

## **APPENDIX E – ELECTRICAL SPECIFICATIONS**

**Niagara Region - 25 Bruce Street, Welland Ontario**  
**Audible / Visual Fire Alarm Upgrades**

---

## **Electrical Specifications**

**Project No. 230610**

**July 14th, 2023**

4999 Victoria Avenue, Niagara Falls, ON L2E 4C9  
Phone: 905-357-4015 Fax: 905-353-1105

745 South Service Road, Suite 301A, Stoney Creek, ON L8E 5Z2  
Phone: 905-561-4016

---

---

**ELECTRICAL SPECIFICATIONS**  
**TABLE OF CONTENTS**

<b>SECTION</b>	<b>TITLE</b>	<b>NUMBER OF PAGES</b>
26 00 00 –	Electrical Specification Contents.....	1
26 03 00 –	Summary of Work .....	2
26 05 00 –	General Requirements for Electrical Work .....	3
26 05 01 –	Basic Materials and Methods.....	7
28 30 00 –	Fire Detection & Notification .....	2
26 05 53 –	Fire Alarm System .....	2

---

**Part 1            General**

**1.1                SUBJECT BUILDINGS and AREAS**

25 Bruce Street, Welland Ontario

**1.2                WORK COVERED BY CONTRACT DOCUMENTS**

- .1      Work of this Contract comprises the supply, modification, relocation and/or installation of fire alarm audio / visual devices, and all required hardware, conduit routing, etc. to facilitate renovations and additions to the fire alarm system at the subject building. This includes all requirements as outlined in the summary scope of work within this section and as shown in the contract drawings and technical specifications.
- .2      Overview: Contractor is to provide labour, materials, equipment, services, and any other requirements to modify the fire alarm system. Decommission the existing fire alarm system in stages, as required, and coordinated in accordance with the Niagara Region shutdown timelines which is to include several overnight and weekend installations (as required), and the installation of new audio/visual and initiating fire alarm devices to maintain full functionality at the conclusion of overnight/weekend shutdown periods.
- .3      The existing fire alarm control panel shall be removed and replaced with a new control panel to accommodate the renovations as outlined on the electrical drawings.

**1.3                SCHEDULING OF THE WORK**

- .1      The contract will be awarded on a date to be determined.
- .2      Work shall be substantially complete by a date as determined by the Owner.
- .3      The Contractor shall perform their work in full cooperation with other trades, and co-ordinate the schedule and sequence of all work with other trades and with the Niagara Region. The Contractor must fully co-ordinate the hours and sequence of the work with the Niagara region for each location and abide by those conditions, to minimize disruptions.
- .4      General phases of the project are as follows, with the fire alarm system functionality to be fully restored upon return to weekday daytime hours (as determined by the Region, as required):
  - .1      Remove existing audible fire alarm devices throughout the building. Stage demolition work such that the building is left with a functional fire alarm notification system. The building shall **NOT** be left without notification devices / fire alarm system at any time, without a fire watch.
  - .2      Supply and install audible / visual fire alarm devices throughout the building, including visual strobe fire alarm devices in rooms as shown on the electrical drawings.
  - .3      Supply and install heat detectors and smoke detectors throughout the building, extending existing fire alarm circuits as shown on the electrical drawings.
  - .4      Supply and install a new FACP complete with an annunciator panel to accommodate the additional audible / visual notification devices.

- 
- .5 Coordinate with the region for shut-down time(s) to tie new notification and initiating devices into the existing fire alarm system. Provide a fire alarm verification report from a third party.
  - .6 General clean up is to be performed throughout all stages of work, ensure all disturbed areas are left clean such that building remains operational.
- 1.4 PRE-ORDERED PRODUCTS PRE-BID WORK**
- .1 N/A.
- 1.5 PRE-PURCHASED EQUIPMENT**
- .1 N/A.
- 1.6 OWNER FURNISHED ITEMS**
- .1 N/A.
- 1.7 ALLOWANCES**
- .1 The following cash allowances shall be carried by the Contractor:
    - .1 \$10,000 for electrical contingency, for uncertainty of existing conditions and items uncovered during demolition, excavation, etc. This does not include anything explicitly shown on the drawings or reasonably implied.
- Part 2 Products**
- 2.1 Fire Alarm**
- .1 Reference sections 28 30 00 & 28 31 00.
- Part 3 Execution**
- All power outages / fire alarm system outages must be coordinated with the Niagara Region to minimize downtime of any area of the building. Provide a fire watch, in accordance with the local fire department regulations, as required to complete all work.
- 3.1 REGULATIONS:**
- .1 All pertinent regulations are to be complied with, including but not limited to:
    - .1 Ontario Building Code - 2012
    - .2 Ontario Electrical Safety Code – 28th Edition/2021
    - .3 CSA Z462-12 – Workplace Electrical Safety

END OF SECTION

**GENERAL REQUIREMENTS FOR ELECTRICAL WORK**

---

**Part 1 General**

**1.1 SUMMARY**

- .1 Section includes: General requirements for electrical work. Applies to all Sections of Divisions 26 and 28.
- .2 By entering into a contract with the Owner, Project Manager or General Contractor, the Contractor acknowledges that he has thoroughly reviewed and understands the intent of the Drawings and Specifications and acknowledges that the Drawings and Specifications are complete and can produce complete and functional systems.
- .3 A 1-year parts and labour warranty on all electrical equipment and the overall installation.

**1.2 DESCRIPTION OF WORK**

- .1 Furnish and install all electrical work in conformance with the requirements of this Section, as a supplement to other general requirements of the project.
- .2 Contractor is responsible for all permits, approvals, inspections etc. with the authorities having jurisdiction. Work will not be considered complete until a certificate of a passed ESA final inspection is produced for this project and a third-party fire alarm verification report is submitted to the engineer noting no deficiencies (not the only requirement for project completion).
- .3 Furnish and install equipment, devices, units, systems, and components in a completely workable installation.

**1.3 LAWS & CODES AND ORDINANCES**

- .1 All work and material shall conform to the requirements of OSHA and all Federal and Provincial Laws and ordinances having jurisdiction at the job site. The Ontario Electrical Safety Code, 28<sup>th</sup> Edition, 2021 (OESC), shall be strictly adhered to (OESC requirements are considered "minimum requirements"). Where requirements of the Contract Documents exceed OESC, the Contract Documents govern.

**1.4 STANDARDS OF MATERIAL AND WORKMANSHIP**

- .1 All material shall be new and shall bear the label of CSA approval (or it's approved equivalent). All material shall be of the best grade and latest pattern of manufacture as specified. All work shall be performed in a neat workmanlike manner and shall present a neat mechanical appearance when completed.
- .2 Manufacturer's catalog numbers are specified for the purpose of establishing a standard. Substitutions will be permitted, prior to bidding, when approved by the Engineer as being equal to or better than the specified item in every respect.

**1.5 DRAWINGS AND SPECIFICATIONS:**

- .1 The Drawings and these Specifications are complementary each to the other, and what is called for by one shall be as binding as if called for by both.

## GENERAL REQUIREMENTS FOR ELECTRICAL WORK

---

### 1.6 INTERFERENCE DRAWINGS

- .1 Where equipment of the electrical system / fire alarm system must be installed in close proximity to equipment of another trade, this Contractor shall prepare and submit the necessary interference drawings for review and comment.
- .2 Submission of the interference drawings to the Engineer for review does not absolve the Contractor of his responsibility for the proper layout and coordination of the work.

### 1.7 RECORD DRAWINGS

- .1 On one (1) digital set of prints and on one (1) physical full size Arch D size paper for this project, mark all changes and deviations from the original plans. Correctly mark all changes in red ink.
- .2 Upon completion of the project, turn these plans over to the Owner for the Owner's record of the exact location of all piping and equipment.
- .3 Certify these plans, "as-built". Plans are not considered certified unless they are signed and sealed by an officer of this contractor's company.

### 1.8 FINAL COMPLETION AND TEST:

- .1 Upon completion of the work, the various systems shall be tested for faulty circuits and grounds in accordance with the method and resistance values outlined in the OESC and for load balance on feeders and branch circuits.
- .2 The completed system shall operate satisfactorily in every respect. Make any repairs or adjustments necessary to this end to the satisfaction of the Owner.
- .3 Prior to the start-up of any system, check all devices and verify the manufacturer's start-up instructions.
- .4 Verify that all equipment is connected to the proper voltage, phase, wire size, and over current protection.
- .5 Ensure that all devices, wiring, conduit runs and equipment is bonded and grounded in accordance with the latest Ontario Electrical Safety Code.

### 1.9 QUALITY ASSURANCE

- .1 Before tendering, become fully acquainted with by-laws of any local or other authority having jurisdiction.
- .2 Carry out all changes and alterations required by the authority inspector of any authority having jurisdiction without delay to the progress of the work and without extra cost.
- .3 Materials and labour provided under this contract shall be of the new and of the highest quality and shall be in compliance with the Canadian Standards Association, Ontario Electrical Safety Code, 28<sup>th</sup> edition, 2021, CAN/ULC, Ontario Building Code 2012, and all Fire Department Regulations.
- .4 Upon completion of the project provide the owner with a certificate of warranty, certificate

**GENERAL REQUIREMENTS FOR ELECTRICAL WORK**

---

of ESA inspection approval, fire-alarm system verification report, as-built drawings and maintenance manuals. This provision shall be met prior to application for the final draw.

- .5 Pay for all permits required for the undertaking and completion of this work.

**1.10 SUBMITTALS**

- .1 Comply with the provisions listed herein.
- .2 Before fabrication of any materials or equipment, submit one (1) digital copy of detailed drawings of equipment and apparatus to the Engineer for review. Do not order materials until review has been given. Check the drawings and note comments, date and signature before submitting.
- .3 Shop drawings must apply to the equipment under consideration. Advertising literature and comprehensive data sheets are not acceptable. The drawings must contain the actual dimensions of unit and dimensioned location and size of all outlets and connections, model range, capacity, hp, voltage, etc., of all accessories listed in the specifications, and/or being provided, and the operating points of the proposed equipment.
- .4 Do not consider review rendered on shop drawings as a guarantee of measurements for building conditions. Where drawings are reviewed, said review does not mean that drawings have been checked in detail. The review does not in any way relieve this contractor from his responsibility or necessity of furnishing material to meet the performance of equipment specified and/or as shown on the contract drawings.
- .5 Electrical items for which shop drawings are specifically requested are listed in each section of the Specification.

**1.11 QUALIFICATIONS**

- .1 Electrical Contractors shall hold a valid Electrical Contractor License in Ontario. All Electrical work shall be performed by qualified electricians holding valid "Certificates of Qualification" issued by the Provincial licensing board.
- .2 The journeyman/apprentice ratio shall not exceed 3:1 (three journeyman to one apprentice).

**1.12 MINOR FIELD CHANGES**

- .1 The location, arrangement and connection of equipment and material as shown on the drawings represent a close approximation to the intent and requirements of the contract. The right is reserved by the Architects to make reasonable changes required to accommodate conditions arising during the progress of the work. Such changes shall be done at no extra cost to the Owner, unless the location, arrangement or connection is more than five feet from that shown.

END OF SECTION

**BASIC MATERIALS AND METHODS**

---

**Part 1 Basic Materials and Methods**

**1.1 WORK INCLUDED**

- .1 Work to be done under this Section shall include furnishings of labour, materials, and equipment required for installation, testing, and putting into proper operation complete electrical systems and fire alarm systems as shown, as specified and as otherwise required.
- .2 Complete systems shall be left ready for continuous and efficient satisfactory operation.

**1.2 STANDARD OF MATERIALS**

- .1 Where materials and equipment are specifically described and named in either the drawings or these Specifications, it is done so in order to establish a standard of material and workmanship.
- .2 Materials required for performance of work shall be new and the best of their respective kinds and of uniform pattern throughout the Work.
- .3 Materials shall be of Canadian manufacture where obtainable. Materials of foreign manufacture, unless specified, shall require approval before being used.
- .4 Equipment items shall be standard products of approved manufacture. Identical units of equipment shall be of same manufacture. In any unit of equipment, identical component parts shall be of same manufacture, but the various component parts comprising the unit need not be of one manufacture.
- .5 Chemical and physical properties of materials and design performance characteristics and methods of construction and installation of items of equipment, specified herein, shall be in accordance with latest issue of applicable Standards or Authorities when such are either mentioned herein, or have jurisdiction over such materials or items of equipment.
- .6 Materials shall bear approval labels as required by Code and/or Inspection Authorities.
- .7 Install materials must be in strict accordance with manufacturer's recommendations.
- .8 Include items of material and equipment not specifically noted on Drawings or mentioned in Specification but which are necessary to make a complete and operating installation.
- .9 Remove materials, condemned as not approved for use, from job site and deliver and install suitable approved materials in their place.
- .10 Unless otherwise noted, all materials and apparatus shall be new.

**1.3 CUTTING AND PATCHING**

- .1 Layout such work for approval before undertaking same.
- .2 Cutting shall be kept to an absolute minimum and performed in a neat and workmanlike manner using the proper tools and equipment. Caution shall be exercised in all cutting and procedures to ensure that concealed services are not affected. **Do not cut if in doubt.** Request Consultant's presence to determine if concealed services exist.

**BASIC MATERIALS AND METHODS**

- 
- .3 Assume responsibility for prompt installation of Work in advance of concrete pouring or similar Work. Should any cutting or repairing of finished/unfinished Work be required because such installation was not done, employ the particular trade whose Work is involved to do such cutting and patching. Pay for any resulting costs. Layout such Work for approval before undertaking same.

**1.4 PAINTING**

- .1 Repair and finish factory finished equipment, damaged or scratched during installation, in an approved manner.
- .2 All structural steel including hangers, brackets, supports and other ferrous metals shall be shop or factory prime painted wherever practicable. Wherever structural steel including hangers, brackets, supports, and other ferrous metals cannot be shop or factory prime painted, wire brush to remove all traces of rust, clean off all traces of dirt, oil, and grease, and apply one coat of an approved rust inhibiting primer in accordance with CGSB-GB-40d and leave ready to receive finish paint.

**1.5 EQUIPMENT IDENTIFICATION**

- .1 Labels for conduits and cables to indicate their content shall comprise pressure sensitive tape. Labels shall be printed on plastic coated tape, 2" x 6" size with black printing on yellow background indicating applicable voltage, i.e. "208Vac".
- .2 Labels shall be manufactured by:
  - .1 W.M. Brady Co. of Canada Limited
  - .2 Ideal Electric Canada Ltd.
- .3 Nameplates shall be white lamacoid with beveled edges and black engraved letters. Fasten nameplates to equipment in a conspicuous location. Locate nameplate on flush mounted panels on front of panel behind hinged door.
- .4 Locate labels as follows:
  - .1 At every end of every conduit, duct or cable run, adjacent to item of equipment serviced.
  - .2 On each exposed conduit, duct or cable passing through a wall, partition or floor (one on each side of such wall partition or floor).
  - .3 At intervals of 50'-0" along every exposed conduit, duct or cable run exceeding 50'-0" in length.
  - .4 At every access point on concealed conduit duct or cable.
- .5 Labels shall be visible from 5'-0" above adjacent floor platform.

**1.6 TESTING**

- .1 Perform tests of equipment and wiring at times requested.
- .2 Tests shall include meggered insulation values, voltage, and current readings to determine balance of panels and feeders under full load, and operation of each piece of equipment for correct operation.
- .3 Supply meters, materials and personnel as required to carry-out these tests.

**BASIC MATERIALS AND METHODS**

- 
- .4 Test electrical work to standards and function of Specification and applicable codes in an approved manner. Replace defective equipment and wiring with new material and leave entire system in complete, first-class operating condition.

- .5 Submit all test results in report format.

**1.7 CONDUIT SLEEVES AND CURBS**

- .1 Provide conduit sleeves of galvanized steel for conduit and cable runs passing through concrete walls, beams, slabs, and floor.

**1.8 SUPPORTS AND BASES**

- .1 Submit proposed method of attachment of hangers and beam clamps, to cellular steel deck for approval before proceeding with the work.

- .2 Supply and erect special structural Work required for the installation of electrical equipment.

- .3 Provide anchor bolts and other fastenings unless noted otherwise. Mount equipment required to be suspended above floor level, where details are not shown, on a frame or platform bracketed from the wall or suspended from the ceiling. Carry supports to either the ceiling or the floor, or both as required, at locations where, because wall thickness is inadequate, it is not permitted to use such brackets.

- .4 Provide channel or other metal supports where necessary, to adequately support lighting fixtures. Do not use wood unless wood forms part of the building structure. All light fixtures shall be independently supported from the structural deck with chains

- .5 Support hangers, in general, from inserts in concrete construction or from building structural steel beams, using beam clamps. Provide additional angle or channel steel members, required between beams for supporting conduits and cables.

- .6 Provide any additional supports required from concrete construction for any piping or equipment, by drilling same and installing expansion bolt cinch anchors.

- .7 Do not use explosive drive pins in any section of Work without obtaining prior approval.

**1.9 HANGERS**

- .1 Hangers for electrical conduit shall be galvanized after fabrication.

- .2 Conduit hangers shall be as manufactured by:

- .1 Burndy Canada Ltd.
- .2 Canadian Strut Products Ltd.
- .3 E. Myatt & Co. Ltd.
- .4 Steel City Electric Co.
- .5 Pilgrim
- .6 Thomas & Betts
- .7 B-line

- .3 Do not use perforated strapping (grapppler bars).

**BASIC MATERIALS AND METHODS**

---

**1.10 WIRING METHODS**

- .1 Install wiring in conduit unless otherwise specified.
- .2 Use thin wall conduit, up to and including 53 mm conduit size, for branch circuit and feeder wiring in ceilings, furred spaces, and in hollow walls and partitions. Use rigid galvanized steel conduit for wiring in poured concrete, where exposed, and for conduit 65 mm or larger. Use rigid PVC conduit for wiring in slabs on grade and wiring below grade.
- .3 Aluminum conduit may be used, in lieu of rigid steel conduit, in clean and dry locations, but shall not be used in poured concrete, or for signal and intercommunication systems wiring.
- .4 Conduit manufacturer's touch-up enamel shall be used to repair all scratches and gouges on epoxy-coated conduit.

**1.11 OUTLET BOXES**

- .1 Boxes shall conform to C.S.A. Standard C22.2 No. 18-1972.
- .2 Where 103 mm square outlet boxes are installed in exposed concrete or cinder block finished areas, blocks will be cut under Masonry Division as instructed under this Section. Opening shall be cut to provide a close fit to boxes and covers so that edges of openings are not visible after installation of plates. Mortar shall not be used to patch up openings that are cut too large or to patch ragged edges.
- .3 Ceiling boxes shall be 103 mm octagon or square, complete with fittings, where required to support fixtures.
- .4 Switch and receptacle boxes shall be:
  - .1 103 mm square with plaster ring, where flush mounted in plaster walls.
  - .2 No. 1104, where flush mounted in wood or drywall, with stud fasteners as required.
  - .3 Masonry boxes in masonry walls.
- .5 Where boxes are surface mounted in unfinished areas they shall be FS conduits.
- .6 Standard outlet boxes shall be manufactured from code gauge galvanized steel.
- .7 Provide a suitable outlet box for each fire alarm device, approved for the particular area it is to be installed.
- .8 Support outlet boxes independently of conduit and cable.
- .9 Locate outlet boxes, mounted in hung ceiling space, so they do not obstruct or interfere with the removal of lay-in ceiling tiles.
- .10 Offset outlet boxes, shown back to back in partitions, horizontally a min. of 150mm to minimize noise transmission between adjacent rooms.
- .11 Use gang boxes at locations where more than one device, of the same system only, is to be mounted. Each system shall utilize separate boxes.

**BASIC MATERIALS AND METHODS**

- 
- .12 Use tile wall covers where 103 mm square outlet boxes are installed in exposed concrete or cinder block in finished areas.
  - .13 Flush mount boxes, panels, cabinets and electrical devices, which are installed in finished areas, shall be provided with suitable flush trims and doors or covers, unless specifically noted otherwise.
  - .14 Provide pre-formed polyethylene vapor barriers for all boxes located in walls with internal vapor barriers.

**1.12 CONDUIT ACCESSORIES, CONDULETS AND FITTINGS**

- .1 Conduit accessories, conduits and fittings shall conform to C.S.A. Standard C22.2 No. 18-1972.
- .2 Rigid conduit bushings shall be as manufactured by:
  - .1 Thomas & Betts Ltd - Series 5031
  - .2 Efcor of Canada Ltd - Series 720B
  - .3 Commander/Iberville.
- .3 EMT Connectors shall be as manufactured by:
  - .1 Thomas & Betts Ltd - Steel City TC 121E Series
  - .2 Efcor of Canada Ltd - Series 720B
  - .3 Commander/Iberville
- .4 Ground bushing shall be as manufactured by:
  - .1 Thomas & Betts – Blackjack or 1220 Series
  - .2 Efcor of Canada Ltd.
  - .3 Commander / Iberville
- .5 Flexible conduit connectors shall be as manufactured by:
  - .1 Thomas & Betts Ltd - Series 3110
  - .2 Efcor of Canada Ltd - Series 1001B
  - .3 Commander/Iberville
  - .4 EMT couplings shall be steel concrete tight to match connectors.
- .6 Conduit fittings shall be as manufactured by:
  - .1 Crouse-Hinds of Canada Ltd.
  - .2 Kondu Mfg. Co. Limited
  - .3 Thomas & Betts Ltd.
  - .4 Killark of Canada
  - .5 Efcor of Canada Ltd.
  - .6 Commander/Iberville
- .7 Steel conduit shall be as manufactured by:
  - .1 Conduits National Co. Ltd.
  - .2 MBF Industries
- .8 Aluminum conduits shall be as manufactured by Alcan Canada Products Ltd.

**BASIC MATERIALS AND METHODS**

---

- .9 Terminate rigid conduit entering boxes or enclosures with nylon insulated steel threaded bushings such as Thomas & Betts – 8125 Series
- .10 Terminate flexible conduit entering boxes or enclosures with nylon insulated steel connectors such as Thomas & Betts 5332 Series or equivalent.
- .11 Install wall entrance seals where conduits pass through exterior walls below grade.
- .12 Provide expansion coupling in conduit runs at building expansion joints and in long runs subject to thermal expansion, all in accordance with manufacturer recommendations.

**1.13 CONDUCTORS, WIRES AND CABLES**

- .1 Wiring installed in conduit, unless otherwise noted, shall be 600volt "RW 90 X-Link". Power wiring shall be copper, minimum No. 12 gauge. Size wires for 2% maximum voltage drop to farthest outlet on a maximum 80% loaded circuit.
- .2 Conductors shall be color coded. Conductors #10 gauge and smaller shall have colour impregnated into insulation at time of manufacture. Conductors size #8 gauge and larger may be color coded with adhesive color coding tape but only black insulated conductors shall be employed in this case, except for neutrals, which shall be white wherever possible.
- .3 Wire shall be as manufactured by:
  - .1 Industrial Wire and Cable (1970) Ltd.
  - .2 Nexans Canada
  - .3 Noramco
  - .4 Phillips Cables Ltd.
  - .5 Prysmian Group
  - .6 Southwire
  - .7 Texcan (Sonepar).
- .4 Neatly arrange circuit wiring in cabinets, panels, pull boxes and junction boxes and hold with nylon cable ties.
- .5 Splice wire, up to and including No. 6 gauge, with nylon insulated expandable spring type connectors such as Thomas & Betts – Marr Max Series.
- .6 Splice large conductors using compression type connections insulated with heat shrink sleeves.
- .7 Where color coding tape is utilized, it shall be applied for a minimum of 2" at terminations, junction and pull boxes and conduit fittings. Do not paint conductors under any condition.
- .8 Color coding shall also apply to bussing in panels and switchgear, disconnects, and metering cabinets.

**BASIC MATERIALS AND METHODS**

---

**1.14 MOUNTING HEIGHTS**

- .1 Mounting height of equipment is from finished floor to centre-line of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at the following heights unless indicated otherwise.
  - .1 Fire alarm horn/strobe, emergency call system visual indicator: 2350mm to top of device (adjust in any case for a minimum of 150mm space between the ceiling and top of device).

END OF SECTION

---

**Part 1            General**

**1.1            GENERAL**

- .1 Previous division 26 sections form part of this section as though written here in full and are to be read in conjunction with this section.
- .2 This section provides for the supply and installation of the extension to the existing fire notification system into the new areas.
- .3 The electrical contractor shall provide all other material and labour including inspection fees to complete the installation and commissioning of this feeder and the feeder breaker.

**1.2            DESCRIPTION**

- .1 All work in conjunction with this installation shall meet the provisions of the Ontario Electrical Safety Code (28<sup>th</sup> Edition/2021), U.L.C. Standard CAN/ULC-S524-14, the Ontario Building Code, FM Global and applicable municipal requirements for building permit approval.

**1.3            RELATED WORK SPECIFIED ELSEWHERE:**

- .1 26 00 00 General Provisions

**1.4            QUALITY ASSURANCE**

- .1 Each and all items of the fire alarm system shall be listed as the products of a single manufacturer under the appropriate category by the U.L.C. and shall bear the U.L.C. label.
- .2 Each and all items of the fire alarm system shall be covered by a one-year parts and labour warranty covering defects resulting from faulty workmanship and materials. The warranty shall be deemed to begin on the date the system is accepted by the Owner on issuance of the substantial performance certificate for the project.
- .3 All control equipment must have Transient Protection Devices to comply with U.L.C. requirements.

**1.5            SHOP DRAWINGS**

- .1 Submit shop drawings for all fire alarm notification devices.
- .2 Shop drawings shall include, without being limited to, the following drawings prepared specifically for this project:
  - .1 Information on Control Panel and Signaling Devices complete with catalogue numbers and wiring information.
  - .2 FACP modules.
  - .3 As-Built layouts marked on a set of building plans indicating panels, annunciators, detectors, pull stations, signals, conduit routes, wiring information, pull boxes, terminal cabinets, and access panels.
  - .4 Upon completion of the installation and testing, submit to the Project Manager or superintendent copies of all shop drawings, diagrams, operating instructions, and descriptive literature, assembled in loose leaf binders identified by Project Name.

---

**Part 2            Materials**

**2.1                FIRE ALARM CONTROL PANEL**

- .1 Contractor to supply and install a new fire alarm control panel, located near principal entrance to the building, as shown on the electrical drawings. The contractor shall be responsible for all labour and material to supply and install new FACP, the contractor is responsible for a fully operational fire alarm system.

**2.2                FIRE ALARM DEVICES**

- .1 Locations of devices shown on drawings is diagrammatic and shall be confirmed.

**2.3                ZONES**

- .1 If existing fire alarm zones cannot be found to suit, a new zone shall be created, and wiring will be from the fire alarm control panel in the electrical room.
- .2 All details of the extension to the fire detection systems shall be confirmed and approved prior to purchase of equipment and installation.

**Part 3            Execution**

**3.1                INSTALLATION**

- .1 All wiring methods and materials used in the installation of the fire alarm system shall conform to the requirements of branch circuit wiring as outlined in the other sections of this specification.
- .2 Minimum wire size for signal circuits shall be #12 AWG, colour coded red for positive and black for negative.

**3.2                VERIFICATION**

- .1 In accordance with CAN/ULC-S537-13.

END OF SECTION

**1. General**

**1.1 General**

- .1 This section provides for the supply/installation of the fire alarm system and associated components / modules.
- .2 The electrical contractor shall provide all other material and labour including inspection fees to complete the installation, commissioning, and confirmation of this work.

**1.2. Description**

- .1 The fire alarm system is a conventional, single stage, zoned, fully integrated fire alarm system.
- .2 These specifications describe the minimum functional requirements for an electronically supervised, micro-processor based, fully integrated system.
- .3 All work in conjunction with this installation shall meet the provisions of the Ontario Electrical Safety Code, U.L.C. Standard CAN/ULC-S524, the Ontario Building Code, FM Global and applicable municipal requirements for building permit approval.

**1.3. Related Work Specified Elsewhere:**

- .1 26 05 00 General Requirements for Electrical Work
- .2 26 05 01 Basic Materials and Methods

**1.4. Quality Assurance**

- .1 Each and all items of the fire alarm system shall be listed as the products of a single manufacturer under the appropriate category by the U.L.C. and shall bear the U.L.C. label.
- .2 Each and all items of the fire alarm system shall be covered by a one year parts and labour warranty covering defects resulting from faulty workmanship and materials. The warranty shall be deemed to begin on the date the system is accepted by the Owner on issuance of the substantial performance certificate for the project.
- .3 All control equipment must have Transient Protection Devices to comply with U.L.C. requirements.

**1.5. Shop Drawings**

- .1 Submit a digital copy of shop drawings.
- .2 Shop drawings shall include, without being limited to, the following drawings prepared specifically for this project:
  - a) Fire Alarm Control Panel.
  - b) Information on Signaling Devices complete with catalogue numbers and wiring information.
  - c) Information on Initiating Devices complete with catalogue numbers and wiring information.
  - d) As-Built layouts marked on a set of building plans indicating panels, signals, conduit routes, wiring information, pull boxes, terminal cabinets

and access panels.

- .3 Upon completion of the installation and testing, submit to the Engineer, copies of all shop drawings, diagrams, operating instructions, and descriptive literature assembled in loose leaf binders identified by Project Name.

## **2. Fire Detection System**

### **2.1 Operation**

- .1 Actuation of any fire alarm device shall:
  - a) Sound the fire alarm horn/strobes throughout the building.
  - b) At the main control panel the alarm shall be displayed by the system alarm red LED on the control panel. Annunciator panel shall be actuated accordingly.
  - c) Send signal to release all door hold-open devices.
  - d) The fire alarm signals shall sound NON-STOP at the temporal rate until silenced at the main control panel. Subsequent alarms shall cause the evacuation signals to activate again.
  - e) Complete addition to the system is to be supervised against failure of operating power. All supervision is to be maintained on all circuits even in the event of a power failure, when the system is on battery standby. The above shall cause a trouble buzzer to sound at the main control along with a common trouble lamp. The control panels on alert is to produce a tone distinct from the tone of the alarm signals located throughout the building.

### **2.2. Fire Alarm Devices**

- .1 Notification devices are to be provided as indicated on the drawings.
- .2 Initiating devices are to be provided as indicated on the drawings.
- .3 The locations of devices shown on drawings are diagrammatic and shall be confirmed where conflict arises during construction.

### **2.3 Zones**

- .1 NAC zones are to be provided as shown on drawings and as required by the OBC.

## **3. Execution**

### **3.1 Installation**

- .1 All wiring methods and materials used in the installation of the fire alarm system shall conform to the requirements of branch circuit wiring as outlined in the other sections of this specification.
- .2 Minimum wire size for signal circuits shall be #12 AWG, color coded red for positive and black for negative.
- .3 In accordance with CAN/ULC-S524, "Installation of Fire Alarm Systems".

### **3.2 Verification**

- .1 In accordance with CAN/ULC-S537, "Verification of Fire Alarm Systems".

END OF SECTION