

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical

### **1.2 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-S524-14, Standard for the Installation of Fire Alarm Systems.
  - .2 CAN/ULC-S526-16, Visible Signal Devices for Fire Alarm Systems, Including Accessories.
  - .3 CAN/ULC-S528-14, Manual Stations for Fire Alarm Systems, Including Accessories.
  - .4 CAN/ULC-S529-16, Smoke Detectors for Fire Alarm Systems.
  - .5 CAN/ULC-S537-13, Standard for the Verification of Fire Alarm Systems.

### **1.3 DESIGNATED CONTRACTOR**

- .1 Hire the services of existing Tyco-Simplex manufacturer of fire and security to supply proprietary fire alarm equipment and provide programming and verification and system bypass labour.

### **1.4 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 system 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.

### **1.5 MAINTENANCE MATERIAL SUBMITTALS**

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

## **PART 2 - PRODUCTS**

### **2.1 DESCRIPTION**

- .1 Existing system is Simplex 4100ES.
- .2 Audible signal devices: to CAN/ULC-S524.
- .3 Visual signal devices: to CAN/ULC-S526.
- .4 Manual pull stations: to CAN/ULC-S528.
- .5 Smoke detectors: to CAN/ULC-S529.
- .6 Regulatory Requirements:
  - .1 To TBS Fire Protection Standard.
  - .2 Subject to Fire Commissioner of Canada (FC) approval.
  - .3 Subject to FC inspection for final acceptance.
  - .4 To Canadian Forces Fire Marshal approval.
  - .5 System components: listed by ULC and comply with applicable provisions of Provincial Building Code, and meet requirements of local authority having jurisdiction.

### **2.2 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 DCLA configuration to central control unit.
- .2 Alarm receiving circuits (active and spare): compatible with smoke detectors and open contact devices.
- .3 Actuation of alarm initiating device: cause system to operate as specified in "System Operation".
- .4 Receiving circuits for supervisory, N/O devices. Devices: wired in DCLA configuration to central control unit.
- .5 Actuation of supervisory initiating device: cause system to operate as specified in "System Operation".

### **2.3 ALARM OUTPUT CIRCUITS**

- .1 Alarm output circuit: connected to signals, wired in class A configuration to central control unit.
  - .1 Signal circuits' operation to follow system programming; capable of sounding continuously.
  - .2 Manual alarm silence, automatic alarm silence and alarm silence inhibit to be provided by system's common control.

## 2.4 AUXILIARY CIRCUITS

- .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 Upon resetting system, auxiliary contacts to return to normal or to operate as pre-programmed.
- .5 Fans: stagger-started upon system reset; timing circuit to separate starting of each fan or set of fans connected to auxiliary contact on system.
  - .1 Timing circuit: controlled by CCU.
- .6 Auxiliary circuits: rated at 2 A, 24 Vdc or 120 Vac, fuse-protected.

## 2.5 WIRING

- .1 Twisted copper conductors: rated 600 V.
- .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.
- .5 Armoured cable shall be FAS type.

## 2.6 MANUAL ALARM STATIONS

- .1 Addressable manual pull station.
  - .1 Pull lever, break glass rod, semi-flush wall mounted type, single action, 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.

## 2.7 AUTOMATIC ALARM INITIATING DEVICES

- .1 All automatic initiating devices shall be addressable.
- .2 Heat detectors, fixed temperature, non-restorable, rated 88 degrees C.
- .3 Thermal fire detectors, combination fixed temperature and rate of rise, non-restorable fixed temperature element, self-restoring rate of rise, fixed temperature 57 degrees C, rate of rise 8.3 degrees C per minute.
- .4 Smoke detector: ionization type.
  - .1 Plug-in type with fixed base.

- .2 Wire-in base assembly with integral red alarm LED, to match existing.

## 2.8 AUDIBLE SIGNAL DEVICES

- .1 Speakers: Cone type, recessed, 20 mm round ceiling mounted, to match existing.
  - .1 Multiple taps adjustable from 0.25 to 2W.
  - .2 90 dB at 3 m with 1W tap.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- .1 Install systems in accordance with CAN/ULC-S524 and TB Fire Protection Standard.
- .2 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.
- .3 Connect alarm circuits to main control panel.
- .4 Install speakers and connect to signalling circuits.
- .5 Connect signalling circuits to main control panel.
- .6 Install remote relay units to control fan shut down.
- .7 Sprinkler system: wire alarm and supervisory switches and connect to control panel.
- .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 Smoke detectors: both devices and base labelled with P-touch to indicate building, floor, column line and device type.
- .13 Provide testing of signalling circuits to ensure system is not over loaded.
- .14 Ensure the wiring is free of opens, shorts or grounds, before system testing and handing over.
- .15 Commissioning shall be performed by one representative of the fire alarm supplier and contractor.

- .16 Manual Stations: Label with P-touch to indicate building, floor, column line and device type.

### 3.2 FIELD QUALITY CONTROL

- .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 such device and alarm circuit to ensure manual stations, thermal and smoke detectors, sprinkler system 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 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. 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.

### 3.3 PROTECTION

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

### 3.4 CLOSEOUT ACTIVITIES

- .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