

PART I GENERAL

I.1 REFERENCES

- .1 Government of Canada
 - .1 NBC-1995, National Building Code of Canada.
 - .2 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.
 - .3 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 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S524-1991, Installation of Fire Alarm Systems.
 - .2 ULC-S525-1978, Audible Signal Appliances for Fire Alarm.
 - .3 CAN/ULC-S526-1987(R1995), Visual Signal Appliances, Fire Alarm.
 - .4 CAN/ULC-S527-1987(R1995), Control Units.
 - .5 CAN/ULC-S529-1987(R1995), Smoke Detectors.
 - .6 CAN/ULC-S536-1997, Inspection and Testing of Fire Alarm Systems.
 - .7 CAN/ULC-S537-1997, Verification of Fire Alarm Systems.

I.2 SYSTEM DESCRIPTION

- .1 The existing system is a fully supervised, microprocessor-based, fire alarm system, utilizing digital techniques for data control and digital, and multiplexing techniques for data transmission.
- .2 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 monitoring agency.
- .3 Zoned, coded, single stage.
- .4 Modular in design to allow for future expansion.

I.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Include:
 - .1 Detail assembly and internal wiring diagrams for control units.
 - .2 Details for devices.
 - .3 Details and performance specifications for control, annunciation and peripherals with item by item cross reference to specification for compliance.
 - .4 Step-by-step operating sequence, cross referenced to logic flow diagram.

I.4 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for fire alarm system for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 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..

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .2 Power supply: to CAN/ULC-S524.
- .3 Control unit: to CAN/ULC-S527.

2.2 SYSTEM OPERATION

- .1 Actuation of any alarm initiating device to:
 - .1 Cause electronic latch to lock-in alarm state at data gathering panel.
 - .2 Indicate zone of alarm at central control unit and at remote annunciators.
 - .3 Audible Signal:
 - .1 Cause audible signalling devices to sound in alarm tone throughout building.
 - .4 Transmit signal to fire department via central station.
 - .5 Cause all existing facility wide functions to operate as programmed.
- .2 Acknowledging alarm: indicated at central control unit.
- .3 Possible to silence signals by "alarm silence" switch at central control unit, after 60 s 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 annunciators.
 - .3 Cause audible signal at central control unit to sound.

- .4 Activate common supervisory sequence.
- .6 Resetting alarm device not to return system indications/functions back to normal until control unit is reset.
- .7 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.
- .8 Troubles on system: suppressed during course of alarm.
- .9 Trouble condition on any circuit in system not to initiate alarm conditions.

2.3 CONTROL PANEL

- .1 The existing fire alarm control panels consist of:
 - .1 Simplex Grinnell

2.4 WIRING

- .1 Twisted copper conductors: rated 300 V, FT-4.
- .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.

2.5 AUTOMATIC ALARM INITIATING DEVICES

- .1 Rate of rise or fixed temperature as noted.

2.6 FIRE ALARM BELL

- .1 Provide 250mm diameter fire alarm bells as noted on plans and to match existing.

2.7 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.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-04.
- .2 Label device zoning as shown on drawings.
- .3 Provide and install system isolators as required..
- .4 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.
 - .3 Locate and install detectors under raised floor. Fasten to steel brackets approximately 300 mm above sub-floor level to clear cables and conduits.
- .5 All fire alarm wiring shall be in conduit. The contractor shall be responsible for the supply and installation of the conduit, wire, wire pulling, junction boxes, electrical boxes, and terminal cabinets in accordance with the manufacturers recommendations.
- .6 The manufacturer shall allow for the necessary amount of on site assistance for the contractor during the construction period.
- .7 Provide 6 complete sets of shop drawings for this specific project. Drawings to include a riser and equipment to be supplied. Drawings to be approved by the engineer before fabrication and supply of the equipment.
- .8 Splices are not permitted.
- .9 Provide necessary raceways, cable and wiring to make interconnections to terminal boxes, annunciator equipment and CCU, as required by equipment manufacturer.
- .10 Ensure that wiring is free of opens, shorts or grounds, before system testing and handing over.
- .11 Identify circuits and other related wiring at central control unit, annunciators, and terminal boxes.
- .12 The manufacturer shall supply reasonable amounts of technical assistance for any changes necessary to conform the work of this specification. During the period inspection, the contractor shall make available electricians as required by the manufacturer.
- .13 The manufacturer shall estimate the number of hours necessary to complete this inspection prior to closing of tenders.
- .14 The manufacturer shall report to the Consulting Engineer after the installation meets all of the above conditions.
- .15 Provide a copy of the inspecting technician's report. Identify each device by location and certify the test results.
- .16 Issue a Certificate of Verification confirming the completion of the verification.

- .17 Include all costs of this inspection in the total tender price.

3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical and CAN/ULC-S537.
- .2 Fire alarm system:
 - .1 Test such device and alarm circuit to ensure manual stations, thermal and smoke detectors sprinkler system transmit alarm to control panel and actuate first stage alarm general alarm ancillary devices.
 - .2 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of systems.
 - .3 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.
 - .4 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.
 - .5 Manitoba Fire Alarm Technician 'M' License:
 - .1 A Manitoba Fire Alarm Technician 'M' License is required to perform fire alarm verifications. The scope of this license allows holders to maintain, service, repair and verify fire alarm systems. Installations of fire alarm systems must still be performed by a licensed electrician. Fire alarm verifications shall be conducted by a qualified person other than the installing contractor or designer.
 - .2 In addition to the name and contact information of the verifying organization, the verification report must include the printed name, the signature, the 'M' license number and the CFAA (Canadian Fire Alarm Association) certificate number of the primary technician conducting the verification.

3.3 DEMONSTRATION AND TRAINING

- .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