

1 GENERAL

1.01 PROJECT DESCRIPTION

- .1 The Chubb Edwards detection systems and fire alarms are addressable and located in Buildings #19 (hotel, 3rd class), #29 and #32 (disinfection), Building no. 14 (1st class hotel). At Building no. 48 (Chapel), a Firelite CMP2402 system is present. In Building #100 (hospital), a Notifier system has been installed. There are no systems in the water filtration factory. The project consists in standardizing the facilities and to reuse the existing equipment and devices as much as possible. The current wiring will be reused and connected to the new fire alarm panel. New detection and alarm devices, auxiliary alarm modules and wiring will be added. Installation will be in accordance with the "Code national du Bâtiment" 1995 and with the Decree 1263-2012 of the "Régie du bâtiment du Québec".
- .2 At the request of the owner the only acceptable product is "CHUBB/EDWARDS" so the quotation lists the equipment of the Chubb Edwards and presents the expected performance for the new fire detection and alarm systems. The components of Buildings 19 and 29 fire alarm system, including the smoke and heat detectors, and the manual stations used for the activation of the pre-action fire protection system protecting the ground floor, the upper floors and the roof spaces, are part of the fire protection system. The work related to these pieces of equipment will be carried out by the sprinkler system or fire protection contractor (section 21 13 16 – Pre-action/Dry-Pipe Sprinkler Systems). Of all the buildings covered by the work, only the fire alarm system at the 1st class hotel (no. 14) will be retained. The equipment present being mainly of the product Chubb Edwards so the detection equipment will be preserved, as well as the audible alarm devices. New detection devices, as well as visual and audible alarms, will be added.

Alarm transmission to outside parties is not be included in this contract. However, the commissioning activities will be coordinated with the Protectron ADT service supplier before the delivery of the fire alarm systems.

1.02 RELATED REQUIREMENTS

- .1 Drawings and general provisions of the contract, including the general requirements of Division 01, apply to this Section.
- .2 Section 26 05 00.

1.03 REFERENCES

- .1 Government of Canada
 - .1 TB OSH Chapter 3-03, 1997-01-28, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-03, Standard for Fire protection Electronic Data Processing Equipment.
 - .2 TB OSH Chapter 3-04, 1994-12-22, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-04, Standard for Fire Alarm Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-2006, Standard for the Installation of Fire Alarm Systems.

- .2 CAN/ULC-S525-2007, Audible Signal Device for Fire Alarm Systems.
- .3 CAN/ULC-S526-2007, Visual Signal Devices for Fire Alarm Systems.
- .4 CAN/ULC-S527-1999, Control Units.
- .5 CAN/ULC-S528-2005, Manual Pull Stations for Fire Alarm Systems.
- .6 CAN/ULC-S529-2002, Smoke Detectors for Fire Alarm Systems.
- .7 CAN/ULC-S530-M1991, Heat Actuated Fire Detectors for Fire Alarm Systems.
- .8 CAN/ULC-S531-2002, Standard for Smoke Alarms.
- .9 CAN/ULC-S537-2004.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Shop drawings: stamped and signed by professional engineer registered or licensed in Canada and in the province of Quebec.
 - .2 Include:
 - .1 Layout of equipment.
 - .2 Zoning.
 - .3 Complete wiring diagram, including schematics of modules.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
 - .3 Manufacturer's Field Reports: manufacturer's field reports specified.
- .4 Closeout Submittals:
 - .1 Submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals in accordance with ANSI/NFPA 20.
 - .2 Departmental Representative will delegate authority for review and approval of submittals required by this Section.
 - .3 Submit to Departmental Representative 2 sets of approved submittals and drawings immediately after approval but no later than 15 working days to prior to final inspection.
 - .4 Submit following:
 - .1 Manufacturer's Data for:
 - .1 Control panel and modules.
 - .2 Storage batteries.
 - .3 Manual pull stations.
 - .4 Heat detectors.
 - .5 Temperature detectors;
 - .6 Open-area smoke detectors.
 - .7 Duct smoke detectors.
 - .8 Addressable module;

- .9 Alarm horns.
- .10 Visible appliances.
- .11 Remote annunciator panel.
- .12 Smoke alarm;
- .13 Radio fire alarm auxiliary transmitter.
- .14 Mark data which describe more than one type of item to indicate which type will be provided.
- .15 Surge Protection (Thunderstorms, lightning storm).
- .16 Submit 1 original for each item and clear, legible, first-generation photocopies for remainder of specified copies.

1.05 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in the installation of fire alarm systems, with five (5) years of experience, approved by the manufacturer.
- .2 Provide services of representative or technician from manufacturer of system, experienced in installation and operation of type of system being provided, to supervise installation, adjustment, preliminary testing, and final testing of system and to provide instruction to project personnel.
- .3 System:
 - .1 To TB OSH Chapter 3-04.
- .4 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .5 Maintenance Service:
 - .1 Provide a maintenance service for a period of one (1) year, including an inspection by the manufacturer one (1) month before the end of the warranty period. The inspection tests shall be in accordance with CAN / ULC-S536-04 (536-04). Submit inspection reports to the Departmental Representative.

2 PRODUCTS

2.01 MATERIALS

- .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer (CHUBB/Edwards. Equivalent products will not be accepted).
- .2 Power supply: to CAN/ULC-S524-06.
- .3 Audible signal devices: to CAN/ULC-S525-07.
- .4 Visual signal devices: to CAN/ULC-S526-07.
- .5 Control unit: to CAN/ULC-S527-11.
- .6 Manual pull stations: to CAN/ULC-S528-05.
- .7 Thermal detectors: to CAN/ULC-S530-91.

- .8 Smoke detectors: to CAN/ULC-S529-02.
- .9 Smoke alarms: to CAN/ULC-S531-02.

2.02 SYSTEM OPERATION

- .1 Provide complete, electrically supervised, code 3 temporal coded, manual and automatic, zoned, annunciated, fire alarm system.
- .2 Provide separate circuits from control panel to each zone of initiating devices. Transmission of signals from more than one zone over common circuit to control panel is prohibited.
- .3 Single stage operation. Operation to actuation following:
 - .1 Manual station.
 - .2 Heat detector.
 - .3 Smoke detector;
 - .4 Flow switch.
- .4 Actuation of single operation device to initiate following:
 - .1 Operation of the audible alarm devices prompting the evacuation of the building based on time;
 - .2 The operation of the building strobe lights;
 - .3 Transmit signal to Protectron ADT's central facility;
 - .4 Zone of alarm device to be indicated (indicator light) on control panels for the fire department;
 - .5 System with addressable device to identify the device in alarm (address) and to locate;
 - .6 Electro-magnetic door holders and door with electromagnetic holders to de-energize;
 - .7 Preserving the alarm status of the system (with the exception of audible alarms stopped manually) until the status of the fire alarm system returns to normal.

2.03 CONTROL PANEL

- .1 For detection circuits class A and B.
- .2 For annunciation circuits class A and B.
- .3 Single stage operation.
- .4 Zoned.
- .5 Coded.
- .6 The life safety system will consist of a network of microprocessors designed specifically for fire protection and include audible alarms for evacuation purposes and safety. The life safety system will be model EST3, UL and ULC approved in accordance with the CAN/ULC-S527 standard. It will also comply with standards 72a, b, c and to the National Fire Protection Association code. The control panel will be modular and include several functional layers, including internal functionalities and user interface, in order to provide maximum flexibility, while restricting system congestion.

- .7 The life safety system will support the following functions and features for each of the system's panels and nodes:
 - .1 Up to 10 smart device loops in the signature series;
 - .2 Up to 125 smart smoke detectors and 125 smart modules per tripping circuit;
 - .3 Up to 152 wired inputs/outputs circuits;
 - .4 Up to 342 manual control switches (input);
 - .5 Up to 456 point indicator lights;
 - .6 Up to 63 remote display points;
 - .7 Ground fault detection identified in panels through signature data circuits and device modules;
 - .8 Actual distribution intelligence, with detectors and modules equipped with their own microprocessor;
 - .9 Timeout during power failures (alternative current) adjustable between 4 hours and 10 hours.
- .8 The system's main liquid crystal display in the fire alarm panel will provide the operator with detailed information on system conditions other than normal conditions. It will be automatically controlled based on system status and will consist of an alphanumerical backlit display with 8 lines and 21 characters.
- .9 Remote annunciator: When indicated on the plans, satellite panels will include a control module et remote display. These modules will include system control buttons with positive tactile feedback and LED light indicators with programmable blink rates and sliding tags to indicate system events. Liquid crystal displays will not be provided due to frost at the facilities.

2.04 POWER SUPPLY

- .1 120 V, ac, 60 Hz input, 24 V dc output from rectifier to operate alarm and signal circuits, with standby power of gell cell batteries minimum expected life of 4 years, sized in accordance with NBC.

2.05 SIGA-270 ADDRESSABLE MANUAL ALARM STATIONS

- .1 Provide non-coded single action type with mechanical reset features.
 - .1 Non-coded single pole normally open contact for single stage.
- .2 Provide station with visible indication of operation.
- .3 Mount stations with operating lever not more than 1.2 m above finished floor, measured from the device center.
- .4 Weatherproof housings, ST1-3150 model.

2.06 AUTOMATIC ALARM INITIATING DEVICES

- .1 Traditional Protectowire linear detector
 - .1 Temperature sensor that will switch on when the set activation temperature is reached. Continuous detection capable of detecting heat at any location along its length. Detector consisting of two steel conductors individually insulated equipped with heat sensitive polymer. Insulated and twisted conductors with heat protection wrap.
 - .2 15.2 m (50 ft) protection coverage.

- .3 UL, ULC and FM approved.
- .4 Available at the alarm point at the following temperatures:
 - .1 155°F (68°C)
 - .2 190°F (88°C)
 - .3 220°F (105°C)
 - .4 280°F (138°C)
 - .5 356°F (180°C)
- .2 Traditional heat detector
 - .1 Rate-of-rise and fixed temperature heat detector, models CR-135, CR-200 et CR135MP.
 - .2 Point detectors designed to be surface mounted in an output box, with support separate from conduits, tubes or electric connections.
 - .1 Auto-reset contacts after rate-of-rise solicitation.
 - .2 Activation at a set temperature prompting an external indication.
- .3 Traditional smoke detector
 - .1 Photoelectric smoke detector model C2M-PDH.
 - .2 Combined device operating based on light diffusion and as a thermistor sensor/rate-of-rise detector.
 - .3 UL and ULC approved.
- .4 Addressable 3D multisensor detector model SIGA-PHS
 - .1 Analog multisensor detector that uses a photoelectric sensor working based on light dispersion and a temperature sensor in order to detect any change in ambient air. The internal microprocessor uses algorithms to analyse the data from the two sensors dynamically and simultaneously based on time and make an alarm decision based on the results of the analysis.
 - .2 Thermostatic element: Ambient temperature alarm at 135°F (57°C).
 - .3 UL, ULC, CSFM and MEA approved.
- .5 Addressable heat detector model SIGA-HFS
 - .1 Heat detector collecting analog data from its rate-of-rise and/or thermostatic sensor.
 - .2 Thermostatic element: Ambient temperature alarm at 135°F (57°C).
 - .3 UL, ULC, CSFM and MEA approved.
- .6 TA-1 mechanical temperature sensor
 - .1 Detector designed to provide reliable monitoring of environments where high or low temperatures are critical.
 - .2 Simple manual settings at two limits: low and high temperature.
 - .3 Temperature display range -34°C (-30°F) to 54°C (130°F).
 - .4 Alarm temperature range 10°C (50°F) to 54°C (130°F).
 - .5 Response time: 14 minutes.
 - .6 Dry contact normally open at 50 ma, 12 Vdc.
- .7 120 volts smoke alarm and emergency batteries, model ~~BRK-7010BSLA~~ KIDDE i12010SCA
 - .1 Photoelectric smoke alarm for chambers operating based on light dispersion.
 - .2 Connection to the 120 Vac circuit and 3 volts sealed lithium battery.
- .3 Alarm temperature range: 4°C (40°F) to 38°C à (100°F).

2.07 ALARM INITIATING DEVICE SPACING AND LOCATION

- .1 The detectors will be installed in accordance with the terms of ULC approval and comply with the requirements of the NFPA 72 standard. Exception regarding operating in freezing temperatures.
- .2 The detectors will be installed at least 300 mm away from lighting fixtures and at least 600 mm from blowers and return air grilles.
- .3 The removal of a detachable detection head from its mounting base must cause the system to generate fault alarms.

2.08 AUDIBLE – VISUAL SIGNAL DEVICES

- .1 Audible Device(s):
 - .1 Horns: 94.5 dB (high) 89.8 dB (low) for surface installation, 24 V, c.c., model G1RF-HD
 - .1 High or low settings.
 - .2 Horn/strobe light combined, model G1RF-HDVM:
 - .1 Horn/strobe light producing an audible tone of 89.8 dBA or 94.5 dBA. The horn must provide continuous or timed. The strobe light integrated must provide several luminous intensities depending the room dimension where it is installed. The luminous intensities of each strobe light are 15 cd, 30 cd, 75 cd or 110 cd. Each strobe light must be synchronized with the others that are in the same environment.
 - .2 Horn/strobe light must be fixed on an electrical box or a mounted box furnished by the manufacturer. Horn/strobe light must be mounted so the center is at least at 2 000 mm above finished floor level and for wall devices the center is at least at 150 mm from the ceiling.
- .3 Motorized bell MB series
 - .1 Available in 150 mm and 250 mm diameters.
 - .2 Sound levels 92 dB and 97 dB at 3 metres.
 - .3 Consumption: 45 ma at 24 Vcc.
- .4 Mini-horn for chambers, model 683-1C
 - .1 Miniature horn producing a sound level of 91 dB at 3 metres.
 - .2 Equipped with an integrated switch allowing silencing for a maximum of 10 minutes, after which the signal resumes until the circuit is inactive or the switch is turned on again.
 - .3 Consumption: 33 ma at 24 Vcc.
 - .4 UL and ULC approved.
- .5 Strobe light model 125STRHR120A
 - .1 NEMA 3R and 4X type corrosion-resistant casing. The light may be attached to a panel or a conduit.
 - .2 Reinforce nylon base consisting of 33% gray fiberglass, which ensures excellent heat resistance and resistance to chemicals. The diffuser will be made of shock-resistant polycarbonate.
 - .3 Operating temperature: -35 to 66°C (-31 to 150°F).
 - .4 Consumption: 120 ma. at 120Vac.
 - .5 Light intensity: 300 000 cd.
 - .6 UL and ULC approved,

2.09 END-OF-LINE DEVICES

- .1 End-of-line devices to control supervisory current in signaling 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 as indicated.

2.10 INTELLIGENT ADDRESSABLE MODULE

- .1 Monitoring and Control Module:
 - .1 Single input module, model SIGA-CT1
 - .1 Connection to a Class B monitored input circuit and an end of line device.
 - .2 Monitoring contact devices as flow, sprinkler system valve monitoring, generator monitoring switches.
 - .3 Connection of these circuits: Alarm, normally open, locking; Alarm, normally open, delayed locking (water flow switches); Active monitoring, normally open, without locking (monitoring of fans, registry, doors, etc.); Active monitoring, normally open, without locking (monitoring switches, disturbance switches).
 - .4 Fixed on a simple electric box of 2½ in (64 mm) deep or a square of 4 in and 1½ in (38 mm) deep with a simple lid.
 - .2 Double Input Module, model SIGA-CT2
 - .1 Connection to a Class B of two monitored input circuits and two end of line devices.
 - .2 Same characteristics as a single input module. Fixed on a double electric box of 2½ in (64 mm) deep or a square of 4 in and 1½ in (38 mm) deep with a double lid.
 - .3 Relay Module, model SIGA-CR
 - .1 Module allowing connection to a form C dry relay before an ampacity of 2,0 A to 24 V c.c. and 0.5 A to 125 V c.a.
 - .2 Fixed on a double electric box of 2½ in (64 mm) deep or a square of 4 in and 1½ in (38 mm) deep with a double lid.

2.11 ISOLATOR MODULE FOR DETECTION CIRCUIT, MODEL SIGA-1M

- .1 Protection module to isolate detection circuit against a default into alarm zone between wires of the analogue loopback.
- .2 Installed between alarm device groups to protect the other devices connected on a same loop. In the event of default between two isolator modules, these ones open immediately the circuit to isolate the sensor group situated in between. The other devices connected to the circuit continue to run normally.
- .3 Class A or style 6 wiring.
- .4 Fixed on a double electric box of 2½ in (64 mm) deep or a square of 4 in and 1½ in (38 mm) deep with a double lid.

2.12 BATTERIES

- .1 Sealed acid-lead batteries.
- .2 The batteries required will have sufficient capacity to ensure the complete operation of the network during 24 hours in monitoring mode and 30 minutes in alarm mode.

- .3 Take into consideration that the required battery will have a capacity higher by 20% than the battery calculation made during commissioning and that the battery calculation presented in the verification report must confirm the required capacity.

2.13 REMOTE FIRE ALARM – INTEGRATED TO THE TELEPHONE SYSTEM

- .1 Mode of transmission and telephone dialer are not included in the contract (executed by other parties).
- .2 Coordinate commissioning with PROTECTRON ADT: Mr. Denis Pichette at dpichette@adteca / telephone: 418 929-0945.
- .3 Relay modules described above (item 2.10.3) will be supplied, installed and commissioned.

2.14 WIRING

- .1 Wire for 120 V circuits: No. 12 AWG minimum solid copper conductor.
- .2 Wire for low voltage DC circuits: No. 14 AWG minimum solid copper conductor
- .3 Wire to remote annunciators: No. 18 AWG minimum solid copper conductor.
- .4 Wire to remote annunciators: No. 18 AWG minimum solid copper conductor.
- .5 Provide plain solid copper 105°C wiring approved for fire alarm and in accordance to the Quebec Construction Code, Chapter 5. Provide the quantity of the manufacturer recommendation.
- .6 For detection use a wire gauge size of at least 16.
- .7 For horn/strobe light signal use a wire gauge size of at least 14.
- .8 For electrical power to fire alarm equipment use a wire gauge size of at least 12.

2.15 AUXILIARY DEVICES

- .1 Remote relay unit to initiate fan shutdown if the starter ventilation power needs a greater capacity than an integrated relay to an addressable relay module of the fire alarm system.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 INSTALLATION

- .1 Install systems in accordance with CAN/ULC-S524-06 and TB OSH Chapter 3-04.
- .2 If required, install remote advisory panel in accordance with indications and connect to main control.

- .3 All the equipment, without exception, should be identified the equipment address with a labelling device as P-Touch, minimum of 12 mm, black letters on a white background.
- .4 Locate and install manual alarm stations and connect to alarm circuit wiring. The existing manual warning devices will be lowered/installed at the height required in the ULC S-524 standard, i.e. 1,200 mm from the center of the device.
- .5 Locate and install detectors and connect to alarm circuit wiring. Maintain a clearance with a minimum radius of 450 mm around and below the detector. Locate duct type detectors in straight portions of ducts.
- .6 Connect alarm circuits to main control panel.
- .7 Install the horns and visual warning devices will be installed where indicated and so the center of the devices is at least 1,800 mm above the finished floor. Wall-mounted devices will be installed no more than 50 mm from the ceiling and will be connected to the alarm circuits.
- .8 Mini fire alarm horns flush-mounted into walls will be installed in Building #19's rooms (hotel) at least 66 mm under the ceiling, measuring from the top of the device. There will be no patching resulting from the installation of the mini-horns. Armoured cables will be used and installation will be class A (distance of 1,200 m horizontally and 300 mm vertically), hidden in the attic space. Passage through floors will be sealed. They will be connected to the fire alarm panel located in the basement and on separate alarm circuits.
- .9 Existing devices to remove: disconnect the circuit upstream and downstream of the device to be removed in order to isolate the pieces of equipment connected to the device. Remove unnecessary wires. Reconnect to the circuit using wiring protected in accordance with the provisions of these specifications (armoured cables, ducts). Provide and install a chrome a chrome finish cover to cover disused electrical boxes.
- .10 Strobe lamps directed upward will be installed outdoors at the new facilities. They will be supplied and installed approximately 5 m from the ground at new facilities. Existing strobe lamps will remain where they are. They will be connected to the alarm panel with a 1 x 14/3 protected cable in accordance with the provisions of these specifications (armoured cable, ducts). Provide and install a new 15A breaker to supply power to the 120 V network. 120 V power will be monitored by a relay energized by the power that will be installed in a closed casing near the fire alarm panel. Power failure will de-energize the relay and open the wire contact of the alarm circuit dedicated to this device, which will cause a failure of the fire alarm panel.
- .11 Install the temperature sensor in the water supply room and in the sprinkler room at a height of 1,200 mm from the floor. Connect the temperature sensor to the newly added addressable module.
- .12 Install the fire alarm panel and annunciator panel so that the display and controls are no more than 1800 mm from the finished floor. A clearance of 1000 mm must be maintained in front of each panel. In the fire alarm panel and in the remote annunciator panel, all of the areas affected will be typed on pieces of paper, which will be inserted where appropriate in the space provided. The liquid crystal display on the control panel shall announce the sprinkler monitoring as described in the drawings. The inside of the fire alarm and remote annunciator panels will be cleared of debris, papers, connection caps, screws, etc., causing unnecessary encumbrance as the work progresses. At the end of the work, the connections to the existing telephone dialer will be re-established (refer to item 2.13 of this section of the specifications).
- .13 Connect signalling circuits to analogue network nearby.

- .14 Install end-of-line devices at end of alarm and signalling circuits at a height of 1,800 mm or less.
- .15 Locate and install isolation module. Each insulation module shall be marked with its designation.
- .16 Locate and install intelligent addressable modules. Each intelligent addressable module shall be marked with its designation
- .17 Locate and install remote relay units to control fan shut down. Each remote relay shall be marked with its designation
- .18 The transmission of alarms to the alarm monitoring centre is outside the scope of this contract. However, the fire alarm equipment supplier is responsible for coordination and commissioning (refer to item 2.13 of this section of the specifications).
- .19 Operate auxiliary functions as long as the fire alarm system is not back to normal and the full recovery of the fire alarm system has been done. In the case there is two steps for the fire alarm system, these functions shall operate during the alarm signal.
 - .1 Transmit signal to fire department.
 - .2 Fire doors that are normally open by magnetic holders.
 - .3 Neutralize doors with electro-magnetic locking mechanism.
 - .4 Unlocking the building main door latch to allow an access to the building by the fire department.
- .20 Automated sprinkler system: coordinate the fire alarm work with the fire protection contractor.
- .21 All detection and alarm devices in the buildings will be verified. These devices will be tested in accordance with the CAN/ULC-S536-04 standard on the inspection and verification of fire alarm devices in order to make sure that all of the devices are operational, that the additional programming has rendered the system fully operational and that auxiliary functions have not been omitted. The specialist, who will hold a RBQ 13.2 license, will list the devices in the ULC S-537-04 verification report and mention that they are existing devices which required only a verification in accordance with the ULC S-536-04 and that said verification was performed. The verification will include (without being limited to) the following items:
 - .1 The inventory of checked devices:
 - .1 Exact model and exact quantity of:
 - .1 Each fire control;
 - .2 Each advisory panel;
 - .3 Auxiliary controls:
 - .1 detection auxiliary control;
 - .2 signal auxiliary control;
 - .3 isolation module auxiliary control (grouped units).
 - .4 Detection devices.
 - .5 Signal devices.
 - .6 Intelligent addressable modules (single-entry, double and addressable relay).
 - .2 The fire alarm operating system as:
 - .1 Alarm transmission.
 - .2 Ventilation shutdown.
 - .3 Fire door and electrical latch to de-energize.
 - .4 Solenoid valve activation by detection and combined mode.
 - .5 Any other programmed function to the fire control to have unprecise and exact report of the fire alarm system function when it is in alarm state.

- .3 The complete report of fire control testing:
 - .1 Control units (model, location, etc.).
 - .2 Annunciator (model, location, etc.).
 - .3 Batteries (models, capacities (volts, amps)).
 - .1 Cut main power supply reading:
 - .1 Supervisory current.
 - .2 Full charged alarm current.
 - .2 Calculation of the load circuit to validate the batteries capacities to meet the CND requirements.
 - .4 Conventional circuit zone number, analog circuit number and:
 - .1 detection devices address.
 - .2 devices location and the detection device model for each location.
 - .5 Circuit number of the signal zone:
 - .1 Note circuit current when alarm mode is activated.
 - .2 Devices location and the signal device model for each location.
 - .3 Device decibel value for the furthest point in the room where is installed the device.
 - .6 The sensitivity for each smoke detector.
 - .7 The velocity for each smoke detector for duct and ventilation.
 - .8 End of line devices location.
 - .9 Default isolator location and the area it serves.
 - .10 Alarm delay before initiation for each sprinkler flow switch.
 - .11 Sprinkler low pressure alarm valve to set. The device activate a supervisory signal.
 - .12 An auxiliary function list and the address of each relay module that activate the functions.
 - .13 List of recommendations (if applicable).
- .22 The project will be managed globally and all of the work and services will be delivered as indicated in the plans and specifications. Coordinate all of the functionalities in order to ensure operability and system interaction. Mention in the ULC S-537-04 verification report that all of the functionalities have not been tested will not be accepted. Commissioning must document that the various buildings' systems comply with the requirements of the National Building Code.

3.03 FIELD QUALITY CONTROL

- .1 Site Tests:
 - .1 Perform tests in accordance with Section 26 05 00 - Common Work Results - for Electrical and CAN/ULC-S537.
 - .2 Fire alarm system:
 - .1 Testing the alarm transmission to the control panel and the general alarm transmission from the manual pull and the thermal and smoke detectors.
 - .2 Check annunciator panels to ensure zones are shown correctly.
 - .3 Simulate grounds and breaks on alarm and signaling circuits to ensure proper operation of system.
 - .4 Class A circuits.
 - .1 Test each conductor on circuits for capability of providing alarm signal on each side of single open-circuit fault condition imposed near midmost point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.

- .2 Test each conductor on circuits for capability of providing alarm signal during ground-fault condition imposed near midmost point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .5 Class B circuits.
 - .1 Test each conductor on circuits for capability of providing alarm signal on line side of single open-circuit fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .2 Test each conductor on circuits for capability of providing alarm signal during ground-fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
 - .2 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.04 TRAINING

- .1 Arrange and pay for a formal training session of at least one hour by fire alarm equipment manufacturer. This training will be supported by the handover of the system instruction manual and of the audit report to the owner. This training will be about:
 - .1 Instruction manual interpretation and the audit report explanation.
 - .2 The operating fire control.
 - .3 The characteristics and the particularities of the system.

3.05 CLEANING

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

END OF SECTION