

PART 1 - GENERAL

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| <u>1.1 Related Sections</u> | .1 | Section 26 05 00 - Common Work Results - Electrical. |
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| <u>1.2 References</u> | .1 | Government of Canada |
| | .1 | NBC-, 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-S528-1991, Manual Pull Stations. |
| | .6 | CAN/ULC-S529-1987(R1995), Smoke Detectors. |
| | .7 | CAN/ULC-S530-1991, Heat Actuated Fire Detectors. |
| | .8 | CAN/ULC-S531-1987(R1995), Smoke Alarms. |
| | .9 | CAN/ULC-S536-1997, Inspection and Testing of Fire Alarm Systems. |
| | .10 | CAN/ULC-S537-1997, Verification of Fire Alarm Systems. |
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| <u>1.3 System Description</u> | .1 | This is an expansion to an existing fire alarm system. |
| | .2 | System to carry out fire alarm and protection functions; including receiving alarm signals; initiating alarm; supervising components and wiring; actuating annunciators and auxiliary functions; initiating trouble signals and signalling to monitoring agency. |
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| <u>1.3 System Description (Cont'd)</u> | .3 | Modular in design to allow for future expansion. |
| | .4 | System to include:
.1 new devices to match the existing. |
| <u>1.4 Requirements of Regulatory Agencies</u> | .1 | System:
.1 To TB OSH Chapter 3-04.
.2 Subject to Fire Commissioner of Canada (FC) approval. |
| | .2 | System components: listed by ULC and comply with applicable provisions of National Building Code Local/Provincial Building Code, and meet requirements of local authority having jurisdiction. |
| <u>1.5 Shop Drawings</u> | .1 | Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Include:
.1 Details for devices.
.2 Details and performance specifications for control, annunciation and peripherals with item by item cross reference to specification for compliance. |
| <u>1.6 Closeout Submittals</u> | .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 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. |
| <u>1.7 Extra Materials</u> | .1 | Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals. |
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1.7 Extra Materials .2 Include:
 (Cont'd) .1 10 spare glass rods for manual pull box
 stations if applicable.

1.8 Waste .1 Separate and recycle waste materials in
Management and accordance with Section 01 74 21 -
Disposal Construction/Demolition Waste Management and
 Disposal, and with the Waste Reduction
 Workplan.

 .2 Place materials defined as hazardous or toxic
 waste in designated containers.

 .3 Ensure emptied containers are sealed and
 stored safely for disposal away from children.

PART 2 - PRODUCTS

2.1 Materials .1 Equipment and devices: ULC listed and
 labelled and supplied by single manufacturer.

 .2 Audible signal devices: to ULC-S524.

 .3 Visual signal devices: to CAN/ULC-S526.

 .4 Manual pull stations: to CAN/ULC-S528.

 .5 Thermal detectors: to CAN/ULC-S530.

 .6 Smoke detectors: to CAN/ULC-S529.

 .7 Smoke alarms: to CAN/ULC-S531.

2.2 System .1 Actuation of any alarm initiating device to:
Operation: .1 Cause electronic latch to lock-in alarm
 state at central control unit.
 .2 Indicate zone of alarm at central
 control unit and remote annunciator.
 .3 Cause audible signalling devices to
 sound and at central control unit.
 .4 Transmit signal to fire department via
 central station.
 .5 Cause air conditioning and ventilation
 fans to shut down or to function to provide
 required control of smoke movement.

- 2.2 System
Operation:
(Cont'd)
- .1 (Cont'd)
 - .6 Cause fire doors and smoke control doors, if normally held open, to close automatically.
 - .7 Cause elevators to return to floor of egress, or to alternate floor, as required.
 - .2 Acknowledging alarm: indicated at central control unit.
 - .3 Subsequent alarm, received after previous alarm has been silenced, to re-activate signals.
 - .4 Actuation of supervisory devices 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 at remote annunciator display.
 - .3 Cause audible signal at central control unit to sound.
 - .4 Activate common supervisory sequence.
 - .5 Resetting alarm supervisory device not to return system indications/functions back to normal until control unit has been reset.
 - .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; whereas visual indication to remain until trouble is cleared and system is back to normal.
 - .7 Trouble on system: suppressed during course of alarm.
 - .8 Trouble condition on any circuit in system not to initiate alarm conditions.
- 2.3 Control Panel .1 Central control unit (CCU): existing
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| <u>2.4 Alarm Output Circuits</u> | .1 | Alarm output circuit: connected to signals, wired to central control unit
.1 Signal circuits' operation to follow system programming. |
| <u>2.5 Auxiliary Circuits</u> | .1 | Auxiliary contacts for control functions. |
| | .2 | Actual status indication (positive feedback) from controlled device. |
| | .3 | Alarm and or supervisory trouble on system to cause operation of programmed auxiliary output circuits. |
| | .4 | Two sets of separate contacts for elevator capture (to main floor of egress and to alternate floor of egress). |
| | .5 | Upon resetting system, auxiliary contacts to return to normal or to operate as pre-programmed. |
| | .6 | Fans: stagger-started upon system reset; timing circuit to separate starting of each fan or set of fans connected to auxiliary contact on system. Timing circuit: controlled by CCU. |
| | .7 | Auxiliary circuits: rated at 2 A, 24 Vdc or 120 Vac, fuse-protected. |
| <u>2.6 Wiring</u> | .1 | To manufacturers recommendations |
| <u>2.7 Manual Alarm Stations</u> | .1 | Manual alarm stations: match existing. |
| | .2 | Addressable manual pull station: match existing. |
| <u>2.8 Automatic Alarm Initiating Devices</u> | .1 | Heat detectors: match existing. |
| | .2 | Addressable thermal fire detectors: to match existing |
| | .3 | Addressable smoke detector: to match existing. |
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2.9 Audible Signal .1 Signals: match existing
Devices

2.10 Visual Alarm .1 Strobe type: match existing.
Signal Devices

2.11 End-of-line .1 End-of-line devices to control supervisory
Devices 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 required.

2.12 Ancillary .1 Remote relay unit to initiate fan shutdown.
Devices

PART 3 - EXECUTION

3.1 Installation .1 Install systems in accordance with
CAN/ULC-S524 and TB OSH Chapter 3-04.

.2 Install manual alarm stations and connect to
alarm circuit wiring.

.3 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.

.4 Connect alarm circuits to main control panel.

.5 Install signals 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.

- 3.1 Installation (Cont'd)
- .8 Install door releasing devices.
 - .9 Install remote relay units to control fan shut down.
 - .10 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
 - .11 Splices are not permitted.
 - .12 Ensure that wiring is free of opens, shorts or grounds, before system testing and handing over.
 - .13 Identify circuits and other related wiring at central control unit, annunciators, and terminal boxes.
- 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 and sprinkler system transmit alarm to control panel and actuate alarms and 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.
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- 3.2 Field Quality .2 Fire alarm system:(Cont'd)
Control .4 (Cont'd)
(Cont'd) .2 (Cont'd)
- 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.
- .3 Provide final PROM program re-burn for system Engineer incorporating program changes made during construction.
- 3.3 Demonstration .1 Provide on-site lectures and demonstration by
and Training operational personnel in use and maintenance of fire alarm system.