

## SECTION 08 35 13.23 – ACCORDION-FOLDING FIRE ACCESS-CONTROL DOORS

### PART 1 – GENERAL

#### 1.01 SUMMARY OF WORK

- A. Division 0 and 1, as indexed, apply to this section.
- B. Furnish and install all horizontal-sliding accordion-folding fire access-control doors shown on the drawings and specified herein.

#### 1.02 RELATED SECTIONS

- A. All headers, support structures, fire protection of support structures, surrounding insulation, jambs, storage pockets, blocking and trim shall be furnished and installed by other sections.
- B. All electrical wire, wiring, conduit and electrical boxes shall be furnished and installed by electrical section including connections to smoke detectors and building fire and access control alarm panels.
- C. Drilling/placement of anchorage points into pre or post tensioned decks, welding/punching/drilling steel members and all drywall work by other sections.
- D. **OPTION:** All track, soffit, chain guide and striker shall be painted by Section 09 90 00. Color shall be selected by the architect.
- E. **OPTION:** *If Section 2.03 G, Remote Access Control and Monitoring by a BMS is selected as an option, the following paragraph should be included:* For remote access control and monitoring the doors via BMS, a MODBUS compatible port will be provided by Won-Door. For additional programming and wiring requirements, consult the Won-Door factory.
- F. **OPTION:** *If Section 2.03 H, Remote Access Control for Security Doors with no monitoring, is selected as an option, the following paragraph should be included:* Interface to the doors is to be accomplished by use of a LOK Module (and a remote line interface if required) A twisted pair of stranded 18 gauge copper conductors is to be provided between the LOK Module at the door location and the control device (or from the LOK module to the remote line interface (5,000' max. wire length) when required). Wiring from the remote line interface (RLI) to the control device shall be stranded 18 gauge copper conductors (20' max. distance from control device).
- G. **OPTION:** *If Section 2.03 J Remote Monitoring via BMS and Access Control via control device for Security Doors is selected as an option, the following paragraph should be included:* For remote monitoring the doors via BMS, a MODBUS compatible port will be provided by Won-Door. Interface to the doors is to be accomplished by use of a LOK Module (and a remote line interface if required). A twisted pair of stranded 18 gauge copper conductors is to be provided between the LOK Module at the door location and the control device (or from the LOK module to the remote line interface (5,000' max. wire length) when required). Wiring from the remote line interface (RLI) to the control device shall be stranded 18 gauge copper conductors (20' max. distance from control device).
- H. **OPTION:** *If Section 2.03H and 2.03M, Remote Access Control and Remote Monitoring via control device for Security Doors is selected, the following paragraph should be included:* Interface to the doors is to be accomplished by use of a LOK Module (and a remote line interface if required). A twisted pair of stranded 18 gauge copper conductors is to be

provided between the LOK Module at the door location and the control device (or from the LOK module to the remote line interface (5,000' max. wire length) when required). Wiring from the remote line interface (RLI) to the control device shall be stranded 18 gauge copper conductors (20' max. distance from control device). Monitoring the doors shall include form C dry contact relays for supervisory, trouble, door status, and alarm condition in the Won-Door controller. For additional output signal requirements, an XRM (Auxiliary Relay Module) will be included. A twisted pair of stranded 18 gauge copper conductors for each output is required from the Won-Door controller to the monitoring device location.

- I. **OPTION:** *If Section 2.03 O, Individual LCD Door Status Display, is selected as an option, the following paragraph should be included:* Wiring for Individual LCD Door Status Display at fire door-One (1) modular telephonic connector, 6 position 4 or 6 contact (USOC RJ14-6P4C or -6P6C) jack shall be supplied at the back of the storage pocket and tied to the 4 square junction box adjacent to the door with CAT 5 cable. The junction box, modular jack and wire shall be furnished and installed by the electrical section. Termination to the LCD panel shall be by punch down block (IDC) and shall be by the electrical section as per the manufacturer's instructions.

### 1.03 QUALITY ASSURANCE

- A. Installation shall be performed by factory trained and certified installers with a minimum of three years' experience installing electrically operated accordion folding fire doors.
- B. Fire doors shall be listed by Underwriters Laboratories for ratings as indicated, when tested in accordance with the requirements of UL 10B and NFPA 252.
- C. Automatic closing system shall be listed by Underwriters Laboratories in accordance with the requirements of UL 864 and UL 294, and in compliance with NFPA 80.
- D. Fire doors used for smoke and draft control shall bear the "S" mark on the fire door UL label and shall have an air leakage of less than 3 CFM/ft<sup>2</sup> at 0.1 inch of water column pressure when tested in accordance with UL 1784 with an artificial bottom seal.
- E. Fire doors used at the point of access to an elevator or elevator lobbies used by fire service personnel for evacuations shall bear the "S" mark on the UL fire door label and shall have an air leakage of less than 3 CFM/ft<sup>2</sup> at 0.1 inch of water column pressure when tested in accordance with UL 1784 without an artificial bottom seal.
- F. Fire Doors shall be capable of resisting an air pressure differential up to 0.05 inches of water column. Optional air pressure resistance up to 0.15 inches of water column available. (See paragraph 2.03 F)

### 1.04 SUBMITTALS

- A. See Section 01 30 00 – Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's technical literature, include UL listing data.
- C. Shop Drawings: Indicate construction and installation details and dimensions, including layout, electrical requirements, required stack depth, height of header above finished floor, and requirements for anchorage and support of each door.
- D. Operation and Maintenance Data: Operating procedures, troubleshooting and repair methods, and wiring diagrams.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Manufacturer's agent will deliver original, unopened packages to a location designated by the General Contractor. All packages must be stored indoors, protected from moisture damage and secure from theft or other damage. General Contractor to note any damage or shortages at time of delivery.

## 1.06 COORDINATION BY GENERAL CONTRACTOR

- A. Coordinate with the following:
  - 1. Fire Alarm system.
  - 2. Electrical.
  - 3. Access Control wiring.
  - 4. Pocket cover doors (if required).
  - 5. Floor and ceiling finish.
- B. Assure accurate installation of header, jamb, and trim. Provide "As-Built" dimensions for opening and storage pocket. Supervise unloading and handling of materials.
- C. Store boxes flat (not more than three high) in a protected dry area.
- D. Permanent power shall be in-place and ready for final connection when fire and access control doors are installed. Assure access to and proper clearance for motor operators.
- E. After testing the fire alarm system, automatic-closing fire doors shall be re-set to the original position. Access control doors shall be re-set after being tested for proper security application.

## 1.07 WARRANTY

- A. Materials and installation shall be warranted against defects in workmanship for a period of one (1) year from the date of substantial completion.

## PART 2 – PRODUCTS

### 2.01 MANUFACTURERS

- A. Horizontal-sliding, accordion-folding, fire, access-control doors as manufactured by Won-Door Corporation shall be specified as one the following:
  - 1. **Fire Only:** Won-Door FG \_\_\_\_ (select one: 20, 60, 90, 180; S, CS, E, TR or MFW – number designates minutes of fire rating, E for point of access to an elevator). (Note: "TR" for temperature rise of not more than 450 °F above ambient at 30 minutes. "MFW" for moveable firewall applications requiring UL 263 or ASTM E-119 compliance with maximum 2 hour rating. When specifying "TR" or "MFW" doors, contact the manufacturer for pocket depths, hanging weight and size limitations.)
  - 2. **Fire and Access Control:** Won-Door AFG \_\_\_\_ (select one: 20, 60, 90, 180; S, CS or E – the pre-fix "A" indicates access control, the number designates minutes of fire rating, E for point of access to an elevator. TR and MFW not available with Security option).
  - 3. **Access Control Only:** Won-Door AFG (with no number designated for fire rating.)
- B. No substitutions allowed.

## 2.02 ACCORDION FIRE DOORS – GENERAL

- A. Provide electrically powered self-closing fire doors of configurations indicated on the drawings.
  - 1. Fire rating as required.
- B. Fire Rating – Fire doors shall be listed by Underwriters Laboratory as special purpose fire doors having a (*select one: 20, 60, 90, 180*) minute fire protection rating in accordance with the requirements of UL 10B and NFPA 252.
- C. Closing and Opening Operation: Automatic Closing System, listed to UL864 and UL294 including motor operator and releasing devices shall be a Microprocessor-based system and shall commence closing upon activation by fire signal, access control signal, low battery voltage or optional low AC voltage.
  - 1. Obstruction Detection: Contact with an obstruction shall cause the door to stop, reverse enough to remove pressure on the leading edge, pause, and then re-close when in an alarm condition.
  - 2. Constant pressure to the leading edge while not under motor power shall prevent motor operation and allow the door to be opened manually.
- D. Exit Device Operation: Provide an exit device on one or both sides of door.
  - 1. In emergency mode, a slight pressure on the exit device will cause the door to open a minimum of 32 inches, pause for 3 seconds, and then automatically close.
  - 2. The open distance shall be field programmable, up to the entire opening width.
  - 3. The pause before re-close shall be field programmable up to 30 seconds.
  - 4. The exit device shall have the ability when not in the emergency (fire) mode to be used to open the door and move it back into the storage pocket.

## 2.03 COMPONENTS

- A. Door Construction: Two parallel, accordion-type walls independently suspended with no floor tracks or pantographs.
  - 1. Panels: 24 gauge steel, V-grooved; modular in design; capable of in-place repair.
  - 2. Perimeter Seals: shall consist of continuous extruded sweeps attached to the top and bottom of the fire door to form a smoke and draft seal.
  - 3. Hanging Weight: 5.5 pounds per sq. ft. (6.5 pounds for temperature rise and moveable firewall doors) when extended across opening.
  - 4. Finish: All steel panels shall have factory-applied protective coatings.
  - 5. Color: Manufacturer's standard platinum.
- B. Suspension System: Two tracks, on 8 - 10 inch centers, attached to overhead structural support.
  - 1. Tracks: minimum 0.125 aluminum extrusion or 14 gauge cold rolled steel.
  - 2. Panel Hangers: Panels shall be suspended by a steel hanger pin and ball bearing roller system.

3. Narrow Lead Post Hangers: 8 wheel ball bearing trolley.
- C. Power source shall be: 120 – 240 volt AC input. System operation voltage shall be dual sourced from DC power supply and backup battery.
- D. Automatic Closing System shall be listed to UL864 and UL294 including capability to send and receive signals from the Fire Control Panel and/or Access Control System, and shall consist of the following:
1. Microprocessor based Electronic Control box with the ability to:
    - a. Monitor dual power sources continually for peak performance including:
      - 1) Detect a missing battery, bad battery, or low battery condition.
      - 2) Detect if the charging circuit is bad.
      - 3) Detect fuse failures.
      - 4) Detect high or low AC conditions.
    - b. Monitor the health of the drive train.
    - c. Monitor inputs including faults associated with: door block, exit device, patron hardware, and key switches.
    - d. Run a “watch dog” monitoring circuit which will force a software restart in the event the software hangs, including tracking the number of resets that occur for diagnostic purposes.
    - e. Withstand aberrant voltages up to 120 volts AC on the fire alarm input circuit without damage including the ability to indicate that the alarm circuit has not been wired as a dry contact, “no voltage” circuit when errant voltages are applied to the circuit.
    - f. Communicate with other microprocessors on the system via an internal bus system.
    - g. Indicate faults or supervised information both locally and at a remote location.
  2. Motor Operator Assembly including a DC gear-motor, drive sprocket, clutch, and position sensors. The motor shall drive the door by means of a chain. Standard motor drive speeds range from 6”-10” per second.
    - a. High speed motor operation up to 24” per second is available for Access Control Doors and conditions requiring high occupant load egress.
  3. Leading Edge shall be pressure sensitive such that contact with an obstruction shall cause the door to stop, pause for a minimum of 3 seconds, then re-close when in alarm mode.
  4. Exit Device will be located on the egress side(s) of each door.
- E. The header shall be provided as an integrated part of the door assembly and shall include track, threaded rods and mechanical attachment hardware.
- F. **OPTION:** Air Pressure Resistance. When an air pressure differential is present at the door location, the door shall be capable of resisting an air pressure differential between 0.05 - 0.15 inches water column and maintain normal operation. For air pressure differentials of 0.05 to 0.1, anti-sway brackets shall be placed interior to the door approximately every five

(5) feet or less and lead post outriggers shall be provided; for air pressure differentials of 0.1 to 0.15, a self-leveling lead post assembly shall provide motorized tracking of the leading edge of the door to assure proper closure. *(NOTE: edit above selections depending on level of pressure differential expected)*

- G. **OPTION:** Remote access control and monitoring is accomplished via the building management system by connecting to the supplied MODBUS enabled port. The control programming is to be provided by the Access Control Section.
- H. **OPTION:** Remote Access Control.
  - 1. **LOK Module Inputs:** With approval from and under the direction of the local authority having jurisdiction, a locking interface to the fire/access control doors shall be accomplished using a Won-Door Corporation supplied LOK Module. Said module shall have local, unsupervised inputs for Lock/Unlock, Panic Lock, Key Close, Key Open, Patron Devices (PAT), Tamper, and Tamper Clear. Local shall mean circuits that are in the near vicinity, within 20 feet, of the LOK module. Use or non-use of each of the inputs is at the discretion of the end user as directed by the AHJ. These inputs shall be dry, no voltage contacts as follows:
    - a. **LOCK/UNLOCK** – When the circuit is open the door shall be open and unlocked. When the circuit is closed the door shall be closed and locked. Locked shall mean that only credentialed inputs will open the door. The open circuit – open door, closed circuit – locked door shall be capable of being switched to open circuit – locked door, closed circuit – open door via a hardware jumper.
    - b. **PANIC LOCK** – When this circuit labeled “PANIC” is held closed, the door shall lock and shall ignore the patron input from the LOK Module until this circuit is restored to normal operation. While the circuit is in the panic state credentialed inputs from other sources besides the LOK module shall be accepted. This input shall be capable of activating on an open circuit instead of a closed circuit by installing a jumper across the NC jumper contacts. Once the circuit is restored to normal operation, the first activation of the LOK module patron input (PAT) or any other PAT input shall reset the door out of PANIC and cause the door to open.
    - c. **Key Close** – When this circuit closes it shall cause an open door to start closing, an opening door to stop, and if held for 3 seconds the door to reset from fire or panic incidents if the underlying inputs (Fire and/or panic) have been previously released.
    - d. **Key Open** – When this circuit closes it shall cause a closed door to start opening and a closing door to stop.
    - e. **PAT (Patron Device)** – When this circuit is closed it shall cause the locked door to open to a field programmable distance. It shall hold at that location until the circuit opens after which it shall delay a field programmable duration from 3 to 30 seconds and then cause the door to re-close. If the door is closed but not locked it shall open to the programmed distance but not re-close.
    - f. **TAMPER** – This circuit shall be a normally closed circuit that when opened causes the TAMPER FAULT to occur as described in the UL 294 Access Control Standard.

- g. **CLEAR** – This circuit when held closed for five seconds shall clear the tamper alarm provided it is being asserted at least 2 minutes after the TAMPER circuit has been restored to normal operation.
- 2. **LOK Module Outputs:** The module shall be capable of having two outputs: Horn and LED. The devices these outputs drive shall be supplied by others.
  - a. The HORN output shall be on if the TAMPER circuit is opened or if the door is moving and the “Beep if Moving” option has been field programmed. This circuit shall drive devices or relays at 10 volts DC and 200 milliamps.
  - b. The LED output shall be on if the lock input is active and off if the lock input is inactive (unlocked). It shall flash off and on if the PANIC input is active. This circuit provides 3.3 volts DC and 30 milliamps.

If the wiring from the control device to the LOK module exceed 20’ wire length, use of the supervised Remote Line Interface (RLI) will be required.

- 3. **Remote Line Interface:** The module shall be capable of having remote inputs for Lock/Unlock, Patron Devices (PAT) and Reset and shall be within 5,000 feet of the LOK module. The lines between the LOK module and the RLI shall be fully supervised for line shorts, open lines, and lines shorted to ground. The Lock/Unlock and PAT inputs shall behave the same as the local inputs of the same name with the exception that the RLI PAT input is not ignored when the PANIC input has been asserted. The RESET input shall be capable of restoring the door to normal operation from the PANIC and FIRE modes provided the cause for the PANIC and/or FIRE condition has been restored to normal. The RLI inputs can activate with dry contacts or they can be driven by voltages between 12-24 DC volts. Each circuit has a separate selector switch for the dry contact vs voltage style inputs.
- J. **OPTION:** Remote Monitoring via BMS and Access Control via control device. For remote monitoring the doors via BMS, a MODBUS compatible port will be provided by Won-Door. For additional programming and wiring requirements, consult the Won-Door factory. For access control, see OPTION H above.
- K. **OPTION:** A Key Switch shall be provided, (In place of the momentary rocker switch located on the door), located as directed by the Architect. (Note: The key switch or approved activation device is required with doors equipped with Access Control option).
- L. **OPTION:** An activation device (*card reader, thumb print scanner, etc.*) by others shall be provided on either side of the door to provide door operation in Access Control mode in lieu of the key switch.
- M. **OPTION:** Remote Monitoring. Monitoring the doors shall include normally open dry contact relays for supervisory, trouble, door status, and alarm condition in the Won-Door controller. If additional outputs are required to monitor the door, an additional auxiliary relay module (XRM) shall be provided with two additional relays to indicate specific status and fault conditions including any two of the following: Open, Opening, Closed, Closing, Stopped, Locked, Exit Device Access, Secure Access, Forced Entry, TLS Failure, Key Switch Failures, Stuck switches, Power Failures, Communication Errors.

- N. **OPTION:** Vision Panel (*Shall be provided on cross corridor applications in Health care facilities*) consisting of a frame and clear glass assembly with listings from Underwriters Laboratory.
- O. **OPTION:** An Individual LCD Door Status Display panel shall be provided adjacent to the door to indicate in the English language the status of the door, i.e. door position and trouble conditions. It shall have a port that allows easy access to a diagnostic tool for the purposes of field programming the door to customized settings. (*Note: Electrical requirements for the Individual LCD Door Status Display panel can be found in paragraph 1.02 I*)
- P. **OPTION:** An infrared light beam shall be provided to monitor the opening path. In the event that an object is placed in the path of the door for more than 3 minutes, the beam shall cause the door to sound an alarm indicating a path obstruction.

#### 2.04 RELATED CONSTRUCTION

- A. Track Support Construction: Provide supports attached to structure and mounting surface for track including drilling/placement of anchorage points into pre or post tensioned decks, welding/punching/drilling steel members, and all drywall work; comply with door manufacturer's instructions and recommendations.
- B. Pocket Construction: Provide rated pocket as specified for storage of accordion door when open; comply with door manufacturer's instructions and recommendations.
- C. Protection: Protect installed work from damage.

### PART 3 – EXECUTION

#### 3.01 EXAMINATION

- A. Verify that adjacent construction is suitable for installation of door.
- B. Verify that electrical utilities have been installed and are accessible.
- C. Verify that door opening is plumb and header is parallel with the finished floor.
- D. Verify clear opening dimensions.
- E. Notify Architect of any unacceptable conditions or varying dimensions.

#### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions, shop drawings and NFPA 80.
- B. Install fire doors plumb and parallel with the finished floor.
- C. Installation shall be performed by factory trained and certified installers with a minimum of three years' experience installing electrically operated accordion folding fire doors.

#### 3.03 ADJUSTING

- A. Adjust door installation to provide uniform clearances and smooth, quiet, non-binding operation.
- B. Test that all operations are functional and meet the requirements of local codes.

#### 3.04 CLEANING

- A. Clean surfaces using manufacturer's recommended means and methods.



3.05 STORAGE OF WASTE AND RECYCLING

- A. Store and recycle waste in accordance with Section 01 74 19 Construction Waste Management and Disposal.

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END OF SECTION