

Part 1 General

1.1 References

- .1 Abbreviations:
 - .1 Electronic Access Control (EAC): 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 CPVX: Central Station Burglar Alarm Systems.
 - .3 CVSG: Mercantile Burglar Alarm Systems.
 - .4 CVWX: Proprietary Burglar Alarm Systems.
 - .5 DRS: Door Release System.
 - .6 PIN: Personal Identification Number.
- .2 Reference Standards:
 - .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S301-09, Standard for Signal Receiving Centre Burglar Alarm System and Operations
 - .2 CAN/ULC-S302-M91(R1999), Standard for Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults.
 - .3 CAN/ULC-S304-06, Signal Receiving Centre and Premise Burglar Alarm Control Units.
 - .4 CAN/ULC-S310-M91(R1999), Installation and Classification of Residential Burglar Alarm Systems.
 - .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.
 - .3 Underwriters' Laboratories (UL)
 - .1 UL 294-2009, Access Control System Units.
 - .2 UL 603-08, Power Supplies for Use with Burglar Alarm Systems.
 - .3 UL 681-1999, Installation and Classification of Burglar and Holdup Alarm Systems.
 - .4 UL 827-2008, Central-Station Alarm Services.
 - .5 UL 1023-2009, Household Burglar Alarm System Units.
 - .6 UL 1076-2005, Safety for Proprietary Burglar Alarm Units and Systems.
 - .7 UL 1641-1999, Safety for Installation and Classification of Residential Burglar Alarm Systems.

1.2 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for access controls and equipment and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
 - .3 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.
- .3 Shop Drawings:
 - .1 Shop drawings to indicate project layout, including details.
 - .1 Shop drawings to indicate, mounting heights and locations, wiring diagrams.
 - .2 Submit zone layout drawing indicating number and location of zones and areas covered.
 - .3 Submit wiring diagrams.
 - .4 Submit complete equipment list.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit 1 sample of each component proposed for inclusion into system. Components will be returned for incorporation into work.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit ULC/UL Product Safety Certificates.
 - .2 Submit verification Certificate that service company is ULC/UL List alarm service company.
 - .3 Submit verification Certificate that security access system is "Certified alarm system".
- .6 Test and Evaluation Reports:
 - .1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .7 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .8 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

- .9 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit Construction/Demolition Waste Management and Disposal in accordance with Section 01 74 21.

1.3 Closeout Submittals

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for access controls and equipment for incorporation into manual.
 - .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.

1.4 Delivery, Storage And Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect access controls and equipment from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 Warranty

- .1 For Access control equipment and materials the 12 month warranty period.
- .2 Manufacturer's Warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.

1.6 Related Sections

- .1 Refer to Section 28 23 00 Video Surveillance for integrated security management software and server.

Part 2 Products

2.1 Materials

- .1 Access Control Panel: Ethernet-Ready Encrypted 4-Door Controller
 - .1 The KT-400 four-door controller is a secure and easy-to-use networked access control solution with support for eight Kantech ioProx XSF entry/exit readers. The KT-400 has an on-board Ethernet port that connects to existing network infrastructure and leverages the benefits of IP-based systems. Combine KT-400 with EntraPass security management software to create a highly scalable solution that can be deployed within one building or across multiple locations. The system easily scales from controlling four doors to a million doors and managing millions of cards at multiple locations.
 - .2 Status Indicators
 - .1 LEDs provide important controller status and diagnostic information. The KT-400 has multiple LED status indicators for: troubleshooting, network activity, power status and outputs activity.
 - .3 Easy Network Connectivity
 - .1 The auto-sensing 10/100Base-T onboard Ethernet port automatically selects compatible Ethernet speeds to provide faster network connectivity. It eliminates the need to purchase an external Ethernet device, saving time and money. The KT-400 uses secure 128-bit AES encryption to communicate with the Gateway.
 - .4 Built-In Expansion
 - .1 The KT-400 allows connection to expansion modules in order to add inputs or to add outputs such as relays and drain outputs. Combining input and output expansion modules provides the flexibility to connect up to 256 inputs and 256 outputs.
 - .5 Removable Terminal Blocks
 - .1 In order to expedite installation and facilitate serviceability, KT-400 features removable terminal blocks that are simple to connect and are color-coded for quick identification.
 - .6 Built-in Web Configuration
 - .1 The web configuration page is accessible through any browser. It can be used to verify and configure the IP settings of the KT-400. For enhanced security, once the KT-400 is configured, the web configuration page can no longer be accessed. The KT-400 can be reset to factory default in the case of a configuration error and the web configuration page will once again be accessible.
 - .7 Occupancy Level Controls
 - .1 KT-400 supports occupancy restrictions for four local areas at the controller level with the anti-passback feature. This feature allows the operator to define a particular area that may have capacity limitations, such as an auditorium, conference room, or laboratory. The KT-400 can

be configured to limit the amount of people permitted into this area. Once the limit has been reached, no additional personnel will be allowed to enter the defined location. This prevents overcrowding or violation of capacity regulations.

- .8 Low Bandwidth Consumption
 - .1 The EntraPass software monitors events occurring at the doors by polling the KT-400 door controllers. The EntraPass Multi-Site Gateway only communicates with the KT-400 if an event has occurred. Communication integrity is ensured through a heartbeat signal which is sent at regular intervals to the EntraPass system. This asynchronous communication significantly reduces the amount of bandwidth required to manage the access control system over the network. If there is a communication failure between EntraPass and the KT-400, an alarm will be triggered in the EntraPass system.
- .9 Supervised Lock Power
 - .1 There are 4 supervised door lock outputs with an internal power supply (12 VDC). In addition, an external power supply (12 VDC – 24 VDC) may also be used to provide power to the lock outputs. This eliminates the need for additional relays. The lock outputs will still be supervised by the KT-400.
- .10 Multiple Communication Ports
 - .1 KT-400 provides multiple controller configurations to suit your specific access control needs. These configurations provide communication with the EntraPass Gateway. You can choose any of the following options:
 - .1 IP (Ethernet)
 - .2 RS-485 (COM1) using a USB to RS-485 converter
 - .3 RS-232 (COM3) for direct connection
- .11 Configurable Reader Outputs
 - .1 There are 4 different possible outputs for each of the 4 onboard reader interfaces for a total of 16 programmable outputs. Reader outputs are used to provide the user with visual (LEDs) and/or audible (buzzer) feedback on access control events.
- .12 End-of-Line Resistors
 - .1 The KT-400 has an onboard capability of monitoring 16 input zones (expandable to maximum 256 zones with the addition of expansion modules). It can support a maximum of 128 inputs using double end-of-line (EOL) resistors or 256 inputs using none or single EOL resistors. This allows the system to monitor more states associated with a customer's installation, significantly increasing the level of security.
- .13 Alarm Panel Integration
 - .1 DSC PowerSeries or MAXSYS alarm panel data integration can be accomplished by connecting it to the KT-400 Controller. Using the KT-400; EntraPass Special, Corporate or Global Editions are able to receive intrusion events, view the status of zones and partitions, and program users' code. In addition the system can be armed/disarmed (single or multiple partitions) via the reader or manual operation from the workstation.
- .14 Elevator Interface

- .1 The KT-400 Ethernet Four-Door Controller supports elevator interfacing with the addition of expansion modules such as the KT-MOD-REL8, KT-MOD-INP16 and KT-MOD-OUT16.
- .15 Physical
 - .1 Cabinet Dimensions
 - .1 (H x W x D) 37.6 x 30.5 x 12.6 cm
 - .2 PCB Dimensions 23.1 x 14.0 x 3.4 cm
 - .3 Cabinet Weight 4.0 kg (8.8 lb)
- .16 Environmental
 - .1 Operating Temperature . . . 2° to 49° C (35° to 120° F); indoor use only
 - .2 Humidity Level Maximum 85% relative humidity non-condensing
- .17 Electrical
 - .1 Power Input
 - .1 KT-400 16.5 VAC or 24 VAC, 75 VA, Class 2 transformer
 - .2 Battery Backup 12 VDC/ 7 or 12 Ah battery supervised; up to 12 hours of operation
 - .3 Reader Power Output . . . Maximum 1.0A @ 5 VDC or 12 VDC, typical 250mA per reader, protected and supervised
- .18 Operational
 - .1 Reader Types Wiegand, proximity, ABA clock and data, bar code, magnetic, integrated keypad, smart card
 - .2 Number of Readers Supported . . . Eight (Kantech ioProx XSF readers only)
 - .3 Monitored Points (Inputs) . . 16 monitored points, single EOL, double EOL
 - .4 Points Maximum Wiring . . . AWG #22 – 600 m (2,000 ft)
 - .5 Door Strike Power 12VDC, maximum 2.0A, typical 500mA per lock, supervised
 - .6 External Lock Power 12 or 24 VDC (up to 28 VDC) supply up to 750 mA per lock for a total of 3 amp
 - .7 Reader Outputs 16 outputs, 25 mA maximum each, open collector outputs
 - .8 Auxiliary Outputs LEDs (door 1, door 2, door 3, door 4, LED, OUT1 and OUT2) and buzzers (Buz,door 1, door 2, door 3, door 4) 25 mA each, open collector outputs
 - .9 Controlled Output Relay . . . Four onboard Form C controlled outputs relay, 30 VDC, 3 amp max each
 - .10 Communication Ports RS-232 with RJ-12, RS-485, Ethernet 10/100Base-T with RJ-45
 - .11 Expansion Port SPI 6-pin connector, bi-directional data exchange supported. Supplies 12 VDC, 500 mA maximum shared with 12 VDC auxiliary port
 - .12 Auxiliary Port Auxiliary 12 VDC, 500 mA maximum shared SPI expansion port

- .13 Communication Speed Up to 115,200 baud (automatic detection over RS-232 and RS-485); 10/100Base-T over Ethernet
- .14 Flash Memory 256 MB for application and data storage (configuration and events can reside for a minimum of 10 years without power)
- .15 RAM 128 MB for application loading and running
- .16 Network Autonomy Distributed data and processing
- .17 Regulatory: EN61000-6-1, EN61000-6-2, EN55022, EN60950, FCC Class B UL-294, UL-1076, RoHS, WEEE, CE
- .19 Model Numbers
 - .1 KT-400 KT-400 PCB, accessory kit and metal cabinet with lock and keys
 - .2 KT-400-PCB KT-400 PCB and accessory kit
- .20 Expansion Modules
 - .1 KT-MOD-INP16 16-zone input module with 41 cm (16 in) SPI cable
 - .2 KT-MOD-REL8 8-relay outputs module with 41 cm (16 in) SPI cable
 - .3 KT-MOD-OUT16 16-zone output module with 41 cm (16 in) SPI cable
- .21 Accessories
 - .1 KT-MOD-SPI-16 SPI cable 41 cm (16 in)
 - .2 KT-MOD-SPI-36 SPI cable 92 cm (36 in)
 - .3 KT-400-ACC Accessory Kit: resistors (4x 1K Ω , 32x 5.6K Ω), ground wire, battery connector and screwdriver
 - .4 KT-400-CAB Black metal cabinet with lock and keys
 - .5 KT-MOD-CAB Cabinet for up to 6 expansion modules, including lock, keys and 92 cm (36 in) SPI cable
 - .6 KT-TAMPER Tamper switch
 - .7 KT-LOCK Cabinet lock and 2 keys
 - .8 KT-400-CON Removable terminal block
 - .9 KT-3LED-PLATE Alarm (3 LED) indicator
- .22 Power Supplies
 - .1 TR1675 Wire-in transformer, 110 VAC/ 16.5 VAC (75 VA), UL approved
 - .2 KT-BATT-12 Gel cell battery, 12 V, 7 Ah
 - .3 KT-BATT-1212 Gel cell battery, 12 V, 12
- .23 Power Supply for Electric Strike
 - .1 Shall be able to convert a 115VAC 60Hz input into sixteen (16) independently controlled 12VDC or 24VDC PTC protected outputs. The outputs shall be activated by an open collector sink or normally open (NO) dry trigger input from an Access Control System, Keypad, Push Button, REX PIR, etc. Units will route power to a variety of access control hardware devices including: Mag Locks, Electric Strikes, Magnetic Door Holders, etc. The FACP Interface enables Emergency

Egress, Alarm Monitoring, or may be used to trigger other auxiliary devices. The fire alarm disconnect feature is individually selectable for any or all of the sixteen (16) outputs.

- .2 Sixteen (16) independently controlled (16) Fail-Safe and/or Fail-Secure power outputs.
- .3 Sixteen (16) auxiliary power outputs (unswitched).
- .4 Output PTCs are rated @ 2.5A.
- .5 Filtered and electronically regulated outputs.
- .6 Supervision:
 - .1 AC Fail
 - .2 Battery Fail and Battery Presence.
- .7 Fire Alarm disconnect (latching or non-latching) is individually selectable for any or all of the sixteen (16) outputs.
- .8 Alarm output relay indicates that FACP input is triggered.
- .9 Fire Alarm disconnect input options:
 - .1 Normally open (NO) or normally closed (NC) dry contact input
 - .2 Polarity reversal input from FACP signaling circuit.
- .10 Built-in charger for sealed lead acid or gel type batteries.
- .11 Instantaneous transfer to stand-by batteries.
- .12 UL Listed in the U.S. and Canada
- .13 Power Input: 115VAC 60Hz
- .14 Voltage Output: 12VDC or 24VDC depending on the Electric strike.
- .15 Power Output: 10A
- .16 Shall be complete with battery.

.2 Security Software

- .1 The corporate security software shall be able to support up to 5 workstations and controls up to 50 doors
- .2 Integrates with Exacq video management systems, American Dynamics DVR's/NVR's(VideoEdge, HDVR, ADTVR, Intellex and Intevo). Integrates with DSC PowerSeries, PowerSeries Neo and Mxsysys intrusion alarm panels.
- .3 Shall be complete with camera and access control licenses.
- .4 For more information on software and server refer to section 28 23 00 Video Surveillance.

.3 Security Server

- .1 The server shall be easy to deploy integrated security platform that gets you up and running in minimal time. It's simple to configure, built on Windows 7 Embedded and includes a customized dashboard for easy system management.
- .2 Shall integrate access control, IP video and intrusion into one common and powerful platform to deliver a holistic security solution. It's pre-loaded with Kantech's EntraPass Corporate Edition software, exacqVision video management software, and includes support for DSC PowerSeries and

MAXSYS intrusion alarm panel integration. Shall be able to provide an ideal platform for small to medium businesses as well as the ability to grow the system to meet organizational needs over time. Shall also be able to support the EntraPass Web remote user platform and the EntraPass Go mobile application right out of the box. It is also compatible with advanced EntraPass features such as Video Vault and Redundant Server. Seamless integration of the latest version of exacqVision video management software and American Dynamics DVRs/NVRs (VideoEdge, HDVR, ADTVR and Intellex) provides real-time video monitoring and playback. The inclusion of exacqVision allows the server to offer faster and more intuitive video searching capabilities.

- .3 For more information on software and server refer to section 28 23 00 Video Surveillance.

- .4 Single door IP door controller

- .1 Supports 2 readers (entry and exit)
- .2 Interchangeable connections for easy install or replacement
- .3 Flexible power input – Power over Ethernet (PoE), PoE+ or 12 VDC
- .4 Compact and attractive design – install it anywhere
- .5 Built-in electronic tamper
- .6 Shall be compatible with security software and uses 128-bit AES encryption to ensure secure communication. It also acts as a polling device to ensure the controllers communicate with EntraPass only as required, reducing network traffic.
- .7 The KT-1 controller has a touch-sensitive button for plug and play installation. Shall have a single button programming, the KT-1 is automatically detected and enrolled onto the EntraPass security management software (v6.02 and higher). With its Ethernet port for direct network connection, its Power over Ethernet capabilities and its unique single button programming, the KT-1 controller is up and running in just a few simple steps.
- .8 A single KT-1 can act as a 'head IP controller', linking together 31 additional controllers under one IP connection in EntraPass. This significantly reduces the amount of IP connections required to EntraPass and reduces programming time on the software. Thus creating installation cost benefits and a highly scalable solution.
- .9 DSC PowerSeries (including NEO) or MAXSYS alarm panel data integration can be accomplished by connecting it to the KT-1 controller (KT-1-PCB model only). Using this controller; EntraPass Special, Corporate or Global Editions are able to receive intrusion events, view the status of zones and partitions, and program users' code. In addition the system can be armed/disarmed (single or multiple partitions) via the reader or manual operation from the workstation.

- .5 Card readers:

- .1 Type: Weigand proximity.
- .2 Communications: weigand/clock and data
- .3 Fitted with LED indicator light.
- .4 Reading distance 25 mm.

- .5 Compatible with client access control hardware and existing reader technology.
 - .6 Proximity Card must be compatible to both existing base building card reader (HID base part number 5355) and 4th floor building renovation card reader (HID multiclass SE base part number 920). The existing card format: H10301, Facility code: start# 7, standard 26 bit format, ISOProx II. The card reader shall be factory programmed to be compatible with existing card system.
 - .7 Multi-Layered Security – Ensures data authenticity and privacy through the multilayered security of HID's SIO.
 - .8 EAL5+ Certified Secure Element Hardware – Provides tamper-proof protection of keys/cryptographic operations.
 - .9 SIO Data Binding – Inhibits data cloning by binding an object to a specific credential.
 - .10 Mobile device support using card emulation - Enables HID access control.
 - .11 SIO Portability – Provides technology independence and portability to other smart card technologies.
 - .12 Upgradeable Hardware Connection – Allows all Wiegand-based communication readers to expand communication capabilities to OSDP, Hi-O and other bidirectional protocols.
 - .13 Field Programmable Readers – Provides secure upgrades for migration and extended lifecycle.
 - .14 Customization and management from a central location – Enables organization to make changes and manage all attached OSDP readers over RS485 wiring.
 - .15 Simultaneous support for 125kHz HID Prox, Indala, AWID and EM4102.
 - .16 Allows for support of future technologies.
 - .17 Secured communications using OSDP with Secure Channel Protocol.
 - .18 Certification: UL294/cUL (US), FCC Certification (US), IC (Canada), CE (EU), C-tick (Australia, New Zealand), SRRC (China), MIC (Korea)4, NCC (Taiwan)4, iDA (Singapore)4, RoHS , FIPS-201 Transparent FASC-N Reader
- .6 Access Control Cards
- .1 Provide 500 proximity cards, cards to be compatible to both base building and 4th floor access control system, confirm type before ordering cards. The existing card format: H10301, Facility code: start# 7, standard 26 bit format, ISOProx II shall be coordinated with Departmental Representative prior to ordering cards. Card reader shall be factory configured and programmed to work with base building cards.
- .7 System Devices:

- .1 Door strike: to be supplied and installed by door hardware supplier and wired by electrical contractor.
- .2 Request to exit motion detector device:
 - .1 Infrared detection, horizontal and vertical targeting for extra layer of security by adjusting the detection zone. The detection area of the sensor shall be able to be adjusted so that it will not "hit" the floor along the doorjamb, defeating any attempt to circumvent door supervision by sliding objects under the door.
 - .2 In addition, it uses infrared detection coupled with DSP sampling to allow the sensor to accurately detect exits and prevent false "Door Forced Open" alarms.
 - .3 Continuous low-voltage operation.
 - .4 Fitted with indicator light.
 - .5 Integrated with local audio alarm (electronic buzzer).
 - .6 Adjustable coverage.
 - .7 Detector Type: Passive infrared
 - .8 Filter Technology: Digital Signal Processing (DSP)
 - .9 Detector Lens: Curtain-type Fresnel lens
 - .10 Detection Range
 - .1 Narrow Targeting Area: 3 m
 - .2 Whole Body: 6 m
 - .11 Piezo Buzzer: 90 dB at 28 VDC, 5-28 VDC, 20 mA (XL & XL2 only)
 - .12 Main Relay Contacts: SPDT, 1A max @ 30 VDC max
 - .13 Main Relay Timer: Adjustable, 0.5 to 60 seconds
 - .14 Main Relay Recycle Timer: Fixed, 0.75 seconds off
 - .15 Lock Control Relay: Available on LT2 and XL2 models only, solid-state relay, N.C., 2A max @ 30 VDC, timed at 2 seconds fixed
 - .16 Tamper Switch: N.C., 100 mA max @ 30 VDC max
 - .17 Indicator Light: Red/Green LED
 - .18 Mounting: Optional backplate available for mounting the T.REX on a standard single-gang electrical box
 - .19 Dimensions (H x W x D): 4.5 x 19 x 4.75 cm
 - .20 Power Consumption: 12-28 VDC, 50 mA
 - .21 Regulatory Certifications: UL294, CE, FCC, ULC
- .3 Door Contacts : ULC approved.
 - .1 Mounting: concealed.
 - .2 Mounting locations: door.
 - .3 Operating gap: 25 mm.
 - .4 Security level: high security
 - .5 Type: magnetic balanced. Complete with 25mm rare earth magnet
 - .6 Colour identical throughout the installation.
 - .7 Provide separate and independent contacts for intrusion

- .8 Sensors shall be installed as close as possible to the leading edge of the door, as a minimum an alarm shall be generated when door movement exceeds 25mm
- .9 UL/ULC approved
- .4 Power supplies:
 - .1 Continuous low-voltage operation output.
 - .2 Equipped with secondary protection for each output.
 - .3 Individual outputs for connection of devices.
 - .4 AC power failure output.
 - .5 DC power failure output and low battery output.
 - .6 Fitted with tamper contact.
 - .7 Wall mounted cabinet with locked door complete with 2 keys.
 - .8 Provide separate power supply for the control panel and separate power supply for all the electric strikes complete with battery back-up.

Part 3 Execution

3.1 Examination

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for access control system installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Installation: Security Access

- .1 Install security access systems and components in accordance with CAN/ULC-S302 CAN/ULC-S310 .
- .2 Install components in accordance with manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.
- .3 Install components secure to walls, ceilings or other substrates.
- .4 Install required boxes in inconspicuous accessible locations.
- .5 Conceal conduit and wiring.

3.3 Site Test And Inspection

- .1 Perform verification inspections and test in presence of Departmental Representative.

- .1 Provide all necessary tools, ladders and equipment.
 - .2 Ensure appropriate subcontractors and manufacturer's representatives and security specialists are present for verification.
 - .3 Ensure that the system is configured through the building Access control system.
- .2 Performance testing:
 - .1 Test procedure: perform test on a "go-no-go" basis.
 - .1 Make only operator adjustments required to show proof of performance.
 - .2 Test to demonstrate and verify that installed system complies with installation and technical requirements of this specification under operating conditions.
 - .3 Test results to be evaluated by Departmental Representative as either acceptable or unacceptable using following procedures.
 - .2 Documentation review:
 - .1 This review will determine if information provided is sufficient to meet requirements of this specification.
 - .2 Provide for review all System manuals, as installed drawings, pretest forms, equipment cabinet pictorial, video and audio equipment details.
 - .3 Mechanical inspection:
 - .1 Departmental Representative and Contractor to tour areas to insure that 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 Dust, debris, etc. are cleaned and removed from site.
 - .2 Equipment is properly labelled.
 - .3 Equipment identified in system's equipment lists are in-place and properly installed.
 - .4 Each System ground method are installed in accordance with manufacturer's instructions and this specification.
- .3 Subsystem functional test:
 - .1 Conduct operational testing after review of documentation and mechanical inspection completed. Proceed 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 Distribution or interface system:
 - .1 Check each door utilizing a volt/ohm (or signal level) meter to confirm each function and to insure that system meets all performance requirements.
 - .3 Total system test:
 - .1 Proceed with testing when system and subsystems are functionally tested and accepted. Total system tests to verify that requirements

have been met for DC sub carrier, and control signals in accordance with this specification.

- .4 Safety:
 - .1 Demonstrate with documentation that access control system meets safety requirements specified in UL 294.
- .4 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 of device locations with reviewed shop drawings.
 - .4 Compatibility of equipment installation with physical environment.
 - .5 Inclusion of all accessories.
 - .6 Device and cabling identification.
 - .7 Application and location of ULC approval decals.
- .5 Technical verification: purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:
 - .1 Validate sensitivity of readers and applicability and application of cards.
 - .2 Connecting joints and equipment fastening.
 - .3 Compliance with manufacturer's specification, product literature and installation instructions.
- .6 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.

3.4 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:
 - .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 and testing.
 - .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 Twice during progress of Work at 25% and 60% complete.
- .3 Upon completion of Work, after cleaning is carried out.

3.5 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove protective coverings from accessories and components.
 - .2 Clean housings and system components, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
 - .3 Clean components free from dirt and fingerprints.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by access controls and equipment installation.

3.7 Training

- .1 Contractor to provide 2 x 2 hour training for user groups and 4 hour training for maintenance staff.

END OF SECTION

Part 1 General

1.1 References

- .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S304-06, Signal Receiving Centre and Premise Burglar Alarm Control Units.
 - .2 CAN/ULC-S306-03, Intrusion Detection Units.
 - .3 ULC-S318-96, Standard for Power Supplies for Burglar Alarm Systems.
 - .4 ULC-C634-M1986, Guide for the Investigation of Connectors and Switches for Use with Burglar Alarm Systems.
- .3 Underwriters' Laboratories (UL)
 - .1 UL 603-08, Power Supplies For Use With Burglar-Alarm Systems.

1.2 Action And Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for control panels, keypad, sensors and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
 - .3 Submit:
 - .1 Functional description of equipment.
 - .2 Technical data for devices.
 - .3 Device location plans and cable lists.
 - .4 Devices mounting location detail drawings.
 - .5 Typical devices connection detail drawings.
- .3 Shop Drawings:
 - .1 Shop drawings to indicate project layout, mounting heights and locations, wiring diagrams, detection device coverage patterns, contact operating gaps, etc.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit UL Product Safety Certificates.
 - .2 Submit verification Certificate that service company is ULC/UL List alarm service company.
 - .3 Submit verification Certificate that intrusion alarm system is Certified Alarm System.

- .5 Test and Evaluation Reports:
 - .1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .6 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .7 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

1.3 Closeout Submittals

- .1 Operation and 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.

1.4 Delivery, Storage And Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect intrusion detection from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return of padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 Warranty

- .1 Manufacturer's Warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.
 - .1 Include manufacturer/dealer recommendations, information and support services for 1 year.

Part 2 Products

2.1 Materials

- .1 Design Criteria:
 - .1 Design intrusion detection system using only ULC/UL listed products.
 - .2 Design intrusion detection system as a ULC/UL certified alarm system.
- .2 Control Panel: ULC approved, expandable and designed for multiplexed expansion.
 - .1 The alarm panel shall have a minimum of 64 zone panel configurations and shall be compatible with the Security Management Software for both Access control and Video surveillance system.
 - .2 Shall have 2-way audio alarm verification via phone and cellular. Alternate Communications via Cellular and IP.
 - .3 Shall be able to perform local and remote downloading.
 - .4 Shall have Multichannel, Frequency Hopping Spread Spectrum technology that enables the system to hop between wireless frequency channels to ensure the seamless transmission of secure communications between the devices and the control panel.
 - .5 Shall have 128 bit AES encryption that offers exceptionally high level of protection against analysis tools and digital attacks.
 - .6 Shall be compatible with access control and video surveillance integrated management software and integrate with access control panel.
 - .7 Control panel shall be complete with power supply to support all active devices, 2 x 7AH capacity battery and metal enclosure with keylock large enough to accommodate the installation of cellular and IP communicator and expansion modules.
 - .8 Power Supply: 16.5 VAC/40 VA @ 50/60 Hz
 - .9 Current Draw (Panel): 85mA (Nominal)
 - .10 Auxiliary Output: 13.75 +/- 5% Vdc/700mA
 - .11 Bell Output: 13.75 +/- 5% Vdc/700mA
 - .12 Acceptable Product: DSC Neo HS2064 complete with input and output modules and additional power supply to support all devices.
- .3 Expansion/Input Module
 - .1 Shall have an 8 zone input module that adds up to eight fully programmable zone to any PowerSeries Neo security system.
 - .2 Supports no end-of-line, single end-of-line and double end-of-line zone loops. (5,600 Ohm resistors)
 - .3 Connect up to 15 modules per system.
 - .4 Tamper contact input.
 - .5 Specifications:
 - .1 HSM2108..... 8 Hardwired Zone Expander
 - .2 Dimensions:.....45mm x 92mm (1.12/16" x 3 5/8")
 - .3 Board Current Draw:130 mA (Max)
 - .4 Voltage:12 VDC Nominal
 - .5 Operating Environment: ... -10°C to 55°C (14°F to 131°F)

- .6 Relative Humidity: 5 to 93%
 - .7 Acceptable Product: DSC Neo HSM2108
- .4 Output Module
 - .1 Shall be a dual-purpose module that provides programmable outputs for controlling external devices, and provides an additional +12 V 1.0 A of additional power.
 - .2 Connect up to 4 modules per system.
 - .3 Fully supervised for AC failure, low battery and AUX failure.
 - .4 Specifications:
 - .1 HSM2204..... High Current PGM Expander
 - .2 Dimensions:.....145mm x 83mm (5 45/64" x 3 17/64")
 - .3 Board Current Draw:.....40 mA (Max)
 - .4 Voltage:12 VDC Nominal
 - .5 Aux Output:1 A Max
 - .6 Transformer Secondary Ratings:.....16.5Vac, 40VA
 - .7 Battery Capacity:4Ah, 7Ah, or 14Ah (2 x 7Ah) max.
 - .8 Operating Environment: ... -10°C to 55°C (14°F to 131°F)
 - .9 Relative Humidity: 5 to 93%
 - .10 Acceptable Product: DSC Neo HSM2204
- .5 Cellular and IP Communicator with serial integration
 - .1 The cellular and IP communicator shall be fully redundant Internet and Cellular dual-path alarm communication Integrated call routing
 - .2 Shall support panel remote uploading/downloading support via Cellular and Internet.
 - .3 Shall have supervision heartbeats via Cellular or Internet
 - .4 128-bit AES encryption via Cellular and Internet
 - .5 Full event reporting
 - .6 SIA and Contact ID protocol
 - .7 Remote activating and programming
 - .8 Programmable via software or keypad
 - .9 UL standard & encrypted line security, ULC passive or active line security levels
 - .10 Active Cellular account is required to use Internet function
 - .11 Visual verification over Cellular or Internet
 - .12 Command and Control via SMS
 - .13 Shall be able to integrate with access control and Entrapass Corporate Edition Security Management software.
 - .14 Supports 3rd party integration via IP
 - .15 Current draw: 120mA
 - .16 Acceptable Product: DSC Neo TL2803G(R)

.6 KeyPad Type 1

- .1 The keypads shall have an input/output terminal that can be programmed to operate as a zone input, programmable output or as a low temperature sensor.
- .2 The keypads shall include adjustable backlit keys that address low-light situations, multiple chimes per zone.
- .3 The keypad shall support up to 128 hardwired, full 32-character programmable labels, full message keypad supports multiple languages, global partition status and full, 32-character programmable phrases.
- .4 Shall have Blue LCD display, Displays outdoor temperature, 5 programmable function keys, Intuitive clock programming, Fire, medical and panic keys
- .5 Shall have adjustable backlight and keypad buzzer.
- .6 Dimensions: 154 mm x 113 mm x 20.5 mm
- .7 LCD Viewable Area: 99 mm x 24 mm
- .8 Current Draw: 125 mA (Max)
- .9 Voltage: 12 VDC Nominal
- .10 Operating Environment: 0° to 49° C
- .11 Relative Humidity: 5 to 93%
- .12 Acceptable Product: DSC Neo HS2LCD

.7 KeyPad Type 2

- .1 The keypads shall have an input/output terminal that can be programmed to operate as a zone input, programmable output or as a low temperature sensor.
- .2 The keypads shall include adjustable backlit keys that address low-light situations, multiple chimes per zone.
- .3 The keypad shall support up to 128 hardwired and wireless zones with built-in wireless transceiver, full 32-character programmable labels, full message keypad supports multiple languages, global partition status and full, 32-character programmable phrases.
- .4 Shall have Blue LCD display, Displays outdoor temperature, 5 programmable function keys, Intuitive clock programming, Fire, medical and panic keys
- .5 Shall have adjustable backlight and keypad buzzer.
- .6 Dimensions: 154 mm x 113 mm x 20.5 mm
- .7 LCD Viewable Area: 99 mm x 24 mm
- .8 Current Draw: 125 mA (Max)
- .9 Voltage: 12 VDC Nominal
- .10 Operating Environment: 0° to 49° C
- .11 Relative Humidity: 5 to 93%
- .12 Acceptable Product: DSC Neo HS2LCDRF9

.8 Wireless Panic Button

- .1 The Wireless Panic Key is a portable personal protection device which allows users to send an emergency notification to the security system, via one large,

easy-to-use button, thus alerting authorities. This attractive, compact and water resistant panic key can be worn around the neck or permanently mounted/clipped to a belt with the multifunction clip.

- .2 When the button of the wireless panic key is pressed, the visual LED indicator confirms the command has been successfully carried out by the security system. The confirmation that the message has been executed by the security system offers 'peace of mind' to users.
- .3 It shall be equipped with a full two-second activation delay to help reduce false alarms, thus minimizing costly false dispatches caused by accidental activations.
- .4 With only a single, large and clearly defined panic button, the wireless panic key allows for trouble-free activation in stressful emergency situations. Portable and simple to use, it allows users to call for support from anywhere within the premises.
- .5 Dimensions: 53 mm x 33 mm x 11 mm
- .6 Weight: 15 g
- .7 Battery: CR2032 (3V Lithium)
- .8 Operating Temperature: -10° to 55°C
- .9 Acceptable Product: DSC Neo PG9938

.9 Detection Accessories:

- .1 Passive Infrared /Microwave Detectors (PIR's): Type 1
 - .1 Coverage pattern: minimum 12m, 90 degrees.
 - .2 Shall have an active infrared anti-mask. Detects attempts to obscure the detector's field of view.
 - .3 Shall have a passive infrared and microwave Doppler radar detection with First Step Processing for superior catch performance and best-in-class false alarm immunity
 - .4 Shall have a Microwave Noise Adaptive Processing. Avoids false
 - .5 alarms from repetitive sources.
 - .6 The detector intelligently adjusts its sensitivity so that it can identify human intruders at virtually any temperature.
 - .7 Shall have small animal immunity feature reduces false alarms from small animals up to 4.5 kg (10 lbs) that may move on the floor within the coverage area of the detector.
 - .8 With Integrated EOL resistors.
 - .9 Shall have flexible mounting height, no adjustments. Reduces installation time and false alarms, improves catch performance.
 - .10 Mounting: wall and ceiling.
 - .11 Current: Standby = 15 mA (UL: Maximum current = 35 mA)
 - .12 Voltage (operating): 9 VDC to 15 VDC
 - .13 Radio Frequency Interference (RFI) Immunity
 - .1 No alarm or setup on critical frequencies in the range from 150 kHz to 2.7 GHz at field strengths less than 10 V/m.

- .14 Acceptable Manufacturer: Bosch, DSC complete with ceiling mount vertical swivel; range is +7° to -16°, while the horizontal swivel range is ±45.
- .2 Passive Infrared/Microwave Detectors (PIR's): Type 2 Long range.
 - .1 Coverage pattern: minimum 30m, 90 degrees.
 - .2 Temperature requirement: 0 – 40 degrees Celsius.
 - .3 Tamper switch.
 - .4 Mounting: wall and ceiling.
 - .5 EN501-2-4 Grade 2 compliant
 - .6 Range adaptive radar and active white light suppression.
 - .7 The microwave transceiver automatically adjusts its detection thresholds based on input from the PIR sensors. Integrating the target distance information from the PIR significantly reduces false alarms from the microwave Doppler radar.
 - .8 An internal light sensor measures the level of light intensity directed at the face of the detector. Sensor data fusion technology uses this information to eliminate false alarms from bright light sources.
 - .9 The detector automatically adjusts PIR sensitivity to identify human intruders at critical temperatures. Dynamic temperature compensation detects human body heat accurately, avoids false alarms, and delivers consistent catch performance at all operating temperatures.
 - .10 Sensor data fusion technology is a unique feature that uses a sophisticated software algorithm to gather signals from five sensors: two pyroelectric sensors, a range adaptive radar sensor, a room temperature sensor, and a white light level sensor. The microcontroller analyzes and compares the sensor data to make the most intelligent alarm decisions in the security industry.
 - .11 Power Requirements
 - .1 Voltage (Operating): 9 VDC to 15 VDC
 - .2 Current (Maximum): < 26 mA with alarm, trouble, and LEDs active.
 - .3 Current (Standby): 18 mA at 12 VDC
 - .12 Outputs for both Models
 - .1 Tamper: Normally-closed (NC) contacts (with cover on) rated at 25 VDC, 125 mA maximum. Connect tamper circuit to 24-hour protection circuit.
 - .13 Trouble: Solid state relay normally-closed (NC) contacts.
 - .14 Alarm: Solid state relay, normally-closed (NC) contacts, power supervised. 3 W, 125 mA, 25 DC, resistance < 10 Ω.
 - .15 Enclosure Design
 - .1 Color: White
 - .2 Dimensions: 127 mm x 69 mm x 58 mm
 - .16 Material: High-impact ABS plastic
 - .17 Indicators

- .1 Alarm Indicator: • Blue LED for TriTech+ alarms
 - .1 Yellow LED for microwave detection
 - .2 Red LED for PIR detection
 - .18 Acceptable Manufacturer: Bosch, DSC complete with ceiling mount vertical swivel; range is +7° to -16°, while the horizontal swivel range is ±45.
- .3 Glass break detector:
 - .1 ULC approved, complete with tamperproof switch and be designed to meet temperature and mounting requirements of project.
 - .2 Shall have Omnidirectional microphone and advanced microprocessor-based glassbreak sensor.
 - .3 Shall have high-level static and transient protection and high RF immunity with SMD construction.
 - .4 Shall have a white noise rejection mechanism.
 - .5 Shall have installer test mode and alarm memory (latching LED) for glassbreak sensor
 - .6 Shall be equipped with MOV transient / static protection.
 - .7 Shall have a sensitivity selection range.
 - .8 Coverage pattern: 7.5m omnidirectional. Range is adjustable; no minimum range.
 - .9 Wall-Mount Models
 - .1 Dimensions: 89 mm x 64 mm x 20 mm
 - .2 Input Voltage: 9 to 16 VDC
 - .3 Current Draw: 12 mA to 12 VDC
 - .4 Current in Alarm: 35 mA @ 12 VDC
 - .5 Alarm Relay: Contact Rating: 1 Amp @ 24 VDC
 - .6 Tamper Switch: Contact Rating: 0.1 Amp @ 24 VDC
 - .7 Microphone Type: Omnidirectional Electret
 - .10 Ceiling-Mount Models
 - .1 Dimensions: 117 mm x 36 mm
 - .2 Input Voltage: 9 to 14.5 VDC
 - .3 Current Draw: 24 mA to 12 VDC
 - .4 Current in Alarm: 32 mA @ 12 VDC
 - .5 Alarm Relay: Contact Rating: 1 Amp @ 24 VDC
 - .6 Tamper Switch: Contact Rating: 0.1 Amp @ 24 VDC
 - .7 Microphone Type: Omnidirectional Electret
- .4 Door Contacts : ULC approved.
 - .1 Mounting: concealed.
 - .2 Mounting locations: door.
 - .3 Operating gap: 25 mm.
 - .4 Security level: high security

- .5 Type: magnetic balanced. Complete with 25mm rare earth magnet
 - .6 Colour identical throughout the installation.
 - .7 Provide separate and independent contacts for intrusion
 - .8 Sensors shall be installed as close as possible to the leading edge of the door, as a minimum an alarm shall be generated when door movement exceeds 25mm
 - .9 UL/ULC approved
- .10 DURESS PUSH BUTTON (Reception Desk)
- .1 The unit consists of a housing that contains the electrical circuitry and magnetic reed contacts, a cover plate to protect the internal electronics and an actuating lever with an Alnico V magnet installed in a cradle in the lever. When the lever is fully closed, the magnet — in proximity to the reed — triggers the circuit. The alarm occurs when the actuating lever is moved 20° to 45° past the fully closed position (approximately 25mm from the fully closed position). On the latching models, an LED on the unit flashes and latches when the lever is opened. It can be reset only at the alarm panel.
 - .2 Nominal Voltage: 12 V DC @ 6 mA
 - .3 Current: Max 8 mA
 - .4 Operational Voltage: 7 V DC to 15 V DC
 - .5 Temperature Range: -17.8°C to 43.3°C
 - .6 Dimensions: 4.50 cm W x 7.37 cm L x 1.93 cm H
 - .7 Weight: 1.5 oz.
 - .8 Housing Material: ABS plastic
 - .9 Form C: Voltage: 30 V
 - .10 DC max. Current: 0.25 A max.
 - .11 Power: 3 W m
- .11 DURESS PUSH BUTTON (Interview room)
- .1 Two (2)Form “C” contacts, DPDT, rated 10amps @ 125/250 VAC, 1/2 HP, 6 amps @ 30 VDC..
 - .2 Shall have momentary button, complete with clear polycarbonate protective cover to help stop false alarm. With customizable text and colour selection options.
 - .3 Shall be mounted flush on wall.
- .12 MULTI-TONE ELECTRONIC CHIME
- .1 Three different tones: single tone chime, dual tone chime, and fading tone chime
 - .2 Any combination of the three tones may be used
 - .3 Includes high-low volume control
 - .4 Mounts into a single gang box
 - .5 12-24 VDC Multi-tone Electronic Chime

- .6 Operating voltage: 12 - 24 VDC
 - .7 Sound output: 80 - 88 dB @ 12 - 24 VDC
 - .8 Current draw: 70 - 180 mA @ 12 - 24 VDC
 - .9 Dimensions: 4.6" x 3" x 1.5"
 - .10 Color: White
 - .11 Material: ABS plastic
 - .12 Wiring: Positive, common, and three positive triggers
- .13 STROBE LIGHT
- .1 The Strobe light shall have a low current consumption, weather-proof strobe in its class. Shall operate on 12V DC and draws a low 115mA.
 - .2 Shall be made of high impact resistant thermoplastic to stand up to abuse. The strobe is rated at 60,000 candle power output.
 - .3 Shall have an operating life in excess of 200 hours of continuous operation.
 - .4 Shall be a 2-wire connection with reverse polarity protection.
 - .5 Shall have a two-colored lead wires AWG#22 for input power connection
 - .6 Lens colors: blue
 - .7 Flash rate: 60 – 100 per minute
 - .8 Operating voltage: 9.6 -14.4VDC
 - .9 Current draw: Max 200mA
 - .10 Dimension: overall diameter 90mm, overall height 77mm
 - .11 Acceptable Product: Amseco SL-401 colour Blue, Seco-Larm SL-126Q colour Blue, Federal Signal SLM300 colour Blue shallow base.
- .14 POWER SUPPLY
- .1 The power supply/charger that converts a 115VAC 60Hz input into a single 12VDC non power-limited output.
 - .2 Input:
 - .1 Input 115VAC, 60Hz, 2.6 amp.
 - .2 Input fuse rated @ 5 amp/250V.
 - .3 Output:
 - .1 12VDC output.
 - .2 10 amp continuous supply current.
 - .3 Output fuse rated @ 15 amp/32V.
 - .4 Filtered and electronically regulated output.
 - .5 Short circuit and thermal overload protection.
 - .4 Battery Backup:
 - .1 Built-in charger for sealed lead acid or gel type batteries.
 - .2 Automatic switch over to stand-by battery when AC fails.
 - .3 Maximum charge current 0.7 amp.
 - .5 Supervision:

- .1 AC fail supervision (form "C" contacts). Notification trigger is selectable for 30 seconds (factory set) or 6 hours.
 - .2 Low battery supervision (form "C" contacts).
 - .3 Battery presence supervision (form "C" contacts).
 - .6 Visual Indicators: AC input and DC output LED indicators.
 - .7 Electrical:
 - .1 Operating temperature: 0° C to 49° C ambient.
 - .2 61.42 BTU/Hr.
 - .3 System AC input VA requirement: 299VA.
 - .8 Mechanical:
 - .1 Enclosure Dimensions (H x W x D approx.): 15.5" x 12" x 4.5" (393.7mm x 304.8mm x 114.3mm) - Accommodates one (1) 12VDC/12AH batteries
- .15 Relay Module
- .1 The Relay module shall be able to convert one (1) 12 to 24 volt AC or DC input into four (4) independently controlled PTC protected outputs. Outputs are activated by an open collector sink or normally open (NO) dry trigger input from an Access Control System, Card Reader, Keypad, Push Button, PIR, etc. The relay module shall be able to route power to a variety of devices. Units shall be powered by one common power source which will provide power for both the board operation and devices, or two (2) totally independent power sources, one (1) providing power for board operation and the other for devices / accessory power. The FACP Interface enables Emergency Egress, Alarm Monitoring, or may be used to trigger other auxiliary devices. The fire alarm disconnect feature is individually selectable for any or all of the four (4) outputs.
 - .2 Input
 - .1 Voltage: 12 to 24 VAC or VDC operation (setting not required), 0.4A @ 12V, 0.2A @ 24V current consumption with all relays energized.
 - .2 Trigger Inputs: Four (4) Access Control System trigger inputs:
 - .1 Four (4) normally open (NO) inputs.
 - .2 Four (4) open collector sink inputs.
 - .3 Any combination of the above.
 - .3 Input Options:
 - .1 One (1) common power input (board and lock power).
 - .2 Two (2) isolated power inputs (one (1) for board power and one (1) for lock/accessory power).
 - .4 Outputs
 - .1 Four (4) Fail-Safe and/or Fail-Secure power outputs.
 - .2 Four (4) auxiliary power outputs (unswitched).
 - .5 Output ratings:
 - .1 Output PTCs are rated 2A each.
 - .2 Main fuse is rated at 10A.
 - .6 Indicators (LED)
 - .1 Red LEDs Outputs are triggered (relays energized).

- .2 Green LED FACP disconnect is triggered.
- .7 Agency Listings
 - .1 UL: Access Control UL294
 - .2 cUL: General Signaling Equipment Evaluated to CSA Standard C22.2 No.205-M1983.
- .8 Physical and Environmental Dimensions (W x L x H) 5.175" x 3.36" x 1.25" (131.4mm x 85.3mm x 31.8mm).
- .9 Temperature
 - .1 Operating 0°C to 49°C (32°F to 120°F).
 - .2 Storage -20°C to 70° C (-4°F to 158°F).
- .10 Relative Humidity 85% +/-5%.
 - .1 BTU/Hr (approx.): 12VAC or VDC: 1.5 BTU/Hr., 24VAC or VDC: 2.5 BTU/Hr.

Part 3 Execution

3.1 Examination

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for intrusion detection installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of .
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Installation

- .1 Install panels, intrusion detection system and components in accordance with manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.
- .2 Install panels, intrusion detection system and components secure to walls, ceilings or other substrates.
- .3 Install required boxes in inconspicuous accessible locations.
- .4 Conceal conduit and wiring.
- .5 The strobe light and multi-tone electronic chime shall be programmed to turn on a selected tone when any of the duress alarm button is pressed and will be reset through the intrusion alarm keypad. A pre-alert tone will be configured and programmed for auto-arming notification.
- .6 Coordinate with Departmental Representative pertaining to programming features.

3.3 Site Test And Inspection

- .1 Perform verification inspections and test in the presence of Departmental Representative.

- .1 Provide necessary tools, ladders and equipment.
 - .2 Ensure appropriate subcontractors , and manufacturer's representatives and security specialists are present for verification.
- .2 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 of device locations with reviewed shop drawings.
 - .4 Compatibility of equipment installation with physical environment.
 - .5 Inclusion of all accessories.
 - .6 Device and cabling identification.
 - .7 Application and location of ULC approval decals.
- .3 Technical verification: purpose to ensure that all systems and devices are properly install and free of defects and damage. Technical verification includes:
 - .1 Measurements of coverage patterns
 - .2 Connecting joints and equipment fastening.
 - .3 Compliance with manufacturer's specification, product literature and installation instructions.
- .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.

3.4 Field Quality Control

- .1 Manufacturer's 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 testing.
 - .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 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.

3.5 Adjusting

- .1 Adjust all components for correct function.

3.6 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove protective coverings from accessories and components.
 - .2 Clean housings and system components, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by intrusion detection installation.

3.8 Training

- .1 Contractor to provide 2 x 2 hour training for user groups and 4 hour training for maintenance staff.

END OF SECTION

Part 1 General

1.1 References

- .1 Underwriters Laboratories of Canada (ULC)
 - .1 ULC-S317-1996, Installation and Classification of Closed Circuit Video Equipment (CCVE) Systems for Institutional and Commercial Security Systems.

1.2 Action And Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for video surveillance equipment and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit:
 - .1 Functional description of equipment.
 - .2 Technical data sheets of all devices.
 - .3 Device location plans and cable lists.
 - .4 Video camera surveillance chart.
 - .5 Video interconnection detail drawings.
- .3 Shop Drawings:
 - .1 Submit shop drawings to indicate project layout, camera locations, point-to-point diagrams, cable schematics, risers, mounting details and identification labeling scheme.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit 1 sample of each camera selected complete with housing, brackets and mounting hardware.
 - .4 Camera will be returned for incorporation into work as appropriate.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit UL Product safety Certificates.
 - .2 Submit verification Certificate that service company is "UL List alarm service company".
 - .3 Submit verification Certificate that monitoring facility is "UL Listed central station".
 - .4 Submit verification Certificate that video surveillance system is "Certified alarm system".
- .6 Test and Evaluation Reports:

- .1 Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .7 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .8 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.
- .9 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

1.3 Closeout Submittals

- .1 Operation and Maintenance Data: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals. Include following:
 - .1 System configuration and equipment physical layout.
 - .2 Functional description of equipment.
 - .3 Manufacturer's Instructions for operation, adjustment and cleaning.
 - .4 Illustrations and diagrams to supplement procedures.

1.4 Delivery, Storage And Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect video surveillance materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.5 Warranty

- .1 Manufacturer's Warranty: submit, for Landlord's acceptance, manufacturer's standard warranty document executed by authorized company official.
- .2 All security system components and labor furnished by the contractor including wiring, software, hardware and custom parts shall be fully warranted for parts, materials, labor and travel expenses for a minimum of three (3) years from date of the final acceptance of the Video Surveillance System.

Part 2 Products

2.1 Design Criteria

- .1 Cameras shall be IP-based and comply with established network and video standards.
- .2 Cameras shall be powered by the switch utilizing the network cable. Power injectors (midspans) shall be provided by the contractor when required for proper operation.
- .3 Cameras shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
- .4 Cameras shall comply with relevant ONVIF profile as defined by the ONVIF Organization.

2.2 Characteristics

- .1 Video Surveillance Camera:
 - .1 The fixed dome network camera shall meet or exceed the following design specifications:
 - .1 The camera shall operate on an open source; Linux-based platform, and including a built-in web server.
 - .2 The camera shall be equipped with an IR-sensitive progressive scan megapixel sensor.
 - .3 The camera shall provide a removable IR-cut filter, providing day/night functionality.
 - .4 The camera shall be equipped with a varifocal lens with P-iris.
 - .5 The camera shall provide local video storage utilizing a microSD/microSDHC/microSDXC memory card expansion.
 - .6 The camera shall be manufactured with an IP52-rated, IK08 impact-resistant, polycarbonate casing.
 - .7 The camera shall provide a manual 3-axis (pan/tilt/rotation) positioning to allow adjustment for optimum camera rotation and placement.
 - .8 The camera shall provide options for clear and smoked lower dome.
 - .2 The fixed dome network camera shall meet or exceed the following performance specifications:
 - .1 Illumination
 - .1 The camera shall meet or exceed the following illumination specifications:
 - .1 HDTV 1080p 25/30 fps with WDR - forensic capture
 - .1 0.16 lux, F1.6 (color)
 - .2 0.03 lux, F1.6, 0 lux with IR illumination on (B/W)
 - .2 HDTV 1080p 50/60 fps without WDR - forensic capture
 - .1 0.32 lux, F1.6 (color)

- .2 0.06 lux, F1.6, 0 lux with IR illumination on (B/W)
- .2 Resolution
 - .1 The camera shall be designed to provide at least two video streams in HDTV 1080p (1920x1080) at up to 60 frames per second (60Hz mode) or 50 frames per second (50Hz mode) using H.264 or Motion JPEG (WDR inactive).
 - .2 The camera shall be designed to provide at least two video streams in HDTV 1080p (1920x1080) at up to 30 frames per second (60Hz mode) or 25 frames per second (50Hz mode) using H.264 or Motion JPEG (WDR active).
 - .3 The camera shall be designed to provide 2 individually cropped out view areas.
 - .4 The camera shall support video resolutions including:
 - .1 1920x1080 (HDTV 1080p)
 - .2 1280x960
 - .3 1280x720 (HDTV 720p)
 - .4 1024x768
 - .5 1024x640
 - .5 The camera shall provide both landscape format (4:3 and 16:9 aspect ratio) as well as corridor format (3:4 and 9:16 aspect ratio).
- .3 Encoding
 - .1 The camera shall support the following video encoding algorithms:
 - .1 Motion JPEG encoding in a selectable range from 1 up to 25/30 frames per second.
 - .2 Motion JPEG encoding in a selectable range from 1 up to 50/60 frames per second.
 - .3 Baseline Profile H.264 encoding with motion estimation in up to 25/30 frames per second.
 - .4 Baseline Profile H.264 encoding with motion estimation in up to 50/60 frames per second.
 - .5 Main Profile H.264 encoding with motion estimation and context-adaptive binary arithmetic coding (CABAC) in up to 25/30 frames per second.
 - .6 Main Profile H.264 encoding with motion estimation and context-adaptive binary arithmetic coding (CABAC) in up to 50/60 frames per second.
 - .7 Support High Profile H.264 encoding with motion estimation up to 25/30 frames per second.
 - .8 Support High Profile H.264 encoding with motion estimation up to 50/60 frames per second.
 - .9 Support H.264 with automatic scene adaptive bitrate control.

- .2 The camera shall provide independently configured simultaneous H.264 and Motion JPEG streams.
- .3 The camera shall in H.264 support Variable Bit Rate (VBR) for video quality adapted to scene content. To protect the network from unexpected bit rate spikes the camera shall support Constant Bit Rate (CBR) or Maximum Bit Rate (MBR).
- .4 The camera shall provide configurable compression levels.
- .5 Support standard baseline profile H.264 with motion estimation.
- .6 Support motion estimation in H.264/MPEG-4 Part 10/AVC.
- .7 The camera shall for its H.264 implementation support scene adaptive bitrate control with automatic dynamic ROI to reduce bitrate in unprioritized regions in order to lowering bandwidth and storage requirements.
- .4 Transmission
 - .1 The camera shall allow for video to be transported over:
 - .1 HTTP (Unicast)
 - .2 HTTPS (Unicast)
 - .3 RTP (Unicast & Multicast)
 - .4 RTP over RTSP (Unicast)
 - .5 RTP over RTSP over HTTP (Unicast)
 - .2 The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
- .5 Image
 - .1 The camera shall incorporate Automatic and Manual White Balance.
 - .2 The camera shall incorporate an electronic shutter operating in the range of 1/66500 s to 1 s.
 - .3 The camera shall incorporate capture mode with the following settings:
 - .1 25/30 fps (WDR-Forensic Capture) (50/60 Hz)
 - .2 50/60 fps (no WDR-Forensic Capture) (50/60 Hz)
 - .4 The camera shall incorporate Wide Dynamic Range - Forensic Capture functionality providing up to 120dB dynamic range.
 - .5 The camera shall support manually defined values for:
 - .1 Color level
 - .2 Brightness
 - .3 Sharpness
 - .4 Contrast
 - .6 The camera shall incorporate a function for optimization of low light behavior.

- .7 The camera shall allow for rotation of the image in steps of 90°.
- .6 IR Illumination
 - .1 The camera shall be equipped with built-in IR LEDs with adjustable illumination intensity.
 - .1 The IR LEDs shall have a range of up to 30 m (100 ft).
 - .2 The IR LEDs shall emit light with a wavelength of 850 nm.
- .7 User Interface
 - .1 Web server
 - .1 The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
 - .2 Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.
 - .2 Language Specification
 - .1 The camera shall provide a function for altering the language of the user interface, and shall include support for at least 10 different languages.
 - .3 IP addresses
 - .1 The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
 - .2 The camera shall allow for automatic detection of the camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.
 - .3 The camera shall provide support for both IPv4 and IPv6.
- .8 PTZ functionality
 - .1 The camera shall:
 - .1 Provide Digital PTZ functionality.
- .9 Event functionality
 - .1 The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - .1 Video Motion Detection
 - .2 Live Stream Accessed
 - .3 Day/Night Mode
 - .4 Camera tampering
 - .5 Manual Trigger/Virtual Inputs
 - .6 PTZ functionality
 - .7 Embedded third party applications

- .8 Edge storage disruption detection
 - .2 Response to triggers shall include:
 - .1 Send notification, using HTTP, HTTPS, TCP, SNMP trap or email
 - .2 Send images, using FTP, HTTP, HTTPS, network share or email
 - .3 Send video clip, using FTP, HTTP, HTTPS, network share or email
 - .4 Send SNMP trap message
 - .5 Activate/Deactivate IR Illumination
 - .6 Recording to local storage and/or network attached storage
 - .7 PTZ control functionality
 - .8 WDR mode
 - .3 The camera shall provide memory for pre & post alarm recordings.
- .10 Edge storage
 - .1 The camera shall support continuous and event controlled recording to:
 - .1 Local memory added to the cameras microSD-card slot
 - .2 Network attached storage, located on the local network
 - .2 The camera shall be able to detect and notify Edge storage disruptions.
- .11 Protocol
 - .1 The camera shall incorporate support for at least IPv4/v6, HTTP, HTTPS, SSL/TLS, QoS Layer 3 DiffServ, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, SSH, NTP, CIFS/SMB, Bonjour.
 - .2 The SMTP implementation shall include support for SMTP authentication.
- .12 Text overlay
 - .1 The camera shall:
 - .1 Provide embedded on-screen text with support for date & time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 - .2 Provide the ability to apply privacy masks to the image.
 - .3 Allow for the overlay of a graphical image, such as a logotype, into the image.
- .13 Security
 - .1 The camera shall support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt

- and secure authentication and communication of both administration data and video streams.
- .2 The camera shall provide centralized certificate management, with both pre-installed CA certificates and the ability to upload additional CA certificates. The certificates shall be signed by an organization providing digital trust services.
- .3 The camera shall support IEEE 802.1X authentication.
- .4 The camera shall provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.
- .5 The camera shall restrict access to the built-in web server by usernames and passwords at three different levels.
- .14 API support
 - .1 The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
 - .2 The camera shall support relevant ONVIF profiles as defined by the ONVIF Organization.
- .15 Embedded applications
 - .1 The camera shall provide a platform allowing the upload of third party applications into the camera.
- .16 Installation and maintenance
 - .1 The camera shall be supplied with Windows-based management software which allows the assignment of IP addresses, upgrade of firmware and backup of the cameras' configuration.
 - .2 The camera shall support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
 - .3 The camera shall allow updates of the software (firmware) over the network, using FTP or HTTP.
 - .4 The camera shall provide the ability to apply a rectangle of customer-defined number of pixels to the image, which can be used as a pixel counter identifying the size of objects in number of pixels.
 - .5 The camera shall accept external time synchronization from an NTP (Network Time Protocol) server.
 - .6 The camera shall store all customer-specific settings in a non-volatile memory that shall not be lost during power cuts or soft reset.
 - .7 The camera shall provide Remote zoom and Remote focus functionality.
- .17 Access log
 - .1 The camera shall provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.

- .2 Provide a connection list of all currently connected viewers.
The file shall include information about connecting IP address, time of connecting and the type of stream accessed.
- .18 Camera diagnostics
 - .1 The camera shall be equipped with LEDs, capable of providing visible status information. LEDs shall indicate the camera's operational status and provide information about power, communication with receiver, the network status and the camera status.
 - .2 The camera shall be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.
 - .3 The camera shall send a notification when the unit has re-booted and all services are initialized.
- .19 Hardware interfaces
 - .1 Network interface
 - .1 The camera shall be equipped with one 10BASE-T/100BASE-TX PoE Fast Ethernet-port, using a standard connector and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).
- .20 Enclosure
 - .1 The camera shall:
 - .1 Be manufactured with an IP52-rated, IK08 impact-resistant, polycarbonate casing.
 - .2 Be fitted with a dehumidifying membrane.
 - .3 Providing encapsulated electronics and captive screws.
- .21 Power
 - .1 Power over Ethernet IEEE 802.3af/802.3at Type 1 Class 3
 - .1 Max: 10.2 W
 - .2 Typical 6.1 W
- .22 Environmental
 - .1 Operate in a temperature range of 0 °C to +50 °C (+32 °F to 122 °F).
 - .2 Operate in a humidity range of 10–85% RH (non-condensing).
- .23 Acceptable Product:
 - .1 Type 1 - 2 MP Axis P3225-LV Mk II, Illustra, Bosch
 - .2 Type 2 – 5 MP Axis P3367V, Illustra, Bosch

2.1 SECURITY MANAGEMENT SOFTWARE

- .1 Shall be able to gain access to doors with a one time unlock command using the EntraPass Go Pass mobile app.

- .2 Automatically move legacy controller to KT-1 and KT-400 door controllers eliminating the need to reprogram.
- .3 Supports up to 20 workstations and controls hundreds of thousands of doors
- .4 Import/synchronize EntraPass operators and users with Microsoft Active Directory for centralized management.
- .5 Automatically log into EntraPass with Windows credentials using Single Sign On in Microsoft Active Directory.
- .6 Integrates with EntraPass Go mobile app – interact with EntraPass with a few taps on your mobile device.
- .7 Integrates with EntraPass Web (remote user platform) to manage access control, IP video, telephone entry and/or intrusion security assets.
- .8 Supports up to 50 concurrent logins of EntraPass Web and/or EntraPass Go First login is provided as standard.
- .9 Integrates with Exacq video management systems, American Dynamics DVRs/NVRs (VideoEdge, HDVR, ADTVR and Intellex) and Kantech INTEVO integrated security platform.
- .10 Integrates with DSC PowerSeries, PowerSeries Neo and MAXSYS intrusion alarm panels.
- .11 Double and triple swipe card at reader (with KT-1/KT-400 controller) to activate such features as activate relay, arm alarm system and lock/unlock doors.
- .12 Easily add ASSA ABLOY Aperio wireless locks to KT-400 or KT-1-M door controllers.
- .13 Network-Ready
 - .1 EntraPass Corporate Edition is a proven platform that offers the ultimate balance between power and affordability in a network environment. EntraPass offers the flexibility to securely connect controllers directly on the network, as well as over RS-485. EntraPass software is compatible with Kantech IP devices such as KT-400/KT-1 controllers and Kantech IP Link (KT-IP) which all utilize highly secure 128-bit AES encryption to ensure communication is not compromised.
 - .2 KT-IP is an RS-232 to TCP/IP interface that connects KT-100 or KT-300 door controllers to a network and the KT-400 controller is a high proven IP controller that supports up to 8 ioProx readers (4 doors IN/OUT control using ioProx XSF readers).
 - .3 For the utmost flexibility and as a truly plug & play IP device, the KT-1 controller features a direct Ethernet port, PoE/PoE+ capabilities and can be easily surface mounted above the door, thus reducing cabling and installation time. With its innovative one-touch set-up and enrollment process, KT-1 provides integrators with the ultimate IP access control installation in minutes. Kantech's IP devices offer real-time access to security information and integrate seamlessly into an existing TCP/IP network; meaning no changes to existing equipment, network, or related systems. They also act as a polling device to ensure the controllers communicate with EntraPass only as required, reducing network traffic.
- .14 Remote, mobile access

- .1 EntraPass Corporate Edition supports the intuitive, state-of-the-art EntraPass Web and EntraPass Go mobile applications which offer customers an unparalleled feature-rich security experience. System administrators can securely connect via the web or a dedicated app on their smart phone/ tablet and manage common access control, video and intrusion functions wherever they are. EntraPass also supports the new EntraPass Go Pass mobile app which allows users with appropriate credentials to quickly and conveniently access secured areas with a few taps of a mobile device. EntraPass Go Pass turns an iOS mobile device into an access control credential. Once the app connects to the Kantech EntraPass server, it presents you with a list of doors that you are authorized to enter.
- .15 Site Architecture
 - .1 A site within EntraPass represents a customer's building, campus, etc. and is composed of many different connections, which have multiple door controllers attached. The system can manage up to 2,048 local/secure IP connections (consisting of KT-100, KT-200, KT-300, KT-1 or KT-400 door controllers) per Multi-Site Gateway. EntraPass supports the use of third party card readers as well as Kantech's renowned ioProx readers. ioProx readers feature a highly secure 39-bit XSF format and can be connected using existing CAT5e cabling for installation cost savings. EntraPass software is highly scalable and can seamlessly expand as the security requirements of your business grow.
- .16 Redundant Server
 - .1 A redundant server protects the EntraPass database against unexpected failures and is an option available with Corporate software. It features real-time data transfer, creating fully functional redundancy at low cost. In the event of primary server failure, the redundancy server which supports all the features and functionality of the primary server.
- .17 Door Controller Compatibility
 - .1 EntraPass software is compatible with Kantech's complete line of door controllers to create a highly scalable solution that can be deployed within one building or across multiple locations. You can mix and match KT-400 and KT-1 together for the best solution to fit your specific needs. EntraPass now makes the migration to KT-1 and KT-400 controllers from legacy Kantech controllers easier for existing Kantech end users. You can automatically move the legacy controller's door programming, access levels, triggers, graphics, etc. to the new controller eliminating the need to reprogram the entire access control system from the ground up.
- .18 Remote System Management Tools
 - .1 The EntraPass Web platform enhances the user experience by delivering remote and convenient real-time access to manage common security tasks and reports from any computer connected to the internet. Security managers on the go can perform a host of functions including locking/ unlocking doors, managing cards and schedules, requesting reports, viewing live video and PTZ control, viewing recorded video, video playback, monitoring events by floor plan and so much more. Simply download the EntraPass Web application from any Windows PC web browser and stay connected even when on the go!

- .2 EntraPass Go is a mobile app that allows you to remotely control your security system from anywhere without being tied to a workstation. EntraPass Go puts you in control of your security. It enables you to interact with EntraPass security management software using only a few taps on your mobile device. The easy-to-use mobile app offers anytime, anywhere real-time management of over 20 security tasks. You can manage/create cards, lock/unlock doors, arm/disarm partitions, view live video from Exacq exacqVision video servers and Kantech INTEVO integrated security platform, view PTZ control, view video playback, request reports and more. EntraPass Go is available for download on the App Store and Google Play.
- .19 Connect Partner Program from Tyco Security Products
 - .1 Kantech is now part of the Connected Partner Program from Tyco Security Products which allows third party partners to develop integrations that communicate through the EntraPass system. The connected program allows the third party partners to develop integrations with EntraPass by using the EntraPass users and events available through Kantech software development kit (SDK).
- .20 Kantech Advantage Program
 - .1 As EntraPass security management software continues to deliver new features and enhancements, it is important to have the productivity tools to effectively use this solution. The Kantech Advantage Program (KAP) allows you to stay current with your EntraPass software installation using tokens. The number of tokens required is based on the EntraPass options activated.
- .21 Video Integration
 - .1 Real-time monitoring capability is a response to the growing importance of video in access control systems. Integration with Exacq video management systems, American Dynamics DVRs/NVRs (VideoEdge, HDVR, ADTVR, Intellex) and Kantech INTEVO integrated security platform provides real-time video monitoring as well as video playback. Video can be linked to access events (such as "door forced open") and recorded from one to sixteen cameras from compatible DVR/NVR simultaneously. All cameras can be called up directly from a floor plan simply by double-clicking on the camera or dome icon. You can then securely store video alarm clips at an offsite location for easy access using Video Vault.
- .22 Synchronization with Microsoft Active Directory
 - .1 EntraPass offers integration with Microsoft Active Directory which synchronizes Active Directory with EntraPass operators and users, eliminating the need for their manual creation in the EntraPass database. The integration also enables single sign on, where operators are automatically authenticated and logged into EntraPass via their Windows credentials with one simple click. platform, users can interface with just one system, for greater simplicity and optimum control. Kantech offers integration kits to connect a DSC PowerSeries, PowerSeries Neo or MAXSYS intrusion alarm.
- .23 Alarm Panel Integration
 - .1 By integrating all security assets such as intrusion detection, access control, video and telephone entry into one common panel to a Kantech access

control system to create a single unified solution. Data integration allows the access control system to receive intrusion events, view zone status and to manage partitions/user codes and arm/disarm via card reader. *Please note: Neo Virtual Keypad offering is not available at this time.

- .2 The virtual zones feature in DSC PowesrSeries Neo allows for the access control events from EntraPass to be sent to the central monitoring center for even better situational awareness.
- .24 Telephone Entry Integration
 - .1 The Kantech Telephone Entry System (KTES) delivers a fully integrated telephone entry and access control solution. The KTES provides visitor/resident entry, tracking and reporting. It uses a touch-tone phone style keypad that offers both familiarity and ease of use. Two-way audio is built-in.
- .25 ASSA ABLOY Aperio Wireless Lock Integration
 - .1 Kantech expands its integrated user experience by adding the support of ASSA ABLOY Aperio wireless locks. The Aperio locks are managed directly through EntraPass. Each Aperio lock communicates with an Aperio wireless hub, which communicates back to the KT-400 and KT-1-M door controllers over RS-485. Online transactions mean that EntraPass is updated in real-time, providing a high level of control and visibility of door actions. See ASSA ABLOY Aperio data sheet on www.kantech.com for additional information.
- .26 Minimum System Requirements
 - .1 Processor (with video integration: Quad Core
 - .2 RAM: 8GB
 - .3 Minimum Free Hard Disk
 - .1 Space for Software: 50GB
 - .4 Color Depth: 24-bit (16 million colors), required for video integration
 - .5 Screen Resolution: 1024 x 768; 48X CD-ROM drive
 - .6 Graphic Adapter Card: PCI express graphics card with 512MB (1GB with video integration) memory and DirectX 9.0 support.
 - .7 Network Interface Card: 10/1000 Base-T network adaptor (Gigabit or Greater with Video Integration).
- .27 Operating System Compatibility
 - .1 Windows 10 Enterprise, Windows 7 Pro/Enterprise/Ultimate, Window 8 and 8.1 Enterprise, Windows Server 2008 R2 Standard/Enterprise, Windows Server 2012 R2 Data Center. All operating systems are supported in 32 and 64-bit version. All operating systems should have their latest Service Packs and updates.
- .28 For integrations, validate specifications of products used.
 - .1 Virtual Environment Supported: VMware Workstation v7 & higher.
- .29 System Capacities
 - .1 Cards: Unlimited
 - .2 Card Families or Site Codes: Unlimited
 - .3 Card Readers/Keypad per Multi-Site Gateway

- .1 KT-400, KT-1, KT-300: Up to 10,000
- .4 Monitored Points (Inputs) per Multi-Site Gateway
 - .1 KT-400, KT-1, KT-300: Up to 100,000
- .5 Auxiliary Outputs for Reader
 - .1 LEDs and Door Alarms per Multi-Site Gateway
 - .1 KT-400, KT-1, KT-300: Up to 100,000
 - .2 Elevator Floors per Cab: 64
- .6 Card User Access Levels: 250 per site
- .7 Access levels per cardholder: KT-300(1) KT-400/KT-1 (5) per site
- .8 Access Level Combinations: Unlimited
- .9 Schedules: 100/site
- .10 Time Intervals per Schedule: KT-300 (4), KT-400/KT-1 (20)
- .11 Holidays: 366 per system
- .12 Operator Workstations: 20 + 1 on the server
- .13 Concurrent EntraPass Web Logins: 50
- .14 Multi-Site Gateways: 41
- .15 System Operator Password: Unlimited
- .16 Operator Security Levels: Unlimited, pre-defined (3)
- .17 Concurrent System Languages: 2
- .18 Number of Printers: One log printer, one report printer, and one badge printer per workstation
- .19 Connections per Multi-Site Gateway: Up to 2048 (IP, USB, Dial up)
- .30 Integration Capabilities
 - .1 Intrusion
 - .1 DSC PowerSeries (PC1616, PC1832, PC1864, PC4020), PowerSeries Neo (HS2016, HS2032, HS2064, HS2128) and MAXSYS (PC4020) Alarm Panels
 - .2 Video
 - .1 Exacq video management systems (v7.8.1) and American Dynamics DVRs/ NVRs (VideoEdge up to v4.6 and previous 4.xx versions), HDVR (v4.3.0.374), ADTVR (first gen v2.2; second gen v2.5), Intellex (up to v5.0) and the INTEVO platform. Intellex Ultra, DVMS and IP all require EntraPass software v3.1 or higher, Intellex LT requires software v2.6 or higher. Panasonic video recorders (requiring option E-COR-DVR-1): WJ-HD309A/316A/616/716, WJ-ND200/300/400.
 - .3 Model Numbers
 - .1 Each EntraPass Corporate Edition software package includes: two additional Workstation licenses, one Server/Workstation license, one Multi-Site Gateway license and one Web license.
 - .4 Software
 - .1 E-COR-V7-LIC: EntraPass Corporate Edition software license
 - .2 E-COR-V7: EntraPass Corporate Edition software Additional Workstation and Gateway Licenses
 - .3 E-COR-WS1: License for 1 Workstation (v3.xx and higher)

- .31 Acceptable Product: Kantech Entrapass Corporate Edition

2.2 SERVER / NETWORK VIDEO RECORDER (NVR)

- .1 High Performance
 - .1 Continuously records up to 1,200 Mbps of video
 - .2 Supports many simultaneous video to web/mobile clients with 900 FPS HD video
 - .3 Simultaneously connect up to 1000 remote clients
 - .4 Optional dual 10Gbps network interfaces for fast archiving or mass client performance
- .2 High Reliability
 - .1 Continuously record during single power source failure with dual power supplies
 - .2 Enterprise-class, continuous-duty hard drives
 - .3 Uninterrupted operation and video preservation in event of one or two drive failures via RAID 5
 - .4 Hot spare drive options for automatic replacement of failed drive
 - .5 Solid-state drive for Linux or Windows operating system
 - .6 Monitors hardware health in exacqVision client and with email/text notifications
- .3 High Capacity
 - .1 Up to 128 IP cameras (8 licenses included)/64 analog cameras per recorder
 - .2 Compatible with thousands of IP camera models
 - .3 Store up to 120TB with front-accessible storage
 - .4 Expandable to over 1.6PB with exacqVision S-Series networked storage
 - .5 Compatible with all exacqVision recorders and software for maximum scalability
- .4 Powerful VMS Software
 - .1 Pre-configured with exacqVision Professional software (standard)
 - .1 EasyConnect automatically finds, addresses and connects IP cameras
 - .2 EasyConnect - automatically finds, addresses and connects IP cameras
 - .3 Powerful integration with retail, financial and access control systems
 - .4 Conduct investigations on recorded video, audio and data with thumbnail or timeline search
 - .5 Bookmark important video for long-term retention
 - .6 Video multi-streaming to optimize storage utilization and network traffic
 - .2 View video anywhere (standard)
 - .1 Unlimited Windows/Linux/Mac PC clients

- .2 Live and recorded video from any browser and most tablets and smartphones
- .3 Upgrade to exacqVision Enterprise software (optional)
 - .1 VideoPush to remotely control video wall clients
 - .2 Case management to organize critical evidence
 - .3 Active Directory/LDAP for IT administration of users
 - .4 Easy, single-screen administration of cameras, users, storage and notifications
- .5 Host Certified Software Applications (CSA)
 - .1 Install CSAs such as video analytics, access control and POS software
 - .2 Tested by Exacq to ensure compatibility
 - .3 Save money and rack space with single security server
- .6 3-Year Warranty
 - .1 Includes a 3-year hardware warranty and technical support from one source
 - .2 Receive constantly increasing VMS functionality with 3 years of unlimited software updates included
- .7 Video Inputs: 16 looping/32
- .8 Compression: H.264, MJPEG
- .9 Frame Rate: 30 FPS (NTSC) or 25 FPS (PAL) per camera
- .10 Alarm Inputs: 16 TTL
- .11 Alarm Outputs: 15 TTL & 1 Relay
- .12 Audio Inputs: 16
- .13 Audio Outputs: 2 2/2/4/4
- .14 IP SETTINGS
 - .1 Maximum IP Cameras: 128
 - .2 Included IP Licenses: 8
 - .3 Alarm Inputs: 4
 - .4 Alarm Outputs 1 TTL & 1 Relay
- .15 Pre-Loaded VMS Software Professional (standard), Enterprise (optional)
- .16 Typical Video Storage Rate: 400 Mbps (Windows) 800 Mbps (Linux)
- .17 Local Client Display Rate (FPS) 700 FPS HD (Windows) / 900 FPS HD (Linux)
- .18 Maximum Hard Drives: 8
- .19 Maximum Storage: 48 TB RAID 5
- .20 Monitor Output: 1 DVI-I + 1 HDMI + 1 DisplayPort, max 2 simultaneous monitors
- .21 Operating System: Windows 7 64-bit, Ubuntu Linux 14.04
- .22 CPU: Gen 4 Intel Core i7
- .23 RAM: 8 GB
- .24 NIC: 2 x 1 Gbps, 2 x 10 Gbps

- .25 USB: 8 (2 front, 6 rear)
- .26 Serial: 1 RS485
- .27 Audio: Outputs 1
- .28 Keyboard & Mouse Included
- .29 Dimensions: 68.6 x 42.9 x 8.9 cm
- .30 Weight: 18.2 - 25 kg
- .31 Regulatory: CE, FCC, cULus, UL Listed
- .32 Power Supplies: Dual Hot Swap
 - .1 Input Voltage: 120/240 VAC auto-sensing
 - .2 Power Consumption: 500 watts max (480 ips)
 - .3 Video Standard: NTSC (30ips) or PAL (25ips)
- .33 Acceptable Product: Exacq Vision Z-series Raid 5 with minimum 20 Terabytes of usable recording storage space.

2.3 NETWORK SWITCH

- .1 Ports
 - .1 24 fixed Gigabit Ethernet SFP ports
 - .2 8 dual-personality ports; autosensing
 - .3 10/100/1000BASE-T or SFP
 - .4 2 port expansion module slots
 - .5 1 RJ-45 serial console port
- .2 Physical Characteristics
 - .1 17.32(w) x 14.17(d) x 1.72(h) in (44 x 36 x 4.36 cm) (1U height)
 - .2 Weight 13.89 lb (6.3 kg)
- .3 Memory and Processor
 - .1 256 MB SDRAM, 32 MB flash; packet buffer size: 2 MB
- .4 Mounting
 - .1 Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included)
- .5 Performance
 - .1 1000 Mb latency: <3.2 microseconds
 - .2 10 Gb/Sec Latency: <2.6 microseconds
 - .3 Throughput: 107.2 Million pps
 - .4 Routing/Switching: 144 Gb/s
 - .5 Routing Table: 12000 entries (IPv4)
- .6 Electrical Characteristics
 - .1 Frequency: 50/60 Hz
 - .2 Maximum Heat Dissipation: 392 BTU/Hr (413.56 kj/hr)

- .3 Voltage: 120-240VAC
- .4 Maximum Power Rating: 115 watts
- .7 Acceptable Product: HP 550-24G-SFP EI Switch with 2 interface slots Transceiver module for copper connectivity, Cisco, Dell

2.4 POE NETWORK SWITCH

- .1 Ports
 - .1 1 open module slot
 - .2 20 autosensing 10/100/1000 ports (IEEE 802.3 Type
 - .3 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab
 - .4 Type 1000BASE-T); Media Type: Auto-MDIX; Duplex:
 - .5 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only
 - .6 1 RJ-45 serial console port
 - .7 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10BASE-T; IEEE 802.3u Type 100BASE-TX; IEEE 802.3ab
 - .8 1000BASE-T Gigabit Ethernet) with PoE or an open mini-GBIC slot (for use with mini-GBIC transceivers)
 - .9 Supports a maximum of 4 10-GbE ports, with optional module
- .2 Physical Characteristics
 - .1 17.44(w) x 15.43(d) x 1.73(h) in (44.3 x 39.2 x 4.4 cm) (1U height)
 - .2 Weight: 13.86 lb (6.29 kg)
- .3 Memory and Processor
 - .1 ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
 - .2 Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256MB DDR SDRAM
- .4 Mounting
 - .1 Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
- .5 Performance
 - .1 1000 Mb latency: <3.4 microseconds
 - .2 10 Gb/Sec Latency: <2.1 microseconds
 - .3 Throughput: 111.5 Million pps
 - .4 Routing/Switching: 149.8 Gb/s
 - .5 Routing Table: 10000 entries (IPv4)
 - .6 MAC Address Table: 64000 entries
- .6 Electrical Characteristics
 - .1 Frequency: 50/60 Hz
 - .2 Maximum Heat Dissipation: 1144 BTU/Hr (1206.9 kj/hr)
 - .3 Voltage: 120-240VAC
 - .4 Idle power: 142w

- .5 Maximum Power Rating: 705w
- .6 PoE Power: 398w
- .7 Acceptable Product: HP 3500-24G-PoE+ yI Switch (J9310A) with Transceiver module for copper connectivity, Cisco, Dell.

2.5 HDMI TRANSMITTER

- .1 Maximum Distance Supported: 70m @ 1920 x 1080
- .2 Maximum Resolution Supported: 3840 x 2160 (UHD-HDMI), 1920 x 1200 VGA, HDBaseT, HDCP, Serial Control
- .3 Shall be powered from a single power supply
- .4 Power adapter: 120-240 VAC 50-60Hz
- .5 Output Voltage /Amperage: 18vdc, 1.0A
- .6 Warranty: 3 Years
- .7 Acceptable Manufacturer: Legrand, Extron, Cablestogo, Gefen

2.6 HDMI RECEIVER (WALL PLATE TRANSMITTER)

- .1 Video Signal Support - HDMI
- .2 HDMI Features Supported - HDCP, 3D, Deep color, Dolby + DTS 7.1 Audio, Consumer Electronics Control (CEC)
- .3 Maximum video resolution - 1080p
- .4 Power adapter: 120-240 VAC 50-60Hz
- .5 Output Voltage, 18vdc, 1.0A
- .6 Warranty: 3 Years
- .7 Acceptable Manufacturer: Legrand, Extron, Cablestogo, Gefen

2.7 HDMI Jack, faceplate and cable (for Meeting rooms)

- .1 Termination style: Female to female HDMI coupler colour white
- .2 Faceplate mounted inside the floor box: Colour White
- .3 Faceplate wall mounted: Stainless steel
- .4 HDMI cable shall have both male end terminated at both ends
- .5 Acceptable Manufacturer: Legrand, Cablestogo, Kramer

2.8 50 INCH SECURITY MONITOR

- .1 Panel
 - .1 Diagonal Size Resolution: 1920*1080 (Full HD)
 - .2 Dimension (mm): 1067(H) x 623(V)
 - .3 Contrast Ratio: 5000:1
 - .4 Response Time(G-to-G): 8ms
 - .5 Type: 60Hz D-LED BLU

- .6 Pixel Pitch(mm): 0.15375(H) x 0.46125(V)
- .7 Brightness(Typ.): 450 Nit
- .8 Viewing Angle(H/V): 178:178
- .9 Orientation: Landscape/portrait
- .2 Connectivity
 - .1 Input: VGA (D-Sub 15 Pin), DVI-D(HDMI Common), DisplayPort 1.2, HDMI1, HDMI2 (thru DVI-D Input, c/w adapter), Component/Composite, Stereo Mini Jack, USB 2.0 x 1
 - .2 Output
 - .1 DisplayPort 1.2 (Loop-Out), Stereo Mini Jack
 - .2 External Control: RS232C(in/out) thru stereo jack, RJ45
 - .3 External Sensor: IR, Ambient Light
- .3 Power
 - .1 Type: Internal
 - .2 Power Supply: AC 100 - 240 V~ (+/- 10 %), 50/60 Hz
 - .3 Power Consumption: Landscape 65W, Portrait 176W
 - .4 Operating Temperature: 0°C - 40°C
 - .5 Operating Humidity: 10%~80%
- .4 Continuous Operation: 24/7
- .5 Shall be complete with adjustable Ceiling mount pole.
 - .1 Ceiling mounts enable display installation from the ceiling on an extended pole that is adjustable in length to position the display at just the right height. The mounted displays can be adjusted in various vertical angles and the directional (horizontal) angle that the displays face can also be adjusted for optimal viewing. The ceiling mounts hold up to four times the weight of the supported display products.
 - .2 Pole length: 1188 to 1588mm
 - .3 Tilt angle: 20 degrees
 - .4 Rotation angle: 360 degrees

2.9 24 INCH SECURITY MONITOR

- .1 Display
 - .1 Screen Size: 24" Commercial/Business grade suitable for continuous use.
 - .2 Active Display Size (HxV): 531.36 (H) x 298.89 (V)
 - .3 Flat / Curved: Flat
 - .4 Resolution (Aspect Ratio): 1920 x 1080 (16:9)
 - .5 Panel Type (PLS/VA/TN): TN
 - .6 Brightness Typ. / Min.: 250nits / 200nits
 - .7 Contrast Ratio (Static): 1000:1 (Typ)
 - .8 Dynamic Contrast Ratio: Mega ∞
 - .9 Pixel Pitch (HxV): 0.27675 (H) x 0.27675 (V)
 - .10 Response Time (G-to-G): 5 ms

- .11 Viewing Angle (Horizontal/Vertical): 170°/160°
- .12 Color Support (16.7M/1B): 16.7M
- .13 Color Gamut (NTSC 1976): 72%
- .14 Refresh Rate (Hz): 60Hz
- .2 Features
 - .1 Eye Saver Mode: Yes
 - .2 Flicker Free: Yes
 - .3 Game Mode: Yes
 - .4 Windows Certification: Windows 10
 - .5 OS Compatibility: Windows, Mac
 - .6 Smart Eco Saving: Yes
 - .7 Interface: VGA, DVI, HDMI, DisplayPort, USB
- .3 Operating Conditions
 - .1 Temperature: 10~40°C
 - .2 Humidity: 10~80 (non-condensing) %
 - .3 Design Color: Black
 - .4 Wall Mount / VESA: 100 x 100
- .4 Power
 - .1 Power Supply: AC 100~240V
 - .2 Power Consumption (Energy Star 6.0 Test Condition): 23 (Typ) W
 - .3 Power Consumption (Off Mode): Less than 0.005 W
- .5 Detailed Dimensions
- .6 Weight: Set Weight without Stand 7.5 (lbs.)
- .7 Power Cable Length: 1.5 m
- .8 Certification: Safety EMC CB (EU): IEC60950-1, EN60950-1, cULus (US,Canada): UL60950-1, KC (Korea): K60950-1, PSB (Singapore), Soncap (Nigeria), Kucas (Kwuit), SASO (Saudi Arabia): IEC60950-1, CCC (China): GB4943-2011 FCC (USA), IC (Canada): FCC Part15 Subpart B, CE (Europe): EN55022, EN55024, KCC Korean) KN22, KN24, C-tick (Australia): AS/NZS3548 (CISPR22), CCC (China): GB9254-2008 GB17625.1-2012
- .9 Green Management: Energy/Environment Mark Energystar 6.0

2.10 WALL MOUNT FOR 24" MONITOR

- .1 VESA compatibility: 200x200
- .2 Touch Overlay compatibility: Supported
- .3 Installation orientation: Landscape and Portrait
- .4 (W*H*D, mm): 48.0 x 255.0 x 30.0
- .5 Weight (kg): 2.4
- .6 Minimum wall thickness (mm): 30
- .7 Tilt/Swivel: 10 degrees tilt, 20 degrees swivel

- .8 To be compatible with supplied 24" LCD Monitor and same Manufacturer

2.11 17" RACK MOUNT SECURITY MONITOR/KEYBOARD

- .1 The Rackmount LCD Keyboard and Touchpad shall be installed in the equipment rack.
- .2 The 17" LCD monitor shall be capable of supporting 1280 x 1024 screen resolution, and is also available with an 8 port KVM switch. With its space saving, single rackspace design and dual-slide functionality, the rackmount LCD monitor can reside in the open position for system monitoring while the keyboard is in the closed position.
- .3 These units shall have rear articulating cable carriers for strain relief and a bright active matrix LCD display for ergonomic viewing of monitoring applications.
- .4 Standard 105 key keyboard with integrated touchpad. 2m connector cable included, and auto detects 120V power. This unit has a range of front to rear mounting of 463mm to 705mm (overall depth is 622mm, this unit will extend through the back of shallower racks).
- .5 Acceptable Manufacturer: Middle Atlantic, Rack Solutions, logear

2.1 UN-INTERRUPTABLE POWER SUPPLY (UPS)

- .1 Extended Runtime: Up to 4 extended battery modules.
- .2 Virtualization-ready: Available in convenient bundles with a network card and management software for rapid integration into your virtual environment.
- .3 Efficiency: Provides industry leading efficiency of up to 99 percent.
- .4 Manageability:
 - .1 Energy metering: The UPS shall have a metering for energy consumption right down to the outlet segments. No other UPS in the industry offers this capability.
 - .2 UPS management: By integrating the Eaton Intelligent Power Manager software, you can monitor and manage the power devices on your network.
- .5 LCD display: LCD shall offer a graphical interface which provides all critical UPS information in a single screen view.
- .6 More power: Protects more devices by providing 28 percent more wattage compared to traditional UPSs.
- .7 Battery life: battery service life by 50 percent.
- .8 Intelligent Power Manager (IPM)
- .9 By integrating IPM with the Eaton 5PX, you can:
 - .1 Remotely monitor and manage multiple devices across your network from a single interface; this can be integrated into an already existing platform, such as VMware, Microsoft or Citrix
 - .2 Suspend non-critical virtual machines, consolidate critical virtual machines and shut down unused servers to extend battery runtime.

- .3 Set server power consumption limits for extended battery runtime with UCS management software
- .10 The 5PX warranty covers both the UPS and the batteries for three years.
- .11 Rating: 3000Watts
- .12 Voltage 120V, 60Hz
- .13 Input Connection: L5-30P
- .14 Output Receptacle: (6) 5-20R and (1) L5-30R
- .15 Power Distribution and Bypass: HotSwap maintenance bypass
- .16 Shall be Rack mount complete with network card, 1 extended battery module and 3m cord.

Part 3 Execution

3.1 Examination

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for video surveillance installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Landlord of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Landlord.

3.2 Installation

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheet.
- .2 Install video surveillance equipment and components in accordance with ULC-S317.
- .3 Install cable, boxes, mounting hardware, brackets, video cameras and system components in accordance with manufacturer's written installation instructions.
- .4 Install components secure, properly aligned and in locations shown on reviewed shop drawings.
- .5 Connect cameras to cabling in accordance with installation instructions.
- .6 Install ULC labels where required.
- .7 The Contractors or subcontractors main resources within the project shall carry proper professional certification issued by the manufacturer and verified by a third party organization to confirm sufficient product and technology knowledge.
- .8 The Contractor shall carefully follow instructions in documentation provided by the manufacturer to ensure all steps have been taken to provide a reliable, easy-to-operate system.
- .9 All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

- .10 All firmware found in products shall be the latest and most up-to-date provided by the manufacturer, or of a version as specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).
- .11 All equipment requiring users to log on using a password shall be configured with user/site-specific password/passwords. No system/product default passwords shall be allowed.
- .12 A properly installed equipment shall meets Low Voltage, Class 2 classification of the NEC.

3.3 Field Quality Control

- .1 Manufacturer's Field Services:
 - .1 Obtain written reports verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product.
 - .2 Submit 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 Upon completion of Work, after cleaning is carried out.

3.4 System Startup

- .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 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 of device locations with reviewed shop drawings.
 - .4 Compatibility of equipment installation with physical environment.
 - .5 Inclusion of all accessories.
 - .6 Device and cabling identification.
 - .7 Application and location of ULC approval decals.
- .3 Technical verification: purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:
 - .1 Measurements of tension and power.
 - .2 Connecting joints and equipment fastening.
 - .3 Measurements of signals (dB, lux, baud rate, etc).
 - .4 Compliance with manufacturer's specification, product literature and installation instructions.

- .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.
 - .3 Operation control of camera lens, pan, tilt and zoom.
 - .4 Switching of camera to any monitor.
 - .5 Switching of system video recorder to selective monitor.
 - .6 Set dwell times.
 - .7 Demonstrate:
 - .1 Sequence viewing of cameras on each monitor.
 - .2 Bypass capability.
 - .3 Display of stored image to cardholder.

3.5 Adjusting

- .1 Remove protective coverings from cameras and components.
- .2 Adjust cameras for correct function.

3.6 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean camera housing, system components and lens, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by video surveillance installation.

3.8 Training

- .1 Contractor to provide 2 hour training for user groups and 4 hour training for maintenance staff.

END OF SECTION

Part 1 General

1.1 Related Requirements

- .1 Refer to all sections of the specification for related work.

1.2 References

- .1 Treasury Board of Canada Secretariat (TBS), Occupational Safety and Health (OSH)
 - .1 Fire Protection Standard-10.
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-06, Standard for the Installation of Fire Alarm Systems.
 - .2 CAN/ULC-S526-07, Visible Signal Devices for Fire Alarm Systems, Including Accessories.
 - .3 CAN/ULC-S527-99, Standard for Control Units for Fire Alarm Systems.
 - .4 CAN/ULC-S528-05, Manual Stations for Fire Alarm Systems, Including Accessories.
 - .5 CAN/ULC-S529-09, Smoke Detectors for Fire Alarm Systems.
 - .6 CAN/ULC-S530-91(R1999), Heat Actuated Fire Detectors for Fire Alarm Systems.
 - .7 CAN/ULC-S531-02, Standard for Smoke Alarms.
 - .8 CAN/ULC-S537-04, Standard for the Verification of Fire Alarm Systems.

1.3 Action And Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for fire alarm system devices and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Indicate on shop drawings:
 - .1 Detail assembly and wiring diagrams
 - .2 Details for devices.

1.4 Closeout Submittals

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for fire alarm system for incorporation into manual.
- .3 Include:
 - .1 Technical data - illustrated parts lists with parts catalogue numbers.
 - .2 Copy of approved shop drawings with corrections completed and marks removed except review stamps.

- .3 List of recommended spare parts for system.

1.5 Maintenance Material Submittals

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

1.6 Delivery, Storage And Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 Description

- .1 Fire Alarm Panel is existing
- .2 System to include:
 - .1 Initiating/input circuits.
 - .2 Output circuits.
 - .3 Auxiliary circuits.
 - .4 Wiring.
 - .5 Manual and automatic initiating devices.
 - .6 Audible and visual signalling devices.
 - .7 End-of-line resistors.
- .3 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .4 Audible signal devices: to CAN/ULC-S524.
- .5 Visual signal devices: to CAN/ULC-S526.
- .6 Manual pull stations: to CAN/ULC-S528.
- .7 Thermal detectors: to CAN/ULC-S530.
- .8 Smoke detectors: to CAN/ULC-S529.
- .9 Smoke alarms: to CAN/ULC-S531.
- .10 Regulatory Requirements:
 - .1 To TBS Fire Protection Standard.
 - .2 Subject to Fire Commissioner of Canada (FC) approval.

- .3 Subject to FC inspection for final acceptance.
- .4 System components: listed by ULC and comply with applicable provisions of NBC, Local, Provincial Building Code and meet requirements of local authority having jurisdiction.

2.2 System Operation: Single Stage (Existing)

- .1 Actuation of any alarm initiating device to:
 - .1 Cause electronic latch to lock-in alarm state at central control unit and data gathering panel/transponder.
 - .2 Indicate zone of alarm at central control unit and at remote annunciator display.
 - .3 For low rise buildings:
 - .1 Cause audible devices throughout building to sound at 20 strokes per minute.
 - .2 Cause audible devices in zone of alarm to sound continuously while other audible devices throughout building sound at 20 strokes per minute.
 - .4 Cause audible signalling devices to sound in alarm tone throughout building.
- .2 Acknowledging alarm: indicated at central control unit.
- .3 Ensure that it is possible to silence signals by "alarm silence" switch at central control unit, after 60 seconds period of operation.
- .4 Subsequent alarm, received after previous alarm has been silenced, to re-activate signals.
- .5 Actuation of any supervisory device to:
 - .1 Cause electronic latch to lock-in supervisory state at central control unit and data gathering panel/transponder.
 - .2 Indicate respective supervisory zone at central control unit and remote annunciator display.
 - .3 Cause audible signal at central control unit to sound.
 - .4 Activate common supervisory sequence.
- .6 Trouble on system to:
 - .1 Indicate circuit in trouble at central control unit.
 - .2 Activate "system trouble" indication, buzzer and common trouble sequence. Acknowledging trouble condition to silence audible indication; visual indication to remain until trouble is cleared and system is back to normal.
- .7 Troubles on system: suppressed during course of alarm.
- .8 Trouble condition on any circuit in system not to initiate alarm conditions.

2.3 Control Panel (Existing)

2.4 Initiating/Input Circuits (To Match Existing)

2.5 Auxiliary Circuits (To Match Existing)

2.6 Booster Panels

Provide Remote Booster Power Supply is a self-contained 24V DC power supply designed to augment fire alarm audible and visual power requirements. The booster shall consist of all of the necessary circuits to monitor and charge batteries, control and supervise four Class B or two Class A Notification Appliance Circuits (NACs) and monitor at least two controlling inputs from external sources as per following:

- .1 Notification Appliance Circuit Rating: EBPS10A - 3.0A max. per circuit @ 24V DC nominal, 10A max total all NACs
- .2 Trouble Relay - 2 amps @ 30V DC
- .3 Auxiliary Outputs – Min four configurable outputs replace NACs 1, 2, 3 or 4, as auxiliary outputs and 200 mA dedicated auxiliary. NOTE: Maximum of 8 Amps can be used for auxiliary output.
- .4 Input Current (from an existing NAC) - 3 mA @ 12V DC, 6 mA @ 24V DC
- .5 Booster Internal Supervisory Current - 70 mA
- .6 Maximum Battery Size - 10 Amp Hours (2 of 12V10A) in cabinet up to 24 Amp hours with external battery cabinet for fire and security applications; up to 65 Amp hours for access control applications in external battery box
- .7 Terminal Wire Gauge - 18 - 12 AWG
- .8 Relative Humidity - 0 to 93% non-condensing @ 32C
- .9 Temperature Rating - 32F to 120F (0 to 49C)
- .10 NAC Wiring Styles - Class A or Class B
- .11 Output Signal Rates - Continuous, 3-3-3 temporal, or follow installed panel's NAC.
- .12 Ground Fault Detection - Enable or disable via jumper
- .13 Agency Listings - UL, ULC, CSFM
- .14 Configurable as auxiliary outputs
- .15 Configurable signal rates
- .16 Field selectable input-to-output correlations
- .17 On-board status LEDs for easy recognition of wiring faults

2.7 Wiring

- .1 Twisted copper conductors: rated 300V.
- .2 To initiating circuits: 18 AWG minimum, and in accordance with manufacturer's requirements.
- .3 To signal circuits: 16 AWG minimum, and in accordance with manufacturer's requirements.
- .4 To control circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.

2.8 Manual Alarm Stations

- .1 Manual alarm stations: pull lever, wall mounted semi-flush or surface type, and general alarm key switch for two stage system bilingual English French signage.

2.9 Automatic Alarm Initiating Devices

- .1 Heat detectors, fixed temperature, non- restorable, rated 57 degrees C.
- .2 Thermal fire detectors, combination fixed temperature and rate of rise, non-restorable fixed temperature element, self-restoring rate of rise, fixed temperature 57 degrees C, rate of rise 8.3 degrees C per minute.
- .3 Smoke detector: ionization type air duct type with sampling tubes with protective housing.
 - .1 Twistlock Plug-in type with fixed base.
 - .2 Wire-in base assembly with integral red alarm LED, and terminals for remote relay alarm LED.
- .4 Addressable smoke detector.
 - .1 Ionization type.
 - .2 Electronics to communicate detector's status to addressable module/transponder.
 - .3 Detector address to be set on detector base head in field.

2.10 Audible Signal Devices

- .1 Bells: surface mounted, single stroke, polarized, 24 V dc, 150 mm, 98db.
- .2 Bells: to match existing type, gongs of special alloy steel, 24 V dc, 150mm, 98db.

2.11 Visual Alarm Signal Devices

- .1 Strobe type: to match existing, red, 24 V dc.
- .2 Designed for surface mounting on walls

2.12 End-Of-Line Devices

- .1 End-of-line devices to control supervisory current in alarm circuits and signalling circuits, sized to ensure correct supervisory current for each circuit. Open short or ground fault in any circuit will alter supervisory current in that circuit, producing audible and visible alarm at main control panel and remotely.

2.13 As-Built Riser Diagram

- .1 Provide Fire alarm system riser diagram for the renovation area

2.14 Ancillary Devices

- .1 Remote relay unit to initiate fan shutdown.

Part 3 Execution

3.1 Examination

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for fire alarm installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 Installation/Scope Of Work

- .1 Install systems in accordance with CAN/ULC-S524.
- .2 Install manual alarm stations and connect to alarm circuit wiring.
- .3 Locate and install detectors and connect to alarm circuit wiring. Mount detectors more than 1 m from air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors. Locate duct type detectors in straight portions of ducts.
- .4 Connect alarm circuits to main control panel.
- .5 Install signal and visual signal devices and connect to signalling circuits.
- .6 Connect signalling circuits to main control panel.
- .7 Install end-of-line devices at end of alarm and signalling circuits.
- .8 Install remote relay units to control fan shut down.
- .9 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
- .10 Room detection system.
 - .1 Install detectors. Make necessary connections between room detection panel and main fire alarm panel.
 - .2 Locate and install audible signals, visual alarms.
- .11 Splices are not permitted.
- .12 Provide necessary raceways, cable and wiring to make interconnections to terminal boxes, annunciator equipment and CCU, as required by equipment manufacturer.
- .13 Ensure that wiring is free of opens, shorts or grounds, before system testing and handing over.
- .14 Identify circuits and other related wiring at central control unit, annunciators, and terminal boxes.

3.3 Field Quality Control

- .1 Fire Alarm Verification to be performed by and independent fire alarm specialist trained from the manufacturer. The complete system shall be tested and verified in accordance with Standard CAN/ULC-S537, Standard for the Verification of Fire

Alarm System Installation. Upon completion, a Certificate of Verification and a copy of the Verification Report shall be submitted to the Departmental Representative.

- .2 Note: Existing devices on existing circuits and zones are generally not shown on the drawings. It is the Contractor's responsibility to determine the locations of all existing devices to verify.
- .3 Fire alarm system:
 - .1 Test such device and alarm circuit to ensure manual stations, thermal, smoke detectors, sprinkler system transmit alarm to control panel and actuate first stage alarm general alarm ancillary devices.
 - .2 Check annunciator panels to ensure zones are shown correctly.
 - .3 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of systems.
 - .4 Addressable circuits system style DCLA:
 - .1 Test each conductor on all DCLA addressable links for capability of providing 3 or more subsequent alarm signals on each side of single open-circuit fault condition imposed near midmost point of each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .2 Test each conductor on all DCLA addressable links for capability of providing 3 or more subsequent alarm signals during ground-fault condition imposed near midmost point of each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .5 Addressable circuits system style DCLB:
 - .1 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals on line side of single open-circuit fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
 - .2 Test each conductor on all DCLB addressable links for capability of providing 3 or more subsequent alarm signals during ground-fault condition imposed near electrically most remote device on each link. Operate Acknowledge/Silence switch after reception of each of the 3 signals. Correct imposed fault after completion of each series of tests.
- .4 Provide final PROM program re-burn for system Departmental Representative incorporating program changes made during construction.

3.4 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 Protection

- .1 Protect installed products and components from damage during construction.

- .2 Repair damage to adjacent materials caused by fire alarm system installation.

3.6 Closeout Activities

- .1 Provide on-site lectures and demonstration by fire alarm equipment manufacturer to train operational personnel in use and maintenance of fire alarm system.

END OF SECTION