

PART 1 - GENERAL1.1 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-S524-06-AMI-EN-EL Standard for Installation of Fire Alarm Systems 2006.
 - .2 CAN/ULC-S525-07-EN-EL, Audible Signal Devices for Fire Alarm Systems Including Accessories 2007.
 - .3 CAN/ULC-S526-07-EN-EL, Visible Signal Devices for Fire Alarm Systems Including Accessories 2007.
 - .4 CAN/ULC-S527-11, Standard for Control Units for Fire Alarm Systems Third Edition 2011.
 - .5 CAN/ULC-S528-05, Manual Pull Stations for Fire Alarm Systems, Including Accessories 2005.
 - .6 CAN/ULC-S529-09 Third Edition Smoke Detectors for Fire Alarm Systems 2009.
 - .7 CAN/ULC-S530-M1991, Heat Actuated Fire Detectors for Fire Alarm Systems.
 - .8 CAN/ULC-S536-S537-2004, Burglar and Fire Alarm Systems and Components.
- .4 National Fire Protection Agency
 - .1 NFPA 72-2002, National Fire Alarm Code.
 - .2 NFPA 90A-2002, Installation of Air Conditioning and Ventilating Systems.

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.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) 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.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
 - .3 Manufacturer's Field Reports: manufacturer's field reports specified.
- .4 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 Authority of Jurisdiction will delegate authority for review and approval of submittals required by this Section.
 - .3 Submit to Authority of Jurisdiction 2 sets of approved submittals and drawings immediately after approval but no later than 15 working days to prior to final inspection.
 - .4 Submit following:
 - .1 Manufacturer's Data for:
 - .1 Control panel modules.
 - .2 Manual pull stations.
 - .3 Heat detectors.
 - .4 Open-area smoke detectors.
 - .5 Duct smoke detectors.
 - .6 Alarm speakers.
 - .7 Visible appliances.
 - .8 Mark data which describe more than one type of item to indicate which type will be provided.
 - .9 Submit original for each item and clear, legible, first-generation photocopies for remainder of specified copies.
 - .2 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 Provide services of representative or technician from manufacturer of system, to supervise installation, adjustment, preliminary testing, and final testing of system and to provide instruction to project personnel.
- .2 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.
- .3 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

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.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 00 10 - General Instructions.

1.5 DESIGNATED
CONTRACTOR

- .1 Hire the services of Chubb Edwards to do the work of this section.

PART 2 - PRODUCTS2.1 MATERIALS

- .1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.
- .2 Audible signal devices: to CAN/ULC-S525.
- .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.

2.2 ACCEPTABLE MATERIALS

.1 The only acceptable materials are manufactured by Chubb Edwards.

2.3 CONTROL PANEL

.1 Reuse existing Edwards EST3 control panel.

2.4 MANUAL ALARM STATIONS

- .1 Provide non-coded single action type with mechanical reset features.
 - .1 Non-coded single pole normally open contact.
 - .2 General alarm key switch for two stage system.
- .2 Stations: surface, semi-flush mounted and interior, weatherproof type as indicated.
 - .1 For surface mounting provide station manufacturer's approved back box.
 - .2 Back box finish to match station finish.
- .3 Equip each station with terminal strip with contacts of proper number and type to perform functions required.
- .4 Stations: type not subject to operation by jarring or vibration.
 - .1 Break-glass-front stations are not permitted; pull-lever break-rod type is acceptable provided presence of rod is not required to reset station.
- .5 Station colour: red.
- .6 Provide station with visible indication of operation.
- .7 Restoration to require use of key.
 - .1 Keys: identical throughout system for stations and control panel(s).
- .8 Mount stations with operating lever not more than 1.2 m above finished floor.

- .9 Where weatherproof stations are required, provide stations with cast metal, weatherproof housings with hinged access doors.
 - .1 Finish housings with red enamel paint and provide permanently affixed metal bilingual signage indicating "FIRE ALARM" with white letters of 19 mm high.

2.5 AUTOMATIC ALARM INITIATING DEVICES

- .1 Heat detectors: provide heat detectors designed for detection of fire by combination fixed temperature rate-of-rise principle.
- .2 Combination Fixed Temperature Rate-Of-Rise Detectors (Spot Type): designed for surface semi-flush 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.
- .3 Open-Area Smoke Detectors: provide detectors designed for detection of abnormal smoke densities by photoelectric principle.
 - .1 Provide necessary control and power modules required for operation integral with control panel.
 - .2 Detectors and associated modules: compatible with control panel and suitable for use in supervised circuit.
 - .3 Malfunction of electrical circuits to detector or its control or power units to result in operation of system trouble signals.
 - .4 Equip each detector with visible indicator lamp that will flash when detector is in normal standby mode and glow continuously when detector is activated.
 - .5 Provide remote indicator lamps for each detector that is located above suspended ceilings, concealed from view.
 - .6 Each detector: plug-in type with tab-lock or twist-lock, quick disconnect head and separate base in which detector base contains screw terminals for making wiring connections.
 - .7 Detector head: removable from its base without disconnecting wires. Removal of detector head from its base to cause activation of system trouble signals.

- .8 Screen each detector to prevent entrance of insects into detection chamber(s).
- .4 Photoelectric Detectors: operate on light scattering principle using LED light source.
 - .1 Detector: respond to both flaming and smoldering fires.
- .5 Locate detectors in accordance with their listing by ULC and the requirements of NFPA 72.
- .6 Mount detectors at underside of ceiling or deck above unless otherwise indicated.
 - .1 For mounting heights greater than 3 m above floor level, reduce actual detector linear spacing from listed spacing as required by NFPA 72.
 - .2 For heights greater than 9 m space detectors no farther apart than 34% of their listed spacing.
- .7 Temperature rating of detectors: in accordance with NFPA 72.
- .8 Locate detectors minimum 300 mm to lighting fixtures and not closer than 600 mm to air supply or return diffuser.
- .9 Ensure detectors, located in areas subject to moisture or exterior atmospheric conditions or hazardous locations as defined by NFPA 70, are approved for such locations.
- .10 Provide detectors with terminal screw type connections.
- .11 Removal of detector head from its base to cause activation of system trouble signals if detectors are provided with separable heads and bases.

2.6 ALARM INITIATING DEVICE SPACING AND LOCATION

- .1 Detector spacing and location: in accordance with manufacturer's recommendations and requirements of NFPA 72.
- .2 Locate detectors minimum 1.5 m from air discharge or return grille, and not closer than 300 mm to lighting fixtures.
- .3 In areas without finished ceilings, mount detectors at underside of deck above unless otherwise indicated.

2.7 DUCT SMOKE
DETECTORS

- .1 Provide detectors installed in ducts of photoelectric type and listed by ULC duct installation.
- .2 Provide integral control and power modules required for operation with main control panel.
- .3 Ensure detectors and associated modules are compatible with main control panel and suitable for use in supervised circuit.
- .4 Detector circuits: 4-wire type where detector operating power is transmitted over conductors separate from initiating circuit. Malfunction of electrical circuits to detector or its control or power modules to cause operation of system trouble signals.
- .5 Provide a separate, fused power circuit for each smoke detection initiating circuit.
- .6 Failure of power circuit: indicated as a trouble condition on corresponding initiating circuit.
- .7 Provide duct detectors in accordance with NFPA 90A.
- .8 Provide duct detectors with approved duct housing, mounted exterior to duct, with perforated sampling tubes extending across width of duct.
- .9 Activation of duct detectors to cause shutdown of associated air handling unit.
- .10 Provide detectors with visible indicator lamp that flashes when detector is in normal standby mode and glows continuously when detector is activated.
- .11 Provide remote indicator lamp for each detector.
- .12 Permanently label remote indicator with description number of associated air handling unit(s).
- .13 Provide each detector with remote test switch. Mount switch not more than 1.8 m above finished floor.
- .14 Permanently label test switch with description number of associated air handling unit(s).

2.8 AUDIBLE SIGNAL
DEVICES

- .1 Audible device(s):
 - .1 Speakers: surface or flush mounting, as indicated.

- .2 Do not exceed 80 percent of listed rating in amperes of notification appliance circuit. Provide additional circuits above those shown if required to meet this requirement.
- .3 Provide appliances specifically listed for outdoor use in locations exposed to weather.
- .4 For surface mounting provide appliance manufacturer's approved back box. Back box finish to match appliance finish.

2.9 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.

2.10 VISUAL ALARM SIGNAL DEVICES

- .1 Surface or 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 shown.
- .3 Protect lamps with thermoplastic lens and bilingual labelling "FIRE" in letters at least 12 mm high.
- .4 Provide visible appliances within 300 mm of each audible appliance as indicated.
- .5 Visible appliances may be part of audio-visual assembly, where more than two appliances are located in same room or corridor.

2.11 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 for connection to base telegraphic alarm loop:
No. 10 AWG minimum solid copper conductor.
- .4 Insulation 90 degrees C minimum with nylon jacket,
type FAS90.
- .5 Colour code wiring.

2.12 ANCILLARY DEVICES

- .1 Remote relay unit to initiate fan shutdown.

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 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 Locate and install signal and visual signal devices
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.
- .8 Locate and install remote relay units to control
fan shut down.

- .9 Leave fire alarm devices active during fitup to eliminate nuisance troubles for Facility Operation Technicians. Provide soft key bypass to fire alarm system for bypassing system during construction.

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, and perform full CAN/ULC-S536 inspection of system.
 - .2 Fire alarm system:
 - .1 Test each device and alarm circuit to ensure manual stations, thermal and smoke detectors transmit alarm to control panel and actuate general alarm and ancillary devices.
 - .2 Check annunciator panels to ensure zones are shown correctly.
 - .3 Simulate grounds and breaks on alarm and signaling 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.
 - .4 Commissioning shall be performed by at least one representative of the fire alarm supplier and installing contractor.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 00 10 - General Instructions.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION