

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 System equipment:
 - .1 Software.
 - .2 Server.
 - .3 Workstation.
 - .4 Access cards.
- .2 Door control equipment:
 - .1 Control panels.
 - .2 Door controllers.
 - .3 Input modules.
 - .4 Output modules.
 - .5 Card readers.
 - .6 Door position switches.
 - .7 Integrated lock.
 - .8 End of line resistors.
- .3 Power supplies.
- .4 UPS.
- .5 Equipment enclosures.
- .6 Cable.

1.2 RELATED SECTIONS

- .1 Section 08 71 11 - Finish Hardware.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition) Safety Standard for Electrical Installations.
 - .2 CAN/CSA-C22.2 No. 182.4-M90 (R2006), Plugs, Receptacles and Connectors for Communication Systems.
 - .2 National Fire Protection Association (NFPA)
 - .1 NFPA 70-2011, Article 517, National Electric Code.
 - .2 NFPA 101-2008, Life Safety Code.
 - .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S302-M91(R1999), Standard for Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults.
-

<u>1.3 REFERENCES</u> (Cont'd)	.3	(Cont'd) .2 CAN/ULC-S303-M91 (1999) Standard for Local Alarm Burglar Alarm Units and Systems. .3 CAN/ULC-S304-06, Signal Receiving Centre and Premise Burglar Alarm Control Units. .4 ULC-306-03 Intrusion Detection Units. .5 ULC-S318-96, Standard for Power Supplies for Burglar Alarm Systems. .6 ULC-C634-86, Guide for the Investigation of Connectors and Switches for Use with Burglar Alarm Systems. .7 ULC-ORD-C1076-86 Proprietary Burglar Alarm Units and Systems.
<u>1.4 DEFINITIONS</u>	.1	Defined acronyms: .1 LCD: Liquid Crystal Display. .2 LED: Light Emitting Diode. .3 PIN: Personal Identification Number. .4 PIR: Passive Infrared Detectors. .5 REX: Request to Exit Device. .6 ACS: Access Control System. .7 KVM Keyboard Video Mouse. .8 RFI: Radio Frequency Interference. .9 STP: Shielded Twisted Pair. .10 UTP: Unshielded Twisted Pair. .11 UPS: Uninterruptible Power Supply. .12 EOL: End of Line.
<u>1.5 WASTE MANAGEMENT AND DISPOSAL</u>	.1	Separate and recycle waste materials in accordance with Section 01 74 20.
<u>1.6 SCOPE OF WORK</u>	.1	Supply and install a new Access Control System (ACS) as shown on the drawings and as specified within these specifications. .2 ACS shall be complete and functioning with all necessary components, programming, configuration, testing, commissioning, patch cables, access cards and interface devices. .3 Develop access group schedules. .4 Coordinate and provide new facility code with the card manufacturer. .5 Collect all user data for system database.

- | | | |
|-------------------------------|-----|--|
| 1.6 SCOPE OF WORK
(Cont'd) | .6 | Provide training and Operation & Maintenance Manuals, as-built documentation, personnel training, demonstration, commissioning and warranty. |
| | .7 | Supply and install ACS as follows: |
| | .1 | Include this building and associated buildings. |
| | .2 | Issue software licenses to Owner authorizing the use of all supplied system software in perpetuity and defining the terms and conditions of post warranty software support, including provision of software upgrades if offered. |
| | .3 | Spare parts. |
| | .8 | All cables will be installed in raceways unless noted otherwise. |
| | .9 | Provide written test results on a door-by-door basis as part of the work. |
| | .10 | Supply and install equipment enclosures to house control panels complete with keyboard/mouse/LCD monitor console. |
| | .11 | Provide recommended spare parts, training and service manuals for maintenance of system. |
| | .12 | Provide list of additional spare parts including manufacturer and model number. |
| 1.7 PERFORMANCE REQUIREMENTS | .1 | System shall be installed to provide ease of operation, servicing, maintenance, testing and expansion of additional services. |
| | .2 | ACS shall support HID Corporate 1000 card data format program (35-bit). |
| | .3 | ACS shall comply with safety requirements specified in accordance with ULC Standards. |
| | .4 | The system shall be provided with a high level of flexibility and comprehensive system management and database reporting capabilities. |
| | .5 | Allow monitoring of overall system for functionality and alarms from multiple points. |
| | .6 | Support multiple access card technologies. |
-

1.7 PERFORMANCE
REQUIREMENTS
(Cont'd)

- .7 Allow or deny access based on criteria established in the software for individual card holders.
- .8 Utilize both access levels and time to determine whether access shall be granted.
- .9 Provide security of door, even in the event communication is lost to the main database, allowing the door to continue to recognize which cards to grant access to and continuing to record access transactions.
- .10 Provide a robust communications protocol to the control panels so that all commands and updates to the panels are verified and will be retried if communications have failed.
- .11 The ACS shall be able to expand in 1 door increments to meet future requirements.
- .12 The ACS shall be capable of interfacing with other systems such as intercom, fire alarm, personal alarm transmitter and CCTV.

1.8 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's literature for each control panel, door device and detection accessory device.
 - .2 Test reports and certificates:
 - .1 Test reports; submit one draft of test plan and report for reviewing including:
 - .1 Procedures for system and equipment testing.
 - .2 Testing checklist.
 - .2 Certificates; submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties:
 - .1 ULC/UL Product Safety Checklists.
 - .3 Training plans and schedules:
 - .1 Submit one draft training plan for review including:
 - .1 Schedule.
 - .2 Sign-up sheets.
 - .3 Reference guides.
 - .4 Detailed training manual.
 - .5 Access group spreadsheet.
-

- 1.8 SUBMITTALS
(Cont'd)
- .4 Shop drawings to indicate:
 - .1 Product data.
 - .2 Door layout, indicate device type at each location.
 - .3 Device mounting and location details.
 - .4 Wiring diagrams.
 - .5 Zone layout drawing indicating number and location of zones and areas covered.
 - .6 Instructions: Submit manufacturer's installation instructions
 - .5 Submit one sample of integrated door lock and five samples of the cards for review and approval by Departmental Representative.

- 1.9 CLOSEOUT
SUBMITTALS
- .1 Operation and Maintenance Manuals to include:
 - .1 Table of contents.
 - .2 Warranty information.
 - .3 Completed test reports and certificates.
 - .4 Parts list indentifying component identification to electronics industry standard and serial numbers.
 - .5 Description of system operation.
 - .6 Functional description of individual equipment pieces.
 - .7 Product data.
 - .8 Manufacturer installation instructions.
 - .9 Maintenance schedule and instructions.
 - .10 Training manual.
 - .2 As-built drawings to indentify:
 - .1 Equipment layout, device type at each location on the floor plans.
 - .2 Typical device connection detail drawings.
 - .3 Equipment and door schedules.

PART 2 - PRODUCTS

- 2.1 SYSTEM
EQUIPMENT
- .1 The operating program should be multi-user and multi-task capable and run on non-proprietary CPU. Widely used application software is based on a standard, high level programming language.
 - .2 Supply and install as required power line conditioner, system power supply, junction box, electronic supervision, system connectors and system cables.
-

2.1 SYSTEM
EQUIPMENT
(Cont'd)

- .3 Supply and install system cables including coaxial cable, multi-conductor control cable, audio and AC power cable as required.
- .4 The system should be easy to use and all commands will be accessible using a mouse or keyboard.
- .5 The system should be modular to facilitate its installation and the development of its capacities while avoiding major modifications in its operation and in saving all defined system and historical data.
- .6 Software:
 - .1 The software used for the system and the development shall be commercially available.
 - .2 All configuration, programming and monitoring of the control panel shall be done through a software program.
 - .3 The software program must have the ability to seamlessly integrate and manage access control, intercom and alarm system functions.
 - .4 Feature shall include but not limited to the following:
 - .1 Anti pass back.
 - .2 Graphics.
 - .3 CCTV integration.
 - .4 Intrusion integration.
 - .5 Badging/photo identification.
 - .6 Block validate cards.
 - .7 Block void cards.
 - .8 Password protection.
 - .9 Clock and calendar, including holiday scheduling.
 - .10 Diagnostics.
 - .11 Door ajar local time.
 - .12 Door ajar remote time.
 - .13 Individual extender held open and strike times.
 - .14 Alarm masking.
 - .15 Elevator control.
 - .16 Lock time.
 - .17 Mantrap.
 - .18 Up to 9 digit PIN codes.
 - .19 Up to 32,000 access level permissions.
 - .20 Allow programming for up to 25 partitions.
 - .21 Event and incident logging.
 - .5 Software shall be capable of operating in English and French.

2.1 SYSTEM
EQUIPMENT
(Cont'd)

- .7 Server components:
 - .1 The system server shall be integrated hardware and software platform that serves as the system management component.
 - .2 It shall provide distributed administration of multiple devices and administer rights and privileges for all attached devices.
 - .3 Minimum hardware requirements:
 - .1 1.3 GHz processor.
 - .2 Supports up to 12 Double Data Rate (DDR) registered ECC Memory, in PC1600 DIMMs. Supported DDR DIMM sizes: 128 MB, 256 MB, 513 MB, 1 GB, and 2 GB. Requires DIMMs to be added in quads of equal capacity.
 - .4 Workstation:
 - .1 The workstation shall be an integrated hardware and software platform that serves as the system management component.
 - .5 Access cards:
 - .1 Standard, plastic, credit card size, sealed and highly resistant to normal handling and weather, fitted with vertical slot punched hole.
 - .2 Guaranteed for specified warranty period against all defects and protected against magnetic encoded cards, metal objects including coins and keys and communication equipment.
 - .3 Coding proximity combined and design with highly secure codification of card information.
 - .4 ISO Thickness, DESFireEV1 aptiQ 16K Bit Memory.

2.2 DOOR CONTROL
EQUIPMENT

- .1 Provide as required equipment cabinets, equipment panels, AC power strips, power line conditioner, system power supply, junction box, door control panels, door activation units, electronic supervising master panel, electronic supervising remote panels, system connectors and system cables.
 - .2 Provide system cables including coaxial cable, multi-conductor control cable, audio and AC power cable as required.
 - .3 The system should be easy to use and designed to maximize tools offered by the Windows
-

2.2 DOOR CONTROL
EQUIPMENT
(Cont'd)

- .3 (Cont'd)
platform. All commands will be accessible using a mouse or keyboard.
- .4 Control panel.
 - .1 The control panel shall be able to operate in a stand alone mode or as part of a system network. All decisions regarding the user access, alarms and automatic timed functions are made at the controller, independent of the computer.
 - .2 The control panel shall have the following features and functionality:
 - .1 Communication direct wire (RS-232/RS-485), Ethernet TCP/IP or dial up communications.
 - .2 Expandable on board memory.
 - .3 12V AC or 12VDC input power.
 - .4 Support HID Corporate 1000 card data format program (35-bit).
 - .5 Flash memory for real time program updates.
 - .6 Battery back-up for event memory.
 - .7 Elevator control support.
 - .8 Status LEDs.
 - .9 Dedicated inputs for tamper and power failure status.
- .5 Door controller.
 - .1 The door controller shall contain the following:
 - .1 Relay for application of power to an electronic locking device, automatic gate or door operator.
 - .2 1.0 A, Form C, dry circuit closure alarm output.
 - .3 The alarm output must be configurable to annunciate the following conditions either via the same relay or separately via an auxiliary relay located on the output board:
 - .1 Door forced condition.
 - .2 Door held open condition.
 - .3 Both conditions.
 - .4 Neither condition.
 - .4 Communication protocol such as RS-485 capable of linking the required number of door controllers into one network.
 - .5 RS-482 serial output for direct connection, modern or Ethernet connection to a personal computer.
 - .6 Door controller shall contain or be configurable to the required number of

2.2 DOOR CONTROL
EQUIPMENT
(Cont'd)

- .5 (Cont'd)
 - .1 (Cont'd)
 - .6 (Cont'd)

inputs and outputs for managing a door, gate or similar entry/exit point.
 - .7 Door controller shall have LCD and LED displays for viewing diagnostic tests, ID functions and programming.
 - .8 All cable and wiring connections shall be of quick disconnect type.
 - .9 Powered from a 120V AC emergency power supply.
 - .10 Internal battery back-up and include the following functionality related to power source:
 - .1 Operating temperature: -10°C to 50°C.
 - .2 Relative humidity: 0% to 90% non-condensing.
- .6 Input module.
 - .1 The input module shall provide alarm input zones and monitor and report line fault conditions, alarm conditions, power faults and tampers. Status LEDs shall provide information about the alarm zone inputs, cabinet tamper and power fault.
 - .2 Input module shall incorporate the following features:
 - .1 Connections to the control panel or door controller.
 - .2 Sufficient current draw.
 - .3 Support single end of line resistors and no end of line zone loops.
 - .4 AUX+ output: 12VDC.
 - .5 Filtered data for noise rejection to prevent false alarms.
 - .6 Dedicated inputs for tamper and power status.
- .7 Output module.
 - .1 The output modules shall provide relay contacts for load switching. The relays shall be configurable for fail safe or fail secure operation. Each relay shall support 'On', 'Off' and 'Pulse'.
 - .2 Output modules shall incorporate the following features:
 - .1 Connects to the control panel or door controller.
 - .2 16 output low current module, 12V.
 - .3 Nominal current draw.
 - .4 Tamper contact.
 - .5 Elevator control support.

2.2 DOOR CONTROL
EQUIPMENT
(Cont'd)

- .8 Card readers.
 - .1 Range up to 15 cm using DESFire EV1 proximity cards with HID Corporate 1000 format.
 - .2 Shall be weatherproof, potted and rugged design.
 - .3 Provide multi-color LED and sound alert for status annunciation.
 - .4 Operating temperature of all readers shall be at least -50°C to 65°C.
 - .5 Accidental or intentional transmission of radio frequency signals into the reader shall not compromise the security access control system.
 - .6 Connection between the reader and the control panel shall be color coded, 6 conductor, #24 AWG or greater gauge, shielded cable. No special connectors shall be required.
- .9 Door position switches.
 - .1 Suitable for type of application.
 - .2 Magnetic contacts shall be triple biased, concealed and have matching color with the door frame.
 - .3 Minimum 3/8" diameter and 1/2" nominal gap distance.
 - .4 If surface mounted type is to be used, it shall be triple biased high security type and the location of application shall be approved by the Departmental Representative.
- .10 Integrated lock.
 - .1 Electric locks shall be integrated mortise latch bolt and multifunction card reader.
- .11 End of line resistors.
 - .1 Supply and install end of line resistors for line supervision.
 - .2 EOLs shall be compatible with line supervision requirements of the system.

2.3 POWER SUPPLY

- .1 Access control panels
 - .1 Continuous low voltage operation output, 12V or 24V DC.
 - .2 Universal AC input (120 to 240V AC).
 - .3 Fused input, auto resetting output overcurrent protection.
 - .4 Overcurrent and overvoltage protection.
 - .5 Power supplies shall meet or exceed all applicable ULC and CSA Standards.
-

- 2.4 UPS
- .1 To overcome the risk of a power outage, an uninterruptible power supply sub-system shall be provided to ensure constant power supply during generator start-up.
 - .2 Should the generator fail to start up and take over after 10 minutes, the system should start the execution of an activity interruption program aimed at placing the system in stand-by-mode in an orderly fashion, without loss of information and prepare it for re-start.
 - .3 The application server should be installed in service mode so that no human intervention is required during re-start.
 - .4 UPS equipment shall be line interactive type.

- 2.5 EQUIPMENT ENCLOSURES
- .1 Cabinets:
 - .1 Wall mounted cabinets shall be properly supported to carry their load and weight.
 - .2 Cabinets shall be able to accommodate all standard 19" frames or components.
 - .3 The cabinet shall be code gauge construction provided with snap catch and brass lock. All cabinets shall be keyed alike.
 - .4 Provide monitored tamper switch.
 - .5 Indoor: NEMA 1 rated, wall mounted, 14 gauge steel cabinet with knockouts. Equipped with fans for ventilation.
 - .6 Outdoor: NEMA 4 rated, wall mounted, 14 gauge steel cabinet without knockouts. Equipped with fans for ventilation and heaters.
 - .7 The cabinet shall be completely earthed and include a vertical earth rail at the back of the cabinet.

- 2.6 CABLES
- .1 Supply and install all cabling as per the manufacturers recommendations.
-

PART 3 - EXECUTION

- 3.1 MANUFACTURER'S INSTRUCTIONS
- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.
- 3.2 INSTALLATION
- .1 Install devices and equipment in locations as noted on the drawings or as determined by site conditions.
- .2 Where the width of a vertical opening shutter or overhead door exceeds three metres, the magnetic contact shall be fitted on both sides.
- .3 Mount EOLs to control supervisory current in each circuit at the device and not in the control panel.
- .4 Cables to be labelled at each end. Labels are to be permanent thermal or heat shrink of suitable size with type written text. Handwritten labels are not permitted.
- .5 Identify all equipment and racks with lamaroid nameplates.
- .6 Use only FT4 rated 1/2" or 3/4" Velcro cable ties. Plastic ty-wraps will not be accepted.
- 3.3 FIELD QUALITY CONTROL
- .1 Manufacturer Services:
- .1 Manufacturer of products, supplied under this Section, to review Work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of Work with Contract.
- .2 Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work at stages listed:
- .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.

3.3 FIELD QUALITY CONTROL (Cont'd)

.1 (Cont'd)

.3 (Cont'd)

.2 Twice during progress of Work at 25% and 60% complete.

.3 Upon completion of Work, after cleaning is carried out.

.4 Obtain reports, within three days of review, and submit, immediately, to Departmental Representative.

3.4 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 manufacturer's representatives are present for verification.

.2 Performance testing.

.1 Test to demonstrate and verify that installed system complies with installation and technical requirements of this specification under operating conditions.

.3 Subsystem functional test.

.1 Conduct operational testing after review of documentation and mechanical inspection completed as follows:

.1 Perform operational test of each subsystem to verify that all equipment is properly connected, interfaced and is functionally operational to meet requirements of this specification.

.2 Safety

.1 Demonstrate with documentation that access control system meets safety requirements specified in UL 294.

.4 Operational verification: Purpose to ensure that devices and systems' performance meet or exceed established functional requirements. Operational verification includes

.1 Operation of each device individually and within its environment.

.2 Operation of each device in relation with programmable schedule and or/specific functions.