

Part 1 General

1.1 REFERENCES

- .1 Abbreviations:
 - .1 Electronic Access Control: 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 PIN: Personal Identification Number.
- .2 Reference Standards:
 - .1 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:
 - .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 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.
 - .2 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 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 monitoring facility is ULC/UL "Listed central station".
 - .4 Submit verification Certificate that security access 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 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.

Part 2 Products

2.1 MATERIALS

- .1 The company appointed to supply, install, connect and start up the system is Tyco
- .2 Design Criteria:



- .1 Design access control and security access systems using only ULC/UL listed products.
 - .2 Design security access system using ULC/UL listed alarm service company, company.
 - .3 Design security access system for ULC/UL listed central station an alarm monitoring facility having capability to provide specified service.
 - .4 Design security access system as a ULC/UL certified alarm system
 - .5 Design access control systems to meet safety requirements to UL 294.
 - .6 Design system to provide door manual and automatic control functions from locations indicated to central monitoring system.
 - .7 Design system to allow for addition of future Door Release System (DRS) controls and activation units by adding appropriate transmission lines and equipment at each location.
 - .8 Design system to consist of homed run control to activation unit connections.
 - .9 Each activation unit must have door panel control function/equipment item located as indicated.
 - .10 Design system to provide ease of operation, servicing, maintenance, testing and expansion of additional services.
- .3 Door controls items and panels:
- .1 Include standard "off the shelf" equipment items to form a complete and operating DRS system.
- .4 Provide system cables including coaxial cable, multiconductor control cable, audio and AC power cable required.
- .5 Power supplies: to CAN/ULC-S318 and UL 603.
- .6 Connectors and switches: to ULC-C634.
- .7 Basic System Criteria:
- .1 Card readers:
 - .1 Type: proximity drive.
 - .2 Proximity technology.
 - .3 Fitted with LED indicator light.
 - .4 Reading distance 50 to 200 mm.
 - .5 Compatible with access card model.
 - .2 Cards: standard, plastic, credit-card size, sealed and highly resistant to normal handling and weather, fitted with vertical slot punched hole.
 - .1 Model and characteristics such as the client's standard
 - .2 Quantity of cards required: 50.
 - .3 Guaranteed for (5) years against all defects and protected against:
 - .1 Magnetic encoded cards.
 - .2 Metal objects including coins and keys.
 - .3 Retail shoplifting detection equipment.
 - .4 Communication equipment.



- .4 Coding:
 - .1 Such as the client's standard.
- .8 System Accessories:
 - .1 Request to exit motion detector device:
 - .1 Infrared detection.
 - .2 Continuous low-voltage operation.
 - .3 Fitted with indicator light.
 - .4 Integrated with local audio alarm (electronic buzzer).
 - .5 Adjustable coverage.
 - .2 Request to exit motion push button device:
 - .1 Heavy duty assembly.
 - .2 Size: square: 50 x 50 mm.
 - .3 Sturdy and attractive finishing plate with security screws.
 - .3 Pull station power interrupt.
 - .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.
 - .5 Voltage: such as the client's standard

Part 3 Execution

3.1 INSTALLATION: BURGLAR ALARM SYSTEM

- .1 Install control access components in accordance with CAN/ULC-S302, CAN/ULC-S310, UL 681 and UL 1641.
- .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.
- .6 Tyco company must be retained for the works on this system.

3.2 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.
- .2 Pretesting procedure:
 - .1 Verify utilizing an approved spectrum analyzer and test equipment that system is fully operational and meets all system performance requirements of this specification.
 - .2 Measure and record, control (and/or voice) carrier levels of every system channel at each of following points in the system:
 - .1 Door located actuating devices.
 - .2 Door control panel functions.
 - .3 Electronic supervisory control units inputs and outputs.
 - .4 Distribution system input and output.
 - .5 Telephone system interface input and output.
 - .3 Submit to Departmental Representative 2 copies of recorded system pretest measurements, along with pretest certification.
- .3 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 form[s], antenna radiation pattern[s], equipment cabinet pictorial[s], antenna pictorial, antenna mount 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 Electrical power circuits designated for system equipment are properly labeled, wired, phased, protected and grounded.
 - .2 Conductor ends are protected by heat shrink wrap; audio spade lugs, barrier strips and punch blocks are used.
 - .3 Dust, debris, solder splatter, etc. are cleaned and removed from site.
 - .4 Equipment is properly labelled.



- .5 Equipment identified in system's equipment lists are in-place and properly installed.
- .6 Each lightning and System ground method are installed in accordance with manufacturer's instructions and this specification.
- .4 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 Control units:
 - .1 Take S/N readings from control unit's input and output in manual (and/or automatic) mode. Check output of DC/Data converter for S/N. Evaluate entire signal quality at baseband connector output of control unit and remote equipment.
 - .3 Audio:
 - .1 Take S/N readings from transmitter input and receiver output with equipment placed in manual gain mode. Check output of the audio converter, modulator or demodulator for S/N. Evaluate entire audio signal at baseband connector input and output of control unit.
 - .4 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.
 - .2 Test each interconnection point (i.e.: door unit, junction box "cross connection", control unit, etc.) to ensure compliance with this specification.
 - .5 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 (and/or audio), sub carrier, and control signals in accordance with this specification.
 - .6 Safety:
 - .1 Demonstrate with documentation that access control system meets safety requirements specified in UL 294.
- .5 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.
- .6 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.
- .7 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.

3.3 FIELD QUALITY CONTROL

- .1 Manufacturer Services:
 - .1 Manufacturer of products, supplied under this Section, to review Work involved in the handling, installation/application, protection and cleaning, of its product[s] 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] [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.
 - .3 Upon completion of Work, after cleaning is carried out.

3.4 PROTECTION

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

END OF SECTION



Part 1 General

1.1 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 building entrance control systems and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings and schematics stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.

1.2 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for building entrance control systems for incorporation into manual.
- .3 Include description of system operation.
- .4 Include parts list, using component identification numbers standard to electronics industry.

Part 2 Products

2.1 SYSTEM DESCRIPTION

- .1 Building entrance control system:
 - .1 Compatible with product line of Tyco integrated. The company appointed for the supply, the installation, the connections and the maintenance of the system is Tyco Integrated Security in Ottawa in Ontario.
 - .1 A secondary post provided with an intercom and a camera is installed near the front door. The visitor presses on a button of the post and activates a sound signal on the master post provided with a color screen at the occupant.
 - .2 The occupant can activate the intercom to have a dialogue with the visitor.
 - .3 The occupant can remotely activate the electrified lock of the door to let the visitor enter the building.

Part 3 Execution

3.1 INSTALLATION

- .1 Install system in accordance with manufacturer's instructions.



- .2 Fix components to walls, to ceilings and to other indicated supports.
- .3 Install required boxes in not visible places
- .4 Hide conduits and cabling.
- .5 The service of the company Tyco Integrated Security must be retained for the works on this system.
 - .1 The scope of work of section 28 13 28 Building entrance control system is an integral part of Division 26.
 - .2 As prescribed at section 01 21 00, an allocation is planned for the works to be realized by Tyco Integrated Security on this system. The contact is Mr. Grant Foster: (613) 526-0379 or (613) 219-6782.
 - .3 All conduits, cables and boxes are to be supplied and installed by
 - .4 Division 26 and are not included in the allocation because they are to be made by the Contractor of Division 26. The Contractor has to coordinate the installation of these conduits, boxes and cables, between post offices, with Tyco Integrated Security.
 - .5 Tyco Integrated Security has to supply, install and connect all the components required and necessary to properly operate of the system.
 - .6 Programming, testing, commissioning and start up of the system must be made by Tyco Integrated Security.

3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform intelligibility tests.

3.3 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by building entrance control system installation.

END OF SECTION



Part 1 General

1.1 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-S525-07, Audible Signal Devices for Fire Alarm Systems, Including Accessories.
 - .3 CAN/ULC-S526-07, Visual Signal Devices for Fire Alarm Systems.
 - .4 CAN/ULC-S527-99, Standard for Control Units for Fire Alarm Systems.
 - .5 CAN/ULC-S528-05, Manual Pull Stations for Fire Alarm Systems.
 - .6 CAN/ULC-S529-09, Smoke Detectors for Fire Alarm Systems.
 - .7 CAN/ULC-S530-91(R1999), Heat Actuated Fire Detectors.
 - .8 CAN/ULC-S531-02, Standard for Smoke Alarms.
 - .9 CAN/ULC-S536-04, Inspection and Testing of Fire Alarm Systems.
 - .10 CAN/ULC-S537-04, Verification of Fire Alarm Systems.
- .3 CSA standard:
 - .1 Chapter I du Code de la Construction du Québec et règlement sur la sécurité dans les édifices publics du Québec.
 - .2 Au chapitre V – Électricité du Code de la Construction du Québec.
 - .3 Spécifications of Montréal city.

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 multiplex fire alarm system and voice communication systems and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Québec, Canada.
 - .2 Indicate on shop drawings:
 - .1 Detail assembly and internal wiring diagrams for control unit[s].
Auxiliary cabinets.
 - .2 Overall system riser wiring diagram identifying control equipment initiating zones signaling circuits; identifying terminations, terminal numbers, conductors and raceways.



- .3 Details for devices.
- .4 Details and performance specifications for control, annunciation and peripherals with item by item cross reference to specification for compliance.
- .5 Step-by-step operating sequence, cross referenced to logic flow diagram.

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 fire alarm and voice communication systems for incorporation into manual.
- .3 Include:
 - .1 Instructions for complete fire alarm system to permit effective operation and maintenance.
 - .2 Technical data - illustrated parts lists with parts catalogue numbers.
 - .3 Copy of approved shop drawings with corrections completed and marks removed except review stamps.
 - .4 List of recommended spare parts for system.

1.4 MAINTENANCE MATERIAL SUBMITTALS

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

1.5 QUALITY ASSURANCE

- .1 Inspection tests to conform to: CAN/ULC-S536.
- .2 Submit inspection report, to Consultant.

Part 2 Products

2.1 MATERIALS

- .1 All equipment and accessory must be standard and come from to a single manufacturer

2.2 DESCRIPTION

- .1 Fire alarm system is existing and addressable: 4100U from Simplex
- .2 Fully supervised, microprocessor-based, fire alarm and voice communication system, utilizing digital techniques for data control and digital, and multiplexing techniques for data transmission.
- .3 System to carry out fire alarm and protection functions; including receiving alarm signals; initiating two-stage alarm; supervising components and wiring; actuating annunciators and auxiliary functions; initiating trouble signals and signalling to fire department.
- .4 Zoned, coded two stage with voice communication triple channel.



- .5 Modular in design to allow for future expansion.
- .6 Operation of system shall not require personnel with special computer skills.
- .7 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .8 Power supply: to CAN/ULC-S524.
- .9 Audible signal devices: to CAN/ULC-S525.
- .10 Control unit: to CAN/ULC-S527.
- .11 Manual pull stations: to CAN/ULC-S528.
- .12 Thermal detectors: to CAN/ULC-S530.
- .13 Smoke detectors: to CAN/ULC-S529.
- .14 Smoke alarms: to CAN/ULC-S531.
- .15 Speakers: to CAN/ULC-S541.
- .16 Regulatory requirements:
 - .1 System:
 - .1 To TBS Fire Protection Standard.
 - .2 System components: listed by ULC and comply with applicable provisions of NBC Local Provincial Building Code, and meet requirements of local authority having jurisdiction.

2.3 SYSTEM OPERATION: VOICE COMMUNICATION – TWO STAGES - THREE CHANNELS

- .1 The operating sequence must be the same as the existing.

2.4 INITIATING/INPUT CIRCUITS

- .1 Receiving circuits for alarm initiating devices such as manual pull stations, smoke detectors, heat detectors and water flow switches, wired in DCLB configuration to central control unit.

2.5 ALARM OUTPUT CIRCUITS

- .1 Alarm output circuit: connected to speakers, wired in Class B configuration to DGP's/transponders.

2.6 EMERGENCY TELEPHONE CIRCUITS

- .1 Telephone circuits for connection of remote emergency telephones: wired in Class B configuration to central control unit.

2.7 AUXILIARY CIRCUITS

- .1 Auxiliary contacts for control functions.

2.8 WIRING

- .1 Copper conductors and 300 V isolated in PVC.



- .2 To initiating circuits: 18 AWG minimum, and in accordance with manufacturer's requirements such as Belden no.8760.
- .3 To signal circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.
- .4 To speaker circuits: twisted, shielded pairs, and in accordance with manufacturer's requirements.
- .5 To telephone circuits: 18 AWG minimum, and in accordance with manufacturer's requirements such as Belden no.8760
- .6 To control circuits: 14 AWG minimum, and in accordance with manufacturer's requirements.
- .7 Risers: twisted, shielded pairs, 1h fire-rated configured to eliminate interference and cross-talk.
- .8 All the cables linking addressable devices or telephones must be shielded
- .9 Identify clearly all conductors with his two extremities by means of well-read ribbon planned to this end
- .10 Terminal board of assembly with identification

2.9 MANUAL ALARM STATIONS

Addressable manual pull station: pull lever, semi-flush wall mounted type, 2 stage, electronics to communicate station's status to addressable module/transponder over 2 wires and to supply power to station. Station address to be set on station in field.

2.10 AUTOMATIC DEVICES OF RELEASE OF ALARM

- .1 Addressable detectors thermal and smoke:
 - .1 Models and characteristics such as existing.

2.11 AUDIBLE SIGNAL DEVICES

- .1 Speakers:
 - .1 Cone type: recessed square 100 mm ceiling wall mounted.
 - .2 Models and characteristics such as existing.

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 as indicated.

2.13 AUXILIARY DEVICES

- .1 Module of addressable interface:
 - .1 Module being of use as interface between devices to contacts N.O. or N.F. and a circuit of addressable release.



- .2 Watched module of interface, including the circuit of connecting of the contact short circuit.
 - .3 Programmable on the spot to indicate the address and the type of report.
 - .4 Relay watched for command of the auxiliary functions.
 - .5 Contact of the relay in 120 V, 2A.
 - .6 Model and characteristics such as the existing.
- .2 Relay of addressable interface:
- .1 Relay serving as interface by a circuit of addressable release.
 - .2 Programmable on-the-spot to indicate the address and the type of report.
 - .3 Relay watched for command of the auxiliary functions.
 - .4 Contact of the relay in 120 V, 2A.
 - .5 Model and characteristics such as the existing.

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 and communication systems installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .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 Consultant.

3.2 INSTALLATION

- .1 Install systems to CAN/ULC-S524 and TBS OSH Fire Protection Standard.
- .2 Install or relocate 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 sound signal devices to CAN/ULC-S526 and connect to signalling circuits.
- .6 Connect signalling circuits to main control panel.
- .7 Install or locate end-of-line devices at end of alarm and signalling circuits.
- .8 Install or locate remote relay units to control fan shut down.
- .9 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
- .10 Connect fire suppression systems to control panel.



- .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.
- .15 Install speakers and connect to speaker circuits.
- .16 Achieve installation in accordance with the last edition of ULC-S524.
- .17 Realize the discontinuation of the required points of detection and the zones of road marking required to allow the realization of the works. Assure the adequate supervision of places during these works.

3.3 CONDUITS AND CONDUCTORS

- .1 Install all the conductor in rigid thin wall steel metallic conduits, unless other indications in the plans or the specification.
- .2 Install conductor for the detection and the telephone in conduits separated from conductor for loudspeakers and bells.
- .3 Fill conduits so that the total surface of the drivers does not exceed 40 % of the surface free of the conduit

3.4 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical and to CAN/ULC-S537.
- .2 Fire alarm system:
 - .1 Test 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 system.
 - .4 Addressable circuits system style DCLB:
 - .1 Test each conductor on 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 (3) signals. Correct imposed fault after completion of each series of tests.



- .2 Test each conductor on 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 (3) signals. Correct imposed fault after completion of each series of tests.
- .3 Provide final PROM program re-burn for system Departmental Representative incorporating program changes made during construction.
- .4 Simulate a ground fault or a break on the circuits of alarm and road marking to make sure of the smooth running of the signals of breakdown
- .5 Test, adjustments and calibration by means of specialized instruments, in the presence of a representative of the manufacturer of the system fire alarm.
- .6 Make a test of the sound levels of the alarms in each of the rooms and record the levels measured in the inspection report. Adjust the power of loudspeakers if we need.
- .7 Verify all the connecting of all equipment (manual posts, check(control), etc.) to make sure:
 - .1 The system is installed according to the plans and prescriptions
 - .2 The system is installed according to the manufacturer instructions
 - .3 Surveillance rules are respected. Verify all the connecting of each devices
 - .4 Run every manual station, thermal detector, detector of combustion products, device of sampling of combustion products.
 - .5 Every detector of combustion products is calibrated on the scene with an approved instrument
- .8 At the end of the verification, provide to the engineer:
 - .1 A certificate giving evidence that this work was made.
 - .2 A complete register of the equipment and the check on two different formulas:
 - .1 The first one, including the quantity of panels, zoning, heralds, manual stations, printers, cathode-ray screens, detectors and combustion products, etc., on the project.
 - .2 The second, including all the equipment describes in the previous paragraph, but enumerated individually, by indicating the location of each of the devices, the date of the inspection, as well as all the deficiencies discovered during the inspection and the date to which the new inspection took place, after the modifications, the voltage in which every detector was calibrated for future reference.
- .9 Verify the programming of system.

3.5 DEMONSTRATION

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



3.6 MAINTENANCE

- .1 Provide one year's free maintenance with two inspections by manufacturer during warranty period.
- .2 Provide individual price on tender form for subsequent PROM re-burns. Price: good for 2 years from date of project completion.
- .3 Provide individual price on bid form for temporary program changes during construction period, to include zone labels, control functions, system operation.

END OF SECTION

