

BLAST MITIGATION

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Blast Resistant Curtain Wall • Series BW3250



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Project: U.S. Federal Courthouse, Coeur d'Alene, ID

Due to the diversity in state/provincial, local, and federal laws and codes that govern the design and application of architectural products, it is the responsibility of the individual architect, owner, and installer to ensure that products selected for use on projects comply with all applicable building codes and laws. U.S. Aluminum exercises no control over the use or application of its products, glazing materials, and operating hardware, and assumes no responsibility thereof.

The rapidly changing technology within the architectural aluminum products industry demands that U.S. Aluminum reserve the right to revise, discontinue or change any product line, specification or electronic media without prior written notice.

NOTE: Dimensions in parentheses () are millimeters unless otherwise noted.

Other metric units shown in this publication are:
 m - meter Kg - kilogram
 Pa - pascal KPa - kilopascal
 MPa - megapascal

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BLAST MITIGATION

Specifications

Blast Resistant Curtain Wall

• Series BW3250

SECTION 08 44 13 ALUMINUM CURTAIN WALL SYSTEMS

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 and trim. *(Specifier list other exclusions).*
Related Work Specified Elsewhere: *(Specifier list).*

QUALITY ASSURANCE

Drawings and specifications are based on the Series BW3250 Curtain Wall 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) 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 15 psf (718 Pa).

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 1 psi pressure load.

Thermal Performance: Series BW3250 shall be tested in accordance with AAMA 1503, and NFRC-100.

Testing Procedures: ASTM 283, E 331, and E 330 - Laboratory performance testing. AAMA 503-08 - Newly Installed Curtain Walls. AAMA 511-08 - Installed Curtain Walls after six months.

Blast Mitigation: System shall meet or exceed the following requirements of the UFC 4-010-01, "DoD Minimum Anti-terrorism Standard for Buildings."

Section B-3.1 Standard 10: Windows, Skylights, and Glazed Doors. To minimize hazards from flying glass fragments, apply the provisions for glazing and window, skylight, and glazed door frames below for all new and existing inhabited buildings covered by these standards. Glazing and frames must work as a system to ensure that their hazard mitigation is effective. These provisions apply even if the minimum standoff distances are met. The specific requirements below provided conventional standoff distances are met, will result in windows, skylights, and glazed doors that comply with this standard for windows provided their visual glazing openings do not exceed 32 square feet (3 m²)

Section B-3.1.1 Glazing: Insulated glass units, use 1/4" (6) laminated glass inner pane as a minimum.

Section B-3.1.2.1 Frame Member

Design: Steel members may be designed using ultimate yield stresses and aluminum members may be designed based on a 0.2% offset yield strength. Equivalent static design loads for the window, skylight, and door members shall be 1 lb per in² (7 kilopascals) applied to the surface of the glazing and frame. Deformations shall not exceed 1/60 of the unsupported member lengths.

Section B-3.1.2.2 Glazing Frame Bite:

The glazing shall have a minimum frame bite of 11/16" (17.5) for structurally glazed systems and 1" (25) for window systems that are not structurally glazed.

Section B-3.1.2.2 Connection Design:

Equivalent static design loads for connections of the window, skylight, or door frame to the surrounding walls or roof, hardware and associated connections, and glazing stop connections shall be 10.8 lbs per in² (75 kilopascals) for glazing panels with a vision area less than or equal to 10.8 ft² (1.0 m²) and 4.4 lbs per in² (30 kilopascals) for glazing panels with a vision area greater than 10.8 ft² (1.0 m²) but less than or equal to 32 ft² (3.0 m²). Loads shall be applied to the surface of the glazing and frame. Connections and hardware may be designed based on ultimate strength for steel and 0.2% offset yield strength for aluminum.

Section B-3.3 Standard 12 Exterior

Doors: For all new and existing buildings covered by these standards, ensure that all exterior doors into inhabited areas open outwards. By doing so, the doors will seat into the door frames in response to an explosive blast, increasing the likelihood that the doors will not enter the buildings as hazardous debris. Alternatively, position doors such that they will not be propelled into rooms if they fail in response to a blast or provide other means to ensure they do not become hazards to building occupants.

Glazing and Glazing Systems

Subjected to Airblast Loadings: System shall be tested in accordance with ASTM F 1642.

II. PRODUCTS MATERIALS

Extrusions shall be 6063-T6 alloy and temper (ASTM B221 alloy T6 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.

BLAST MITIGATION

Specifications

Blast Resistant Curtain Wall

- Series BW3250

SECTION 08 44 13 ALUMINUM CURTAIN WALL SYSTEMS

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

All mullions and horizontals shall have flexible (PVC) thermal break material located on exterior side of glass plane. Exterior glazing seal gasket shall be

secured by extruded aluminum pressure plates fastened to main grid members. Provisions shall be made at all sealed horizontals to weep moisture accumulation to the exterior. A cover shall be snapped over pressure plate to show only a sharp, uninterrupted exterior profile.

Framing members shall provide for straight-in glazing on all sides, with through sightlines and no projecting stops or face joints. Vertical and horizontal framing members shall have a nominal width of 2-1/2" (63.5). Overall depth of system shall be (Specify). System shall provide for two piece horizontal framing so that all fasteners at intersection of horizontal and vertical members will be concealed. There shall be no exposed fasteners at perimeter sections.

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.



Project: Orlando Immigration Center, Orlando, FL

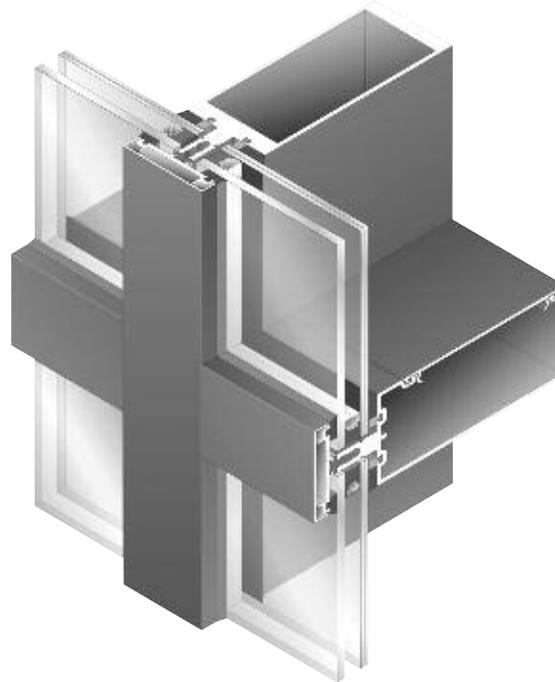
BLAST MITIGATION

Technical Data

Blast Resistant Curtain Wall • Series BW3250

Security, versatility, and economics make Series BW3250 Blast Resistant Curtain Wall a defense standard for low to mid-rise applications where protection from blast shock wave is required. Series BW3250 is thermally improved by a continuous thermal spacer interlocked with the horizontal and vertical pressure plates. Dual colors can be achieved by specifying different finishes for the exterior face covers and interior mullions. Two piece horizontals and extruded shear blocks allow for a concealed horizontal to vertical joint. These joint intersections also have concealed injection molded End Dams for controlling any infiltrated water.

DEFENDER BLAST MITIGATION PRODUCTS



SERIES BW3250
Blast Resistant Curtain Wall

SERIES	WIDTH	OVERALL DEPTH	GLAZING INFILL	APPLICATIONS
BW3250	2-1/2" (63.5)	8" (203.2)	1" (25)	Low-Rise to Mid-Rise Buildings Where Blast Resistance is Required.

For custom size and profile extrusions please visit usalum.com.

GLASS SIZES*	
Glass Width and Height	= Daylight Opening + 1-3/8" (34.9)

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

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BLAST MITIGATION

Special Features

Blast Resistant Curtain Wall • Series BW3250

The DEFENDER Series BW3250 Blast Resistant Curtain Wall System has been engineered specifically to offer maximum protection within a specified blast radius. BW3250 is an extension of the Series 3250 Curtain Wall Systems, utilizing many of the same proven design concepts. BW3250 requires that 1" (25) insulating impact resistant glass be used.

Injection molded Closure Plates at top and bottom of verticals prevent perimeter seal failure. Injection molded End Dams at vertical and horizontal intersections control any infiltrated water. See page 16-N1 for additional information.

NOTE: To accelerate installation times with pinpoint accuracy of Horizontal Shear Blocks to Curtain Wall Mullions see pages 56-P1 and 57-P1.

CP900
Closure
Plate

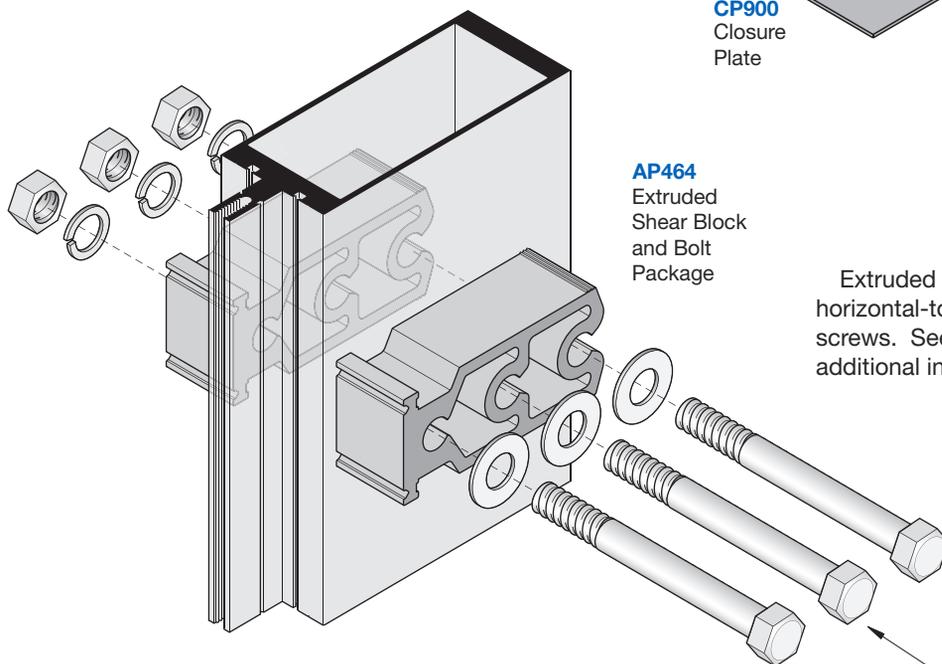
HD975
End Dam

CP900
Closure
Plate

AP464
Extruded
Shear Block
and Bolt
Package

Extruded aluminum Shear Blocks for tight horizontal-to-vertical joinery with no exposed screws. See pages 13-N1 and 14-N1 for additional information.

Center bolt in Shear Block connections only required at 10.8 psi conditions.



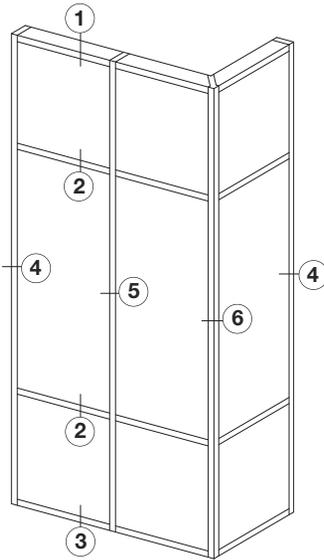
BLAST MITIGATION

Typical Details

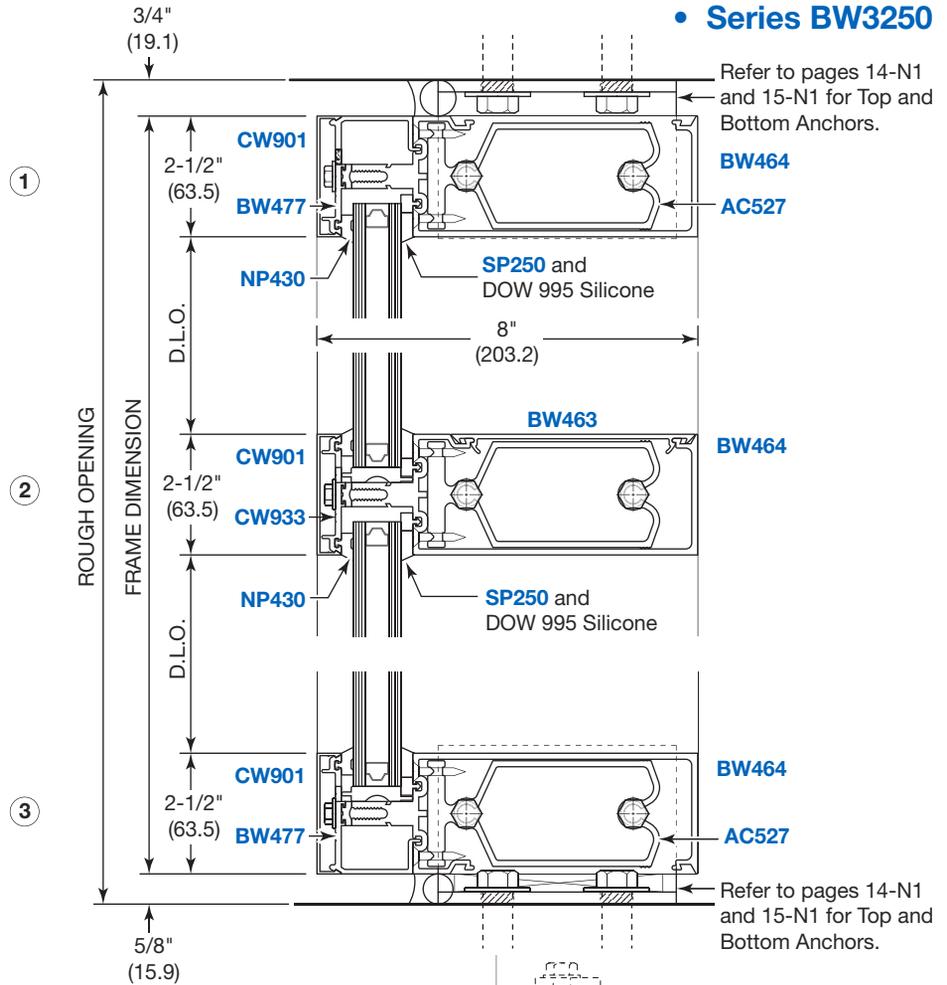
Blast Resistant Curtain Wall

• Series BW3250

FOR 2.91 PSI

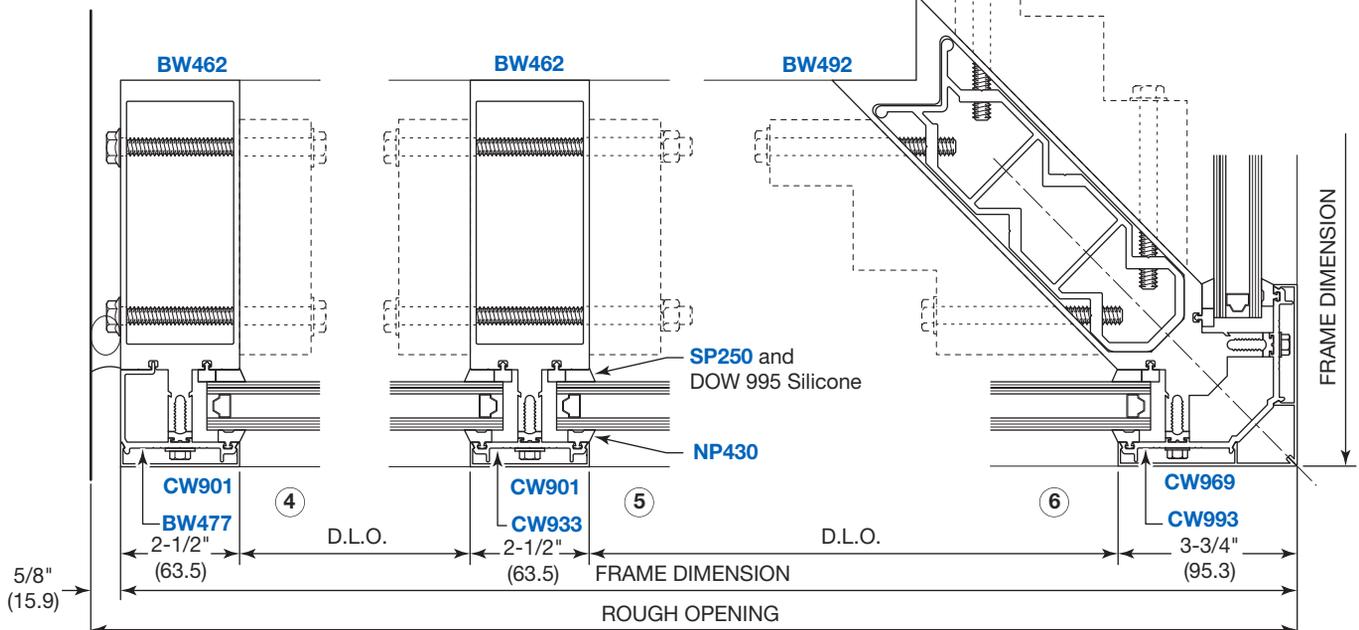


TYPICAL ELEVATION



Refer to pages 14-N1 and 15-N1 for Top and Bottom Anchors.

Refer to pages 14-N1 and 15-N1 for Top and Bottom Anchors.



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NOT TO SCALE

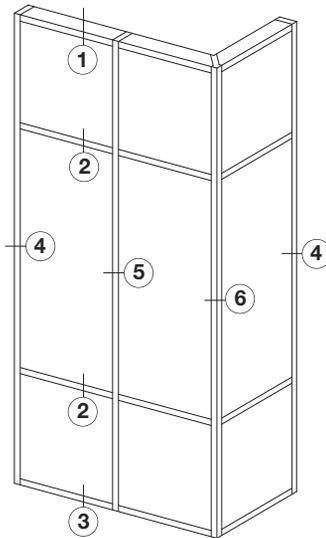
BLAST MITIGATION

Typical Details

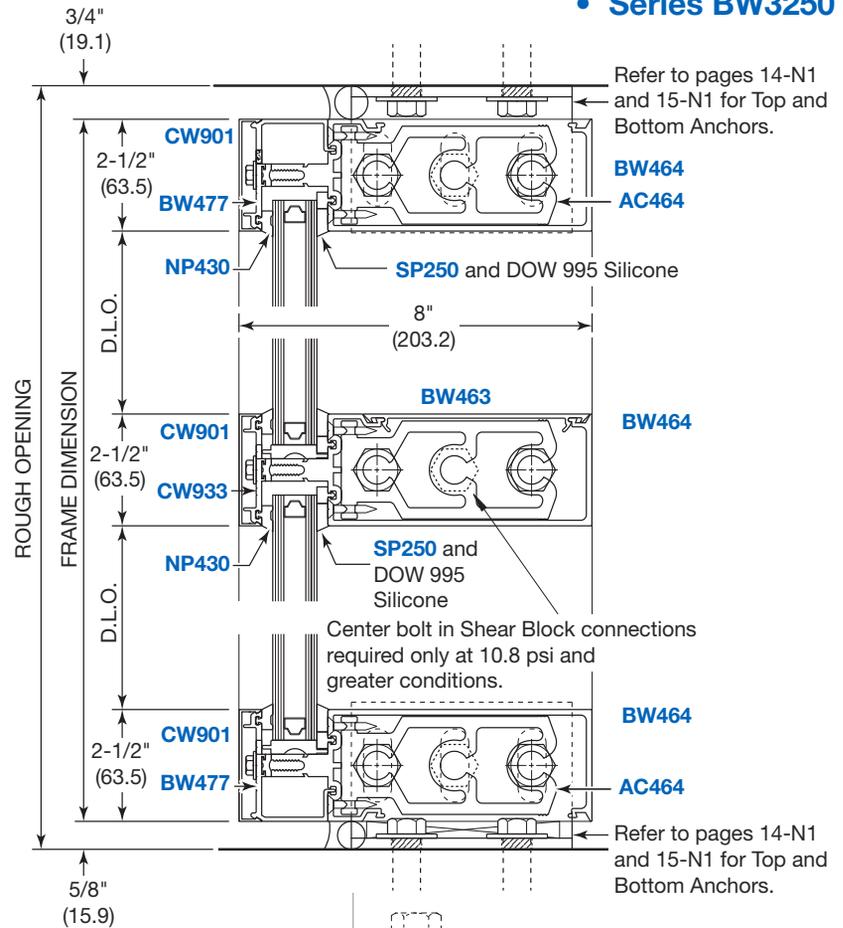
FOR 4.4 AND 10.8 PSI

Blast Resistant Curtain Wall

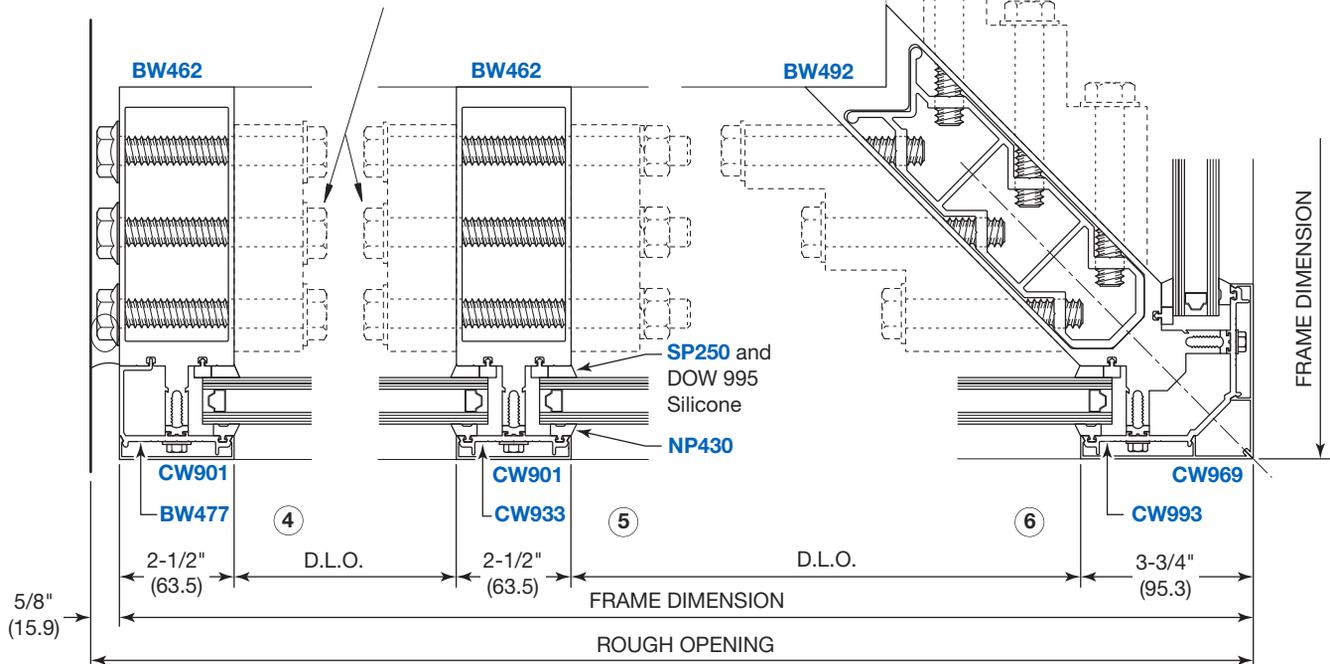
• Series BW3250



TYPICAL ELEVATION



Center bolt in Shear Block connections required only at 10.8 psi and greater conditions.



NOT TO SCALE

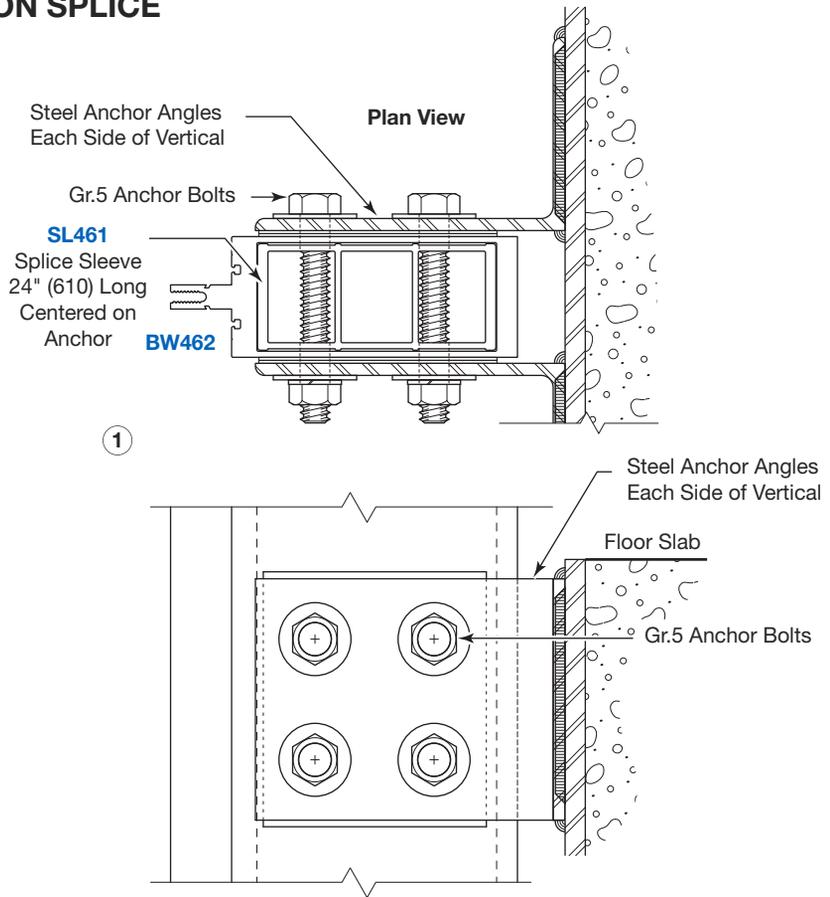
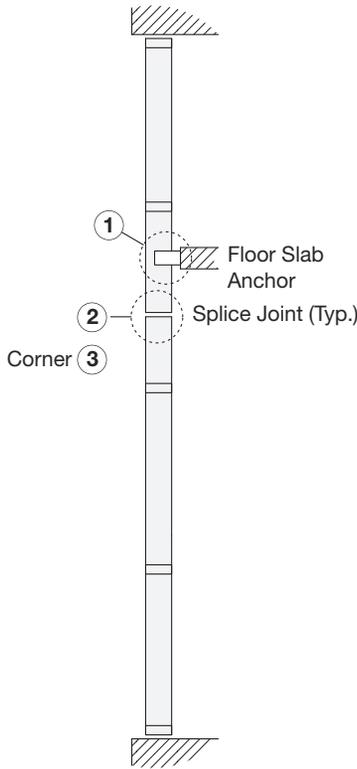
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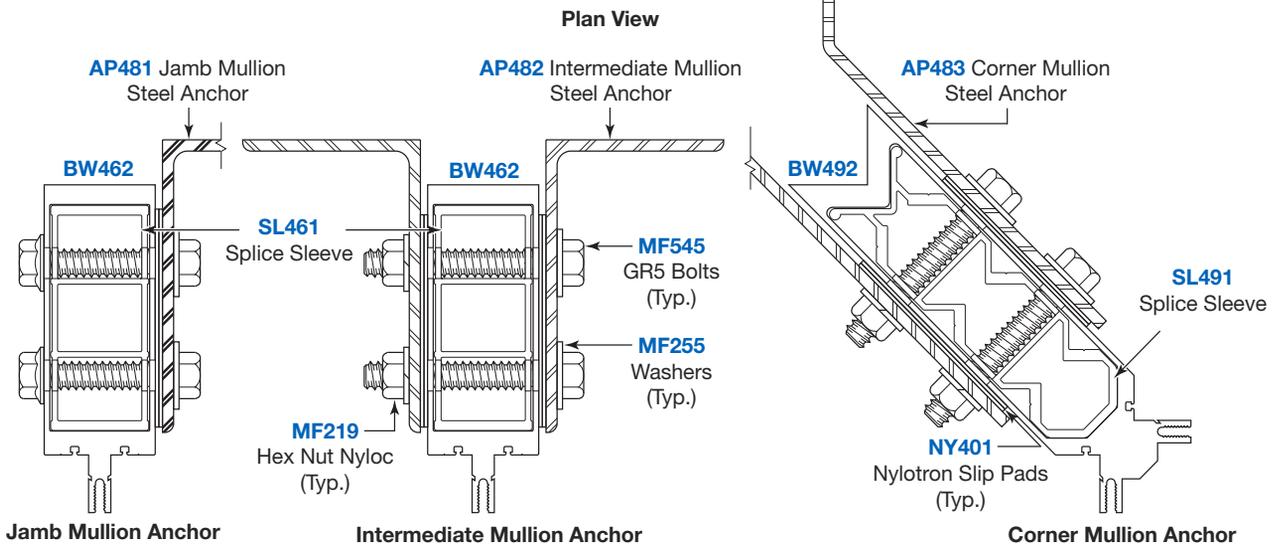
Typical Details

Blast Resistant Curtain Wall • Series BW3250

MID-SPAN ANCHORS AND MULLION SPLICE



NOTE:
Steel Anchor Sizes and Thickness Vary per Project.



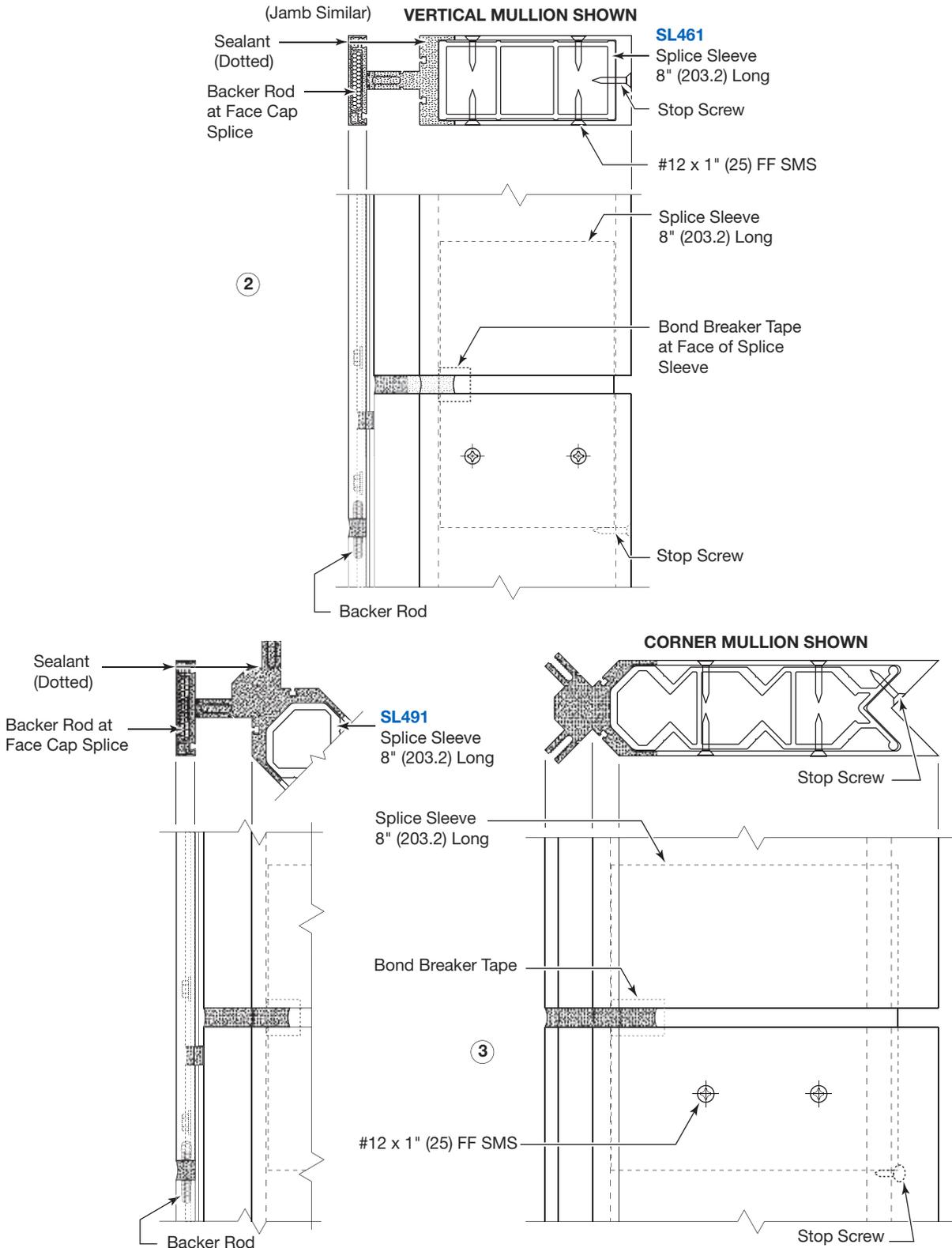
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BLAST MITIGATION

Typical Details

Blast Resistant Curtain Wall • Series BW3250

MID-SPAN ANCHORS AND MULLION SPLICE



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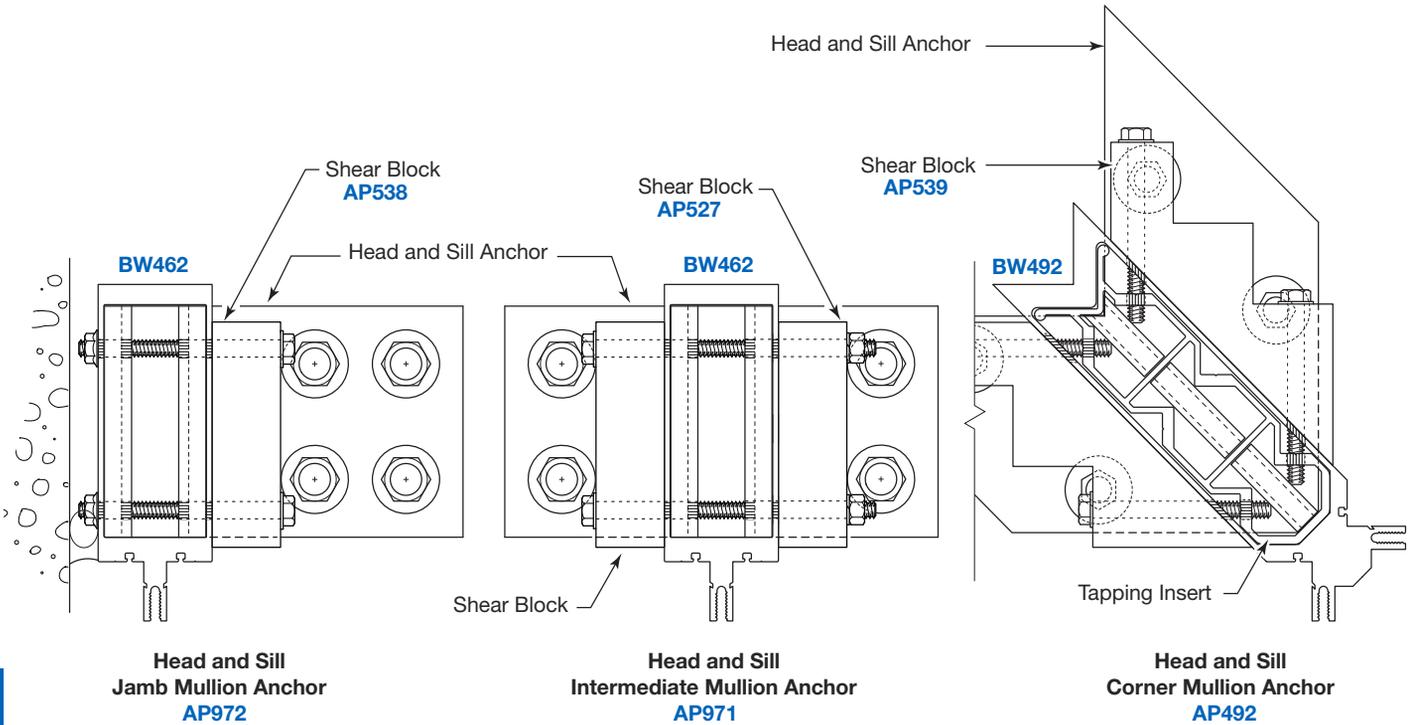
BLAST MITIGATION

Typical Details

Blast Resistant Curtain Wall • Series BW3250

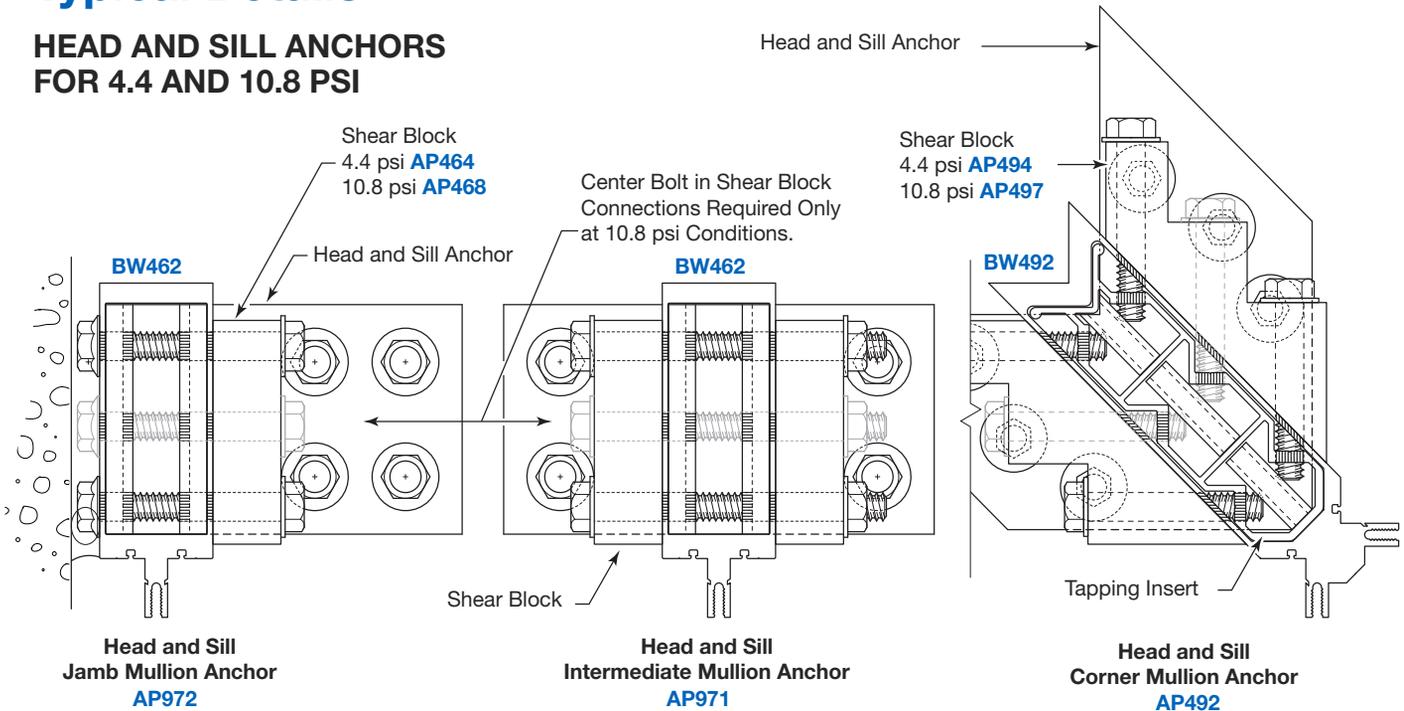
HEAD AND SILL ANCHORS FOR 2.91 PSI

Plan View
Sills Shown, Heads Similar



Typical Details

HEAD AND SILL ANCHORS FOR 4.4 AND 10.8 PSI



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BLAST MITIGATION

Windload and Deadload Charts

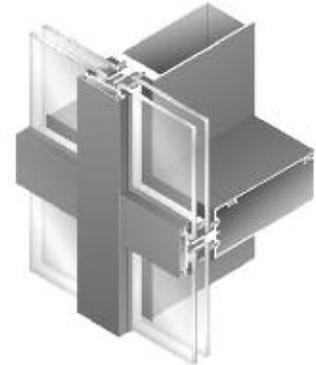
Blast Resistant Curtain Wall

• Series BW3250

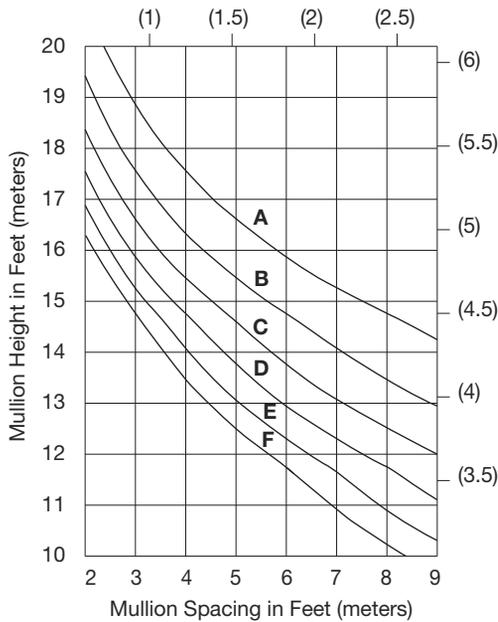
CAPTURED VERTICAL MULLIONS FOR 1" GLAZING

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.



Blast Resistant Captured Vertical Glazed Curtain Wall

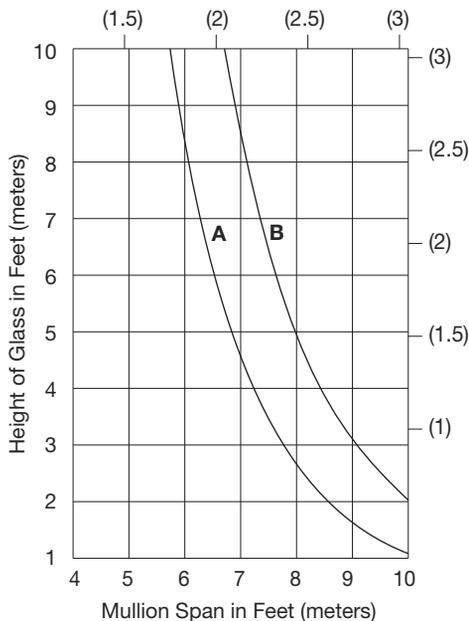


Limitation of vertical mullions for:
 CURVES A = 30 PSF (1436 Pa)
 CURVES B = 40 PSF (1915 Pa)
 CURVES C = 50 PSF (2394 Pa)
 CURVES D = 60 PSF (2873 Pa)
 CURVES E = 70 PSF (3352 Pa)
 CURVES F = 80 PSF (3830 Pa)



BW462
 $I_{xx} = 25.619 (1066.34 \times 10^4)$
 $S_{xx} = 6.777 (111.04 \times 10^3)$

CAPTURED HORIZONTALS FOR 1" GLAZING



Curve A = 1/4 Point Setting Block Locations
 Curve B = 1/8 Point Setting Block Locations

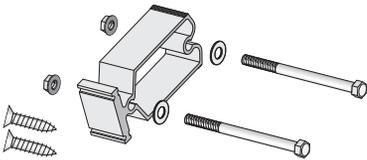
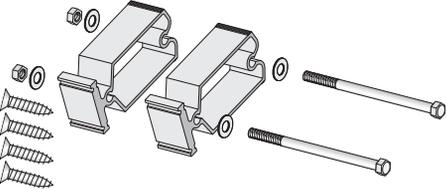
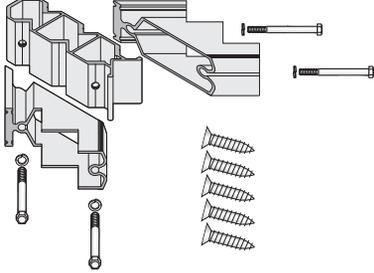
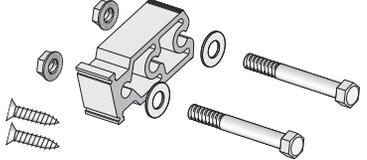
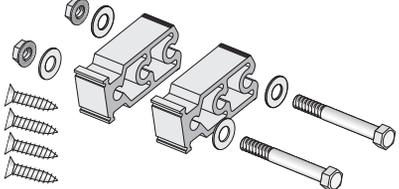
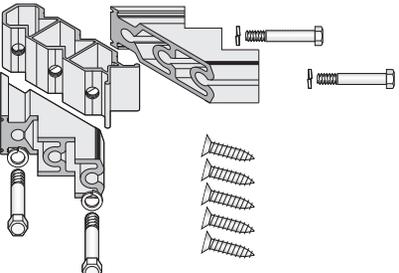


BW464
 $I_{yy} = 1.393$
 $S_{xx} = .894$

BLAST MITIGATION

Accessories

Blast Resistant Curtain Wall • Series BW3250

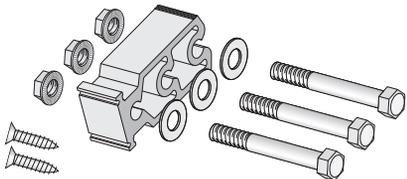
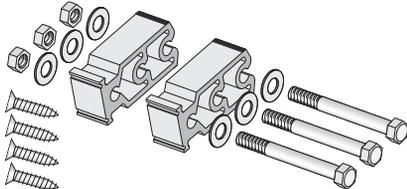
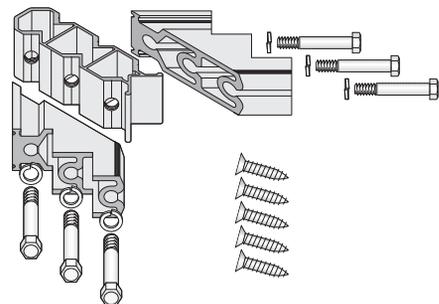
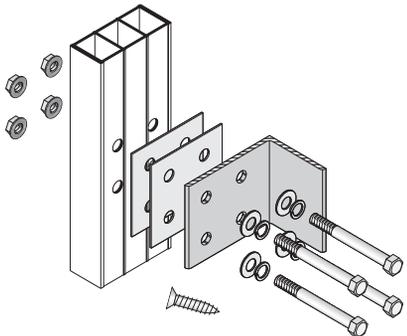
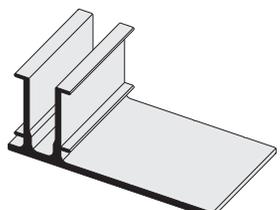
PART NO.	HORIZONTAL SHEAR BLOCK AND BOLT PACKAGES FOR UP TO 2.91 PSI	PKG. QTY.
AP538	 <p>Jamb Mullion: (1) AC527 Shear Block (2) MF353 3/8"-16 x 5" (127) GR5 Bolts (2) MF251 3/8" (9.5) Flat Washers (2) MF304 3/8"-16 Flange Nuts (2) ST277 #12 x 1" (25) FH SMS</p>	6
AP527	 <p>Intermediate Mullion: (2) AC527 Shear Blocks (2) MF368 3/8"-16 x 6-1/2" (165) GR5 Bolts (4) MF251 3/8" (9.5) Flat Washers (2) MF265 3/8"-16 Hex Nuts, NyLoc (4) ST277 #12 x 1" (25) FH SMS</p>	12
AP539	 <p>Corner Mullion: (2) AC539 Shear Blocks (4) MF342 3/8"-16 x 4" (102) GR5 Bolts (4) MF254 3/8" (9.5) Lock Washers (1) TB539 Tapping Block (5) ST277 #12 x 1" (25) FH SMS</p>	6
PART NO.	HORIZONTAL SHEAR BLOCK AND BOLT PACKAGES FOR UP TO 4.4 PSI	PKG. QTY.
AP464	 <p>Jamb Mullion: (1) AC464 Shear Block (2) MF545 5/8"-11 x 4-1/2" (114) GR5 Bolts (2) MF255 5/8" (16) Flat Washers (2) MF529 5/8"-11 Flange Nuts (2) ST277 #12 x 1" (25) FH SMS</p>	6
AP465	 <p>Intermediate Mullion: (2) AC464 Shear Blocks (2) MF565 5/8"-11 x 6-1/2" (165) GR5 Bolts (4) MF255 5/8" (16) Flat Washers (2) MF219 5/8"-11 Hex Nuts, NyLoc (4) ST277 #12 x 1" (25) FH SMS</p>	12
AP494	 <p>Jamb Mullion: (2) AC494 Shear Blocks (4) MF540 5/8"-11 x 4" (102) GR5 Bolts (4) MF256 5/8" (16) Lock Washers (1) TB490 Tapping Block (5) ST277 #12 x 1" (25) FH SMS</p>	6

Z

BLAST MITIGATION

Accessories

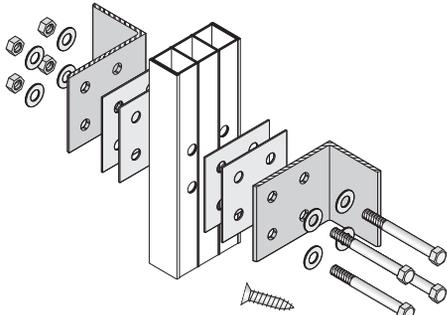
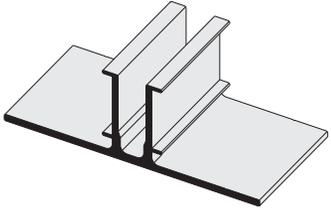
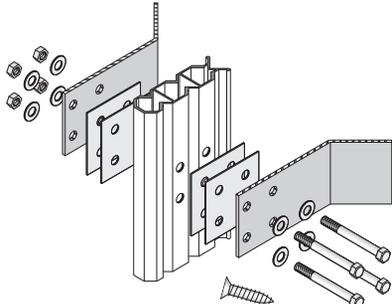
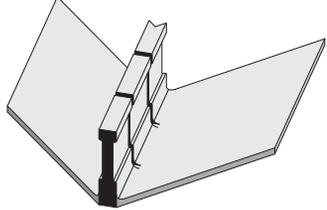
Blast Resistant Curtain Wall • Series BW3250

PART NO.	HORIZONTAL SHEAR BLOCK AND BOLT PACKAGES FOR UP TO 10.8 PSI	PKG. QTY.
AP467	 <p>Jamb Mullion: (1) AC464 Shear Block (3) MF545 5/8"-11 x 4-1/2" (114) GR5 Bolts (3) MF255 5/8" (16) Flat Washers (3) MF529 5/8"-11 Flange Nuts (2) ST277 #12 x 1" (25) FH SMS</p>	6
AP468	 <p>Intermediate Mullion: (2) AC464 Shear Blocks (3) MF565 5/8"-11 x 6-1/2" (165) GR5 Bolts (6) MF255 5/8" (16) Flat Washers (3) MF219 5/8"-11 Hex Nuts, NyLoc (4) ST277 #12 x 1" (25) FH SMS</p>	12
AP497	 <p>Corner Mullion: (2) AC494 Shear Blocks (6) MF540 5/8"-11 x 4" (102) GR5 Bolts (6) MF256 5/8" (16) Lock Washers (1) TB490 Tapping Block (5) ST277 #12 x 1" (25) FH SMS</p>	6
PART NO.	TOP AND BOTTOM JAMB, AND MID SPAN ANCHORS	PKG. QTY.
AP481	 <p>Jamb Mullion Anchor: (1) SL462 Anchor Support (2) NY401 Slip pads (4) MF535 5/8"-11 x 3-1/2" (89) GR5 Bolts (4) MF255 5/8" (16) Flat Washers (1) ST277 #12 x 1" (25) FH SMS</p>	6
AP972	 <p>Top and Bottom Anchor for Jamb Mullion</p>	6

BLAST MITIGATION

Accessories

Blast Resistant Curtain Wall • Series BW3250

PART NO.	TOP AND BOTTOM JAMB, AND MID SPAN ANCHORS	PKG. QTY.
<p>AP482</p>	 <p>Intermediate Mullion Anchor: (1) SL462 Anchor Support (4) NY401 Slip Pads (4) MF545 5/8"-11 x 4-1/2" (114) GR5 Bolts (8) MF255 5/8" (16) Flat Washers (4) MF219 5/8"-11 Hex Nuts, NyLoc (1) ST277 #12 x 1" (25) FH SMS</p>	<p>12</p>
<p>AP971</p>	 <p>Top and Bottom Anchor for Intermediate Mullion</p>	<p>12</p>
<p>AP483</p>	 <p>Corner Mullion Anchor: (1) SL492 Anchor Support (4) NY401 Slip Pads (4) MF545 5/8"-11 x 4-1/2" (114) GR5 Bolts (8) MF255 5/8" (16) Flat Washers (4) MF219 5/8"-11 Hex Nuts, NyLoc (1) ST277 #12 x 1" (25) FH SMS</p>	<p>6</p>
<p>AP492</p>	 <p>Top and Bottom Anchor for Corner Mullion</p>	<p>6</p>

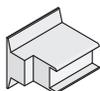
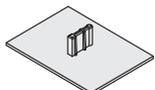
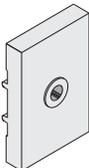
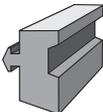
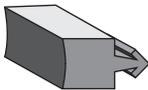
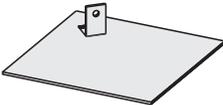
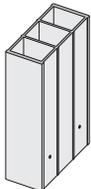
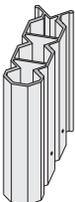
BLAST MITIGATION

Accessories

Blast Resistant Curtain Wall

• Series BW3250

FOR 1" (25) GLAZING

PART NO.	DETAIL	DESCRIPTION	PKG. QTY.
HD975		End Dam for Vertical Mullions	50
CP900		Closure Plate for Vertical Mullions	50
CW368		Temporary Glass Retainer for Mullions	50
NP430		Exterior Gasket	250' Roll
SP250		Interior Spacer Gasket	250' Roll
SB504		Setting Block for 1" (25) Glass; 4" (101.6) Long	100
MS222		Screw for Pressure Bar 1/4"-20 x 1" (25) HWHCS with SRG5	200
CP901		Closure Plate for Corner Vertical Mullions	10
SL461		Splice Sleeve for Jamb and Intermediate Mullions	12
SL491		Splice Sleeve for Corner Mullions	6

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