

## SECTION 08330

### SmokeShield® UL CLASSIFIED SMOKE AND DRAFT CONTROL DOOR

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, 1995 EDITION).

THIS SECTION ASSUMES THE PROJECT MANUAL WILL CONTAIN COMPLETE DIVISION 1 DOCUMENTS INCLUDING SECTIONS 01330 SUBMITTAL PROCEDURES, 01620 PRODUCT OPTIONS, 01630 PRODUCT SUBSTITUTION PROCEDURES, 01660 PRODUCT STORAGE AND HANDLING REQUIREMENTS, 01770 CLOSEOUT PROCEDURES, AND 01780 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, E.G.: \_\_\_\_\_.

OPTIONAL PARAGRAPHS ARE SEPARATED BY A REDLINED "OR," E.G.:

OR

## PART 1 GENERAL

### 1.1 SUMMARY

- A. Section Includes: [Manual] [and] [electric operated] automatic closing rolling SmokeShield UL listed leakage rated assembly.
- B. Related Sections:
  - 1. 05500 Metal Fabrications. Door opening jamb and head members.
  - 2. 06100 Rough Carpentry. Door opening jamb and head members.
  - 3. 08310 Access Doors and Panels. Access doors.
  - 4. 08700 Hardware. Padlocks. Masterkeyed cylinder.
  - 5. 09910 Paints. Field painting.
  - 6. Division 16. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.
- C. Products That May Be Supplied, But Are Not Installed Under This Section:

1. Control station.
2. Smoke/heat detectors.
3. Annunciator.

INCLUDE APPROPRIATE LANGUAGE BELOW, INCLUDING A REFERENCE TO SECTION 01230 ALTERNATES, IF ROLLING SMOKESHIELD UL LISTED LEAKAGE RATED ASSEMBLIES ARE INCLUDED IN ANY ALTERNATES, ADD SECTION 01230 TO 1.1 B. DELETE IF NO ALTERNATES.

D. Alternates:

## 1.2 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Provide doors with Underwriters' Laboratories, Inc. label for "Leakage Rated Assembly" or "S" label.
  - a. Comply with NFPA 105 air leakage requirements.
  - b. Pass UL test procedure 1784.
2. Provide doors with Underwriters' Laboratories, Inc. label for the fire rating classification, [3 hr] [1 ½ hr] [1 hr] [3/4 hr].

## 1.3 SUBMITTALS

A. Reference Section 01330 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. Quality Assurance/Control Submittals:
  - a. Provide proof of manufacturer ISO 9001:2000 registration.
  - b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
  - c. Provide manufacturer's installation instructions.
4. Closeout Submittals:
  - a. Operation and Maintenance Manual.
  - b. Certificate stating that installed materials comply with this specification.

## 1.4 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: ISO 9001:2000 registered and a minimum of five years experience in producing smoke and fire control doors of the type specified.
2. Installer Qualifications: Manufacturer's approval.

## 1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01660 - 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.

**PART 2 PRODUCTS**

**2.1 MANUFACTURER**

- A. Manufacturer: Cornell Iron Works, Inc., Crestwood Industrial Park, Mountaintop, PA 18707. Telephone: (800) 233-8366, Fax: (800) 526-0841. Underwriters Laboratories, Inc. (UL), ISO 9001:2000 Registered.

INSERT NAME, ADDRESS, AND PHONE NUMBERS OF LOCAL DISTRIBUTOR BELOW.

- 1. Distributor:

- B. Model: ERC11

- C. Substitutions: Reference Section 01630 Product Substitution Procedures.

**2.2 MATERIALS**

- A. Curtain:

- 1. Slats: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, 22 gauge ASTM A 653, Commercial Quality, galvanized steel with plain steel bottom bar and UL tested vinyl smoke sealing astragal.

OR

- 1. Slats: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, 22 gauge AISI type 304 series stainless steel with stainless steel bottom bar and UL tested vinyl smoke sealing astragal.
- 2. Fabricate continuous interlocking slat sections with high strength galvanized steel endlocks riveted to slats per UL requirements.
- 3. Slat Finish:
  - a. GalvaNex™ Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex™ produces a superior finish against corrosion and abrasion. GalvaNex™ components include a limited two year finish warranty.

OR

- a. GalvaNex™ Coating System and phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

OR

- a. Stainless Steel: No. 4 finish.
- 4. Bottom Bar Finish:

- a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: Phosphate treatment followed by a corrosion inhibitive baked-on zinc-rich gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: ASTM A 123, Grade 85 zinc coating, hot-dip galvanized.

OR

- a. Steel: Phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

OR

- a. Stainless Steel: No. 4 finish.

B. Guides:

- 1. Steel: 12 gauge formed shapes.

OR

- 1. Stainless Steel: 12 gauge formed shapes.

- 2. Finish:

- a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: Phosphate treatment followed by a corrosion inhibitive baked-on zinc-rich gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: ASTM A 123, Grade 85 zinc coating, hot-dip galvanized.

OR

- a. Steel: Phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

OR

- a. Stainless Steel: No. 4 finish.

C. 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 to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

D. Brackets: Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.

- 1. Finish:

- a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: Phosphate treatment followed by a corrosion inhibitive baked-on zinc-rich gray polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

OR

- a. Steel: ASTM A 123, Grade 85 zinc coating, hot-dip galvanized.

OR

- a. Steel: Phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

- E. Hood and mechanism covers: [24 gauge galvanized steel] [24 gauge stainless steel] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

- 1. Finish:

- a. GalvaNex™ Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex™ produces a superior finish against corrosion and abrasion. GalvaNex™ components include a limited two year finish warranty.

OR

- a. GalvaNex™ Coating System and phosphate treatment followed by baked-on polyester powder coat, [color as selected by Architect from manufacturer's standard color range, minimum 32 colors] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

OR

- a. Stainless steel: No. 4 finish

- F. Smoke Seals:

- 1. [Bottom Bar: UL Tested PVC double bulb seal.] [Bottom Bar Motor Operated Units: Combination smoke seal/sensing edge.]
- 2. Guides and Head: Replaceable, UL Listed, nylon pile smoke seals sealing against fascia side of curtain.

## 2.3 ACCESSORIES

STANDARD LOCKING METHODS ARE LISTED BELOW.

- A. Locking:

- 1. [Manual Push-Up] [Manual Crank Hoist]: Padlockable slide bolt on coil side of bottom bar at each jamb extending into slots in guides.

OR

AVAILABLE LOCKING OPTIONS ON ALL ROLLING SMOKESHIELD UL LISTED LEAKAGE RATED ASSEMBLIES. CONSULT CORNELL ENGINEERING SERVICES (800) 233-8366 EXT. 551 OR 641 FOR OTHER OPTIONS.

1. Padlockable slide bolt on coil side of bottom bar at each jamb extending into slots in guides. [Provide interlock switches on motor operated units.]

OR

1. Masterkeyable cylinder operable from [coil] [fascia] [both] side[s] of bottom bar. [Provide interlock switches on motor operated units.]

PLASTIC LAMINATE COUNTERTOPS ARE AVAILABLE FOR OPENINGS UP TO 15'-0" (4.57 M) WIDE. 12" (305 mm) MINIMUM SILL DEPTH; 36" (914 mm) MAXIMUM SILL DEPTH.

- B. Countertop: 1 ½ Hour UL Labeled, 1-5/8" (41 mm) thick, plastic laminate covered, size and configuration made for opening size and wall construction. Color as selected by Architect from standard range of Wilson Art, Nevamar, Formica or Pionite plastic laminates.

OR

STAINLESS STEEL COUNTERTOPS ARE AVAILABLE FOR OPENINGS UP TO 11'-2" (3.40 M) WIDE AND FOR WALLS UP TO 12" (305 MM) THICK. SILL DEPTH EQUALS WALL THICKNESS PLUS 7 ½" (190.5 mm).

- B. Countertop: 1 ½ Hour UL Labeled, 2" (51 mm) thick, 14 gauge #4 finish stainless steel. ["T" shaped design for face of wall mounted unit] [Rectangular shape design for between jambs mounted unit] of size and configuration for opening size and wall construction.

- C. [Photoelectric Smoke/Heat Detector] [Ionization Smoke Detector]: UL listed.

FIRE EMERGENCY ANNUNCIATORS ARE AVAILABLE FOR USE WITH A M100 SERIES FDCL MOTOR OPERATOR AND SS90 SERIES RELEASE DEVICES. SOUNDER/STROBE AVAILABLE WITH FDCL OPERATOR AND ALL SS90 SERIES DEVICES; VOICE WARNING MODULE AVAILABLE WITH TYPE B2 AND SS90C SYSTEM ONLY. COORDINATE WITH SECTIONS 2.4-A & 2.4-C, DELETE IF NOT DESIRED.

- D. Fire Emergency Annunciator: [Provide ADA compliant sounder/strobe] [Provide Voice warning Module] fire emergency annunciator to give advanced warning that the fire door is about to close. Warning signal to activate upon alarm signal.

EXPOSED MOVING OPERATOR COMPONENTS LOWER THAN 8 FEET ABOVE FLOOR LEVEL THAT CREATE POSSIBLE PINCH POINTS ARE REQUIRED TO BE COVERED PER UL 325. SPECIFY AN OPERATOR COVER WHENEVER THIS FIELD CONDITION EXISTS.

- E. Operator [and Full Bracket Mechanism] Cover: Provide [24 gauge galvanized steel] [24 gauge stainless steel] sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood.

## 2.4 OPERATION

- A. M100 Series Motor Operated: Model FS, UL listed and FM approved, NEMA 1 enclosure rating, horsepower as recommended by manufacturer, [115v single] [230v single] [208/230v three] [460v three] phase service. Provide open drip-proof motor, removable without affecting setting of limit switches; UL listed thermal overload protection; solenoid brake; planetary reduction gearing and rotary limit switches; transformer with 24 v control secondary; and all integral electrical components prewired to terminal blocks.

Automatic closure shall be activated by fusible link [or a local smoke/fire detector] [or a central smoke/fire alarm system]. Doors shall not require a releasing device when activated by an alarm signal.

Doors shall maintain an average closing speed of not more than 9" (229 mm) per second during automatic closing. When automatic closure is activated, electric sensing edge and push button are inoperable.

Doors shall be fail-safe and close upon power failure.

Resetting of spring tension or mechanical dropouts shall not be required. Upon restoration of power, replacement of fusible link or clearing of the alarm signal, doors shall immediately reset by opening with the push button.

OR

- A. M100 Series Motor Operated: Model FDCL, UL listed and FM approved, NEMA 1 enclosure rating, ½ horsepower operator, [115v single] [230v single] [208/230v three] [460v three] phase service. Provide open drip-proof motor, removable without affecting setting of limit switches; UL listed thermal overload protection; electromagnetic disc brake; spurgear / sprocket and chain reduction gearing and rotary limit switches; transformer with 24 v control secondary; and all integral electrical components prewired to terminal blocks.

Automatic closure shall be activated by [electric thermal sensors] [fusible link] [or a local smoke/fire detector] [or a central smoke/fire alarm system]. Doors shall not require a releasing device when activated by an alarm signal.

Doors shall maintain an average closing speed of not more than 9" (229 mm) per second during automatic closing.

Operator shall have an internal battery backup that prevents failsafe closing for at least two hours after power outage. Battery backup system shall monitor fusible link and alarm signals and initiate automatic closing upon any alarm.

Electric sensing edge on door curtain shall be operable during all methods of closing including closing during a power outage. When closing during a power outage, the sensing edge shall stop door travel when an obstruction is encountered and hold the door for two seconds before releasing the door to close again.

Each operator shall be provided with a key test station to test automatic closing of the fire door. Key test station shall also include a low battery indicator.

Resetting of spring tension or mechanical dropouts shall not be required. Upon restoration of power, replacement of fusible link or clearing of the alarm signal, doors shall immediately reset by opening with the push button.

OR

- A. Manual M100 Crank Hoist: Provide combination crank / controlled closing system operator including removable hand crank, geared reduction unit and a combination close operation / automatic drop test cable located at floor level. Integral to the unit is a locking mechanism to hold the door at any position of travel during normal door operation mode and a governor to control automatic closing speed.

Automatic closure shall be activated by fusible link [or a local smoke/fire detector by means of a fail-safe releasing device] [or a central smoke/fire alarm system by means of a fail-safe releasing device].

Doors shall maintain an average closing speed of not more than 9" (229 mm) per second during normal and automatic closing.

Resetting of spring tension or mechanical dropouts shall not be required.

OR

- A. Manual M100 Chain Hoist: Provide combination chain / controlled closing system operator including endless steel chain, geared reduction unit, chain keeper and a combination close operation / automatic drop test cable located at floor level. Integral to the unit is a locking mechanism to hold the door at any position of travel during normal door operation mode and a governor to control automatic closing speed. Automatic closure shall be activated by fusible link [or a local smoke/fire detector by means of a fail-safe releasing device] [or a central smoke/fire alarm system by means of a fail-safe releasing device]. Doors shall maintain an average closing speed of not more than 9" (229 mm) per second during normal and automatic closing. Resetting of spring tension or mechanical dropouts shall not be required.

OR

- A. Manual Push-Up with Conventional Spring Release System: Provide lift handles on bottom bar and pole with hook. Automatic closure shall be activated by fusible link [or a local smoke/fire detector by means of a fail-safe releasing device] [or a central smoke/fire alarm system by means of a fail-safe releasing device]. Doors shall maintain an average closing speed of not less than 6" (152 mm) nor more than 24" (610 mm) per second during automatic closing per NFPA 80. Resetting of spring tension and mechanical dropouts by a trained door systems technician is required.

MOST COMMON CONTROL STATIONS FOR MOTORIZED COUNTER FIRE DOORS ARE LISTED BELOW; CONSULT CORNELL ENGINEERING SERVICES (800) 233-8366 EXT. 551 OR 641 FOR OTHER OPTIONS. DELETE IF MANUALLY OPERATED.

1. Control Station: Surface mounted, "Open/Close/Stop" push buttons; NEMA 1.

OR

1. Control Station: Flush mounted, "Open/Close/Stop" push buttons; NEMA 1B.

OR

1. Control Station: Surface mounted, "Open/Close" key switch with "Stop" push button; NEMA 1.

OR

1. Control Station: Flush mounted, "Open/Close" key switch with "Stop" push button; NEMA 1B.

SMOKE SEAL/SENSING EDGE IS REQUIRED WITH M100 MOTOR OPERATOR SYSTEMS. COORDINATE WITH 2.2F. DELETE IF MANUALLY OPERATED.

- B. Smoke Seal/Sensing Edge: Provide automatic [reversing] [stop] control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.

WIRELESS SENSING EDGE CONNECTION UTILIZES AN EMBEDDED RESISTOR WITHIN AN ELECTRIC SENSING EDGE TO PROVIDE A FULLY SELF-MONITORING EDGE SYSTEM.

1. Provide an electric sensing edge device. Contact before door fully closes shall cause door to immediately [stop downward travel and reverse direction to the fully opened position] [stop downward travel]. Provide a self-monitoring wireless sensing edge connection to motor operator eliminating the need for a physical travelling electric cord connection between bottom bar sensing edge device and motor operator. Supervised system alters normal door operation preventing damage, injury or death due to an inoperable sensing edge system.

OR

1. Provide an electric sensing edge device. Contact before door fully closes shall cause door to immediately [stop downward travel and reverse direction to the fully opened position] [stop downward travel]. Provide [self-coiling cable] [retracting safety cord and reel] connection to control circuit.

C. Automatic Closing and Speed Governor Mechanism:

FOLLOWING OPTION IS FOR MOTOR OPERATED DOORS ONLY. BOTTOM BAR SENSING EDGE (2.2 F. AND 2.4 B.) IS REQUIRED.

1. M100 FireGard™ Motor Operated System:
  - a. Activation: [Central alarm system] [Local smoke and heat detectors] or power outage or melting of fusible link.
  - b. Operation: Motor operator shall close door upon signal from [central alarm system] [local smoke and heat detectors], power outage or melting of fusible link.
  - c. Closing Speed: Not more than 9 inches (229 mm) per second.
  - d. Reset Procedure: Operation of control station after alarm is cleared or power is restored or replace fusible link; resetting of spring tension or mechanical dropouts shall not be required.

OR

1. M100 FireGard™ [Crank] [Chain] System:
  - a. Activation: Melting of fusible link or use of combination close operation / automatic drop test cable located at floor level [or alarm signal with use of a [SS90-B2][SS90-B] series release device].
  - b. Operation: Hand [crank] [chain] operated for normal use. When automatic closing is activated, integral brake and [crank] [chain] operator shall disengage. Integral governor controls closing speed.
  - c. Average Closing Speed: Not more than 9 inches (229 mm) per second.
  - d. Reset Procedure: Resetting of spring tension or mechanical dropouts shall not be required. If tested by activating automatic drop test cable, reset by releasing drop test cable. If activated by a release device, re-insert chain end link into release device. If tested by melting / cutting of fusible link, replace fusible link.

OR

1. Fusible Link with SS90-B2 Release Device – Manual Push-Up Operation:

- a. Activation: [Central alarm system] [Local smoke and heat detectors] or power outage in excess of 72 hours or melting of fusible link.
- b. Average Closing Speed: Not less than 6 inches (152 mm) nor more than 24 inches (610 mm) per second.
- c. Reset Procedure: Reset spring tension and mechanical dropouts; reset SS90B2 or replace fusible link.

OR

1. Fusible Link with SS90-B Release Device – Manual Push-Up Operation:
  - a. Activation: [Central alarm system] [Local smoke and heat detectors] or power outage in excess of 10 seconds or melting of fusible link.
  - b. Average Closing Speed: Not less than 6 inches (152 mm) nor more than 24 inches (610 mm) per second.
  - c. Reset Procedure: Reset spring tension and mechanical dropouts; reset SS90B or replace fusible link.

OR

1. Fusible Link – Manual Push-Up Operation:
  - a. Activation: Melting of fusible link.
  - b. Average Closing Speed: Not less than 6 inches (152 mm) nor more than 24 inches (610 mm) per second.
  - c. Reset Procedure: Reset spring tension and mechanical dropouts; replace fusible link.

## **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**

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Comply with NFPA 80 and NFPA 105 and follow manufacturer's installation instructions.

### **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. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

### 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 to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION