SECTION 084229 - AUTOMATIC ENTRANCES

PART 1 - GENERAL

1.1 MSU ISSUES

A. The building entrance nearest the accessible parking spaces shall be designated the primary accessible entrance and will have an automatic swinging entrance door. (This shall not be construed to mean that all other public entrances are not required to be accessible in accordance with code.) When used in conjunction with multiple openings, the automated door should be the one providing the most direct path for those using the door. The building approach and floor plans shall accommodate automated entrances and the required sensing devices so that cross traffic patterns, rain, or snow do not interfere with sensor operations.

B. Provide a vestibule space for energy conservation and the convenience of the person inside the entrance hall. The vestibule must be large enough to avoid overlapping of sensors for exterior and vestibule doors, and to minimize having interior and exterior doors open at the same time.

C. The automatic swinging door will have photoelectric touch switch operation, with either two modes of operation (“day” and “off”), or three modes of operation (“day”, “night”, and “off”).

1. In the “day” mode, the door will open automatically when a photoelectric switch is touched, either inside or outside the door. The door will be maintained open by an adjustable time delay switch and/or a presence sensor on the out swing side of the door. The door may also be operated manually without excessive pressure.
2. In the “night” mode, the door will be normally locked and open automatically when a photoelectric switch is touched on the inside, or a key switch is operated on the outside. The door will be maintained open by an adjustable time delay switch and/or a presence sensor on the out swing side of the door.
3. In the “off” mode, the power supply to the operator will be cut off. All maintenance operations may be performed in this mode. The door will continue to operate as a manual exit door.

D. In addition to the photoelectric touch switch and key operation specified in this standard, a minimum of one automatic swinging exterior entrance per building will be equipped with card access. This will be provided in conjunction with any new building construction, major building renovation, or replacement of exterior entrances.

E. M.S.U. expects the contractor to guarantee, maintain and repair the equipment for one year after final acceptance by the University, with any repairs being made during the first year to be guaranteed for a year after the repair. Before performing maintenance, the contractor shall notify the M.S.U. Key Shop to allow shop personnel to observe and learn maintenance or repair procedure. Before the end of the first year, the Contractor shall provide, at the owner’s convenience, a maintenance and repair summary demonstration to acquaint the M.S.U. Key Shop personnel with the automatic entrance door operations and equipment. At that time, one copy of all installation and repair manuals and any plug-in electronics, modules or circuit boards shall be submitted to the M.S.U. Key Shop.

F. All aluminum doors will be finished with Class I, Clear Anodic Finish as specified in this standard unless an alternate finish is authorized by MSU. Other finishes will be authorized as appropriate to meet design goals.

G. Before ordering door operators, determine if building compressed air is available in the building or an integrated compressor is required.

1.2 SUMMARY

A. This Section includes exterior swinging, automatic entrance door assemblies.

B. Related Sections include the following:

1. Division 8 Section DOOR HARDWARE for hardware to the extent not specified in this Section.
2. Division 8 Section ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS for additional information on aluminum entrances.
3. Division 8 Section GLAZING for materials and installation requirements of glazing for automatic entrance doors.

1.3 DEFINITIONS

A. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.

1.4 SUBMITTALS

A. Maintenance Data: For door operators and control systems to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs a certified inspector.

B. Manufacturer Qualifications: A qualified manufacturer with company certificate issued by AAADM.

C. Source Limitations: Obtain automatic entrance door assemblies through one source from a single manufacturer.

D. Welding: Qualify procedures and personnel according to AWS D1.2, “Structural Welding Code-Aluminum.”

E. Low-Energy Power-Operated Door Standard: BHMA A156.19.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NEPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

G. Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify openings to receive automatic entrance door assemblies by field measurement before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

A. Templates: Obtain and distribute, to the parties involved, templates for doors, frames, and other work specified to be factory prepared for installing automatic entrance doors. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic entrance doors to comply with indicated requirements.

B. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrance doors with hardware required for the rest of Project.

C. Electrical System Roughing-in: Coordinate layout and installation of automatic entrance door assemblies with connections to power supplies and security access control system.

1.8 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of automatic entrance door assembly Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance door assembly operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
2. Sheet and Plate: ASTM B 209.
3. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

B. Stainless-Steel Bars: ASTM A 276 or ASTM A 666, Type 304.

C. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.

D. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos; formulated for 30-mil thickness per coat.

2.2 AUTOMATIC ENTRANCE DOOR ASSEMBLIES

A. General: Provide automatic entrance door assemblies including doors, framing, headers, door operators, activation and safety devices, and accessories required for a complete installation.

B. Swinging Automatic Entrance Door.

1. Configuration: Single-swinging door.

   a. Traffic Pattern: One way.
   b. Mounting: Between jambs.

2. Door Operator: Low energy, power operated.
3. Activation Device: Photoelectric touch switch on each side of door to activate door operator.
4. Finish: Finish framing, door(s), and header with Class I, clear anodic finish.

2.3 COMPONENTS

A. Framing Members: Manufacturer's standard extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.

1. Size: 1-3/4 by 5 inches.

B. Stile and Rail Doors: Manufacturer's standard 1-3/4-inch- thick glazed doors with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded, or incorporate concealed tie-rods that span full length of top and bottom rails.

1. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
2. Stile Design: Minimum of 5-inch width.
3. Rail Design: Upper rail, minimum of 5-inch height. Bottom rail, minimum of 12-inch height.

C. Glazing: As specified in Division 08 Section GLAZING.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

2.4 DOOR OPERATORS

A. Operators shall be 4800 Series Auto-Equalizer manufactured by LCN Closers, Model # OTBVNG, NPN Syncing Output.

1. Mounting: Surface.

B. Control Box shall be ES798 Series as manufactured by LCN Closers.

1. Mounting: Recessed, within sight of the door, and covered by a locked access door.

2.5 ACTIVATION AND SAFETY DEVICES

A. Photoelectric Touch Switch: OPTI-TOUCH Switch by Banner Engineering Corp. with contrasting-colored engraved message.

1. Mounting: Horizontal, recess mounted, semi-flush in wall at the height of 34” on center. Do not install the guard provided with the switch.

a. Banner model number OTBVN6L (used in conjunction with a LCN air operated closer and powered from the closer power supply).
b. Banner model number OTBVR81L (used in conjunction with any closer but a separate power supply is required).

2. Message Plate Material: Stainless steel.
3. Message: "Touch to Open."

B. Card Reader: In situations where a Card Reader is required in accordance with Section 1.1 D. above, contact the M.S.U. Project manager to determine the system to be used and the location of the reader. It will be mounted at 40” on center, above the Photoelectric Touch Switch.

C. Key Switch: Door control switch with key-controlled actuator; enclosed in 2-by-4-inch junction box. Provide faceplate engraved with letters indicating switch functions.

1. Face Plate Material: Stainless steel.
2. Functions:

a. “DAY”: Door will open automatically when a touch button switch is activated inside or outside.
b. “NIGHT” Door will be normally locked and open automatically when the touch button switch is activated from the inside, or a key switch is operated from the outside.
c. “OFF” Power supply to the operator will be cut off and the door will continue to operate as a manual exit door.

3. Mounting: Recess mounted, semi-flush in wall.

D. Strikes: Electric Strike locking mechanism by HES, Inc..

E. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.6 HARDWARE

A. General: Provide units in sizes and types recommended by automatic entrance door and hardware manufacturers for entrances and uses indicated and consistent with Division 8 Section "Door Hardware". Finish exposed parts to match door finish, unless otherwise indicated.

B. Thresholds: BHMA A156.21, extruded-aluminum, raised thresholds, with beveled edges with a slope of not more than 1:2 and maximum height of 1/2 inch. Provide cutouts as required for door operating hardware.

C. Weather Stripping: Manufacturer's standard replaceable components.

1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

D. Weather Sweeps: Manufacturer's standard nylon brush sweep.

E. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket.

F. Caution Sign: BHMA A156.10; 6 inches in diameter, with minimum 1/2-inch- high, black lettering on a yellow background with the words "CAUTION AUTOMATIC DOOR."

2.7 FABRICATION

A. General: Factory fabricate automatic entrance door assembly components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

1. Form aluminum shapes before finishing.
2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws fabricated from stainless steel.

    a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
    b. Reinforce members as required to receive fastener threads.

4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

B. Framing: Provide automatic entrance doors as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

1. Fabricate tubular and channel frame assemblies with manufacturer's standard welded or mechanical joints. Provide sub frames and reinforcement as required for a complete system to support required loads.
2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
3. Form profiles that are sharp, straight, and free of defects or deformations.
4. Prepare components to receive concealed fasteners and anchor and connection devices.
5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
6. Fabricate exterior components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
7. Provide anchorage and alignment brackets for concealed support of assembly from the building structure.
8. Allow for thermal expansion of exterior units.

C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.

E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."

F. Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

1. Provide sliding weather stripping, mortised into door, at perimeter of swinging doors.
2. Exterior Doors: Provide compression-type weather stripping at fixed stops. At locations without fixed stops, provide sliding-type weather stripping retained in adjustable strip mortised into door edge.
3. Weather Sweeps: Mount sweeps to underside of door bottoms of exterior doors.
4. Finger Guards: Provide finger guards at each center-pivoted entrance door that has clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position. Anchor guards to hinge-jamb frame.

G. Activation and Safety Devices: Factory install devices in doors and headers.

2.8 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrance doors.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight.

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

B. Entrances: Install automatic entrance doors plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
2. Set headers, operating brackets, and guides level and true to location with anchorage for permanent support.
3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
4. Provide thresholds at exterior doors.

C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.

D. Glazing: Install glazing as specified in Division 08 Section GLAZING.

E. Sealants: Comply with requirements specified in Division 7 Section JOINT SEALANTS to provide weather tight installation.

1. Set framing members thresholds, and flashings in full sealant bed.
2. Seal perimeter of framing members with sealant.

F. Signage: Provide caution signs on each automatic entrance door, visible from both sides of door. Mount caution signs and signs indicated below with centerline 60 inches above finished floor.

3.3 ADJUSTING

A. Adjust door operators, controls, and hardware for smooth and safe operation, for weather tight closure, and complying with requirements BHMA A156.19 for low-energy power-operated doors.

B. Lubricate operating hardware and other moving parts.

C. Readjust door operators and controls after repeated operation of completed installation equivalent to 3 days' use by normal traffic (100 to 300 cycles). Lubricate hardware, operating equipment, and other moving parts.

D. Occupancy Adjustment: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.

3.4 CLEANING AND PROTECTION

A. Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.

1. Comply with requirements in Division 08 Section "GLAZING for cleaning and maintaining glass.

3.5 DEMONSTRATION

A. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrance doors and door operators.

END OF SECTION 084229