

**Part 1 General**

**1.1 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-S524-2001, Standard for the Installation of Fire Alarm Systems.
  - .2 CAN/ULC-S525-1999, Audible Signal Device for Fire Alarm Systems.
  - .3 CAN/ULC-S526-2002, Visual Signal Devices for Fire Alarm Systems.
  - .4 CAN/ULC-S527-1999, Control Units.
  - .5 CAN/ULC-S528-1991, 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-S536-S537-2004, Burglar and Fire Alarm Systems and Components.

**1.2 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.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Include:
    - .1 Layout of equipment.
    - .2 Zoning.
    - .3 Complete wiring diagram, including schematics of modules.
- .3 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 Submit following:
    - .1 Manufacturer's Data for:

- .1 Open-area smoke detectors.
- .2 System wiring diagrams:
  - .1 Submit complete wiring diagrams of system showing points of connection and terminals used for electrical connections in the system.
- .3 Design data: Power Calculations:
  - .1 Submit design calculations for existing system to substantiate that battery capacity exceeds supervisory and alarm power requirements.
  - .2 Show comparison of detector power requirements per zone versus control panel smoke detector power output per zone in both standby and alarm modes.
  - .3 Show comparison of notification appliance circuit alarm power requirements with rated circuit power output.
- .4 Test Reports:
  - .1 Open-area 2-wire smoke detectors.
  - .2 Preliminary testing:
    - .1 Final acceptance testing.
    - .2 Submit for inspections and tests specified under Field Quality Control.

### **1.3 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Installer: company or person specializing in fire alarm system installations approved by manufacturer with minimum 5 year experience.
- .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.
  - .2 Subject to Fire Commissioner of Canada (FC) approval.
  - .3 Subject to FC inspection for final acceptance.

### **1.4 DELIVERY, STORAGE, AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

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**Part 2            Products**

**2.1                MATERIALS**

- .1      Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .2      Visual signal devices: to CAN/ULC-S526.
- .3      Smoke detectors: to CAN/ULC-S529.

**2.2                SYSTEM OPERATION**

- .1      Maintain and extend existing FA system to accommodate revised architectural layouts.
- .2      Existing fire alarm control panel Siemens Cerberus Pyrotronics MXL-V.

**2.3                AUTOMATIC ALARM INITIATING DEVICES**

- .1      Combination Fixed Temperature Rate-Of-Rise Detectors (Spot Type): designed for surface outlet box mounting and supported independently of conduit, tubing or wiring connections.
  - .1          Contacts: self-resetting after response to rate-of-rise actuation
  - .2          Operation under fixed temperature actuation to result in external indication.
  - .3          Detector units located in boiler rooms, showers, or other areas subject to abnormal temperature changes to operate on fixed temperature principle only.
- .2      Mount detectors at underside of ceiling or deck above unless otherwise indicated.
- .3      Locate detectors minimum 300 mm to lighting fixtures and not closer than 600 mm to air supply or return diffuser.
- .4      Provide detectors with terminal screw type connections.
- .5      Removal of detector head from its base to cause activation of system trouble signals if detectors are provided with separable heads and bases.

**2.4                VISUAL ALARM SIGNAL DEVICES**

- .1      Flush-mounted assembly of stroboscopic type suitable for use in electrically supervised circuit and powered from notification appliance circuits.
- .2      Appliances: minimum of 15 candela measured as approved by ULC, but not less than effective intensity required by National Building Code of Canada for appliance spacing and location as shown.
- .3      Protect lamps with thermoplastic lens and labelled "FIRE" in letters at least 12 mm high.
- .4      Provide visible appliances as indicated.
- .5      Visible appliances may be part of audio-visual assembly, where more than two appliances are located in same room or corridor.

**2.5                CONDUIT**

- .1      Electrical Metallic Tubing (EMT):

## **2.6 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 for connection to base telegraphic alarm loop: No. 12 AWG minimum solid copper conductor.
- .5 Insulation 90 degrees C minimum with nylon jacket.
- .6 Colour code wiring.

## **2.7 AS-BUILT RISER DIAGRAM**

- .1 Fire alarm system riser diagram: in glazed frame minimum size 600 x 600 mm.
- .2 Modify existing riser to reflect all changes made in scope of work.

## **Part 3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 INSTALLATION**

- .1 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-04.
- .2 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of 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.
- .3 Connect signalling circuits to main control panel.

### **3.3 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 Test each device and alarm circuit to ensure manual stations, smoke detectors transmit alarm to control panel and actuate general alarm.
    - .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 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 Maintenance Manuals::
  - .1 All new equipment shall be added to building maintenance manuals including.
    - .1 Revised wiring schematics
    - .2 Equipment cutsheets

### **3.4 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**