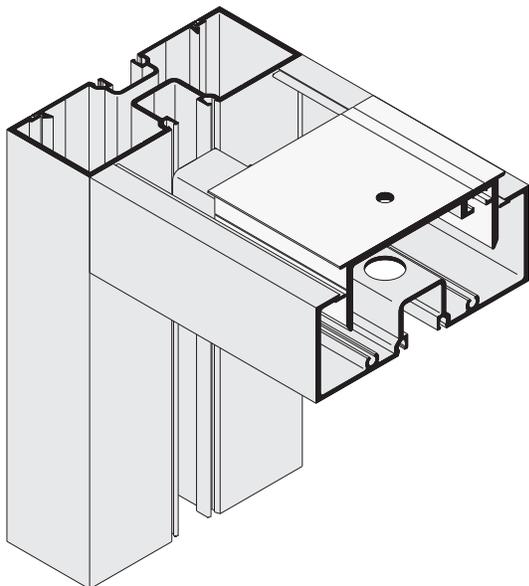
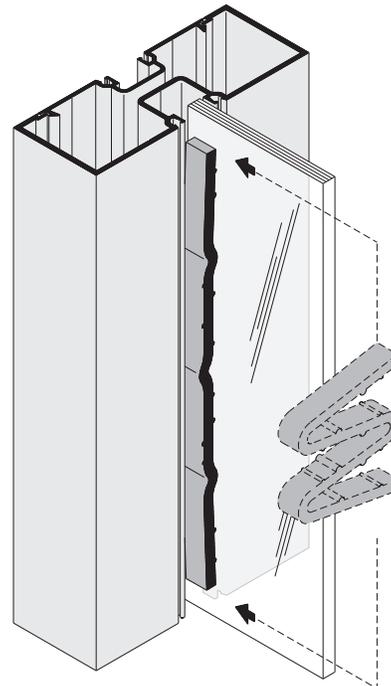
- Series 400 & 400-S
- Series 450 & 450-S
- Series 451 & 451-S
- Series IT451

Details show Series 450 members. Other Series are similar



Apply silicone to two sides of glazing pocket at vertical/horizontal joint and glazing reglets. Slide Water Deflector down into position. Seal over top edges of Water Deflector leaving a gap on outside edge allowing water to drain into Subsill.

Stretch "W" Block and slide it between glass and mullion into deep glazing pocket. Push it all the way until it clears glass and locks into place. These blocks are used to prevent glass from "walking" out of the pocket caused by extreme vibration or minor earthquakes.



When optional Head Anchors are used, fasten them to structure through head member access hole. Anchors may be shimmed as required. Use AF400 or FF400 Subsill when using option Head Anchors.

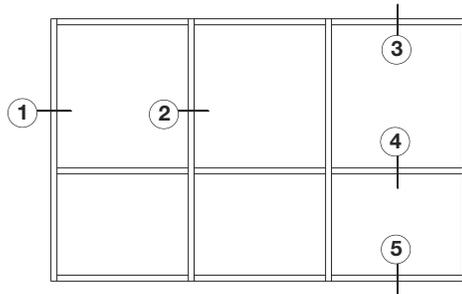
STOREFRONTS

Typical Details

Center Glazed • Series 400

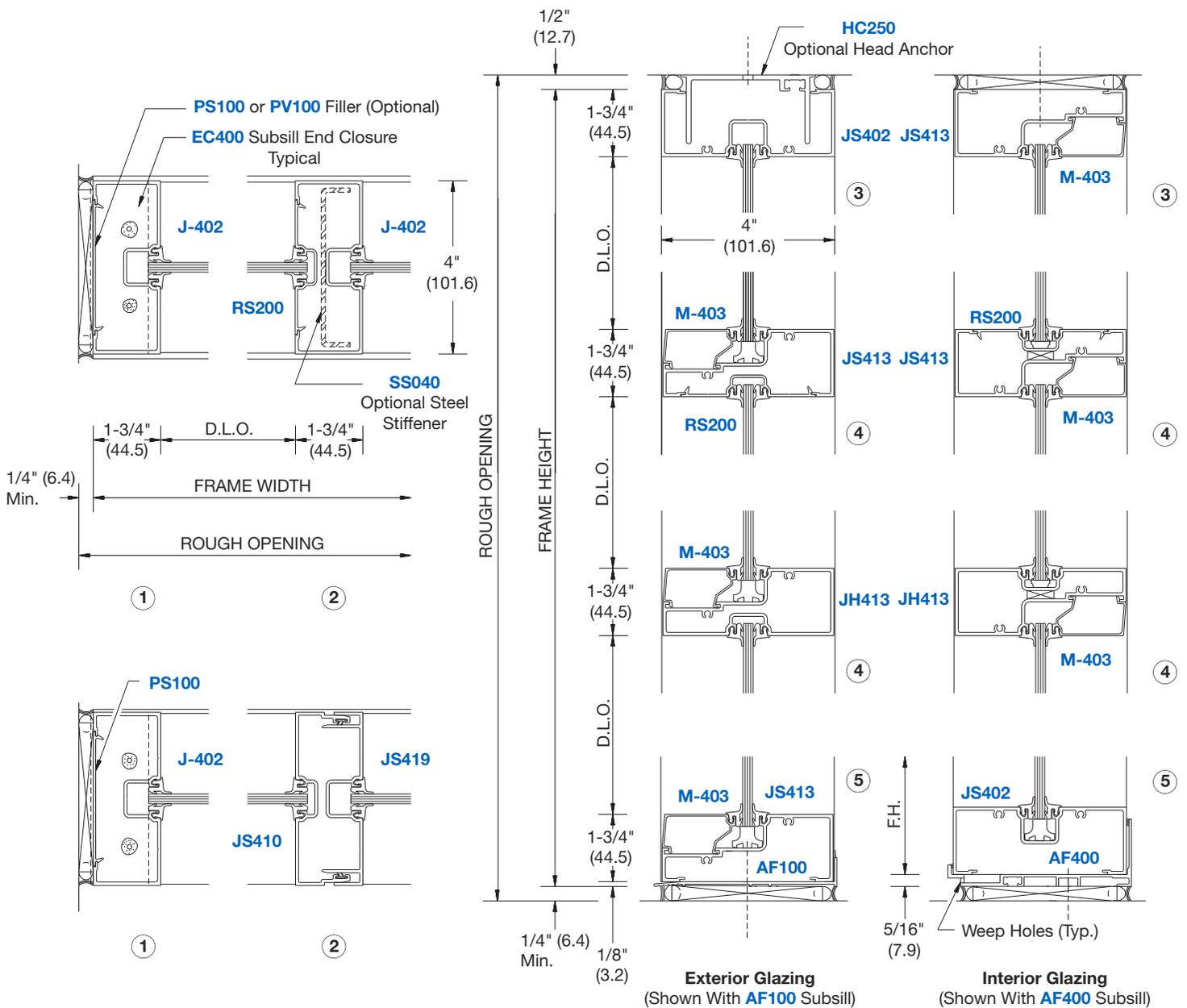
SCREW RACE JOINERY FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.



TYPICAL ELEVATION

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



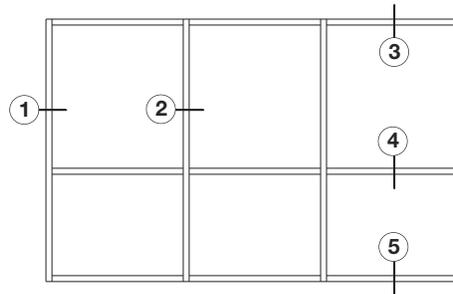
STOREFRONTS

Typical Details

Center Glazed • Series 400

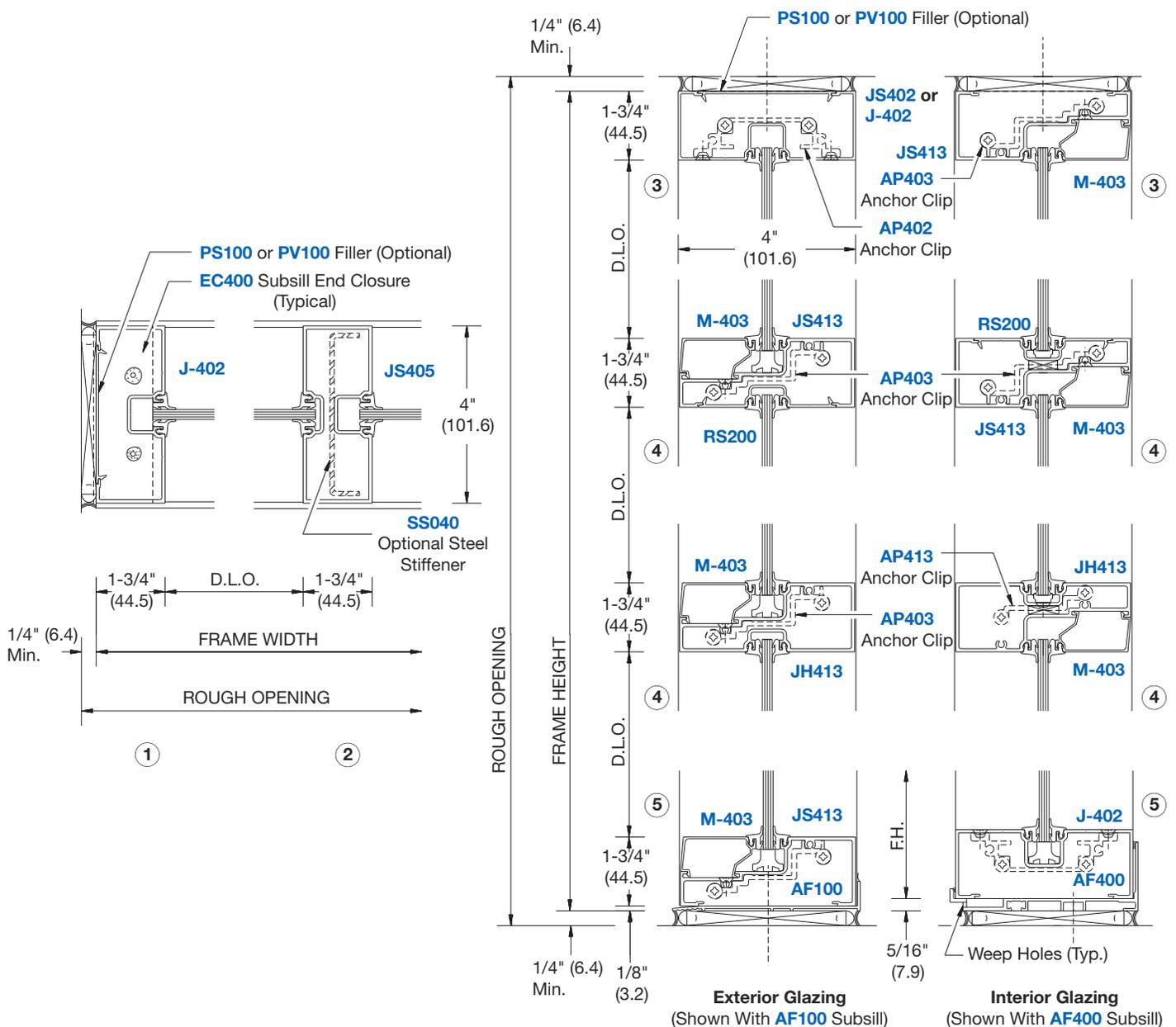
ANCHOR CLIP JOINERY FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.



TYPICAL ELEVATION

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



NOT TO SCALE

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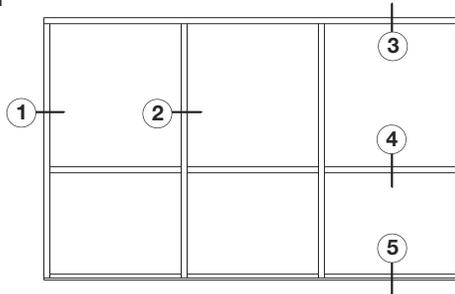
STOREFRONTS

Typical Details

Center Glazed Stacking • Series 400-S

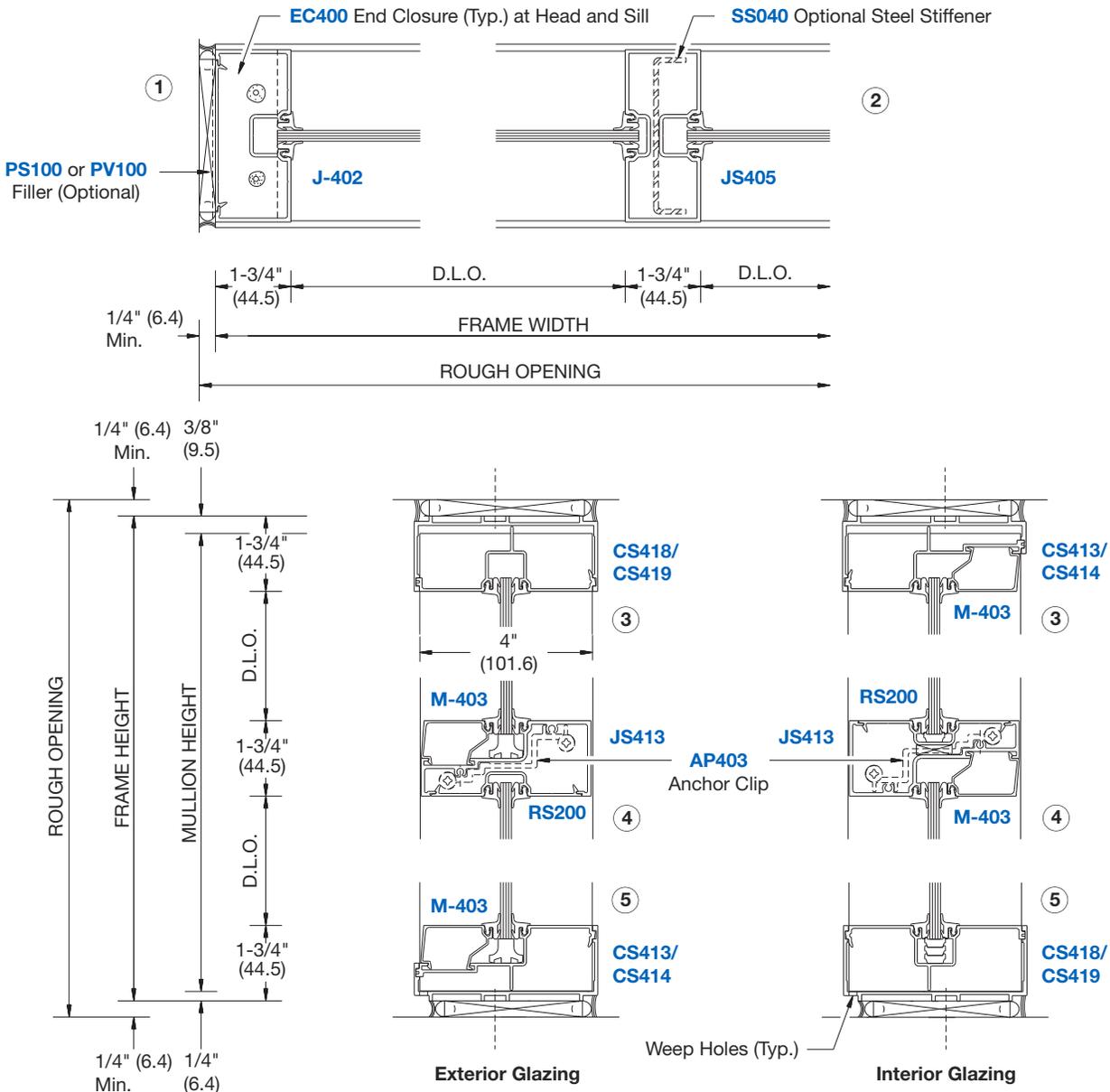
STACKING INSTALLATION FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.



TYPICAL ELEVATION

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



NOT TO SCALE

STOREFRONTS

Typical Details

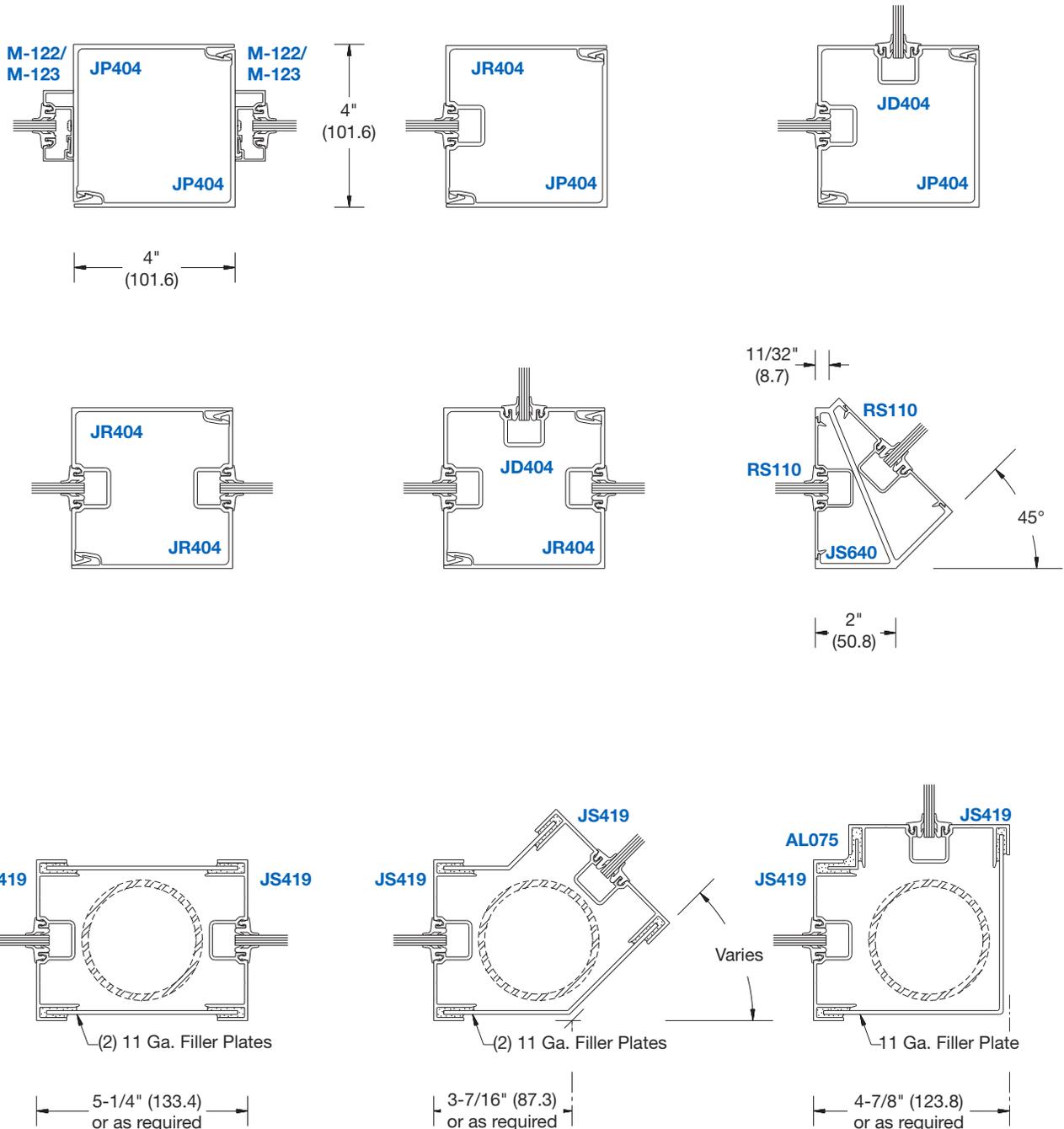
Center Glazed

- Series 400
- Series 400-S

CORNER CONDITIONS AND POST COVERS FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



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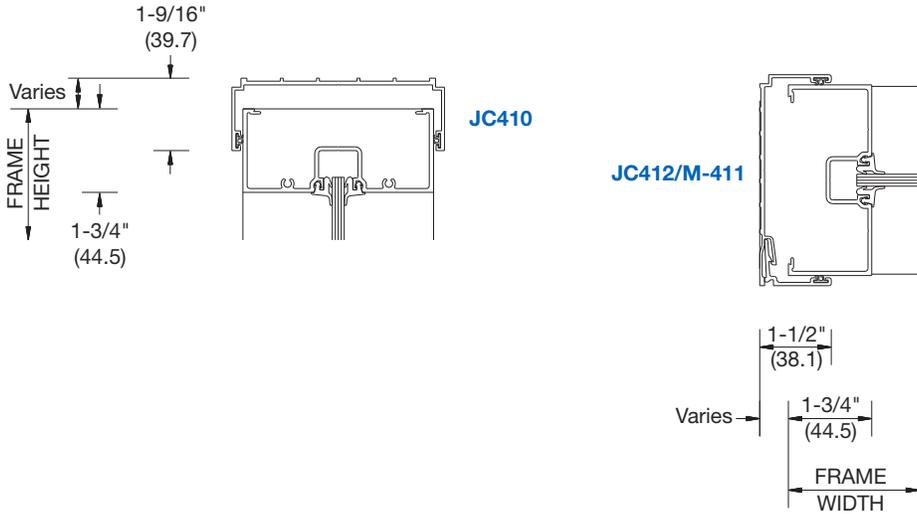
STOREFRONTS

Typical Details

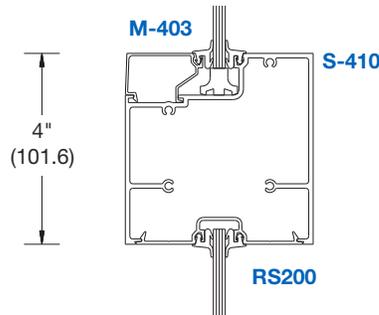
**COMPENSATING CHANNELS
(FOR HEAD AND JAMBS)
FOR 1/4" (6) OR 3/8" (10) GLAZING**

Center Glazed
 • Series 400
 • Series 400-S

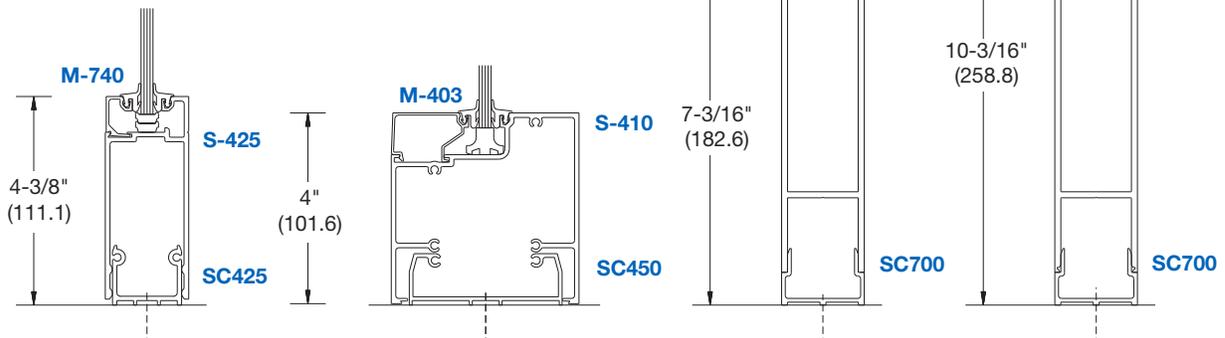
NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
 NP238 Glazing Gaskets are used for 3/8" (10) glazing.



4" HIGH HORIZONTAL MEMBER



BULKHEADS (IN LIEU OF STANDARD SILLS)



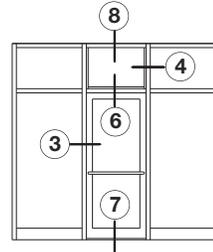
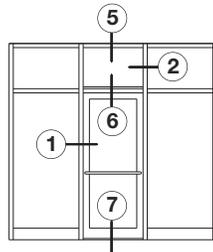
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STOREFRONTS

Typical Details

DOOR FRAMING FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.



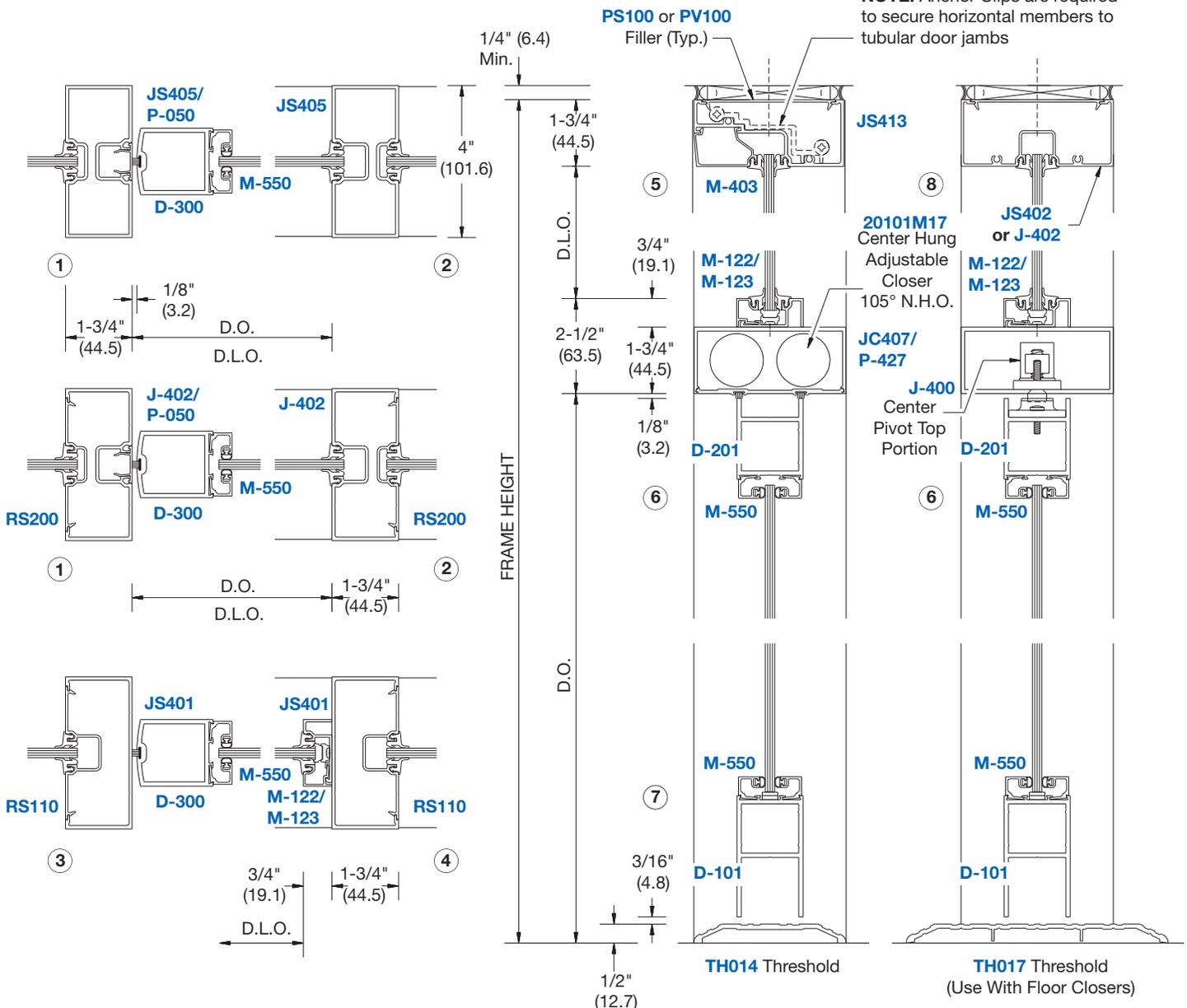
Center Glazed

- Series 400
- Series 400-S

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.

CENTER HUNG DOORS

NOTE: Anchor Clips are required to secure horizontal members to tubular door jambs



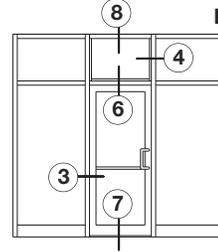
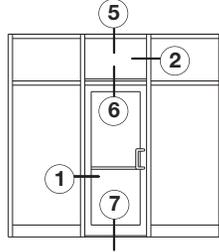
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STOREFRONTS

Typical Details

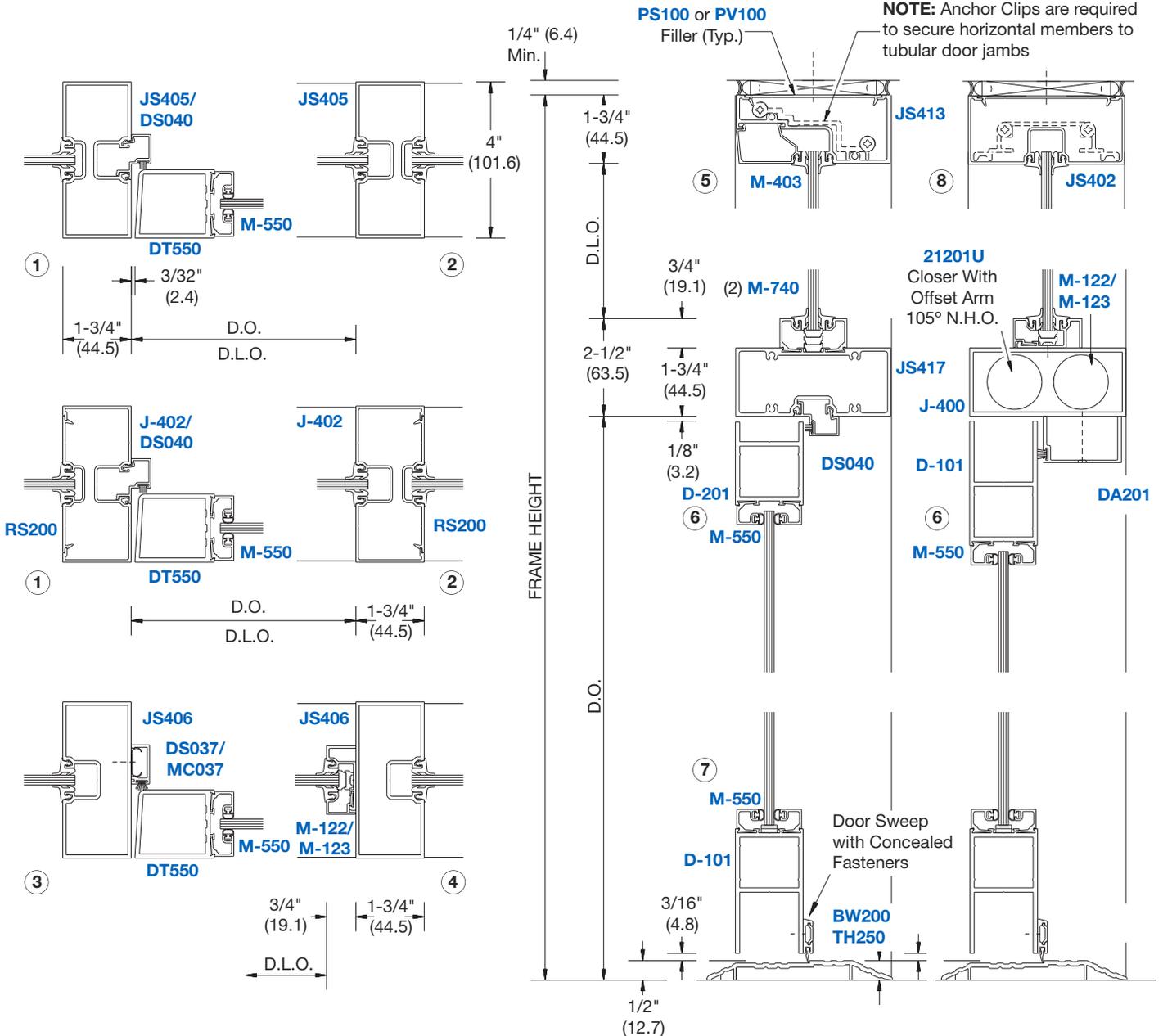
DOOR FRAMING FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.



NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.

OFFSET HUNG DOORS



NOT TO SCALE

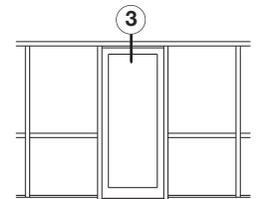
Typical Details

DOOR FRAMING SPECIAL CONDITIONS FOR 1/4" (6) OR 3/8" (10) GLAZING

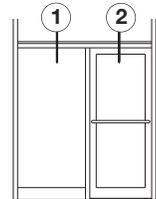
Center Glazed

- Series 400
- Series 400-S

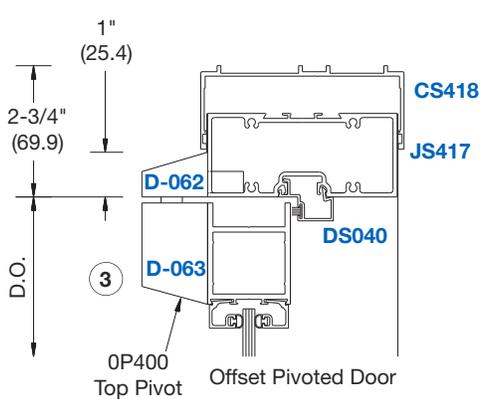
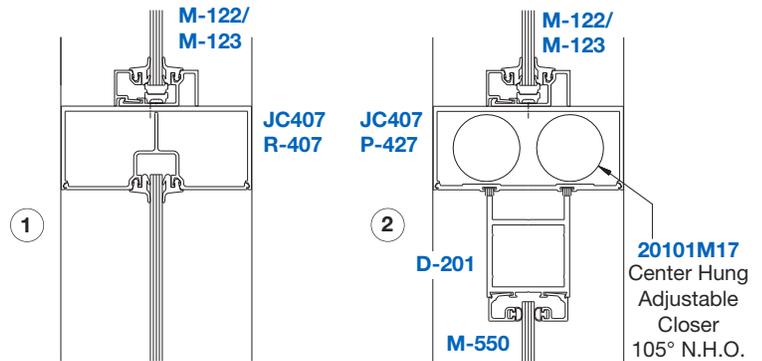
NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.



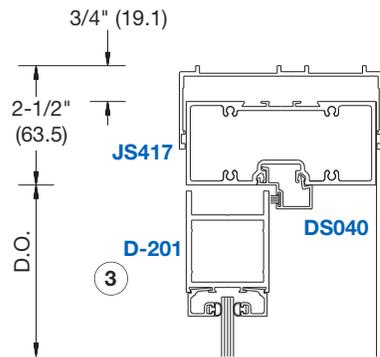
Series 400-S Door Header



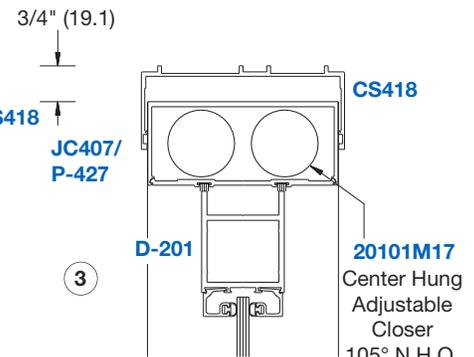
Continuous Header



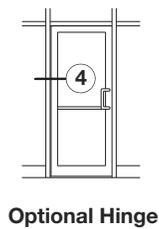
Offset Pivoted Door



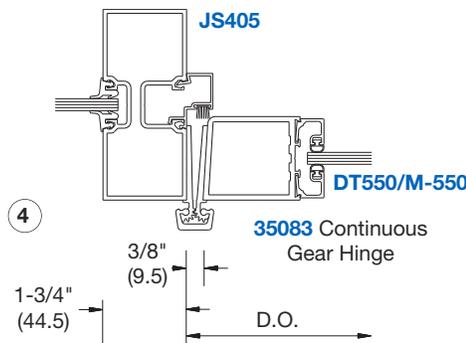
Butt Hung Door



Center Pivoted Door



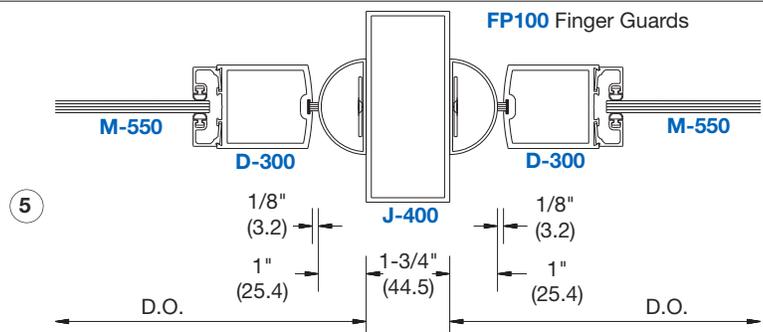
Optional Hinge



35083 Continuous Gear Hinge



Automatic Door Hinging Jamb



NOT TO SCALE

STOREFRONTS

Windload Charts

Center Glazed

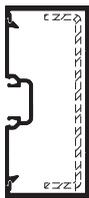
- Series 400
- Series 400-S

STANDARD WALL VERTICAL MULLIONS FOR 1/4" (6) OR 3/8" (10) GLAZING

Deflection criteria to be in accordance with AAMA TIR-A11 - L/175 or L/240 + 1/4" (6.4 mm) for spans greater than 13'-6" (4.1 m) but less than 40'-0" (12.2 m). Codes and specifications may vary. No single lite of glass shall deflect more than 3/4" (19 mm). Glass is not considered as contributing to resistance of deflection. Aluminum alloy 6063-T6 allowable stress for windload is 15,200 psi. (89 MPa), and steel reinforcing allowable stress for windload is 21,600 psi. (183 MPa).

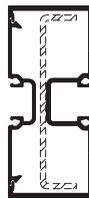
These charts include unbraced length analysis and are based on at least one horizontal being placed at the midpoint of the span. For other applications, please contact U.S. Aluminum Technical Sales at (800) 262-5151, or visit our web site at usalum.com.

Limitation of vertical mullions for:
 CURVES **A** = 15 PSF (718 Pa)
 CURVES **B** = 20 PSF (957 Pa)
 CURVES **C** = 25 PSF (1197 Pa)
 CURVES **D** = 30 PSF (1436 Pa)
 CURVES **E** = 40 PSF (1915 Pa)



JS401/RS200
 $I = 2.365 (98.44 \times 10^4)$
 $S = 1.183 (19.39 \times 10^3)$

IAL+STL = 4.702 (195.71×10^4)



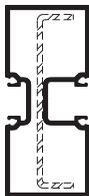
J-402/RS200
 $I = 2.054 (85.49 \times 10^4)$
 $S = 1.027 (16.83 \times 10^3)$

IAL+STL = 4.391 (182.77×10^4)



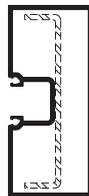
JS402/RS200
 $I = 2.116 (88.07 \times 10^4)$
 $S = 1.058 (17.34 \times 10^3)$

IAL+STL = 4.453 (185.35×10^4)



JS405
 $I = 1.989 (82.79 \times 10^4)$
 $S = .995 (16.31 \times 10^3)$

IAL+STL = 4.326 (180.08×10^4)



JS406
 $I = 1.970 (82 \times 10^4)$
 $S = .994 (16.29 \times 10^3)$

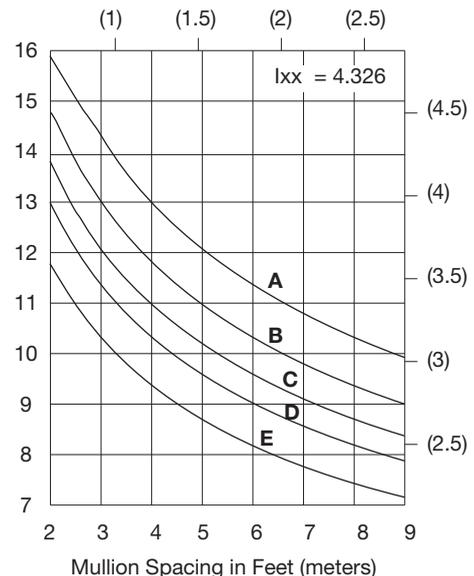
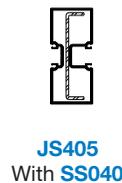
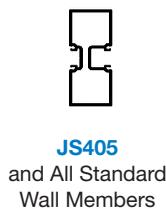
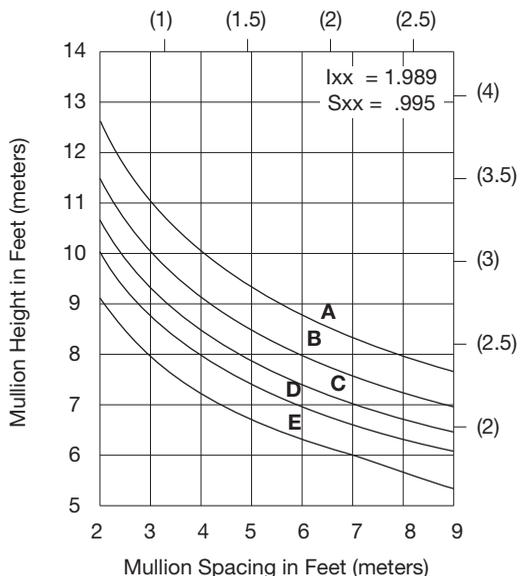
IAL+STL = 4.307 (179.27×10^4)



JS410/JS419
 $I = 2.646 (110.13 \times 10^4)$
 $S = 1.323 (21.68 \times 10^3)$

IAL+STL = 4.301 (179.02×10^4)
 (with SS469)

Following charts are based on the section properties of **JS405**.



NOT TO SCALE

Online usalum.com By Phone (800) 262-5151
 Online crlaurence.com By Phone (800) 421-6144

Deadload Charts

INTERMEDIATE HORIZONTAL MULLIONS

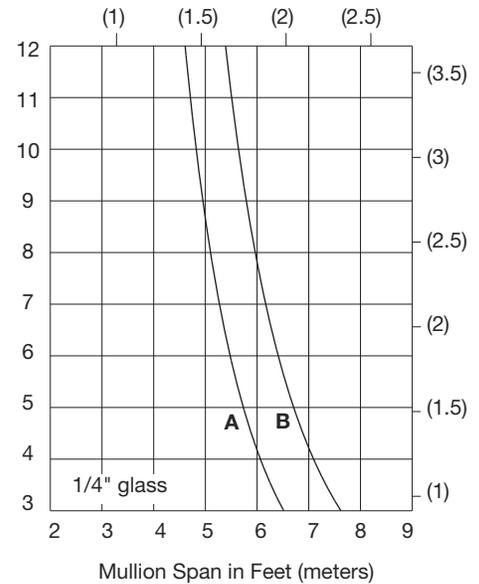
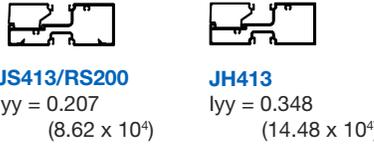
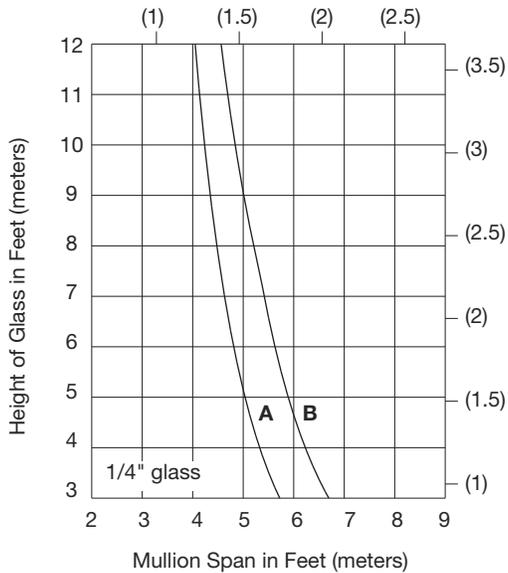
FOR 1/4" (6) OR 3/8" (10) GLAZING

Center Glazed

- Series 400
- Series 400-S

Deadload charts are based on 1/8" (3.2) maximum allowable deflection at the center point of the horizontal mullion and on a glass weight of 3.25 p.s.f. (15.87 Kg/m²)
Glass shall rest on two setting blocks located at:

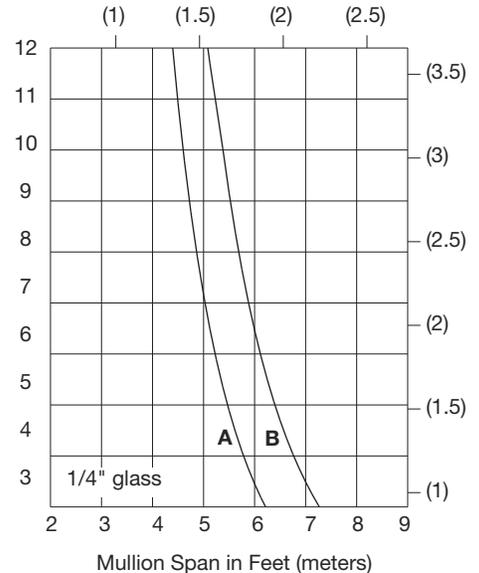
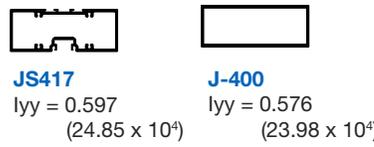
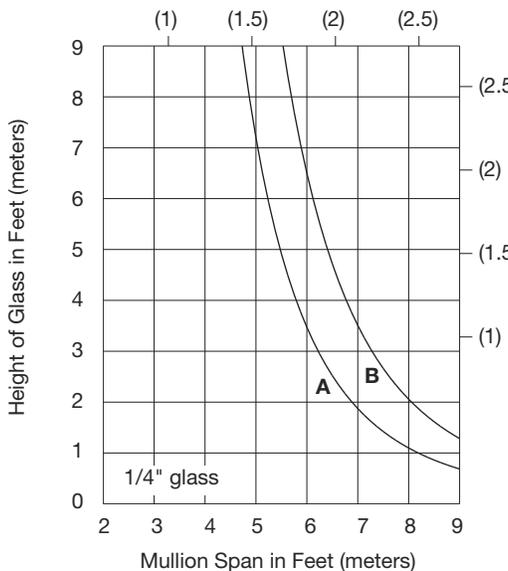
CURVES **A** = 1/4 points
CURVES **B** = 1/8 points or 8" (203.2) from corners, whichever is larger



DOOR HEADERS

Deadload charts for door headers are based on 1/16" (1.6) maximum allowable deflection at the center point of the header and on a glass weight of 3.25 p.s.f. (15.87 Kg/m²)
Glass shall rest on two setting blocks located at:

CURVES **A** = 1/4 points
CURVES **B** = 1/8 points or 8" (203.2) from corners, whichever is larger



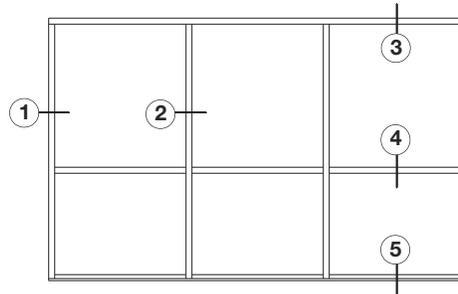
STOREFRONTS

Typical Details

Center Glazed
• Series 450-S

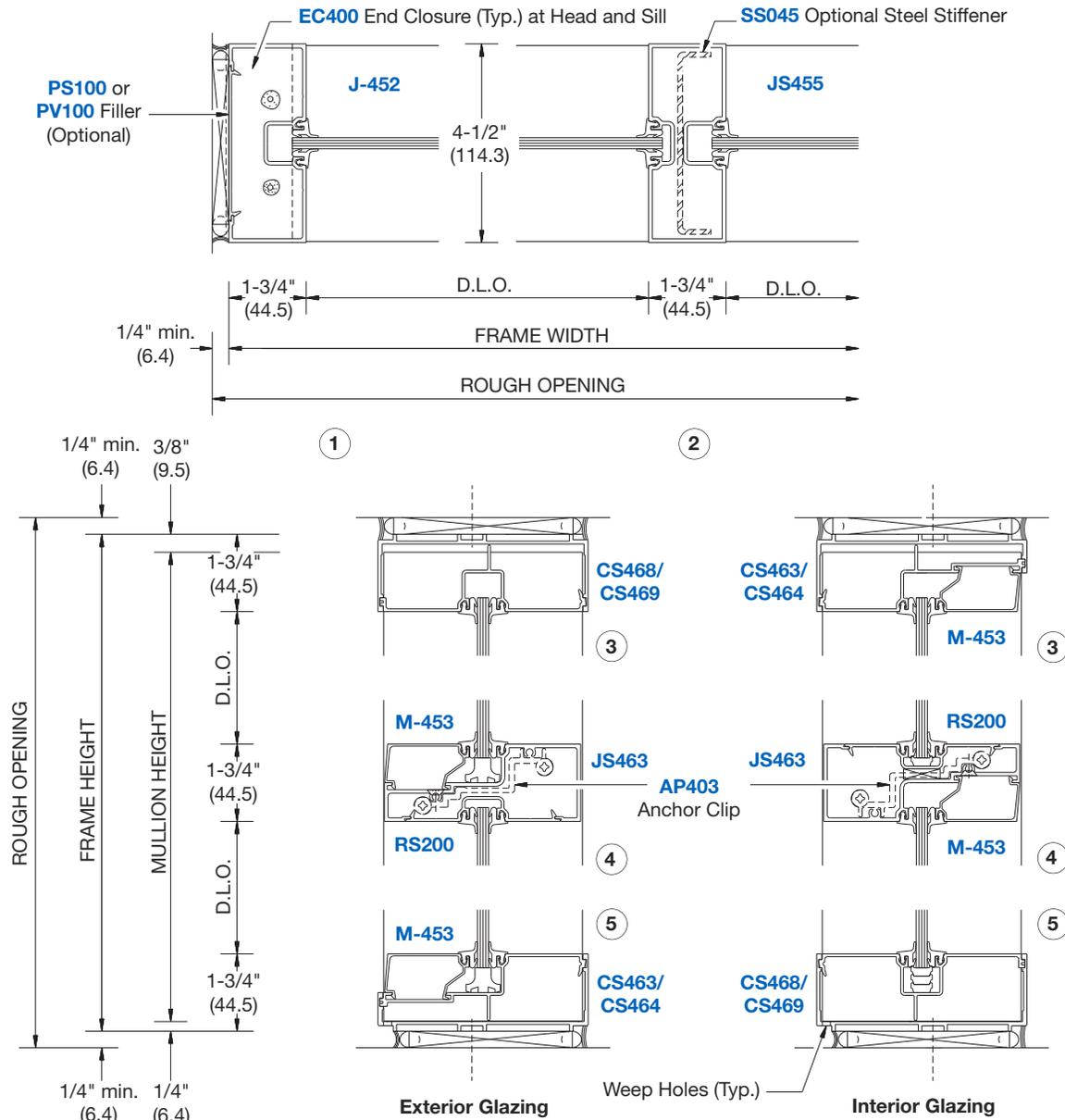
FOR 1/4" (6) OR 3/8" (10) GLAZING STACKING INSTALLATION

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.



TYPICAL ELEVATION

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



NOT TO SCALE

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Online crlaurence.com By Phone (800) 421-6144

STOREFRONTS

Typical Details

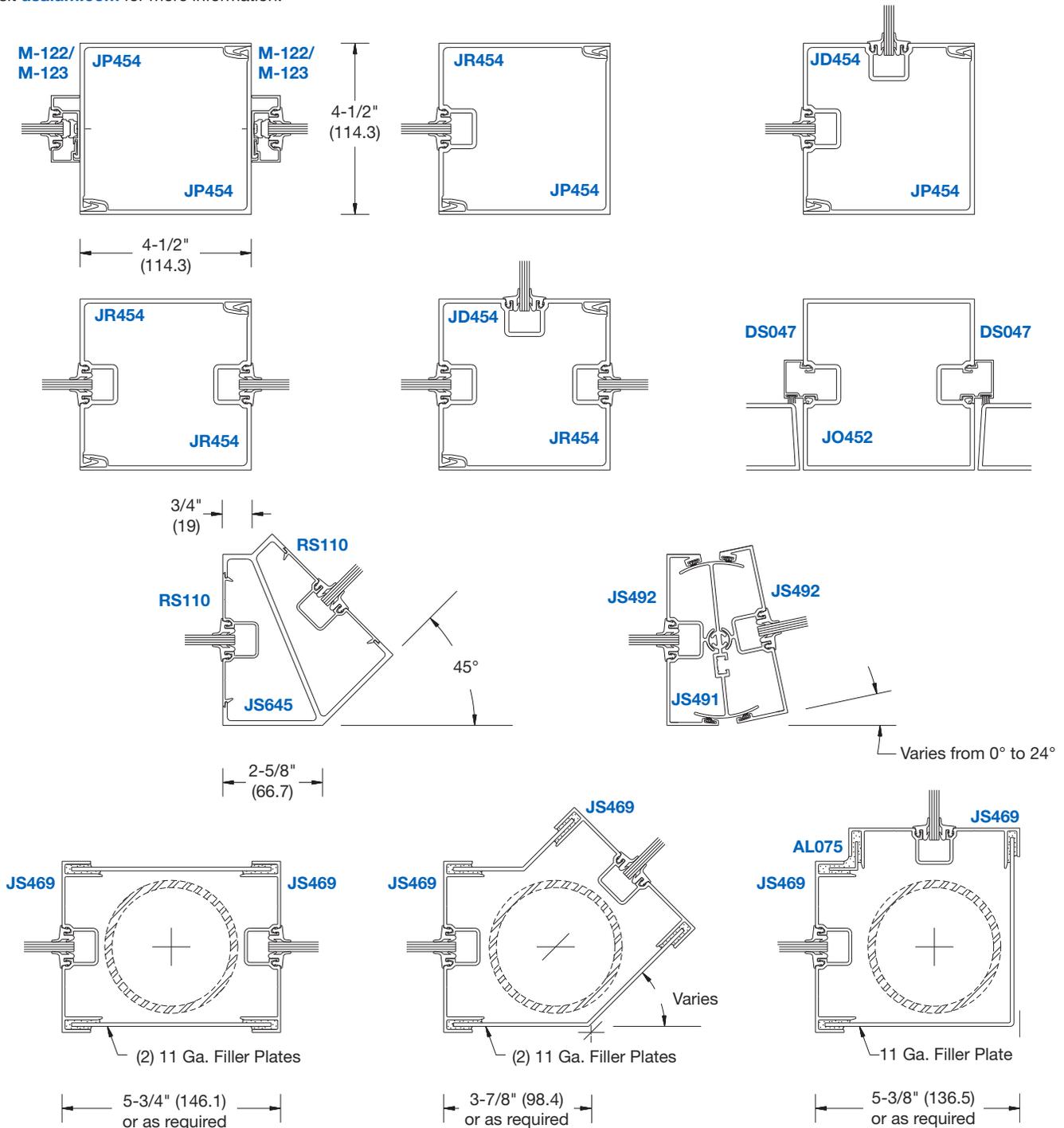
Center Glazed

- Series 450
- Series 450-S

FOR 1/4" (6) OR 3/8" (10) GLAZING CORNER CONDITIONS AND POST COVERS

NOTE: Part numbers shown are available in 24' (7.3 m) stock lengths. Visit usalum.com for more information.

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



NOT TO SCALE

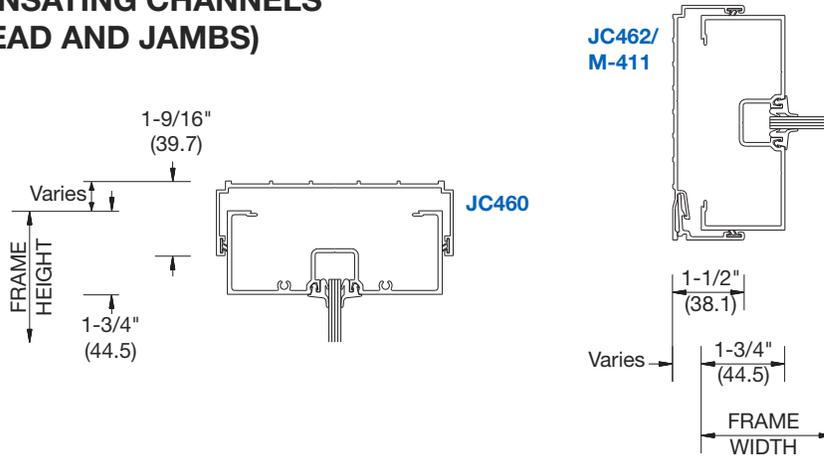
STOREFRONTS

Typical Details

Center Glazed

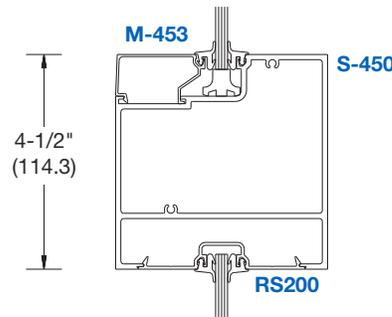
- Series 450
- Series 450-S

FOR 1/4" (6) OR 3/8" (10) GLAZING COMPENSATING CHANNELS (FOR HEAD AND JAMBS)



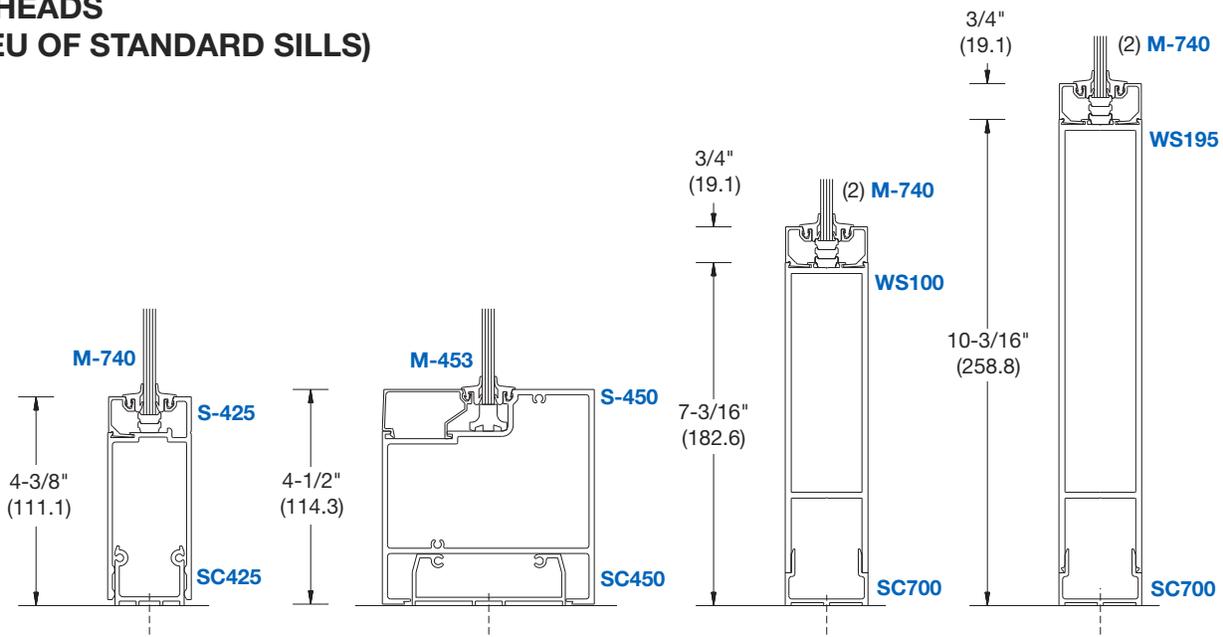
NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.

4-1/2" HIGH HORIZONTAL MEMBER



BULKHEADS

(IN LIEU OF STANDARD SILLS)



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Online crlaurence.com By Phone (800) 421-6144

STOREFRONTS

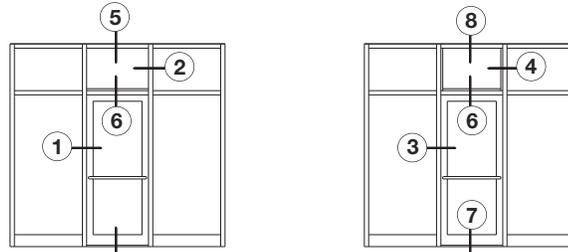
Typical Details

FOR 1/4" (6) OR 3/8" (10) GLAZING

NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.

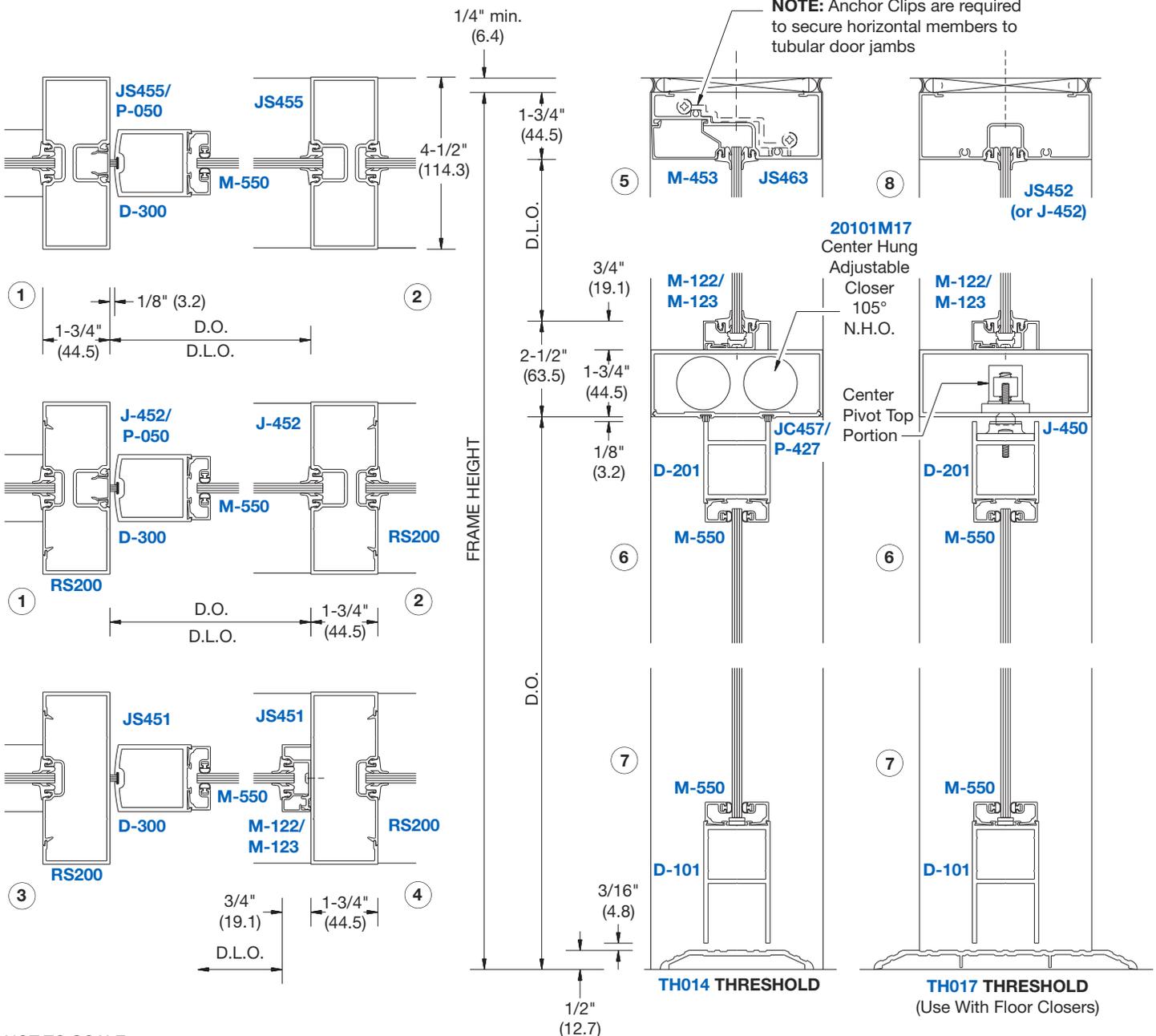
Center Glazed

- Series 450
- Series 450-S



CENTER HUNG DOOR

NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.



NOT TO SCALE

STOREFRONTS

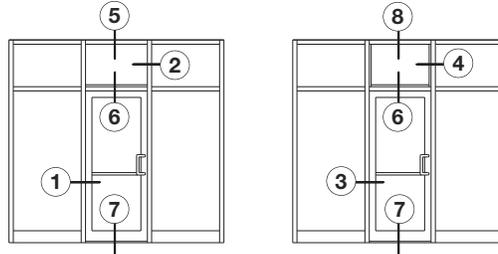
Typical Details

FOR 1/4" (6) OR 3/8" (10) GLAZING

Center Glazed

- Series 450
- Series 450-S

NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.

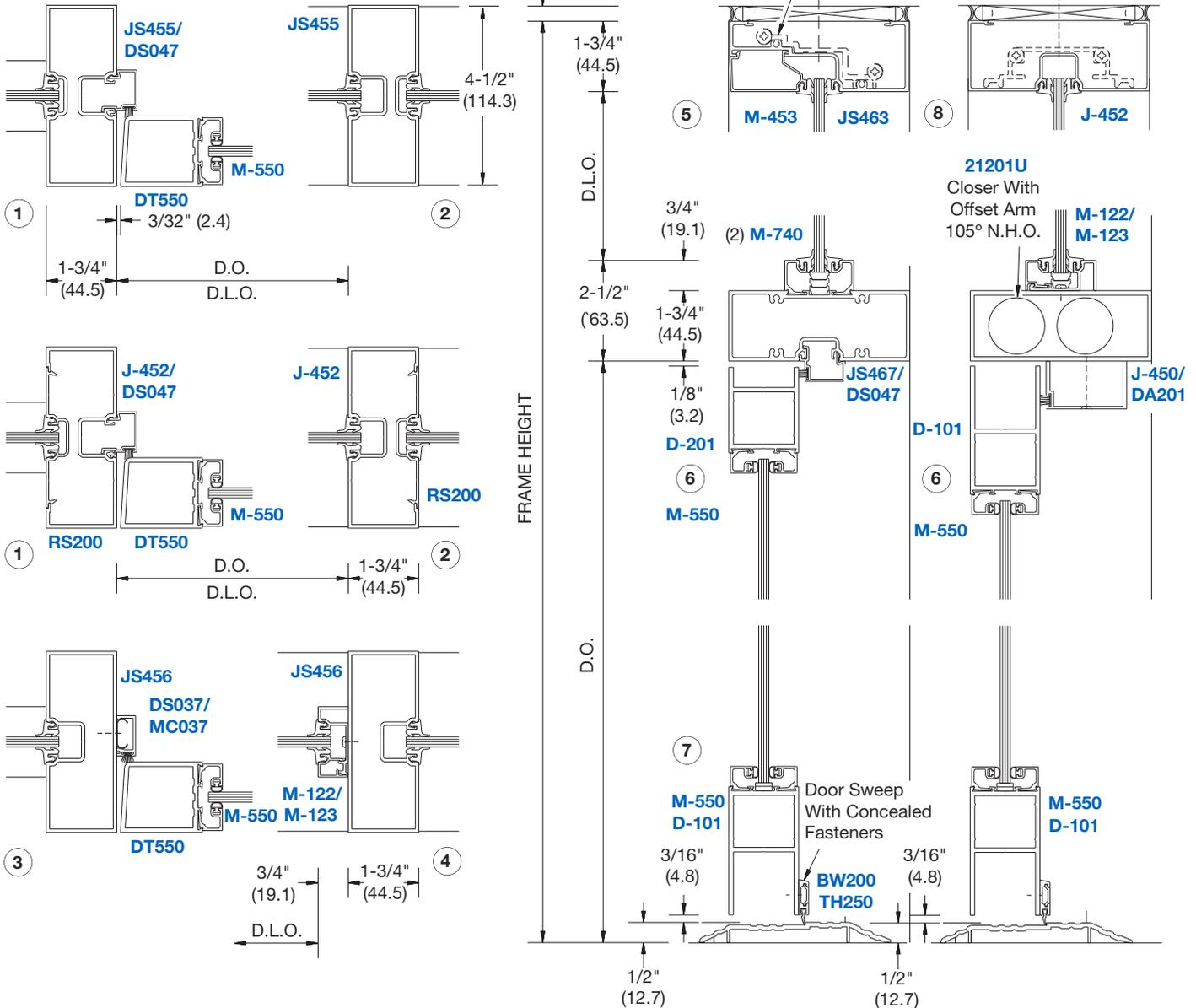


NOTE: NP225 Glazing Gaskets are used on both sides of 1/4" (6) glass. (Typical)
NP238 Glazing Gaskets are used for 3/8" (10) glazing.

OFFSET HUNG DOOR

1/4" min.
(6.4)

NOTE: Anchor Clips are required to secure horizontal members to tubular door jambs



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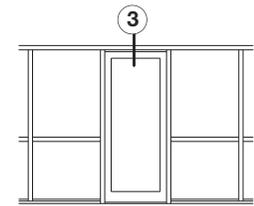
Typical Details

DOOR FRAMING SPECIAL CONDITIONS

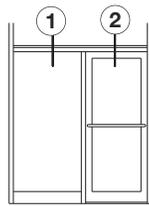
NOTE: Door Frames are available in stock to accommodate 36" x 84" (914 x 2134) and 72" x 84" (1829 x 2134) door openings. Visit usalum.com for more information.

Center Glazed

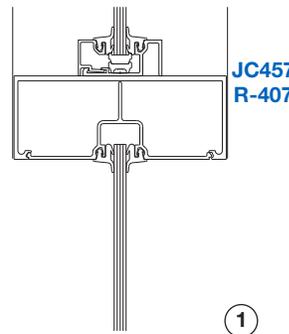
- Series 450
- Series 450-S



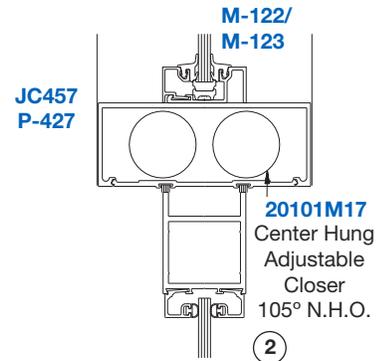
Series 450-S Door Header



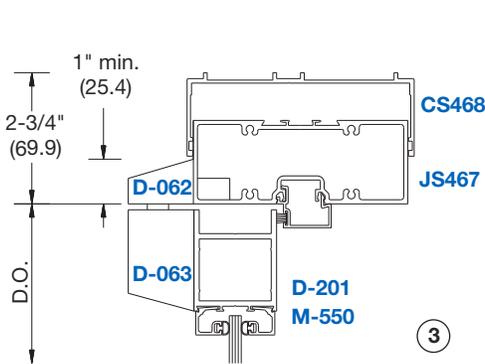
Continuous Header



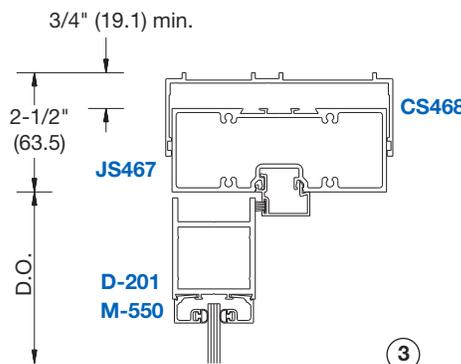
1



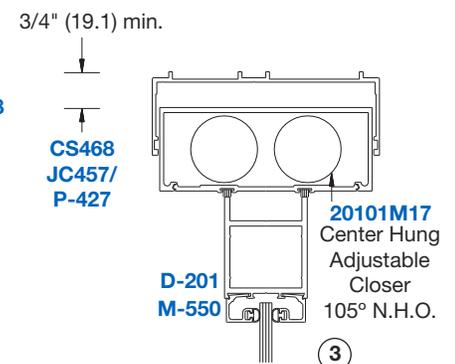
2



Offset Pivoted Door



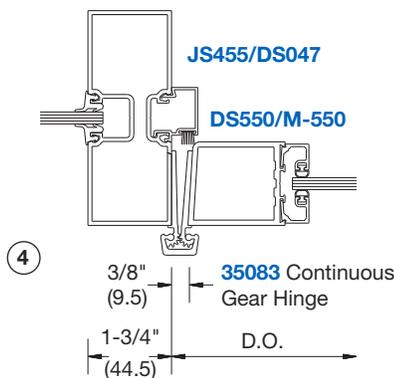
Butt Hung Door



Center Pivoted Door



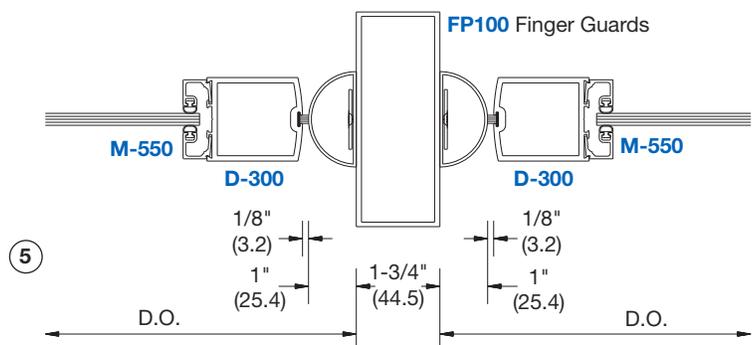
Optional Hinge



4



Automatic Door Hinging Jamb



5

NOT TO SCALE

STOREFRONTS

Windload Charts

Center Glazed

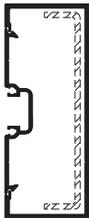
- Series 450
- Series 450-S

STANDARD WALL VERTICAL MULLIONS FOR 1/4" (6) OR 3/8" (10) GLAZING

Deflection criteria to be in accordance with AAMA TIR-A11 - L/175 or L/240 + 1/4" (6.4 mm) for spans greater than 13'-6" (4.1 m) but less than 40'-0" (12.2 m). Codes and specifications may vary. No single lite of glass shall deflect more than 3/4" (19 mm). Glass is not considered as contributing to resistance of deflection. Aluminum alloy 6063-T6 allowable stress for windload is 15,200 psi. (89 MPa), and steel reinforcing allowable stress for windload is 21,600 psi. (183 MPa).

These charts include unbraced length analysis and are based on at least one horizontal being placed at the midpoint of the span. For other applications, please contact U.S. Aluminum Technical Sales at (800) 262-5151, or visit our web site at usalum.com.

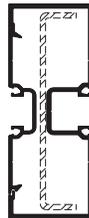
Limitation of vertical mullions for:
 CURVES **A** = 15 PSF (718 Pa)
 CURVES **B** = 20 PSF (957 Pa)
 CURVES **C** = 25 PSF (1197 Pa)
 CURVES **D** = 30 PSF (1436 Pa)
 CURVES **E** = 40 PSF (1915 Pa)



JS451/RS200

I = 2.661 (110.76 x 10⁴)
 S = 1.182 (19.38 x 10³)

IAL+STL = 5.914 (246.19 x 10⁴)
 With **SS045** Steel



J-452/RS200

I = 2.707 (112.67 x 10⁴)
 S = 1.203 (19.72 x 10³)

IAL+STL = 5.960 (248.11 x 10⁴)
 With **SS045** Steel



JS452/RS200

I = 2.783 (115.84 x 10⁴)
 S = 1.236 (20.27 x 10³)

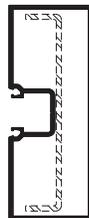
IAL+STL = 6.036 (251.27 x 10⁴)
 With **SS045** Steel



JS455

I = 2.653 (110.43 x 10⁴)
 S = 1.179 (19.32 x 10³)

IAL+STL = 5.906 (245.86 x 10⁴)
 With **SS045** Steel



JS456

I = 2.634 (109.64 x 10⁴)
 S = 1.171 (19.19 x 10³)

IAL+STL = 5.887 (245.07 x 10⁴)
 With **SS045** Steel

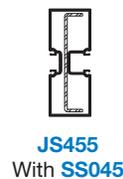
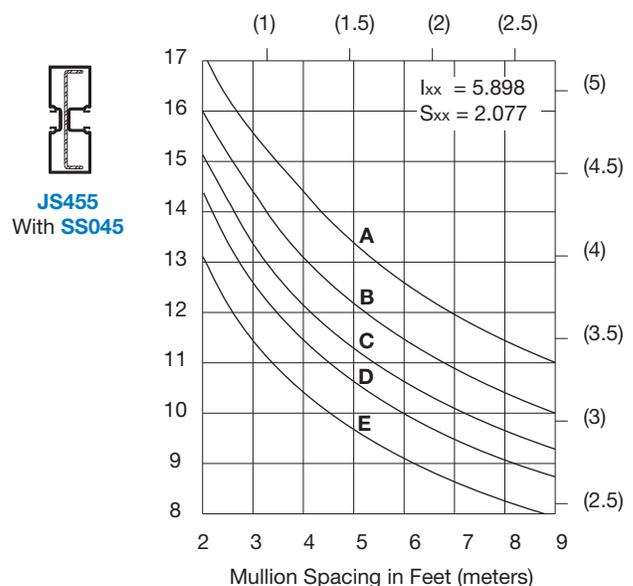
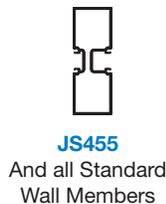
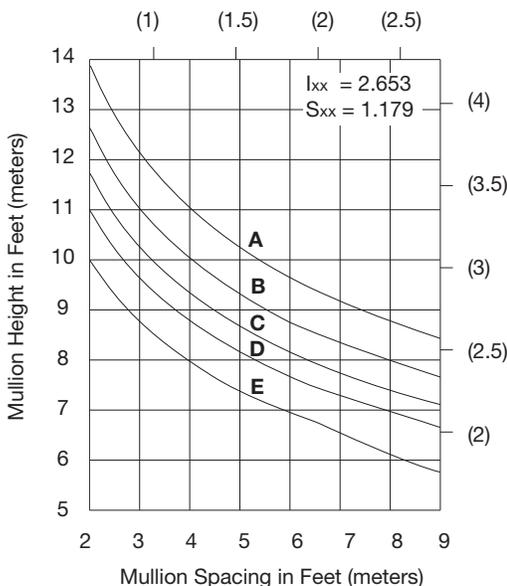


JS460/JS469

I = 3.509 (140.06 x 10⁴)
 S = 1.559 (25.56 x 10³)

IAL+STL = 5.165 (214.98 x 10⁴)
 With **SS469** Steel

Following charts are based on the section properties of **JS455**.



Deadload Charts

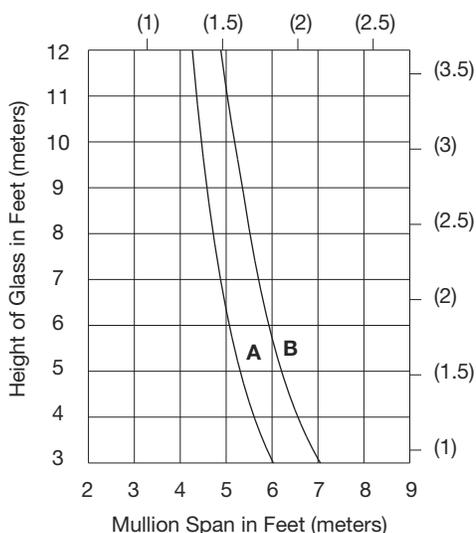
INTERMEDIATE HORIZONTAL MULLIONS FOR 1/4" (6) OR 3/8" (10) GLAZING

Center Glazed

- Series 450
- Series 450-S

Deadload charts are based on 1/8" (3.2) maximum allowable deflection at the center point of the horizontal mullion and on a glass weight of 3.25 p.s.f. (15.87 Kg/m²)
Glass shall rest on two setting blocks located at:

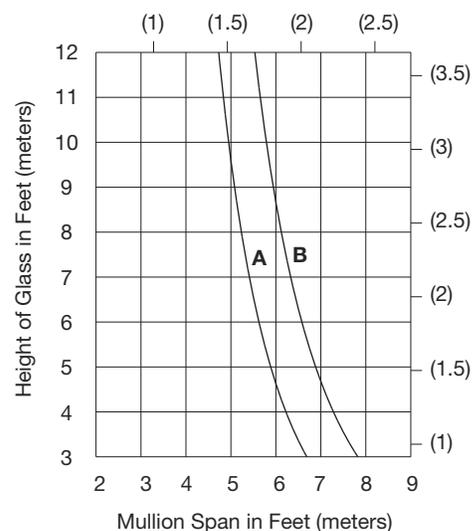
- CURVES A = 1/4 points
- CURVES B = 1/8 points or 8" (203.2) from corners, whichever is larger



JS463/RS200
I_{yy} = .255
(10.61 x 10⁴)



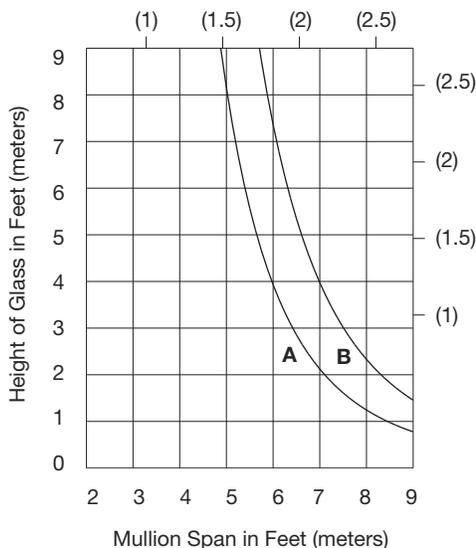
JH463
I_{yy} = .386
(16.07 x 10⁴)



DOOR HEADERS

Deadload charts for door headers are based on 1/16" (1.6) maximum allowable deflection at the center point of the header and on a glass weight of 3.25 p.s.f. (15.87 Kg/m²)
Glass shall rest on two setting blocks located at:

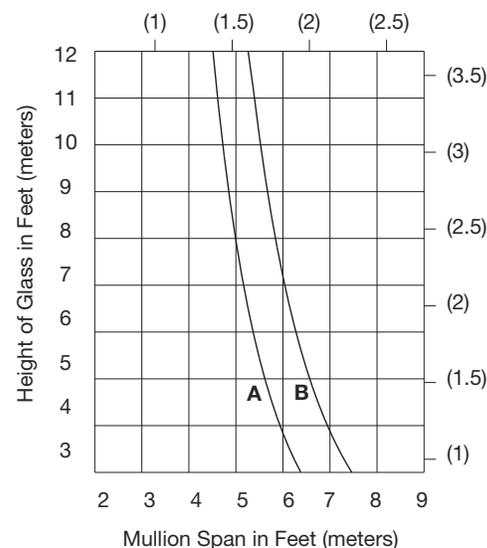
- CURVES A = 1/4 points
- CURVES B = 1/8 points or 8" (203.2) from corners, whichever is larger



JS467
I_{yy} = .656
(27.30 x 10⁴)



J-450
I_{yy} = .640
(26.64 x 10⁴)



STOREFRONTS

Accessories

Center Glazed

- Series 400 & 400-S
- Series 450 & 450-S

PART NO.	DETAIL	DESCRIPTION	PKG. QTY.	WHERE USED			
				400	400-S	450	450-S
SB140		Setting Block	100	●	●	●	●
SB525		Setting Block for JS417, JS467, and WS100	20	●		●	
SB045	Use (2) per Location	Setting Block for S-425 and Inside Glaze Horizontals	100	●		●	
WB452		Edge Blocking	50	●	●	●	●
SV418		Splice Sleeve for Series 400 Stacking Head	10		●		
SV413		Splice Sleeve for Series 400 Stacking Sill	10		●		
SV468		Splice Sleeve for Series 450 Stacking Head	10				●
SV463		Splice Sleeve for Series 450 Stacking Sill	10				●
SV300		Splice Sleeve for Series 400 Stacking Sill	10		●		
SV400		Splice Sleeve for Series 450 Stacking Sill	10				●

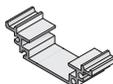
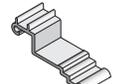
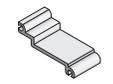
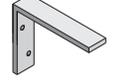
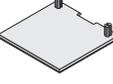
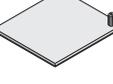
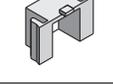
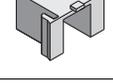
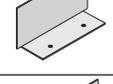
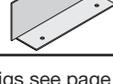
For Steel Stiffeners and Drill Jigs see page 04-B3.

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STOREFRONTS

Accessories

- Center Glazed**
- Series 400 & 400-S
 - Series 450 & 450-S

PART NO.	DETAIL	DESCRIPTION	PKG. QTY.	WHERE USED			
				400	400-S	450	450-S
ST251		Assembly Screws #10 x 1" (25) HH SMS	200	●	●	●	●
AP402		Head Anchor Clip with Screws	20	●		●	
AP403		Horizontal / Sill Anchor Clip with Screws	20	●	●	●	●
AP413		Inside Glaze Anchor Clip for Intermediate Horiz. with Screws	20	●	●	●	●
HC250		Head Anchor Use Three Per Bay or as Required	30	●		●	
AP050		Angle Clip for S-425 and WS100 with Screws	10	●		●	
CP040		Vertical Closer Plate	20	●	●		
CP045		Vertical Closer Plate	20			●	●
WD160		Water Deflector for Shallow Pocket	50	●	●	●	●
WD150		Water Deflector for Deep Pocket	50	●	●	●	●
EC400		End Dam	20	●	●		
EC450		End Dam	20			●	●

For Steel Stiffeners and Drill Jigs see page 04-B3.

Online usalum.com By Phone (800) 262-5151
 Online crlaurence.com By Phone (800) 421-6144

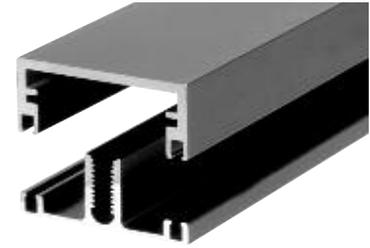
STOREFRONTS

Typical Details

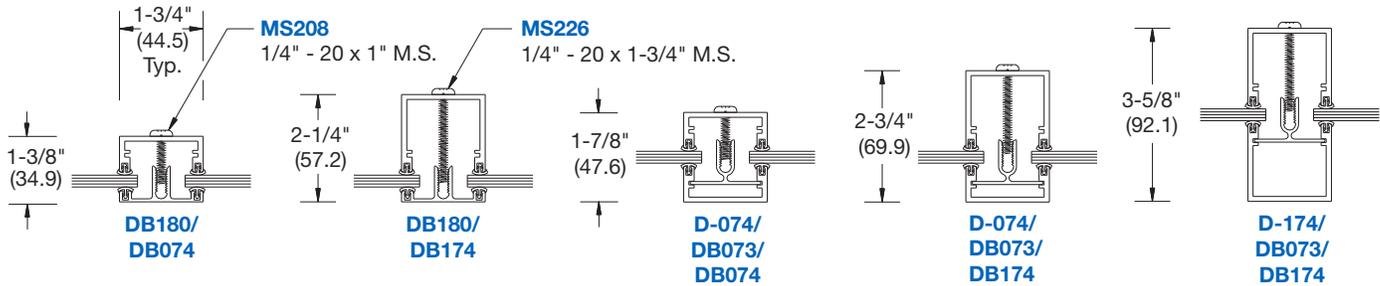
Miscellaneous Framing

DIVISION BARS

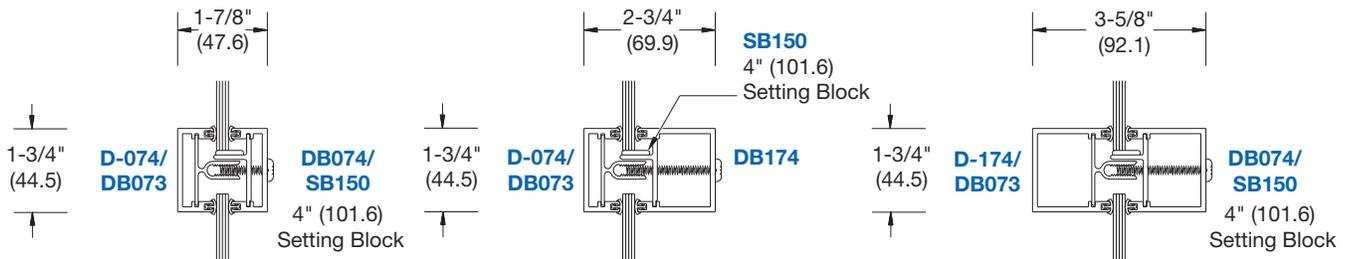
SHOWN WITH 1/4" (6) GLAZING TYPICAL



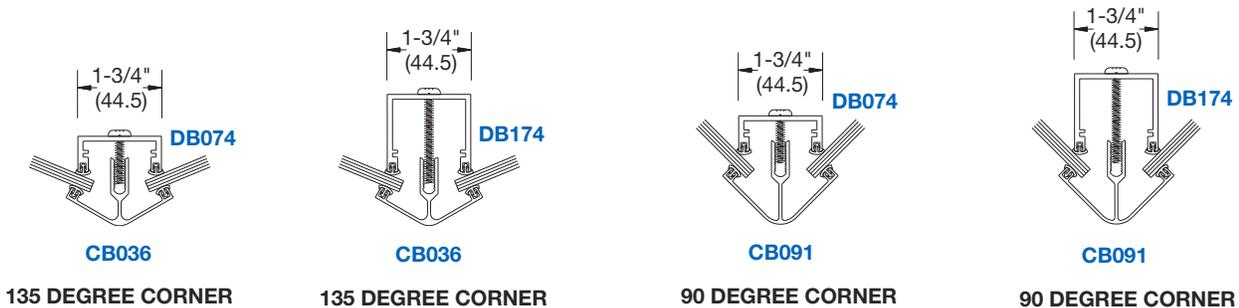
VERTICAL MEMBERS



HORIZONTAL MEMBERS



CORNER MEMBERS



NOTE: All stocks lengths on this page are available in clear anodized or bronze anodized finishes, and are 24' (7.3 m) in length unless noted otherwise. Visit usalum.com for more information.

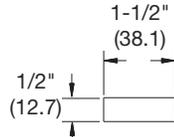
NOT TO SCALE

STOREFRONTS

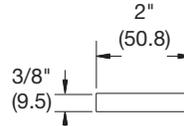
Typical Details

Miscellaneous Framing

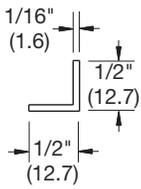
BARS AND ANGLES



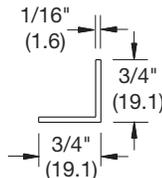
B-150



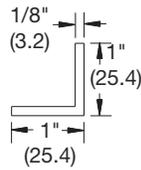
B-237



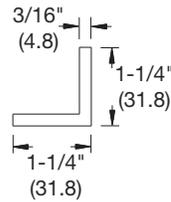
A-050



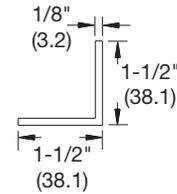
AL075



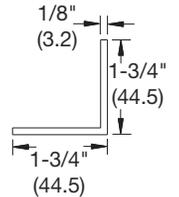
A-100



A-125

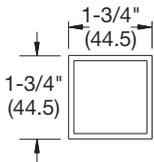


A-150

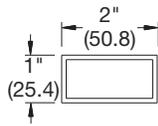


A-175

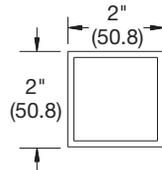
TUBES



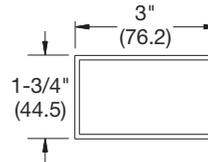
J-175



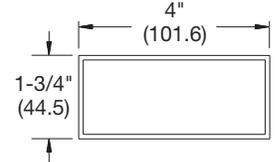
J-200



J-220

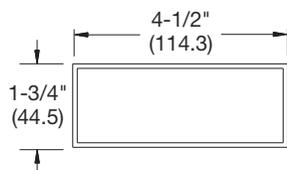


J-300



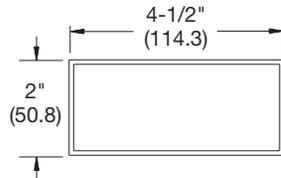
J-400

24' (7.3 m)



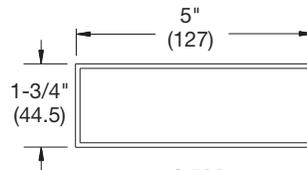
J-450

24' (7.3 m)



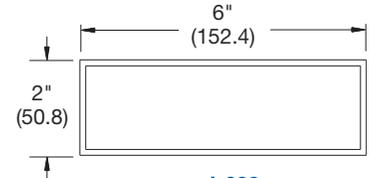
I-450

24' (7.3 m)



J-500

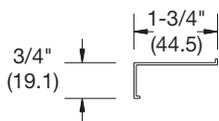
24' (7.3 m)



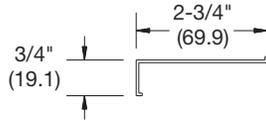
J-600

24' (7.3 m)

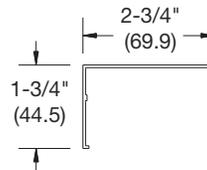
SILL COVERS AND JAMB MOLDINGS



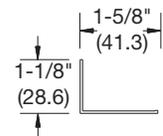
SC100



SC200



SC400



SJ300

NOTE: All stock lengths on this page are available in clear anodized or bronze anodized finishes, and are 21' (6.4 m) in length unless noted otherwise. Visit usalum.com for more information.

NOT TO SCALE

STOREFRONTS



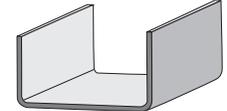
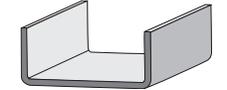
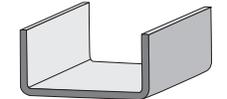
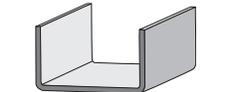
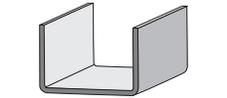
Accessories

Steel Stiffeners and Drill Jigs

STEEL STIFFENERS*

PRIMED HOT ROLLED COMMERCIAL QUALITY, ASTM A-559

DRILL JIGS

PART NO.	DETAIL	DESCRIPTION	STOCK LENGTH	PART NO.	TO PREPARE	FOR	SYSTEM	PKG. QTY.
SS040		3-5/8" (92) x 3/4" (19) x 12 GA. Use with Series 400 and 400-S	16' (4.8 m)	DJ050	Verticals	Screw Spline	Center Glaze Series 400 and Series 450	1
SS964		3-1/2" (88.9) x 1-11/16" (42.8) x 7 GA. Use with Series 400 and 400-S	16' (4.8 m)	DJ025	Verticals	Shear Block	Center Glaze Series 400-S and Series 450-S	1
SS045		4-1/8" (104.7) x 3/4" (19) x 12 GA. Use with Series 450 and 451	16' (4.8 m)	DJ125	Verticals	Screw Spline and Shear Block	Center Glaze Series 451 and Series 451-S	1
SS452		2-15/16" (74.6) x 1-1/4" (31.7) x 10 GA. Use with Flush Front FF452	16' (4.8 m)	DJ125	Verticals	Screw Spline	Center Glaze Series IT451	1
				DJ150	Verticals	Shear Block		1
DJ452	Verticals	Screw Spline	Flush Front Series FF450	1				
SS469		2-11/32" (59.5) x 1-1/32" (26.2) x 10 GA. Use with Flush Front FF460/FF469	16' (4.8 m)	DJ552	Verticals	Screw Spline	Flush Front Series FF451 Series FT451	1
DJ652	Verticals	Horiz.	Flush Front Series FF600	1				
SS552		2-1/4" (57) x 1-3/16" (30.2) x 10 GA. Use with Flush Front FF552/FT552	16' (4.8 m)	DJ752	Verticals	Horiz.	Flush Front Series FF601 Series FT601	1
SS569		2" (50.8) x 1-7/16" (36.5) x 10 GA. Use with Flush Front FF560/FF569/FT560/FT569	16' (4.8 m)	DJ210	Verticals	AP463 and AP563	OS-2 Series OS450/450-SG and Series OS451/451-SG	1
SS652		4-1/2" (114.3) x 1-1/4" (31.7) x 10 GA. Fits FF652	16' (4.8 m)	DJ650	Verticals	AP664 and AP764	OS-2 Series OS600/600-SG and Series OS601/601-SG	1
SS769		3-1/2" (88.9) x 1-7/16" (36.5) x 10 GA. Fits FF769 and FT769	16' (4.8 m)	DJ525	Verticals	AP555	BG Systems Series BG450 Series BG525 Series BT525	1

*Steel Stiffeners shown are the more popular models. For additional information on Stiffeners, contact U.S. Aluminum Technical Sales at (800) 262-5151.

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