

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 08 71 00 - Door Hardware - General.
- .3 Section 26 05 31 - Splitters, Junction, Pull Boxes and Cabinets.
- .4 Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.
- .5 Section 27 10 05 - Structured Cabling for Communication Systems.

1.2 REFERENCE DOCUMENTS

- .1 National Fire Protection Association (NFPA)
 - .1 NFPA 70, Article 517, National Electric Code.
 - .2 NFPA 101, Life Safety Code.

1.3 REFERENCE STANDARDS

- .1 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S319-05, Electronic Access Control Systems.
 - .2 ULC-ORD-C634-86, Guide for the Investigation of Connectors and Switches for Use with Burglar Alarm Systems.
- .2 Underwriters' Laboratories (UL)
 - .1 UL 294, Standard for Safety for Access Control System Units.
 - .2 UL 1034, Burglary-Resistant Electric Locking Mechanisms.
- .3 Canadian Electrical Code, 2015.
- .4 National Building Code of Canada 2015 (NBCC)

1.4 DESIGN PERFORMANCE REQUIREMENTS

- .1 System shall be an open architectural family of interface devices that provide a complete and fully functional hardware/firmware infrastructure for access control software host systems. This specification defines the hardware devices, functionality and communications.
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- .2 Access control system shall consist of the following major components
 - .1 Door Controller - supports two Wiegand or clock data card / Pin readers. 1.6 Input monitor interface - supports 16 analog inputs, 2 non - latching output relays.
 - .2 Key FOB reader.
 - .3 Power supplies
 - .4 Magnetic Door Lock.
 - .5 Emergency Door Release.
 - .6 Request to exit motion detector device.

1.5 COMMUNICATIONS

- .1 Fire safety:
 - .1 Existing fire rating of room 2051 doors (if applicable) must be maintained.
 - .2 The fire alarm override must operate independently of access control panel functions.

1.6 SUBMITTALS

- .1 Product Data: Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit 3 copies of manufacture's literature/datasheets for each control panel, power supply, card reader
 - .2 Submit:
 - .1 Functional description of equipment.
 - .2 Technical data for all devices.
 - .3 Device location plans and cable lists.
 - .4 Devices mounting location detail drawings.
 - .5 Typical devices connection detail drawings.
 - .2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit shop drawings to indicate project layout, including details.
 - .1 Submit shop drawings to indicate, mounting heights and locations, wiring diagrams, door equipment configurations.
 - .2 Submit wiring diagrams.
 - .3 Submit complete equipment list.
 - .3 Quality Assurance Submittals: Submit the following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
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- .2 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit ULC/UL/CSA Product Safety Certificates.
 - .2 Submit verification Certificate that service company is ULC/UL/CSA List alarm service company.
 - .3 Submit verification Certificate that security access system is "Certified alarm system".
- .3 Instructions: Submit manufacturer's installation instructions.
- .4 Manufacturer's Field Services: Submit copies of manufacturer's field reports.

- .4 Maintenance Data: Submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .1 Include:
 - .1 System configuration and equipment physical layout.
 - .2 Functional description of equipment.
 - .3 Instructions of operation of equipment.
 - .4 Illustrations and diagrams to supplement procedures.
 - .5 Operation instructions provided by manufacturer.
 - .6 Cleaning instructions.

 - .5 Provide a copy of inspecting technician's report to Departmental Representative. Identify each device by location and certify the test results.

 - .6 Issue a Certificate of Verification confirming the completion of the verification.

 - .7 Provide Departmental Representative with a written list of equipment warranty periods.

 - .8 Operation and Maintenance Manuals: Submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .1 Include:
 - .1 System configuration.
 - .2 Functional description.
 - .3 Instructions and diagrams.
 - .4 Cleaning instructions.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Deposit packaging materials in appropriate container on site for recycling or reuse.

 - .2 Avoid using landfill waste disposal procedures when recycling facilities are available.
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- .3 Collect and separate plastic, paper packaging and corrugated cardboard.
- .4 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin.

1.8 WARRANTY

- .1 Project Warranty: Refer to Division 1 for project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.
- .3 Upon Departmental Representative's approval of the installed system, a 1 year warranty on parts will be in effect.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Provide system cables including multi-conductor control cable and AC power cable required.
 - .1 Power supplies: ULC, CSA, or C-UL listed.
 - .2 Connectors: to ULC/ORD-C634.
 - .2 Door Controller
 - .1 Shall be connected to the network interface module via RS-485, and shall support 16, 2/4-state supervised input circuits and 2 auxiliary relay outputs.
 - .3 Proximity FOB key/card reader:
 - .1 Type: 125 kHz proximity type with Wiegand output.
 - .2 Fitted with LED indicator light.
 - .3 Compatible with contractor supplied proximity cards /FOB keys.
 - .4 Sealed in a weatherproof housing to allow continuous operation in adverse weather conditions, as indicated.
 - .5 Shall be compatible with existing system (Keyscan System VII) in place.
 - .4 Emergency Door Release:
 - .1 Blue housing with easily legible instructions printed on housing.
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- .2 Surface mounted in 50mm deep single gang junction box.
- .3 2 single pole-double throw 10 amp contacts.
- .4 1 single pole-double throw lock release.
- .5 CSA or cUL approved.

- .5 Magnetic Door Lock:
 - .1 Holding force: 1200 lbs
 - .2 12 volt power supply.
 - .3 Operating Temperature: -10 degrees C to 60 degrees C.
 - .4 Complete with mounting bracket.
 - .5 Magnetic door lock to fail open.
 - .6 CSA or cUL approved.

- .6 Request to exit motion detector device:
 - .1 Infrared detection.
 - .2 Continuous low-voltage operation.
 - .3 Fitted with indicator light.
 - .4 Integrated with local audio alarm (electronic buzzer).
 - .5 Adjustable coverage.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and datasheet.

3.2 INSTALLATION: ACCESS CONTROL SYSTEM

- .1 Install access control key FOB reader in accordance with CAN/ULC-S319-05.

 - .2 Fully enclose external cables in electrical metal tubing conduit, from activating unit location's enclosure to and above ceiling wall mounted junction boxes.

 - .3 Provide tamperproof attachments for the unit cover plate.

 - .4 Securely fasten all components to wall, ceiling, or other substrate or structure.
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- .5 Install components in accordance with manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.
 - .6 Install required boxes in inconspicuous accessible locations.
 - .7 Conceal conduit, wiring, control panels, and power supplies.
 - .8 Mount conduit, wires, control panels, and power supplies on wall high enough to not interfere with building operations.
 - .9 Install wiring in conduit. No exposed cable will be accepted.
 - .10 Enclose in electrical metal tubing conduit external cables for associated junction box to remaining system locations, from junction box to above ceiling mounted cable ducts or master conduit routes.
 - .11 Main core conduits (53 mm) shall not exceed 9 meters between junction boxes.
 - .12 Maximum of two (2) 90 degree bends between any conduit pull points.
 - .13 Where EMT is used in slab, use steel type EMT with concrete tight couplings.
 - .14 All conduits shall be equipped with approved type expansion joints and clamps whenever conduits cross expansion joints of building.
 - .15 Conduit shall be installed at a minimum of 152 mm from heating pipes not insulated and a minimum of 200 mm from all electrical cabling.
 - .16 All wall and floor penetrations shall be sealed with an approved fire retardant sealing compound around the conduit.
 - .17 All conduits shall be supported independently of the suspended ceiling. Conduits NOT to be anchored to suspended ceiling connection rods.
 - .18 Separate conduits shall be provided as indicated on drawing.
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- .19 Interconnect pull strings in all junction boxes.

3.3 VERIFICATION

- .1 Perform verification inspections and test in the presence of Departmental Representative.
 - .1 Provide all necessary tools, ladders and equipment.
 - .2 Ensure appropriate subcontractors and security specialists are present for verification.
 - .2 Mechanical inspection
 - .1 Departmental Representative and Contractor to tour all areas to insure that all Systems and Subsystems are installed in place for proof of performance testing.
 - .2 Take system inventory at this time. Verify following items before beginning proof of performance tests:
 - .1 All electrical power circuits designated for system equipment are properly labeled, wired, phased, protected and grounded.
 - .2 Conductor ends are protected by heat shrink wrap; audio spade lugs, barrier strips and punch blocks are used.
 - .3 Wiring meets applicable codes and standards.
 - .4 Wiring is complete.
 - .5 Dust, debris, solder splatter, etc. are cleaned and removed from site.
 - .6 All equipment is properly labeled.
 - .7 All equipment identified in System's equipment lists are in-place and properly installed.
 - .8 Each System ground method are installed in accordance with this specification.
 - .3 Visual verification: Objective is to assess quality of installation and assembly and overall appearance to ensure compliance with Contract Documents. Visual inspection to include:
 - .1 Sturdiness of equipment fastening.
 - .2 Non-existence of installation related damages.
 - .3 Compliance with reviewed shop drawings.
 - .4 Compatibility of equipment installation with physical environment.
 - .5 Inclusion of all accessories.
 - .6 Device and cabling identification.
 - .4 Upon Departmental Representative's approval of the installed system, a one (1) year warranty on parts will be in effect.
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3.4 CLEANING

- .1 Remove protective coverings from accessories and components.
- .2 Adjust all components for correct function.
- .3 Clean housings and system components, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
- .4 Clean all components free from dirt and fingerprints.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCE STANDARDS

- .1 Government of Canada
 - .1 TB OSH Chapter 3-03, 1997-01-28, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-03, Standard for Fire protection Electronic Data Processing Equipment.
 - .2 TB OSH Chapter 3-04, 1994-12-22, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-04, Standard for Fire Alarm Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 National Fire Protection Agency
 - .1 NFPA 72-2016, National Fire Alarm Code.
 - .2 NFPA 90A-2018, Installation of Air Conditioning and Ventilating Systems.
- .4 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015 (NBC).
- .5 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-14, Standard for the Installation of Fire Alarm Systems.
 - .2 CAN/ULC-S525-16, Audible Signal Device for Fire Alarm Systems.
 - .3 CAN/ULC-S526-16, Visual Signal Devices for Fire Alarm Systems.
 - .4 CAN/ULC-S528-14, Manual Pull Stations for Fire Alarm Systems.
 - .5 CAN/ULC-S536-S537-13, Burglar and Fire Alarm Systems and Components.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
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- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
 - .3 Manufacturer's Field Reports: manufacturer's field reports specified.

- .4 Closeout Submittals:
 - .1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI/NFPA 20.
 - .2 Departmental Representative will delegate authority for review and approval of submittals required by this Section.
 - .3 Submit to Authority of Jurisdiction 2 sets of approved submittals and drawings immediately after approval but no later than 15 working days to prior to final inspection.
 - .4 Submit following:
 - .1 Manufacturer's Data for:
 - .1 Horn-strobes.
 - .2 Wiring.
 - .3 Conduit.
 - .4 Outlet boxes.
 - .5 Fittings for conduit and outlet boxes.
 - .6 Submit 1 original for each item and clear, legible, first-generation photocopies for remainder of specified copies.
 - .2 Test Reports:
 - .1 Preliminary testing:
 - .1 Final acceptance testing.
 - .2 Submit for inspections and tests specified under Field Quality Control.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in fire alarm system installations with documented experience approved by manufacturer.

 - .2 Provide services of representative or technician from manufacturer of system, experienced in installation and operation of type of system being provided, to supervise installation, adjustment, preliminary testing, and final testing of system and to provide instruction to
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project personnel.

.3 System:

- .1 To TB OSH Chapter 3-04.
- .2 Subject to Fire Commissioner of Canada (FC) approval.
- .3 Subject to FC inspection for final acceptance.
- .4 To Fire Marshal approval.

.4 Extra Materials:

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.5 Maintenance Service:

- .1 Provide one year's free maintenance with two inspections by manufacturer during warranty period. Inspection tests to conform to CAN/ULC-S536. Submit inspection report to Departmental Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, shipping, handling and unloading:

- .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Waste Management and Disposal:

- .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .2 Power supply: to CAN/ULC-S524.
- .3 Audible signal devices: to CAN/ULC-S525.

2.2 AUDIBLE SIGNAL DEVICES

- .1 Audible device(s) to match existing:
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- .1 Horn-strobes: weatherproof mounting as indicated on drawings, 24 V dc.
- .2 Do not exceed 80 percent of listed rating in amperes of notification appliance circuit. Provide additional circuits above those shown if required to meet this requirement.
- .3 As indicated on drawings, provide weatherproof listed devices.
- .4 Finish appliances in red enamel.
- .5 For surface mounting provide appliance manufacturer's approved back box. Back box finish to match appliance finish.

2.3 WIRING

- .1 Solid copper, twisted pair CSA FAS 105, FT-4 cables: insulation rating not less than 300 V.
- .2 Each conductor shall be permanently labeled at both ends.
- .3 All fire alarm wiring shall be installed in rigid non-metallic conduit.
- .4 Wire for 120 V circuits: No. 12 AWG minimum solid copper conductor.
- .5 Wire for low voltage DC circuits: No. 14 AWG minimum solid copper conductor and in accordance with manufacturer's requirements.
- .6 Insulation 75 °C minimum with nylon jacket.
- .7 Colour code wiring.

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 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-04.
 - .2 Connect alarm circuits to main control panel.
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- .3 Locate and install horn-strobes and connect to signaling circuits.
- .4 Connect signaling circuits to main control panel.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests:
 - .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and CAN/ULC-S537.
 - .2 Fire alarm system:
 - .1 Test each new device and alarm circuit to ensure manual stations, transmit alarm to control panel and actuate single stage alarm.
 - .2 Simulate grounds and breaks on alarm and signaling circuits to ensure proper operation of system.
 - .3 Class B circuits.
 - .1 Test each conductor on circuits for capability of providing alarm signal on line side of single open-circuit fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .2 Test each conductor on circuits for capability of providing alarm signal during ground-fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
- .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.