SECTION 08 33 00

StormDefender™ by Cornell

Tornado & Hurricane Protection Rolling Doors

**GENERAL NOTES TO SPECIFIER:**

This specification section has been prepared to assist design professionals in the preparation of project or office master specifications. It follows guidelines established by the construction specifications institute, and therefore may be used with most master specification systems with minor editing.

Edit carefully to suit project requirements. Modify as necessary and delete items that are not applicable. Verify that referenced section numbers and titles are correct. (Numbers and titles referenced are based on MasterFormat®, 2004 edition).

This section assumes the project manual will contain complete division 01 documents including sections 01 33 00–submittal procedures, 01 62 00–product options, 01 25 13–product substitution procedures, 01 66 00–product storage and handling requirements, 01 77 00–closeout procedures, and 01 78 00–closeout submittals. If the project manual does not contain these sections, additional information should be included under the appropriate articles.

This is an open proprietary specification allowing users the option of approving other manufacturers which comply with the criteria specified herein.

**\*\*Notes to the specifier\*\*** are contained in boxes and should be deleted from final copy.

Optional items requiring selection by the specifier are enclosed within brackets, e.G.: [35] [40] [45]. In cases where one of the optional items is a standard feature of the door model, it is listed in the first position. Make appropriate selection and delete others.

Items requiring additional information are underlined and highlighted, e.G.: \_\_\_\_\_\_\_\_\_\_\_\_\_.

**PART 1** GENERAL

1.1 SUMMARY

A. **Section Includes:** Electric operated, automatic closing, overhead rolling doors

B. **Related Sections:**

1. 05 50 00–Metal Fabrications. Door opening jamb and head members.

2. 06 10 00–Rough Carpentry. Door opening jamb and head members.

3. 08 31 00–Access Doors and Panels. Access doors.

4. 09 91 00–Painting. Field painting.

5. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm systems.

C. **Products That May Be Supplied, But Are Not Installed Under This Section:**

1. Control Station

2. Annunciator

1.2 SYSTEM DESCRIPTION

A. **Certifications:**

1. Provide certification of compliance with ICC 500-2020 ICC/NSSA Standard for the Design and Construction of Storm Shelters

2. Provide certification of compliance with FEMA 361 Safe Rooms for Tornados and Hurricanes

3. Provide certification of compliance to sustain 300 psf wind pressure in accordance with ASTM E330.

4. Provide certification of compliance in accordance with the requirements of ASTM E1886 Large Missile Impact for FEMA 361 assemblies.

B. **Design Requirements:**

1. **Wind Loading:**

a. Supply doors to withstand at least 250 psf (11970 Pa) design wind load (tornado) (300 psf test pressure at 1.2 times the design wind load)

a. Supply doors to withstand at least 200 psf (9576 Pa) design wind load (hurricane) (300 psf test pressure at 1.5 times the design wind load)

2. **Cycle Life:**

1. Construction for usage of up to 20,000 cycles for the life of the product

1.3 SUBMITTALS

A. Reference Section 01 33 00–Submittal Procedures; submit the following items:

1. **Product Data**

2. **Shop Drawings:** Include special conditions not detailed in Product Data. Show interface with adjacent work.

3. **Certifications**

 a. Provide certification of compliance with ICC 500-2020 ICC/NSSA Standard for the Design and Construction of Storm Shelters

b. Provide certification of compliance with FEMA 361 Safe Rooms for Tornados and Hurricanes

c. Provide certification of compliance to sustain 300 psf wind pressure in accordance with ASTM E330.

d. Provide certification of compliance in accordance with the requirements of ASTM E1886 Large Missile Impact for FEMA 361 assemblies.

3. **Manufacturer's installation instructions**.

4. **Closeout Submittals:**

a. Operation and Maintenance Manual.

b. Certificate stating that installed materials comply with this specification.

c. Warranty Statement

1.4 QUALITY ASSURANCE

A. Qualifications:

1. **Manufacturer Qualifications:** ISO 9001:2015 registered and a minimum of five years experience in producing fire and smoke control units of the type specified.

2. **Installer Qualifications:** Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

A. Reference Section 01 66 00–Product Storage and Handling Requirements.

B. Follow manufacturer's instructions.

1.6 WARRANTY

A. **Standard Warranty:** Two years from date of shipment against defects in material and workmanship.

B. **Maintenance:** Submit maintenance service agreement for installed products for owner’s consideration and acceptance.

**PART 2** PRODUCTS

2.1 MANUFACTURER

A. **Manufacturer:**

1. **Cornell:** 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366.

2. **Cookson**

**Substitutions:** Not permitted.

2.2 PRODUCT INFO

A. **Model:** PSD361

2.3 MATERIALS

A. **Curtain:**

1. a. **Steel with Finish as Described Below:** Minimum 12 gauge, ASTM A1008 or ASTM A1011 grade 40 steel

b. **Stainless Steel:** 12 gauge AISI type 304 stainless steel

2. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **SpectraShield® Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

b. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [weathered iron, weathered brown, earth, weathered bronze, terra cotta, stucco, platinum, olde copper, rust, dark roast, weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

c. **Stainless Steel:** #4 type 304 finish

**\*\* NOTE TO SPECIFIER** \*\* For vinyl decal graphic, max. height is 10 ft.; no width limit.

1) **Vinyl Decal Graphics:** Flat face surface of door curtain slats to include factory applied [4] [2] -color process, 2 mil thick vinyl graphic image, 3M® or equal. Graphic image to be selected and electronically supplied by customer.

B. **Endlocks:**

1) Retention groove integrated into the body of the slat used to retain the slats within the guides.

2) 16 gauge aluminum secured with tabs integrated into the body of the slat used to restrain the slats in a horizontal position relative to one another.

C. **Bottom Bar:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Configuration:**

a. 12G formed bottom bar profile with steel [stainless steel] strengthening insert

2. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **SpectraShield® Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

b. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [weathered iron, weathered brown, earth, weathered bronze, terra cotta, stucco, platinum, olde copper, rust, dark roast, weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

c. **Stainless Steel:** #4 type 304 finish

D. **Guides:**

1. **Fabrication**

a. Minimum 1/4 inch (6.35mm) [structural steel] Top of inner and outer guide shapes to be flared outwards to form bellmouth for smooth entry of curtain into guides. Top 16 ½” (419.10 mm) of coil side guide shapes to be removable for ease of curtain installation and as needed for future curtain service.

2. **Finish:**

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

 a. **SpectraShield® Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

b. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) Zirconium pre-treatment followed by baked-on polyester powder coat, with [weathered iron, weathered brown, earth, weathered bronze, terra cotta, stucco, platinum, olde copper, rust, dark roast, weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

c. **Stainless Steel:** #4 type 304 finish

E. **Counterbalance Shaft Assembly:**

1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width

2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door.

3. Provide tension wheel for applying and adjusting spring torque.

F. **Brackets:** Fabricate from minimum 3/8 inch (9.525 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

1. **Finish:**

a. **SpectraShield® Coating System (Color Selected by Architect):**

Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

b. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

Zirconium pre-treatment followed by baked-on polyester powder coat, with [weathered iron, weathered brown, earth, weathered bronze, terra cotta, stucco, platinum, olde copper, rust, dark roast, weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

c. **Stainless Steel:** #4 type 304 finish

G. **Hood:**

Minimum 24 gauge [galvanized steel] [stainless steel] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets

\*\* **NOTE TO SPECIFIER** \*\* Select one of the following.

a. **GalvaNex™ Coating System (Stock Colors):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] baked-on polyester enamel finish coat

b. **SpectraShield® Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

c. **Atmoshield®** **Powder Coating System (Color Selected by Architect):**

1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat

2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [weathered iron, weathered brown, earth, weathered bronze, terra cotta, stucco, platinum, olde copper, rust, dark roast, weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

d. **Stainless steel:** #4 type 304 finish

2.4 OPERATION

\*\* **NOTE TO SPECIFIER** \*\* FEMA361/ICC 500 does not mandate specific notification standards. This system may be designed to deploy automatically by alarm, by failsafe activation and by manual operator via secured stations. The AlarmGard systems will provide a safe and controlled rate of descent, an internal failsafe release device in the event of power failure, automatic reset and open and an integrated cycle counter.

A. **Motor Operation:**

1. **AlarmGard Motor Operation:** UL, cUL listed NEMA 1 enclosure, horsepower as recommended by manufacturer, [115v single] [230v single] [208/230v three] [460v three] phase service. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.

a. Provide a failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms

b. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.

c. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.

d. Provide logic for [1] [2] [3] fully monitored safety reversing devices such that the failure of any single monitored device will cause the motor operator to automatically revert to constant pressure to close.

e. Electrically activate door system automatic closure by [notification from central alarm system] [manual guarded station operation] or [extended power outage exceeding four hours].

f. Provide an automatic alarm closure selectable time delay of zero or ten seconds.

g. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.

h. Maintain automatic closure speed at not more than 9” (229 mm) per second.

i. Enable safety edge function during alarm closing while power is present for [0] [1] [3] cycle[s]. Enable door to rest upon obstruction following this sequence.

j. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human interaction.

k. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human interaction.

l. Provide an integral, non-resettable cycle counter.

m. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.

n. Provide minimum #50 roller chain for drive connection from motor drive assembly to the door drive shaft.

o. Install system only with manufacturer supplied or specified fasteners.

p. Notify electrical contractor to mount control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.

q. Test door system no less than twice annually to ensure full compliance with intended functions.

1. **AlarmGard Plus Motor Operation with Chain Hoist and Battery Backup:** UL, cUL listed NEMA 1 enclosure, horsepower as recommended by manufacturer, [115v single] [230v single] [208/230v three] [460v three] phase service. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.

a. Provide a failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms

b. Equip operator with an emergency manual chain hoist assembly that provides emergency operation during non-alarm power failure.

c. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.

d. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation.

e. Provide logic for [1] [2] [3] fully monitored safety reversing devices such that the failure of any single monitored device will cause the motor operator to automatically revert to constant pressure to close.

f. Electrically activate door system automatic closure by [notification from central alarm system] [notification from local detectors] or [extended power failure].

g. Provide an automatic alarm closure selectable time delay of zero or ten seconds.

h. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices.

i. Maintain automatic closure speed at not more than 9” (229 mm) per second.

j. Enable safety edge function during alarm closing while power is present for [0] [1] [3] cycle[s]. Enable door to rest upon obstruction following this sequence.

k. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human interaction.

l. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human interaction.

m. Provide an integral, non-resettable cycle counter.

n. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.

o. Provide minimum #50 roller chain for drive connection from motor drive assembly to the door drive shaft.

p. Install system only with manufacturer supplied or specified fasteners.

q. Notify electrical contractor to mount control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions.

r. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5.

\*\* **NOTE TO SPECIFIER** \*\* The items listed below are optional secondary entrapment protection devices, and may be used in conjunction with a set of primary entrapment protection photo eyes or with constant pressure close operation. Coordinate with primary entrapment protection; delete if not desired.

A. **Sensing/Weather Edge:**

1. **Electric sensing edge device:** Automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and automatically reverse direction to the fully opened position. Provide a wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator.

2. **Monitered electric sensing edge** seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position. Provide a [retracting safety cord and reel] [self-coiling cable] connection to control circuit.

2.5 ACCESSORIES

\*\* **NOTE TO SPECIFIER** \*\* Fire emergency annunciators are available for use with a AlarmGard motor operator and FireGard series release devices. Horn/strobe available with all FireGard series devices; strobes may require synchronization with other systems. Voice warning module available with type by device only. Delete below if not desired.

A.  **Emergency Annunciator:**

1. [ADA compliant horn/strobe] [Voice Warning Module] emergency annunciator to give advanced warning that door is about to close, activating warning signal upon alarm or activation.

\*\* **NOTE TO SPECIFIER** \*\* Include R-BBU battery back-up system with AlarmGard motor operators to add a four hour time delay to auto-closing upon power failure. This system does not provide for power opening of the unit, but allows for programming open/close obstruction cycling should the sensing edge encounter a stationary obstruction in the opening during AC power, alarm signal closing. Coordinate with section for AlarmGard™ motor operated systems. Delete if not desired.

B. **Battery Back-Up:**

1. **Model R-BBU Battery Back-Up System for AlarmGard Motor Operator:**

a. Prevent gravity closure for a minimum of four hours due to power failure.

**\*\* NOTE TO SPECIFIER** \*\* Exposed moving operator components lower than 8 feet above floor level require covers per UL 325. Specify an operator cover whenever this field condition exists.

D. **Operator and Full Bracket Mechanism Cover:**

1. Provide minimum 24 gauge [galvanized steel] [stainless steel] sheet metal cover [to provide weather resistance] [to enclose exposed moving operating components] at coil area of unit. Finish to match door hood.

**\*\* NOTE TO SPECIFIER \*\*** LED-illuminated light kit is a guide mounted LED light strip to provide an additional visible color coded notification on the door opening status. Delete below if not required.

1. **LED Light Kit :**
	1. Include LED Light Kit in [5ft] [10ft] [15ft] length. IP68 rated LED light kit to include guide mounting channel, power supply, controller and signal wire. LED lights to be solid red when door is closed, flash red when door is in motion and solid green when door is fully open.

**PART 3** EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

1. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing.

3.5 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

3.6 DEMONSTRATION

A. Demonstrate proper operation, testing and reset procedures to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

**END OF SECTION**