

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 ULC-S524, Standard for the Installation of Fire Alarm Systems.
 - .2 ULC-S526, Visible Signal Devices for Fire Alarm Systems, Including Accessories.
 - .3 ULC-S528, Manual Stations for Fire Alarm Systems, Including Accessories.
 - .4 ULC-S529, Smoke Detectors for Fire Alarm Systems.
 - .5 ULC-S537, Standard for the Verification of Fire Alarm Systems.

1.3 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 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 Ontario, Canada.
 - .2 Indicate on shop drawings:
 - .1 Detail assembly and internal wiring diagrams for control units, consoles and auxiliary cabinets.
 - .2 Overall system riser wiring diagram identifying control equipment, initiating zones and signalling 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.

1.4 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.

1.6 DESIGNATED CONTRACTOR

- .1 Hire the services of Tyco Integrated Fire & Security to do the relevant work of this section.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Existing system is Siemens.
- .2 Audible signal devices: to ULC-S524.
- .3 Visual signal devices: to ULC-S526.
- .4 Manual pull stations: to ULC-S528.
- .5 Smoke detectors: to 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 c/w 15 cd strobe light.
 - .1 Multiple taps adjustable from 0.25 to 2W.
 - .2 90 dB at 3 m with 1W taps.
 - .3 Recess in tile ceilings. Provide surface mounted enclosure for open ceiling areas.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install systems in accordance with 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/strobe lights and connect to new signalling circuits.
- .5 Connect signalling circuits to main control panel. Provide new components to connect to speaker/strobe lights.
- .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 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.