SECTION 08 33 00
TORNADO AND HURRICANE RESISTANT COILING DOORS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. Provide all materials, labor, equipment and services necessary to furnish, deliver and install all work under this section as shown on the contract documents, specified herein, and as specified by the job conditions.

1.02 DESCRIPTION

A. Related work specified elsewhere:

1. Metal Fabrication.	Section 05 50 00
2. Rough Carpentry.	Section 06 10 00
3. Access Panels & Doors:	Section 08 31 00
4. Painting:	Section 09 91 00
5. Electrical:	Division 26

1.03 SUBMITTALS

A. Procedures: Furnish submittals in accordance with the general requirements specified.

B. Shop Drawing: Furnish shop drawings for architect's approval. Include elevations, sections, and details indicating dimensions, materials, finishes, conditions for anchorage and support of each coiling door.

C. Listings and Certifications:
1. Submit manufacturer's Code Compliance Research Report published by an IAS accredited nationally recognized independent agency confirming compliance of the door assembly in accordance with the International Building Code.
2. Listed, labeled and certified by Underwriters Laboratories or Intertek testing laboratory for product compliance with FEMA P-361 Safe Rooms for Tornadoes and Hurricanes.
3. Listed, labeled and certified by Underwriters Laboratories or Intertek testing laboratory to ICC 500-2020 Standard for Design and Construction of Storm Shelters.
4. Listed, labeled and certified by Underwriters Laboratories or Intertek testing laboratory for a wind pressure rating of +/-252 psf for tornado shelters and +/-201 psf for hurricane shelters in accordance with ICC 500-2020.
5. Listed, labeled and certified by Underwriters Laboratories or Intertek testing laboratory for missile impact rating of 15 lbs at 100 mph in accordance with the requirements of ICC 500-2020.
6. Listed, labeled and certified by Underwriters Laboratories or Intertek testing laboratory for product compliance with ASTM F3038-21 Standard Test Method for Timed Evaluation of Forced Entry Resistant Systems with a rating of 60 minutes.
7. Listed and certified by Underwriters Laboratories or Intertek testing laboratory in accordance with UL 752, Standard for Safety Bullet-Resisting Equipment to a Level 1 Ballistic Resistance Rating.

D. Product Literature: Submit manufacturer's technical literature describing the product to be used under this section.

E. Maintenance and Operating Manuals: Furnish complete manuals describing the materials, devices and procedures to be followed in operating and maintaining all tornado and hurricane resistant coiling doors under this section. Include manufacturer's brochures and parts lists describing the actual materials used in the product.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with applicable FEMA requirements as well as laws, codes, ordinances and regulations of

federal, state and municipal authorities having jurisdiction.
2. Listed under a certified Code Compliance Research Report in accordance with the applicable sections of the International Building Code.

B. Manufacturer Requirements: Manufacturer shall have been in the business of and have experience in manufacturing wide span opening protective door assemblies as well as providing dependable credible service for a minimum of ten (10) years.

C. Operational Cycle Life: Tornado and hurricane resistant coiling doors shall be designed and constructed for a minimum 10,000 operating cycles for the life of the door assembly. Cycles shall be verifiable by a non-resettable cycle counter located within the door's motor operator control panel.

1.05 DELIVERY, STORAGE AND HANDLING

A. General: Deliver and store materials in manufacturer's original packaging, labeled to show name, brand and type. Store materials in a protected dry location off the ground in accordance with manufacturer's instructions.

1.06 WARRANTY

A. Tornado and Hurricane Resistant Coiling Door Warranty: Provide Two (2) Year, 10,000 Cycle Warranty, effective as of the date of shipment, signed by the manufacturer and installer agreeing to repair or replace work which has failed as a result of defects in materials or workmanship. Upon notification within the warranty period, such defects shall be repaired at no cost to the owner.

PART 2 PRODUCTS

2.01 TORNADO AND HURRICANE RESISTANT COILING DOORS

A. Manufacturer: Tornado and hurricane resistant coiling doors shall be the model SafeSpace™ SS500X-PC as manufactured by McKEON. Assembly shall be approved for use in FEMA P-361 safe rooms and ICC 500-2020 storm shelters including a 60 Minute Forced Entry Resistance Rating and a Level 1 Ballistic Resistance Rating.

2.02 MATERIALS

A. Curtain: Shall be assembled of extruded alloy interlocking slats. Curtain shall be formed of EX slat profile sections of gauge thickness as required to sustain the minimum required design wind pressure.
1. Slat cross section shall not be less than 3" wide by 1-1/8" deep.

B. Bottom Bar: Shall consist of a double 3" x 3" structural steel angle assembly formed to fit and engage the curtain assembly.

C. Guides: Each guide assembly shall be fabricated of structural steel support angles no greater than 4" x 4" and guide retaining angles of a minimum 6" depth to retain curtain in the guides under the design wind pressure and impact forces specified.

D. Mounting Brackets: Fabricated of hot rolled 3/16" minimum steel plates, brackets shall be provided to house ends of the counterbalance barrel assembly.

E. Hood: Shall be provided to entirely enclose coiled curtain and counterbalance barrel assembly. Hood shall be fabricated of a minimum 22 gauge G90 galvanized steel, designed and formed to match brackets. Top and bottom shall be bent and reinforced to provide for proper stiffness.

F. Counterbalance Assembly: Coiling door shall be counterbalanced by means of adjustable steel helical torsion springs attached to shaft enclosed in pipe with required mounting blocks or rings for attachment of curtain. Grease sealed bearings or self-lubricating graphite bearings shall be attached to the spring barrel which shall be fabricated of hot formed structural quality carbon steel seamless pipe.

G. Electric Motor Operator: Door shall be provided with a compact power unit designed and laboratory listed by the door manufacturer. Operator shall be equipped with an adjustable screw-type limit switch to break the circuit at termination of travel. High efficiency planetary gearing running in an oil bath, shall be furnished together with a centrifugal governor, magnetic operated brake and a fail-safe magnetic release device, completely housed to protect against damage, dust and moisture. An efficient overload protection device, which will break the power circuit and protect against damage to the motor windings shall be integral with the unit. Operator is to be housed in a NEMA type 1 enclosure.
   a. Motor: Shall be intermediate duty, thermally protected, ball bearing type with a class A or better insulation. Horsepower of motor is to be 1/2hp minimum or of manufacturer's recommended size, whichever is greater.
   b. Starter: Shall be size "0" magnetic reversing starter, across the line type with mechanical and electrical interlocks, with 10 amp continuous rating and 24 volt control circuit.
   c. Reducer: Planetary gear type, 80% efficiency minimum.
   d. Cycle Counter: Non-resettable operational cycle counter.

H. NFS Operation: The operating system shall prevent the tornado and hurricane storm door from closing during building power interruption to the motor operator for a period of up to eight hours. Once the NFS cycle lapses, the door shall self-close at a controlled governed rate of closure not greater than 6" per second.

I. Control Stations: Each tornado and hurricane storm door shall be provided with three position push button control station marked open, close and stop that is active during normal and alarm conditions. The control station shall remain operable as long as there is no main power failure to the motor operator.

J. Master Control Station: Provide a single master control station that can simultaneously activate all of the tornado and hurricane storm doors in the facility to the emergency closed or open positions. The master control station shall remain operable as long as there is no main power failure to the door’s motor operators.

K. Emergency Alarm Activation: With or without main power to the motor operator, upon activation by the facility’s alarm system the hurricane and tornado storm door shall immediately self-close to the fully closed position. Once the emergency alarm condition has been cleared and main power has been restored, the door shall automatically power itself back to the fully open position.

L. Emergency Manual Operation: The door assembly shall be equipped with an emergency hand chain that shall remain operable during an emergency alarm condition. The emergency hand chain shall also remain operable during main power failure lasting up to eight hours, after the eight hours have lapsed, the door assembly shall automatically self-close and remain in the closed position until main power has been restored to the motor operator. The hold open sequence of the emergency manual operation mode shall be programable so that during an emergency alarm condition or main power failure, not exceeding eight hours, the door assembly shall remain open for a period of five to thirty minutes after the hand chain has opened the door and before the door assembly begins to automatically self-close again.

M. Obstruction Sensing Safety Edge: The obstruction sensing safety edge shall be programable to either stop or reverse upon coming in contact with an obstruction during the close cycle of the door. The obstruction sensing safety edge shall remain active and operable as long as there is no main power failure to the motor operator. During main power failure, if the obstruction sensing safety edge comes in contact with an obstruction during the self-closing mode, the door shall stop and remain in contact with the obstruction until it is removed and the door can continue to the fully closed position.

N. True Test Panel: Tornado and hurricane storm doors shall be provided with a True Test panel. The test panel shall be designed so that it simulates an actual emergency alarm condition and activates all of the doors to self-close to the fully closed position. Once all of the doors have satisfactorily closed and the test panel has been reset, all of the doors shall automatically power themselves back to the fully open and alarm ready reset condition. Only one test panel shall be required to test all the tornado and hurricane storm doors on this project simultaneously.

O. Finish: After completion of fabrication, clean all metal surfaces to remove dirt and chemically treat to provide for powder coat adhesion. Provide powder coat finish of color as selected by architect from manufacturer's standard RAL powder coat selection chart.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces and field conditions to which this work is to be performed and notify architect if conditions of surfaces exist which are detrimental to proper installation and timely completion of work.

B. Verify all dimensions taken at job site affecting the work. Notify the architect in any instance where dimensions vary.

C. Coordinate and schedule work under this section with work of other sections so as not to delay job progress.

3.02 INSTALLATION

A. Perform installation using only factory approved and certified representatives of the coiling door manufacturer.

B. Install coiling door assemblies at locations shown in perfect alignment and elevation, plumb, level, straight and true.

C. Adjust coiling door installation to provide uniform clearances and smooth non-binding operation.

D. Install wiring in accordance with applicable local codes and the National Electrical Code Standard. Materials shall be UL listed.

3.03 PROTECTION AND CLEANING

A. Protect installed work using adequate and suitable means during and after installation until accepted by owner.

B. Remove, repair or replace materials which have been damaged in any way.

C. Clean surfaces of grime and dirt using acceptable and recommended means and methods.