
Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 00 10 – General Instructions.
- .2 Section 01 33 00 – Submittal procedures.
- .3 Section 01 35 29.06 – Health and Safety Requirements.
- .4 Division 26 – Electrical.

1.2 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 CAN/CSA-B651 for handicap access, ADA compliant.

1.3 DESIGN REQUIREMENTS

- .1 All Card Reader Turnstiles shall be of the type as shown on the drawings and of the following unit size: 330 mm (13") in width, 1220 mm (48") in length and 965 mm (38") in height, with a lane width of 560 mm (22"). The unit is to interface with card readers and/or bar code scanners. A status indicator light is to be included.
- .2 The turnstile unit is to be a fail safe operation, such that in the event of a power failure, the barriers retract to the open position.
- .3 The unit is to recognize patterns of movement through the lane to differentiate between a person pushing or pulling an item and a person attempting to piggy back on a valid entry. Beam scanning algorithmic pattern detection show valid users of the lane to be within 6mm (1/4").
- .4 The system is to have the following detecting and signaling capabilities:
 - .1 Entry and exit with an authorized card.
 - .2 Entry and exit that is authorized.
 - .3 System is to reset in 5 seconds if an authorized card being read by the system but no entry or exit taking place.
 - .4 Unauthorized card being presented.
 - .5 Card presented for entry but exit occurring.
 - .6 Card presented for exit but entry occurring.
 - .7 Obstruction of an infrared beam path.
 - .8 Unauthorized person following an authorized person through the beam path at least 6 mm (¼ inch) distance apart at waist height, that is, "tailgating or piggybacking".
 - .9 Forced entry through the steel barriers.
 - .10 All beams in the path of the glass barriers will act simultaneously as detection and safety beams to minimize the potential for the barrier to close on an individual in the lane.

- .11 Intelligent Infrared Beams: minimum 40 required per lane.
- .12 Beams controlled by intelligence capable of differentiating between relatively smaller inanimate objects and human targets, for example, an umbrella, briefcase, large purse, rolling laptop bag and a person.
- .13 At the factory sensitivity setting, user behavior tolerated by the software without generating an alarm condition due to:
 - a) Part passage through the beams and moving back out again.
 - b) Hesitation in the beam field for less than 5 seconds.
 - c) Presenting a card for authorization while within the beam-field, but before completing passage through it.
 - d) Speed: Time delay of no greater than 10 ms in signaling passage through the beams and readying the optical turnstile for the next user except when a greater delay is caused by the attached access control system.
 - e) The speed and torque of the glass barrier is adjustable.
- .5 Unit system is to allow one person per second throughout, tailgate, crawl over and under detection. System is to allow bi-directional or single direction movement.
- .6 Unit system is to interface with building access control, fire and life safety system and monitoring devices.
- .7 Industrial duty infrared photoelectric beams (915 mm (36")) linked to primary input/output board – 32-bit microprocessor with on board wireless LAN connectivity.
- .8 The controller & access control operation should be as follows:
 - .1 An access card or other credential is presented to the customer supplied access control reader mounted inside the casework. If entry is authorized, the top mounted indicator LEDs with light as a green arrow pointing in the direction authorized and a chime will sound indicating to the user that they may pass.
 - .2 Unauthorized access attempts and tailgaters are to be singled out by local visual/audible alarms.
 - .3 Minimize false alarms through the use of sensing beams:
 - .1 connected to intelligent detection algorithms utilizing a microprocessor using neural network intelligence,
 - .2 process a high number of people without security guard intervention, unless access is rejected by the system or a system anomaly occurs,
 - .3 ensure a fast throughput, approximately one person per second, subject to access control system,
 - .4 buffering multiple inputs from an access control system to maximize throughput both directions,
 - .5 to allow safe emergency egress without hindrance of a physical barrier. The steel barriers “breakaway” in the direction of travel,
 - .6 allow for visitor management such that when activated, an unlimited number of visitors can pass through the lane. The system will reset to a normal operation mode once the last visitor has passed through and 3 seconds of inactivity have elapsed.
- .9 Product finish on the exterior is to be steel cladding with a powder coat finish of a brownish colour to match the existing paint colour finish on the steel stair newel posts and stair railings. The top is to be stainless steel.

- .10 Electrical requirements are as follows:
 - .1 240w 24 VDC 10A power supply supplied with unit for each set up lane.
 - .2 A dedicated 120V 15A separate circuit is to be provided at each turnstile unit location.
 - .3 Mains PSU, 110V, and PSU remotely installed near the turnstile(s).
 - .4 Wiring Requirements:
 - a) Power: two conductor cable, minimum 18 gauge.
 - b) Power distances: 24 vDC, 100 feet on 18 gauge cable.
 - c) Earth cables: earth connection from each pedestal to ground, using a green/yellow-sleeved cable with a minimum conductor cross sectional area of 18 gauge.
 - d) Card readers: as required by access control system manufacturer.
 - e) Access control points: as required by access control system manufacturer.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The card reader turnstile manufacturer shall furnish shop drawings of all components showing layout, placement, elevations, sections and details.
 - .1 Provide scalable drawing(s) of each turnstile unit, illustrating front, side and top views. Drawings shall include all options, special features, finishes, component dimensions, construction details and tolerances. Coordination is required for all installation interfaces as required by other trades (electrical requirements, etc.). Drawings shall be available in electronic format for viewing.
- .3 Product Data:
 - .1 Submit manufacturer's printed product data sheets on each product that is to be used in the fabrication of card reader turnstiles. Include: component dimensions, construction details, power connection points, finishes and configurations.
- .4 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .5 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .6 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .7 Manufacturer's Field Services: submit reports within 3 days of receipt from manufacturer.
- .8 Instructions: submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- .1 Meet requirements in Section 01 45 00 - Quality Control.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Turnstiles shall be manufactured or furnished by a single manufacturer.

- .4 The manufacturers shall have production facilities including all tools, equipment and machinery necessary for the fabrication and installation of work specified, complete with skilled personnel.
- .5 Manufacturer Qualifications: Not less than 10 years' experience in the actual production of specified products.
- .6 Provide a list of five (5) installations of comparable stature completed in the past 5 years.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packaging: Products shall have adequate packaging to protect the finished surfaces from soiling or damage during shipping. Separate materials for recycling where possible.
- .2 Delivery: Deliver materials in manufacturer's original, unopened containers with identification labels intact.
- .3 Storage: Store materials in such a manner as to prevent any damage or intrusion of foreign matter. Store within the building in space designated for storage. Items not properly stored will not be warranted against damage due to unsatisfactory conditions.
- .4 Handling: Care shall be used at all times to prevent any damage.

1.7 PROJECT SITE CONDITIONS

- .1 Heating and air conditioning systems providing temperature and humidity at occupancy levels must be in operation.
- .2 Flooring is required to be finished under turnstiles.
- .3 Wet operations must be complete prior to installation.

1.8 WARRANTY

- .1 Card Reader Turnstile Warranty: standard frame 5 years on parts from date of acceptance. Defects in material and workmanship within this time are to be replaced or repaired at no additional charge to the Departmental Representative.
- .2 Defects include but are not limited to:
 - .1 Structural failure of units.
 - .2 Failures of electrical and microprocessor components.
 - .3 Failures in normal unit operation.

Part 2 Products

2.1 MATERIALS

- .1 The pedestal shell, structural support members and bottom shall be constructed steel, finished as noted above, with a powder coat finish of a brownish colour to match the existing paint colour finish on the steel stair newel posts and stair railings. All sections are to be reinforced where necessary to form a rigid structure with all surfaces flush

joints. Remove tool and die marks and stretch lines or blend into finish. The pedestal tops only shall be 14 gauge stainless steel, type 304.

- .2 All edges shall be de-burred and shaved to provide a smooth finish.
- .3 Pedestal ends shall be rounded.

2.2 SYSTEM DESCRIPTION

- .1 Lane configuration (refer to drawings):
 - .1 Multiple adjacent lanes; two pedestal with interior.
 - .2 All lanes must have 2 arms of swinging glass in a bi-parting manner to allow for the fastest allowable opening time.
- .2 Optics:
 - .1 Minimum 40 pulsed multi sensor beam array per lane.
- .3 Inputs: Voltage—free switching, current sense 1mA typical.
 - .1 Entry Request: normally open.
 - .2 Exit Request: normally open.
 - .3 Invalid card: normally open.
 - .4 FACP: normally closed.
 - .5 Load cell sensor logic is integrated into primary and secondary boards for crawl over top sensing.
- .4 Outputs (9 required):
 - .1 Relay outputs for the following functions:
 - a) Proof of Entry – normally open.
 - b) Proof of Exit – normally open.
 - c) Invalid Entry Alarm – normally open.
 - d) Tailgate Entry Alarm – normally open.
 - e) Invalid Exit Alarm – normally open.
 - f) Tailgate Exit Alarm – normally open.
 - g) Crawl Through Alarm – normally open.
 - h) Entry Card Reader Shunt – normally closed.
 - i) Exit Card Reader Shunt – normally closed.
- .5 Serial Port: Two RS485 multi-drop serial ports for transmitting flow and other operational data and two 422 multi-drop serial ports for touch-screen communications. Expansion to wireless communication port to accept wireless closed radio or LAN transceiver.
- .6 Audible Alarms: Provide for each lane triggered in an alarm condition.
 - .1 Local integrated sound card in turnstile shall have the following:
 - a) Card read accepted tone.
 - b) Tailgate alarm tone.
 - c) Invalid lane entry alarm tone.
 - d) Crawl alarm tone.
 - e) On board volume adjustments including “mute”.
- .7 Card Readers: System compatible with all major access control technologies for Owner-provided card readers of suitable dimensions to be mounted into pedestals.
- .8 Turnstile:
 - .1 Pedestal style: refer to materials above. Barriers: ½ “ thick tempered glass.

- .2 Wiring: 485 signal interconnection: minimum conductor of 18 gauge/4 conductor cable between each pedestal.
- .3 Card Reader Mounting: at pedestal ends recessed under an acrylic cover located in each end of the top supplied by security system integrator.
- .4 Displays:
 - a) Large status indicator (LSI) using easy to understand graphics set behind smoked acrylic panels in top.
 - b) Graphic indicators are:
 - i) Card icon – to indicate lane is ready for card read.
 - ii) Green arrow pointing into lane – to indicate that the lane is ready for the user to proceed.
 - iii) Flashing red “X” or a flashing red square if available – to indicate that lane is in alarm.
 - iv) Solid red “X” or a red square if available– to indicate that lane is in use from the opposite direction.
- .5 Sounder:
 - a) Card read accepted tone.
 - b) Tailgate alarm tone.
 - c) Invalid lane entry alarm tone.
 - d) Crawl alarm tone.
 - e) On board volume adjustment including “mute”.
- .6 Lane Layouts: position as indicated on drawings.
- .9 Accessories:
 - .1 Provide indicators designed to illuminate when an alarm is activated to provide a visual indication of the lane alarm status.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Set card reader turnstiles in place at locations shown on drawings, level and square using mounting platform leg levellers.
- .2 Install accessories in accordance with manufacturer’s instructions and recommendations.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests/Inspection.
 - .1 Operate equipment and verify that performance criteria specified in this section has been achieved.

3.4 PROTECTION

- .1 Provide all necessary protective measures to prevent damage of turnstile units from exposure to other construction activity.

3.5 CLEANING

- .1 Perform cleaning operations in accordance with manufacturer's recommendations.
- .2 Remove all protective plastic masking from all surfaces.
- .3 Remove or repair damaged or defective units.

END OF SECTION