

PART 1 - GENERAL

1.1 Description of System

- .1 Provision of a complete Closed Circuit Television (CCTV) System.
- .2 System includes:
 - .1 Digital Video Recorders to record data from all CCTV cameras. Recorder is complete with hard drive to record a minimum of 7 days of coverage at a quality of recording acceptable to Contract Administrator.
 - .2 Capability of activating recording upon motion detection. Only cameras within the field of view would be activated.
 - .3 LCD Monitors for camera recording viewing. One (1) 19" monitor located in mech/elec room, four (4) 22" monitors with one located near each entrance. The four monitors within the station are to be located in vandal-resistant heated and ventilated enclosures.
 - .4 Internet capability.
 - .5 New weather-proof outdoor cameras c/w vandal-resistant enclosures.
 - .6 Appropriate camera lenses for application.
 - .7 Appropriate camera housings for location.
 - .8 Camera controller to provide flexible viewing (single or multiple views per monitor) and recording options (length and quality of storage) as required by Contract Administrator.
 - .9 All associated camera mounts, power supplies, wiring, connectors, etc. to provide a complete and operational CCTV system to the satisfaction of the Contract Administrator.

1.2 Requirements of Regulatory Agencies

- .1 System:
 - .1 To Underwriters Laboratories of Canada.
 - .2 Canadian Electrical Code - Latest Edition.
 - .3 CSA electrical bulletins in force at time of tender.

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 26 05 01.
- .2 Include:
 - .1 Layout of equipment.
 - .2 Complete wiring diagram, including schematics of cameras and interconnection of all devices.
- .3 CCTV system manufacturer shall prepare system circuit wiring diagrams after award of contract. Drawings shall be approved by Contract Administrator prior to roughing.

1.4 Operation and Maintenance Data

- .1 Provide data for incorporation into maintenance manual specified in Section 26 05 01.
 - .2 Operation and Maintenance Manual to include:
 - .1 Operation and maintenance instructions for complete CCTV system to permit effective operation and maintenance.
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- .2 Technical data - illustrated parts lists with parts catalogue numbers.
- .3 Copy of approved shop drawings.

1.5 Maintenance

- .1 Provide one year's free maintenance with two inspections by manufacturer during the year. Submit inspection report to Contract Administrator. Second inspection to be performed during the last month of warranty period.
- .2 Warranty service is to be provided no later than the first business day following the report of service required.

PART 2 - PRODUCTS

2.1 Materials

- .1 Digital Video Recorders: rack mounted network server. Sufficient digital recorders are to be provided to record from all cameras indicated on plans plus 25% future capacity. IPC 4038 3TB c/w software c/w ability for recording and remote viewing.
- .2 Viewing monitors: 19" & 22" LCD Flat panel.
- .3 CCTV Outdoor Cameras: IP, high resolution, color, vandal proof, c/w lens. Bosch 100 series c/w KT kit and IP license.
- .4 Rackmount 24V AC Central Powered Supply.
- .5 Rackmount network HP gigabyte switch.
- .6 Rackmount UPS/Surge protection of DVR and switch.
- .7 Atlas wall mount rack to house above equipment.
- .8 The above materials are minimum standards of acceptance.

2.2 Equipment and Devices

- .1 All new equipment must operate without causing interference to other building equipment.

2.3 Manufacturers

- .1 Acceptable manufacturers for CCTV system: as above or approved equal.
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2.4 Qualified Installers

- .1 Acceptable installers to have the following qualifications:
 1. Be certified by the system manufacturer.
 2. On site personnel to be experienced, competent trades people.
 3. Maintain offices and service personnel in the Province of Manitoba.
 4. Maintain a minimum of two 24-hour service numbers made available to the Facility Manager.
 5. Maintain a level of local stock capable of replacing any part that may prove defective.

2.5 Conductors

- .1 System wiring shall be copper. Power circuits sized for maximum 3% voltage drop. Joints in junction boxes are to be labelled. The colour scheme for the wiring shall be adhered to throughout the building.
- .2 Video cabling shall be FT-4 rated Cat 5e.
- .3 Power wiring FT-4 rated, minimum 18/2 and as sized for voltage drop.
- .4 CCTV system wiring to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 Installation

- .1 Install DVR as indicated and connect to ac power supply.
 - .2 Locate and install camera locations as indicated, and connect to system controller and power supply.
 - .3 Final connection to DVR terminals to be done by the manufacturer's representative.
 - .4 Final program CCTV system at the completion of project to the satisfaction of the Contract Administrator.
 - .5 Install video cabling with a minimum number of bends to prevent stress on cabling shielding.
 - .6 All wiring to be in conduit.
 - .7 Adjust camera lenses to provide a view acceptable to Contract Administrator.
 - .8 Provide network connection to allow system viewing through internet to Transit Security desk on their existing network. Internet connection by Contract Administrator.
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3.2 Commissioning

- .1 Commissioning of the system shall be done by the manufacturer with the assistance of the electrical Subcontractor and the Contract Administrator. Costs for the complete commissioning shall be included in this contract. All the connections of all the equipment shall be verified to ensure:
 - .1 That the system is installed as per plans and specifications and is operating and acceptable to the Contract Administrator.
 - .2 That the system is installed as per the recommendations of the manufacturer.
 - .3 That all cameras are operative and shall be checked for proper operation and calibration.
 - .4 That the recording operation, quality and duration is acceptable to the Contract Administrator.
 - .5 Above revisions are made where necessary by the electrical Subcontractor. The necessary technical assistance to carry out these changes shall be provided by the manufacturer.
 - .6 During the period of verification, the electrical Subcontractor shall furnish one (1) journeyman electrician.

3.3 Instruction

- .1 Provide personal instruction and training to system users on complete system operation.
- .2 Provide customer software support for a period of one (1) year including user mistakes.

3.4 Warranty

- .1 The system shall carry a one year warranty from the date of the Engineer's final acceptance.

3.5 Tests

- .1 Perform tests in accordance with Section 26 05 01.

3.6 Spare Parts

- .1 Provide the following spare parts: one (1) exterior camera.

PART 1 - GENERAL

1.1 Related Work

- .1 Mechanical: Division 21, 23
- .2 Building wires: Section 26 05 21.

1.2 Description of System

- .1 System includes:
 - .1 Control panel to carry out fire alarm and protection functions including receiving alarm signals, initiating general alarm, supervising system continuously, actuating zone annunciators, and initiating trouble signals.
 - .2 Trouble signal devices.
 - .3 Power supply facilities.
 - .4 Manual alarm stations (bilingual).
 - .5 Automatic alarm initiating devices.
 - .6 Sprinkler system supervisory devices.
 - .7 Audible signal devices.
 - .8 Visual signal devices.
 - .9 End-of-line devices.
 - .10 Variable 3 minute inhibit feature
 - .11 Auxilliary devices.
 - .12 Ancilliary devices.
- .2 Operation of any alarm initiating device to: STAGE 1:
 - .1 Cause audible and visual signal devices to sound an intermittent pre-signal throughout the building.
 - .2 Transmit signal to external Municipal fire alarm system via autodialer.
 - .3 Cause address/zone of alarm device to be indicated on control and annunciator panels.
 - .4 Cause ventilating fans to shut down or to function so as to provide required control of smoke movement.
 - .5 Cause fire doors and smoke control doors if normally held open, to close automatically. STAGE 2:
 - .6 Enter stage 2 after 5 minute pre-signal timer timeout or by activation of a keyswitch in any manual pull station.
 - .7 Cause all audible and visual signal devices to sound continuously throughout project.
 - .8 Cause all electronically locked doors to unlock.

1.3 Requirements of Regulatory Agencies

- .1 System:
 - .1 To Underwriters Laboratories of Canada
 - .2 Canadian Electrical Code - Latest Edition
 - .3 CSA electrical bulletins in force at time of tender.
 - .4 TB, PMM, OSH Chapter 3-4 "Standard for Fire Alarm Systems" (Fire Commissioner's Standard).

1.4 Shop Drawings

- .1 Submit shop drawings in accordance with Section 26 05 01.
- .2 Include:
 - .1 Layout of equipment.
 - .2 Zoning/Addressing.
 - .3 Complete wiring diagram, including schematics of modules and interconnection of all devices.
- .3 Fire alarm system manufacturer shall prepare system circuit wiring diagrams after award of contract. Drawings shall be approved by Contract Administrator prior to roughing.

1.5 Operation and Maintenance Data

- .1 Provide data for incorporation into maintenance manual specified in Section 260501.
- .2 Operation and Maintenance Manual to include:
 - .1 Operation and maintenance 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.

1.6 Maintenance

- .1 Provide one year's free maintenance with two verification inspections by manufacturer during the year. Inspection tests to conform to ULC-S537-latest edition. Submit inspection report to Contract Administrator. Second verification to be performed during the last month of warranty period.

PART 2 - PRODUCTS

2.1 Materials

- .1 Power supply: to ULC-S524.
- .2 Audible signal devices: to ULC-S525.
- .3 Control unit: to ULC-S527.
- .4 Manual fire alarm stations: to ULC-S528.
- .5 Thermal detectors: to ULC-S530.
- .6 Smoke detectors: to ULC-S529.

2.2 Control Panel

- .1 Addressable.
 - .2 Micro-processor based.
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- .3 Field programmable.
- .4 Enclosure: CSA Enclosure 1, sheet steel lockable with clear shatterproof material over zone indicating lights and components.
- .5 The control panel shall include but not be limited to the following components:
 - .1 Address indication of any devices in alarm or trouble and complete with supervised alarm and trouble indication and zone disconnect switches.
 - .2 Bell circuits as required. (minimum two circuit)
 - .3 Power supply indicator.
 - .4 Battery bank (24VDC) to operate under supervision for 24 hours with 5 minute alarm capacity at the end of this period.
 - .5 Battery (automatic high-low), failure LED and battery trouble LED.
 - .6 Subsequent operation or additional alarm circuit.
 - .7 Municipal connection module.
 - .8 Trouble lights, buzzer and silence switch combination with ringback feature.
 - .9 Trouble annunciation for each initiating circuit and each audible device circuit in the system, electrically supervised.
 - .10 Control panel shall be of modular construction and complete with all necessary identified terminals for field connection to zone as indicated.
 - .11 All electrical connections to be accessible through hinged lockable door.
 - .12 Power supply shall be 120Vac as indicated.

2.3 Equipment and Devices

- .1 Matching addressable devices including addressable smoke detectors, addressable smoke duct detectors, addressable heat detectors, supervisor modules, trouble modules, addressable pull stations complete with back boxes, end of line resistors, remote annunciators (LCD type), data gathering panels, audible devices with temporal pattern and visual fire alarms.
- .2 Data gathering panels to operate as stand alone systems upon loss of communication conductors.

2.4 Manufacturers

- .1 Acceptable manufacturers for fire alarm systems: Edwards, Mircom by Firetech, Simplex, Notifier.

2.5 Conductors

- .1 System wiring shall be copper. Bell circuits sized for maximum 5% voltage drop. Joints in junction boxes are to be labelled. The colour scheme for the wiring shall be adhered to throughout the building.
 - .1 Bell circuits (minimum) 2#14AWG red and black R90 in conduit.
 - .2 Initiating circuits (minimum) 2#18AWG yellow and white R90 in conduit - type as per fire alarm manufactures recommendations.
 - .3 Auxillary ccts (minimum) 2#14AWG black and white R90 in conduit.
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PART 3 - EXECUTION

3.1 Installation

- .1 Install systems: to ULC-S524.
- .2 Install main control panel as indicated and connect to ac power supply.
- .3 Locate and install manual alarm stations as indicated, and connect to initiating circuit wiring.
- .4 Locate and install thermal and smoke detectors as indicated and connect to initiating circuit wiring.
- .5 Install sprinkler system supervisory devices.
- .6 Connect alarm circuits to main control panel.
- .7 Locate and install audible devices as indicated and connect to signalling circuits (2 minimum). Alternate audible device circuit wiring.
- .8 Connect signalling circuits to main control panel.
- .9 Install end-of-line devices as required at end of alarm and signalling circuits as indicated.
- .10 Final connection to panel terminals to be done by the manufacturers representative at the time of verification.
- .11 Do not install smoke detectors adjacent to mechanical outlets including diffusers and grills.
- .12 Change any heat detector where the surrounding ambient temperature exceeds the design capability of the device, to a suitable device, at no additional cost.
- .13 Final program fire alarm system at the completion of project to the satisfaction of the Contract Administrator.
- .14 Install smoke duct detectors in duct work as recommended by fire alarm manufacturer.

3.2 Verification

- .1 Verification of the system shall be done by the manufacturer with the assistance of the Electrical sub-contractor and the Contract Administrator. Costs for the complete verification inspection shall be included in this contract. Do a complete verification of the fire alarm system after complete
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- .1 (Cont'd)
installation. All the connections of all the equipment shall be verified to ensure:
 - .1 That the system is installed as per plans and specifications of the Contract Administrator and is operating and acceptable to all authorities having jurisdiction.
 - .2 That the system is installed as per the recommendations of the manufacturer.
 - .3 That the system is electrically supervised. To accomplish this, each wire connected to each device shall be verified by disconnecting to ensure continuity of the supervisory circuit.
 - .4 That all devices are operative, each manual station, detector, etc. shall be checked for proper operation and calibration.
 - .5 That any necessary changes to conform to Article .1, .2, .3, .4 above are made where necessary by the Electrical sub-contractor. The necessary technical assistance to carry out these changes shall be provided by the manufacturer.
 - .6 During the period of verification, the Electrical sub-contractor shall furnish one (1) journeyman electrician.
- .2 Verification shall conform to ULC-S537-latest edition.
- .3 When the verification is complete, the manufacturer shall send to the Contract Administrator the following:
 - .1 Certificate of Verification
 - .2 A complete report of all the equipment checked during the verification.

3.3 Warranty

- .1 The system shall carry a one year warranty from the date of the Architects final acceptance.

3.4 Tests

- .1 Perform tests in accordance with Section 26 05 01 and ULC-S537.
- .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 ancillary devices.
 - .2 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of trouble signals.