



## Tornado Resistant Openings



Rocky Mountain Metals, Inc. introduces Openings Solutions classified to FEMA P-361 (2015) and certified to ICC 500 (2014). These openings are tested as complete assemblies including doors, frames and hardware as required by the International Building Code for use in tornado shelters in Group E occupancies. This includes among other applications new construction at K-12 schools and extends to critical emergency operation facilities.

The offerings consists of openings of up to 8 ft. in width and 9 ft. in height for double doors and 4 ft. in width and 9 ft. in height for single doors and is also extended to shutters (openings with four sided frames).

### **Single Doors and Shutters**

Min dimensions	width	2 ft 6 inches
	height	4 ft
Max dimensions	width	4 ft
	height	9 ft

In and out swing

### **Double doors**

Min dimensions	width	6 ft
	height	6 ft 8 inches
Max dimensions	width	8 ft
	height	9 ft

Out swing only



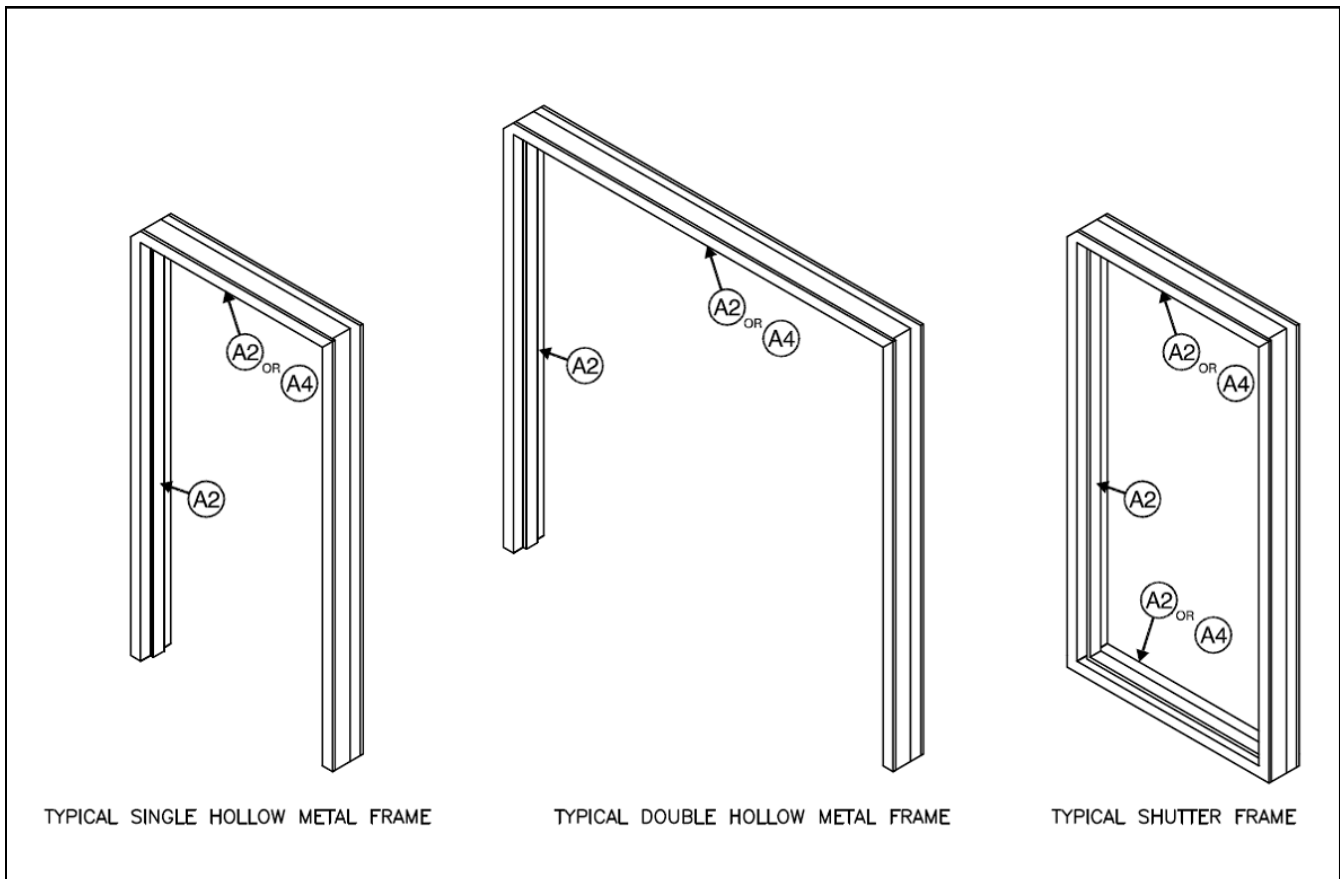
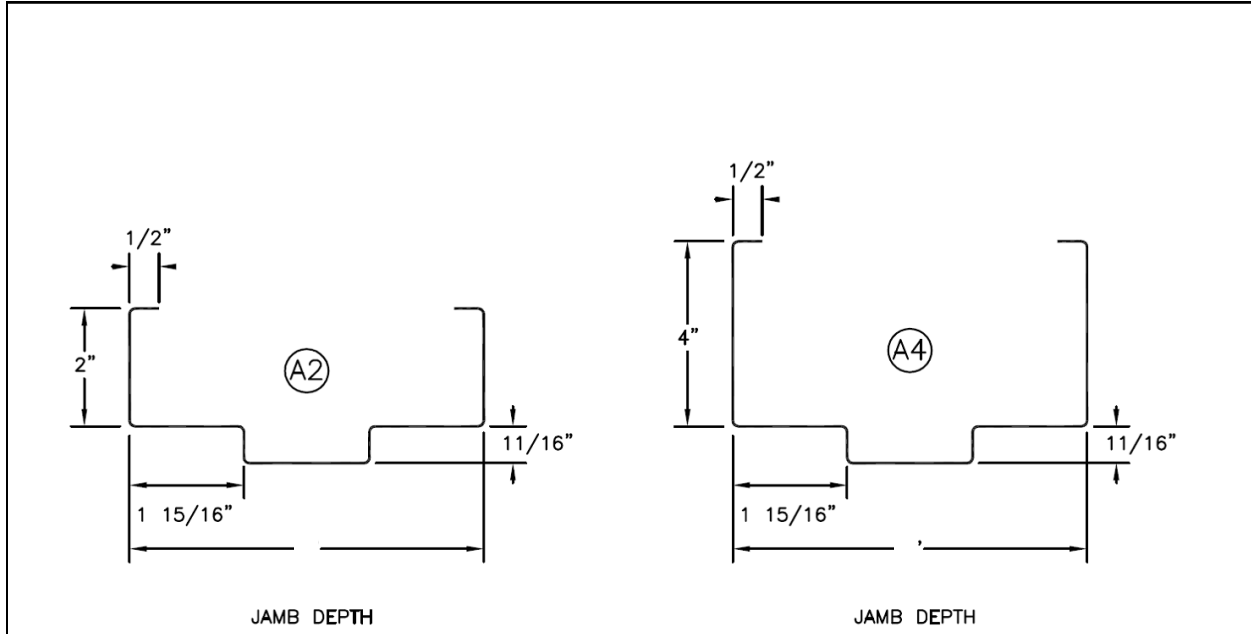
## 1400 FEMA Frame and Shutter Frame Details for Tornado Resistant Openings

Material	Galvannealed A40 ASTM-A-653
Thickness	14 Ga. Galvannealed
Dimensions	2" jambs and 2" or 4" heads as specified
Construction	Mitered and welded face and back
Appearance	Square, true and free of defects, warp and buckle
Reinforcements	4 pcs 7 Ga. 1 1/4" x 10" joggled hinge reinforcement, drilled and tapped. Back welded for additional strength Strike and bolt preps 12 Ga. x 12" long, spot and MIG welded Strike jambs prepared for three rubber silencers, unless otherwise specified
Hardware Locations	Any specified locations
Guards	Dust covers on all frames. Mortar guards on frames for masonry walls
Wall Anchors	Below 7' in Height - 4 anchors 7' and above in Height - 5 anchors
Head Anchors	5' and above in Width - 2 anchors
Bolts	As per specified by RMMI
Spreaders	Temporary spreader bars welded to the bottom of all three sided frames. To be removed before installation
Marking	Embossed with opening numbers above the middle hinge. In the jamb for continuous hinge frames
Finish	Thoroughly cleaned and coated with a rust inhibiting primer meeting requirements as per ANSI/SDI A250 10
Options	UL labeling requirements as specified
Shutter Frame Sizes	Min: 2' 6" x 4'                      Max: 4' x 9'
Door Frame Sizes	Min: 2' 6" x 4'                      Max: 8' x 9'

Shutter Frames are manufactured as four sided frames



## 1400 FEMA Frames for Tornado Resistant Openings





## 1400 FEMA Door/Shutter for Tornado Resistant Openings

Face Material	Galvannealed A40 or ASTM-A-653
Face thickness	14 Ga.
Construction	Hollow metal with 18 Ga. vertical steel stiffeners (ribs). Space insulated with glass wool insulation between ribs. Flush construction
Door thickness	1 3/4" Standard
Hardware Locations	Per Project Requirements
Reinforcements	7 Ga. 1 1/4" x 10" joggled hinge reinforcement, drilled and tapped 12 Ga. mortise hardware tabs, drilled and tapped 12 Ga. surface hardware and trim reinforcement
Edge reinforcement	Horizontal and vertical edges reinforced with 12 Ga. (min) full length channels spot welded to the face sheets
Vertical edges	Fully welded with no visible seam
Handing	Doors are handed
Appearance	Faces and edges free of defects, warp and buckle
Finish	Thoroughly cleaned and coated with a rust inhibiting primer meeting requirements as per ANSI/SDI A250.10
Options	UL Labeling requirements as specified

