PTC 2020-02

FIRE ALARM SYSTEM & MISC. UPGRADES
VARIOUS LOCATIONS
SAULT STE. MARIE, ONTARIO

SEPTEMBER 2020

Social Services | Services Sociaux
Zhawenimi-Anokiitaagewin
Sault Ste. Marie District

Here to help.
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September 22, 2020

SUBJECT: **INVITATION TO TENDER**
PTC 2020-02
FIRE ALARM SYSTEM & MISC. UPGRADES
VARIOUS LOCATIONS
SAULT STE. MARIE, ONTARIO

The *Sault Ste. Marie Housing Corporation (SSMHC)* invites sealed tenders for a **FIRE ALARM SYSTEM & MISC. UPGRADES** at the locations listed in the enclosed documents.

In order to be considered, all tenders must be received by the *Sault Ste. Marie Housing Corporation*, 180 Brock Street, Sault Ste. Marie, ON P6A 3B7, no later than **Tuesday, October 6th , 2020** at **2:00 P.M. LOCAL TIME** at which time the tenders will be publicly opened.

Please complete the tender and other related forms as applicable and return in the envelope provided.

The completion date for this contract is **90 days** after the award.

The lowest or any tender will not necessarily be accepted.

Yours truly,

Jeff Barban,
Director of Housing Services

Housing Services
180 Brock Street
Sault Ste. Marie, ON
P6A 3B7

Tel: 705-946-2077
Fax: 705-946-5628
www.socialservices-ssmd.ca

DIVISION NUMBER **TOTAL PAGES**

DIVISION 0 - PRE-BID

DIVISION 26 – ELECTRICAL

1. GENERAL DESCRIPTION OF WORK

.1 Provide all materials, labour, and equipment required for the following upgrades:

.1 Replace and existing fire alarm systems with new addressable type fire alarm systems, including independent fire alarm verification at 53 Chapple Avenue, 55 Chapple Avenue, and 101 Chapple Avenue.

.2 Replace existing corridor and public area lighting with new LED lighting upgrades at 101 Chapple Ave.

.3 Replace existing T-bar ceiling grid systems on the first floor at 101 Chapple Ave.

.4 Allow for changes to operations and functions to be made by on-site software programming selections.

.5 Ensure equipment manufacturer provides information regarding wiring requirements before bidding. Owner will not be responsible for added cost and changes due to additional manufacturer's requirements.

.6 Do not re-use any components of existing system unless specifically stated or as indicated on drawings.

.7 All panels, devices, wiring, conduit, etc. shall be recessed, and/or surface mounted and properly finished with approvals from the Engineer.

.8 Contractor will be responsible to apply and pay for all required permits including Building Permits through the *City of Sault Ste. Marie*. A copy for each site is to be submitted to the Owner prior to commencing work.

.2 Coordinate with Sault Ste. Marie Housing Corporation staff, 48 Hour Notice to all tenants for access required into the apartment units. All contractors are required to be equipped with a mask, and abide by COVID-19 safety protocols, as per the Algoma District Health Unit guidelines.

2. SITE LOCATIONS

53 Chapple Avenue, Sault Ste. Marie, Ontario.
55 Chapple Avenue, Sault Ste. Marie, Ontario.
101 Chapple Avenue, Sault Ste. Marie, Ontario.

3. ACCESS TO SITE & INQUIRIES

.1 Bidders may obtain access to the site by contacting:

Liza Chikoski
Infrastructure and Asset Manager
Sault Ste. Marie Housing Corporation
180 Brock Street
Sault Ste. Marie, ON P6A 3B7
Telephone: (705) 759-5131 Fax: (705) 946-5628
L.Chikoski@socialservices-ssmd.ca

.2 Bidders may address inquiries to:

David Barban P.Eng
Consulting Engineer
Nor Mech Engineering Inc.
1141 Old Garden River Road
Sault Ste. Marie, ON P6A 6J8
Telephone: (705) 942-0114 Fax: (705) 942-0181
normech.david@shaw.ca

.3 All inquiries are to be submitted in writing via email no later than **Friday, October 2nd, 2020** by **12:00 p.m. LOCAL TIME.**

.4 Clarifications and or revisions will be issued to bidders by Addendum prior to bid closing.

4. MANDATORY PRE-BID MEETING

.1 A mandatory pre-bid briefing meeting will be held for all bidders starting at:

55 Chapple Avenue, SAULT STE. MARIE on

TUESDAY, SEPTEMBER 29TH, 2020 at **10:30 A.M.**

Note: Attendance at the entire meeting is mandatory for all bidders. All attendees are required to be equipped with a mask, and abide by COVID-19 safety protocols, as per the Algoma District Health Unit guidelines.

5. SCHEDULE OF WORK & COMPLETION DATE

.1 Start work upon award of contract and carry out operations continuously to ensure completion of all items within **ninety (90) days** of date of Purchase Order.

.2 All bidders are to allow for this schedule when submitting their tender.

6. CLOSING DATE - LOCATION

.1 In order to be considered, the tender must be received on the forms and in the envelope provided at:

Sault Ste. Marie Housing Corporation
180 Brock Street
Sault Ste. Marie, ON P6A 3B7

Closing Date: Tuesday, October 6th, 2020 at 2:00 p.m. LOCAL TIME

7. SECURITY

.1 Bid Security will be required in accordance with Clause 4.1 of the *Instructions to Bidders*.

.2 If awarded the contract, Performance Security will be required in accordance with Clause 4.2 of the *Instructions to Bidders*.

8. BID ACCEPTANCE

.1 The lowest of any bid will not necessarily be accepted.

.2 If the Contractor that is awarded the work cannot complete the work as specified, it is at the sole discretion of the Owner to issue remainder of work to the Contractor of its choice.

.3 The Owner reserves the right to award the Contract in whole or in part.

.4 Notwithstanding any tender documents that may be made available for information purposes at other locations, bids will only be accepted on the *Tender Submission Form* submitted in the envelope provided in the tender package duly obtained and paid for if a charge is levied, and registered at the offices of the *Sault Ste. Marie Housing Corporation (SSMHC)*.

END OF SECTION

1. FORM OF CONTRACT

1.1 The documents forming the Contract between Owner and Contractor are those contained in Article A3 of the Stipulated Price contract published by the *Canadian Construction Documents Committee (CCDC-2) 2008*.

2. TENDER SUBMISSION

2.1 The Bidder shall:

.1 put the bidder's name and return address on the envelope provided for the Tender Submission Form,

.2 complete and fully execute the Tender Submission Form supplied and all appendices in all respects with appropriate documents and all requisite information,

2.2 The Tender and any amendments thereto **may not** be submitted orally or by telecommunications which include but are not limited to telex, telegram and telephone transmission of facsimiles.

2.3 The total amount of the firm, fixed tender price shall be given in writing and numerals. All writing shall be with ink or typewriter except with signature of the bidder which shall be written with ink. Tenders that are incomplete or contain any omission, erasure, alteration, addition, condition, limitation or that show any irregularity may be rejected.

2.4 The tender shall be properly signed and the complete address of the bidder shall be given on the tender. If the bidder is a co-partnership, each member shall sign the tender; if a corporation, it shall execute the tender by its duly authorized officers.

2.5 The bidder shall include all schedules, and other information specified to enable the Owner to determine the bidder's compliance with the requirements of the Contract Documents. In the event work cannot be completed in accordance with the specified requirements, the bidder shall clearly and explicitly state what the deviations are.

2.6 Upon request, a bidder shall verify any information including price contained in his tender, and any tender may be rejected if the Owner is not satisfied with the information furnished.

2.7 The submission of a tender proposal shall indicate the acceptance by the bidder of all instructions and conditions contained in the Contract Documents and the tender shall be a firm offer binding the bidder.

2.8 Tenders shall not be withdrawn or modified and shall be open to acceptance by the Owner for a period of **thirty (30) days** following the date for the receipt of tender proposals. The price quoted therein shall be **FIRM FIXED PRICES** which shall remain valid and binding on the bidder in the event the tender proposal is accepted by the Owner.

2.9 The bidder shall submit tender proposals on the basis of using the products, materials and methods indicated or specified. Where alternatives are listed, use one only from the list.

2.10 Submit with the tender, under material variations, but do not include in the firm fixed tender price, all proposals to substitute other products, materials and methods for those indicated or specified. For each proposed substitution, submit the name of the manufacturer or supplier, the trade name, an explicit description, the amount by which the firm fixed tender price would be changed and all other information necessary for the evaluation of the proposal.

2.11 The Owner will determine which, if any, substitutions will be accepted and the Contract price will be adjusted accordingly. The accepted products, material or method will become part of the Contract.

2.12 The Owner reserves the right to amend or supplement the Contract Documents at any time prior to the established closing date. Additional information, changes, clarifications or corrections made by the Owner or Consultant on the Owner's behalf to the Contract Documents during the time of bidding shall be issued in the form of addenda which will become part of the Contract and shall be covered in the tender price. The bidder shall acknowledge receipt of these addenda in the space provided in the tender forms.

2.13 The bidder is advised that the Owner will not reimburse the bidder for any costs incurred in preparation of a tender proposal.

3. SALES TAX

3.1 All Provincial Sales and Excise taxes are to be included in the Tender Amount.

3.2 The Harmonized Sales Tax (H.S.T.) is to be included with the Total Tender Amount.

4. BONDS, BID AND PERFORMANCE SECURITY

4.1 Bid Security

.1 The Bidder shall include together with the Bidder's Tender Submission Form any one of a **Bid Bond** in the form attached hereto from a Surety

acceptable to the Owner, a certified cheque, a Bank Draft or an irrevocable Letter of Credit in favour of the Owner in the amount stipulated in the Tender Submission Form, valid for a period of **thirty (30) days** from the date of tender closing unless otherwise stipulated in the Tender Submission Form.

.2 Such deposit shall be security to the Owner that the tenderer, if successful, will execute the contract documents and supply the Contract Performance Security in accordance with Section 00200, Clause 4.2.

.3 Failure to comply with Clause 4.1.2 may result in forfeiture of the Bid Security.

.4 Bid Security of all tenderers, except the lowest and second lowest tenderers will be returned within **three (3) business days** of the award of the Contract.

.5 The Bid Security of the two low tenderers will be returned when the Contract has been awarded in accordance with Section 00200, Clause 8.

4.2 **Performance Security**

.1 The Contractor shall provide, at the Contractor's costs, **Performance Security** in favour of the Owner in order to secure the due and faithful performance of the Contract, which shall be as follows:

.1 a Performance Bond is issued by a Surety Company acceptable to the Owner's approved form which is attached hereto and shall be in an amount equal to 50% of the Contract Price;

.2 if the Contract price is less than $1,000,000.00, but over $100,000.00, the following alternate forms of security are acceptable in lieu of such Performance Bond:

(i) an irrevocable letter of credit, bank draft, or certified cheque; or
(ii) bearer or negotiable bonds of Canada, the Province of Ontario, or the Ontario Hydro Electric Power Commission (bonds to be assessed at market not face value); or
(iii) such other collateral as may be acceptable to the Owner and in each case, the alternate forms of security shall be equivalent to 20% of the Contract Price.

.3 if the Contract price is less than $100,000.00, the alternate forms of security listed in 4.2.1.2 (i), (ii), & (iii) shall be equivalent to 10% of

the Contract Price.

.2 If the Contractor fails to meet the requirements of this section within **seven (7) business days** of receipt by the Contractor of the award letter, then the Owner at is sole option may terminate the Contract and use the **Bid Security** toward damages.

.3 If the Security is in the form of a **Performance Bond**, the document shall be retained by the Owner for a period of two (2) years from the date on which the last payment under the contract falls due, after which it will be returned to the Contractor on the Contractor's request.

.4 If alternate security is provided pursuant to this section it will be returned to the Contractor **forty-five (45) days** after completion of the Work and the correction of all deficiencies. If deficiencies involve seasonal work which must be postponed, the security shall be reduced to an amount equal to the value of the work which remains to be completed and the balance of the security returned to the Contractor **forty-five (45) days** after all other work is completed.

.5 If required by the Supplementary Conditions, the Contractor shall provide at the Contractor's cost a Labour and Material Payment Bond, in the Owner's approved form which is attached hereto and it shall be in an amount equal to 50% of the total Contract Price.

5. EXAMINATION OF THE SITE AND CONTRACT DOCUMENTS

5.1 Before submitting a Tender the Bidder shall carefully examine the site of the proposed work, evaluate the existing conditions and limitations and include the amounts in the tender to cover the cost of all items required to be done to fulfill the Contract.

5.2 The Bidder shall report any discrepancies, errors or omissions to the Owner, the Bidder will be deemed to have accepted all such specifications and drawings as being accurate and the Owner will not approve any extra charges subsequent to acceptance of the Tender.

5.3 Questions arising from the bidder's inspection at the site will be answered in addenda where deemed necessary. Existing building information may be available for inspection at the office of the owner. The bidder shall interpret this information according to his own judgment and not rely upon it as accurately descriptive of subsurface conditions which may be found to exist.

5.4 Any bidder who is in doubt as to the true meaning or intent of an item in the Contract Documents or who discovers any discrepancies, errors or omissions in

the Contract Documents shall notify the owner and request clarification or correction thereof. All such request shall be in writing or shall be confirmed in writing. No responsibility will be accepted by the Owner for unsupported oral communications or instructions.

5.5 The bidder shall ascertain, from the relevant authorities, the availability and existing locations of all services to the project, and without limiting the generality of the foregoing, in particular such services as electric light, power, sewers, water supply, gas, telephone and transportation and availability of roads for traffic, and shall ascertain what prior notice will be required for the installation of the service to the project.

6. QUALIFICATION INFORMATION

6.1 The Owner reserves the right to require any Bidder to submit qualification information prior to the award of the Contract which qualification information shall include the submission of evidence of the capability of the Bidder to carry out and to maintain properly the work and the equipment, together with details of the qualifications of the Bidder's staff that may be employed in the execution of the Contract.

6.2 The Owner reserves the right of interpretation of qualification information and any decisions made by the Owner based upon its findings which may affect the award of the Contract shall be final.

6.3 The Owner reserves the right to give preference to materials, products and equipment:

6.3.1 of Canadian origin and manufacture,

6.3.2 which are environmentally friendly,

6.3.3 which are energy efficient.

7. ACCEPTANCE OR REJECTION OF TENDERS

7.1 Under no circumstances will the Owner consider a Tender which is:

(i) not received at the address given in the Invitation to Tender, within the time prescribed therein;

(ii) not properly signed,

7.2 The Owner has the unqualified right to:

(i) accept or reject any Tender or all Tenders; and

(ii) waive the formalities in any Tender documents as the interest of the Owner may require; without giving any reasons for any such action.

7.3 The Owner is not obliged to accept any Tender because it is the lowest tender submitted.

8. AWARD OF CONTRACT

8.1 When a Tender is called for more than one project, a Contract may be awarded on the basis of all or any one or more of the projects, unless otherwise stated in the Invitation to Tender.

8.2 The Owner has up to **thirty (30) days** after the date of tender closing to notify the Bidder that his Tender is accepted.

8.3 The Contract shall be deemed to be awarded on the date that the Owner advises the Bidder in writing of such award.

8.4 If the Bidder alters or withdraws the Bidder's Tender after the date of tender closing or if the Bidder does not provide Insurance or other documents in accordance with the terms of Section 00200 and Section GC11.1 of the General Conditions within the times specified by the Owner, then the Owner may treat the Bidder's Tender and any right of the Bidder to contract or Contract as terminated, and may take such further action as the Owner deems advisable to recover any damages suffered by the Owner.

8.5 If there is any discrepancy in the Tender Submission Form or documents submitted by the Bidder, between any amount shown in writing and in figures, the Owner may choose to accept the amount shown in writing or to reject the tender.

8.6 If a contract is awarded, the following documents will all form part of the Contract:

Instruction to Bidders

Stipulated Price Contract CCDC

Supplementary General Conditions

Tender Submission Form

Specifications with Appendices and Addenda

Schedules

Award Letter

Purchase Order

9. PRICE BREAKDOWN

9.1 Immediately upon the opening of tenders the low bidder or bidders may be requested to submit a detailed breakdown (trade by trade) of the cost of the work. The owner will indicate the amount of detail required and the Contractor(s) must present the information promptly.

10. PROOF OF ABILITY

10.1 The Bidder shall be competent and capable of performing the various items of work.

10.2 The Bidder shall provide, when requested, the firm's latest Workers' Safety Insurance Board Experience Rating and a signed letter which states only competent personnel will he employed on this project in accordance with Occupational Health and Safety Act - Bill 208.

10.3 The Bidder may be required to furnish names of references conversant with bidder’s performance on similar work, names and experience of senior personnel to be used on the work, and such statements of his financial resources as may be found necessary.

10.4 All Contractors and Subcontractors employees who work in a Corporate workplace and/or job site are required to have a valid identification card that confirms the worker has attended a “Standardized Safety Orientation Course” administrated by the **Sault Safe Community Partnership**, or the *Sault Ste. Marie Construction Association* or an equal Safety Coarse as determined by the *Sault Ste. Marie Housing Corporation (SSMHC)*.

END OF SECTION

Jeff Barban
Sault Ste. Marie Housing Corporation
180 Brock Street,
Sault Ste. Marie, ON P6A 3B7

RE: PTC 2020-02
LOCATION: 53 , 55, 101 CHAPPLE AVENUE
SAULT STE. MARIE, ONTARIO
TENDER CLOSING: TUESDAY, OCTOBER 6, 2020
@ 2:00 P.M. LOCAL TIME

Having carefully examined the Contract Documents and visited the site and examined all conditions:

1) _____ has attached the material
Company Name
and information as required in the Bid Documents and agree to construct/repair/replace the materials/services/building components on the projects named above, owned by the *Sault Ste. Marie Housing Corporation (SSMHC)*, at a total lump sum fixed price of:

a) Total lump sum price $_____

b) Harmonized Sales Tax (13% H.S.T.) $_____

c) **Total** **$_____**

Total in writing including 13% H.S.T.

_____ Canadian Dollars

including payment of all applicable federal, provincial and municipal taxes, utility permits, etc.

2) I/We agree to comply in all respects with the requirements set out in the Bid Documents including ADDENDA Nos. to . (If no addenda have been received, indicate "NIL" in the spaces provided.)

3) This bid will be considered accepted and a contract entered into, upon receipt of a duly authorized Purchase Order.

4) I/We agree to commence this work immediately upon being notified in writing to

do so by the owner and that contract work will be on a continuous basis.

5) I/We expressly warrant that the prices contained in my/our bid, whether as unit prices or lump sums are quoted in utmost good faith on my/our part without any collusive arrangement or agreement with any other person or partnership or corporation.

6) I/We expressly represent that I/We are not party or privy to any deceit tending to mislead the owner into accepting my/our bid as a truly competitive bid whether to the prejudice, injury or benefit of *Sault Ste. Marie Housing Corporation (SSMHC)*.

7) Further to our bid, I/we propose the following substitute products listed below showing the addition to a deduction from the bid amount.

Description of Proposed Alternative	**Addition to Contract**	**Deletion to Contract**

I/We acknowledge that each of the above proposed alternative [s] is subject to the written approval of the *Sault Ste. Marie Housing Corporation*.

8) I/We agree to complete the work acceptable to the Corporation within **90 days** of date of Purchase Order.

9) If successful I/We will submit a progress schedule, on the form attached.

10) Amount of Bid Security required – **10 %**

11) If our tender is accepted it is our intention to employ subcontractors in accordance with the General Conditions of the contract. All portions of the work, other than those to be placed with the subcontractors will be executed by ourselves with our own workforce. List of subtrades for trade work is listed below.

SECTION TRADEWORK SUBCONTRACTOR

_____

_____

_____

_____

11.1 There is to be no change to the above list without the written consent of the subcontractor concerned or the owner.

12) **WHEN THE TENDER IS CALLED FOR MORE THAN ONE PROJECT, THE HOUSING CORPORATION RESERVES THE RIGHT TO AWARD THE WHOLE PROJECT OR PART THEREOF. NOTE: NO PARTIAL BIDS WILL BE ACCEPTED.**

SIGNED AND SEALED THIS _____DAY OF_____, 20 ____

***CONTRACTOR:** _____

AUTHORIZED SIGNING OFFICER: _____

TITLE: _____

SIGNATURE:_____

ADDRESS:_____

CITY: _____**POSTAL CODE:** _____

TELEPHONE: _____**FAX:** _____

WITNESS: _____ (Must be witnessed if no seal)

NOTE: BIDDERS ARE ADVISED THAT FAILURE TO COMPLETE THIS FORM WILL BE CAUSE FOR DISQUALIFICATION OF THE BID.

***Affix Corporate Seal.**

1. DEFINITIONS

.1 The word **"Owner"** means the applicable Social Housing Provider.

.2 The word "**Day**" means a calendar day unless otherwise stated.

2. Article GC 10.2 LAWS, NOTICES, PERMITS AND FEES

.1 Amend Clause 10.2.2 to read "The Owner shall pay for permanent easements and rights of servitude. The Contractor will be responsible for covering all costs and applying for all Building Permits, Electrical Permits, and any other permits, licenses, or certificates necessary for the performance of the Work which were in force at the date of bid closing. Contractor is to provide proof of permits to Owner.

3. LIABILITY INSURANCE

.1 Commercial General Liability insurance shall be with limits of not less than **$5,000,000** per occurrence, an aggregate limit of not less than **$5,000,000** within any policy year with respect to completed operations, and a deductible not exceeding $5,000. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the Contractor, the Owner may agree to increase the deductible amounts.

.2 Commercial General Liability insurance providing third party bodily and personal injury and property damage coverage in an amount of not less than **$5,000,000** per occurrence, stating *Sault Ste. Marie Housing Corporation* is an additional insured and containing a Cross Liability and/or Severability of Interest Clause, protecting each insured to the same extent as if they were separately insured.

4. W.S.I.B.

.1 The contractor shall produce a valid W.S.I.B. Certificate of Clearance Form at the commencement of the contract and updated copies as renewed.

END OF SECTION

1. LIST OF DRAWINGS

E1.1 – E 1.4 – 53 Chapple Avenue Existing/Revised & New Electrical Layout

E1.1: .....Partial Level 1 Plan (East)
E1.2: .....Partial Level 1 Plan (West)
E1.3: .....Partial Level 2 Plan (East)
E1.4 .....Partial Level 2 Plan (West)

E2.1 – E 2.9 – 55 Chapple Avenue Removal & New Electrical Layouts

E2.1: .....Partial Level 1 Plan (South)
E2.2: ..... Partial Level 1 Plan (Centre)
E2.3 .....Partial Level 1 Plan (East)
E2.4: .....Partial Level 2 Plan (South)
E2.5: ..... Partial Level 2 Plan (Centre)
E2.6: .....Partial Level 2 Plan (East)
E2.7: .....Partial Level 3 Plan (South)
E2.8: ..... Partial Level 3 Plan (Centre)
E2.9 .....Partial Level 3 Plan (East and Penthouse)

E 3.1 – E 3.16 – 101 Chapple Avenue Fire Alarm Panel & Lighting Upgrades Electrical Removals & New Electrical Layouts.

E3.1: .....Partial Level 1 Plan (West) Removals
E3.2: .....Partial Level 1 Plan (East) Removals
E3.3 .....Partial Level 2 Plan (West) Removals
E3.4: .....Partial Level 2 Plan (East) Removals
E3.5: ..... Partial Level 2 Plan (Centre) Removals
E3.6: .....Partial Level 1 Plan (East) New Electrical Layouts
E3.7: .....Partial Level 2 Plan (West) New Electrical Layouts
E3.8: .....Partial Level 2 Plan (East) New Electrical Layouts
E3.9 ..... Partial Level 1 Plan (West) Removals - Lighting
E3.10: ..... Partial Level 1 Plan (East) – Removals - Lighting
E3.11: ..... Partial Level 2 Plan (West) – Removals Lighting
E3.12 ..... Partial Level 2 Plan (East) – Removals – Lighting
E3.13: .....Partial Level 1 Plan (West) – New Electrical Layouts - Lighting
E3.14: ..... Partial Level 1 Plan (East) – New Electrical Layouts - Lighting
E3.15: .....Partial Level 2 Plan (West) – New Electrical Layouts - Lighting
E3.16: ..... Partial Level 2 Plan (East) – New Electrical Layouts - Lighting

END OF SECTION

APPENDIX "A"

ITEMIZED PRICES ~ COST BREAKDOWN	
53 CHAPPLE AVENUE – FIRE ALARM SYSTEM UPGRADES	**$**
55 CHAPPLE AVENUE – FIRE ALARM SYSTEM UPGRADES	**$**
101 CHAPPLE AVENUE – FIRE ALARM SYSTEM UPGRADES	**$**
101 CHAPPLE AVENUE – NEW LIGHTING SYSTEM and NEW CEILING GRID UPGRADES	**$**

APPENDIX "B"

Proponents who have not undertaken work of this nature with this office in the past two years are required to complete Appendix "B" giving a brief description of their company and a list of recently completed projects of this nature complete with references from Owners or Consultants involved in the installations.

Tender Award will be made on the basis of verified acceptable references, completed projects, and tender price, not withstanding the owner's right to reject any or all of the submitted tender.

COMPANY NAME: _____

BRIEF DESCRIPTION:

PROJECT: **(Include Location & Date Completed**	**REFERENCES:** **OWNER OR CONSULTANT** **(Include Name & Address)**

1 GENERAL

1.1 SCOPE OF WORK

1.1.1 This Contractor shall provide all labour, materials and equipment to complete all of the Electrical work as shown on the Drawings, and/or as specified herein and includes, but is not necessarily limited to, the work indicated in the following paragraphs:

1.1.1.1 Remove/revise, replace, and upgrade the existing old conventional fire alarm systems at all three Apartment Buildings; to a new addressable type fire alarm system & related components, including upgrade to new combination horn/strobes, revising & adding new wiring and devices, and the addition of new Apt Suite fire alarm provisions, in order to upgrade the existing fire alarm system to meet current Code standards.

1.1.1.2 This Contractor shall interconnect existing 'Fire Alarm fan shut-down relays' for all the interior MUA units, and all the existing exterior MUA or rooftop units; to the building's newly upgraded Fire Alarm System Panel. Review/verify extents on site.

1.1.1.3 This Contractor shall replace & upgrade all existing HVAC duct type smoke detectors on the existing interior MUA units, and all existing exterior MUA or rooftop units; and upgrade these devices to new addressable type and interconnect to the building's newly upgraded Fire Alarm System Panel. Review/verify extents on site.

1.1.1.4 Reconnect all existing fire alarm door hold open devices and other miscellaneous auxiliary devices, to the new addressable fire alarm system panel. Ensure to provide sufficient power supply for the new fire alarm panel, to suit the building's quantity of auxiliary devices, and ensure that the power supply is equal to or better than existing older fire alarm system. Review & verify extents on site.

1.1.1.5 Where applicable, Contractor to remove all redundant fire alarm devices and End-of-line resistors, and provide a new blank coverplate over top of the outlet box. Colour of coverplate to match colour of adjacent finishes.

1.1.1.6 This contractor shall provide new ½" dia EMT fire alarm conduit into Apt Suites, surface mounted, concealed from view as much as possible, and painted to match colour of adjacent finishes. Firestop at all Corridor wall penetrations.

1.1.1.7 Contractor to reuse existing building remote fire alarm monitoring provisions, where possible. Confirm and/or upgrade as necessary, such that each building's remote monitoring system, has a Phone line and cellular backup. As required, switch out GSM board, replace older equipment with new, revise monitoring company, and generally upgrade existing remote monitoring provisions to meet current Code, CAN/ULC-S561, and newly revised SSM Housing standards. Review & verify extents on site.

1.1.1.8 Where indicated, supply & install new addressable type carbon monoxide detector c/w sounder base, and interconnect to new addressable fire alarm system panel.

1.1.1.9 This Div.26 Contractor shall carry all costs associated with the removal / disposal of existing T-bar ceiling grid & tiles for the Level One Corridor areas on 101 Chapple Ave.

Apt Building, and for the installation of new 2'x2' T-bar ceiling grid & new ceiling tiles.

1.1.1.9.1 New T-bar grid ceiling shall be fire-rated type, 24" x 24" mineral fibre acoustic tiles, non-directional fissured pattern, square edge, white colour.

1.1.1.9.2 Acceptable Product: Certain Teed Corp ~ Performa Baroque #PBT-157; or equivalent.

1.1.1.10 The following is a brief summary required at each individual Apartment Building:

1.1.1.10.1 <u>53 Chapple Ave Apt Building</u>:
- Replace and upgrade fire alarm panel system and all related fire alarm devices & components.
- Replace/revise and add new fire alarm wiring circuits (Class 'A' or 'B'). Provide one circuit per floor.
- Remove old Apt Suite mini-horn c/w touch silence, install blank matching coverplate.
- Supply & install new Apt Suite combination (addressable) wall mounted horn/strobe, c/w multi-adjustable output provisions for both the horn sound levels dBA, as well as multi-adjustment candella levels for the strobe.
- remove and replace existing T-bar grid ceiling tiles as required to conduct fire alarm upgrades and wiring.
- install new air transfer door grille c/w fire damper, on bottom half of the existing Boiler Room door, as indicated on plans.

1.1.1.10.2 <u>55 Chapple Ave Apt Building</u>:
- Replace and upgrade fire alarm panel system and all related fire alarm devices & components.
- Replace/revise and add new fire alarm wiring circuits (Class 'A' or 'B'). Provide one circuit per building Wing, and one circuit per floor.
- Remove old Apt Suite mini-horn c/w touch silence, install blank matching coverplate.
- Supply & install new Apt Suite combination (addressable) wall mounted horn/strobe, c/w multi-adjustable output provisions for both the horn sound levels dBA, as well as multi-adjustment candella levels for the strobe.
- remove and replace existing T-bar grid ceiling tiles as required to conduct fire alarm upgrades.

1.1.1.10.3 <u>101 Chapple Ave Apt Building</u>:
- Remove existing (interior) public area lighting, such as Corridors, Storage Rooms, Common Room, Janitor Room, etc.; and upgrade to new LED lighting c/w new lighting controls. Revise & modify existing wiring as required, and reuse existing lighting circuits.
- Remove existing T-bar ceiling grid systems on the Level 1 main corridor areas, and supply & install new replacement fire-rated 2'x2' T-bar ceiling grid system. New grids to be installed at similar mounting heights (or slightly lower +- 1 inch further down), to suit new recessed LED troffer installations, and enable easier removal of tiles in future.
- supply & install protective 3M fire-blanket on top side of all new recessed LED troffers and pot lights in the Level One corridor areas, to maintain integrity of fire separation of this ceiling assembly.
- touchup / make good, and paint the Level 2 corridor ceilings at old light fixture & misc. device locations that may not be covered up by new replacement light fixtures or devices.

- Replace and upgrade fire alarm panel system and all related fire alarm devices & components.
- Replace/revise and add new fire alarm wiring circuits (Class 'A' or 'B'). Provide one circuit per building Wing, and one circuit per floor.
- Supply & install new addressable heat detector within each Apt Suite, c/w new wiring within painted EMT conduit/outlet box provisions.
- Remove old Apt Suite mini-horn c/w touch silence, and install blank matching coverplate.
- Supply & install new Apt Suite combination (addressable) wall mounted horn/strobe, c/w multi-adjustable output provisions for both the horn sound levels dBA, as well as multi-adjustment candella levels for the strobe.
- remove and replace existing T-bar grid ceiling tiles as required to conduct fire alarm upgrades.

1.1.2 Use proper fire rated wiring and approved fire stopping systems, as applicable. All electrical wiring and materials in ceiling spaces must be 'FT6' return air plenum rated.

1.1.3 Provide power and connection to all required equipment supplied by other Sections. Coordinate final power requirements with final shop drawings.

1.1.4 Coordinate with other trades for related work and for location and type of equipment supplied, as well as verify with the Mechanical Drawings and other Specification Sections.

1.1.5 Use Flexible type cabling to all vibrating, motor driven equipment.

1.1.6 All cutting and patching of all openings up to and including 150mm (6") shall be by respective Section. Coordinate with General Contractor for all other larger required openings. Sealing of walls, floors, ceilings shall be pre-formed with respective materials and approved Systems suitable for the penetration. Penetration through fire rated walls, shall be sealed with ULC Listed Materials and Systems for the application, all as per General Contractor, Consultant, O.B.C., and local Inspection Department approval.

1.1.6.1 Acceptable Product: 3M Firemaster (Thermal Ceramics) Listed Products and Systems suitable for the application; Hilti Firestopping; or equivalent.

1.1.6.2 Each Section shall submit **Shop Drawings of products and methods of all 'Firestopping Products'** to be used, and respective approved "Firestop System(s)", which will be used per application.

1.2 EXAMINATION

1.2.1 Tenderers are advised to carefully examine all Drawings and Specifications and be satisfied that work can be satisfactorily carried out without changes to building, as required and as shown on these Drawings.

1.2.2 Report at once any defect or interference affecting work of these Sections, and do not proceed until satisfactory conditions are corrected.

1.3 CODES

1.3.1 Refer to Division 1 and Ontario Electrical Safety Code based upon CSA C22.1-02 or latest Edition.

1.3.2 Work in accordance with these drawings and specifications, meet the latest requirements of Canadian Electrical Code, Fire Code, and the latest ULC standards, and applicable Municipal & O.B.C. regulations.

1.3.3 Conform to CAN/ULC-S561 ~ Installation and Services for Fire Signal Receiving Centres and Systems.

1.3.4 The code, regulations, statute, by-law or this specification, having most stringent requirement, shall apply.

1.3.5 Note that requirements of latest edition of the Ontario Building Code are to be adhered to, which includes requirements of American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2010 - Energy Standard For Buildings Except Low-Rise Residential Buildings.

1.4 MECHANICAL LOCATION

1.4.1 Allowances must be carried by each Contractor for Alterations necessary in the arrangements of apparatus, electrical, conduits, ducting, piping, and equipment that must be incorporated, due to Site conditions, which may differ from **proposed Schematic Drawing Layouts**.

1.4.2 Any Alterations necessary in the above arrangements, that have been installed prior to proper study of existing conditions and approval, and/or coordination with other subtrades, must be performed to accommodate or overcome conditions encountered, and shall be done without additional cost to Owner.

1.4.3 Where dimensions locate services and/or equipment, no other location may be selected and used without Consultant's approval.

1.5 STANDARDS OF MATERIALS

1.5.1 The materials and equipment used in construction of this building shall meet requirements of Ontario Building Code and ASHRAE Standard 90.1-2010.

1.5.2 New materials and equipment are specifically described and named in this specification for purpose of establishing a standard of materials and workmanship.

1.5.3 New materials required for performance of work shall be best of their respective kinds and of a uniform pattern throughout the work.

1.5.4 Where a manufacturer's name is used and is noted as **`Shall be'**, Tender Price shall be based on use of materials or equipment for name mentioned. Alternates to listed equipment shall be

included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.5.5 All equipment listed as **`Acceptable Product'**, means that the item named and specified by catalogue number meets Specification in all respects regarding performance, quality of material and workmanship, similar to existing campus equipment, and is acceptable to Consultant.

1.5.5.1 All proposed alternate equipment that is to be considered as an Equivalent product, must meet all the same standards as the listed 'acceptable product', and it is the responsibility of the contractor/supplier to verify and prove to Consultant that any proposed alternate equipment is equal, for it to be considered. This must occur before the deadline for submission.

1.5.5.2 No alternate products will be reviewed/assessed by Consultants for equivalency **within 5 working days** of Tender Close. Unless accepted as an Equivalent, all Alternates to listed equipment shall be included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.5.5.3 Tender Price shall be based upon Acceptable base products, or accepted Equivalent products, only.

1.6 SHOP DRAWINGS

1.6.1 It is this Consultant's preference to receive and review Shop Drawings **electronically** via email; which will help expedite the process.

1.6.2 Otherwise contractor shall submit to Consultant, six (6 only) hard copies of submittals listed with reasonable promptness and in an orderly sequence so as to not cause delay in the Work.

1.6.3 Submit shop drawings in accordance with General Requirements. Show on shop drawings, details of construction, dimensions, capacity, weight and electrical performance characteristics of equipment or material. Where applicable, include wiring, single line, and schematic diagrams.

1.6.4 Each Section shall submit **Shop Drawings of products and methods of all 'Firestopping Products'** to be used, and respective approved "Firestop System(s)", which will be use per application.

1.7 OPERATION AND MAINTENANCE DATA

1.7.1 Submit operation and maintenance data in accordance with Division 1.

1.7.2 Include in the manuals, information based on the following requirements:

1.7.3 Operation and maintenance instructions to be sufficiently detailed with respect to design elements, construction features, component function and maintenance requirements to permit effective start-up, operation, maintenance modification and expansion of any portion or feature of installation.

1.8 **DEFINITIONS**

1.8.1 The following are definitions of terms and expressions used in the specification:

1.8.1.1 "Inspection Authority" means Electrical Safety Authority (ESA).

1.8.1.2 "Electrical Code" means Canadian Electrical Code CSA C22.1-02 or code in force at project location.

1.8.1.3 "Indicated" means as shown on contract drawings or as noted in contract documents.

1.9 **E.S.A. PERMIT AND INSPECTION**

1.9.1 Contractor required to obtain and carry all costs associated with necessary electrical permits and inspections for all electrical work associated with this project.

1.9.2 Obtain a Final Certificate of Acceptance from Electrical Safety Authority (ESA) on completion of work and submit copy to Consultant, as well as include a copy in each of the Project Data Booklets. Consultant will carry out inspections and prepare deficiency list for action by Contractor, during and upon completion of project.

2 **PRODUCTS**

2.1 **GENERAL**

2.1.1 Equipment and material to be new CSA certified or special Hydro approval, manufactured to minimum standards quoted, but incorporating additional specified requirement.

2.1.2 Manufacturer's nameplates and CSA labels to be visible and legible after equipment is installed.

2.1.3 Control panels and component assemblies to be shop manufactured.

2.1.4 Use regular material and equipment available from regular production of manufacturer.

2.1.5 This contractor shall coordinate KAIC rating requirements with other subtrades to ensure all Mechanical equipment provided, match building electrical service KAIC requirements.

2.2 **STANDARDS**

2.2.1.1 The specified product and/or system shall be designed, manufactured, tested and installed in compliance with the following codes and standards:

2.2.1.1.1 Institute of Electrical and Electronic Engineers (ANSI/IEEE C62.11, C62.41, C62.45).

2.2.1.1.2 American National Standards Institute.

2.2.1.1.3 Federal Information Processing Standards Publication 94 (FIPS PUB 94).

2.2.1.1.4 National Electrical Manufacturer Association (NEMA LS-1 1992 Peak Current Testing).

2.2.1.1.5 National Fire Protection Association (NFPA 70, 75 and 780).

2.2.1.1.6 MIL Standard 220A Method of Insertion Loss Measurement.

2.2.1.1.7 Canadian Electrical Code ~ CSA C22.1-02 .

2.2.1.1.8 Underwriters Laboratories UL 1283 and UL 1449 (3rd edition).

2.2.1.1.9 Canadian Standards (cETL).

2.3 CONDUIT AND BOXES

2.3.1 Conduit Fastenings

2.3.1.1 Provide one hole steel straps to secure surface conduits 2"(50 mm) and smaller. Use two hole steel straps for conduits larger than 2"(50 mm).

2.3.2 Conduit Fittings - General

2.3.2.1 Provide fittings manufactured for use with conduit specified.

2.3.2.2 Provide factory "bends" where 90^{o} bends are required for 2"(50 mm) and larger conduits.

2.3.2.3 Provide watertight type connectors and coupling for PVC or EMT, as required.

2.3.3 Outlet and Conduit Boxes - General

2.3.3.1 4"(100 mm) square or larger outlet boxes as required for special devices.

2.3.3.2 Gang boxes where wiring devices are grouped.

2.3.3.3 Blank coverplates for boxes without wiring devices.

2.3.4 Sheet Steel Outlet Boxes

2.3.4.1 Galvanized steel single and multi-gang flush device boxes for flush installation, minimum size 3"x 2"x 1-1/2"(75 mm x 50 mm x 38 mm, unless otherwise indicated. Use shallow type boxes for exterior walls. 4"(100 mm) square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.

2.3.4.2 Galvanized steel utility boxes for outlets connected to surface mounted EMT conduit, minimum size 4"x 2"x 1-1/2"(100 mm x 50 mm x 38 mm).

2.3.4.3 4"(100 mm) octagonal outlet boxes for lighting fixtures.

2.3.5 Exterior Wall and Cold Ceiling Outlets

2.3.5.1 Outlet boxes shall be equipped with vapour proof plastic boxes to fit over.

2.3.5.2 Plastic boxes shall be used on the interior of exterior walls to prevent infiltration of cold air and condensation.

2.4 FIRE ALARM

2.4.1.1 Refer to Drawings and Specification Section 28 31 00, for further details and requirements.

2.4.1.2 Contractor is required to review and verify extents of existing fire alarm systems and existing devices on site. Drawings have been provided to show general design intent. Note that existing fire alarm devices/equipment have been shown based upon original drawings, and have not been necessarily field verified.

2.4.1.3 It is the responsibility of the Fire Alarm System manufacturer and Installer, to ensure that the new fire alarm system and its associated new components provided are in sufficient quantity for coverage, verify & adjust device spacing as required, and new devices are adjusted (i.e. dBA, candella, etc.), to meet the latest Code requirements, and to the satisfaction of the local City Building Dept Inspector.

2.4.1.4 All Fire alarm system work and devices modified and/or added under this project, shall be verified as per the latest issue of **CAN-ULCS537 Verification of Fire Alarm Systems** standard.

2.4.1.4.1 Submit F/A Verification Report to Consultant and insert copy in each Project Data Booklet.

2.5 COVERPLATES

2.5.1 Unless otherwise indicated, provide coverplates for all new / modified wiring devices to match existing adjacent coverplates; both in material, type and colour.

2.5.2 If no existing coverplates within the general vicinity, provide matching coverplate or paint coverplate to match adjacent finishes. (Typical)

2.5.3 Provide blank coverplates at any removed wiring devices, unless indicated to be completely removed and wall infilled.

2.5.4 Coverplates shall be from one manufacturer throughout project.

2.5.5 Sheet steel utility box cover for wiring devices, installed on surface mounted utility boxes.

2.5.6 Acceptable Product: Leviton, Hubbell, Pass&Seymour, or equivalent.

3 EXECUTION

3.1 INSTALLATION

3.1.1 All fire alarm devices and equipment that may be subject to public vandalism or abuse, shall be secured and protected within new and/or reused (where applicable) key-locked enclosures.

3.1.2 Provide mounting and supports required for safe installation to Consultant's satisfaction, as per manufacturer's recommendations, and all to meet latest requirements of E.S.A. and Code.

3.1.3 Shop finish metal enclosure surfaces by removal of rust and scale, cleaning, application of rust resistant primer inside and outside, and at least two coats of finish enamel.

3.1.4 Clean and touch-up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

3.2 LABELLING AND IDENTIFICATION

3.2.1 All new and/or reused (if applicable) fire alarm related junction boxes and enclosures shall be identified / labelled, as such.

3.2.2 Whenever possible or applicable, provide red-coloured junction boxes and enclosures for fire alarm devices or equipment.

3.2.3 Identify names of all Electrical Equipment and HVAC Unit Disconnect Switches, using phenolic plastic laminate, machine engraved black plates, white letters; adhered & fastened. Wording on nameplates to be approved by Consultant, prior to manufacture.

3.2.4 As applicable, provide clear P-Touch labelling c/w black type-written lettering on ALL equipment disconnect switches and ALL new, relocated, or reused receptacle coverplates, clearly indicating respective electrical panel and circuit feed.

3.2.5 After all removals, modifications, and additions, this Contractor shall allow to provide all new type-written electrical panel legends for all existing electrical panels that have been affected by these renovations.

3.3 WIRING IDENTIFICATION

3.3.1 Provide permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders. Colour code wiring to Canadian Electrical Code, Section 4. Maintain identification system at all junction boxes, splitters, cabinets and outlet boxes.

3.4 ACCESS DOORS

3.4.1 This Contractor shall supply & install access doors, fire rated or not, for furred ceilings or spaces

for servicing the equipment and accessories or for inspection of safety, operating or fire devices for installation under the Division erecting the walls or ceilings.

3.4.2 Access doors shall be flush mounted 600 mm x 600 mm for body entry and 300 mm x 300 mm for hand entry unless otherwise noted. Doors shall open 180°, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps. Steel shall be prime coated. Doors shall be of approved manufacturer with published literature, and for fire rated ceilings, access doors shall be the fire rated type.

3.4.3 Provide fire rated access doors at locations where required to maintain the fire rating of the walls, floors and ceilings.

3.4.4 Acceptable Product: Zurn, Enpoco, Anco-Lehage.

3.5 LOCATION OF OUTLETS AND EQUIPMENT

3.5.1 Location of outlets, junction boxes or disconnects of equipment indicated may be changed by Consultant at no extra cost or credit, providing distance does not exceed 10 feet, information is given before installation, Consultant considers it to be reasonable, and construction is similar.

3.6 PROTECTION & LABELLING

3.6.1 Protect exposed live equipment such as panel mains and outlet wiring during construction for personnel safety. Shield and mark all live parts "LIVE-120 VOLTS', or with appropriate voltage.

3.6.2 Provide permanent Shock and Arc Flash protection warning label provisions and required PPE, on all applicable equipment, to comply to the Ontario Electrical Code Rule 2-306.

3.7 CONDUIT, SLEEVES AND HOLES

3.7.1 Install conduit, and sleeves prior to pouring of concrete.

3.7.2 Holes through exterior walls to be flashed and made weatherproof.

3.7.3 Install cables, conduits and fittings neatly and close to building structure so that necessary furring can be kept to minimum.

3.8 INSULATION RESISTANCE TESTING

3.8.1 When applicable, megger all main circuits, feeders and large electrical equipment up to 600V, with a 1000V instrument. Ensure that resistance to ground is not less than that required by Code before energizing. Verify extents with Consultant.

3.8.2 Submit report of Testing procedures.

3.9 CLEANING & PROTECTION

3.9.1 Contractor will also be required to store their materials neatly and out of the way, at all times.

3.9.2 Contractor shall allow after each shift, to thoroughly clean up work areas free of all tools, materials, and refuse caused by their respective work.

3.9.3 Contractor shall allow to use throw tarps and poly to temporarily cover and protect floors, furniture, and finishes; while work is being conducted in that location. Remove protective tarps and clean up area, prior to moving on to another location, and after each shift.

3.9.4 Contractor to provide 'ram board' to protect the Level One flooring at 101 Chapple Ave Apt Building, during the fire alarm, lighting, and new Corridor T-bar ceiling installations.

3.9.5 Refer to General Requirements. Clean construction materials from all exposed wiring devices, coverplates, outlets, cabinets, enclosures, tubs, panelboards, etc.

3.9.6 At time of final cleaning, clean all fire alarm devices, lighting bulbs, reflectors, lenses (inside & outside), and other lighting surfaces that have been exposed to construction dust and dirt.

3.10 FIELD CONDITIONS

3.10.1 Exact dimensions and locations of equipment shall be checked and verified in the field. Without additional charge or expense to the owner, make necessary changes to accommodate structural conditions.

3.10.2 Notify the Consultant immediately and secure their authority in writing for such revisions before proceeding. Changes and alterations required by an inspector of authority shall be carried out without additional cost to the Owner.

3.11 WORKMANSHIP

3.11.1 First class workmanship only will be accepted, and will be deemed to include safety, efficiency, durability and neatness of detail.

3.11.2 When electrical work is being carried out, this must be done under the direction of at least one licensed journeymen electrician who shall at all times be on the job site.

3.12 COOPERATION WITH OTHERS & TENANTS

3.12.1 This Contractor will be expected and required to confer and cooperate with the other tradesmen and contractors in order to eliminate any unnecessary delays to any work being done in the building.

3.12.2 This Contractor will be required to be considerate and cooperate with the Apt Building tenants and SSM Housing property managers.

3.12.3 Contractor to make allowances to request access into individual Apt Suites, with advance notice and scheduling with SSM Housing; and they shall meet scheduled targets and appointments to enter Apt Suites. Note that Apt. Suite access for renovations, requires a minimum 48 hours notice from Contractor via through SSM Housing.

3.12.4 Each subtrade shall allow after each shift, to thoroughly clean up work areas free of all tools, materials, and refuse caused by their respective work.

4 WARRANTY

4.1.1 The Warranty period shall commence on established day of Substantial Completion of the overall project.

4.1.2 All equipment and materials provided under this Section shall be complete with a minimum 2 full year parts & labour warranty (including all travel costs) during the Warranty period; unless otherwise indicated.

4.1.3 All LED light fixtures shall be complete with a 10 year extended warranty.

END OF SECTION

1 GENERAL

1.1 RELATED WORK DESCRIBED ELSEWHERE

1.1.1 Electrical General Requirements — Section 26 05 01

1.2 SCOPE OF WORK

1.2.1 This Contractor shall provide all labour, materials and equipment for complete and functional addressable type Fire Alarm System; all as indicated on drawings, and/or as specified herein.

1.2.2 Replace/rework and upgrade the existing old conventional fire alarm panels, complete with associated existing remote fire alarm annunciator panel, and existing F/A devices & wiring; with new addressable type devices and wiring to meet latest Code requirements. Review/verify extents on site.

1.2.3 This Section shall supply & install all EMT conduit, outlet boxes, & junction box systems required for this new fire alarm system, and especially where installation is to be exposed. Fire alarm system Manufacturer/Supplier will be required to provide this Installer with final EMT conduit sizing and routing, to suit full fire alarm system, including manufacturer's recommended installation requirements. Reuse existing conduit/outlet box systems and/or fire alarm wiring, as applicable.

1.2.4 Alternatively, in lieu of EMT conduit, contractor may opt to use return air (FT6) plenum rated armoured (ULC fire approved type) red BX cabling, when above within concealed ceiling spaces.

1.2.5 All F/A system conduit and wiring shall be concealed from view and/or 'fished' down existing walls as much as possible. All outlet boxes are to be flush mounted. If not possible, all surface mounted conduit/outlet boxes shall be painted to match adjacent walls / finishes.

1.2.6 This contractor to provide all interconnections, new/revised wiring, and other related fire alarm system equipment as required to provide a complete & functional Fire Alarm System; including remote monitoring provisions to meet the latest requirements of CAN/ULC-S561.

1.2.7 Contractor may reuse existing fire alarm system remote monitoring provisions, and shall provide additional equipment (and/ or replace all equipment ~ if required); and ensure that each building has both a telephone line and cellular backup, and shall setup & commission remote monitoring ensuring that it is fully functional.

1.2.8 Provide and install a new addressable fire detection and alarm system consisting of the following main components:

1.2.8.1 Main Central Control Station (CCS) c/w LCD display, to replace the existing old conventional fire alarm panel.

1.2.8.2 Remote fire alarm system annunciator panel at Main Entrance.

1.2.8.3 Addressable manual pull stations, as shown on the drawings.

1.2.8.4 Addressable photoelectric smoke detection, as shown on drawings.

1.2.8.5 Addressable heat detection (Fixed and Rate of Rise), as shown on drawings. Provide standard and high temperature type detectors, as applicable.

1.2.8.6 Supply and carry all costs associated with replacing existing & installing new addressable Duct type smoke detection devices for all M.U.A. & HVAC units; and interface with new addressable fire alarm panel system.

1.2.8.7 Provide addressable Carbon Monoxide detection devices interconnected to new addressable fire alarm panel, in all rooms that have natural gas fired equipment, such as: Boiler Room, DHW Tank Rooms, etc.

1.2.8.8 Interconnect existing Sprinkler System Monitoring (i.e. sprinkler system waterflow(s) and valve supervisory switches, etc); and interface with new addressable fire alarm panel system. Review and verify extents of existing on site.

1.2.8.9 Provide combination horn / strobe devices located throughout the building, as proposed on the drawings, and/or as required to suit Code. Final quantities and locations to be confirmed by Fire Alarm manufacturer (based upon performance characteristics of their own devices). Contractor to adjust dBA and candella levels to suit site conditions, and meet Code and the local authority having jurisdiction.

1.2.8.10 Contractor to program new fire alarm panel software with regards to providing silencing provisions for the Apt. Suite horn/strobe units. (i.e. Use ‘software’, versus old conventional method of using touch-silence buttons).

1.2.8.11 Interconnect existing fire alarm ‘fan shutdown’ controls for existing M.U.A. and HVAC equipment that are capable of introducing fresh air into building, and interface with new addressable fire alarm panel system. Review and verify extents of existing on site.

1.2.8.12 As applicable, this contractor shall provide all interconnections, relays, wiring, and other related equipment, as indicated on drawings and/or to suit existing Apt Building setup; including but not limited to the following:
- Elevator controller (floor recall),
- Building’s Carrier B.M.S. Control System (alarm status);
- Security D.A.C.S. panel (release doors upon fire alarm),

1.2.8.13 The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling (fire alarm) system. The authorized representative of the manufacturer of the major equipment (i.e. Fire Alarm Control panels), shall be responsible for the satisfactory installation of the complete system.

1.2.8.14 Contractor shall provide, from the acceptable manufacturer's current product lines, equipment and components, which comply, with the requirements of these specifications.

1.3 SHOP DRAWINGS

1.3.1 Submit shop drawings in accordance with General Specification requirements.

1.3.2 Electronic shop drawing submission is preferred.

1.4 STANDARDS OF MATERIALS

1.4.1 The materials and equipment used in construction of this building shall meet and/or exceed the requirements of the National & Ontario Building Codes, U.L.C., C.S.A., and the ASHRAE Standard 90.1-2010 for Energy Efficient Design of New Buildings.

1.4.2 New materials and equipment are specifically described and named in this specification for purpose of establishing a standard of materials and workmanship.

1.4.3 New materials required for performance of work shall be best of their respective kinds and of a uniform pattern throughout the work.

1.4.4 Where a manufacturer's name is used and is noted as **`shall be',** Tender Price shall be based on use of materials or equipment for name mentioned. Alternates to listed equipment will **NOT** be accepted.

1.4.5 **Acceptable Products** means that an item named and specified by catalogue number **meets Specification in all aspects** regarding performance, quality of material and workmanship, and is acceptable to Consultant. Alternate products are acceptable, as long as they are equivalent and meet the same standards, performance, and quality of the listed product. It will be the Contractor/supplier's responsibility to provide sufficient information to support that their alternate is equivalent, all to the Owner/consultant's satisfaction.

2 CODES & STANDARDS

2.1 All equipment, material, and installations shall conform to the latest version of the following applicable Codes, Standards (including technical service bulletins and addenda), and Regulations of Authorities having jurisdiction:

2.2 The equipment and installation shall comply with the current provisions of the following codes and standards:

2.2.1 Underwriters Laboratories Inc. Standards.
ULC shall list the system and all components for use in fire protective signaling systems. The ULC Label shall be considered as evidence of compliance with this requirement. The equipment shall be listed by ULC under the following standards as applicable:

ULC-S527 Control Units for Fire Alarm Systems.

ULC S301	Central and Monitoring Station Burglary Alarm Systems.
ULC S302	Burglary Alarm Systems for Financial and Commercial Premises.
ULC S303	Local Burglary Alarm.
ULC S304	Central and Monitoring Station Burglary Alarm Units.
ULC S306	Intrusion Detection Units.
ULC/ORD 1076	Proprietary Burglary Alarm.
ULC/ORD 693	Central Station Fire Protective Signalling.
UL 294	Access Control System Units.
ULC-S529	Smoke Detectors for Fire Alarm Systems.
ULC-S530	Heat Detectors for Fire Alarm Systems.
ULC-S525	Audible Signal Appliances for Fire Alarm Systems.
ULC-S526	Visual Signal Appliances for Fire Alarm Systems.
ULC-S528	Manual Pull Stations for Fire Alarm Systems.
ULC-S548	Alarm Initiating and Supervisory Devices for Water Type Extinguishing Systems.
ULC-S533	Egress Door Securing and Releasing Devices.
ULC-S536	Inspection and Testing of Fire Alarm Systems.
ULC-S524	Installation of Fire Alarm Systems.
ULC-S537	Verification of Fire Alarm Systems.
ULC-S561	Installation & Services for Fire Signal Receiving Centres and Systems.

NOTE: Any equipment not bearing a ULC Label shall be removed and replaced with compatible ULC labeled equipment at the contractor's expense.

2.3 Adhere to latest requirements of the Ontario Hydro Electrical Safety Code, the Ontario Building Code, and Local Building Codes.

2.4 International Standards Organization. The system and all components will be manufactured to ISO 9001 international Quality Management and Quality Assurance Standards.

2.5 In the case of any discrepancy between these specifications, the project drawings, and any applicable local codes, the installed Fire Alarm / Life Safety System shall comply with the most stringent requirement.

3 PRODUCTS:

3.1 SYSTEM CONFIGURATION - GENERAL

3.1.1 All Life Safety System equipment shall be arranged and programmed to provide the early detection of fire, the notification of building occupants, the automatic summoning of the local fire department, the override of the HVAC system operation, and the activation of other auxiliary systems to inhibit the spread of smoke and fire, over-ride Audio systems (whenever applicable), and to facilitate the safe evacuation of building occupants. In all operating modes, the processing of fire alarms shall have the highest priority.

3.1.2 The system supplied under this specification shall utilize node to node, direct wired, multi-priority peer-to-peer network operations. The system shall utilize electronically addressed, smoke

detectors, heat detectors and input/output modules as described in this specification.

3.1.3 Devices shall be listed for both fire and security applications. System performance shall not be degraded when fire and security devices are installed in the same system.

3.1.4 When integrated system capabilities are utilized, all operations shall be based on application programming in order to provide the greatest flexibility in integrating fire, intrusion, access control and video functions, and assure compliance with all required codes and standards.

3.2 POWER SUPPLY

3.2.1 Standby power supply shall be an electrical battery with capacity to operate the system under maximum supervisory load for 24 hours and capable of operating the system for fifteen (15) minutes of evacuation alarm on all devices, operating at maximum load.

3.2.2 The capacity of the power supply shall be equal to or greater than the existing power supply currently serving each Apt. Building.

3.2.3 The system shall include a charging circuit to automatically maintain the electrical charge of the battery. The system shall automatically adjust the charging of the battery to compensate for temperature.

3.2.4 System power supply(s) shall provide multiple power limited 24 VDC output circuits as required by the panel.

3.2.4.1 Upon failure of normal (AC) power, the affected portion(s) of the system shall automatically switch over to secondary power without losing any system functions.

3.2.4.2 Each system power supply shall be individually supervised. Power supply trouble signals shall identify the specific supply and the nature of the trouble condition.

3.2.4.3 All standby batteries shall be continuously monitored by the power supply. Low battery and disconnection of battery power supply conditions shall immediately annunciated as battery trouble and identify the specific power supply affected.

3.2.4.4 All system power supplies shall be capable of recharging their associated batteries, from a fully discharged condition to a capacity sufficient to allow the system to perform consistent with the requirements of this section as per ULC.

3.3 DISPLAY

3.3.1.1 The main display interface shall show the first and most recent highest priority system events without any operator intervention. All system events shall be directed to one of four message queues. Messages of different types shall never intermixed to eliminate operator confusion.

3.3.1.2 A "Details" switch shall provide additional information about any device highlighted by the operator.

3.4 INITIATING DEVICE CIRCUITS

3.4.1 Initiating device circuits monitoring manual fire alarm stations, smoke and heat detectors, waterflow switches, valve supervisory switches, fire pump functions, and air pressure supervisory switches shall be Class A (Style "D" or "E"), and/or Class B (Style "A" or "B"); as applicable. Initiating device circuits monitoring magnetic security contacts, motion detectors, duress station, glass break and intrusion type devices, shall be Class B (Style "A" or "B").

3.4.2 Notification Appliance Circuits

3.4.2.1 All notification appliance circuits shall be Class A (Style "Z"), and/or Class B (Style "Y"); as applicable. All notification appliance circuits shall have a minimum circuit output rating of: 2 amps @ 24 vdc; 50 watts @ 25V audio, and 35 watts @ 70V audio. The notification circuits shall be power limited. Non-power limited circuits are not acceptable.

3.4.3 Data Communications Link (DCL)

3.4.3.1 When a data communications link (DCL) covers more than one fire/smoke compartment, a wire-to-wire short shall not effect the operation of the circuit from the other fire/smoke compartments. The DCL connecting network panel/nodes, annunciators, command centers, shall be Class A (style 7) and/or Class B (style 4); as applicable. The media shall be copper except where fiber optic cable is specified on the drawings.

3.4.3.2 When a network is wired in a Class B configuration, a single break or short on the network wiring isolates the system into two groups of panels. Each group continues to function as a peer-to-peer network working with their combined databases. When wired using a Class A configuration, a single break or short on the network wiring causes the system to isolate the fault, and network communication continues uninterrupted, without any loss of function. Should multiple wiring faults occur, the network re-configures into many sub-networks and continues to respond to alarm events from every panel that can transmit and receive network messages.

3.4.3.3 The DCL connecting addressable/analog devices shall be capable of sharing the same pair of wires for: smoke and motion detectors, monitor modules, control modules, isolation modules, intrusion detection modules and notification circuit modules. The DCL shall be wired Class A (style 6 or 7) and/or Class B (style 4); as applicable.

3.4.3.4 The signaling line circuit connecting to the network audio communications shall be Class A (style 6) and/or Class B (style 4); as applicable. The circuit shall be power limited.

3.5 PANEL COMPONENTS & FUNCTIONS

3.5.1 The control panel(s) shall be a multi-processor based networked system designed specifically for fire.

3.5.2 The control panel shall be listed and approved as one system for the application standard(s) as listed under the General section.

3.5.3 The control panel shall include all required hardware, software and site specific system programming to provide a complete and operational system. The control panel(s) shall be designed such that interactions between any application can be configured, and modified using software provided by a single supplier. The control panel(s) operational priority shall assure that life safety takes precedence among the activities coordinated by the control panel.

3.5.4 Control panel shall include the following capacities:
1-loop, and expandable up to 4.
Each loop supporting up to 250 device addresses (125 detectors and 125 modules max.).
Maximum T-taps/loop: 124.
Support digital dialers/modems, and multiple communication ports/protocols.
Support multiple chronological events.

3.5.5 The control panel shall include the following features:

3.5.5.1 Ability to download all network applications and firmware from the configuration computer from the configuration computer from a single location on the system.
3.5.5.2 Provide electronic addressing of analog/addressable devices.
3.5.5.3 Provide an operator interface control/display that shall annunciate, command and control system functions.
3.5.5.4 Provide an internal audible signal with different programmable patters to distinguish between alarm, supervisory, trouble and monitor conditions.
3.5.5.5 Provide a discreet system control switch provided for reset, alarm silence, panel silence, drill switch, previous message switch, next message switch and details switch.
3.5.5.6 Provide system reports that provide detailed description of the status of system parameters for corrective action or for preventative maintenance programs. Reports shall be displayed by the operator interface or capable of being printed on a printer.
3.5.5.7 Provide an authorized operator with the ability to operate or modify system functions like system time, date, passwords, holiday dates, restart the system and clear control panel event history file.
3.5.5.8 Provide an authorized operator to perform test functions within the installed system.

3.5.6 The control panel shall contain a standby power supply that automatically supplies electrical energy to the system upon primary power supply failure. The system shall include a charging circuit to automatically maintain the electrical charge of the battery.

3.5.7 Acceptable Product: Edwards # IO1000G-CA series Main Control Panel, including an Edwards #RLCD-C c/w #RLED24 & #RA-ENC2 remote annunciator panel; or equivalent.

3.6 FIELD MOUNTED SYSTEM COMPONENTS

3.6.1 Smoke Detectors & Accessories:

3.6.1.1 Analytical Microprocessor Addressable Detectors - General:

3.6.1.1.1 Early warning analog addressable detectors shall use state-of-the-art multi-sensor technology. Each detector shall incorporate a microprocessor capable of making alarm decisions based on fire parameter algorithms stored in the detectors head. The microprocessor shall evaluate all sensing elements simultaneously and take into account real-time environmental conditions and the duration of an event, resulting in reliable and accurate decisions that distinguish real fire conditions from unwanted deceptive nuisance alarms. Digital filters shall eliminate signal patterns that are not typical of fires. Detectors that use the control panel processor to make alarm decisions are not acceptable.

3.6.1.1.2 Addressable detectors shall be capable of full digital communications using both broadcast and polling protocols. The maximum total analog loop response time for detectors shall be 750 ms.. The maximum alarm response time for the system to sound an alarm shall not be more than 3-seconds regardless of the detector location or the number of detectors on the addressable loop. The analog loop controller shall support up to 250 devices including 125 modules, 125 detectors and 125 isolator bases. The analog loop must not require shielded wire and shall be capable of a total distance of 4000 feet minimum using #18AWG twisted pair when 100 addressable detectors and 100 addressable modules are connected. The analog loop shall support up to 124 wiring T-taps.

3.6.1.1.3 The analog loop controller shall be able to “map” and supervise the location of each addressable device installed on the loop. Device supervision shall be provided for any device that is missing, added or changes to the device type, alarm settings, features, location or changes to the wiring layout or detector bases. It shall be possible to display or print the device “map” from a laptop. The “map” shall indicate all devices on the addressable loop complete with the customer defined device location name, device and base type, supervision information and wiring as-built layout including all T-taps. If two devices are inadvertently switched during routine maintenance, the loop controller shall be able to identify the change and if the device types are identical, it shall automatically download environmental information specific to that device location and all programming shall remain intact for the respective location of each device. No reprogramming or manual addressing shall be required. If the device types do not match, both devices shall still provide their inherent protection, programmed functions shall respond accordingly for that device location and a trouble shall be logged on the system. The “map” shall indicate which devices have been switch, what device type was expected and what device type is actually installed in that location.

3.6.1.1.4 Each detector shall have the ability to learn its environment and automatically adjust its reference value for changes in its environment. Detectors that require adjustments to their sensitivity settings months after they are installed are not acceptable. Environmental compensation shall allow each sensing element to adapt to short and long term changes caused by dirt, dust, humidity, temperature and ageing. The detector shall adjust and update its sensitivity (% obscuration) and ambient temperature baselines for each sensing element approximately six times per hour. The detector shall utilise a 4-hour rolling average of the environmental information and for verification purposes also maintain a 24-

hour average of the analog values, both of which may be taken into account in the alarm decision making process.

3.6.1.1.5 The detectors on-board micro-processor shall monitor the environmental effects on its baseline and generate a “maintenance alert” message at the control panel when the detectors environmental compensation is 80% used up indicating it should be cleaned. This event shall be programmable to initiate any type of system response such as send a pocket pager message to maintenance. When the environmental compensation head room is 100% used up, a trouble condition shall latch on the system to advise that the detector requires cleaning immediately. Up to this point the detectors sensitivity shall not have been compromised. Dirty detectors that continue to be ignored will eventually post an internal device fault and will not false alarm as a result of the accumulation of dirt. Dirty detectors that false alarm if not cleaned are not acceptable.

3.6.1.1.6 The detector shall be capable of identifying up to 32 self-diagnostic codes including verification that the detectors reference value is within its prescribed factory and ULC limits. Sensitivity reports shall include the percent obscuration that the detectors alarm level is set at and the percentage of compensation used as a result of environmental factors (dirt, dust, humidity, etc). This information shall be available for system maintenance and may be requested per device or generate reports based on only the detectors that require cleaning.

3.6.1.1.7 The early warning analog addressable detectors and the analog loop controller shall provide increased reliability and inherent survivability through intelligent analog conventional operation. Detectors shall automatically change to stand alone, conventional device operation in the event of a loop controller polling communications failure. In the analog conventional detector mode, each detector shall continue to operate using its programmed sensitivity and “learned” environmental information stored in the detector’s memory at the time of communication failure. The analog loop controller shall be capable of monitoring the loop and activating a loop alarm, without communicating to the devices, if any detector reaches its alarm sensitivity threshold.

3.6.1.1.8 Each device shall be capable of automatic electronic addressing and/or custom addressing without the use of DIP or rotary switches. Devices using DIP or rotary switches for addressing, either in the base or on the detector shall not be acceptable.

3.6.1.1.9 Each detector shall have a separate means of displaying communication and alarm status. A green LED shall flash to confirm normal status communication with the analog loop controller. A red LED shall flash to display alarm status. Both LED’s on steady shall indicate an alarm in the conventional stand-alone mode status. The LEDs shall be visible through a full 360 degree viewing angle.

3.6.1.1.10 It shall be possible to matrix program analog detectors. Responses shall be programmable based on activated detectors within the physical location to one another and/or the number of activated detectors in a programmable group or groups.

3.6.2 **Detectors – 4D Multi-Sensor Detectors (Ion, Photoelectric, Thermal & Time):**

3.6.2.1 Provide intelligent Signature Series 4D multi-sensor smoke detectors in order to provide the fastest detection to the broadest range of fire types without having to pre-determine the environment contents or possible types of smoke and fire. Detectors that must have their environment type predefined are not acceptable since environment contents are continually changing. The multi-sensor analog detector shall gather analog information from each of its three sensors: a light scattering type photoelectric sensor for visible smoke, a unipolar ionization sensor for invisible particles of combustion and an ambient temperature sensor for monitoring the amount of heat. The integral microprocessor shall employ time-based algorithms to dynamically examine values from the three sensors simultaneously and make an alarm decision based on that data. Separately mounted photoelectric detectors, ionization detectors and heat detectors in the same location are not acceptable alternatives. Detectors that do not operate in unison are not acceptable.

3.6.2.2 Each detector shall be capable of adapting to ambient environmental conditions. The temperature sensor shall self-adjust to the ambient temperature of its environment. In addition to contributing to the algorithm based alarm decision, the integral heat sensor shall cause an alarm when it senses a change in ambient temperature of 65ºF (35ºC) or reaches it fixed temperature alarm set point of 135ºF (57ºC) nominal. Only detectors with heat elements that operate independently and contribute to the smoke alarm algorithm decision are acceptable.

3.6.2.3 The detector shall have a ULC Smoke Sensitivity Range of 0.67-3.7% obscuration/ft (305mm). The alarm smoke obscuration per foot setting shall be field selectable to any one of five sensitivity settings ranging from 1.0% to 3.5%. The pre-alarm smoke obscuration per foot setting shall be field selectable in .05% increments for a total of 10 selections per sensitivity setting starting at 0.5% smoke obscuration per foot. Multi-sensor analog detectors shall be capable of an automatic day/night alternate sensitivity adjustment for both alarm and pre-alarm thresholds. Alarm and pre-alarm events shall have independent programmable responses. The pre-alarm message shall display in the monitor queue and the alarm message in the alarm queue.

3.6.2.4 The multi-sensor detectors shall be rated for ceiling or wall mount applications and for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide and low air velocities up to 500 ft/min. (2.54 m/sec) without requiring specific duct detector housings or supply tubes. The multi-sensor detector shall be rated for ceiling installation with maximum 30-foot (9.1m) centers. For clean room applications requiring very early warning pre-alarm sensitivities, recommended area coverage is 200 square feet.

3.6.2.5 The detector shall be protected by a ULC listed protective guard in areas where subjected to mechanical damage or abuse. The design must be 100% compatible with the detector and must not affect the detector sensitivity or reduce detector spacing. The guard shall be low profile and suitable for flush or surface mounted detectors.

3.6.2.6 The intelligent multi-sensor detector shall be suitable for operation in the following environment: Temperature: 32ºF to 100ºF (0ºC to 38ºC); Humidity: 0-93% RH, non-condensing; Elevation : Up to 6,000 ft (1828 m).

3.6.2.7 Acceptable Product: Edwards #SIGA-OSD c/w #SIGA-SB base; or equivalent.

3.6.3 **Detectors - Photoelectric Smoke Detector, (Duct Detector Use):**

3.6.3.1 Photoelectric detector shall utilize a light scattering type photoelectric smoke sensor to detect visible particulates produced by combustion. The integral microprocessor shall dynamically examine values from the sensor and initiate a system alarm based on the analysis of data.

3.6.3.2 The alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5% smoke obscuration per foot. The photo detector shall be suitable for operation in the following environment: Temperature: 32ºF to 120ºF (0ºC to 49ºC); Humidity: 0-93% RH, non-condensing; Elevation: no limit.

3.6.3.3 **Duct Detector Housing:**

3.6.3.3.1 The Analytical Microprocessor-based photoelectric smoke detector shall be readily adaptable for use in air duct smoke detection applications, using a housing that mounts to the outside of the duct. When used for duct smoke detection, the smoke detectors will not forfeit any of the system functionality that they have when used as area smoke detectors.

3.6.3.3.2 The duct smoke detection housing shall allow the detector to sample and compensate for, variations in duct air velocity between 300 and 4,000 feet per minute.

3.6.3.3.3 Remote alarm LEDs and Remote Test Stations shall be supported by the duct smoke detector and provided where indicated.

3.6.3.4 Acceptable Product: Edwards #SIGA-SD c/w sampling tube.

3.6.4 **Detectors – Combination Fixed Temperature/Rate of Rise Heat Detector:**

3.6.4.1 Intelligent Heat Detector shall have a solid state heat sensor, and shall transmit an alarm at a fixed temperature of 135° F (57°C) or due to a temperature Rate of Rise of 15°F/minute (9°C/minute). The detector shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm.

3.6.4.2 The heat detector shall be rated for ceiling installation at 70 ft (21.3m) centers and be suitable for wall mount applications.

3.6.4.3 Acceptable Product: Edwards #SIGA-HRS.

3.6.5 **Detectors - Fixed Temperature Heat Detector:**

3.6.5.1 Intelligent Heat detector shall have a solid-state heat sensor, and shall transmit an alarm at a fixed temperature of 135° F (57°C). Detector shall continually monitor the

temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm.

3.6.5.2 Heat detector shall be rated for ceiling installation at 50 ft (15.2m) spacing.

3.6.5.3 Acceptable Product: Edwards #SIGA-HFD.

3.6.6 **Detector Bases - Standard:**

3.6.6.1 Mounting bases shall support all microprocessor-based detector types detailed in this specification. Removal of the respective detector shall not affect communications with other addressable devices.

3.6.6.2 Field wiring connections shall be made to the room side of the base, so that wiring connections can be made or disconnected by the contractor without the need for remove the mounting base from the electrical box.

3.6.6.3 Bases will have the option of external LED operation, Relay Base or Data Line Isolator Base.

3.6.7 **Detector Base - Relay:**

3.6.7.1 The relay base shall support all Addressable Detector types and have the following requirements:

3.6.7.1.1 Form “C” contacts rated at 1 amp @ 30VDC and listed for “pilot duty”. The position of the contact shall be supervised.
3.6.7.1.2 Separate power shall not be required to the relay base.
3.6.7.1.3 The relay shall automatically de-energize when a detector is removed. The relay operation shall be exercised by the detector processor on power up.
3.6.7.1.4 The relay shall be a bi-stable type and selectable for normally open or normally closed operation.
3.6.7.1.5 For added survivability, relay operation shall be controlled by the detectors microprocessor. The relay shall be capable or operation in the conventional stand-alone mode in the event communication is lost with the loop controller. Relay bases not controlled by the detector’s microprocessor shall not be acceptable.

3.6.8 **Detector Base - Isolator:**

3.6.8.1 The isolator base shall support all Addressable Detector types and have the following requirements:

3.6.8.2 The isolator shall operate within a minimum of 23msec of a short circuit condition on the

analog communication wiring.

3.6.8.3 An analog addressable detector mounted with an isolator base shall only use 1 address on the loop. It shall be possible to provide one isolator for every detector to achieve the highest level of survivability possible. The analog loop controller shall support up to 250 devices including 125 modules and 125 detectors with 125 isolator bases.

3.6.8.4 In a Class A configuration, the analog loop controller shall identify an isolated circuit condition and provide communications to all non-isolated analog devices.

3.6.8.5 Isolators are required between all *Floor Areas* as defined in the NBC.

3.6.9 **Microprocessor Based Intelligent Modules:**

3.6.9.1 Fire Alarm System shall incorporate microprocessor-based addressable modules for the monitoring and control of system Input and Output functions over a 2 wire electronic communications loop, using both broadcast and serial polling protocols. All modules shall display communications and alarm status via LED indicators.

3.6.9.2 The function of each connected module shall be determined by the module type, and shall be defined in the system software through the application of a personality code.

3.6.9.3 All addressing of the Microprocessor-based Addressable Modules shall be done electronically, and the electrical location of each module shall be automatically reported to the Fire Alarm Control Panel, where it may be downloaded into a PC, or printed out. The addressing of the modules will not be dependent on their electrical location on the circuit.

3.6.9.4 All field wiring to the Microprocessor-based Addressable Modules shall be supervised for opens and ground faults and shall be location identified to the module of incidence.

3.6.9.5 Diagnostic circuitry, and their associated indicators, with reviewable Trouble Codes, shall be integral to the Microprocessor-based Addressable Modules to assist in troubleshooting system faults.

3.6.9.6 Each module shall be suitable for operation in the following environment: Temperature: 32°F to 120°F (0°C to 49°C); Humidity: 0-93% RH, non-condensing.ition and provide communication

3.6.10 **Single Input Module:**

3.6.10.1 Microprocessor-based Addressable Modules shall be used to provide one (1) supervised Class B (style B) input circuit capable of latching operation for use with contact devices, non-damped Waterflow Switches, non-latching supervisory sprinkler switches.

3.6.10.2 Acceptable Product: Edwards #SIGA-CT1.

3.6.11 **Dual Input Module:**

3.6.11.1 Microprocessor-based Addressable Modules shall be used to provide two (2) independent supervised Class B (style B) input circuits capable of operation with contact devices. Both of the input circuits shall be terminated to, and operated from, the same microprocessor-based addressable module.

3.6.11.2 Modules configured for Waterflow operation shall have an automatic delay of 15 seconds before reporting the Waterflow alarm condition to the Fire Alarm Control Panel. The module shall monitor sprinkler supervisory switches and shall automatically report the supervisory function to the Fire Alarm Control Panel each time the associated dry contact closes.

3.6.11.3 Acceptable Product: Chubb Edwards #SIGA-CT2.

3.6.12 **Monitor Module:**

3.6.12.1 The Microprocessor-based Addressable Monitor Module shall be factory set to support one (1) supervised Class B Normally-Open Active Non-Latching Monitor circuit.

3.6.12.2 The module shall automatically report the monitor function to the Fire Alarm Control Panel each time the associated dry contact closes.

3.6.13 **Riser Select Signal Module:**

3.6.13.1 The Microprocessor-based Addressable Riser Select Signal Modules shall be capable of selecting from one or two 24Vdc risers and connecting to one (1) supervised 2A Class B (style Y) Notification Appliance Output Circuit.

3.6.14 **Control Relay Module:**

3.6.14.1 Microprocessor-based Addressable Control Relay Modules shall provide one form “C” dry relay contact rated at 2 amps @ 24 Vdc or 0.5 amps at 120 VAC to, control external appliances or equipment processes. The control relay module shall be rated for pilot duty applications. The position of the relay contact shall be confirmed by the system firmware.

3.6.14.2 Acceptable Product: Edwards #SIGA-CR.

3.6.15 **Microprocessor Based Addressable Manual Pull Stations:**

3.6.15.1 Fire Alarm System shall incorporate single stage (and/or 2-stage ~ as applicable) microprocessor-based addressable Manual Pull Stations connected over a 2 wire electronic communications loop, using both broadcast and serial polling protocols. All Manual Pull Stations shall display communications and alarm status via LED’s mounted

on their integral, factory assembled module. Mount all pull stations on latch side of door at no more than 600mm from doorway and 1200mm above floor.

3.6.15.2 All addressing of the Manual Pull Stations shall be done electronically, and the electrical location of each station shall be automatically reported to the Fire Alarm Control Panel, where it may be downloaded into a PC, or printed out. The addressing of the Manual Pull Station will not be dependent on their electrical location on the circuit.

3.6.15.3 Provide intelligent single action single-stage fire alarm stations where shown on plans. The fire alarm station shall be of metal construction with an integral toggle switch to activate alarm signals. Stations shall be finished in red with silver “PULL IN CASE OF FIRE” lettering. The manual station shall be suitable for mounting on a North American 2-½” (64mm) deep, single-gang electrical box.

3.6.15.4 Provide intelligent single action single-stage fire alarm stations at D.A.C.S. door mag lock locations, as shown on plans. The fire alarm station shall be interconnected to the Door Access Control system to release door in case of emergency, as per requirements of the Ontario Building Code [OBC 3.4.6.15(4)]. Provide required permanent red lamacoid legible signage on respective door, to meet requirements of the Ontario Building Code [OBC 3.4.6.15(4)(g - h)].

3.6.15.5 All Manual Fire Alarm stations shall be suitable for operation in the following environment: Temperature: 32°F to 120°F (0°C to 49°C); Humidity: 0-93% RH, non-condensing.

3.6.15.6 Acceptable Product: Edwards #SIGA-270 series; or equivalent.

3.6.16 **Carbon monoxide alarm detector:**

3.6.16.1 Ceiling mounted, intelligent microprocessor detector, 15.20 to 19.95 VDC operating voltage, c/w electrochemical cell with approximately a 10-year life expectancy before requiring replacement.

3.6.16.2 Acceptable Product: Edwards #SIGA-COD c/w #SIGA-AB4GT sounder base; or equivalent.

3.6.17 **Notification Devices:**

3.6.17.1 All appliances shall be of the same manufacturer as the Fire Alarm Control Panel specified to insure compatibility between the appliances and the control panels, and to insure that the application of the appliances are done in accordance with the single manufacturers’ instructions.

3.6.17.2 **Notification Appliances – Horn/Strobe:**

3.6.17.2.1 Compact low-profile, combination horn and strobe, wall mounted c/w clear lens strobe, red body, and red “FIRE” markings.

3.6.17.2.2 Horn audible output shall be adjustable, to suit building construction & acoustic properties, and meet Code dBA requirements. Sound pressure to be adjusted such that it is 15 dBA above the average ambient sound level, or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater. These values are to be measured at five feet (1500mm) above the floor.

3.6.17.2.3 Strobes shall provide a smooth light distribution pattern field selectable candela 15 cd, 30 cd, 75 cd, and 110 cd flash output rating, UL1971 listed with in-out screw terminals shall be provided for wiring. The strobe (15, 30, 75, 110) candela rating shall be view from the side window to verify the setting. All strobes shall be synchronization to within 10 milliseconds for an indefinite period shall not require the use of separately installed remote synch modules.

3.6.17.2.4 The device shall have plastic protective cover for during installation.

3.6.17.2.5 The actual candela setting on the visual shall be marked on the appliance.

3.6.17.2.6 These devices are also to replace any existing wall mounted conventional fire horn or fire bell devices.

3.6.17.2.6.1 Acceptable Product: Edwards ~ Genesis LED #G1AVRF; or equivalent.

4 SEQUENCE OF OPERATIONS

4.1 General

4.1.1 Upon alarm activation of any area smoke detector, heat detector, manual pull station, sprinkler waterflow, the following functions shall automatically occur:

4.1.1.1 The internal audible device shall sound at the control panel.

4.1.1.2 The LCD Display shall indicate all applicable information associated with the alarm condition including: zone, device type, device location and time/date.

4.1.1.3 Remote annunciator LCD/LED's associated with the alarm zone shall be illuminated.

4.1.2 The following Actions shall occur simultaneously:

4.1.2.1 Activate horn / visual strobes:

4.1.2.1.1 Alert occupants that they should leave the building via the stairs (nearest exit) immediately.

4.1.2.1.2 The horn & visual strobe shall continue to sound & flash until the system has been reset.

4.1.2.1.3 The visual strobe shall not stop operating when the "Alarm Silence" is pressed.

4.1.2.2 Transmit signal to the central monitoring station.

4.1.2.3 Transmit signal to the (B.M.S.) building automation system.

4.1.2.4 All automatic events programmed to the alarm point shall be executed and the associated outputs activated.

4.1.2.5 All self-closing fire/smoke doors hold open devices, shall be released.

4.2 **Duct Smoke Activation - Alarm**

4.2.1 Upon alarm activation of any duct smoke detector, the following functions shall automatically occur:

4.2.1.1 The internal audible device shall sound at the control panel or command center.
4.2.1.2 Display the event on the graphical workstation and display a pictorial image.
4.2.1.3 The LCD display shall indicate all applicable information associated with the alarm condition including; zone, device type, device location and time/date.
4.2.1.4 Any remote or local annunciator LED's associated with the alarm zone shall be illuminated.
4.2.1.5 Transmit signal to the building automation system.
4.2.1.6 Transmit signal to the central station.
4.2.1.7 Shutdown the local air handling unit.
4.2.1.8 All automatic events programmed to the alarm point shall be executed and the associated outputs activated.

4.3 **Supervisory Operation**

4.3.1 Upon supervisory activation of any sprinkler valve supervisory switch, the following functions shall automatically occur:

4.3.1.1 The internal audible device shall sound at the control panel or command center.
4.3.1.2 Display the event on the graphical workstation and display a pictorial image.
4.3.1.3 The LCD display shall indicate all applicable information associated with the supervisory condition including; zone, device type, device location and time/date.
4.3.1.4 Any remote or local annunciator LCD/LED's associated with the supervisory zone shall be illuminated.

4.4 **Trouble Operation**

4.4.1 Upon activation of a trouble condition or signal from any device on the system, the following functions shall automatically occur:

4.4.1.1 The internal audible device shall sound at the control panel or command center.
4.4.1.2 Display the event on the graphical workstation and display a pictorial image.
4.4.1.3 The LCD keypad display shall indicate all applicable information associated with the

trouble condition including; zone, device type, device location and time/date.

4.4.1.4 Any remote or local annunciator LCD/LED's associated with the trouble zone shall be illuminated.

5 QUALITY ASSURANCE

5.1 Equipment and materials shall be provided by an experienced reputable manufacturer to ensure proper specification adherence, final connection, test, turnover, warranty compliance, and service. The manufacturer is required to have been in the fire alarm industry (service and installation) for a minimum of ten (10) years.

5.2 The manufacturer shall have in-house engineering and project management capability consistent with the requirements of this project. Qualified and approved representatives of the system manufacturer shall perform the detailed engineering design of central and remote control equipment, and provide supplemental installation drawings to facilitate installation by all related subtrades.

5.3 All equipment and components shall be the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling system, access control, and smoke control system. The authorized representative of the manufacturer of the major equipment, such as control panels, shall be responsible for the satisfactory installation of the complete system.

5.4 All control panel assemblies and connected field appliances shall be provided by the same system supplier, and shall be designed and tested to ensure that the system operates as specified. The system shall utilize independently addressed, microprocessor-based smoke detectors, heat detectors and modules as described in this specification.

5.5 All equipment and components shall be installed in strict compliance with the manufacturer's recommendations.

6 EXECUTION

6.1 Installation

6.1.1 The entire system shall be installed in accordance with the latest edition of CAN/ULC-S524 and the approved manufacturer’s manuals and wiring diagrams. This contractor shall furnish all labour, wiring, indicated outlet boxes, cabinets and similar devices necessary for a complete, functional life safety fire alarm system.

6.1.2 Provide all necessary power supply, interconnecting and remote signal wire in dedicated conduit throughout and installed in accordance with the manufacturer’s wiring diagrams and the requirements of the Canadian Electrical Code and the Inspection Authority.

6.1.3 NOTE: This contractor shall carry all costs required to supply & install all required fire alarm

system rough-in EMT conduit, outlet boxes, junction boxes, and associated fire stopping.

6.1.4 All penetration of floors, corridor walls, fire-rated rooms, and fire walls shall be sealed with approved fire stopping systems, and in accordance with all local fire codes.

6.1.5 End-of-line resistors shall be furnished as required, for mounting as directed by the manufacturer.

6.2 Testing and Inspection:

6.2.1 The manufacturer's factory trained representative shall make an inspection of the fire alarm equipment, including those components necessary to the direct operation of the system such as manual stations, thermal and smoke actuated detectors and controls, whether or not manufactured by the manufacturer.

6.2.2 The inspection shall comprise an examination and test of such equipment for the following:

6.2.2.1 That the type of equipment installed is that designated by the specifications.
6.2.2.2 That the wiring connections to all equipment components show that the installer undertook to have observed ULC requirements.
6.2.2.3 That all products of combustion (smoke) detectors have been properly calibrated and adjustments set correctly.
6.2.2.4 That the representatives equipment has been installed in accordance with the manufacturer's recommendations.
6.2.2.5 That the supervisory wiring of all devices connected to a supervised circuit is operating and that the wiring, having been met to the satisfaction of the inspecting officials.
6.2.2.6 Testing to be done in the presence of the local building inspector, the local fire Marshall, and/or Consultant, where required.
6.2.2.7 Fire alarm system shall be verified as per the latest issue of CAN-ULCS537 Verification of Fire Alarm Systems standard.

6.3 **Identification**

6.3.1 Supply & Install identification labelling for all Fire Alarm System wiring, junction boxes, and EMT conduit systems, using clear legible type-written labels.

7 WARRANTY

7.1 The Fire Alarm System manufacturer shall warrant the installed system free from any defects of material and installation for a minimum warranty period of Two Years from the date of project Substantial Completion. Any deficiencies shall be immediately corrected at no additional cost to the owner.

7.2 Fire Alarm System Installer shall provide a **two (2) year full parts and labour warranty** for all new equipment supplied & installed under this section. Warranty period shall start from date of project substantial completion, as long as Final Fire Alarm System Verification for the entire system has been provided. Otherwise, warranty period does not start until system is fully functional and verified.

8 TRAINING

8.1 The Fire Alarm System Supplier shall allow for scheduling and presenting a minimum of one 1.0 hour long Owner training/demo session (per Apt. Building); as well as provide instruction to the Local Municipal Fire Department (as required), detailing the proper operation of the newly installed System.

8.2 The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.

8.3 The instruction shall also cover Schedule of Maintenance required by ULC, and any additional maintenance that is recommended and/or required by the system manufacturer.

END OF SECTION

1 GENERAL

1.1 RELATED WORK DESCRIBED ELSEWHERE

1.1.1	Electrical General Requirements	Section 26 05 01
1.1.2	Lighting Controls	Section 26 50 35

1.2 SCOPE OF WORK

1.2.1 Supply & Install **new interior LED light fixtures** and related miscellaneous equipment (at the **101 Chapple Ave. Apt Building only**); all as indicated on drawings, and as described within the following Section.

1.2.2 Remove all indicated existing incandescent and fluorescent light fixtures, and carry all costs associated to properly dispose of all old fixtures, lamps, & ballasts.

1.2.3 Coordinate final light fixture locations with new suspended T-bar ceiling Installer, and existing site conditions that may cause interferences.

1.2.4 It is the intention to install the new corridor 2'x2' recessed LED troffers within the new T-bar ceiling grid, and keep the new corridor ceilings as high as possible.

1.2.5 Contractor to ensure that all new replacement LED light fixtures are eligible for the Save-On-Energy retrofit incentive program.

1.2.5.1 Acting on the Owner's behalf, this Contractor shall apply for, coordinate, and complete all necessary Retrofit application forms, with the local electrical utility company to qualify for the Save on-Energy Lighting Retrofit Rebate Program.

1.2.5.2 Contractor to allow to supply & install all requested information, site photographs, and documentation requested by the Save on-Energy Lighting Retrofit Rebate Program, both before and after construction.

1.2.5.3 All rebate monies are to be directed to the Sault Ste. Marie Housing - Social Services Department.

1.2.6 Photometric Layouts:

1.2.6.1 Submit Photometric drawing layouts of all interior lighting systems, showing 'footcandle' values of lighting within the AutoCad floor plans, and the site plan. AutoCad drawings will be provided by Consultant upon request.

1.3 SHOP DRAWINGS

1.3.1 Submit shop drawings in accordance with Section 260501, and General Specification requirements under Submittal Procedures.

1.3.2 Contractor to ensure that each light fixture shop drawing clearly indicates required warranty coverage, and meets or exceeds specified base products.

1.3.3 Ensure that light fixtures meet specifications, particularly with respect to the height of the light fixtures, as well as type of mounting, controls, kelvin, and lumen output.

1.4 STANDARDS OF MATERIALS

1.4.1 The materials and equipment used in construction of this building shall meet and/or exceed the requirements of the Ontario Building Code, C.S.A., and the ASHRAE Standard 90.1-2010 for Energy Efficient Design of New Buildings.

1.4.2 New materials and equipment are specifically described and named in this specification for purpose of establishing a standard of materials and workmanship.

1.4.3 New materials required for performance of work shall be best of their respective kinds and of a uniform pattern throughout the work.

1.4.4 Where a manufacturer's name is used and is noted as **`Shall be'**, Tender Price shall be based on use of materials or equipment for name mentioned. Alternates to listed equipment shall be included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.4.5 All equipment listed as **`Acceptable Product'**, means that the item named and specified by catalogue number meets Specification in all respects regarding performance, quality of material and workmanship, similar to existing school equipment, and is acceptable to Consultant.

1.4.5.1 All proposed alternate equipment that is to be considered as an Equivalent product, must meet all the same standards as the listed ‘acceptable product’, and it is the responsibility of the contractor/supplier to verify and prove to Consultant that any proposed alternate equipment is equal, for it to be considered. This must occur before the deadline for submission.

1.4.5.2 No alternate products will be reviewed/assessed by Consultants for equivalency **within 5 working days** of Tender Close.

1.4.5.3 Unless accepted as an Equivalent, all Alternates to listed equipment shall be included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.4.5.4 Tender Price shall be based upon Acceptable base products, or accepted Equivalent products, only.

2 PRODUCTS

2.1 INTERIOR LIGHTING FIXTURE SCHEDULE

2.1.1 **Type ‘A’** - Layin T-bar ceiling recessed LED troffer, 600mm x 600mm (2'x2'), 55mm high low

profile, white, 31.4W input, 80 CRI, standard 0-10VDC dimming, 60,000 hrs life at L84, complete with baked matte white enamel finish, acrylic frosted lens, 3449 delivered lumens, 3500K, 120 volt, and 10 year warranty.

2.1.1.1 Acceptable Product: Eaton-Cooper Lighting #22CGT-3535C-120V series; or equivalent.

2.1.2 **Type 'B'** - Surface mounted ceiling LED troffer, 600mm x 600mm (2'x2'), 55mm high low profile, white, 31.4W input, 80 CRI, standard 0-10VDC dimming, 60,000 hrs life at L84; complete with 2x2 CGT surface mount kit, baked matte white enamel finish, acrylic frosted lens, 3449 delivered lumens, 3500K, 120 volt, and 10 year warranty.

2.1.2.1 Acceptable Product: Eaton-Cooper Lighting #22CGT-3535C-120V series c/w #CGTSURF22 kit; or equivalent.

2.1.3 **Type 'C'** - Surface mounted ceiling LED troffer, 300mm x 1200mm (1'x4'), 55mm high low profile, white, 39.4W input, 80 CRI, standard 0-10VDC dimming, 60,000 hrs life at L84; complete with 1x4 CGT surface mount kit, baked matte white enamel finish, acrylic frosted lens, 4189 delivered lumens, 3500K, 120 volt, and 10 year warranty.

2.1.3.1 Acceptable Product: Eaton-Cooper Lighting #14CGT-4035C-120V series c/w #CGTSURF14 kit; or equivalent.

2.1.4 **Type 'D'** - Surface mounted, 1200mm (4 ft) long, ceiling or wall mounted stairwell LED luminaire, c/w integral occupancy sensor & daylight photocell controllers; 120V; white housing; low-glare full frosted (wide distribution) opal acrylic lens to conceal LEDs; 37.9 Watts input power, 106 LPW efficacy; 3935 lumens; 85 CRI; 3500K; 60,000 hours life at L70; 10 year warranty; and one programming remote (Eaton-Cooper #ISHH-01) to be labelled and left with Owner.

2.1.4.1 Acceptable Product: Eaton-Cooper Lighting #4SWLED-LD4-40SL-LW-UNV-L835-CD1-SVPD3-U; or equivalent.

2.1.5 **Type 'F'** - 1200mm (4 ft) long surface mounted (or chain suspended) LED strip (single) luminaire; 120V; white housing; low-glare full frosted opal acrylic lens to conceal LEDs; 21 Watts input power, 113 LPW efficacy; 2410 lumens; non-dimming; 84 CRI; 4000K; L70 @ 50,000 hours life; and 10 year warranty.

2.1.5.1 Acceptable Product: Eaton-Cooper Lighting #4SLSTP2040DD-UNV series; or equivalent.

2.1.6 **Type 'G'** - 100mm (4") diameter LED potlight; 120V; recessed; ultra-low profile (pancake) shallow housing with remote driver / junction box, reflector with diffusing opal flat lens to conceal LEDs, matte white flange; 60.3 LPW efficacy, 12.0 Watts input, 723 lumens, 90 CRI; (field selectable CCT colour temperature ~ 3500K); L70 @ 50,000 hours life; and 10-year warranty.

2.1.6.1 Acceptable Product: Eaton-Cooper Lighting #HLB4-06-9FS-1EMWR series; or equivalent.

2.1.7 **Type 'H'** - 4 ft long surface mounted LED vanity wall luminaire, installed at +- 7'-6" AFF (above vanity mirror), 4'-0" long, 22.0 watts, 3000 lumens, 120V, luminous white acrylic diffuser, polished chrome ends, 3500K colour temperature, and 10 year warranty.

2.1.7.1 Acceptable Product: XTC Lighting #WS-4173-L22-PC-35K-DD1; or equivalent.

3 EXECUTION

3.1 INSTALLATION

3.1.1 Provide mounting and supports required for safe installation to Consultant's satisfaction and E.S.A. Inspector.

3.1.2 Provide the required hanging materials to independently suspend each light fixture to the structure.

3.1.3 Coordinate and ensure compatibility of all light fixtures with all lighting control devices.

3.1.4 Final location of all chain suspended light fixtures, to suit final equipment layout of rooms, avoid interferences with existing ductwork & equipment, and/or shall be determined on site with Consultant at later date.

4 WARRANTY

4.1 The Warranty period shall commence on established day of Substantial Completion of the overall project.

4.1.1 All light fixtures and associated equipment supplied & installed under this section, shall be complete with a minimum 2-year full parts & labour warranty (including travel costs), during the Project Warranty period.

4.1.2 All new LED light fixtures supplied & installed by this Contractor, shall be complete with a minimum **ten (10) year warranty**. Labour is not included after the project 2-year Warranty Period. Contractor to ensure that each light fixture shop drawing clearly indicates warranty coverage. As an alternate option, the Manufacturer/Supplier may also provide a 'letter of guarantee' indicating the warranty coverage.

END OF SECTION

1 GENERAL

1.1 RELATED WORK DESCRIBED ELSEWHERE

1.1.1 Electrical General Requirements — Section 26 05 01

1.1.2 Lighting — Section 26 50 00

1.2 WORK INCLUDED

1.2.1 Lighting Occupancy sensor Supplier/Manufacturer is required to provide full a Bill of Materials; and shall submit complete site-specific field wiring schematics for each area.

1.2.2 Provide a factory-trained occupancy sensor Rep to provide remote support & assistance for commissioning and programming of all new occupancy sensor systems. No on-site Technician commissioning is expected to be required.

1.3 SHOP DRAWINGS

1.3.1 Submit shop drawings in accordance with Section 260501, and General Specification requirements under Submittal Procedures.

1.3.2 Lighting Control Wiring Schematics:

1.3.2.1 Occupancy sensor Supplier/Manufacturer is required to submit with shop drawings, a complete Bill of Materials, and shall submit complete site-specific field wiring schematics for each area using AutoCad floor plans. Base AutoCad drawings will be provided by Consultant upon request.

1.4 STANDARDS OF MATERIALS

1.4.1 The materials and equipment used in construction of this building shall meet and/or exceed the requirements of the Ontario Building Code, C.S.A., and the ASHRAE Standard 90.1-2010 for Energy Efficient Design of New Buildings.

1.4.2 New materials required for performance of work shall be best of their respective kinds and of a uniform pattern throughout the work.

1.4.3 Where a manufacturer's name is used and is noted as **`Shall be'**, Tender Price shall be based on use of materials or equipment for name mentioned. Alternates to listed equipment shall be included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.4.4 All equipment listed as **`Acceptable Product'**, means that the item named and specified by catalogue number meets Specification in all respects regarding performance, quality of material and workmanship, similar to existing school equipment, and is acceptable to Consultant.

1.4.4.1 All proposed alternate equipment that is to be considered as an Equivalent product, must meet all the same standards as the listed 'acceptable product', and it is the responsibility of the contractor/supplier to verify and prove to Consultant that any proposed alternate equipment is equal, for it to be considered. This must occur before the deadline for submission.

1.4.4.2 No alternate products will be reviewed/assessed by Consultants for equivalency **within 5 working days** of Tender Close. Unless accepted as an Equivalent, all Alternates to listed equipment shall be included as an Alternate to Base Price, and inserted in appropriate section of the Bid Form.

1.4.4.3 Tender Price shall be based upon Acceptable base products, or accepted Equivalent products, only.

1.5 QUALITY ASSURANCE

1.5.1 Manufacturer experience: manufacturer of all Lighting Control Systems shall have a minimum of 10 years of continuous experience in manufacturing lighting control products and luminaires.

1.5.2 Supplier and Contractor to review and verify compatibility of all new light fixtures, with all new lighting control sensors, switching, dimming, and related lighting control equipment described herein, and ensure complete and functional lighting control systems, as per design drawing intentions.

2 PRODUCTS

2.1 LIGHTING OCCUPANCY SENSORS

2.1.1 All Occupancy Sensors shall have 15 minute time delay (unless otherwise indicated).

2.1.2 All power packs, lighting load control relays, etc. are to be installed above in nearest accessible T-bar ceiling space, or within adjacent M/E Rooms, and/or as indicated. Label respective controls accordingly using P-Touch labelling, and record locations on As-Built Drawings.

2.1.3 Adjust and set all Sensors to **only** monitor Designated Area.

2.1.4 Provide heavy-duty white coated **Wireguards** for occupancy sensors in all public area locations which may be subject to damage, abuse or vandalism, such as all Corridors, Garbage Rooms, Laundry Rooms, etc. Wireguards are to be as low profile and small as possible.

2.1.4.1 Acceptable Product: Legrand #WC series; or equivalent.

2.1.5 Locations shown on drawing are approximate only. Consult manufacturer and their respective Installation Guidelines for **final positioning** of occupancy sensors to ensure proper sensor coverage/operation, and avoid false triggering (i.e. Proximity to Heaters, HVAC diffusers, etc.).

2.2 LIGHTING OCCUPANCY SENSOR SCHEDULE

2.2.1 **Type 'A'** - Combination wall switch/occupancy sensor, 120V, white, dual technology (Ultrasonic / PIR), 180^{o} and up to 1000 ft2 coverage, fully adjustable, and 15 minute time delay.

2.2.1.1 Provide white Legrand #WC series wireguards where applicable.

2.2.1.2 Decommission switch function in Janitor Rooms and Washrooms, such that it acts as occupancy sensor only (no manual over-ride).

2.2.1.3 Acceptable Product: Eaton-Cooper #ONW-D-1001-MV series; or equivalent.

2.2.2 **Type 'B'** - Hard-wired, low voltage, dual technology (Ultrasonic / PIR), ceiling mounted occupancy sensor, white, 360^{o} coverage and up to 2000 ft^{2} coverage, fully adjustable, 15 minute time delay, c/w power pack (SP20-MV switchpack).

2.2.2.1 Provide white Legrand #WC series wireguards where applicable.

2.2.2.2 Acceptable Product: Eaton-Cooper #OAC-DT-2000; or equivalent.

2.2.3 **Type 'PC'** - Supply & install photocell controller to control and operate Security LED light fixture, at Main Front Entrance Vestibule. Photocell to modulate and dim lighting to maintain 30 footcandles, and shall turn light on when dark.

2.2.3.1 Acceptable Product: Eaton-Cooper; or equivalent.

3 EXECUTION

3.1 INSTALLATION

3.1.1 Supply and Install all related equipment and devices as per manufacturer's recommendations and requirements, for a complete and functional system.

3.1.2 Documentation – Contractor shall provide accurate "as built" drawings to the owner indicating correct and latest program information.

3.1.3 Operation and Service Manuals – Provide operation and service manuals for all components as indicated in the General Provisions.

4 WARRANTY

4.1 The Warranty period shall commence on established day of Substantial Completion of the overall project.

4.1.1 All lighting controls and associated equipment supplied & installed under this section, shall be complete with a minimum 2 full year parts & labour warranty (including travel costs), during the Warranty period.

END OF SECTION