
28 00 00 FIRE ALARM SYSTEM

1.1 GENERAL REQUIREMENTS

1. The specification covering the General Conditions of the Contract, General Specifications, Instructions to Bidders and all associated sections from an integral part of this specification and shall be read in conjunction herewith.

1.2 SCOPE

1. Provide all materials, labour, plant and equipment required for a complete and working installation as herein specified and as shown on the drawings.
2. The electrical installation shall be in accordance with the current edition of the Canadian Electrical Code, Provincial and Municipal codes and regulations.
3. Obtain all permits, approvals and pay all related fees required for this installation.
4. All equipment supplied under this Contract shall be new and be C.S.A. approved.
5. Co-ordinate all telephone conduit runs with MTS before installation begins.
6. Arrange for, and co-ordinate, rough-in and final inspections with City of Winnipeg, Contract Administrator and Building Engineer.

1.3 EXAMINATION

1. Examine the architectural, interior design, structural and mechanical drawings to ensure that the work under this Contract can be satisfactorily carried out. Report any discrepancies to the Contract Administrator prior to submission of tender.
2. Examine the site, local conditions and all existing apparatus if any to be re-used and verify that the condition of this equipment is suitable for its intended use in the new construction.

1.4 SUPERVISION

1. Supervise the work at all times through a responsible and competent supervisor.
2. Full co-operation shall be shown with other trades to facilitate installations and to avoid delays in carrying out the work.

1.5 ACCURACY OF DATA

1. Drawings are schematic; exact locations, distances, levels and other dimensions shall be governed by the building as constructed.
2. Outlets or equipment shall be moved to any point within a 10' radius when the Contract Administrator requests relocation before the work has been substantially completed, without additional cost.

1.6 APPROVAL OF MATERIAL

1. Request for approval of material as equals or alternates in accordance with B6 to that specified shall be submitted to the Contract Administration with a stamped self-addressed envelope and performance specifications three (3) working days prior to the tender submittal. Samples shall be provided on request.

1.7 SHOP DRAWINGS

1. Submit shop drawings of electrical equipment to the Contract Administrator for review. Fabrication of equipment shall not commence until the Contract Administrator has reviewed shop drawings of such equipment. Two sets shall be submitted with local Inspection Department approval where required.

1.8 "AS-BUILT" DRAWINGS

1. Keep a record set of drawings on the site at all times recording any changes that may occur. Submit these drawings to the Contract Administrator upon completion of the work. As-builts shall include circuiting of new and existing equipment to remain. Transfer changes to electronic disc AutoCAD file. Submit disc and hard copy for final review and submission to Owners.
2. Submit a Certificate of Inspection from the local Inspection Authority upon completion of work and include with As-builts.
3. The Contract Administrator reserves the right to recommend that a portion of the Contract funds be withheld pending submission of acceptable as-built drawings.

1.9 TEST

1. The electrical installation shall be completely tested demonstrating that the equipment and systems installed perform in the manner intended.

1.10 GUARANTEE

1. The satisfactory operation of all work shall be guaranteed for a period of 12 calendar months after final acceptance of the building.

1.11 GROUNDING

1. The entire installation shall be grounded in accordance with the Canadian Electrical Code.
2. Isolated ground conductors for panels shall be minimum #6 (green insulation) and be in one continuous, separate run, to the building water main (unless noted otherwise). Where required, panels shall be equipped with a separate isolated ground bus connected to the aforementioned ground conductor.

28 31 30 ADDRESSABLE FIRE ALARM SYSTEM (NEW SYSTEM)

DESCRIPTION

1. The system shall be a microprocessor based, single stage, addressable fire alarm system. All equipment shall be supplied by one manufacturer and shall be manufactured to ISO 9001 standards.
2. The system shall include:
 1. Control panel to carry out fire alarm and protection functions including receiving alarm signals, initiating a general alarm, supervising the system continuously, annunciating alarms and initiating trouble signals.
 2. Addressable manual alarm stations.
 3. Addressable and non-addressable automatic alarm initiating devices.
 4. Addressable input and output modules.
 5. Audible and visual signals.
 6. End of line resistors
 7. Alpha-numeric annunciator.

OPERATION

1. The system shall be a single-stage system. Operation of any alarm initiating device shall:
 1. Display the event type, alarm time and location message at the fire alarm control panel (and remote alpha-numeric annunciator).
 2. Cause all audible signals to sound at a temporal rate.
 3. Cause all visual signals to flash in a synchronized manner.
 4. Cause all air conditioning and ventilating fans to shut down.
 5. Close all fire and smoke doors to close automatically if normally held open.
 6. Cause all elevators to home to the ground floor.
 7. Transmit an alarm signal to a remote monitoring agency.
2. Operation of any supervisory initiating device shall:
 1. Display a location message at the fire alarm control panel.
 2. Display a distinct message to indicate device operation, shall not be combined with the indication of a wiring fault on that circuit.
 3. Cause an integral signal to sound at the control panel and remote annunciators.

MATERIALS

1. Materials and devices shall be supplied by a single manufacturer and shall be U.L.C. listed as follows:
 1. Power supply: to CAN/ULC-S527-1999
 2. Audible signal devices: to CAN/ULC-S525-1999
 3. Visual signal devices: to CAN/ULC-S526-2002
 4. Control unit: to CAN/ULC-S527-1999
 5. Manual fire alarm stations: to CAN/ULC-S528-1999
 6. Heat detectors: to CAN/ULC-S530-2002
 7. Smoke detectors: to CAN/ULC-S529-2002
 8. Installation: to CAN/ULC-S524-2001

CONTROL PANEL

1. The control panel shall be an Edwards EST2, or equal; microprocessor based panel complete with:
 - a. One to four Class "A" addressable data circuits. Each circuit shall have the capability of controlling up to 125 analog addressable heat or smoke detectors, and up to 125 input or output modules. Addressable data circuits shall not require the use of twisted or shielded wires in normal applications. Addressable data circuit shall have capacity for a minimum of 10% spare capacity for any type of addressable device.
 - b. Two to eight Class "B" audible/visual signal circuits, each rated for 2 amps at 24 Vdc. Additional signals circuits, if required: shall utilize panel mounted signal riser modules.
2. CPU shall store all basic system functionally and job specific data in non-volatile memory; and shall be fully field programmable via laptop.
3. LCD display module with a 4 line by 20 character backlit Liquid Crystal Display. In the alarm mode display total number of unacknowledged events and the type of event on display. Reserve 40 characters of display space for custom messages. To include Back and Next/Ack display control switches.
4. Provide LED indicators for the following common control functions: AC Power, alarm, supervisory, monitor, trouble, disable, ground fault, CPU fail, and test.
5. Provide common control keys (pushbuttons) and LED's for reset, alarm silence, trouble silence, drill, and auto-evacuation cancel.
6. Provide a common alarm and common trouble contact for Central Station connection.
7. Power supply and battery sized sufficiently to provide 24 hours of standby power followed by 30 minutes of continuous alarm.

ANNUNCIATORS

1. Edwards 2-LSRA-C, or equal; flush mounted, alpha-numeric annunciator with a 4 line by 20 character backlit Liquid Crystal Display, to display all alarm zones. To include Back and Next/Ack display control switches; and display LED's for Normal, Alarm, Supervisory and Trouble. Include an Enable/Disable key switch and pushbutton controls for Alarm Silence, Trouble Silence, Reset and Drill.
2. Edwards STI-7500H plexiglass cover complete with key lock shall be provided when the annunciator is located in a public area or corridor.

PASSIVE GRAPHIC

1. Provide a passive colour cad graphic drawing indicating the building outline, corridors, stairs and fire alarm zones, Graphic to be 500mm x 500mm mounted behind a clear plexiglass cover, complete with a brushed aluminum frame.

MANUAL STATIONS

1. Edwards SIGA-270, or equal; analog addressable manual stations, single stage, pull lever, single action complete with glass rod. Where surface mounted, use an Edwards 27193-11 surface wallbox.

HEAT DETECTORS

1. Edwards SIGA-HRS, or equal; analog addressable heat detector, combination fixed temperature/rate of rise heat detector, rated for 70 foot spacing. Detector shall be

- complete with a green polling LED and a read alarm LED. Detector to mount on a standard, isolator, or relay base; as indicated.
2. Edwards SIGA-HFS, or equal; analog addressable heat detector, 57X fixed temperature heat detector, rated for 70 foot spacing. Detector shall be complete with a green polling LED and a red alarm LED. Detector to mount a standard, isolator, or relay base; as indicated.
 3. Edwards 284C, or equal; heat detector, 88C fixed temperature heat detector, rated for 50 foot spacing. Detector shall be wired to an addressable input module via a supervised class "B" circuit, with and end of line resistor.

SMOKE DETECTORS

1. Area detectors shall be an Edwards SIGA-IPHS, or equal; analog addressable type smoke detector, complete with a green polling LED and a red alarm LED. Detector to combine ionization photo-electric and heat detector sensors in a single unit; and apply an algorithm for all three elements to maximize detection sensitivity. Detector to have automatic environmental compensation, day/night sensitivity adjustment, and dirty warning indication. Detector to mount on a standard, isolator, or relay base; as indicated.
2. Duct detectors shall be an Edwards SIGA-PS, or equal; analog addressable photoelectric type detector, complete with a green polling LED and a read alarm LED. Detector to have automatic environmental compensation, day/night sensitivity adjustment, and dirty warning indication. Detector to mount on a standard, isolator, or relay base; and be housed in a SIGA-DH duct housing. Provide the appropriate length sampling tubes as required.

BASES

1. Edwards SIGA-SB, or equal; standard plug-in base.

INPUT MODULES

1. Edwards SIGA-CT1, or equal; addressable input module complete with a supervised class "B" input circuit to monitor non-addressable contact devices. Module to include a green polling LED and a red alarm LED.
2. Edwards SIGA-WTM, or equal; addressable flow/tamper module with a supervised class "B" alarm input for sprinkler flow and a supervised class "B" supervisory input for sprinkler tamper. Module to include a green polling LED and a read alarm LED.

RELAY MODULES

1. Edwards SIGA-CR, or equal; addressable relay complete with a form "C" dry relay contact rated 0.5 amps at 120 VAC. Module to include a green polling LED and a red alarm LED.

ISOLATOR MODULES

1. Edwards SIGA-IM, or equal; addressable isolator module. Module to isolate short circuits within floor areas exceeding 2,000 square meters and between floors as indicated on the drawings, so that a fault within one floor area shall not affect another floor area.

HORNS

1. Edwards 757-5A-TW, or equal; white finish, horn with a peak output of 103 dBA at e meters. Horn to be field selected for a temporal output. When surface mounted, use an Edwards 757A-SBW surface box.

DOOR HOLDERS

1. Edwards 1504-N5, or equal; semi-flush wall mounted door holder, complete with an adjustable swivel contact plate, 120 VAC.

END OF LINE RESISTORS

1. Edwards EOL-P1, or equal; end of line resistor complete with an adjustable swivel contact plate, 120 VAC.

SYSTEM PROGRAMMING

1. The system shall be fully programmable in the field with the need for special tools and shall not require field replacement of electronic integrated circuits. Systems that require factory burning of e-proms will not be accepted.
2. All programming to be performed via the control panel keypad or a lap-top computer.
3. All field programming to be stored in non-volatile memory.
4. The system programming shall have 2 levels of password protection. The first level shall be used for accessing system controls such as disabling devices and accessing history logs. The second level shall access system programming functions.
5. Any system output, control module or riser module may be programmed to activate on any single input or nay combination of inputs.
6. Final system programming shall be performed during the construction period. System installer to provide a detailed list of zone and device designations to the Contract Administrator prior to completing the final system programming.
7. The system shall be fully programmed and operational prior to the commencement of the verification inspection.

General:

1. Locate, install, wire and connect all components and devices in accordance with the requirements of the manufacturer and ULC S524.

Mounting of Equipment:

1. Shall be mounted as follows:
 - a. 6 inches above the bottom of grid ceilings in the Public spaces of the 1st 2nd and 3rd floors;
 - b. 12 feet above finished floor in the Public spaces of the 4th floor;
 - c. 88 inches above finished floor in all other areas.
2. Mount equipment square and plumb with building lines. Install devices flush and square with finished surfaces.

Identification:

1. Clearly identify zone on control panels, FAMCP's, devices, etc.
2. Identify wires and cables with wire markers to indicate box circuit numbers and terminals, signal circuit numbers and terminals, annunciator wiring. Identify wiring in each box, panel, cabinet, etc. Coding of identification to meet with the approval of the Contract Administrator.

Miscellaneous Devices

1. Wire and connect combination door closer and holder devices.
2. Wire and connect to Fire Department interface in telephone room.
3. Wire and connect fan shutdown interlocks as indicated.

Testing

1. The complete system shall be tested and verified in accordance with CAN 4-S537-82, "Standard for the Verification of Fire Alarm System Installations". The manufacturer shall conduct all testing and provide necessary technical personnel. The Electrical SubContractor to provide necessary manpower to facilitate testing.
2. The manufacturer shall conduct an overall examination of the system installation for the following:
 1. The type of equipment installed is that designated by the Contract Administrators' specifications.
 2. The wiring connections to all equipment components show that the installer undertook to have observed ULC and CSA requirements.
 3. Equipment has been installed in accordance with the manufacturer's recommendations and that all signaling devices are operable.
 4. The supervisory components are operating and that regulations governing such supervisory wiring have been met to the satisfaction of the Inspection Authorities.
3. The complete system shall be tested in the presence of the Contract Administrator, The City's Representative, and the Local Inspection Authorities, on completion of the verification. Tests shall demonstrate that the fire alarm system will function in an acceptable manner. The Electrical inspector shall be the final authority in determining the acceptable manner of operation.
4. Include all costs for setting up and testing the fire alarm system as directed by the Contract Administrator.
5. Include for zone identification floor plan at each floor and main control panel. Floor plan to be CADD derived and be plasticized.

Verification Certificate

1. On completion of the testing, submit to the Contract Administrator, a Test Report certified by both the manufacturer and Electrical Subcontractor including:
 1. A copy of the inspecting Technician's report showing location of each device and certifying the test results of each device.
 2. A Certificate of Verification confirming that the Inspection has been completed and showing the conditions upon which such Inspection and Certification have been rendered.
 3. Proof of Liability Insurance for the Inspection.

END OF SECTION