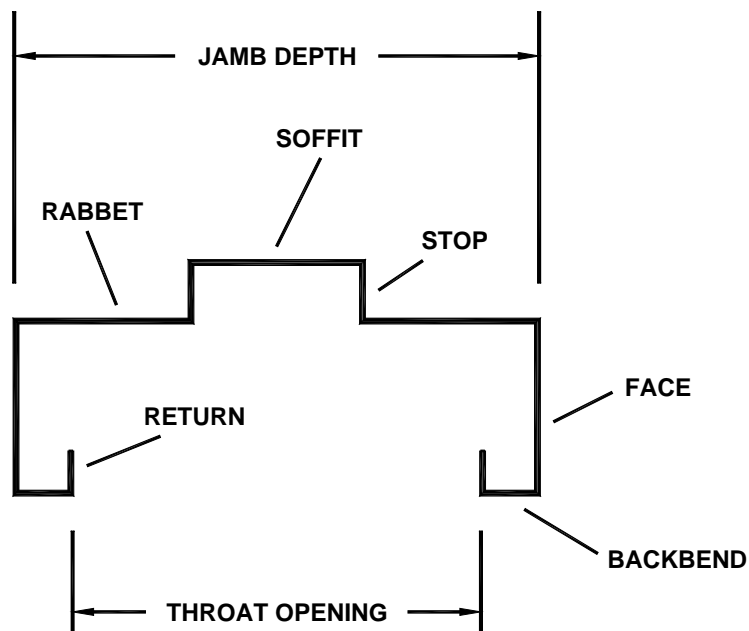


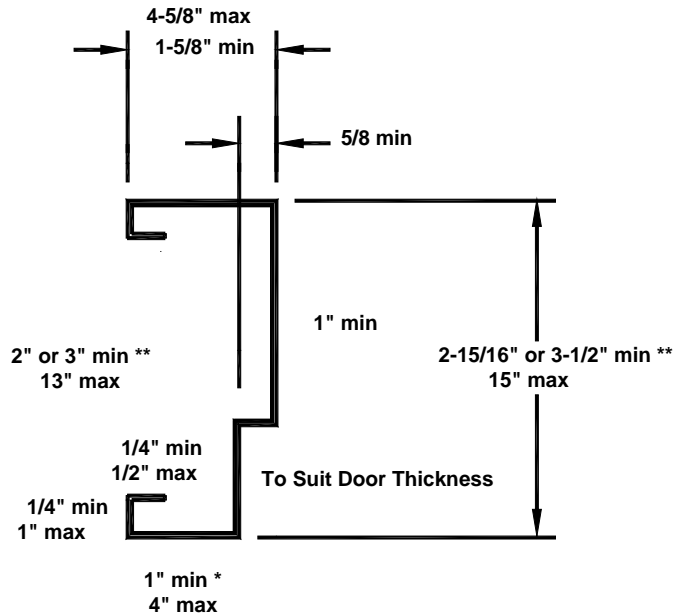
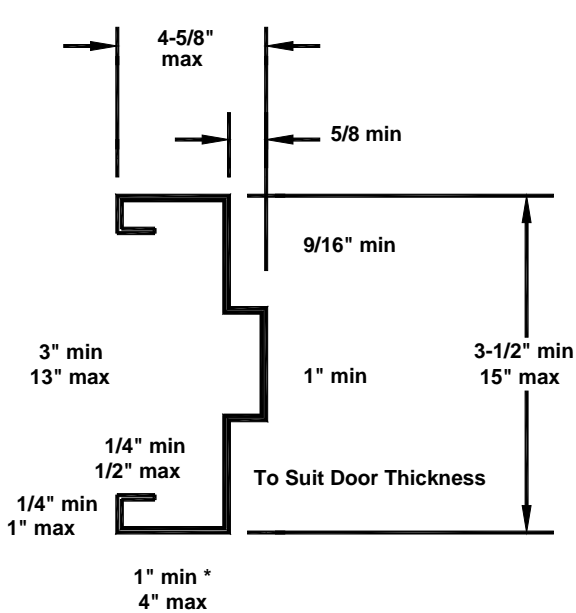
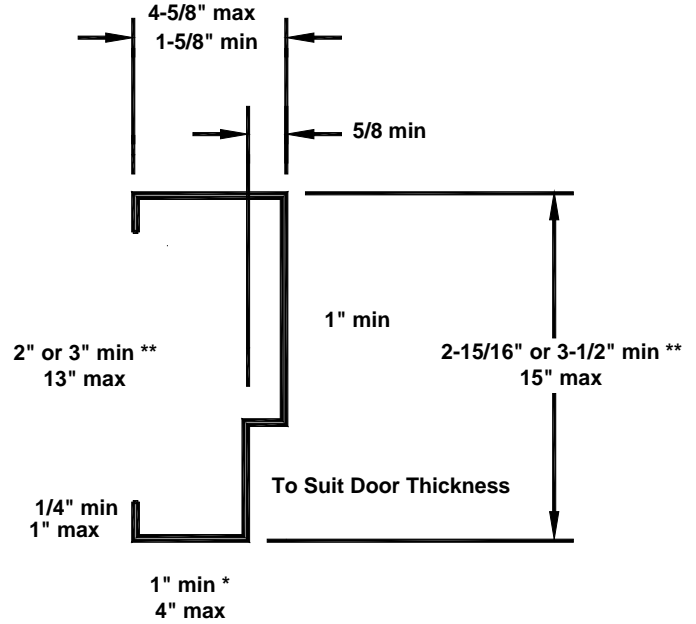
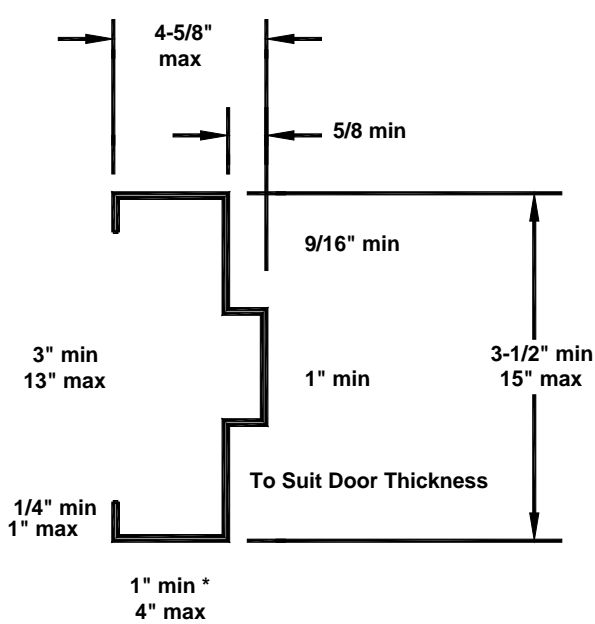
These requirements apply to all fire rated doors, frames, and windows.

Requirements for the installation of these assemblies are included in the Standard of the National Fire Protection Association for Fire Doors and Fire Windows, NFPA-80 and the Door Components' installation instructions.

Terminology used in describing these frames follows as closely as possible the American National Standard for Nomenclature for Steel Doors and Steel Door Frames, ANSI A250.7.

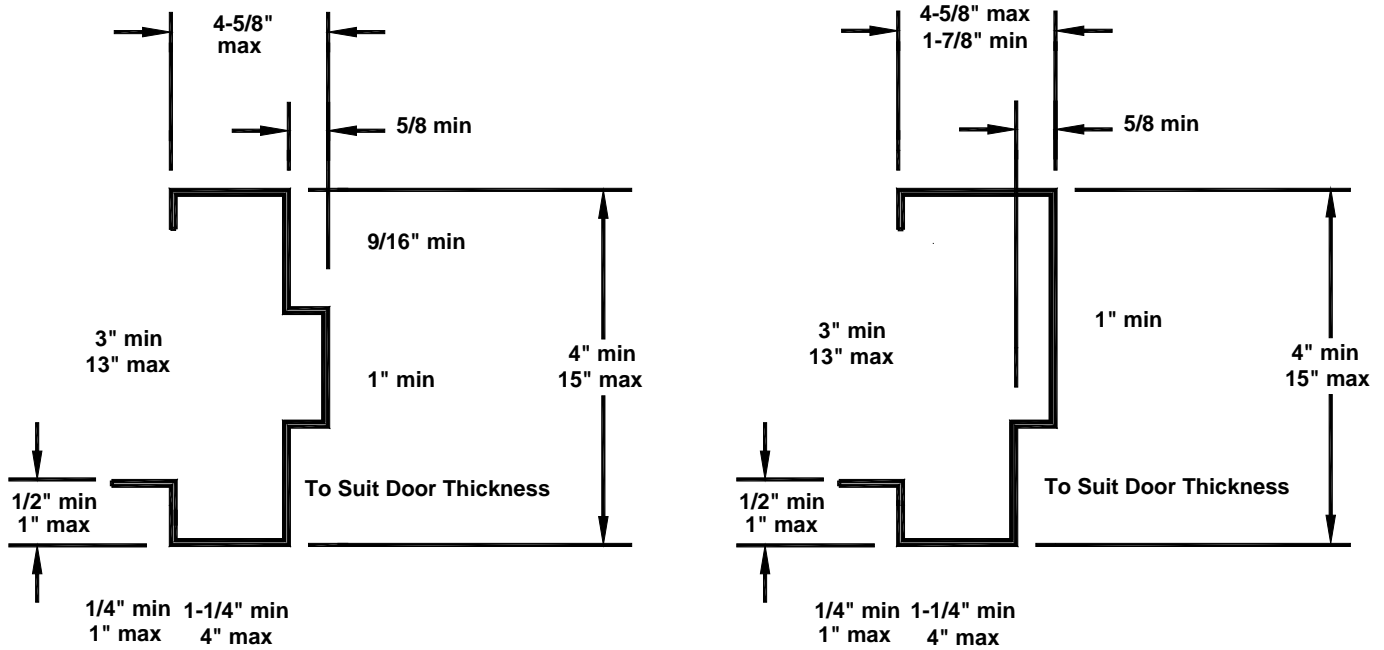


*Note: Minimum and maximum dimensions shown in this section may be further restricted by frame elevation and wall type.*

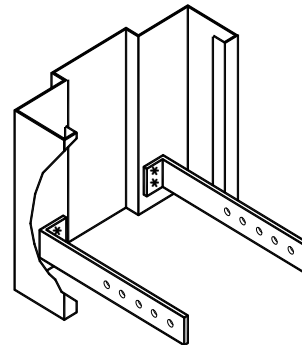
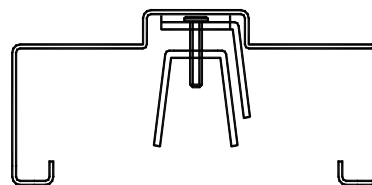
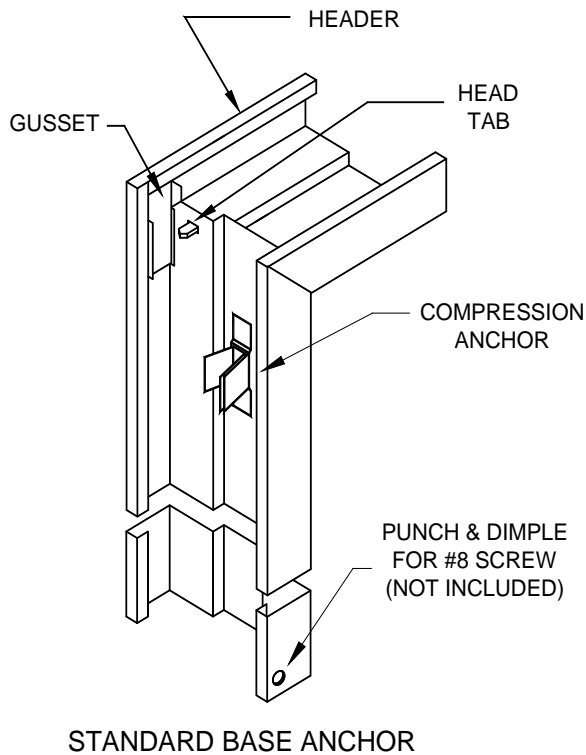
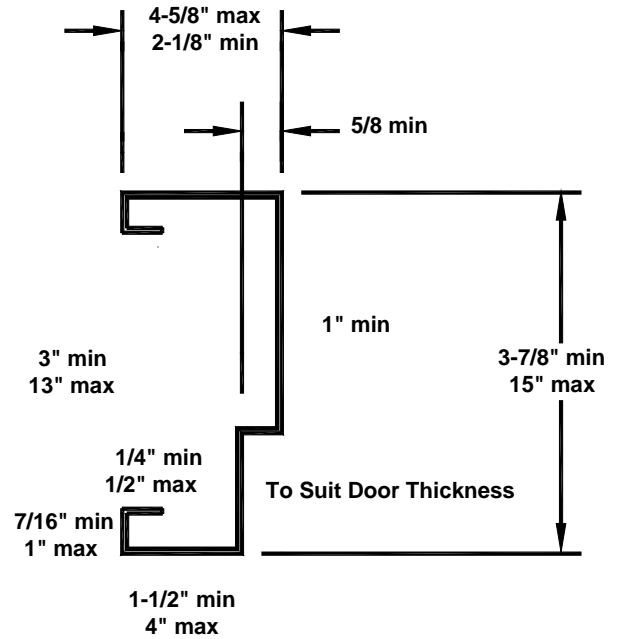
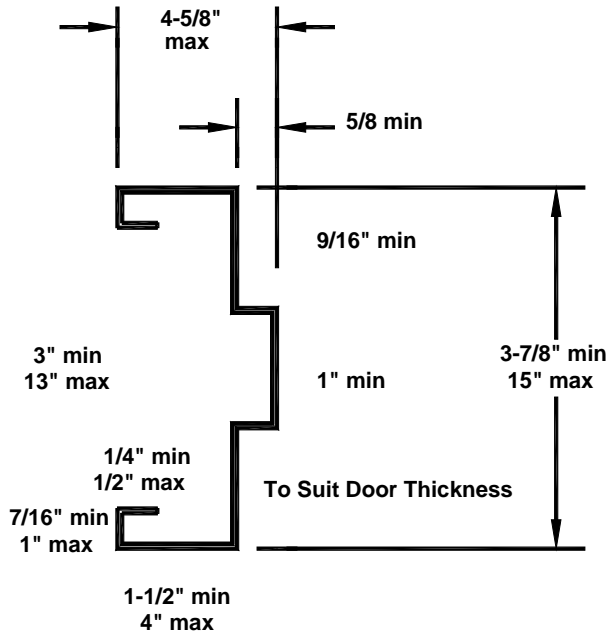


\* 1" min face permitted at masonry, 1-1/4" min at drywall

\*\* 2" throat permitted when door side face is min 2" and opposite face is min 2-5/8"

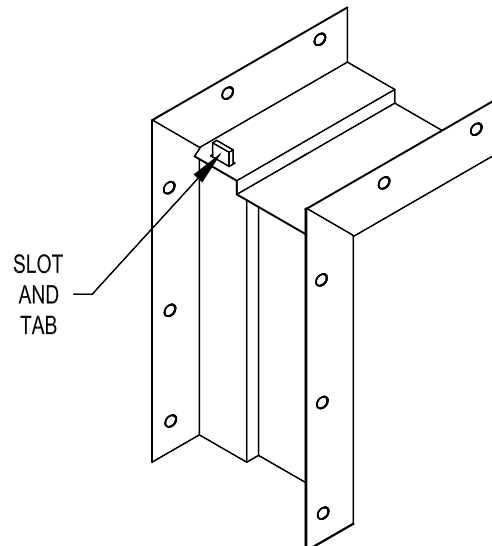
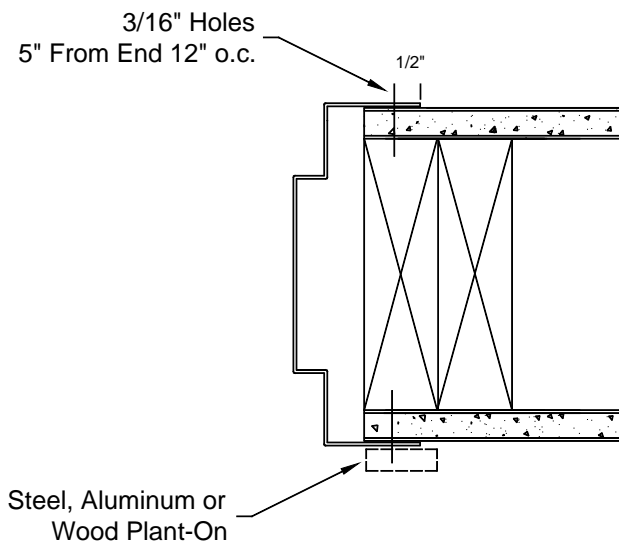
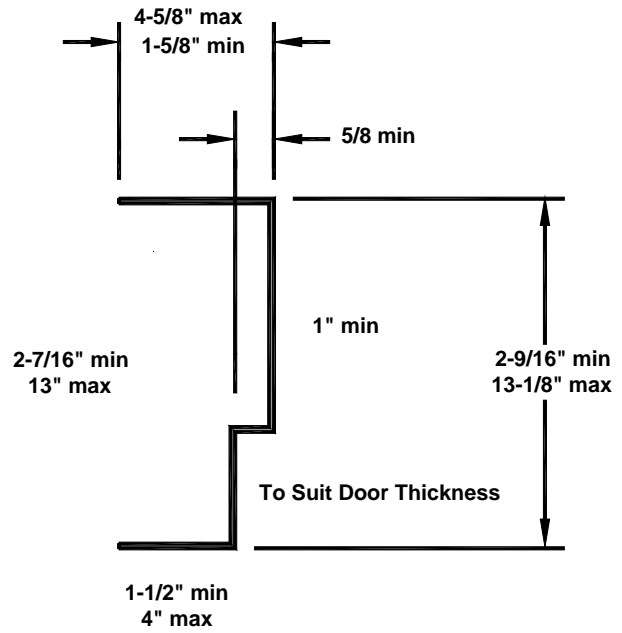
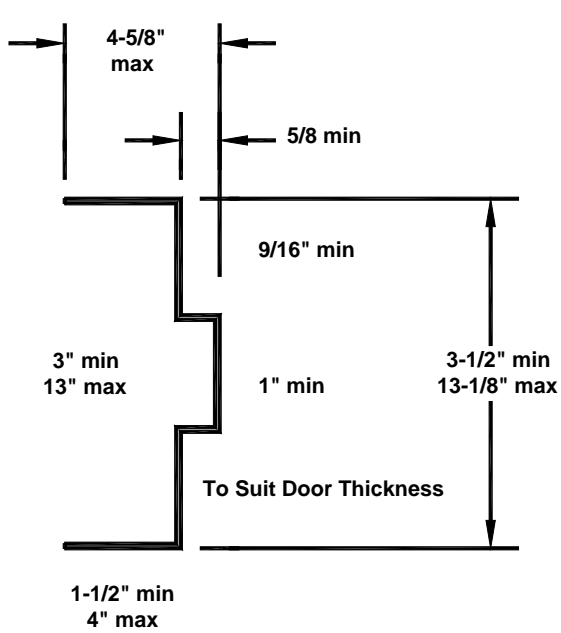


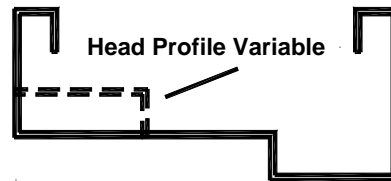
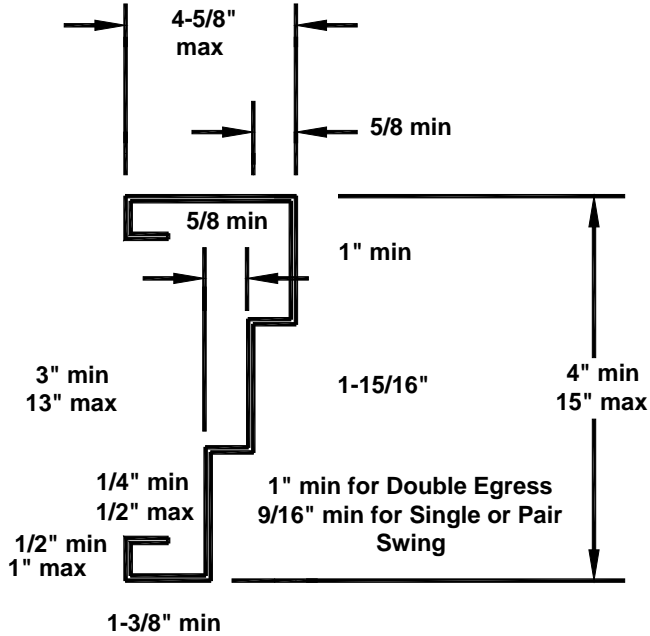
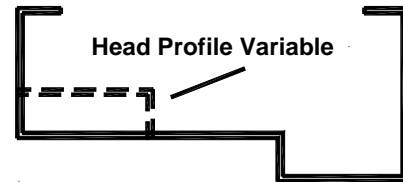
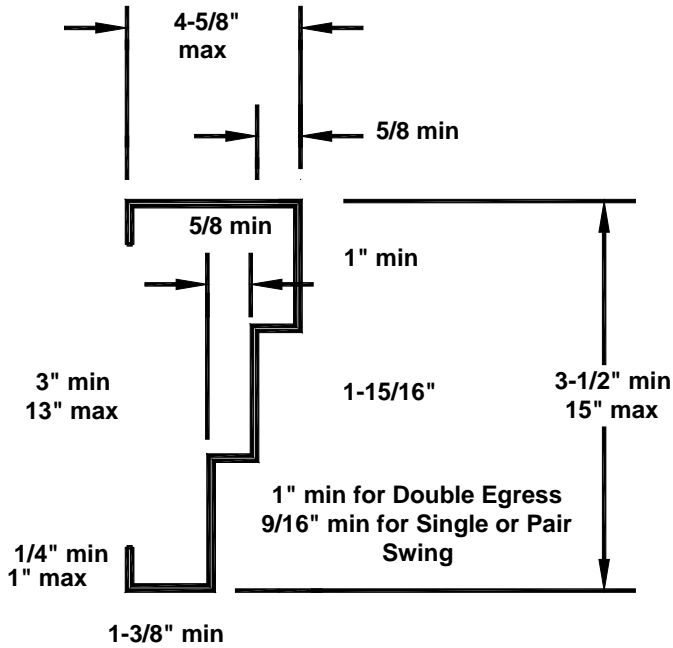
Standard profile frames may have combinations of the above backband types.



ALTERNATE BASE ANCHOR

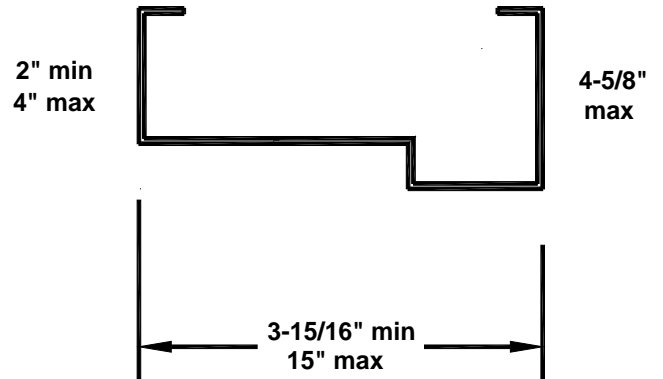
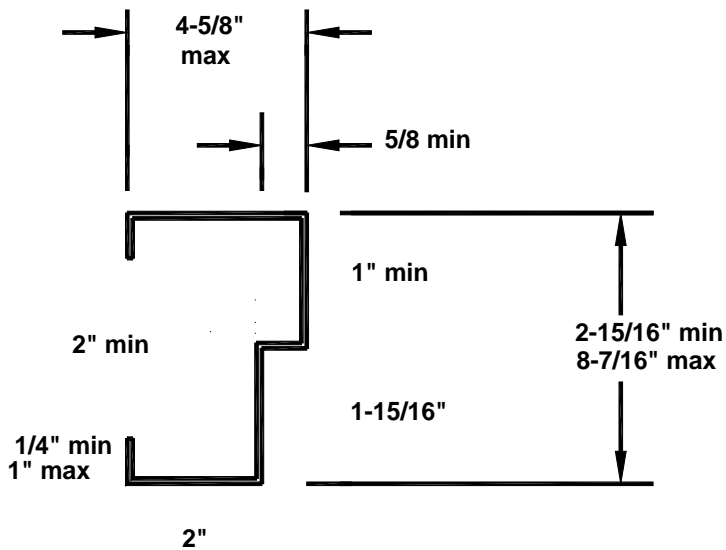
## NAIL-IN FACE FRAMES



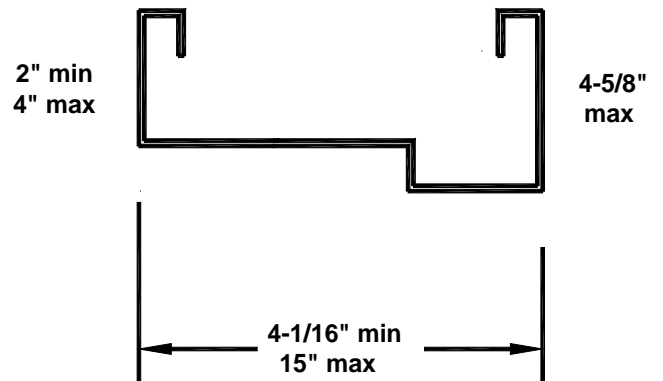
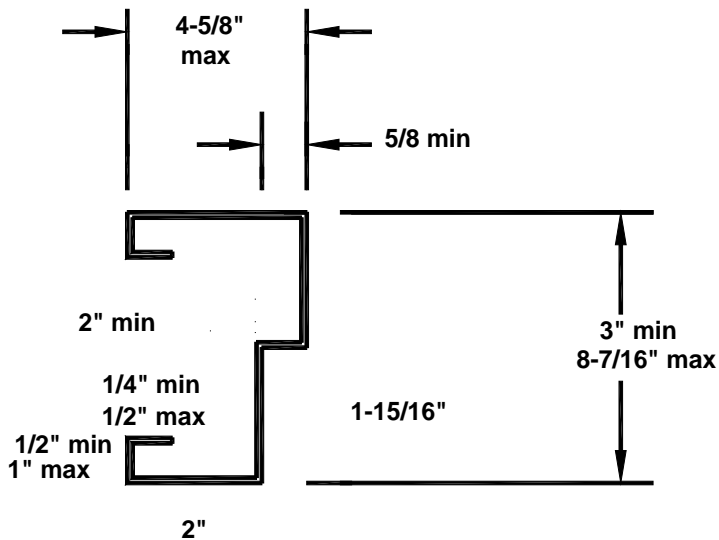


Frames may have combinations of the previous backbend types.

## SWING CLEAR DOUBLE EGRESS



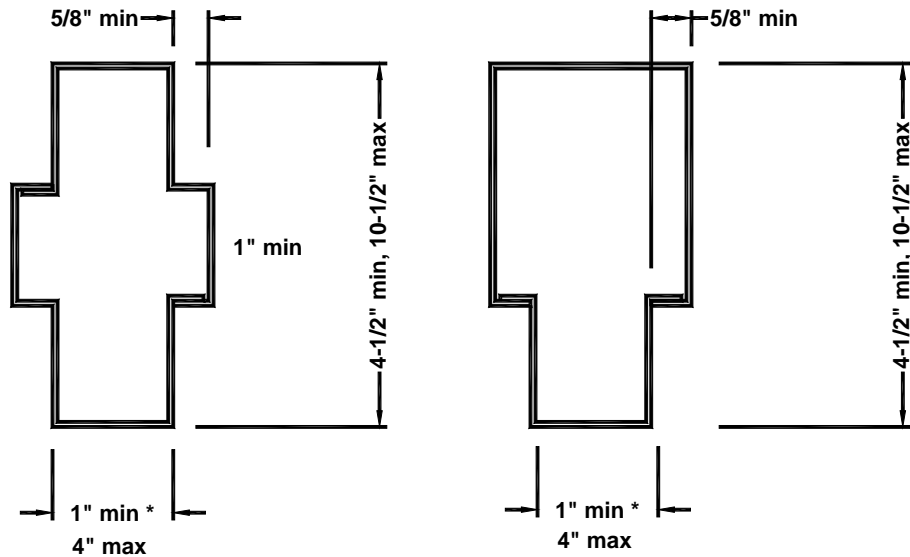
$$\text{Head Jamb Depth} = (2 \times \text{Jamb Soffit}) + 1 \frac{15}{16}$$



$$\text{Head Jamb Depth} = (2 \times \text{Jamb Soffit}) + 1 \frac{15}{16}$$

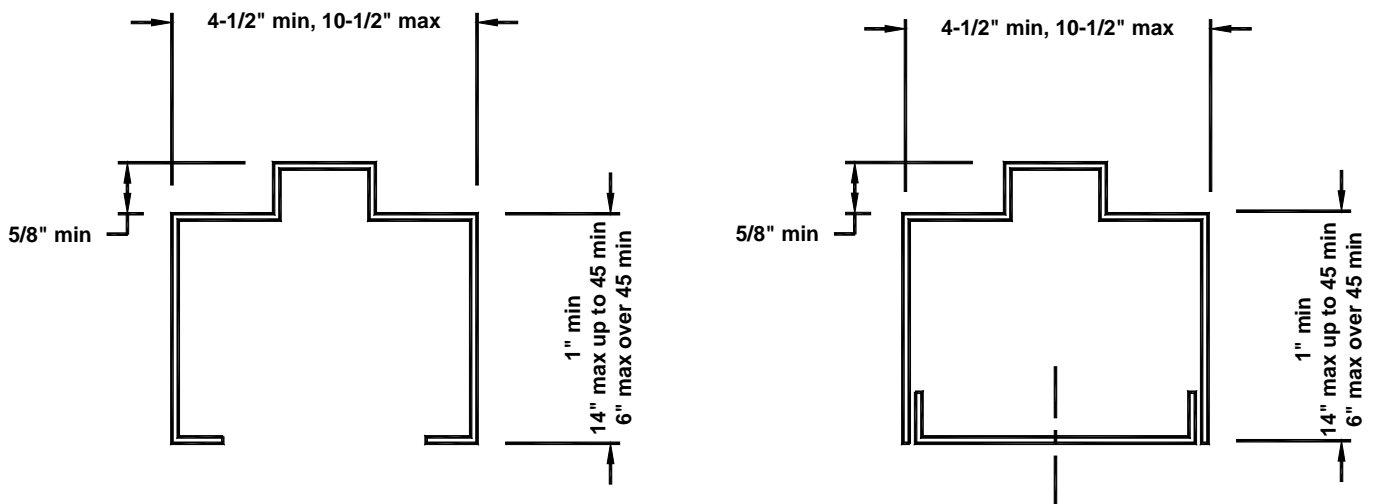
Frames may have combinations of the previous backbend types.

## MULLIONS AND SILLS



\* 1" minimum at members surrounding glazed openings in sidelight or window frames. 1-1/4" minimum at all transom frames and at members surrounding door openings in sidelight frames.

### Mullions

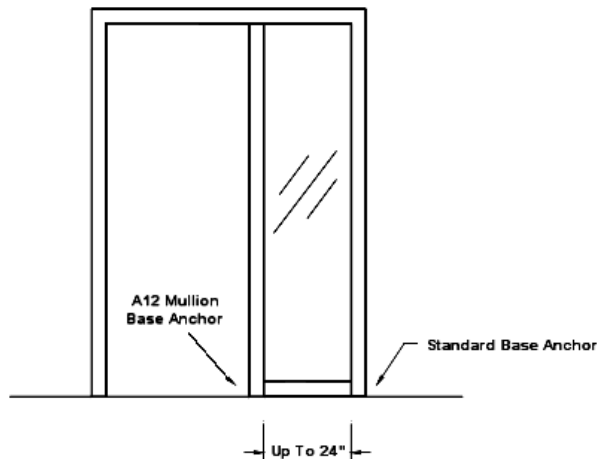


### Sills

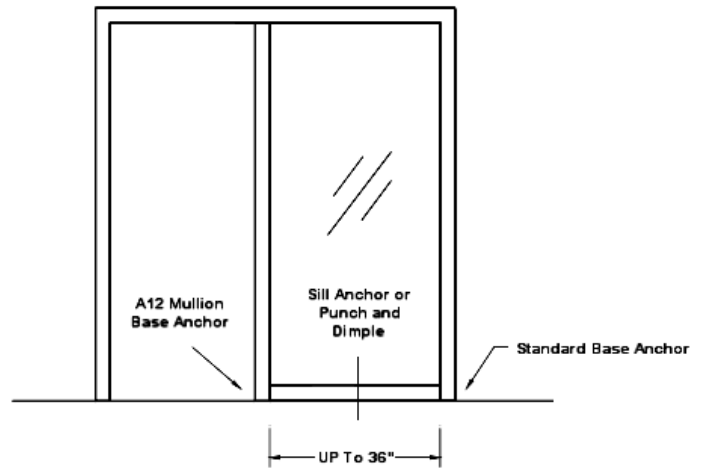
## Approved Methods for Anchoring Mullions and Sills

Standard anchorage for sills is one anchor for every foot with a minimum of two anchors.

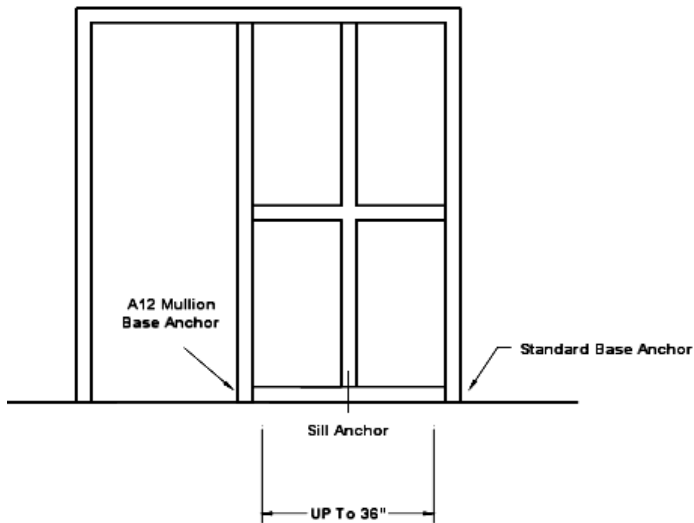
This can include an A12 mullion base anchor and a standard jamb base anchor for the appropriate wall type.  
Sill anchors are to be spaced evenly.



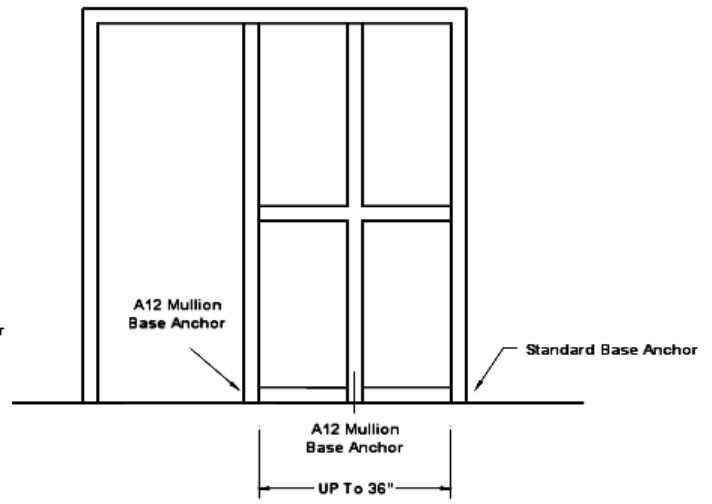
**2 Anchors Total**



**3 Anchors Total**

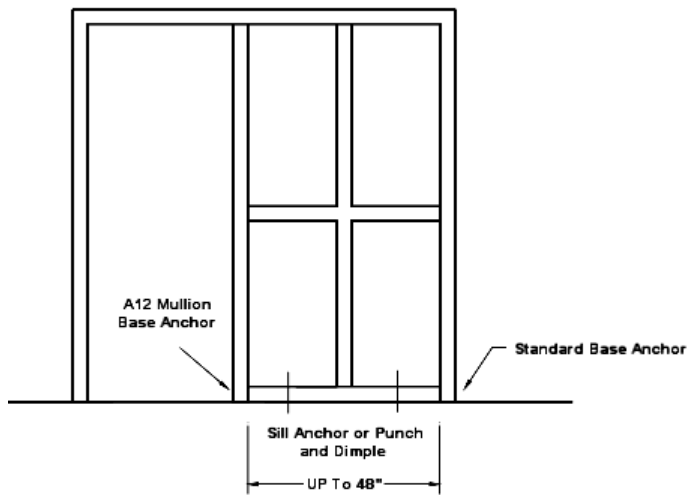


**3 Anchors Total**

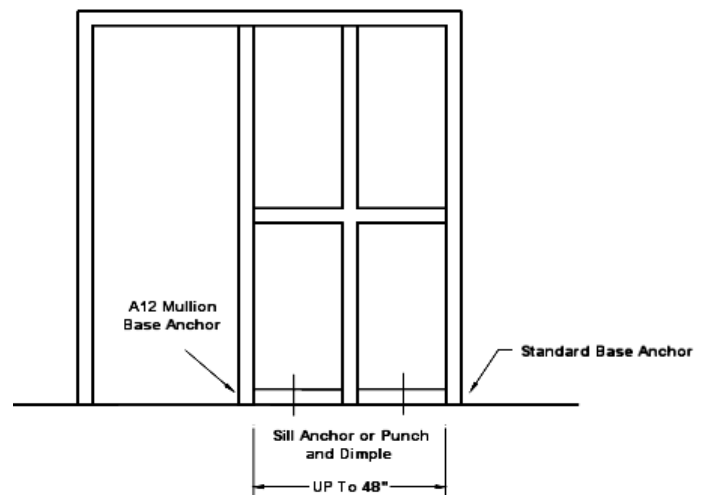


**3 Anchors Total**

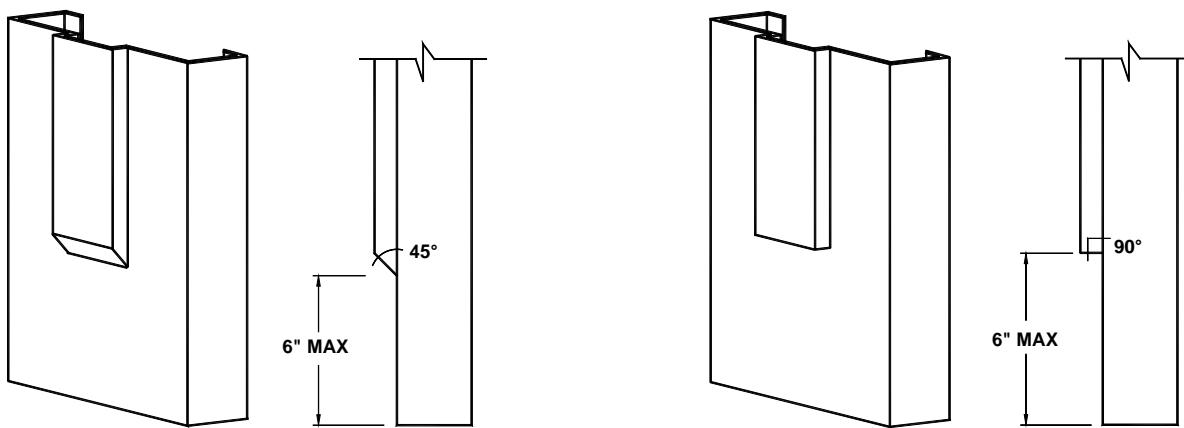
Mullions may be run to the top of the sill or to the floor ... mullion or sill anchors to be supplied accordingly.



**4 Anchors Total**



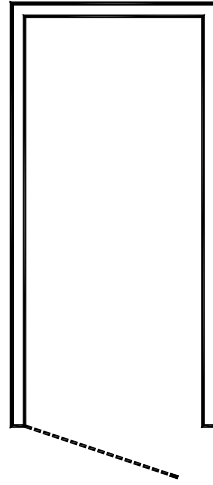
**4 Anchors Total**



**Hospital stops available for 20 min to 180 min frames**

**Maximum 6" above the floor line, 45° and 90° only**

## SINGLE SWING FRAME LIMITATIONS



### Standard Profile Frames -

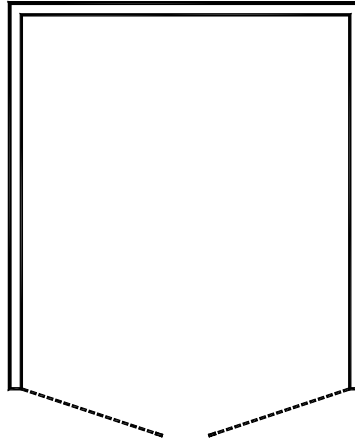
Maximum Jamb Opening Size:	4'-0" x 10'-0"		5'-0" x 12'-0"
Minimum Jamb Depth:	Per Section Detail		4"
Maximum Jamb Depth:	15"		15"
Minimum Gage:	16	OR	16
Maximum Gage:	12		12
Maximum Rating Steel/Wood Stud:	3 Hour		1-1/2 Hour
Maximum Rating Masonry:	3 Hour		1-1/2 Hour
Construction:	Knock-Down or Welded		Welded
Minimum Face:	Per Section Detail		1-1/2"

### Drywall Pressure Anchor Frames -

Maximum Jamb Opening Size:	4'-0" x 9'-0"
Minimum Jamb Depth:	3-7/8"
Maximum Jamb Depth:	15"
Minimum Gage:	16
Maximum Gage:	14
Maximum Rating Steel/Wood Stud:	1-1/2 Hour
Maximum Rating Masonry:	N/A
Construction:	Knock-Down

### Nail-In Face Frames -

Maximum Jamb Opening Size:	3'-6" x 7'-6"
Minimum Jamb Depth:	2-9/16"
Maximum Jamb Depth:	13-1/8"
Minimum Gage:	16
Maximum Gage:	12
Maximum Rating Steel/Wood Stud:	1-1/2 Hour
Maximum Rating Masonry:	N/A
Construction:	Knock-Down

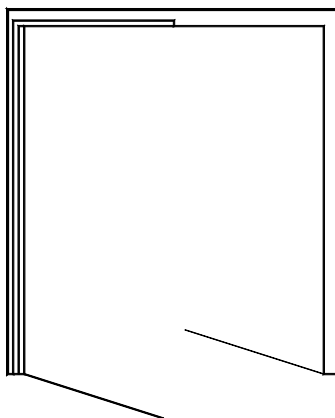


## Standard Profile Frames -

Maximum Jamb Opening Size:	8'-0" x 10'-0"	10'-0" x 12'-0"
Minimum Jamb Depth:	Per Section Detail	4"
Maximum Jamb Depth:	15"	15"
Minimum Gage:	16	16
Maximum Gage:	12	12
Maximum Rating Steel/Wood Stud:	3 Hour	1-1/2 Hour
Maximum Rating Masonry:	3 Hour	1-1/2 Hour
Construction:	Knock-Down or Welded	Welded
Minimum Face:	Per Section Detail	1-1/2"

## Drywall Pressure Anchor Frames -

Maximum Jamb Opening Size:	8'-0" x 9'-0"
Minimum Jamb Depth:	3-7/8"
Maximum Jamb Depth:	15"
Minimum Gage:	16
Maximum Gage:	14
Maximum Rating Steel/Wood Stud:	1-1/2 Hour
Maximum Rating Masonry:	N/A
Construction:	Knock-Down

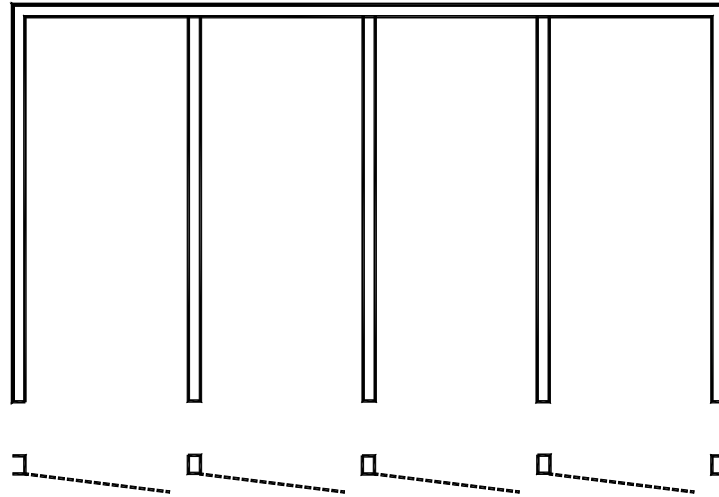


## Double Egress Frames -

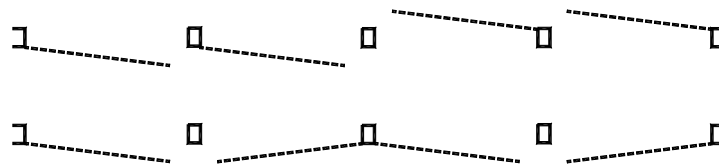
Maximum Jamb Opening Size:	8'-0" x 8'-0"		8'-0" x 10'-0"
Minimum Jamb Depth:	3-1/2"		3-1/2"
Maximum Jamb Depth:	14-1/2"		14-1/2"
Minimum Gage:	16	OR	16
Maximum Gage:	12		12
Maximum Rating Steel/Wood Stud:	1-1/2 Hour		3 Hour
Maximum Rating Masonry:	1-1/2 Hour		3 Hour
Construction:	Knock-Down		Welded

## Swing Clear Double Egress Frames -

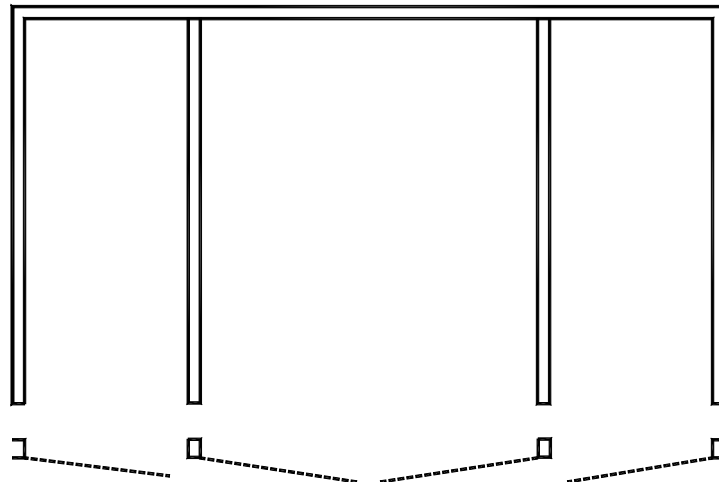
Maximum Jamb Opening Size:	8'-0" x 8'-0"
Minimum Jamb Depth:	2-15/16" Legs, 3-15/16" Head
Maximum Jamb Depth:	8-7/16" Legs, 15" Head
Minimum Gage:	16
Maximum Gage:	12
Maximum Rating Steel/Wood Stud:	1-1/2 Hour
Maximum Rating Masonry:	1-1/2 Hour
Construction:	Welded



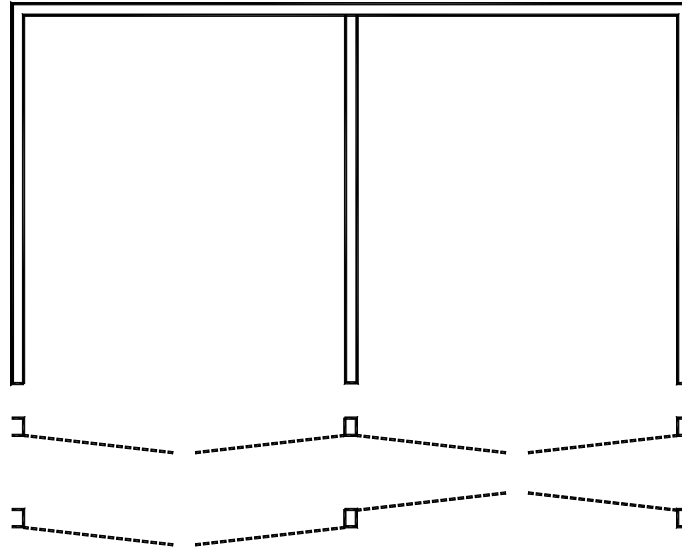
**Welded Mullions**  
(Doors may be hinged on welded mullions only)



**Welded or Removable Mullions**  
(Doors may be hinged on welded mullions only)



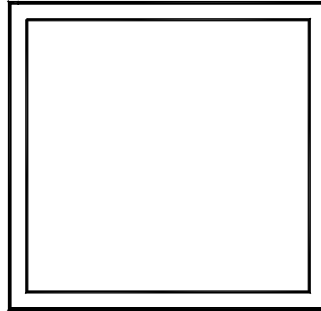
**Welded Mullions**  
(Doors may be hinged on welded mullions only)



**Welded Mullions**  
(Doors may be hinged on welded mullions only)

#### Standard Profile Frames -

Maximum Overall Frame Size:	12'-8" x 8'-4" Outside Dimensions
Maximum Opening Size:	4'-0" x 8'-0" singles, 8'-0" x 8'-0" pairs
Minimum Jamb Depth:	4-1/2"
Maximum Jamb Depth:	10-1/2"
Minimum Gage:	16
Maximum Gage:	12
Maximum Rating Steel/Wood Stud:	1-1/2 Hour
Maximum Rating Masonry:	1-1/2 Hour
Construction:	Welded
Mullion:	Removable or Welded



## **1/4" Wired Glass**

Maximum Opening Width:	54" (20 - 45 min)
Maximum Opening Height:	54" (20 - 45 min)
Maximum Clear Glass Area:	1296 sq inches (20 - 45 min)
Minimum Jamb Depth:	4-1/2"
Maximum Jamb Depth:	15"
Minimum Face:	1"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

## **Pilkington Wired Glass with Pemko FG3000 Fireglaze (or equal)**

Maximum Opening Width:	98" (20 - 45 min)
Maximum Opening Height:	106" (20 - 45 min)
Maximum Clear Glass Area:	4704 sq inches (20 - 45 min)
Minimum Jamb Depth:	5-3/4"
Maximum Jamb Depth:	15"
Minimum Face:	2"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 9" on center

\* 20 minute without hose stream



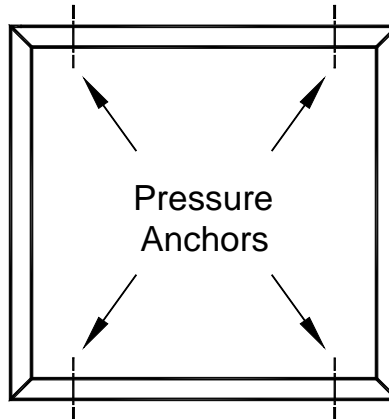
## SINGLE BORROWED LITE LIMITATIONS

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### FireLite® (or equal)

Maximum Opening Width:	95" (20 - 60 min) 56½" (90 min)
Maximum Opening Height:	95" (20 - 60 min) 56½" (90 min)
Maximum Clear Glass Area:	3325 sq inches (20 - 60 min) 2627 sq inches (90 min)
Minimum Jamb Depth:	4-3/4"
Maximum Jamb Depth:	14-1/2"
Minimum Face:	1"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

\* 20 minute without hose stream



### Drywall Pressure Anchor Frames -

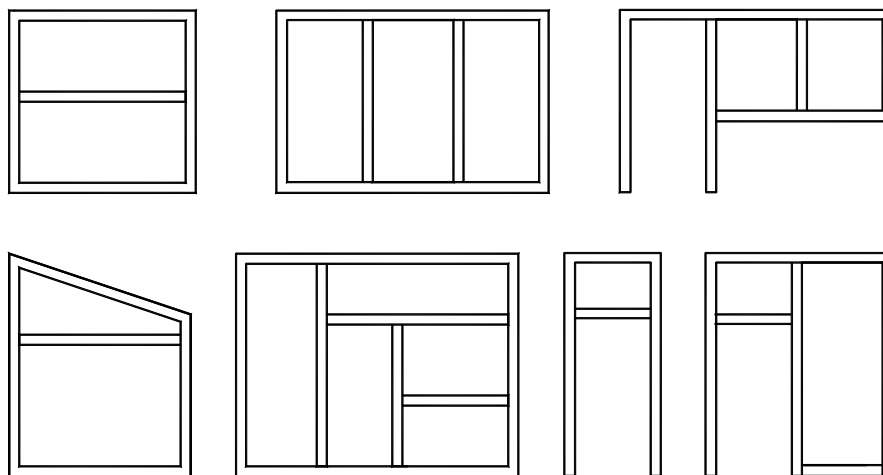
#### **1/4" Wired Glass**

Maximum Opening Width:	54" (20 - 45 min)
Maximum Opening Height:	54" (20 - 45 min)
Maximum Clear Glass Area:	1296 sq inches (20 - 45 min)
Minimum Jamb Depth:	4-3/4"
Maximum Jamb Depth:	15"
Minimum Face:	1-1/2"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Knock-Down
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

#### **FireLite® (or equal)**

Maximum Opening Width:	54" (20 - 45 min)
Maximum Opening Height:	96" (20 - 45 min)
Maximum Clear Glass Area:	3325 sq inches (20 - 45 min)
Minimum Jamb Depth:	4-3/4"
Maximum Jamb Depth:	15"
Minimum Face:	1-1/2"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Knock-Down
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

\* 20 minute without hose stream



## ¼" Wired Glass

Maximum Overall Frame Size:	174"x 120"
Maximum Opening Width:	54" (20 - 45 min)
Maximum Opening Height:	54" (20 - 45 min)
Maximum Clear Glass Area:	1296 sq inches (20 - 45 min)
Minimum Jamb Depth:	4-1/2"
Maximum Jamb Depth:	15"
Minimum Face:	1"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

## Pilkington Wired Glass with Pemko FG3000 Fireglaze (or equal)

Maximum Overall Frame Size:	174"x 136" Drywall 174"x 144" Masonry
Maximum Opening Width:	98" (20 - 45 min)
Maximum Opening Height:	106" (20 - 45 min)
Maximum Clear Glass Area:	4704 sq inches (20 - 45 min)
Minimum Jamb Depth:	5-3/4"
Maximum Jamb Depth:	15"
Minimum Face:	2"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 9" on center

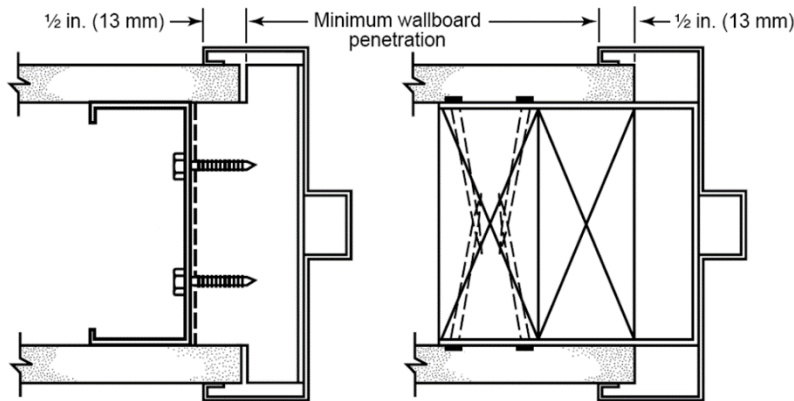
\* 20 minute without hose stream

**FireLite® (or equal)**

Maximum Overall Frame Size:	174"x 120"
Maximum Opening Width:	95" (20 - 60 min) 56½" (90 min)
Maximum Opening Height:	95" (20 - 60 min) 56½" (90 min)
Maximum Clear Glass Area:	3325 sq inches (20 - 60 min) 2627 sq inches (90 min)
Minimum Jamb Depth:	4-3/4"
Maximum Jamb Depth:	15"
Minimum Face:	1"
Minimum Gage:	16
Maximum Gage:	14
Construction:	Welded
Glass Stop:	Min. 18 Gage 5/8" x 5/8" with #8 screws 4" from ends and 12" on center

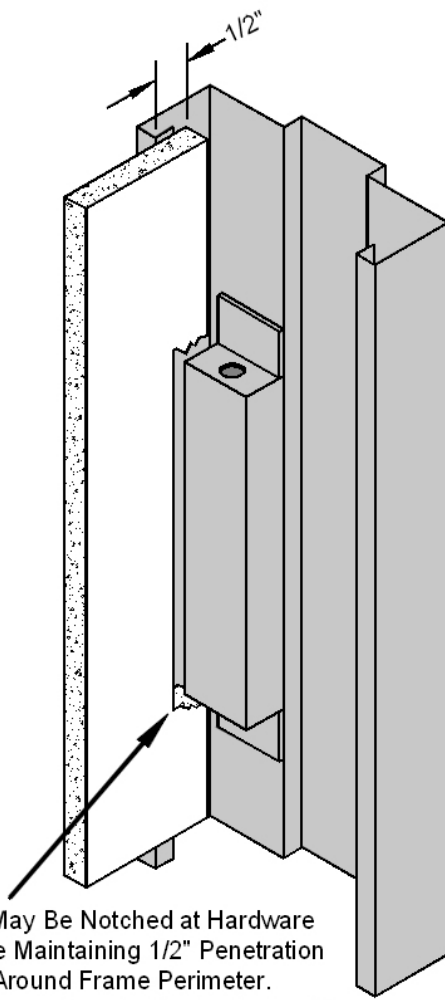
\* 20 minute without hose stream

## WALLBOARD PENETRATION PER NFPA-80

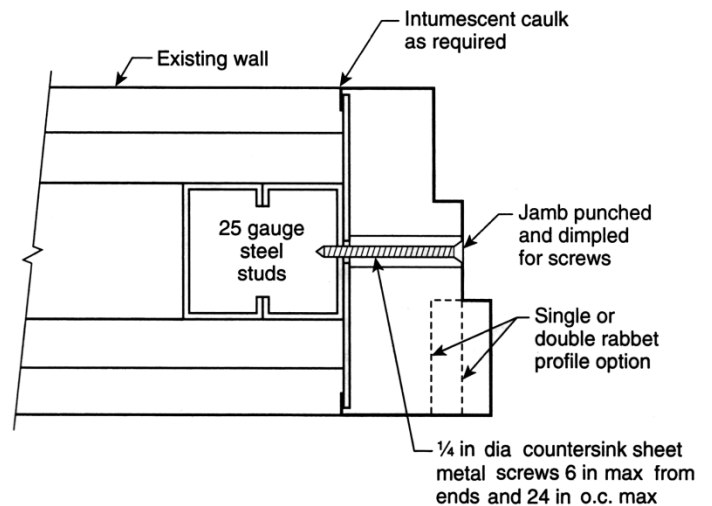


Pressed steel door frame with steel stud anchors

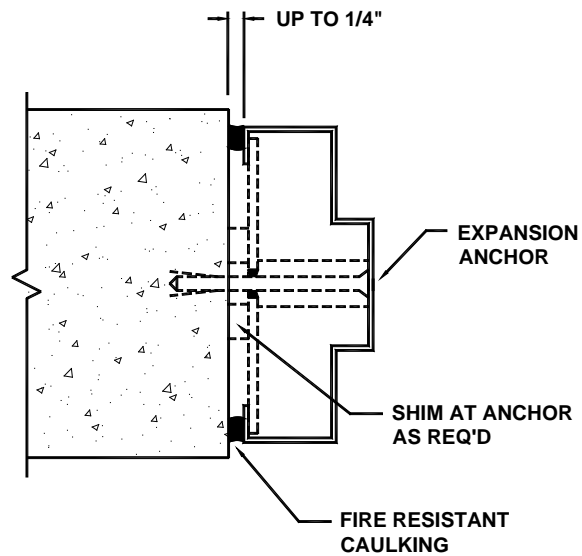
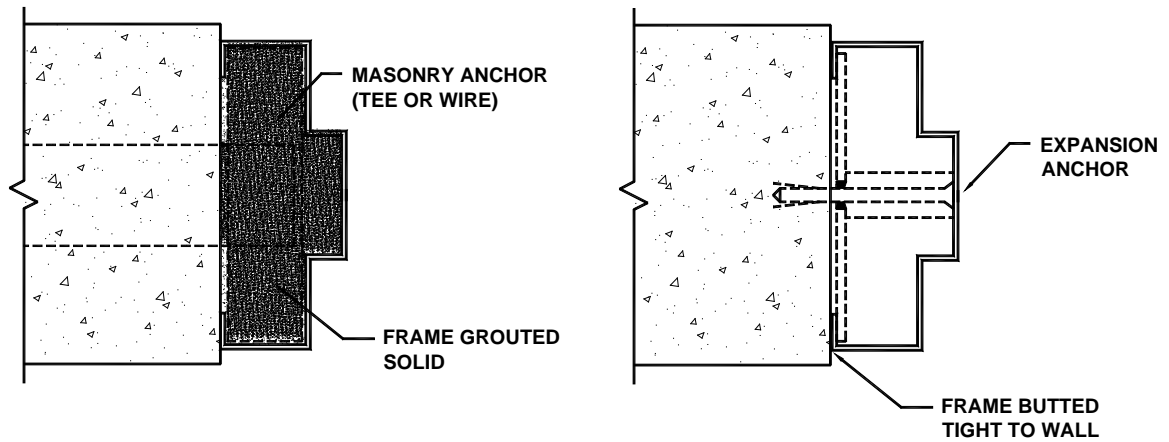
Pressed steel door frame with wood stud anchors



Wallboard May Be Notched at Hardware Boxes While Maintaining 1/2" Penetration Elsewhere Around Frame Perimeter. Exposed Seams May Be Filled with Fire Calk.

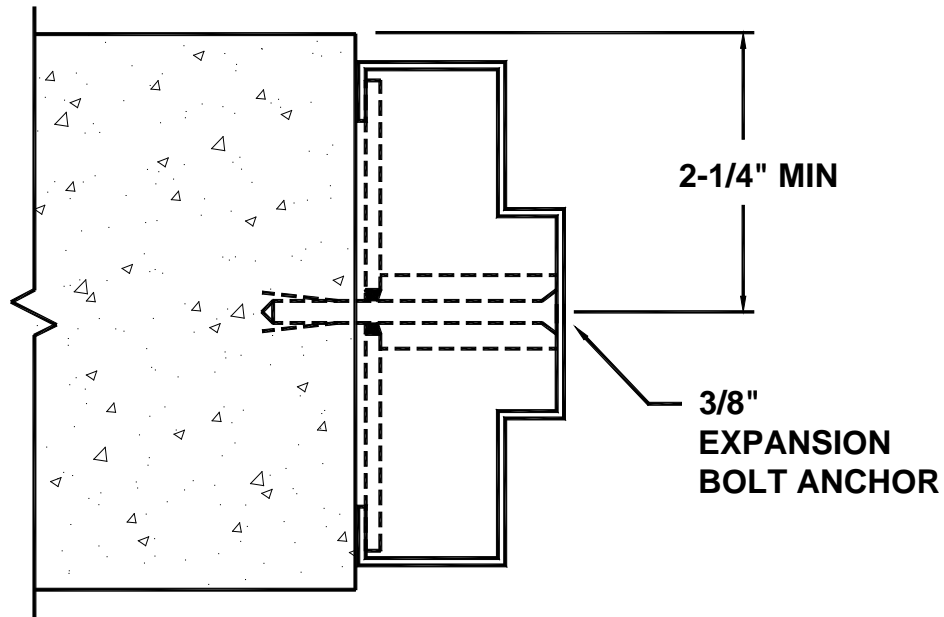


Alternate Flush Mount Method for Steel Stud Walls with No Wallboard Penetration Required.



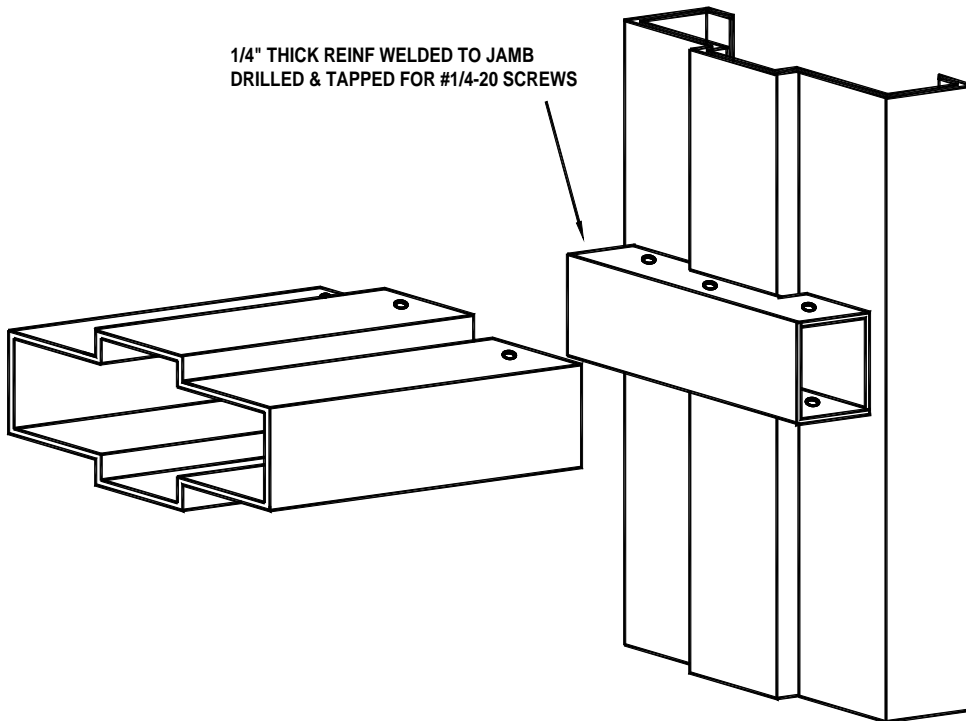
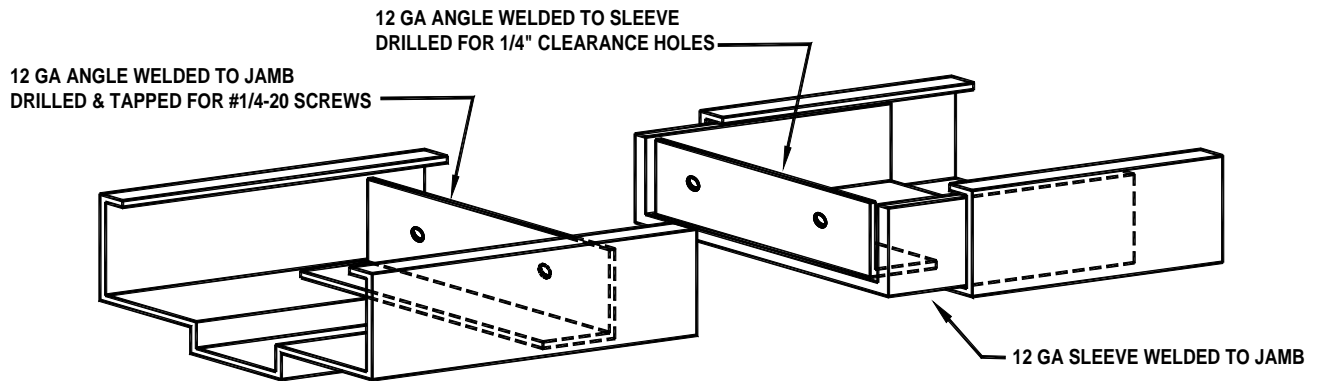
If expansion bolt anchors are to be used, the soffit shall be provided with 7/16" dimpled holes located not more than **6" from the top and bottom** with intermediate holes spaced no more than **26" on center**. The installer is to provide each hole with a minimum 3/8" roundhead bolt.

The bottom bolt acts as the base anchor. As such, adjustable type base anchors are not permitted at these frames as they would conflict with the required location of the bottom bolt.
















No expansion bolt anchor shall be set closer to the edge of the wall opening than six times the diameter of the anchor or closer to another anchor than eight times the diameter of the anchor.

## Mechanical Field Splices for Oversized Frames (45 Minute Maximum Rating)



## FIRE-RATED DOOR TYPES

		CORES <sup>1</sup>	H	P	S	TR-250 <sup>P</sup>	TR-250 <sup>G</sup>	TR-450
DOOR TYPE		RATINGS (MINUTES)	MAXIMUM OPENING SIZE					
	SINGLE	20 45 60 90	4-0x10-0	4-0x8-0	5-0x12-0	4-0x8-0	4-0x9-0	5-0x12-0
	SINGLE	180	4-0x10-0	3-0x7-0	4-0x10-0	4-0x8-0		
	PAIR	20 45 60 90	8-0x10-0	6-0x8-0	10-0x12-0	8-0x8-0	8-0x9-0	10-0x12-0
	PAIR	180	8-0x10-0		8-0x9-0	8-0x8-0		
	DOUBLE EGRESS	20 45 60 90 180	8-0x10-0		8-0x10-0	8-0x8-0		
	SINGLE LOUVER <sup>3</sup>	45 60 90	4-0x10-0		5-0x12-0			
	PAIR LOUVER <sup>3</sup>	45 60 90	8-0x10-0		10-0x12-0			
	SINGLE w/ LITE <sup>4</sup>	20 45 60 90	4-0x10-0	4-0x8-0	5-0x12-0	4-0x8-0	4-0x9-0	5-0x12-0
	PAIR w/ LITE <sup>4</sup>	20 45 60 90	8-0x10-0	6-0x8-0	10-0x12-0	8-0x8-0	8-0x9-0	10-0x12-0
	DUTCH DOOR	20 45 60 90 180	4-0x10-0		4-0x10-0			
	STC-40	20 45 60 90 180				4-0x8-0		
	STC-48 <sup>5</sup>	20 45 60 90		3-2x7-0				
	STC-50 - STC-53	20 45 60 90		3-0x7-0				

1. H=HONEYCOMB P=POLYSTYRENE(EPS) S=STEEL STIFFENED TR-250<sup>P</sup>=STANDARD TEMP RISE CORE  
TR-250<sup>G</sup>=SPECIAL TEMP RISE CORE TR-450=STEEL STIFFENED W/ HIGH DENSITY INSULATION
2. ALL DOORS AVAILABLE 1-3/4" THICK FOR 14, 16, 18 GAUGES
3. SEE LOUVER AND GLAZING SPECIFICATIONS FOR MAXIMUM SIZES FOR THOSE COMPONENTS
4. LIMITED GLAZING AVAILABLE FOR 180 MIN DOORS – SEE GLAZING SPECIFICATIONS OR CALL FOR AVAILABILITY.
5. STC48 AVAILABLE IN PAIRS UP TO 6470 OR SINGLES WITH LITES UP TO 100 SQ INCHES

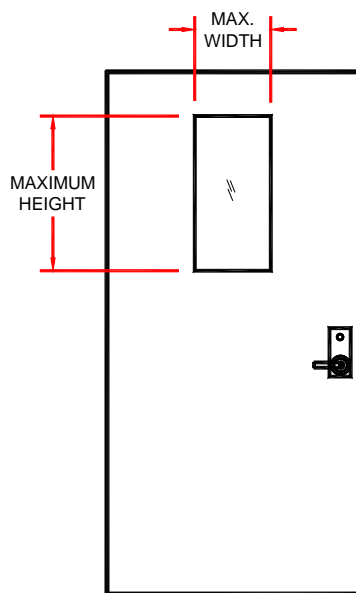
## Maximum Glass Opening Sizes Permitted for Doors

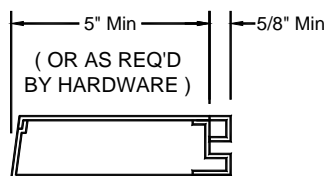
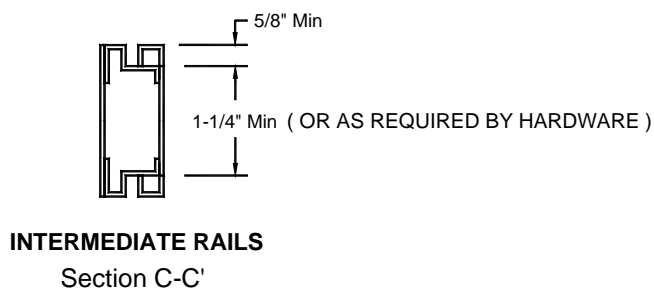
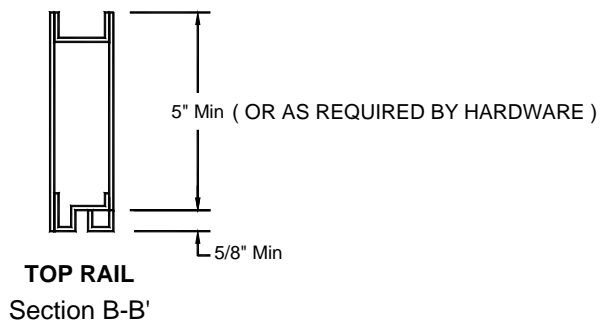
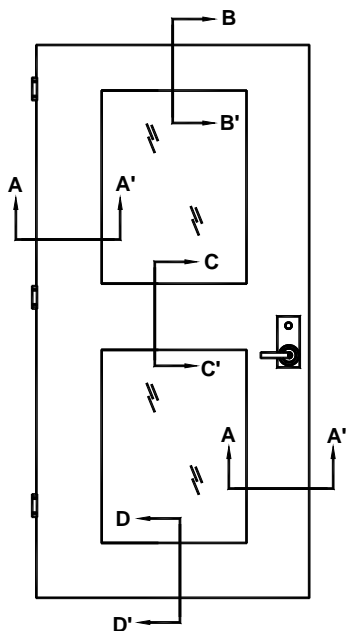
RATING (MINUTES)	MAX WIDTH	MAX HEIGHT	MAX AREA PER LITE	MAX AREA PER LEAF	MAX WIDTH	MAX HEIGHT	MAX AREA PER LITE	MAX AREA PER LEAF	MAX WIDTH	MAX HEIGHT	MAX AREA PER LITE	MAX AREA PER LEAF
20	36	54	1296	2400	34	84	2856	2856	36	89	3204	3204
45	36	54	1296	2400	34	84	2856	2856	36	89	3204	3204
60	12	33	100	100	12	46	1716	1716	36	89	3204	3204
90	12	33	100	100	12	46	1716	1716	36	56-1/2	2034	2034
180	-	-	-	-	-	-	-	-	12	33	100	100
60 TR	12	33	100	100	12	33	100	100	12	33	100	100
90 TR	12	33	100	100	12	33	100	100	12	33	100	100
180 TR	-	-	-	-	-	-	-	-	-	-	-	-

WIRE GLASS

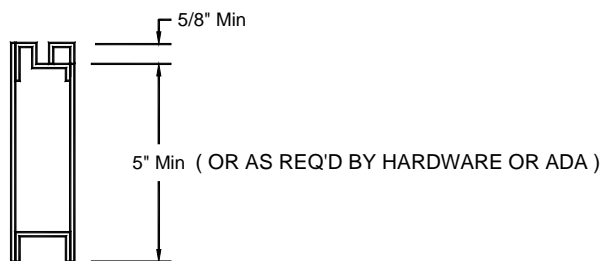
PILKINGTON GLASS  
w/ PEMKO FIREGLAZE  
(OR EQUAL)

FIRELITE  
(OR EQUAL)

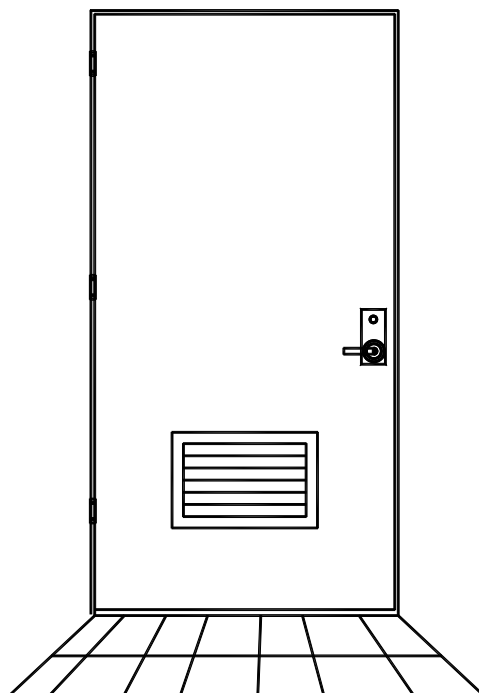




**STILES**  
Section A-A'



**BOTTOM RAIL**  
Section D-D'



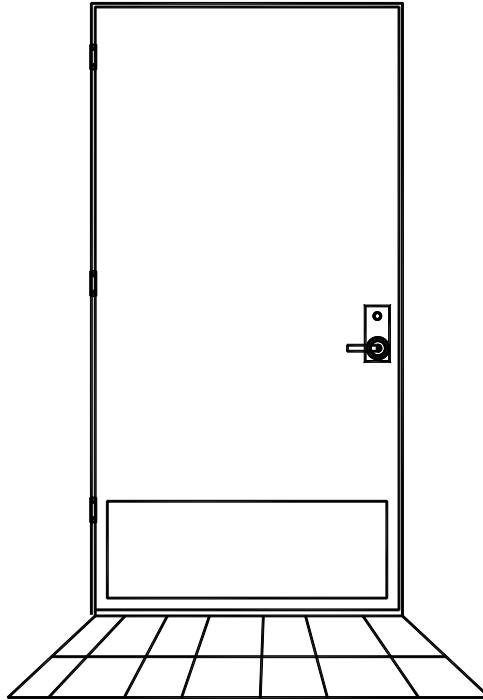
Louvers are **NOT** permitted in the following :

- 20 Minute Doors
  - 3 Hour Doors
- Doors with Exit Devices
  - Doors with Lites
- The Top Half of a Door
- Temperature Rise Doors
- Transoms of Frames

Louvers are restricted to use in 45, 60 and 90 min doors where smoke control is not a consideration. They must be listed Fusible Link types and may not exceed 24"x 24".

Per DCI Installation Instructions, the "S" indicated on the label for this door is voided by the use of louvers.

Cutout in door does not need to be channeled when using Anemostat FLDL-UL with HM-Clips.

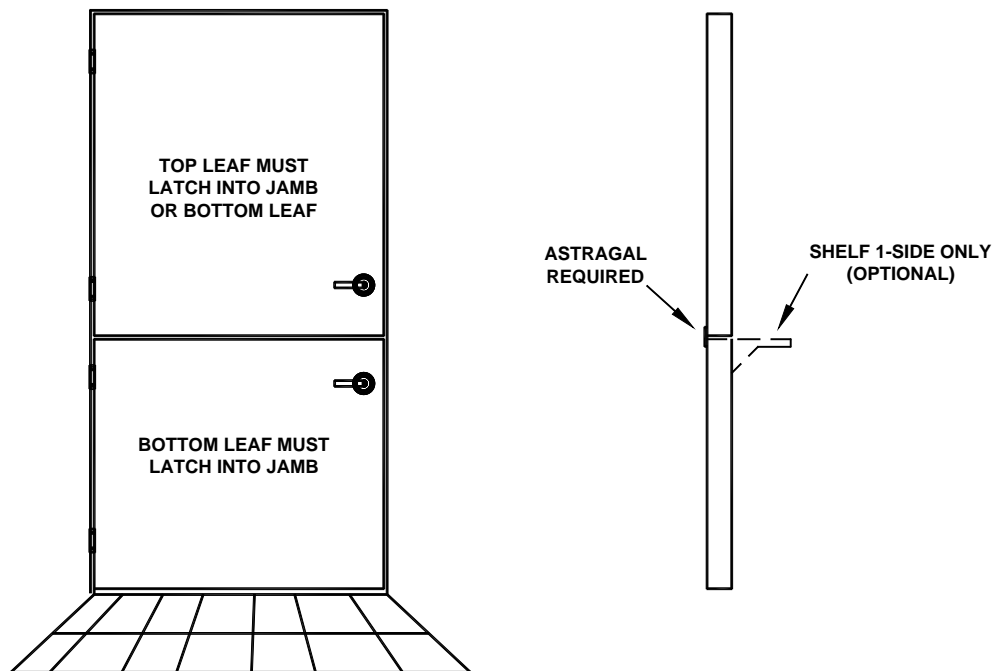


Per HMMA 850 & NFPA 80:

"The top of the plate shall be a maximum of 16 inches above the bottom of the door unless otherwise tested and labeled.  
Such plates may be on both faces. No other plates shall be installed."

*Exception:*

Life Safety Code NFPA 101 permits the following for Health Care Facilities only:  
"Nonrated, factory- or field-applied protective plates, unlimited in height, shall be permitted."



Rated up to 3 hours

4'-0" x 10'-0" maximum opening size

Dead latch is permitted in top leaf when not in a means of egress.

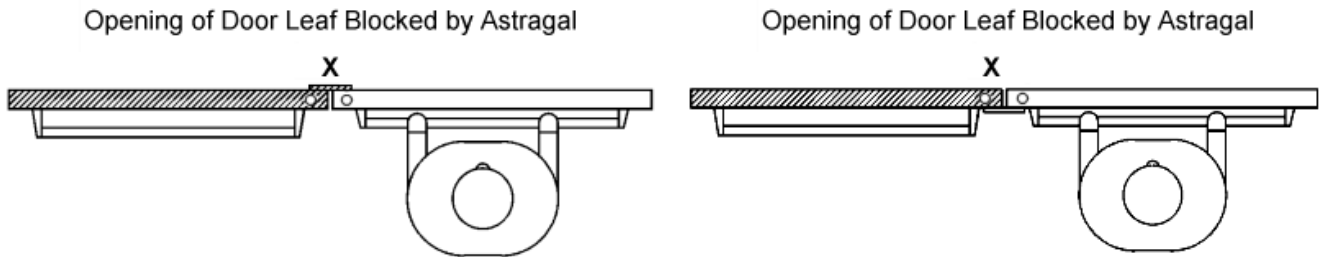
Dead bolt (in addition to latches) is permitted when not in a means of egress.

1. Overlapping flat bar astragals are not required on standard pairs of doors or double egress doors up to 8'-0" x 10'-0" in size and up to a 3-hour fire rating.
2. Astragals are NOT permitted on pairs of doors with vertical rod exit devices on both leaves, or when rim panic devices are used on both leaves with a hardware mullion.
3. Overlapping flat bar astragals ARE required on all standard pairs over 10'-0" high or when one leaf exceeds 4'-0" in width. (Therefore, exit devices may not be used on standard pairs of doors over 10'-0" high or when either door leaf is over 4'-0" wide)
4. The customer may need to provide additional gasketing/smoke-seal type astragals to comply with UL1784 smoke and draft control requirements where required by code.

### Standard swing pairs of doors with vertical rod devices:

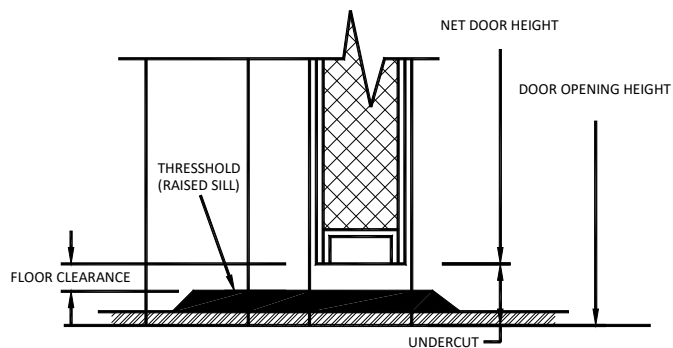
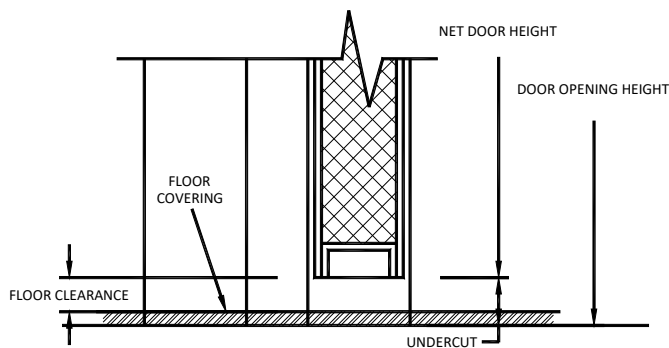
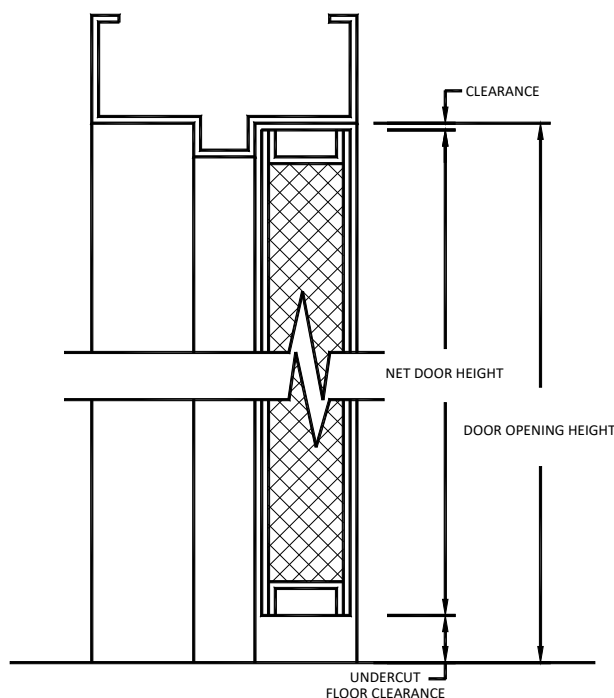
With two vertical rods, an astragal applied to the pull side of one leaf would disable the leaf without the astragal.

An astragal applied to the push side of one leaf would also disable the leaf with the astragal.



Astragals **ARE** permitted when a door with a vertical rod device is used with an inactive leaf equipped with flush bolts.

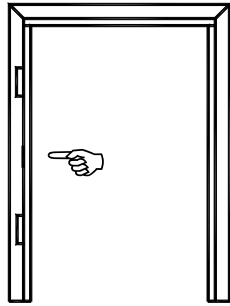
(Where only one leaf is needed to satisfy egress requirements)



## Maximum Clearances allowed:

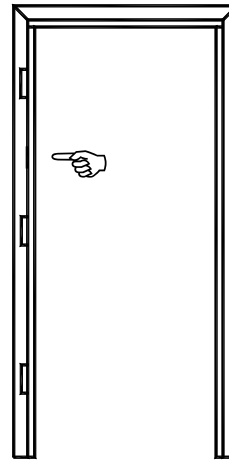
Clearance Between Bottom of Door and ...	
raised sill *	3/4"
floor without sill	3/4"
rigid floor tiles	3/4"

\* Life Safety Code, NFPA 101 limits sill height to 1/2" in a means of egress.  
 ADA limits sill height to 1/2" at all accessible doors.



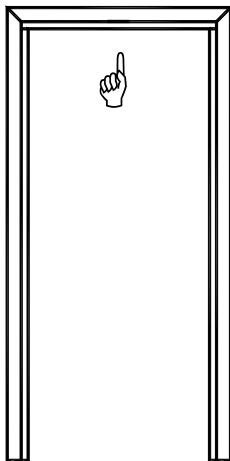
2 HINGES OR PIVOTS

-----  
MIDDLE OF HINGE JAMB RABBET  
(PLUS OR MINUS 8 INCHES)



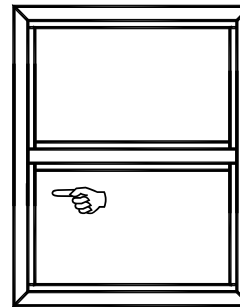
3 OR 4 HINGES OR PIVOTS

-----  
HINGE JAMB RABBET AT 52" TO  
68" FROM BOTTOM OF FRAME



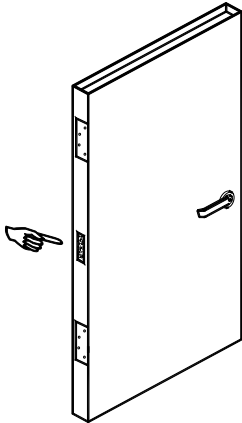
NO HINGES (CONTINUOUS OR  
SURFACE HINGES)

-----  
DOOR SIDE RABBET OF HEAD  
CENTERED IN WIDTH AT SINGLES  
CENTERED OVER INACTIVE LEAF AT PAIRS



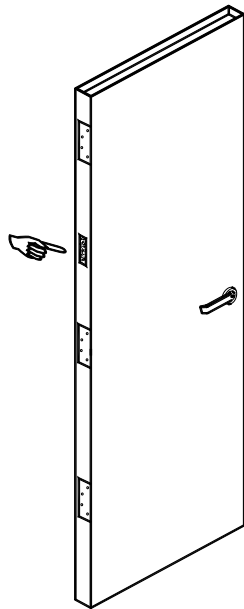
BORROWED LITE

-----  
ANYWHERE VISIBLE -  
PREFERABLY ON SIDE JAMB,  
ON RABBET OPPOSITE GLASS,  
ABOUT HALFWAY UP



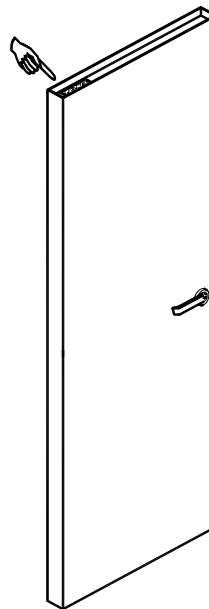
2 HINGES OR PIVOTS

-----  
MIDDLE OF HINGE EDGE  
(PLUS OR MINUS 8 INCHES)



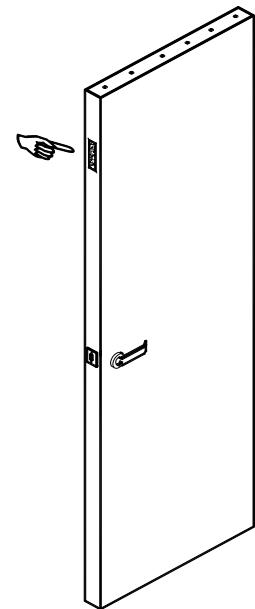
3 OR 4 HINGES OR PIVOT:

-----  
HINGE EDGE 52" TO 68"  
FROM BOTTOM OF DOOR



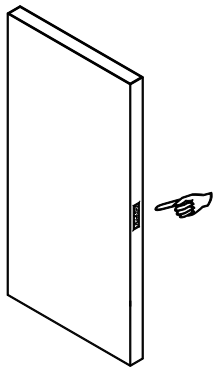
CONTINUOUS OR SURFACE  
HINGES OR POCKET PIVOTS

-----  
TOP OF DOOR AS TIGHT AS  
POSSIBLE TO THE HINGE EDGE  
FOR EITHER STANDARD CHANNEL  
OR FOR FLUSH AND SEAL



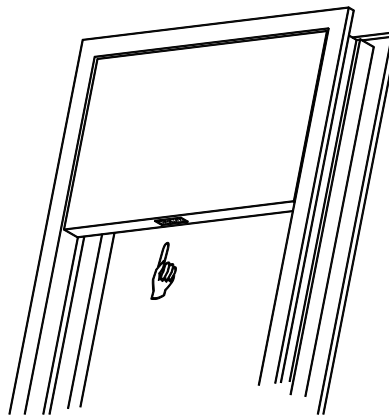
DOOR WITH REMOVABLE TOP CAP  
& CONTINUOUS OR SURFACE  
HINGES OR POCKET PIVOTS

-----  
LOCK EDGE AT 6" DOWN  
FROM TOP OF DOOR



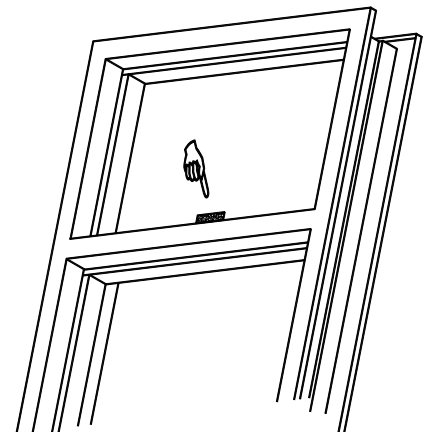
LOOSE PANEL

-----  
ON ANY EDGE



WELDED IN FRAME  
NO TRANSOM BAR

-----  
ON BOTTOM EDGE  
CENTERED IN WIDTH  
(PLUS OR MINUS 8 INCHES)



WELDED IN FRAME  
WITH TRANSOM BAR

-----  
ON FACE OF PANEL  
STOP SIDE - CENTERED IN WIDTH  
(PLUS OR MINUS 8 INCHES)

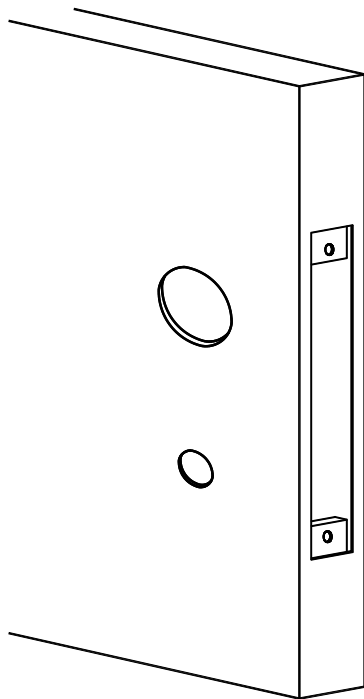
### FIELD PREPS PERMITTED ON RATED HOLLOW METAL FRAMES AND DOORS

THE FOLLOWING IS PERMITTED PER NFPA 80 (2013 EDITION) SECTIONS 4.1.3.2 – 4.1.3.4.

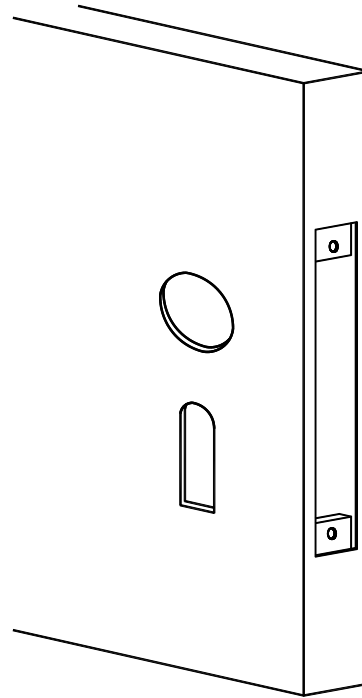
FOR JOB SITE PREPARATION OF SURFACE-APPLIED HARDWARE, FUNCTION HOLES FOR MORTISE LOCKS, AND HOLES FOR LABELED VIEWERS, AND PROTECTION PLATES:

SURFACE-APPLIED HARDWARE SHALL BE APPLIED TO THE FACE OF THE DOOR OR FRAME WITHOUT REMOVING MATERIAL OTHER THAN DRILLING **ROUND HOLES**.

THE HOLES SHALL NOT BE PERMITTED TO EXCEED A DIAMETER OF 1" WITH THE EXCEPTION OF CYLINDERS.



**PERMITTED**



**NOT PERMITTED**