

*This section includes Tornado Resistant Steel Door and Frame assemblies. This section relies on the Hollow Metal Manufacturers Association (NAAMM.org) industry standards. 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 00 - 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-14 - Standard Specification for Carbon Structural Steel.
- .2        ASTM A653/A653M-15e1- Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3        ASTM A1011/A1011M-17a 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        ICC 500-2014- Standard for the Design and Construction of Storm Shelters
- .5        HMMA 802-07 - Manufacturing of Hollow Metal Doors and Frames.
- .6        HMMA 840-16 - Installation and Storage of Hollow Metal Doors and Frames.
- .7        NFPA 80-16 - Standard for Fire Doors and Other Opening Protectives.

- .8 UL10B - Standards for Fire Tests of Door Assemblies.

#### 1.4 PERFORMANCE REQUIREMENTS

- .1 Structural Performance:
  - .1 Provide doors capable of withstanding a peak reflected pressure of 1.76psi in accordance with tested ICC 500 standards.
  - .2 Missile Impact Testing: 15-lb wood 2x4 traveling without pitch or yaw at 100 mph and striking perpendicular to the surface.
  - .3 All items in assembly to conform to ICC 500 performance criteria.

#### 1.5 REGULATORY REQUIREMENTS

- .1 Installed Door and Frame Assembly: Conform to [NFPA 80] [\_\_\_\_\_] for fire rated class [as scheduled.] [as indicated.].
- .2 In conformance with ICC 500 (2014) standards

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

*Include the following ONLY if specifying for a LEED project. Specify only the technical requirements necessary to achieve the credits desired for this project. AMBICO Tornado Resistant products offer significant advantages to firms interested in supporting LEED certification*

- .5 Sustainable Design:
  - .1 Section 01 35 18: LEED documentation procedures.
  - .2 Provide required LEED documentation for Product [recycled content] [regional materials] [low emitting materials].
  - .3 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements]. Section 01 35 18: LEED documentation procedures.
  - .4 Submit Type 3 Environmental Product Declaration (EPD) for Products of this Section. .
- .7 Closeout Submittals
  - .1 Section 01 78 10: Submission procedures.

- .2 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with and registered with manufacturer.

## **1.7 QUALITY ASSURANCE**

- .1 Perform work to 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 Other Acceptable Manufacturers:

.1 [\_\_\_\_\_].

.2 [\_\_\_\_\_].

.3 Substitutions: [Refer to Section 01 60 00.] [Not permitted.]

**2.2 PERFORMANCE REQUIREMENTS**

.1 Assemblies shall comply with test criteria established in ICC 500 (2014).

**2.4 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.

**2.5 ACCESSORIES**

*AMBICO tornado resistant steel door and frame assemblies are supplied with hinges and Securitech latching devices as an integral part of the tested assembly. Additional hardware items shall be supplied by Section # 08 71 10. All 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 loose.

.2 Door Hardware: Multi-point [Mortise lock] [Exit device] to be factory supplied [and pre-installed].

.3 Primer: Rust inhibitive zinc phosphate.

**2.6 FABRICATION**

.1 Manufacture doors and frames in accordance with ICC 500 tested assemblies.

*Specify door thickness and other values with caution as they vary in order to meet fire standards. Openings that are fire rated up to 90 minutes, require doors 1 3/4" (45mm) thick. Steel Doors.*

.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 Weld structural steel channels flush to top and bottom of door.
  - .5 Weld hardware reinforcement plates in place.
- .2 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.
- .3 Multi-point latching devices to be factory supplied [and pre-installed].
- .4 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, door tag, model number, and performance rating.

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

- .1 Hinges and multi-point 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.]

## **2.8 FINISHES**

- .1 Factory Finish: Factory applied zinc phosphate 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 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 00.

### **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  $\pm 1/16$ in (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.

**END OF SECTION**