

ARCHITECTURAL SPECIFICATION TOURLOCK 180+90 SECURITY REVOLVING DOOR

 **BOON EDAM**

YOUR
ENTRY
EXPERTS.



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SECURITY REVOLVING DOORS

SECTION 08 42 33

PART I GENERAL

1.01 SECTION INCLUDES

- A. This section covers the furnishing and installation of a complete Automatic Security Revolving Door System. Provides a complete system that has been fabricated, assembled, and tested for proper operation at the factory.
- B. It includes curved side walls, canopy, ceiling, LED ceiling lights, door wings, hardware, glass, motor drive system, emergency collapsing mechanism, communication system, self-diagnostics tool, safety system and infrared sensor system as required for installation.

1.02 RELATED SECTIONS

- A. Section 07915 - Sealant, Caulking and Seals
- B. Section 08400 - Entrances and Storefronts
- C. Section 08710 - Door Hardware
- D. Section 08810 - Glass and Glazing
- E. Section 09600 - Flooring
- F. Section 16123 - Electrical Supply and Termination

1.03 REFERENCES

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials used in Buildings.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum
- C. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- E. ASTM A 480/A 480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
- F. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- G. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.04 QUALITY ASSURANCE

- A. Manufacturer shall be a company specializing in the supply of automatic security revolving doors with a minimum of 10 years' experience.
- B. Manufacturer shall supply a factory-trained supervisor during installation of the door.
- C. Manufacturer must provide for a local, factory-trained, field service technician to competently service the doors; and to provide for the local support of the customer's service technicians, in the event that the customer's trained technician is not available.

1.05 SUBMITTALS

- A. Submit project specific shop drawings, finish samples and Operating & Maintenance Manuals.
- B. Indicate pertinent dimensions, general construction, component connections and locations, anchorage methods and locations, hardware, and installation details.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job site in manufacturer's packaging undamaged, complete with installation instructions.
- B. Store off ground, under covered area, protected from weather and construction activities.

1.07 PROJECT/SITE CONDITIONS

- A. Revolving doors install on finished floor or optional Matwell ring.
- B. Floor must be dead level at any point within the footprint of the revolving door.

1.08 WARRANTY

Boon Edam warrants its products against defects in material and workmanship for a period of twelve (12) months from the date of shipment of the product. This warranty excludes glass breakage, normal wear on finishes or damage that occurs due to abuse, misuse or acts of God.

PART II – PRODUCTS

2.01 MANUFACTURER

Boon Edam, Inc., 402 McKinney Parkway, Lillington, NC 27546.

(910) 814-3800 Fax: (910) 814-3899 Homepage: www.boonedam.us

2.02 PRODUCT

Boon Edam Tourlock 180+90 Automatic Security Revolving Door models

Tested and certified to confirm with UL Standard 325 and 2593 and CSA22.2#247(Canada).

2.03 DOOR CONSTRUCTION

- A. **Side Walls and Canopy:** Shall have a standard inside diameter of 6'6" or 7'0" and be manufactured from six (6) extruded aluminum posts and (1) 12" (300mm) high canopy, and four (4) extruded aluminum bottom rails. Segmented sidewalls are not acceptable due to premature equipment failure, compromised security, excessive noise, and visual appearance.
- B. **Door Wings Narrow Stile:** Four (4) door wings as designed and manufactured of 1 5/8" x 2 5/8" narrow stile aluminum extrusions and reinforced with internal aluminum door corners for strength. Door wings must utilize removable horsehair weather stripping on three sides. Door wings must be capable of book-folding forward or backward allowing for emergency egress.
- C. **Door Wings Medium Stile (Optional):** Four (4) door wings as designed and manufactured of 1 3/4" x 3 1/2" medium stile aluminum extrusions and reinforced with internal aluminum door corners for strength. Door wings must utilize removable horsehair weather stripping on three sides. Door wings must be capable of book-folding forward or backward allowing for emergency egress.
- D. **Ceiling:** Shall be fabricated of formed aluminum sheet in a pie-shaped configuration. The ceiling system must fasten and secure each section in a secured position, and can only be removed by authorized personnel. Servicing of the doors and access to the controls must be from the floor position. Doors that require servicing access from the top are not acceptable.

2.04 EQUIPMENT

- A. **Drive System:** Overhead drive system with one 60 Watt AC motor attached to the internal structural framing. The door shall be powered by a 110 VAC, 1-phase service (240 VAC 1-phase option available as required). The motor shall utilize an internal angle encoder for constant monitoring of door position and a Frequency Controller to provide for the following characteristics:
 - 1. **Throughput:** Adjustment of rotation speed through a digital setting.
 - 2. **Throughput/Safety:** Constant regulation of rotation speed.
 - 3. **Starting/Safety:** Adjustment of startup and run torque through a digital setting to minimize force required to stop and alarm the door in the event of an obstruction.
 - 4. **Reversing/Safety:** Independent adjustment of reversing torque through a digital setting to minimize reversing force.
 - 5. **Stopping/Safety:** Adjustment of stopping distance through a digital setting.
 - 6. **Security:** Protected Security over Frequency Control settings.
- B. **Braking Assembly:** Positive braking and stopping shall be performed by DC dynamic braking incorporated within the drive system. Other auxiliary disc brakes are not considered to be equal. The brake unit is to provide the following characteristics:
 - 1. Adjustable braking force through digital setting
 - 2. Adjustable braking time through digital setting
- C. **Locking Assembly:** Shaft locking shall be performed by a Tourlock incorporated within the drive system. The locking unit is to provide the following characteristics:
 - 1. Remain locked at all times until unlocked by authorized signal from the access control device or emergency system.
 - 2. Lock immediately after a signal from IRS sensor system or other incorporated system.
- D. **Controls:** Microprocessor-based electronics utilizing a minimum Programmable Logic Controller (PLC) with the following characteristics:
 - 1. RAM & ROM memory
 - 2. Lithium battery backup
 - 3. Self-diagnostics for quick detection of problem source
 - 4. Visual display of problem source
- E. **Emergency Collapsing Mechanism:** Precision-engineered center shaft door hangers and disks that allow the door wings to be collapsed under pressure and stored in a book-fold position. Center shaft hangers and disks are finished in black and provide tension to hold the door wings in position when the center shaft electric locking is released. The door wings shall be capable of being collapsed outward under pressure on the outer stile not to exceed 130 pounds to meet NFPA code requirements. Overhead door wing hangers and magnetic locking on each separate door wing are not acceptable.
- F. **Ceiling Lights:** Two (2) LED ceiling lights. Lights require a separate 120V or 240V power circuit (power to be supplied by others).
- G. **Battery Backup (Optional):** (15 minute maximum) to keep electric locking system engaged and thus the door secure during power outage. The door is recommended to be connected to a permanent emergency power source (UPS or emergency generator).

2.05 COMMUNICATION SYSTEM

- 1. authorized entry method, the door shall signal the user when the door receives the authorized access signal from the access control system.
- 2. The door must both voice annunciate and visually signal the authorized user to step into the door in order to start the rotation of the door.
- 3. The visual signal must be located 60" above the floor on the vertical jamb of the door entrance.
- 4. Voice annunciation and visual signals must be utilized in the event of an unauthorized entry attempt or security violation. In addition, a violation light signal must be activated within the unauthorized entry compartment.

- A. **Security Reporting:** The door must have the capability of providing security violation alerts to the access control system or an on-site remote panel (not supplied by Boon Edam). Standard alarms include:
1. **Piggyback Alarm:** In the event of an attempted entry of two-persons in the same compartment, the door shall provide a closed dry contact signal to the Access Control System.
 2. **Tailgating Alarm:** In the event of an unauthorized person attempting to tailgate entry in a separate compartment (from an authorized user), the door shall provide a closed dry contact signal to the Access Control System.
 3. **Authorized Passage (Return Signal):** When an authorized user successfully passes, the door shall provide a 500ms closed pulse to the Access Control System to validate passage.
 4. **Lock Signal:** When the door is locked and secure, a closed signal is sent to the Access Control System. The lock signal will open upon authorization from the Access Control, Fire Alarm Activation or Maintenance mode activation.
 5. **Maintenance Alarm:** When the door is left in Maintenance mode, a closed signal, notifying the door is left unsecure, is sent to the Access Control System.
 6. **Doorwing Breakout Alarm (Optional):** An alarm signal is available to notify that the doorwings have been collapsed and are unsecure.
 7. **Power Loss (Optional):** An alarm signal is available to notify that the mains power has been lost or disconnected.
 8. **Slidebolt Locks Engaged (Optional):** An alarm signal is available to notify that one or both Slidebolt locks are engaged.
- B. **Boon Connect:** (Available on USA models only) IP-addressable, software system that provides diagnostic and configuration tools for the technician and facility manager. Users can access door operations and events using devices such as a PC, laptop or tablet via peer-to-peer connection or through a secured corporate network. Must include remote-diagnostics for ease of troubleshooting without having to access the door. Technical diagnostics and tuning capabilities should evaluate door's sensors, door-wing alignment, motor, logic controller, and drive systems without having to remove the ceiling panels. Remote monitoring software must provide visibility to number of rotations and alarm events.

2.06 SECURITY EQUIPMENT

- A. **IRS Infrared Sensor System:** Ceiling mounted infrared sensors capable of performing the following functions:
1. Detecting the presence of a person after receiving an authorized signal from the access control system, and initiating door rotation. The door must remain in a standby mode in the "X" position and must not start rotating until the authorized person enters the door. Initiating door rotation from the "+" position is unacceptable.
 2. Detecting the presence of a person within the door and preventing unauthorized entry in the form of tailgating by immediately stopping the door in the plus position, sounding the alarm and annunciating proper instructions. The door must stop in a plus position which allows the unauthorized tailgating person to exit the door compartment without being trapped, and therefore eliminate the reversing of the door. If the door has rotated beyond the plus position on a tail-gating attempt then the door will return to the plus position allowing the user to exit the door.
 2. Detecting the presence of a person in a compartment in order to track the person's presence and position within the door, and to ensure that the authorized person actually passed completely through the door.
 3. Sensors other than infrared are not acceptable.
- B. **Direction/Obstruction Sensing:** Sensors shall lock the 4-wing door set immediately if the door set is pushed in the opposite direction of travel, and then sound the alarm and annunciate proper instructions
- C. **Doorwing Breakout Monitoring (Optional):** The door shall be capable of determining when each doorwing panel is fixed in its correct position. Sensors shall determine if a doorwing has been bookfolded and out of its operating position. When such a condition occurs, the door shall stop operation and signal an alarm condition.

- D. **Activation:** Activation of the Tourlock shall be by an external card reader, biometrics, or any other access control device that provides a dry contact to the control box of the door. Card reader or other activation devices are not provided by Boon Edam. Mounting pedestals for access control devices are not included.
- E. **StereoVision Anti-Piggybacking System (Optional):** The StereoVision shall determine if more than one person is trying to pass through a single compartment of the Tourlock on one authorization. The StereoVision utilizes a near infrared and digital camera technology to create three dimensional images of the interior of the Tourlock. The microprocessor analyzes the images and determines if the authorized person passing through the Tourlock is actually alone or with another person. If the authorized person is verified to be alone, the door will continue its full 180° rotation cycle and the user will gain entry. If piggybacking is detected, an alarm signal will sound and stop and block in the “X” position and rotate back to the “+” position allowing both persons to exit the door. The StereoVision® system shall be capable of logging data and setting adjustment enhancement analysis (Systems utilizing pressure mats for detecting tailgating and piggybacking are not considered equal or acceptable).
- E. **Anti-Passback System:** Provide a signal from the door to the access control system indicating that the authorized user has successfully passed through the door. Connection to access control system is by access control system supplier. Doors utilizing the “x” rest position as the only anti-passback solution are not considered equal.

2.07 SENSOR SYSTEM

- A. **Safety Switches:** A system of standard pressure sensitive switches in front of the fixed sidewalls shall stop the door’s rotation immediately upon compression. All switches must be tied into the Programmable Logic Controller, and must cause the door to stop rotation until any malfunctions are corrected. System components shall be incorporated as follows:
 - a. **S.R.B. - Safety Rail Bentwall Switch - Standard:** A multi-directional, closed-contact pressure sensitive switch contained within a black rubber profile mounted to the edge of each inbound right curved side wall that will immediately stop the door’s rotation if compressed.
 - b. **S.R.D. - Safety Rail Doorwing Sensor - (Optional):** A multi-directional closed-contact pressure sensitive switch contained within a black rubber profile mounted to the bottom rail of each door wing that will immediately stop the door’s rotation if compressed.
- B. **Torque Limiting:** A setting within the programming of the Frequency Controller in the drive system that allows the rotation force to be significantly minimized, allowing the doorset to be stopped manually by applying minimal pressure against its rotation. The Direction Sensors will not allow for the manual forced rotation of the door in the reverse direction while the Torque Limiting feature is engaged.
- C. **Emergency Egress Doors:** The four (4) door wings shall be capable of collapsing, in the direction of egress and allow for unobstructed egress in cases of emergency or fire alarm signal.
- D. **Reversing Button:** A flush mounted button recessed in the vertical mid-post that initiates the reversing of the door in the event that a person or object is entrapped in either side compartment. The button’s activation is controlled by the motor encoder, the Programmable Logic Controller and the IRS presence sensors within the compartment.

2.10 PERFORMANCE/THROUGHPUT

The revolving door unit must be a 4-wing SIMULTANEOUS TWO-WAY TRAFFIC door. Throughput is defined as the number of people per minute which can pass through a door in *one direction only*.

- A. Throughput is a function of the number of compartments in the door multiplied by the number of full revolutions a door can safely make in a one-minute time frame. Given that the number of door compartments is four (4) and the safe maximum number of revolutions per minute is six (6), the maximum throughput in any one direction is 24 people per minute. Taking into consideration all user and environmental factors, the average expected throughput in any one direction is between 15 and 20 people per minute.
- B. Active/Passive Piggyback detection. For throughput enhancement, the door shall be capable of selective control which allows switching between actively blocking and rejecting attempted piggyback attempts, or passive detection with allowed passage and alarm notification to Security of a potential piggyback attempt. Selective control is managed through the Access Control System.

2.11 HARDWARE/MATERIALS

- A. **Safety Glass:** All flat glass in door wings shall be clear safety glass and all curved glass shall be clear bent safety glass.
- B. **Laminated Glass:** All flat glass in door wings shall be clear laminated safety glass and all curved glass shall be clear laminated safety glass.
- C. **Bullet Resistant:** Comparable to UL Level 3 for all glass used within the door. Bullet resistant security products shall meet HPW-TP-0500.02, ASTM C 1036-97, WMFL.
- D. **Aluminum Extrusions:** All commercial grade extrusions shall be of aluminum alloy 6063 -T6 per ASTM B-221.
- E. **Weather Stripping:** Genuine horsehair weather stripping shall be on all required edges of door wings to provide a seal between door wings and drum that meets ASTM E-283.
- F. **Glazing Seal:** All glass shall be sealed with push in glazing vinyl with the exception of Bullet Resistant, silicone glazing to be used.
- G. **Pivot:** Floor mounted pivot under the center shaft to provide smooth rotation. Bullet Resistant models shall use a floor mounted bearing and race under the center shaft to provide smooth rotation.
- H. **Center Shaft:** Extruded center shaft shall be of aluminum alloy 6061-T6 per ASTM B-221 with connection to the speed control and pivot.

2.12 FINISH

The following finishes are available for the enclosure walls, rotating door wings and ceiling.

- A. **Anodized Coatings**
 - 1. AAMA 611 Architectural Class 1 Clear anodized Type AA-M10C22 A41
 - 2. AAMA 611 Architectural Class 1 anodized Type AA-M10C22 A44: Light, Medium and Dark Bronze, Black and Champagne.
- B. **Painted Coatings**
 - 1. AAMA 2605 Superior Performing Organic Coatings (e.g.: Duranar, Fluropon; 70% Kynar Fluoropolymers).
 - 2. AAMA 2604 High Performance Organic Coatings (e.g.: Powder Coating).
- C. **Stainless Steel Clad Type 304**
 - 1. #4 Brushed Satin
 - 2. #8 Highly Polished (mirror finish)
- D. **Bronze Clad Alloy #280 (Muntz Metal)**
 - 1. #4 Brushed Satin
 - 2. #8 Highly Polished (mirror finish)

2.13 OPTIONAL FEATURES

The following are features and options available with the Tourlock.

1. Matwell ring
2. Doorwing Breakout monitoring
3. Power Loss monitoring
4. Surface Applied Slidebolt Locks
5. Battery Backup/UPS
6. StereoVision Anti-piggybacking System
7. Safety Rail Doorwing Sensor
8. Bullet Resistant
9. Loose control panel for remote mounting

PART III – EXECUTION

3.01 INSTALLATION

- A. **Inspection:** Installer must examine the location and advise the Contractor of any site conditions unacceptable for proper installation of product. The minimum conditions necessary to initiate installation are:
 1. Floor must be dead level at any point within the footprint of the door.
 2. Finished floor must be installed.
 3. Exterior grade for adequate drainage must be properly designed.
 4. Power supply must be installed.
- B. **Erection:** Install revolving doors in accordance with manufacturer's printed instructions. Set units level, plumb, and with uniform hairline joints. Anchor securely into place. Use only factory trained installers.
- C. **Adjustment:** Installer shall adjust door, hardware and sensors for smooth operation and proper performance.
- D. **Instruction:** A factory-trained installer shall demonstrate to the owner's maintenance crew the proper operation of the door and the necessary service requirements such as lubrication, cleaning, and inspection of components upon completion of installation.
- E. **Cleaning:** Clean metal and glass surfaces carefully after installation to remove excess caulk, dirt and labels.

Boon Edam, Inc. reserves the right to change this specification at any time without notice.