

Part 1 **General**

1.1 SECTION INCLUDES

- .1 Intelligent System Controller.
- .2 Card Reader.
- .3 Recessed Door Contacts.
- .4 Access Control System Hardware Enclosures.

1.2 RELATED REQUIREMENTS

- .1 Refer to all Sections of the Technical Specifications and Issued Construction Drawings for all related Work.

1.3 ALTERNATES

- .1 No alternate manufacturers will be accepted other than the Approved Manufacturers specified under this Section.

1.4 WORK INCLUDED

- .1 The Contractor shall design and build a Physical Access Control System based on GENETEC Unified Security Platform.
 - .2 The Contractor shall design and build a system, that is non-proprietary using an open architecture concept.
 - .3 The Contractor shall visit the Site and investigate all new access-controlled doors and their control panels/ head-end locations and verify existing conditions prior to submitting their bid.
 - .4 The Contractor shall supply, install, program, test and commission new Genetec-compatible Access Control Intelligent Controllers, Reader Modules, Input/ Output Modules, and Card Readers to replace the existing non-Genetec compatible counterparts
 - .5 The Contractor shall supply, assemble, and install the access control panels and the required components.
 - .6 The field-level devices i.e., Door Contacts/ Door Position Switches, Electric Door Strikes, and Electrified Exit Device/ Hardware shall be installed as indicated.
 - .7 The Contractor shall verify and certify the product, installation, and performance of supplied, installed, tested, and/ or commissioned software and hardware.
 - .8 All Category 6 and network wiring shall be provided including termination and testing by the Contractor.
 - .9 The Contractor shall supply, install, program, test, and commission all required hardware as per Access Control Hardware Schedule.
 - .10 The Contractor shall complete the wiring to provide a complete an operational system.
 - .11 The Contractor shall coordinate, verify, and confirm all sequence of operations required with the Contract Administrator for the controlled and monitored doors. The Contractor
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shall include and program all these sequences of operations in to the new GENETEC Unified Security Platform.

- .12 The installation of the new equipment shall have “**security**” in mind and follow industry standards and best practices.

1.5 ABBREVIATIONS AND ACRONYMS

- .1 Physical Access Control System (PACS):
 - .1 Control of people through entrances and exits of controlled area. Security utilizing hardware systems and specialized procedures to control and monitor movements within a controlled area.
 - .2 AFF: Above finished floor.
 - .3 CSMS: Centralized Security Management System.
 - .4 EPT/ PTH Electrical Power Transfer/ Power Transfer Hinge.
 - .5 IP: Internet Protocol.
 - .6 ISC: Intelligent System Controller.
 - .7 Maglock: Electromagnetic Lock.
 - .8 PACS: Physical Access Control System.
 - .9 PoE: Power Over Ethernet.
 - .10 REX/ RTE: Request-to-Exit.
 - .11 RIM: Reader Interface Module.
- .12 Refer to all Sections of the Technical Specifications and Issued Construction Drawings for all related abbreviations and acronyms applicable to this Section.

1.6 REFERENCE STANDARDS

- .1 Canadian Standards Association (CSA):
 - .1 CSA C22.1, Canadian Electrical Code (CEC), Part I.
 - .2 CSA C22.1HB, Canadian Electrical Code Handbook - An Explanation of Rules of the Canadian Electrical Code, Part I.
 - .3 CSA C22.2 No. 0.4, Bonding and Grounding of Electrical Equipment.
- .2 Underwriter’s Laboratories Canada (ULC):
 - .1 CAN/ULC-60839-11-1 - Alarm and Electronic Security Systems - Part 11-1, Electronic Access Control Systems - System and Components Requirements.
- .3 Underwriters' Laboratories (UL):
 - .1 UL 294, Access Control System Units.
- .4 Building Industry Consulting Services International (BICSI):
 - .1 BICSI ESSDRM 3rd, Electronic Safety and Security Design Manual, Third Edition.
 - .2 BICSI 005-2013, Electronic Safety and Security (ESS) System Design and Implementation Best Practices.

- .5 Refer to all Sections of the Technical Specifications and Issued Construction Drawings for all related reference standards applicable to this Section.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

- .1 For all submittals including Shop Drawings, refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Action and Informational Submittals.

1.8 CLOSEOUT SUBMITTALS

- .1 For other submittals including As-built Drawings and O&M Manuals, refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Closeout Submittals.

1.9 QUALITY ASSURANCE

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Quality Assurance.
- .2 Qualifications:
 - .1 The Contractor shall be trained and certified by the Approved Manufacturer as listed below:
 - .1 GENETEC

1.10 DELIVERY, STORAGE AND HANDLING

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Delivery, Storage and Handling.

1.11 WARRANTY

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Warranty.

Part 2 Products

2.1 LICENCED PRODUCTS

- .1 The following items shall be integrated into the City Systems, but shall be supplied by the Contractor, and shall be coordinated with the Contract Administrator:
 - .1 All GENETEC Software Licenses – for existing and Contractor Supplied Streamvault,
 - .2 Camera and Access controller licensing,
 - .3 25 Additional Access Control Keyfobs.

The Contractor shall be responsible for the supply of all software and licensing to operate the system during construction and for at least one year after total performance and coordinate all future licensing with the City via the Contract Administrator.

2.2 Master Controller

- .1 General:
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- .1 Provide one new Genetec Synergis Cloudlink controller for the two new buildings.

2.3 INTELLIGENT SYSTEM CONTROLLER

- .1 General:
 - .1 The intelligent controller shall provide decision making, event reporting, and database storage for hardware platform. Two reader interfaces shall provide control for two doors and capable of supporting up to an additional 62 doors in paired and or alternate reader configurations with peripheral interface devices.
 - .2 The controller shall communicate with the host via on-board 100BaseTX Ethernet port link or faster.
 - .3 Two physical barriers shall be controlled. Each reader port shall accommodate HID Signo Card Readers.
- .2 Technical Specifications:
 - .1 Primary Power: twelve to twenty-four volts of direct current (12-24VDC) +/- 10%, 500mA maximum.
 - .2 Communications Ports:
 - .1 Host Port 0: 10/100 Ethernet.
 - .2 Host Port 1: RS-232.
 - .3 Peripheral interface Port: RS-485, 2-wire.
 - .3 Inputs:
 - .1 Eight general purpose - programmable circuit type.
 - .2 Two dedicated: tamper and power monitor.
 - .4 Outputs: Four relays – Form-C, 5 Amp, 30 volts direct current.
 - .5 Readers Ports: Two reader ports:
 - .1 Unregulated pass through (150 mA maximum) or regulated 12VDC.
 - .2 Signaling Clock and Data, Wiegand or 2-wire RS-485.
 - .6 Keypad: Multiplexed with card data.
 - .7 LED: Two-wire or one-wire bicolor support.
 - .8 Buzzer: One-wire LED mode.
 - .9 Temperature: zero to seventy degrees Centigrade (0-70° C) operational, -55 to 85 degrees Centigrade (-55 - 85° C) storage.
 - .10 Humidity: ten to ninety-five percent (10 - 95%) relative humidity, non-condensing (RHNC).
 - .11 Standards:
 - .1 UL294 Recognized, CE Compliant, ROHS,
 - .2 FCC Part 15 Class A, NIST Certified Encryption.
- .3 Technical Features:
 - .1 Connectivity: 10/100 Ethernet, RS-232, Dial-up.
 - .2 Door Control:
 - .1 Two-reader ports: Clock and Data, Wiegand, or RS-485.
 - .2 Eight programmable inputs, four relays, diagnostic LEDs.
 - .3 Access Control:

- .1 240,000 Cardholder capacity, 50,000 Transaction buffer, 32 Access Levels per cardholder, 19-digit (64-bit) user ID and 15-digit PIN numbers maximum, Activation and Deactivation dates, If/then Macro capability.
- .4 Card Formats:
 - .1 Eight active card formats per intelligent controller.
 - .2 19-digit (64-bit) User ID and 15-digit PIN numbers maximum.
 - .3 PIV-II, CAC, TWIC card compatible.
- .5 Card Reader Functions:
 - .1 Multiple card format support by reader.
 - .2 Paired reader support.
 - .3 Alternate reader support.
 - .4 Elevator support.
 - .5 Turnstile support.
 - .6 Biometric device support.
 - .7 Open Supervised Device Protocol (OSDP) compliant.
 - .8 Occupancy count.
 - .9 Support of multi-occupancy rules.
 - .10 Anti-passback support:
 - .1 Area-based, reader-based, or time based.
 - .2 Nested area, hard, soft, or timed forgiveness.
 - .11 Supports host-based approval rules.
 - .12 Keypad support with programmable user commands, card input.
 - .13 Shunt relay support.
 - .14 Strike follower relay support.
- .6 Database Functions:
 - .1 Configurable card database.
 - .2 Supports up to nineteen (19) digital card numbers.
 - .3 Supports pin codes up to fifteen (15) digits.
 - .4 Programmable card activation and deactivation times and dates.
 - .5 Card issue code, ADA and VIP flags (up to 32 bits); PIV (75 bits); Smart Card (200 bits).
 - .6 Up to 128 access levels per user.
 - .7 Ability to track people and objects.
- .7 Intrusion Alarm Functions:
 - .1 Supports entry delays and exit delays.
 - .2 Area monitoring.
 - .3 Standard alarm masking.
 - .4 Provides control and alarm processing from the keypad.
- .4 Acceptable Product:
 - .1 MERCURY SECURITY LP1502.

2.4 POWER SUPPLY MODULE

- .1 Technical Specifications:

- .1 Input Power: 120VAC.
- .2 Output power: 12VDC to 24VDC.
- .3 Operating temperature: -20C to 50C.
- .4 Full load efficiency: 83%
- .5 Low battery disconnect: @70% of battery voltage
- .2 Acceptable product:
 - .1 LifeSafety FPO series power supply with B100 Secondary Power Supply and D8 Power Distribution Module.

2.5 **BACK UP BATTERY**

- .1 A 12 Volt back up battery is to be provided for the access control panel.
- .2 Acceptable product
 - .1 Generic, NP-12 12 Volt battery.

2.6 **READER INTERFACE MODULE**

- .1 General:
 - .1 The peripheral interface device shall provide a solution for interfacing to TTL/Wiegand/RS-485 type readers and door hardware. The intelligent controller shall accept data from a reader with clock/data, Wiegand or RS-485 signaling, provide a tri-stated LED control and buzzer control. It shall also provide six Form-C relay outputs and eight supervised inputs for monitoring. The controller shall communicate via a 2-wire RS-485 interface.
- .2 Technical Specifications:
 - .1 Primary Power:
 - .1 12-24VDC \pm 10%, 150mA maximum.
 - .2 Communication: 2-wire RS-485, 4,000 feet using Belden 9841:
 - .1 Reader Interface: two reader ports, data card/keypad, clock/data, data-1/data-0, or 2-wire RS-485.
 - .2 LED: one-wire bi-color LED support or two-wire.
 - .3 Buzzer: one-wire LED mode.
 - .3 Keypad: 8-bit Mercury, 8-bit Dorado, or 4-bit HID.
 - .4 Pass through or 12VDC regulated power, 125mA each reader.
 - .5 Inputs: eight general purpose programmable type and two dedicated for tamper and power monitor.
 - .6 Outputs: two relays – Form-C, 5 Amps at 30VDC.
 - .7 Temperature: -40 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
 - .8 Humidity: 5-95 percent RHNC.
 - .9 Standards: UL 294 recognized, CE compliant, RoHS.
- .3 Technical Features:
 - .1 Card Formats:
 - .1 19-digit (64-bit) User ID and 15-digit PIN numbers maximum.
 - .2 PIV-II, CAC, TWIC card compatible.

- .2 Card Reader Functions:
 - .1 Multiple card format support by reader.
 - .2 Single reader support.
 - .3 Alternate reader support.
 - .4 Turnstile support.
 - .5 Keypad support with programmable user commands, card input.
 - .6 Shunt relay support.
 - .7 Strike follower relay support.
- .3 Database Functions:
 - .1 Supports up to nineteen (19) digital card numbers.
- .4 Intrusion Alarm Functions:
 - .1 Supports entry delays and exit delays.
 - .2 Provides control and alarm processing from the keypad.
- .5 Offline mode operation:
 - .1 Door mode:
 - .1 Unlocked, locked, facility code only.
 - .2 Relay Mode:
 - .1 Programmable for offline conditions.
- .4 Acceptable Product:
 - .1 MERCURY SECURITY MR50-S3 or equivalent

2.7 LOCK MODULE

- .1 Technical features:
 - .1 Provide multiple outputs for direct lock control.
 - .2 Colour coded by function configuration jumpers for ease of programming.
 - .3 Configurable fail-safe, fail-secure, and dry contact modes of operation.
 - .4 Able to act as Fire Alarm Interface (FAI).
 - .5 Provide fault detection and fault reporting.
- .2 Acceptable product:
 - .1 LifeSafety C8 Lock Module.

2.8 CARD READER

- .1 Typical Read Range:
 - .1 Seos Cards: 4 to 10 cm
 - .2 Prox Cards: 6 to 10 cm
- .2 Mounting: Wall Switch Size.
- .3 Colour: Black.
- .4 Keypad: No.
- .5 Dimensions:
 - .1 HID Singo 20: 4.5 cm W x 12.15 cm L x 1.95 cm D.

- .2 HID Singo 40: 8 cm D x 12.15 cm L x 1.95 cm D.
- .6 Operating Voltage Power supply: 5-16 VDC (Linear Power Supply).
- .7 Peak Current Draw 250 mA.
- .8 Operating Temperature: -35°C to 66°C.
- .9 Operating Humidity: 0% to 95% relative humidity non-condensing.
- .10 Transmit Frequency:
 - .1 2.4 GHz.
 - .2 13.56 MHz.
 - .3 125 kHz.
- .11 Communications:
 - .1 OSDP with SCP over RS-485.
 - .2 Wiegand/ Clock and Data Interface 500 ft. (150m) 22 AWG (Shielded Cable).
- .12 Panel Connection: Terminal Strip.
- .13 Certifications: UL 294/cUL, FCC Certification, Canada Certification.
- .14 Housing Material: UL94 Polycarbonate.
- .15 Warranty: Limited Lifetime.
- .16 Acceptable Product(s):
 - .1 HID Singo 20 mullion
 - .2 HID Singo 40 multiclass reader

2.9 MAGNETIC DOOR CONTACT/ DOOR POSITION SWITCH

- .1 Mounting: Recessed.
- .2 Size: 25.4 mm Dia.
- .3 Circuit: DPDT.
- .4 Gap: 19.05 mm.
- .5 Colour: White.
- .6 Form: Form C.
- .7 Voltage: 175 VDC max.
- .8 Current: 250 mA max.
- .9 Maximum contact resistance: 0.14 ohms.
- .10 Acceptable Product(s): Generic 199-12-WG-W or Approved Equal in Accordance with B8 complete with Generic MC-180 door channel magnet.

2.10 EXIT DEVICE AND ELECTRIC STRIKE

- .1 Motion sensor as request to exit device
 - .1 Technical features:
 - .1 Detector type: Passive Infrared
 - .2 Filter Technology: Digital Signal Processing (DSP)

- .3 Detection range: 3 m to 6 m
- .4 Main contact relay: SPDT, 1A max @30VDC
- .5 Power consumption: 12-28VDC, 50 mA
- .2 Acceptable product: Kantech TREX-LT RTE
- .2 Electric Strike
 - .1 Features:
 - .1 Stainless steel finish.
 - .2 Static strength: 1500 lbs.
 - .3 Field selectable lock mode.
 - .4 Voltage input: 12 or 24 VDC
 - .5 Faceplate: ANSI Grade 1 square corners
 - .2 Acceptable product: RCI 6 line S65U electric Strike, Assa Abloy 5200C or HES 9400 Series.

2.11 ACCESS CONTROL SYSTEM HARDWARE - PANELS AND ENCLOSURES

- .1 All wall-mounted Access Control System Hardware shall be housed in a Manufacturer-approved enclosure.
- .2 All enclosures shall use wire channels when running the wires.
- .3 All enclosures shall be lockable. All keys are to be handed over to the Contract Administrator after commissioning.
- .4 No. of Door(s): Single Door.
- .5 Colour: black.
- .6 Material: 16 Gauge steel.
- .7 Features: Quarter-turn Latch Cover, Louvered, and has main backplate.
- .8 Dimension:
 - .1 20" H x 16" W x 4.5" D.
 - .2 24" H x 20" W x 4.5"D.
- .9 Acceptable Product:
 - .1 LifeSafety Power E2M enclosure.
 - .2 LifeSafety Power E4M enclosure.

Part 3 Execution

3.1 EXAMINATION

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Examination.

3.2 INSTALLATION

- .1 Refer to the following Specifications and related Contract Documents and comply with the installation requirements applicable to this Section:
 - .1 Section 28 05 00 – Common Work Result for Safety and Security Systems.

- .2 Install Physical Access Control System and Components in accordance with:
 - .1 National Building Code of Canada.
 - .2 Canadian Electrical Code.
 - .3 ULC CAN-60839-11-1 – Alarm and Electronic Security Systems - Part 11-1: Electronic Access Control Systems - System and Components Requirements.
 - .4 ANSI/BICSI 005-2016 - Electronic Safety and Security (ESS) System Design and Implementation Best Practices.
- .3 Install Bonding and Grounding in accordance with:
 - .1 Canadian Electrical Code.
 - .2 TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
- .4 Install components in accordance with the Manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.
- .5 Install components secure to walls, ceilings or other substrates.
- .6 Install required boxes in inconspicuous accessible locations.
- .7 Conceal conduit and wiring.
- .8 Provide tamperproof unobtrusive back box with stainless steel cover plate where items installed in areas with suspended ceiling, fixed tile, plaster, or concrete walls, and/or metal door frames.
- .9 Fully enclose cables in conduit or flexible protective armor, from unit location's enclosure back box to and above ceiling and/or wall mounted junction boxes.
- .10 Provide tamperproof attachments for each unit cover plate to receptacle back box.
- .11 Enclose in conduit or flexible protective armor for associated junction box to remaining system locations, from junction box to above ceiling mounted Security cable trays or master Security conduit routes.
- .12 Securely fasten all components to wall, ceiling, or other substrate or structure.
- .13 Provide all necessary interconnections, services and adjustments required for a complete and operable access control system.
- .14 Install control signal, communications, and line grounding as necessary to preclude ground loops, noise, and surges from adversely affecting systems operations.

3.3 IDENTIFICATION AND LABELLING

- .1 Identify and label cables, terminations, devices and equipment as per communications and security standards, industry best practices and Manufacturer's instructions.

3.4 DRAWINGS

- .1 Contractor shall provide complete drawings showing arrangement and wiring of access control system. Drawings shall be AutoCAD format.

3.5 FIELD QUALITY CONTROL

- .1 Manufacturer Certified Access Control Installer:
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- .1 Installer 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 Certified Access Control Installer Field Services:
 - .1 Obtain written reports from manufacturer verifying compliance of Work, in handling, installing, applying, protecting, and cleaning of product.
 - .2 Submit 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 Ensure manufacturer's representative is present before and during critical periods of installation, testing and commissioning.
 - .4 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.
 - .2 Once during progress of Work at 60% and 90% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

3.6 TESTING AND INSPECTION

- .1 Refer to Section 28 08 00 – Testing of Electronic Safety and Security Systems for all related testing and inspection requirements.

3.7 ADJUSTING

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Adjusting.

3.8 CLEANING

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Cleaning.

3.9 PROTECTION

- .1 Refer to Section 28 05 00 – Common Work Results for Electronic Safety and Security under the Article for Protection.

3.10 DEMONSTRATION AND TRAINING

- .1 Notify the Contract Administrator with a minimum of 4 weeks in advance prior to conducting the training.
 - .2 Schedule the demonstration and training at least 10 business days prior to substantial completion and/ or building occupancy or as per the Contract Administrator's suggested date whichever comes first.
 - .3 Provide visual aids including projectors, as applicable.
 - .4 Provide hard copy of training materials and user guides compiled in folders or binders for each participant, as applicable.
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- .5 Provide Records of Attendance Sheets signed both by the trainer and trainees with applicable time and date. Contractor to submit this document as part of the Closeout Submittals.
- .6 The Contractor shall coordinate with Manufacturer in providing support to the Security System training on Site, as applicable.
- .7 Training:
 - .1 Provide a minimum of 2 hours for end-user and operator training.
 - .2 Provide a minimum of 2 hours for maintenance personnel training.

END OF SECTION
