

*This section includes AMBICO Tornado Resistant Steel Door and Frame assemblies that can be fire rated or non-rated. Hinges and latches are tested as part of the tornado resistant assembly and must be supplied by the door manufacturer or alternatively must meet with the door manufacturer's approval. Note: Doors up to 3'0 x 7'0 x 1 3/4" (900mm x 2100mm x 45mm) may be fire rated up to 90 minutes in singles or in pairs. Non-fire rated Tornado Resistant Steel Door and Frame Assemblies can be provided for door openings as large as 4'0" x 8'0" x 2 1/8" (1200mm x 2400mm x 53mm) in singles or in pairs. This section relies on both the Canadian Steel Door Manufacturers Association (CSDMA.org) as well as on the Hollow Metal Manufacturers Association (NAAMM.org) industry standard. This section includes proprietary, descriptive and performance specification requirements. Edit to avoid conflicts.*

## **Part 1            General**

### **1.1                SECTION INCLUDES**

*This article includes a summary of the content of this section which will not be included in other sections. This article is NOT intended to be used as a trade or other form of jurisdictional content.*

- .1      Tornado resistant [non-rated] [fire rated] pressed steel frames.
- .2      Tornado resistant [non-rated] [fire rated] steel swing doors.
- .3      Factory- supplied [and installed] hinges and latching devices.

### **1.2                RELATED SECTIONS**

*This article references other specification sections that inter-rely on this section. This listing should include those sections that describe subjects or products that affect this section directly.*

- .1      Section [\_\_\_\_\_ - \_\_\_\_\_]: Masonry mortar fill of metal frames.
- .2      Section 07 92 00 - Joint Sealing: Caulking between doors and adjacent construction.
- .3      Section 08 71 10 - Door Hardware - General.
- .4      Section 09 91 15 - Painting: Field painting of [doors] [frames] [doors and frames].

### **1.3                REFERENCES**

*List reference standards below that are included within the text of this section, when edited for a project specification. Delete references that do not apply to this project.*

- .1      ASTM A36/A36M-05 - Standard Specification for Carbon Structural Steel.
- .2      ASTM A653/A653M-06 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3      ASTM A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- .4      ASTM E330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

- .5 FEMA Standard 361 Design and Construction for Community Shelters on 'safe rooms' in homes in wind zones
- .6 Canadian Steel Door Manufacturers Association (CSDMA), Selection and Usage Guide for Steel Doors and Frames, 1990.
- .7 HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
- .8 HMMA 840-99 - Installation and Storage of Hollow Metal Doors and Frames.
- .9 NFPA 80-07 - Standard for Fire Doors and Other Opening Protectives.
- .10 UL10C-98 Standards for Positive Pressure Fire Tests of Door Assemblies.

#### 1.4 PERFORMANCE REQUIREMENTS

*Include this article if all doors should meet the same performance requirement; otherwise, specify individual performance for door types in Part 2 or in a door schedule.*

- .1 Structural Performance:
  - .1 Provide doors capable of withstanding a peak reflected pressure of 12.25 kPa (7psi) tested to ASTM E330 and FEMA 361 standards.
  - .2 Rebound: 100%
  - .3 Missile Impact Testing: 15-lb wood 2x4 traveling without pitch or yaw at 100 mph and striking perpendicular to the surface.
  - .4 All items in assembly to conform to FEMA 361 performance criteria.

#### 1.5 REGULATORY REQUIREMENTS

*AMBICO can supply Tornado Resistant Door and Frame Assemblies with 45 or 90 minute fire rating labels. Fire doors and frames are available in sizes up to 3'0"x7'0"x 1 3/4" (900 mm x 2100mm x 45mm) single door openings or 2/3'0"x7'0" x 45 mm (2/900mm x 2100mm x 45mm) paired openings where the two door leafs are supplied with a mullion.*

- .1 Installed Door and Frame Assembly: Conform to [NFPA 80] [\_\_\_\_\_] for fire rated class [as scheduled.] [as indicated.].

#### 1.6 SUBMITTALS

- .1 Section [01 33 00]: Submission procedures.
- .2 Product Data: Provide product data on door construction and [\_\_\_\_\_].
- .3 Shop Drawings: Indicate door and frame elevations, internal reinforcement, anchor types, closure methods, [finishes] location of cut-outs for hardware.
- .4 Samples: Submit manufacturer's door finish samples, as well as manufacturer's frame corner sample.
- .5 Test Data:

- .1 Submit independent test data from a recognized licensed laboratory indicating compliance with the tornado resistance requirements.

## 1.7 QUALITY ASSURANCE

- .1 Perform Work to requirements of [CSDMA (Canadian Steel Door Manufacturers Association)] [HMMA (Hollow Metal Manufacturers Association)] standards.
- .2 Manufacturer: Minimum 5 years documented experience manufacturing tornado resistant door and frame assemblies.
- .3 Pre-installation Meeting: Convene a pre-installation meeting [2] [ \_\_\_\_ ] weeks before start of installation of door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

## 1.8 DELIVERY, STORAGE AND PROTECTION

- .1 Section [01 61 00]: Transport, handle, store, and protect products.
- .2 Comply with HMMA 840.
- .3 Weld minimum two temporary jamb spreaders per frame prior to shipment.
- .4 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .5 Store in vertical position, spaced with blocking to permit air circulation between components.
- .6 Store materials out of water and covered to protect from damage.
- .7 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

## 1.9 WARRANTY

- .1 Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

## Part 2 Products

### 2.1 MANUFACTURERS

*List the manufacturers acceptable for this project. Edit the subsequent descriptive specifications of Part 2, to identify project requirements and to eliminate any conflict with specified manufacturer's products.*

- .1 AMBICO Limited  
1120 Cummings Avenue  
Ottawa, Ontario, Canada K1J 7R8  
Toll Free Phone 888-423-2224  
Phone 613-746-4663

Toll Free Fax                    800-465-8561  
Fax                                    613-746-4721

**2.2**

- .1 Other Acceptable Manufacturers:
  - .1 [\_\_\_\_\_].
  - .2 [\_\_\_\_\_].
- .2 Substitutions: [Refer to Section 01 60 00.] [Not permitted.]

**2.3****MATERIALS**

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M.
  - .1 Coating designation [Z275] ([G90]) for exterior door assemblies.
  - .2 Coating designation [ZF001] ([A01]) for interior door assemblies.
- .2 Reinforcement [Channel]: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M, [ZF75] ([A25]).
- .3 Structural Plate: Hot rolled steel to ASTM A1011.

**2.4****ACCESSORIES**

*AMBICO tornado resistant steel door and frame assemblies are supplied with hinges and latching devices as an integral part of the tested assembly. Additional hardware items shall be supplied by Section # 08 71 10. Other accessories specified in this section shall be supplied by the door and frame manufacturer.*

- .1 Hinges: Heavy weight butt type to be factory supplied [and pre-installed].
- .2 Door Hardware: [Mortise lock] [Exit device] to be factory supplied [and pre-installed].
- .3 Primer: Rust inhibitive zinc chromate.

**2.5****FABRICATION**

- .1 Manufacture doors and frames in accordance with FEMA 361 standards.

*Specify door thickness and other values with caution as they vary in order to meet tornado resistant standards. Openings up to than 3'0" x 7'0" (914 mm x 2134 mm) require doors 1 3/4" (45mm) thick. Openings between 3'0" x 7'0" (914 mm x 2134 mm) and up to 4'0"x 8'0" (1200mm x 2400mm) require doors 2 1/8" (53mm) thick .*

- .2 Steel Doors, Swing Type:
  - .1 Sheet steel faces, thickness, design, and core suitable to achieve specified tornado resistance.
  - .2 Tornado resistant construction, longitudinal edges [mechanically inter-locked] [welded, filled and sanded] with [no] visible edge seams.
  - .3 Top and Bottom Channels: Inverted, recessed, welded steel channels.

- .4 Astragals: Metal astragals for double doors designed to conform with tornado resistant requirements.
  - .5 Weld structural steel channels flush to top and bottom of door.
  - .6 Weld hardware reinforcement plates in place.
- .3 Steel Frames: Swing Type
- .1 Sheet steel and metal thickness appropriate to maintain tornado resistance.
  - .2 Factory assemble and weld frames.
  - .3 Mullions for Double Doors: [Fixed] [Removable] type.
  - .4 Provide and factory-install three single silencers for single doors [and mullions of double doors] on strike side, and two single silencers on frame head at double doors.
- .4 Hinges and latching devices to be factory supplied [and pre-installed].
- .5 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, door tag, model number, and performance rating.

## **2.6 PRE-INSTALLATION OF SWINGING DOOR HARWARE**

- .1 Hinges and latching device to be supplied complete with tornado resistant steel door and frame in conformance with tornado resistant requirements of project.
- .2 [Hinges and latching device shall be factory pre-installed on the tornado resistant steel door and frame assembly.]

## **2.7 FINISHES**

- .1 Factory Finish: Factory applied zinc chromate primer [to be applied to all exposed surfaces] [touch-up only, where product has been welded and ground smooth].

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install components including doors, frames, and hardware in accordance with manufacturer's written instructions.
- .2 Install doors and frames to [CSDMA] [HMMA 840] standards [and in accordance with NFPA 80, and local authority having jurisdiction].
- .3 Coordinate with [masonry] [gypsum board] [concrete] [\_\_\_\_\_] wall construction for anchor placement.
- .4 Set frames plumb, square, level and at correct elevation.
- .5 Allow for deflection to ensure that structural loads are not transmitted to frame.

- .6 Adjust operable parts for correct clearances and function.
- .7 Finish paint in accordance with Section 09 91 15.

**3.2 ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than ± 1/16in (1.5mm) in compliance with HMMA 841.

**3.3 FIELD QUALITY CONTROL**

- .1 Provide qualified manufacturer's representative to instruct installers on the proper installation and adjustment of door assemblies.
- .2 Provide manufacturer's representative to inspect door installation, and test minimum ten (10) cycles of operation. Correct any deficient doors.

**3.4 SCHEDULE**

*Include this article to identify variations of products or installation requirements specified. If door and/or frame schedules are listed on drawings or on separate schedule sheets, do not repeat statements in this article.*

- .1 Blast Resistant Door Schedule:

Tag	Room	Nominal Size	Thickness	Material	Glazing	Fire Rating	Comments
D-1	100	2/750mm x 2400mm	53	GS	D	NFR	
D-2	101	3'0" x 7'0"	1 3/4"	GS	D	FR	
<ul style="list-style-type: none"> <li>Material types: GS = Galvanized Steel</li> <li>Door elevation types: D=Flush</li> <li>Fire Label types: FR= Fire rated to 90 minutes, NFR= Non-fire rated</li> </ul>							

**END OF SECTION**