



# VETRINA

HIGH QUALITY WINDOWS & DOORS

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B-Pro installation -Visiting Quarters, CH2MHill / AFCEE, DoD UFC 4-010-01

## Energy Absorbing Blast Mitigation Window Systems Advanced Innovative Technology

# SYSTEMS PROFILE

## ■ About the Company

B-Pro Safeguard system was created to serve the requirements of the Department of Defense UFC 4-10-01 (2007) AT/FP criteria and to provide the U.S. military and other U.S government agencies the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of blast and AAMA testing.

B-Pro Safeguard erected a state of the art plant equipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

## ■ The Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach.

This technology utilizes the frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the glazed unit to stay in the opening and to protect the people within the building.

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtain wall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

All B-Pro products are modular stackable units that are interconnected and can be installed mulled together within a single opening with no need for any steel mullions or other reinforcement.

"When blast pressure overcomes the strength of a conventional blast window, the thick glazing is projected into the protected space at high velocity, representing significant hazard to occupants of that area."

"This 'graceful failure' of the Muntin window (an Energy Absorbing window developed by the Department of States) is in sharp contrast to the catastrophic failure mechanism of a conventional blast window manufactured with thick laminated glazing or monolithic tempered glass."

Source: U.S. Department of State Bureau Of Diplomatic Security Physical Security Division Blast Resistant Structural Muntin Window System

## ■ Testing

The B-Pro blast mitigation products have been tested for:

- \*DoD UFC4-010-01 AATFP criteria -2007
- \*ASTM F1642 Hazard Rating
- \*GSA Performance condition 2, 3a-3b
- \*AAMA requirements.



Please feel free to contact B-Pro's blast engineering team for your blast mitigation window and door projects at any time.

# ENERGY ABSORBING ANCHORS(EAA) INNOVATIVE TECHNOLOGY

## The Energy Absorbing Anchor (EAA)

B-Pro Safeguard offers an extraordinarily sophisticated Energy-Absorbing system approach. This technology utilizes the window frames, glazing, hardware and anchoring system as energy dissipating components.

Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy, which allows the window to stay in the opening and to protect the people within the building.



Following extensive research, including many hundred of full scale blast tested windows, B-Pro identified the most efficient energy dissipating component: the Energy Absorbing Anchor (EAA).

This simple looking small piece of galvanized steel sheet, releases much of the blast load off the window and off the supporting wall.



This allows B-Pro to design light and cost saving windows and more than that: it allows the project's architect and structural engineer to design light, conventional construction walls that in most cases do not require any reinforcement.

# THE BENEFITS OF B-PRO EAA

The benefits of B-Pro EAA were recognized in numerous government projects and by leading blast consulting firms such as Weidlinger Associates Inc.

...Weidlinger Associates Inc. (WAI) modeled and analyzed the B-Pro window system ... The benefits of the Energy Absorbing Anchor were significant... As a result of this study, WAI acknowledges the beneficial performance of the B-Pro window and Energy Absorbing Anchor."



WEIDLINGER ASSOCIATES<sup>®</sup> INC  
CONSULTING ENGINEERS

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NEW YORK NY  
10014-3656  
PHONE 212 367.3000  
FAX 212 367.3030

<http://www.wai.com>

28 August 2009

B-Pro Safeguard Inc. (USA)  
B-Pro Safeguard Inc. (Korea)  
305 Camer Drive  
Unit #6  
Bensalem, PA 19020

Re: B-Pro Energy Absorbing Anchors

Dear Sirs,

Weidlinger Associates is working with B-Pro Safeguard Inc to analyze and evaluate the performance of the B-Pro window system in response to blast loading when attached to a building envelope by means of Energy Absorbing Anchors. Working with Moty Emek and Oldcastle Glass, WAI modeled and analyzed the B-Pro window system to demonstrate the acceptable performance of the glass and frames, as defined in the building specifications, in response to the US Government specified blast loads. WAI first calibrated the analytical models of the B-Pro window and Energy Absorbing Anchors to explosive test data that was provided by Mr. Moty Emek, representing B-Pro and Oldcastle Glass. WAI then used the calibrated properties of the Energy Absorbing Anchor to analyze the performance of a B-Pro window assembly attached to a stud wall. The benefits of the Energy Absorbing Anchor were significant, not only did a thinner laminated glass make-up satisfy the required hazard level, but the mullions were significantly lighter and the surrounding stud walls were significantly less rigid than is typically required by conventional hardened window construction. As a result of this study, WAI acknowledges the beneficial performance of the B-Pro window and Energy Absorbing Anchor for the window dimensions and blast loading regimes that were investigated. This benefit may be applicable to a wide range of conventional construction, including stud walls, concrete walls and masonry walls.

Sincerely,

Dr. Robert Smilowitz,  
Principal

# B-PRO SAFEGUARD PRODUCTS CHART

B-Pro Series	Type	Frame Depth	AAMA rating	Thermal Performance		Blast Testing			
				U Factor	CRF frame	Pressure (psi)	Impulse (psi-msec)	Testing Standard	Hazard Level
400	Dual Action; Inward casement	3"	DAW-C40 Water 12.12psf			45	159	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 2
								UFC4-010-01	***Medium
400PA	Dual Action; Inward casement	3"	DAW-C40 Water 12.12psf	**0.34	**CR58	7.3	43.5	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 2
								UFC4-010-01	***Medium
500	Fixed: Punched; Ribbon; Storefront	4-3/4"	F-AW80 Water 15psf	*0.44	*64	45	159	ASTM F 1642	Minimal Hazard
				**0.42				GSA-TS01	Condition 2
								UFC4-010-01	***Medium
510	Fixed: Punched; Ribbon; Storefront	3-3/8"	AP-C-30 Water 12.12psf	*0.44	*61	38.6	104	ASTM F 1642	Low
				**0.41				GSA-TS01	Condition 3b
								UFC4-010-01	***Very Low
600	Sliding	5"	HS-C35 Water 12psf			51	115	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 2
								UFC4-010-01	***Medium
610	Sliding	4 3/4"	CW-PG45 Water 12.12psf	**0.36	**CR50	7.3	43.5	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 2
								UFC4-010-01	***Medium
800	Awning	3-3/8"	AP-C30 Water 12.12psf	*0.52	*51	38.6	104	ASTM F 1642	Low
				**0.51				GSA-TS01	Condition 3b
								UFC4-010-01	***Very Low
700	Alum. Door	3"	Air 0.06cfm/ft <sup>2</sup> @ 6.24psf Water 6psf			51	115	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 3a
								UFC4-010-01	***Medium
770	Alum. Door	1-3/4"				Blast performance is demonstrated through project specific analysis			
750ST	Steel Door	1-3/4"	Air <0.01 L/s/m @ 1.60psf			38.6	104	ASTM F 1642	Minimal Hazard
								GSA-TS01	Condition 2
								UFC4-010-01	***Medium
900	Curtain Wall	* 2-1/2"				Blast performance is demonstrated through project specific analysis			

Performance results at the above chart are quoted from independent testing laboratories reports

\* Following AAMA 1503 testing standard

\*\* Following NFRC 100/200/500 testing/analysis standards

\*\*\* The terms "Medium" and "Very Low" refer to the UFC 4-010-01 "Level of Protection" definition.

# Mullion width

# DUAL ACTION (TILT & TURN) AND CASEMENT WINDOW

## BLAST MITIGATION PRODUCT

# B-Pro 400

### ■ About the company

B-Pro Safeguard, Inc. was created to serve the AT/FP requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of field blast test and AAMA weather testing.

### ■ Blast Mitigation Windows Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the window frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the window to stay in the opening and to protect the people within the building.

### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	100	160	Check with the B-Pro technical support before specifying
Pressure (psi)	7	35	45	
B-Pro 400	V	V	V	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	DAW-C40 Water 12.12psf	74 mm (3")	Thermally broken aluminum section. Insulated Glass Unit.



\*EMRTC Blast Test

### ■ B-Pro 400 Tilt & Turn Window

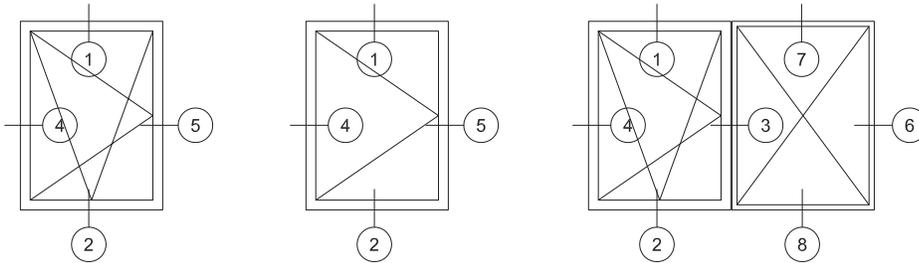
The B-Pro 400 is a sophisticated window system that allows the inward opening both for tilt and full opening positions. This window design is light and architecturally appealing. It's a low maintenance, efficient and convenient window system. The B-Pro 400 has also a casement and fixed window versions. All these versions are interconnected and can be installed in mullied units within a single opening with no need for any steel mullions or other reinforcement. The B-Pro 400 utilizes high quality durable however easily replaceable hardware. This is a thermally broken window equipped with Insulated Glass Unit to comply with any specification.

# B-Pro 400

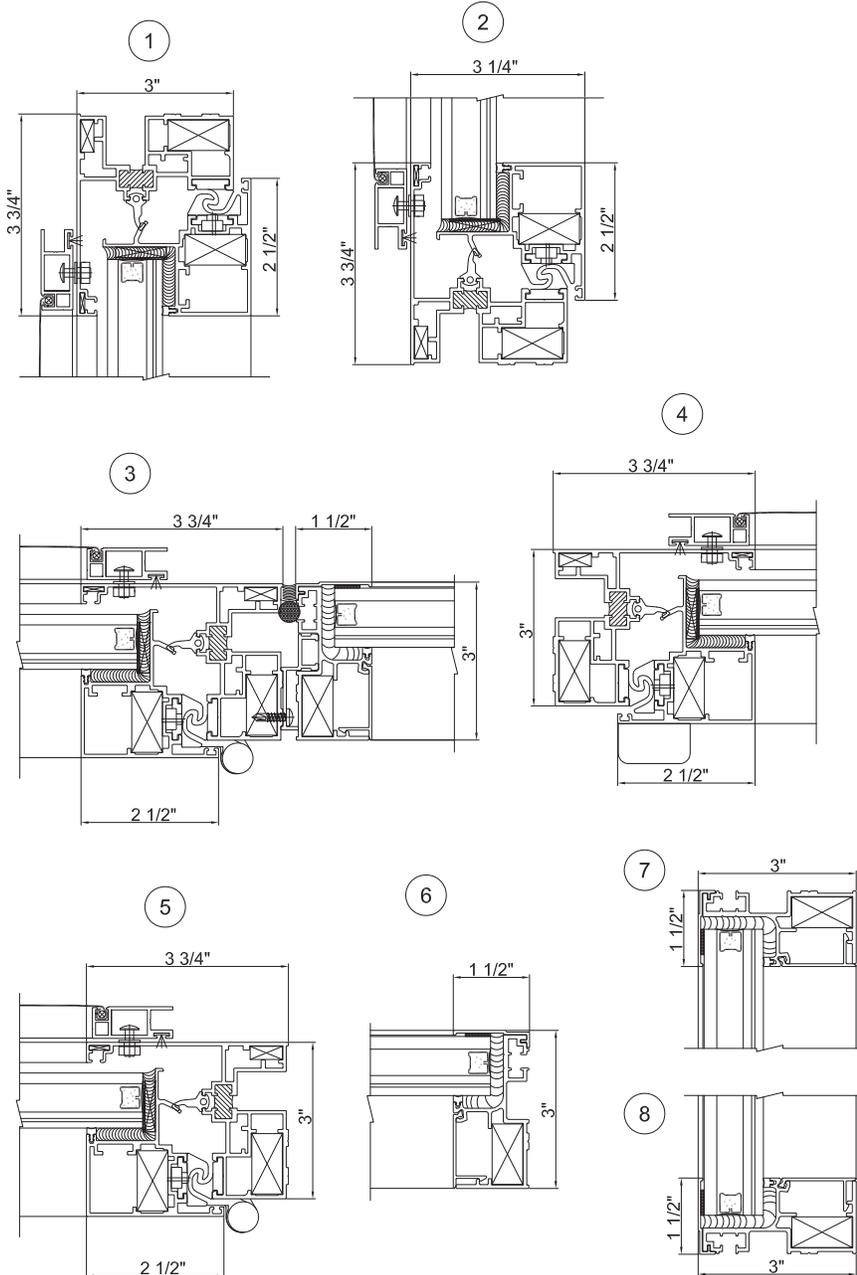
## DUAL ACTION (TILT & TURN) AND CASEMENT WINDOW

### ELEVATIONS AND DETAILS

#### ELEVATIONS



#### DETAILS



# DUAL ACTION (TILT & TURN) AND CASEMENT WINDOW

## BLAST MITIGATION PRODUCT

# B-Pro 400PA

### ■ About the company

B-Pro Safeguard, Inc. was created to serve the AT/FP requirements of the Department Of Defense UFC 4-010-1 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of field blast test and AAMA weather testing.

### ■ Blast Mitigation Windows Technology

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### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	100	160	Check with the B-Pro technical support before specifying
Pressure (psi)	7	35	45	
B-Pro 400	V	X	X	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	DA C-40 Water 12.12psf	74 mm (3")	NFRC 100/200/500 U Factor 0.34: CR 58



\*HTL Blast Test

### ■ B-Pro 400 PA Tilt & Turn Window

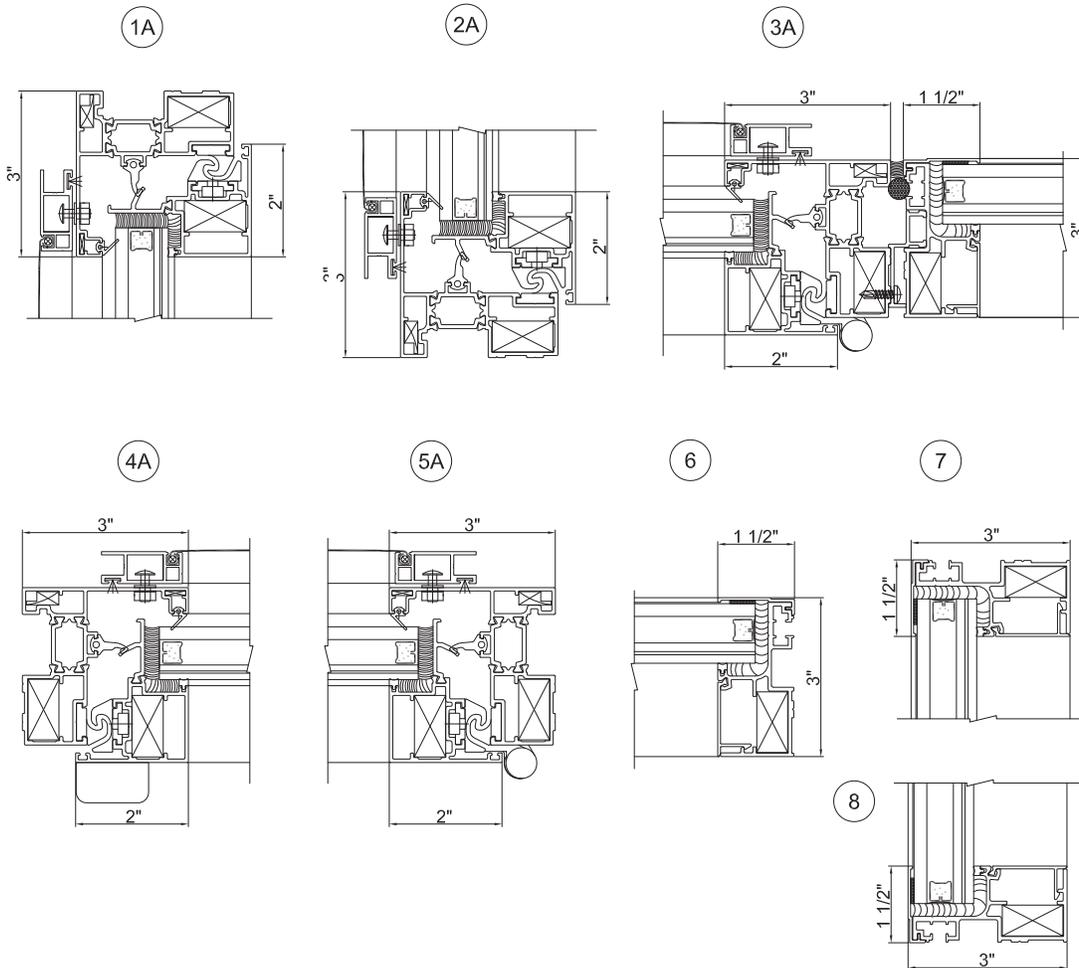
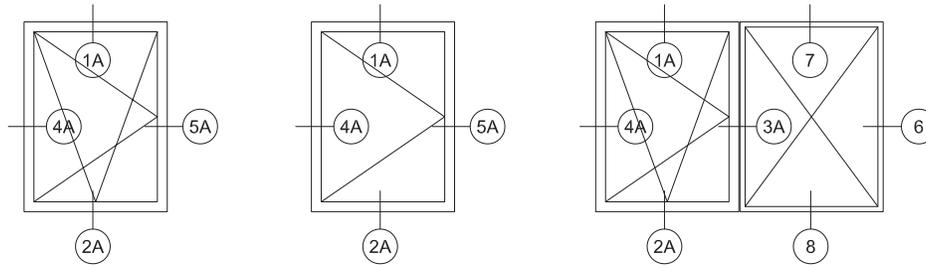
The B-Pro 400PA is a sophisticated window system that allows the inward opening both for tilt and full opening positions. This window design is light and architecturally appealing. It's a low maintenance, efficient and convenient window system. The B-Pro 400PA has also a casement and fixed window versions. All these versions are interconnected and can be installed in mullied units within a single opening with no need for any steel mullions or other reinforcement. The B-Pro 400PA utilizes high quality durable however easily replaceable hardware.

The B-Pro 400PA is a "green window": its shapes are pre-assembled with glass reinforced polyamide bars to achieve the enhanced thermal performance required for all Energy Star Climate Zones.

# B-Pro 400PA

## DUAL ACTION (TILT & TURN) AND CASEMENT WINDOW

### ELEVATIONS AND DETAILS



### ■ About the company

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### ■ Blast Mitigation Windows Technology

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### ■ Products & Aesthetics

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### ■ Technical Support and Fabrication

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### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	40	85	160	Check with the B-Pro technical support before specifying
Pressure ( psi )	6	35	45	
<b>B-Pro 500</b>	V	V	V	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	F-AW80 Water 15psf	120 mm (4-3/4")	AAMA 1503 U Factor=0.44 (NFRC=0.42);CRF=64



\*HTL Blast Test

### ■ B-Pro 500 Fixed Window and Storefront

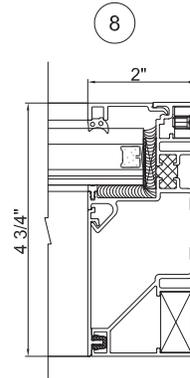
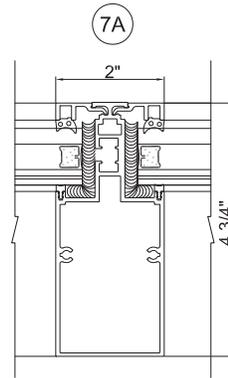
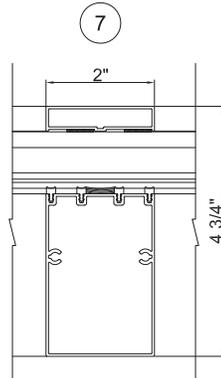
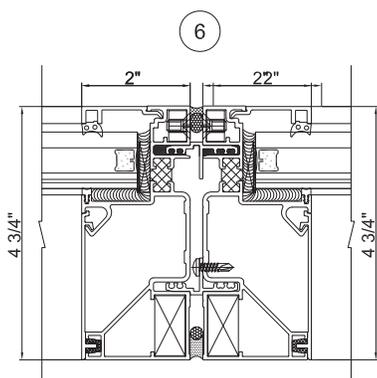
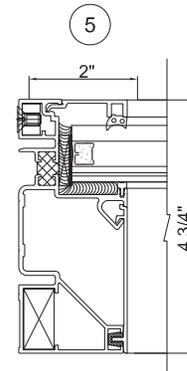
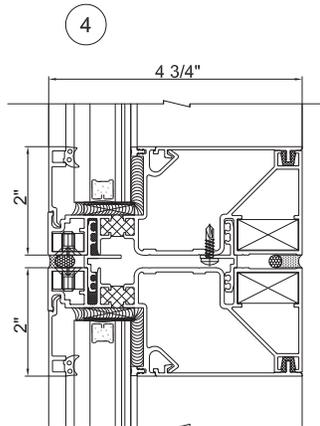
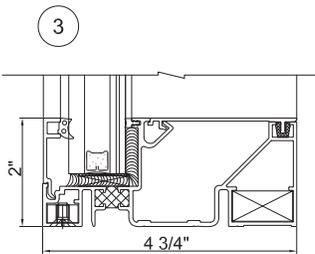
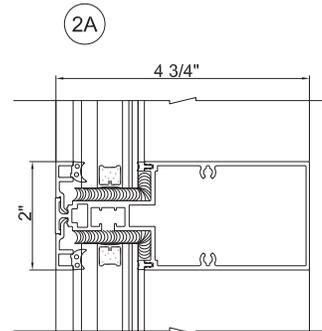
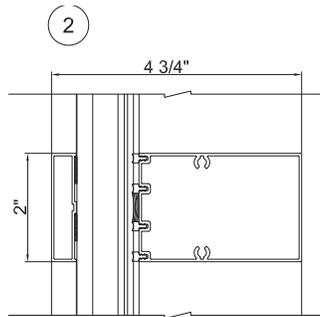
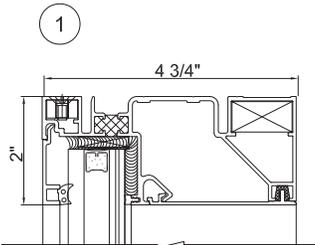
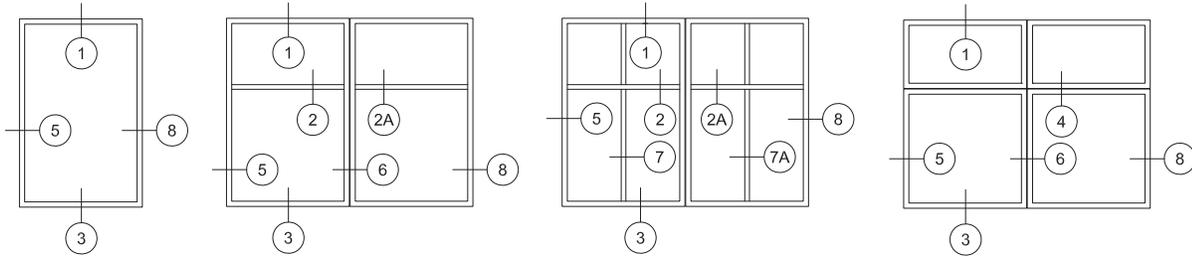
The B-Pro 500 is a high level blast mitigation fixed window and storefront. This is a modular stackable product to be utilized as a punched window, ribbon window and as a storefront. The B-Pro 500 is a low maintenance, efficient, low cost window with outstanding ease of installation at any given condition. Its versatile design allows for any architectural implementation. This is a thermally broken window equipped with Insulated Glass Unit to comply with any specification.

# B-Pro 500

## FIXED WINDOW & STOREFRONT

### ELEVATIONS AND DETAILS

#### ELEVATIONS



### ■ About the company

B-Pro Safeguard, Inc. was created to serve the requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of blast and AAMA weather testing.

### ■ Blast Mitigation Windows Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the window frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the window to stay in the opening and to protect the people within the building.

### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtain wall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	85	160	Check with the B-Pro technical support before specifying
Pressure ( psi )	7	35	40	
B-Pro 510	V	V	X	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	AP-C30 Water 12.12psf	85mm (3-3/8")	AAMA 1503 U Factor=0.44 (NFRC=0.41);CRF=61



\*HTL Blast Test

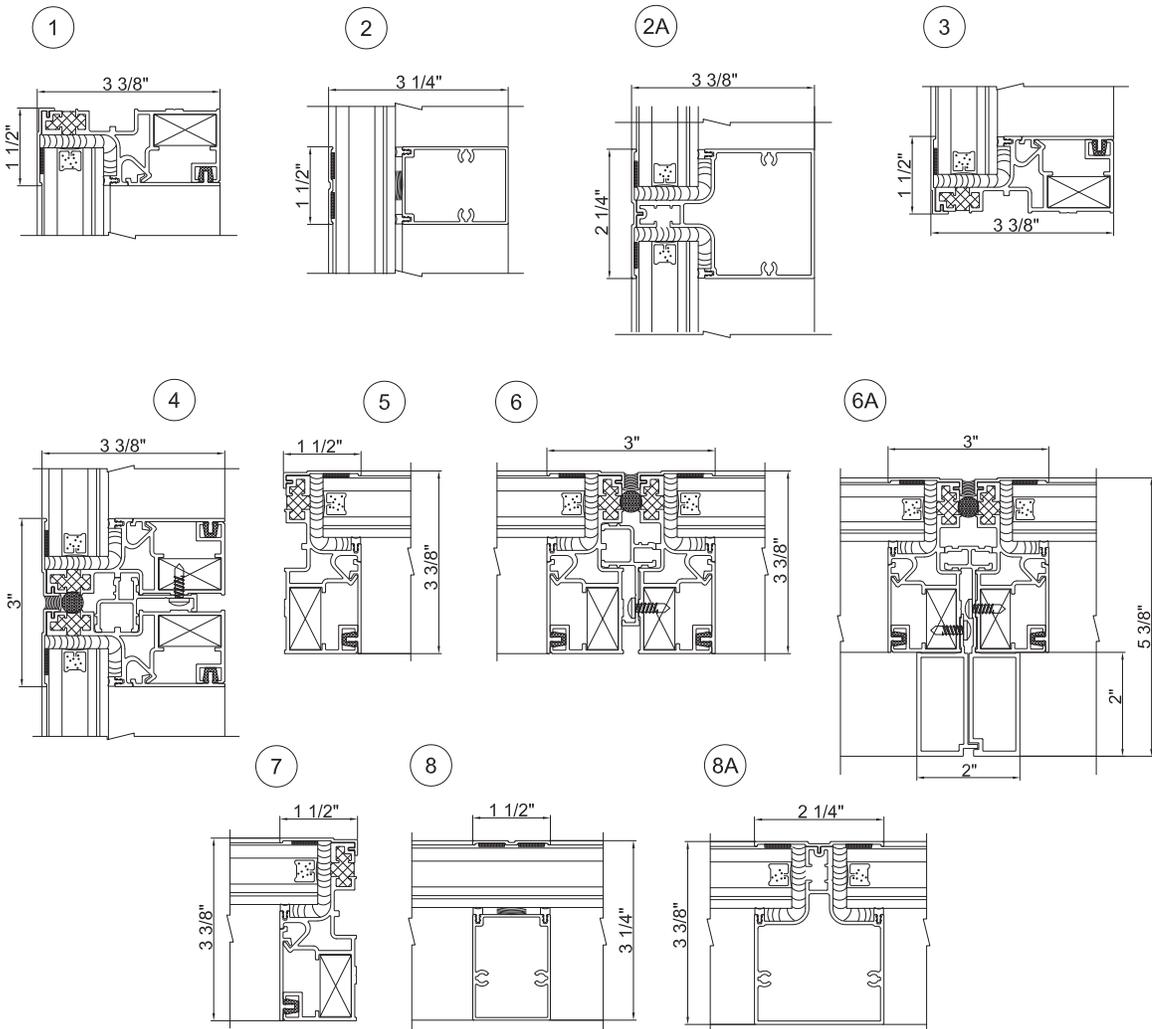
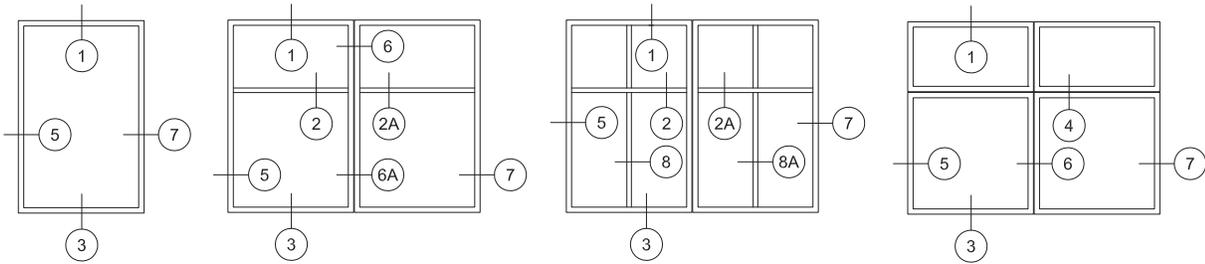
### ■ B-Pro 510 Fixed Window and Storefront

The B-Pro 510 is a high level blast mitigation fixed window and storefront. This is a modular stackable product to be utilized as a punched window, ribbon window and as a storefront. The B-Pro 500 is a low maintenance, efficient, low cost window with outstanding ease of installation at any given condition. Its versatile design allows for any architectural implementation. This is a thermally broken window equipped with Insulated Glass Unit to comply with any specification.

# B-Pro 510

## FIXED WINDOW & STOREFRONT

### ELEVATIONS AND DETAILS



### About the company

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### Blast Mitigation Windows Technology

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### Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	85	160	Check with the B-Pro technical support before specifying
Pressure ( psi )	7	35	45	
B-Pro 600	V	V	X	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	HS-C35 Water 12psf	124mm (5")	Thermally broken aluminum sections. Insulated Glass Unit



\*EMRTC Blast Test

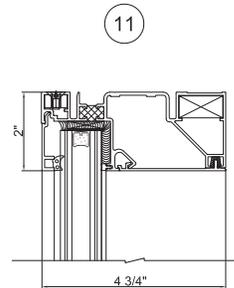
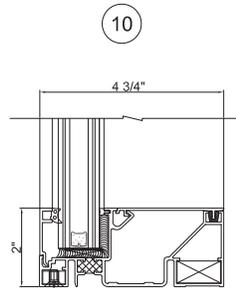
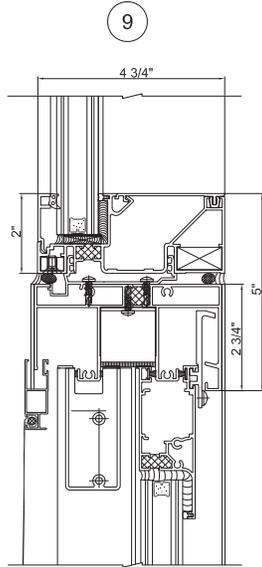
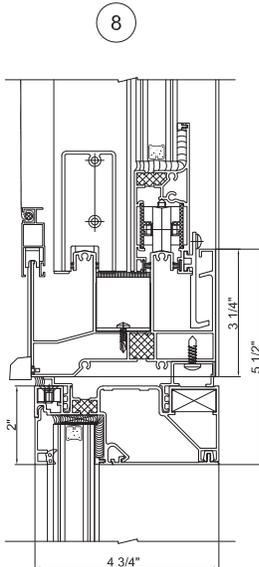
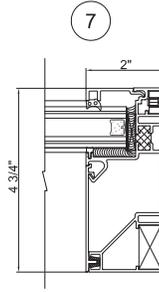
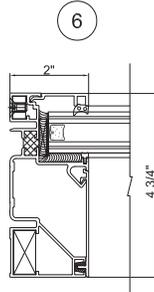
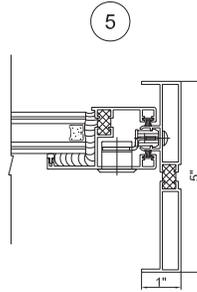
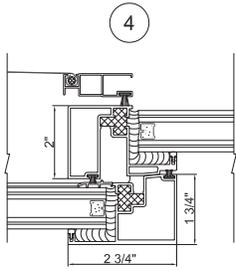
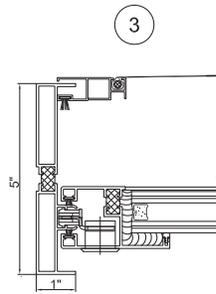
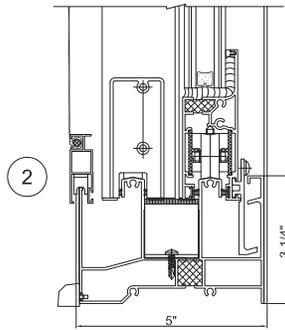
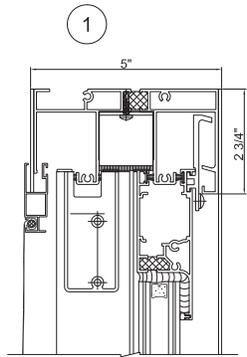
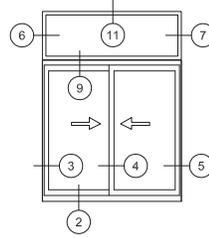
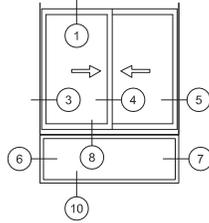
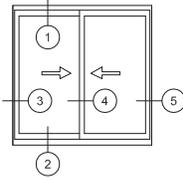
### B-Pro 600 Sliding Window

The B-Pro 600 is the only available high level blast mitigation sliding window in the world. This innovative window was developed to allow the use of a low maintenance, efficient, low cost window especially for military housing. The B-Pro 600 is a stackable window and can be installed in mullioned units or interconnected with the B-Pro 500 within a single opening with no need for any steel mullions or other reinforcement. The B-Pro 600 utilizes high quality durable however easily replaceable hardware. This is a thermally broken window equipped with Insulated Glass Unit to comply with any specification.

# B-Pro 600

## SLIDING WINDOW

### ELEVATIONS AND DETAILS



### ■ About the company

B-Pro Safeguard, Inc. was created to serve the AT/FP requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of field blast test and AAMA weather testing.

### ■ Blast Mitigation Windows Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the window frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy, which allows the window to stay in the opening and to protect the people within the building.

### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	85	160	Check with the B-Pro technical support before specifying
Pressure (psi)	7	35	45	
B-Pro 610	V	X	X	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	CW-PG45 Water 12.12psf	120 mm (4-3/4")	NFRC 100/200/500 U Factor=0.36; CR=50



\*HTL Blast Test

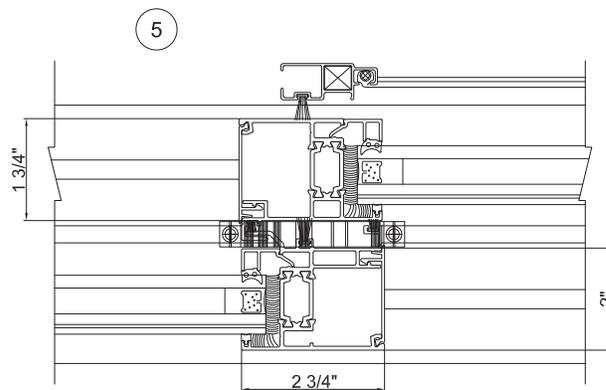
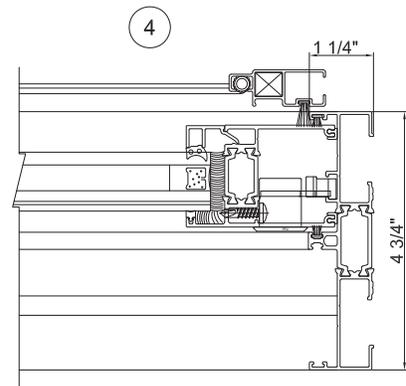
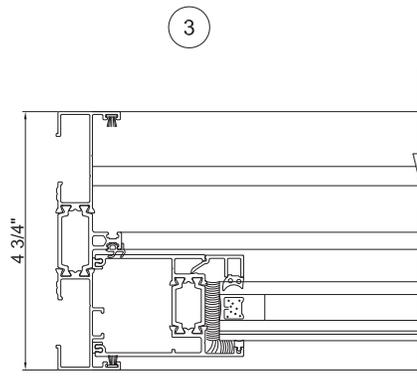
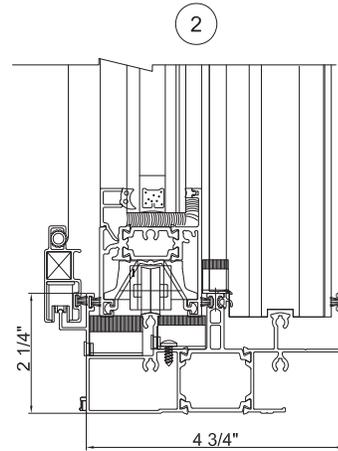
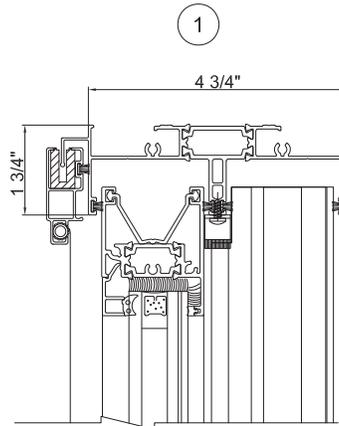
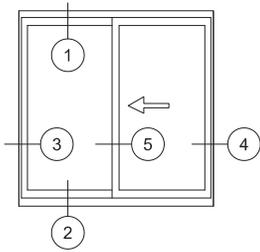
### B-Pro 610 Sliding Window

The B-Pro 610 is the thermally improved blast mitigation sliding window. This innovative window was developed to allow the use of a low maintenance, efficient, low cost window especially for military housing. The B-Pro 610 is a stackable window and can be installed in mulled units or interconnected with the B-Pro 510 within a single opening with no need for any steel mullions or other reinforcement. The B-Pro 610 utilizes high quality durable however easily replaceable hardware. The B-Pro 610 is a "green window": its shapes are pre-assembled with glass reinforced polyamide bars to achieve the enhanced thermal performance required for all Energy Star Climate Zones.

# B-Pro 610

## SLIDING WINDOW

### ELEVATIONS AND DETAILS



### ■ About the company

B-Pro Safeguard, Inc. was created to serve the AT/FP requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of field blast test and AAMA weather testing.

### ■ Blast Mitigation Windows Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the window frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the window to stay in the opening and to protect the people within the building.

### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation window systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	100	160	Check with the B-Pro technical support before specifying
Pressure ( psi )	6	35	45	
B-Pro 800	V	V	X	

\*Level A corresponds to the UFC 4-010-01 requirements where "conventional construction standoff distances are achieved".

### ■ Technical Data

Glazing	AAMA Rating	Frame Depth	Thermal Performance
According to the specified requirements	AP-C30 Water 12.12psf	84mm (3-3/8")	AAMA 1503 U Factor=0.52 (NFRC=0.51);CRF=51



\*HTL Blast Test

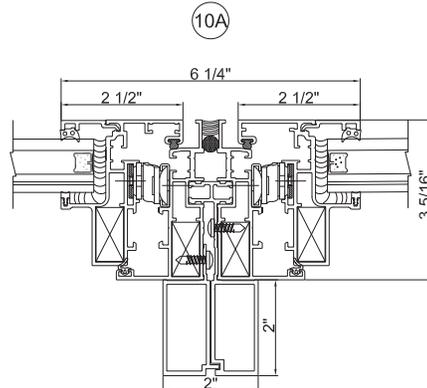
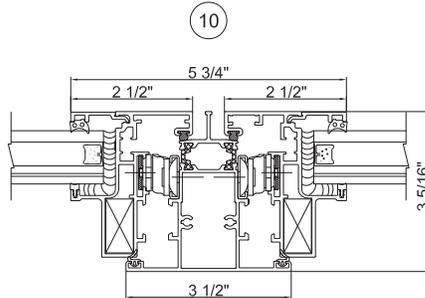
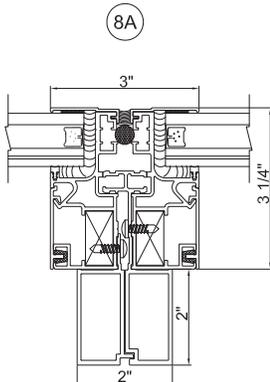
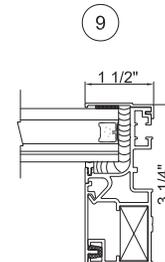
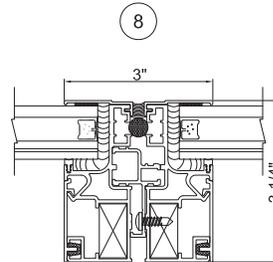
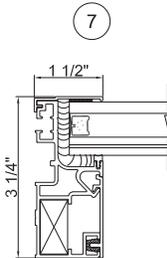
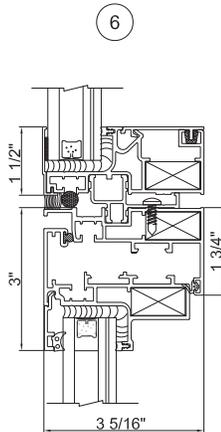
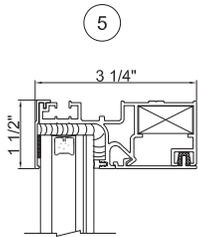
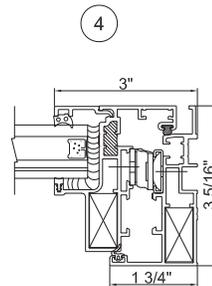
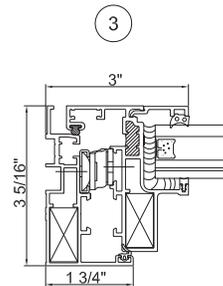
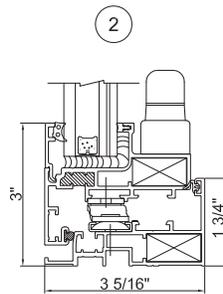
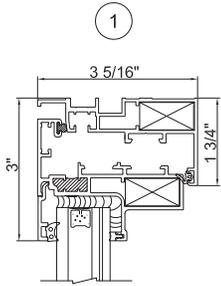
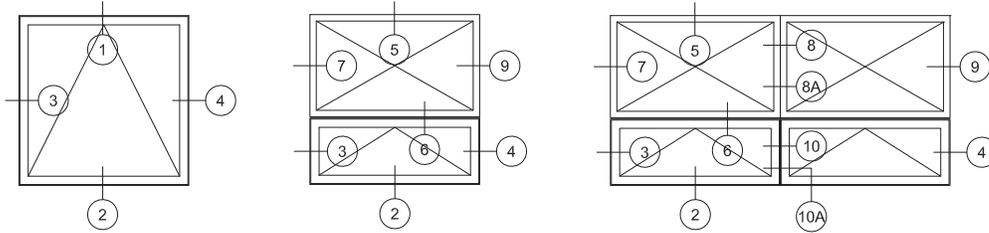
### ■ B-Pro 800 Awning Window

The B-Pro 800 is a sophisticated window system that allows the inward opening both for tilt and full opening positions. This window design is light and architecturally appealing. It's a low maintenance, efficient and convenient window system. The B-Pro 800 has also a casement and fixed window versions. All these versions are interconnected and can be installed in mulled units within a single opening with no need for any steel mullions or other reinforcement. The B-Pro 800 utilizes high quality durable however easily replaceable hardware. This is a thermally broken window equipped with Insulated Glass Unit to comply with any specification.

# B-Pro 800

## AWNING WINDOW

### ELEVATIONS AND DETAILS



# GLAZED AL DOOR

## BLAST MITIGATION PRODUCT

# B-Pro 700

### ■ About the company

B-Pro Safeguard, Inc. was created to serve the requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of blast and weather testing.

### ■ Blast Mitigation Glazed doors Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the door frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the glazed door to stay in the opening and to protect the people within the building.

### ■ Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### ■ Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation door systems. The B-Pro team is committed to quality, service and support.

### ■ Blast Rating

B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	85	160	Check with the B-Pro technical support before specifying
Pressure ( psi )	7	35	45	
B-Pro 700	V	V	X	

\*Level A corresponds to the UFC 4-010-01 DoD Min. requirements . where "conventional construction standoff distances are achieved".

### ■ AAMA environmental rating : Air 0.06cfm/ft<sup>2</sup> @ 6.24psf Water 6psf



\*EMRTC Blast Test

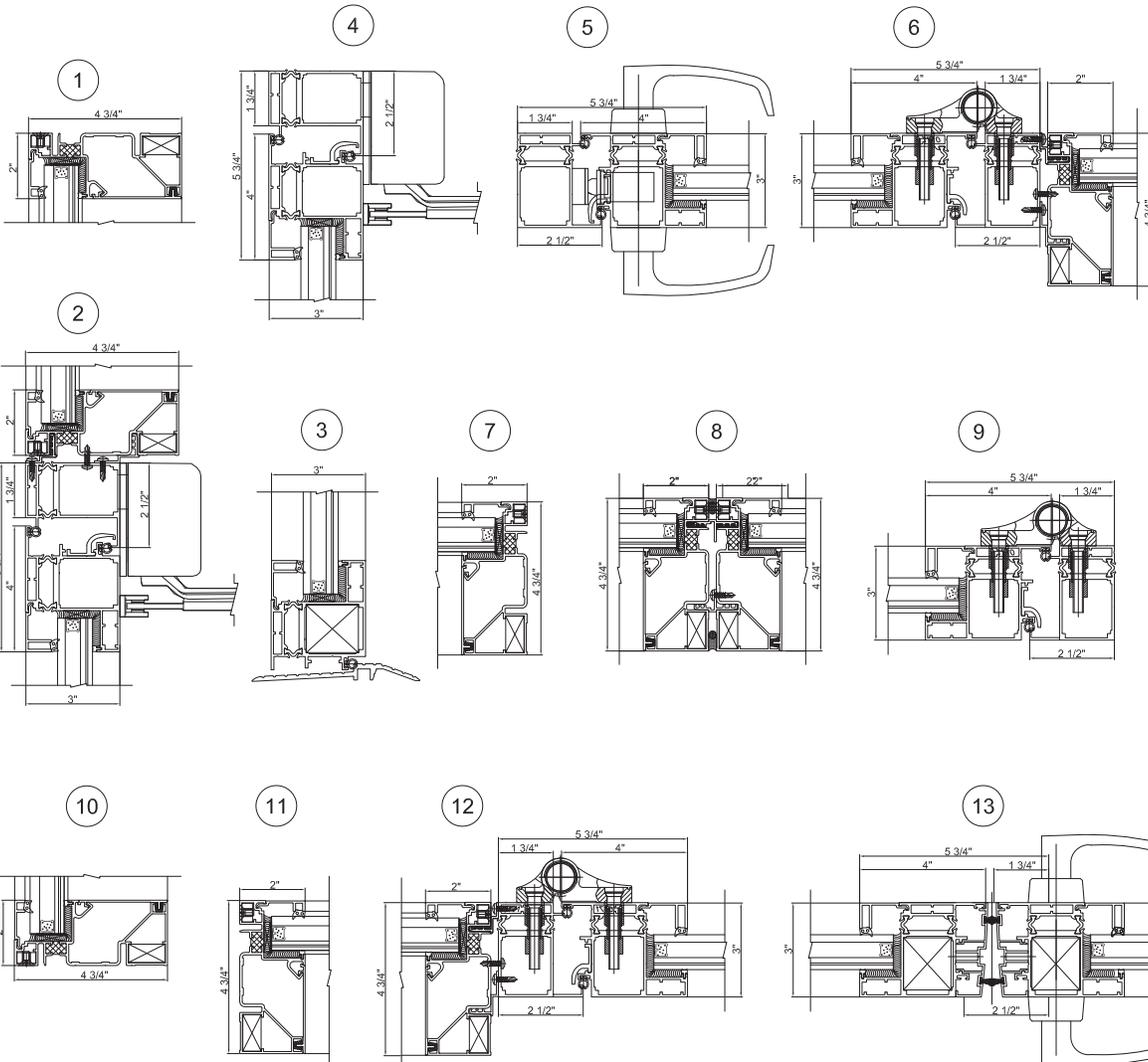
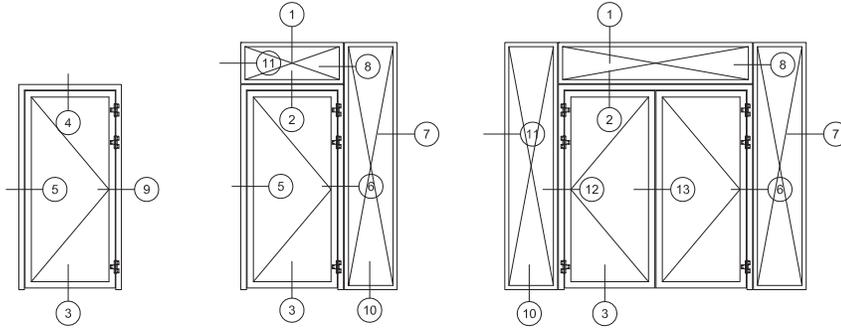
### ■ B-Pro 700 Glazed Door

The B-Pro 700 innovative glazed aluminum door was developed to allow the use of a low maintenance, efficient, low cost aluminum glazed door. This is a modular stackable product that can be combined together with the B-Pro 500 to create storefront and entrance units. The B-Pro 700 utilizes high quality durable however easily replaceable hardware. This is a thermally broken glazed aluminum door equipped with Insulated Glass Unit to comply with any blast door specification.

# B-Pro 700

## GLAZED AL DOOR

### ELEVATIONS AND DETAILS



# GLAZED AL DOOR

## BLAST MITIGATION PRODUCT

# B-Pro 770

### About the company

B-Pro Safeguard, Inc. was created to serve the requirements of the Department Of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of blast and weather testing.

### Blast Mitigation Glazed doors Technology

B-Pro Safeguard offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the door frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the glazed door to stay in the opening and to protect the people within the building.

### Products & Aesthetics

The real-life experience of the B-Pro engineering team which include hundreds of thousands successful installations as well as the developing of numerous blast mitigation windows, doors and curtainwall systems, has provided B-Pro with the expertise in designing and refining the product in order to meet the most demanding architectural criteria while providing the highest level of blast protection required.

### Technical Support and Fabrication

B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation door systems. The B-Pro team is committed to quality, service and support.

### Blast Rating

B-Pro Blast Levels	A*	B	C	Blast performance demonstration
Impulse (psi*msec)	43			Blast performance is demonstrated through project specific analysis.
Pressure ( psi )	7			
B-Pro 770	V			

\*Level A corresponds to the UFC 4-010-01 DoD Min. requirements . where "conventional construction standoff distances are achieved".

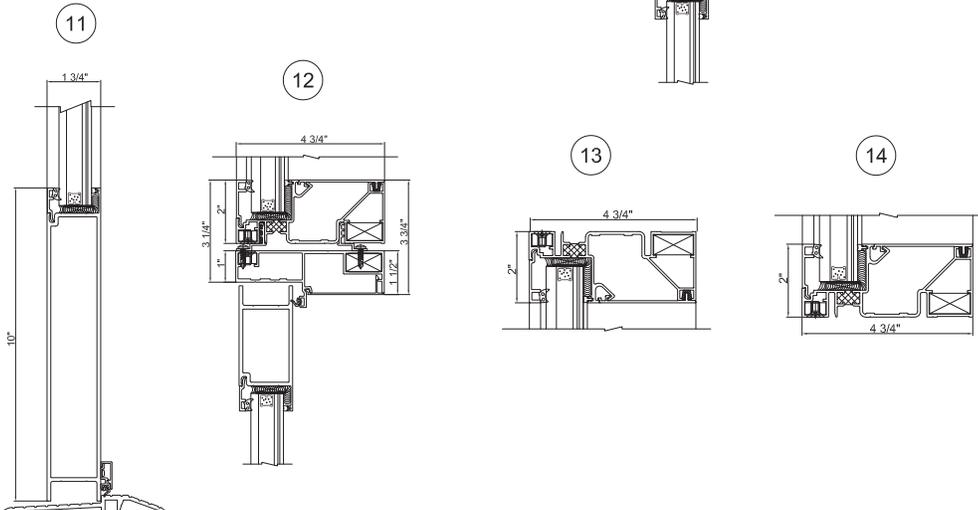
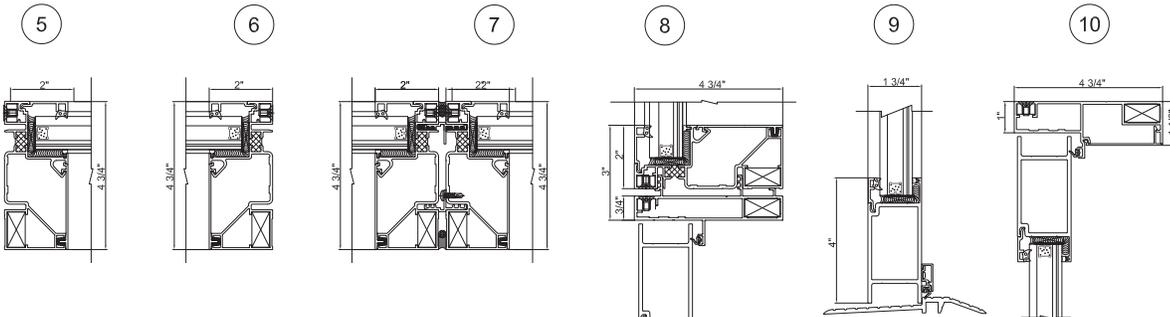
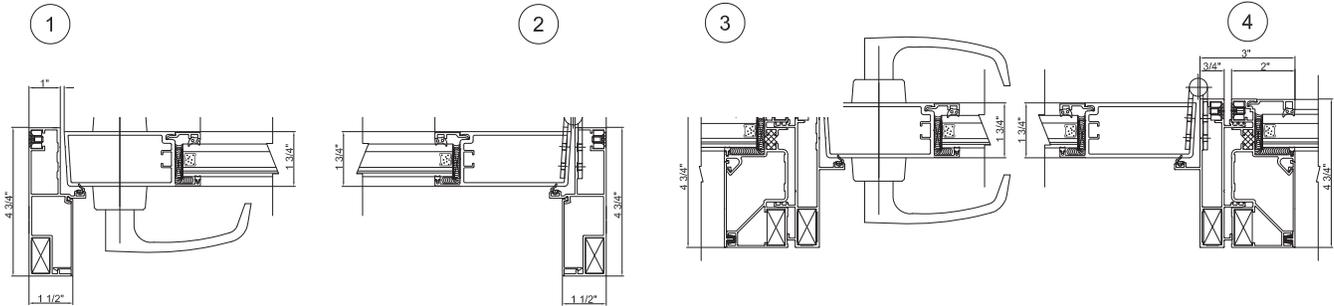
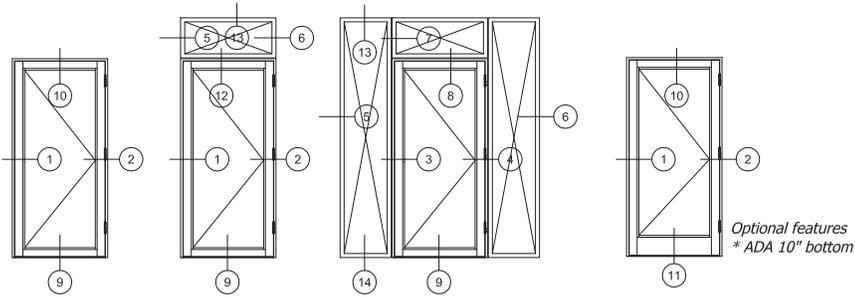


\*EMRTC Blast Test

### B-Pro 770 Glazed Door

The B-Pro 770 innovative glazed aluminum door was developed to allow the use of a low maintenance, efficient, low cost aluminum glazed door. This is a modular stackable product that can be combined together with the B-Pro 500 to create storefront and entrance units. The B-Pro 770 utilizes high quality durable however easily replaceable hardware. This is a non thermally broken glazed aluminum door equipped with Insulated Glass Unit to comply with any door hardwares.

# B-Pro 770



\* ADA 10" bottom

# GLAZED STEEL DOOR

## BLAST MITIGATION PRODUCT

# B-Pro 750ST

### ■ About the company

B-Pro Safeguard, Inc. was created to serve the requirements of the Department of Defense UFC 4-010-01 and the GSA and to provide the U.S. government the most advanced and cost effective protective glazing systems. The B-Pro products were developed by the world's most experienced engineers in the field and were subjected to a rigorous series of blast testing.

### ■ Blast Mitigation Glazed Steel Doors Technology

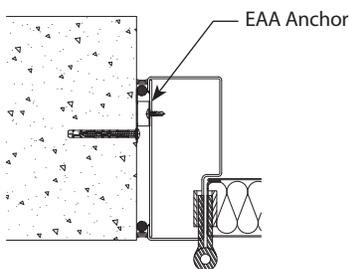
The B-Pro 750 ST glazed steel door offers an extraordinarily sophisticated, patented Energy-Absorbing system approach. This technology utilizes the door frames, glazing, hardware and anchoring system as energy dissipating components. Once hit by the blast wave dynamic loading, those components are gradually deforming, hence absorbing a significant portion of the blast energy which allows the glazed door to stay in the opening and to protect the people within the building. For the conventional blast steel door, the expansion bolts for fixing the door frame to the concrete will subject to shear, and may break if the door should take that high blast load and the high blast resistance door requires the welding to the embedded sub-frame or the door frame should be casted in the wall. However, B-Pro's steel door with innovative energy absorbing anchor (EAA) system does not require the use of the subframe or casting anymore. This door can be equipped with any specified hardware requirement. The glazed steel door equipped with Insulated Glass Unit to comply with DoD AT/FP glazed door requirement.



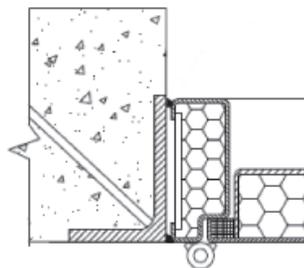
\*HTL Blast Test

### ■ Technical Support and Fabrication

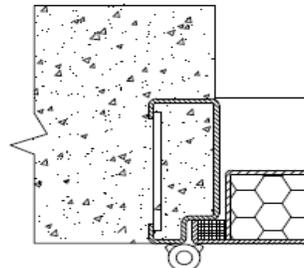
B-Pro Safeguard erected a state of the art plant quipped with modern machinery dedicated for the manufacturing of blast mitigation door systems. The B-Pro team is committed to quality, service and support.



<EAA Anchor system>



<Not required>



<Not required>

### ■ Blast Rating

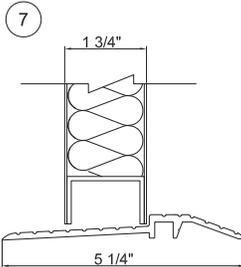
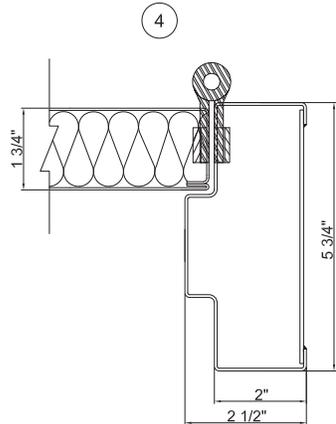
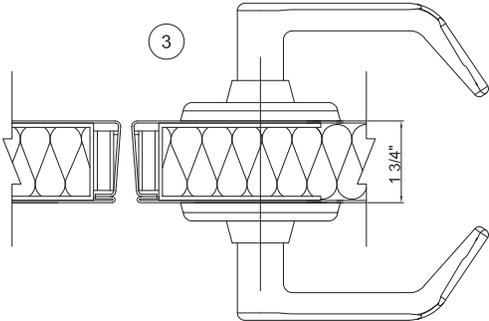
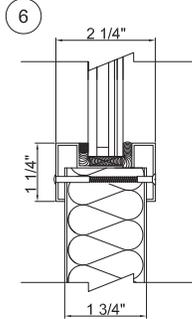
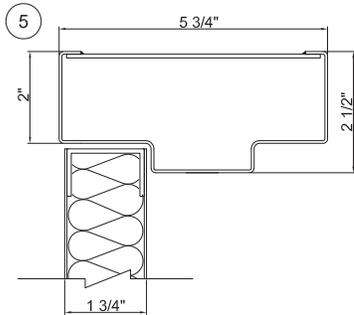
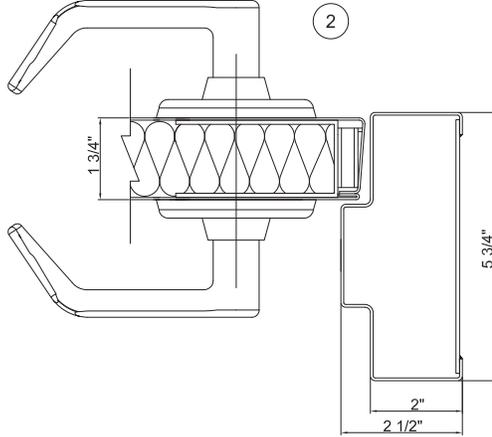
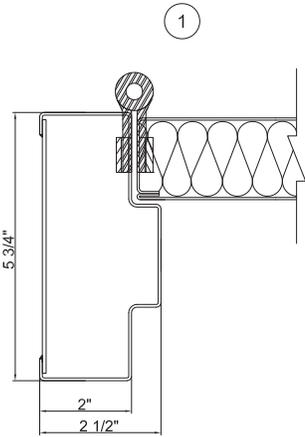
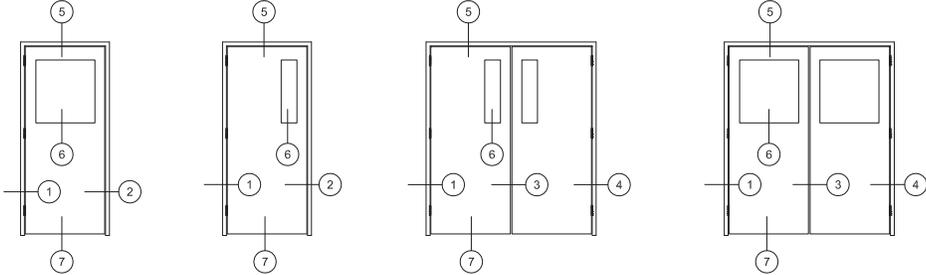
B-Pro Blast Levels	A*	B	C	Extreme blast environment
Impulse (psi*msec)	43	100	160	Check with the B-Pro technical support before specifying
Pressure (psi)	7	40	45	
B-Pro 750ST	V	V	X	

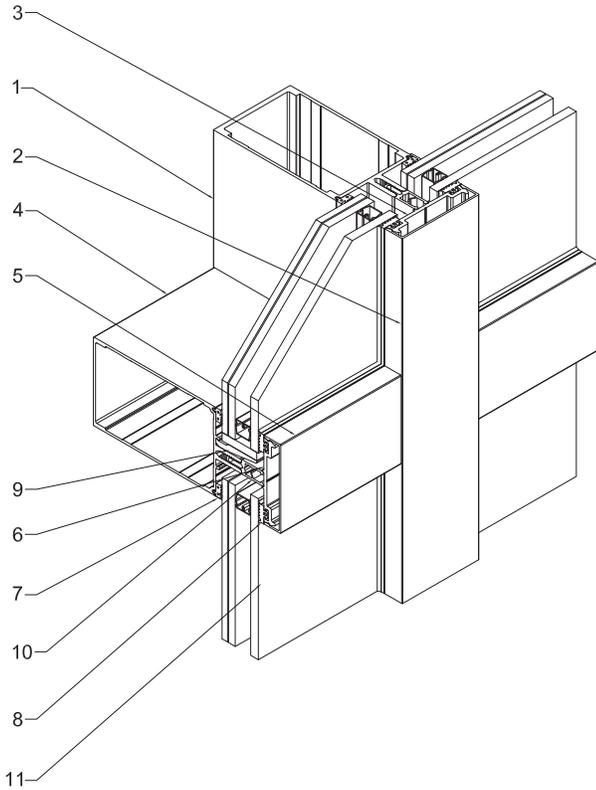
\*Level A corresponds to the UFC 4-010-01 DoD Min. requirements . where "conventional construction standoff distances are achieved".

# B-Pro 750ST

## GLAZED STEEL DOOR

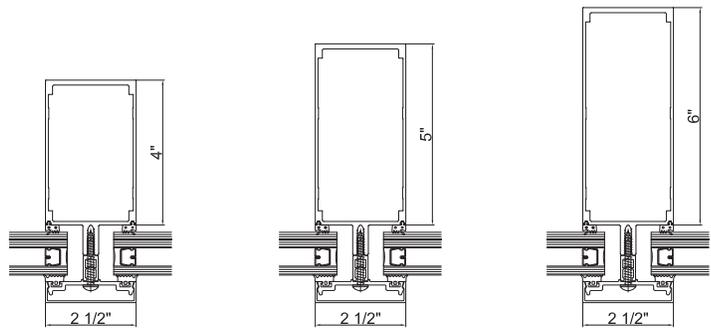
### ELEVATIONS AND DETAILS



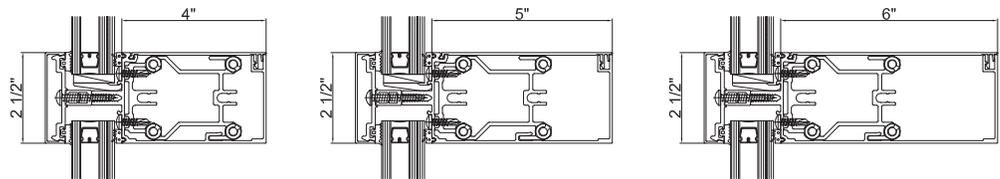


- 1 - Vertical Mullion
- 2 - Vertical Cap
- 3 - Vertical Pressure Plate
- 4 - Horizontal Mullion
- 5 - Horizontal Cap
- 6 - Horizontal Pressure Plate
- 7 - Internal Glazing Gasket
- 8 - External Glazing Gasket
- 9 - Glass Support
- 10 - Thermal Polyamid
- 11 - Insulating Glass Unit

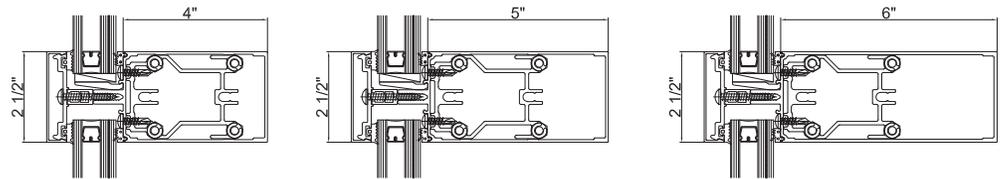
**Vertical Mullion**



**Horizontal Open Mullion**



**Horizontal Turbular Mullion**



**Blast Rating**

B-Pro Blast Levels	A*	B	C	Blast performance demonstration
Impulse (psi*msec)	43			Blast performance is demonstrated through project specific analysis.
Pressure (psi)	7			
B-Pro 900	V			

\*Level A corresponds to the UFC 4-010-01 DoD Min. requirements . where "conventional construction standoff distances are achieved".

# PROJECT GALLERY

## FT. BELVOIR COMMUNITY HOSPITAL FT. BELVOIR, VIRGINIA

TRAINOR GLASS COMPANY  
7020 TROY HILL ROAD ELKBRIDGE, MD 21075



9025 Richmond Hwy  
Fort Belvoir VA



## BRITISH HIGH COMMISSION OTTAWA (ONTARIO)

VERVAL LTEE  
GATINEAU (QUEBEC)

HOK  
OTTAWA, ONTARIO, CANADA



# PROJECT GALLERY

**BTL 144 UNIT UOQ, K-16 AIRFIELD**



**EDUCATION CENTER, USAG HUMPHREYS**



**BOWLING CENTER / CLUB, CAMP CARROLL**



**B-PRO SAFEGUARD, INC.**  
EDMB BLAST FENESTRATION

# PROJECT GALLERY

**TRANSIENT LODGING WELLNESS, CAMP HUMPHREYS**



**160RM DOMITORY, KUNSAN AIR BASE**



# PROJECT GALLERY

## VISITING QUARTERS, KUNSAN AIR BASE

