

Wainfleet Library and Fire Station No. 2

Condition Assessment – 2015



Location:	31909 Highway No. 3, Wainfleet, Ontario
Facility Type:	Community Library, Fire Station and EMS station
Construction Date:	Circa 1971
Additions:	1975, 1999, renovated in 2006
No. of Storeys:	One (1)
Ancillary Features:	Community meeting room
General Description:	<ul style="list-style-type: none"> - Block and brick library structure - Load bearing block and steel roof on Fire Station - Pitched roof on Library - Flat roof on connecting link between Library and Fire Station
Date of Inspection:	June 23, 2015
Inspector:	Hank Huitema, M. Eng., P. Eng., Kalos Engineering Inc. Richard Nan, Township of Wainfleet
Recommendations:	<ul style="list-style-type: none"> - Review integrity of Siporex roof panels in fire station - Replace heating system - Install grease interceptor in Community Hall kitchen - Provide CO/NO2 detection and ventilation in Fire Station - Replace kitchen exhaust hood - Provide new building automation system - Upgrade lighting - Install fire alarm system - Replace dated electrical panels

TABLE OF CONTENTS

		PAGE
1.	GENERAL DESCRIPTION	3
2.	OBSERVATIONS	3
	A. Substructure	3
	B. Building Exterior	3
	C. Building Structure	3
	D. Mechanical Systems	4
	E. Electrical Systems	4
	F. Roof.....	4
	G. Other Items.....	4
3.	CONCLUSIONS.....	4

LIST OF APPENDICES

Appendix A	Photographs
Appendix B	Limit of Liability
Appendix C	Mechanical and Electrical Assessment
Appendix D	Roof Assessment
Appendix E	Cost Estimate

1. GENERAL DESCRIPTION

The Wainfleet Library/Fire Station No. 2 was originally constructed in 1971 and consisted of the Fire Station only. The library was added in 1999, on the west side of the fire station. The dates and order of the various additions is unknown.

2. OBSERVATIONS

Kalos Engineering Inc. completed a structural condition review (visual only). Our review and this report are based strictly on the visual examination of this structure. Richard Nan from the Township of Wainfleet was also present during the review.

Structural analysis of the existing structure was not performed.

Refer to the attached Limits of Liability.

The overall condition of the Library and Fire Station No. 2 was good. The observations of this building structure summarized below.

A. Substructure

- The foundation was not visible and as such, no comments are provided.

B. Building Exterior

- The entire library building is brick clad. No signs of distress were noted,
- The entire fire station, community hall and EMS were clad in pre-painted vertical metal siding. No issues were noted. Some dents were noted near the EMS entrance,
- The air condition unit for the EMS office was installed in a window opening. The balance of the opening was covered in plywood. A more permanent installation may be desired.

C. Building Structure

- The library appears to be load bearing concrete block with a wood truss roof. The structure was not visible but no signs of distress were observed,
- The fire station structure consisted of a steel frame enclosure. It was noted that the roof material above the open web steel joists was Siporex panels. These light weight panels were common in the 1970s and are based on a gypsum composition. These panels do not fair well with exposure to water. It was noted that some water stains

were evident. The integrity of these panels should be reviewed to ensure that they have not been compromised. Replacement may be required.

- The structure of the community wall was not visible except the load bearing concrete block walls. The roof structure is unknown,
- The library ceiling exhibits many water stains, presumably from roof leaks. These should be reviewed,

D. Mechanical Systems

Refer to Appendix C – report completed by DEI Associates

E. Electrical Systems

Refer to Appendix C – report completed by DEI Associates

F. Roof

Refer to Appendix D – report completed by Canadian Academy of Building Sciences.

G. Other Items

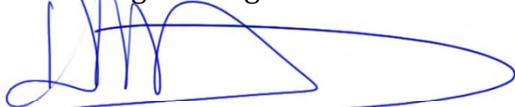
- A fire station is to be designed as a post disaster structure in accordance with the Ontario Building Code. This provides a higher level of structural integrity to ensure that the facility is able to withstand natural events and still perform its lifesaving functions. This design capacity should be reviewed and confirmed for Fire Station No.2.

3. CONCLUSIONS

The building appeared to be in good condition with only a few maintenance /remedial works required. Inspection of the roof should review the source of the leaks and make repairs

Respectfully submitted,

Kalos Engineering Inc.



Per: Hank A. P. Huitema, M. Eng., P. Eng.
Senior Structural Engineer

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APPENDIX A

Photographs

2015 Condition Assessment
Wainfleet Library & Fire Station No.1
July, 2015



Photo 1 - East elevation (fire station)



Photo 2 - South elevation (library)



Photo 3 - Southwest elevation



Photo 4 - North elevation (fire station)



Photo 5 - North elevation (EMS entrance)



Photo 6 - East elevation (fire station)



Photo 7 - South downspout (going thru bldg)



Photo 8 - Short downspout



Photo 9 - Typical soffit



Photo 10 - HVAC units in enclosure



Photo 11 - Window AC for EMS



Photo 12 - Transformer and septic



Photo 13 - Library ceiling water stains



Photo 14 - Library ceiling water stains



Photo 15 - Library ceiling water stains



Photo 16 - Library meeting room



Photo 17 - Meeting room exit door



Photo 18 - Library reception desk



Photo 19 – Fire station structure



Photo 20 – Fire station roof (Siporex)



Photo 21 – Fire station overhead door



Photo 22 – Fire station meeting room



Photo 23 – Community room looking east



Photo 24 – Community room looking west



Photo 25 - Community room - kitchen hood



Photo 26 - Community room - kitchen cooler



Photo 27 - Exit sign not working

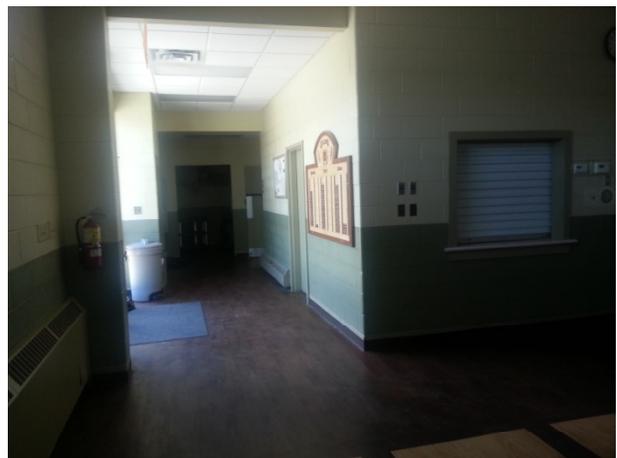


Photo 28 - Hall to entrance and kitchen



Photo 29 - Roof hatch



Photo 30 - plant growth on roof

APPENDIX B

Limit of Liability

No party other than the Client shall rely on the Consultant's work without the express written consent of the Consultant. The scope of work and related responsibilities are defined in the Conditions of Assignment. Any use which a third party makes of this work, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Decisions made or actions taken as a result of our work shall be the responsibility of the parties directly involved in the decisions or actions. Any third party user of this report specifically denies any right to any claims, whether in contract, tort and/or any other cause of action in law, against the Consultant (including Sub-Consultants, their officers, agents and employees).

The work reflects the Consultant's best judgement in light of the information reviewed by them at the time of preparation. Unless otherwise agreed in writing by Kalos Engineering Inc., it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. This is not a certification of compliance with past or present regulations. No portion of this report may be used as a separate entity; it is written to be read in its entirety.

This work does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with a property. No physical or destructive testing and no design calculations have been performed unless specifically recorded. Conditions existing but not recorded were not apparent given the level of study undertaken. Only conditions actually seen during examination of representative samples can be said to have been appraised and comments on the balance of the conditions are assumptions based upon extrapolation. Kalos Engineering Inc. can perform further investigation on items of concern if so required.

Only the specific information identified has been reviewed. The Consultant is not obligated to identify mistakes or insufficiencies in the information obtained from the various sources or to verify the accuracy of the information.

Kalos Engineering Inc. is not investigating or providing advice about pollutants, contaminants or hazardous materials. The Client and other users of this report expressly deny any right to any claim, including personal injury claims which may arise out of pollutants, contaminants or hazardous materials, including but not limited to asbestos, mould, mildew or other fungus.

Applicable codes and design standards may have undergone revision since the subject property was designed and constructed. As a result design loads (particularly loading from occupancy, snow, wind, rain and seismic loads) and the specific methods of calculating capacity of the system to resist these loads may have changed significantly. Unless specifically included in our scope, no calculations or evaluations have been completed to verify compliance with current building codes and design standards.

Budget figures are our opinion of a probable current dollar value of the work and are provided for approximate budget purposes only. Accurate figures can only be obtained by establishing a scope of work and receiving quotes from suitable contractors.

Time frames given for undertaking work represent our opinion of when to budget for the work. Failure of the item, or the optimum repair/replacement process, may vary from our estimate.

APPENDIX C

Mechanical and Electrical Assessment

**Wainfleet
Library, EMS, Fire Hall 2, & Community Center
Mechanical & Electrical Facility Audit
31909 Park Street
Wainfleet, Ontario**

For:

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July 2015
DEI Project No. 15161

TABLE OF CONTENTS

1.0 INTRODUCTION.....3

2.0 SUMMARY3

2.1 Building Life Expectancy.....3

3.0 MECHANICAL SYSTEMS.....3

3.1 General.....3

3.2 Building Code Compliance.....3

3.3 Site Services4

3.4 Insulation4

3.5 Plumbing and Drainage.....4

3.6 Fire Protection.....5

3.7 Heating and Ventilation.....5

3.8 Temperature Controls6

3.9 Gas Piping6

3.10 Proposed/Recommended Mechanical Renovations.....7

APPENDIX A – MECHANICAL SITE PHOTOS8

4.0 ELECTRICAL SYSTEMS26

4.1 General.....26

4.2 Code Compliance26

4.3 Services and Distribution Equipment26

4.4 General Lighting27

4.5 Exit and Emergency Lighting27

4.6 Fire Alarm.....27

4.7 Public Address.....28

4.8 Voice/Data Network.....28

4.9 Security Systems.....28

4.10 Miscellaneous Systems28

4.11 Proposed/Recommended Electrical Renovations28

APPENDIX B – ELECTRICAL SITE PHOTOS30

1.0 INTRODUCTION

Kalos Engineering Inc. retained DEI & Associates Inc. to review the existing multi purpose building containing the Library, EMS Office, Fire Hall #2, and the Community Center with respect to the existing mechanical and electrical systems (constructed circa: Fire Hall and Community Center are located in the original building 19 . The Library is the latest addition).

The purpose of the review was to determine the status of the installed mechanical and electrical systems relative to current codes and standards. The review is also to address the costs of upgrading the mechanical heating and ventilation system and electrical lighting and power systems to present standards.

No destructive testing was undertaken. Analysis was limited to visual inspections. Throughout this report the letter ‘P’ followed by a number represents a picture in the Appendix.

2.0 SUMMARY

2.1 Building Life Expectancy

The mechanical systems within the building (except Library) have generally exceeded their life expectancy. The library is the latest addition and can expect another 5-10 years from the equipment. The recommended renovations and a conventional building maintenance program could with major cost expenditure, rejuvenate the existing building to an environment comparable to a new facility; however, a majority of the mechanical and electrical systems are prohibitive to repair.

3.0 MECHANICAL SYSTEMS

3.1 General

The mechanical systems in the building generally reflect the year of construction. Equipment has been minimally maintained and replaced only when in disrepair.

There is no sprinkler fire protection system in the building. Local fire extinguishers are the only means of protection. An exterior fire hydrant upstand is located approximately 25 m from main entrance of the Library near Arena and the coverage of the fire hydrant to properly serve the facility needs to be determined.

Asbestos containing materials were not noticed but it is recommended that a thorough review of the insulation be carried out and up to date conditions be reported. All costs associated with any asbestos remediation have not been included in this report.

3.2 Building Code Compliance

<i>Ontario Building Code</i>	<i>Compliance</i>
Plumbing fixtures, piping, and installation to meet code.	No
Fire protection system (sprinkler).	No
Minimum mechanical ventilation of 7.5 l/s per occupant.	No
Minimum mechanical exhaust of 25 l/s per sanitary fixture.	Yes
Minimum heating requirement 18° C.	Yes
Fire dampers installed at all fire ratings/separations.	No
NFPA exhaust hood in Community Centre Kitchen.	No

Gas Utilization Code

Combustion and fresh air required in rooms with gas fired equipment.	No
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ASHRAE Standards

Minimum mechanical ventilation of 7.5 l/s per occupant.	No
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Building automation system to reduce energy consumption.	No
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Ontario Fire Code

Portable fire extinguisher with maximum travel distance of 23 meters and at exits.	Yes
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3.3 Site Services

The domestic water service to the entire building consists of a supply line from the common cistern tank that also feeds other municipal buildings. This is a private water system. There is one 1" line entering the fire hall mechanical room (P1). A UV filter station is installed in the mechanical room. The water entrance is readily accessible for inspection and maintenance.

It was noted all sanitary drainage from the building is routed to a septic system. The system was not investigated. The size of the sanitary drain in the building could not be located or confirmed. There are two sanitary lines that exit the building behind the library and wye together just before the septic tank. Town staff noted that there have been blockages in the pipe at the wye location. Additional cleanouts have been provided to allow maintenance.

All storm water from the roof extends down through exterior rainwater downspouts and appears to discharge below grade and presumed to run to the adjacent pond. The size or route of the storm drains could not be located or confirmed.

3.4 Insulation

There is minimal insulation installed on the domestic water piping and no insulation on the heating piping to/from the boiler system (P2, P3).

3.5 Plumbing and Drainage

The existing washroom plumbing fixtures and trim are in fair condition in the Fire Hall and Community Center (P4, P5, P6).

The fixtures in the Library are in good condition but are not barrier free height or elongated as required by the OBC (P7, P8). The sink in the Library staff room is pumped. There is a small pump under the counter. A gravity sewer is required by code when available. The sink should not have a pump. A gravity sewer is available, but was not connected to avoid having to cut the floor to reach the sewer.

The EMS office has a macerating toilet (P9). Town staff noted that there has been a drainage problem from the standard water closet that was previously in this office. The problem could not be cleared so this alternate toilet/pump was installed.

There are no proper barrier free plumbing fixtures installed in the building.

Domestic hot water is provided through one (1) gas fired domestic hot water heater in the Fire Hall mechanical room (P2). There is combustion air into the room and venting is proper.

There is no existing hot water recirculating system on the domestic hot water system. It takes time and a loss of water to get hot water to the taps.

The sanitary venting system was not reviewed as all of this piping is typically hidden in walls and above ceilings.

Most of the building roofs are drained with downspouts around the outside of the building. There is a flat roof area over the Library staff room area. This roof area sees a lot of water from the sloped roofs around it, draining to it (P10). The three (3) roof drains are likely overwhelmed during heavy rain. There is also an area of ponding on the roof in a low spot away from the drain (P11).

There is a 3" draft port in the Fire Hall for filling the trucks. Water is drawn out of the cistern. There is also a mechanism and gauge to read the volume level of the cistern (P18). Town staff noted that the draft port is not used.

The kitchen in the Community Center does not have a grease interceptor installed on the sinks to prevent grease from entering the sanitary system. This is a septic system and not tied to a municipal sanitary sewer, so a grease interceptor is not required, but is recommended.

3.6 Fire Protection

The present fire protection system consists of fire extinguishers at minimal locations throughout the building and a single fire hydrant upstand located approximately 25 m from the building at the underground cistern.

There are no sprinkler or standpipe systems installed.

The Ontario Building Code would require a replacement building of this size and use to be sprinklered.

3.7 Heating and Ventilation

The individual systems are as follows:

Library

The Library is heated with two gas roof top units and electric baseboards around the perimeter of the building generally under the windows.

Air conditioning is provided with two (2) packaged gas heat/electric cooling rooftop units (P12). The units are in fair condition, original equipment when the library was constructed. Neither rooftop unit has a fresh air damper for ventilation to the space. This is contrary to the Ontario Building Code. The air system recirculates the air only. No outdoor air is brought into the space. The two units also do not have an economizer that would allow free cooling when the outside air temperature is cooler than the space. Much energy can be saved during cooling times when the mechanical cooling does not have to run in lieu of opening the economizer damper and bring in cooler outdoor air entirely.

Two thermostats (one for each rooftop unit) are located side by side behind the checkout counter (P13). The washrooms and janitor room are exhausted with a rooftop exhaust fan. This fan is in fair condition. A storage room off the staff room is not ventilated at all.

Fire Hall 2

The Fire Hall is heated by a hot water boiler system. There are two hydronic unit heaters in the truck bay (P16) and baseboard radiation in the lounge room (P17). The Fire Hall has no air conditioning and has no ventilation. There is a window air conditioner in the lounge.

The boiler system (boiler, pumps, piping, expansion tank, etc.) appear original and in poor condition (P3, P14, P17).

There is no CO/NO2 detection in the truck bay to operate an exhaust system to prevent noxious gas buildup from vehicle emissions.

Community Center

The community center is heated from the boiler in the fire hall adjacent. There is hydronic radiation around the outside perimeter walls (P19), at the entrance lobby area (P20), and a unit heater in the kitchen (P21). The washrooms have electric baseboard heat (P22).

Air conditioning and ventilation air are from two gas fired/electric cooling HVAC units mounted on grade outside the hall (P23). Exterior ductwork climbs the side of the building to enter into the ceiling space. Air is distributed from ceiling diffusers (P24). The two HVAC units have gas heat, but are not connected to gas. These two units operate as air conditioning only. As such they do not operate in the winter which means there is no fresh ventilation air in the winter for this space.

The kitchen exhaust hood & exhaust system are not NFPA-96 compliant (and were not compliant even at the time they were installed) (P25, P26, P27). The construction of the hood, ductwork, and fan do not meet previous or current NFPA-96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. The chemical fire suppression system installed under the hood is a proper installation.

Ceiling fans exhaust the washrooms.

EMS Office

The EMS Office is heated from the boiler in the adjacent Fire Hall. There is hydronic radiation around the outside perimeter walls. A window air conditioner provides air conditioning. There is no ventilation in the space.

A ceiling fan exhausts the washroom.

3.8 Temperature Controls

The building control system is limited to local control of each piece of equipment. No energy management system exists to conserve energy.

HVAC equipment have thermostats (P30). The unit heaters in the fire hall have a custom collection of timers and thermostats to produce occupied/unoccupied temperature control (P31).

3.9 Gas Piping

The existing gas piping is original to the building. It is in fair condition. Paint is required to prevent corrosion.

3.10 Proposed/Recommended Mechanical Renovations

Plumbing and Drainage

Generally the existing sanitary and storm drainage system will remain. The following renovations are proposed:

- .1 Remove unused water systems/equipment from cistern (fire hall draft port).
- .2 Replace the existing plumbing fixtures.
- .3 Provide new barrier free plumbing fixtures.
- .4 We recommend single source gas fired high efficiency hot water heaters for the building (with suitable capacity for the load) complete with re-circulating system and pipe insulation.
- .5 Provide a grease interceptor for the Community Centre Kitchen.
- .6 Repair sewer in EMS Office for use of a standard water closet.
- .7 Insulate water piping.
- .8 Resize & replace storm drainage from flat roof area.

Heating and Ventilation

- .1 Renovate the rooftop Library HVAC units to provide outdoor air dampers and economizers for fresh air to space and free cooling.
- .2 Expand boiler system to Library and remove electric heat.
- .3 Ventilate the Library Storage Room.
- .4 Provide CO/NO₂ detection system in Fire Hall to operate ventilation system.
- .5 Provide ventilation system for Fire Truck Bay.
- .6 Provide furnace/ventilation system for Fire Hall Lounge and EMS Office.
- .7 Replace/upgrade the boiler system and expand it to the Library.
- .8 Insulate all the heating piping.
- .9 Provide gas to community center HVAC units to allow winter heat and ventilation.
- .10 Replace the existing kitchen hood exhaust system and provide NFPA exhaust hoods, ducts & exhaust fan, and make up air systems.

Controls

- .1 Provide a new Building Automation System for the building.

APPENDIX A – MECHANICAL SITE PHOTOS



P1 – Water entrance and UV filter



P2 – Uninsulated water piping, water heater



P3 – Uninsulated heating piping, boiler system piping



P4 – Plumbing fixtures



P5 – Plumbing fixtures



P6 – Plumbing fixtures



P7 – Plumbing fixtures



P8 – Plumbing fixtures



P9 – EMS macerating water closet



P10 – Flat roof



P11 – Roof ponding



P12 – HVAC unit without dampers



P13 – Library thermostats



P14 – Boiler



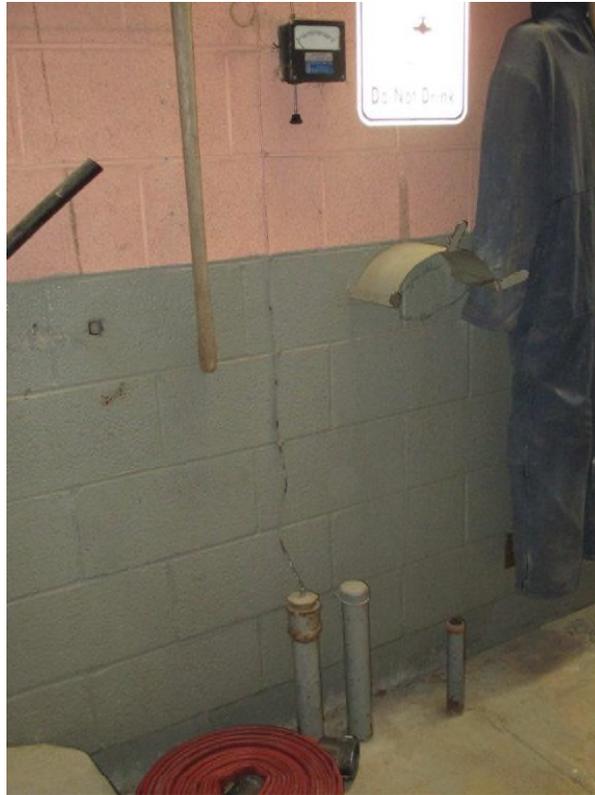
P15 – Fire Hall unit heater



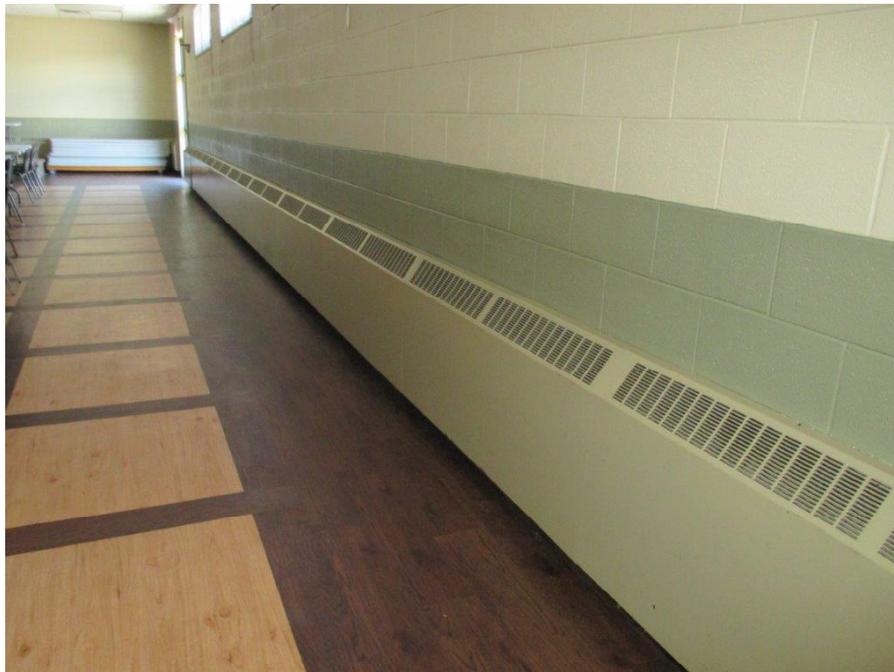
P16 – Lounge hydronic radiation



P17 – Boiler piping system



P18 – Cistern level gauge



P19 – Community Center perimeter hydronic radiation



P20 – Community Center hydronic radiation



P21 – Kitchen unit heater



P22 – Washroom electric baseboard heat



P23 – Community Centre HVAC units



P24 – Community Centre



P25 – Kitchen exhaust hood



P26 – Kitchen exhaust hood sheetmetal material



P27 – Kitchen exhaust hood roof fan



P28 – Kitchen exhaust chemical fire suppression



P29 – Kitchen exhaust chemical fire suppression



P30 – Community Center thermostat controls for HVAC units



P31 – Fire Hall temperature controls

4.0 ELECTRICAL SYSTEMS

4.1 General

The electrical systems in the building generally reflect the year of construction. Equipment has been maintained and replaced only when in disrepair.

Due to the quantity of additions to the building an overall load study is recommended to confirm that the service is adequate and how much available capacity is remaining.

4.2 Code Compliance

<i>Ontario Building Code</i>	<i>Compliance</i>
Rule 3.2.7.1 (1): Minimum average normal lighting illumination of 5.0 foot-candles in every exit, exit corridor, or corridor providing access to an exit.	Yes
Rule 3.2.7.3 (1): Minimum average emergency lighting illumination of 1.0 foot-candles at floor or tread level in exits, routes to an exit, corridors serving change rooms, and areas where the public may congregate.	No
Table 9.34.2.A: Service spaces or service rooms lit to 20 fc.	Yes
Rule 3.4.5.1 Continuously illuminated exit signage at every exit door or to indicate the direction of egress in public corridors and/or passageways.	No
Rule 3.8.1.5.1 Controls for the operation of building services or safety devices located in the barrier free path of travel and intended to be operated by the occupant shall be accessible to a person in a wheelchair and mounted at not more than 1.2 m above finished floor.	No
 <i>Electrical Code</i>	
Installations appeared to be in compliance.	No

4.3 Services and Distribution Equipment

The facility is serviced from a main incoming service located in a closet within the Community Center (P1). The service is a 400A 120/240V/1P/3W. The main service panel is old and parts are no longer readily available. It is recommended to replace the panel with one of a current manufacturer. This service then branches out to service the other spaces within the facility. There are a 175A-2P and a 100A-2P breaker feeding the Library panels, a 200A-2P breaker feeding the kitchen (and community center)(P15), and a 100A-2P feeding the fire hall. The Fire Hall panel feeds the few circuits in the EMS office.

A 200A disconnect was installed that fed to a cam-lock system on the exterior of the building for power available for outside events (fair, etc.)(P3).

An emergency generator feed was supplied to the building with a transfer switch and disconnect switch (P2) to back up that facility. The emergency service is shared with the Arena, Works Building, and Town Hall. A load study is recommended to confirm the proper size of the existing generator. Current code requires that emergency services are to be installed with multiple transfer switches. One transfer switch for life safety and a second transfer switch for all other equipment. This would require a complete reworking of the emergency power system.

The library has 2 panels serving the area. A 200A 120/240V/1P/3W newer panel in the janitor storage room and an old outdated ITE 225A rated 120/240V/1P/3W panel in the craft room. The panel in the Janitor's Room was full and there were only 4 spaces within the panel in the Craft Room.

The Fire Hall No. 2 panel (Panel B) was a Square D 225A rated 120/240V/1P/3W panel and there was no available space within. The Fire Hall panel feeds the few circuits in the EMS office.

4.4 General Lighting

The exterior lighting was a mixture of fixtures around the building (P4, P5, P6) consisting of LED replacement lamps in the Library soffit, high pressure sodium near the EMS Office, halogen flood lights at the Fire Hall, and incandescent globes at the Community Hall. It is recommended to replace all exterior lighting to be LED and of one fixture type for ease of maintenance and energy efficiency.

The Library lighting was a mixture of T8 recessed basket style fixtures K12 troffers (P7). Cylinders with replacement LED lamps were installed in the sky lights. There were also incandescent track fixtures. The washrooms had T12 2' strip fixture at the vanity. It is recommended that all fixtures be replaced with LED complete with automatic control and dimming for daylight harvesting for energy efficiency within the Library.

A 2 lamp T12 1x4 fixture was installed in the EMS Office and one lamp was not working. There was an incandescent fixture installed within the Washroom. Both fixtures should be replaced complete with automatic control.

The lighting within the Fire Hall No. 2 was a mixture of T8 strips (P10) and recessed troffers. The Washroom and Boiler Room lighting was incandescent keyless fixtures. It is recommended to replace it with LED and provide automatic control.

The Community Center was lit with 4 lamp T12 troffers with K12 lenses (P8). Several lenses were broken. It is recommended to replace these fixtures with new LED complete with automatic control.

4.5 Exit and Emergency Lighting

The Library's exit and emergency fixtures were old halogen (P9) and incandescent. It is recommended to replace the exit and emergency fixtures with new LED for reliability and also to increase coverage.

There were no exit and emergency fixtures installed within the EMS Office and Fire Hall No. 2. These are required as per code.

The Community Center had exit combo's installed above the doors only. The coverage was not adequate for the space. Additional signage and remote heads are required to meet building code.

4.6 Fire Alarm

An EST fire shield control panel was installed within the Library Vestibule. It was a single zone system

and served the Library only.

Additional device coverage is required in storage rooms that did not have detection. All the pull stations are mounted too high for accessibility requirements.

Several detectors appeared to be damaged within the Library and Offices.

Only 2 bells were installed within the Library. Additional signal devices would be required to meet audibility standards. Pull stations were also mounted too high for accessibility (P16).

The EMS Office did not have any detection devices.

The Fire Hall No. 2 had heat detectors tied into the security system.

The Community Center had residential smoke alarms installed in the common area. There were no detectors within the Kitchen or Storage Rooms. Also the Kitchen fire alarm suppression system was not tied into the fire alarm system.

It is recommended to have all areas of the entire building tied into a single multi zone fire alarm control panel.

4.7 Public Address

A public address system was not installed within the facility. An audio system complete with microphone outlet was installed within the community center.

4.8 Voice/Data Network

A fiber network (P13) was installed into the staff room of the Library to service the facility. There appeared to be data in the Library only. A wireless access point was installed within the Community Hall and all other spaces appeared to have telephone only.

The data rack was installed within the Janitor's Room of the Library. There was no cable management system used and all cables are hanging or laying on ceiling tiles (P12).

It is recommended to add additional data throughout the facility to suit the user's needs.

4.9 Security Systems

A security system is present within the facility. There were motion sensors, glass break, and some heat detectors.

4.10 Miscellaneous Systems

The Library and Fire Hall had excessive amounts of AC90 installed. The cabling was not properly supported as per code and much of it was lying on the ceiling tile (P12, P17).

Receptacle coverage appeared to be adequate for the use within the Library. Additional receptacles would be recommended within the Fire Hall and Community Center.

4.11 Proposed/Recommended Electrical Renovations

Distribution

- .1 Upgrade the existing service.
- .2 Replace outdated panels.
- .3 Rework emergency power to comply with code.

Lighting

- .1 Upgrade existing exterior lighting to LED complete with automatic controls.
- .2 Upgrade interior lighting to LED.
- .3 Provide automatic controls for interior lighting.
- .4 Upgrade emergency lighting and exit signage to meet code.

Fire Alarm

- .1 Provide a complete fire alarm system for the entire facility.

Public Address System

- .1 Upgrade the audio system within the community hall.

Voice/Data Network

- .1 Properly support at existing cabling.
- .2 Provide additional voice data to the entire facility to suit users.

Miscellaneous Systems

- .1 Properly support all AC90 cable.
- .2 Provide additional receptacles within the Fire Hall and Community Center.

APPENDIX B – ELECTRICAL SITE PHOTOS



P1 – Existing service entrance



P2 – Incoming emergency service



P3 – Exterior cam-lock system



P4 – Exterior lighting (Community Center)



P5 – Exterior lighting (Fire Hall)



P6 – Exterior lighting (Library)



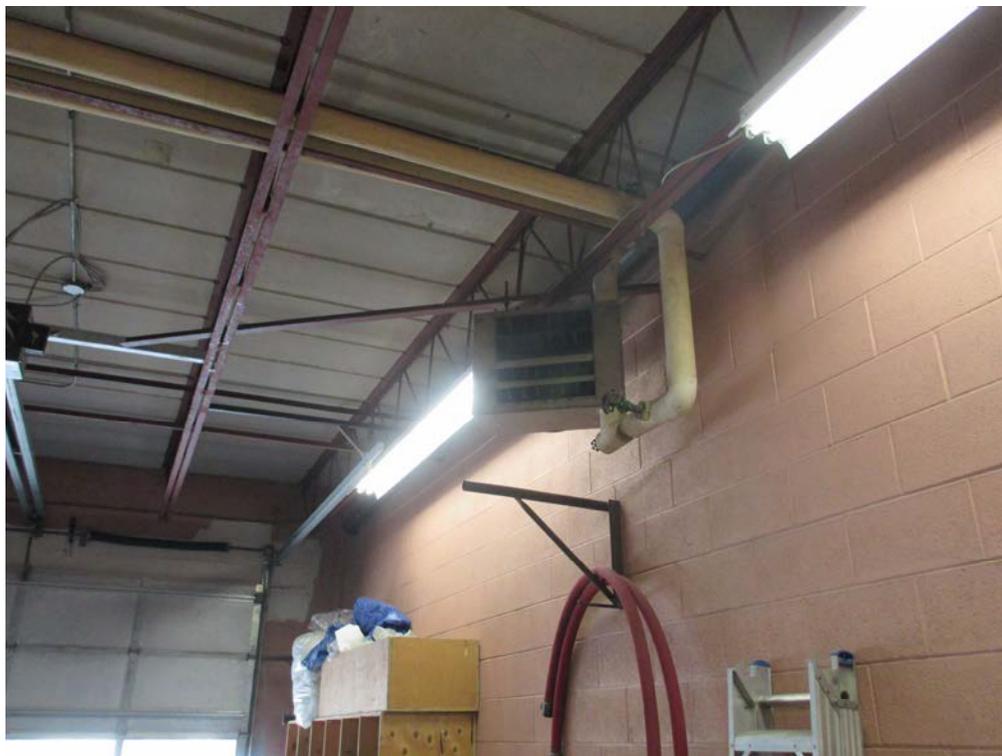
P7 - Library lighting



P8 - Community Center lighting



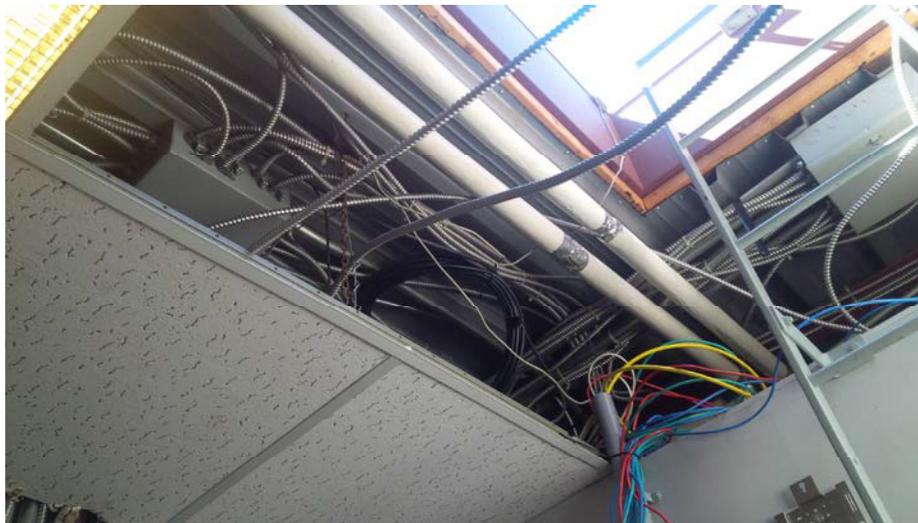
P9 – Library emergency lighting



P10 – Fire Hall lighting



P11 – Library distribution panel



P12 – Library excess AC90 and data cabling



P13 – Library incoming fibre



P14 – Fire Hall #2 distribution panel



P15 – Kitchen distribution panel



P16 – Library fire alarm device mounted too high



P17 – Unsupported AC90 cable

APPENDIX D

Roof Assessment

Kalos Engineering
3-875 Main Street West
Hamilton, Ontario L8S 4P9

July 30, 2015

Project: Wainfleet Library Roof Assessment

Project: 1530A

Project Address: 31909 Park Street
Wainfleet, Ontario

Attention: Hank Huitema P. Eng.

At the request of Hank Huitema P. Eng. (Kalos Engineering) C.A.B.S. Inc. attended the site at 2: 45 P.M. on Tuesday June 23, 2015. The following are our observations:

Observations:

Flat Roof

- C.A.B.S. Inc. observed that some ceiling tiles on the interior of the library were wet or damaged due to leakage. (Photo 1 & 2)
- We noted that on the flat roof over the library, which appears to be a 2-ply modified bitumen system, the gravel ballast has been displaced.
- The screen for the drain, adjacent to the EMS, is missing and the other drain screen appears to be plugged with debris which is causing ponding and inhibiting proper drainage of the roof. (Photo 3)
- C.A.B.S. Inc. observed that beside the downspout of the evestrough, at the transition from the sloped shingle roof from the EMS onto the flat roof, there is a concrete paver and trees are growing on the roof membrane long with moss and as well as a buildup of debris. (Photo 4)
- We noted that the caulking at the end of the evestrough, which marries into the upper parapet wall, has sagged a bit and is separated from the evestrough. (Photo 5)
- It was noted that there is a coating with what appears to be mesh embedded in it on the upstands of the curbs as well as onto the deck at the two roof top units, on the flat roof. (Photo 6)
- There is substantial ponding of water around the rooftop unit and the smaller exhaust in from the roof hatch access. (Photo 7 & 8)
- C.A.B.S. Inc. removed some of the maple tree keys that were blocking drainage around the screen for the roof. (Photo 9)
- Another issue was with this roof not being maintained is that there is a constant stream of water coming out through the condensate on the air conditioning unit adding to the volume of water on the roof. (Photo 10)
- It was noted that the evestrough for the library roof at the corner, where the light sensor is, is pulling away from the wall and may allow for water to filter in down below. (Photo 11)
- It appears that at the corner, below the light sensor, the SBS cap sheet membrane at the corner, the membrane underneath had not been degranulated or the granules have not been embedded into the rubber, which can create a source of water ingress. (Photo 12)
- It is C.A.B.S Inc.'s opinion that the curb for the roof hatch is too low and from our observations of the water line, the water could possibly back up through the bottom of the flange of the roof hatch and cause leakage.
- Substantial vegetation on the flat roof is detrimental to the roof membrane.
- It has been our experience that roots could conceivably damage the roof membrane.

- C.A.B.S Inc. observed that the gas line to the roof top units is rusting. (Photos 13 & 14)
- The proper gum boxes were not used for the electrical services for the rooftop unit and we noted that where the wire protrudes through the caulking at the flex wire there is a substantial hole which would allow for water infiltration. (Photos 15 & 16)
- Sealant on chimney collar is failing. (Photo 17)
- We were advised, by library staff that in the back room there was water near a diffuser which could account for this leakage.
- C.A.B.S Inc. noted a fish mouth in the membrane beside the eavestrough in front of the rooftop unit where the condensate tube is broken.
- There is no Pea trap on this one unit whereas the other unit is flowing freely.
- Both units were running but the one with no Pea trap is not flowing, which may indicate that water is infiltrating from the inside of the unit.
- It was observed that the membrane adjacent to this area on the wall showed no sign of embedment of the granules.
- There is a little bleed out of hot bitumen but in our opinion they have just buttered the joint for esthetics and not functionality.
- C.A.B.S Inc. is of the opinion that the roof drains on the flat roof are too small to accommodate the volume of rain that would come from both adjacent sloped roofs.
- It was observed that the flat roof at the location where the reshingling on the lower EMS portion was done, was riddled with roofing nails which, if stepped on could conceivably puncture the roof membrane. (Photo 18)
- It was noted that the Styrofoam underneath the sleepers for the gas line has deteriorated from the UV rays of the sun.
- The metal cap flashing at the back of the tie-in to the wall for the EMS has no sealant on the cap flashing. (Photo 19)
- C.A.B.S Inc. is uncertain as to how the termination of the roof membrane is sealed at this location.
- We noted that the parapet walls have been built up and terminate in behind the eavestrough, at the tie in from the flat roof to the sloped library roof, beside where the skylight is.
- The ceiling tiles had been replaced as well as in the back room where we had been informed that there was a downspout coming out of the wall from the roof drain and the roof drain itself was plugged so there is a possibility that the water has backed up from the section of the drain into the ceiling space below.
- C.A.B.S. Inc. was unable to determine the condition of the seal between the joint of the shingles and the top of the membrane termination.

Shingled Roof

- When C.A.B.S. Inc. spoke with the library staff we were advised that there was water leakage in the building.
- Part of the leakage area was just beyond the skylight.
- The metal flashing seals on the corners of the skylight have failed and could allow a wind driven rain access into and behind the roof assembly.
- C.A.B.S Inc. noted that the sealant on the skylight has sheared from the flashing to the cap flashing on the skylight. (Photos 1 – 3)
- We observed that the seal on one of the units of the skylight appears to have failed.
- Condensation was observed between the panes of glass on the sealed unit.
- C.A.B.S Inc. observed that the counter flashing coming from underneath the skylight flashing is not sealed and is away from the connection.
- There is what appears to be a gravel stop at the base of the shingles and it appears that a roofing felt comes from the gravel stop but how far up the felt goes under the shingles we are unsure. (Photo 4)

- In order to be able to determine positively, this eavestrough would have to be removed.
- It was observed that in some locations the sealant that is underneath the snap caps for the skylight is very sporadic and some of it is right at the base where any water gaining access would be capable of coming inside.

Conclusion:

Flat Roof:

It has been our experience that a lack of maintenance is common on both flat and sloped roofs, however flat roofs are more prone to problems when neglected. It is common for drains to become plugged due to lack of cleaning as debris such as leaves, dirt, vegetation and even plastic bags can easily plug a drain and cause water backup, which will eventually find its way into the building.

C.A.B.S Inc. frequently observes that many roof penetrations such as gum boxes, gas lines and sealants will fail over time and cause water leakage, if not maintained. It is important that the selection of drains accommodate the volume of water and in this case not only the flat roof will trap rain water but also the roofs on both sides drain directly onto this roof.

Good roofing practices dictate that all curbs and penetrations must terminate a minimum of 8 inches above the finished plane of the roof, which is not the case in this instance. Mechanical equipment must also be maintained and rusting gas lines can lead to severe problems over time, if not addressed.

Sloped Roofs:

Typically sloped shingled roofs are easier to maintain if eavestroughs are cleaned annually and all sealants used are checked to see if they are failing. Any penetrations should also be checked. The shingles on the roof of the library appear to be in relatively good shape. We would estimate these shingles to have a longevity of 5 years.

Skylights:

Skylights are usually prone to problems either from failed sealants on flashings or by failure of the seal on sealed units and typically if they are reviewed periodically for problems, water leakage can be avoided.

Recommendations:

Flat Roof

- Initiate at the minimum an annual inspection of the roofing system.
- Seal all gum boxes and flashing terminations.
- Clean the roof surface of debris and vegetation.
- Clean out roof drains and replace missing screen.
- Conduct a monthly review of roof drains and clean screens to enhance water drainage.
- Install additional drains or larger roof drains to accommodate the volume of rain water.
- Install Pea trap to missing one on roof top unit.
- Replace deteriorated Styrofoam insulation under pavers.
- It has been our experience that if painted with a latex paint the longevity of the Styrofoam is increased.
- Engage a competent roofer to ensure all seams on the modified bitumen roof membrane are properly sealed and install wood blocking to raise roof hatch to acceptable height.
- Secure flashings and eavestroughs and ensure they are properly sealed.

Shingled Roof

- Conduct a minimum of an annual review of the shingles to ensure they are seated properly.
- Verify flashings are secure and sealed.

Skylights

- Replace sealed unit.
- Maintain caulking on flashings and snap caps, where required.

We trust the above is satisfactory. Please direct any questions you may have to my attention.

Yours Truly:

Jim Jennings
Manager
Canadian Academy of Building Sciences Inc.



Wainfleet Library
Roof Assessment
Photographic Summary

Project: 1530A

Photo 1



Photo 2



Red arrows indicate areas of water leakage in back room and main library.

Photo 3



Photo 4



Drain screen missing from drain on lower roof. Vegetation of roof beside paver.

Photo 5



Photo 6



Sealant is separated from end of eave. Elastomeric coating at curb of unit.

Photo 7



Photo 8



Ponding water was observed at numerous locations on this small roof area.

Photo 9



Photo 10



C.A.B.S. Inc. removed Maple keys from around drain screen to allow water to drain. Condensate from roof top unit adds to water ponding.

Photo 11



Photo 12



Evestrough is pulling away from wall. Membrane seam does not appear to be sealed as there is a lack of bleed out of hot bitumen.

Photo 13



Photo 14



Rusting gas lines can become problematic if not addressed.

Photo 15



Photo 16



Proper goosenecks should be used at all penetrations. Note the hole at the top where the wire and flex comes through the top of the cone.

Photo 17



Photo 18



Sealant is failing on collar. The roof membrane is littered with roofing nails from the reshingling of the lower part over the EMS area.

Photo 19



No sealant at flashing termination on parapet wall tie in.

Sloped Shingled Library Roof

Photo 1



Photo 2



Sealant on flashings of skylight is failing at corner. Sealant also inconsistent on skylight units.

Photo 3



Photo 4



Caulking shearing at top of flashings. Connection of gravel stop questionable.

Canadian Academy of Building Sciences Inc.
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Phone: 905-333-0694 Cell: 905-802-2221 Email: c.a.b.s@cogeco.ca

Kalos Engineering
3-875 Main Street West
Hamilton, Ontario L8S 4P9

July 30, 2015

Project: Wainfleet Fire Station # 2 Roof Assessment

Project: 1520A

Project Address: 31907 Park Street
Wainfleet, Ontario

Attention: Hank Huitema

As per your request, C.A.B.S Inc. visited the above noted project at 2:00 P.M. on Tuesday, June 23, 2015. The following are our observations:

Observations:

- The roof over the fire hall is a shingled roof, a portion of which has been reshingled.
- The older shingles are starting to show signs of deterioration and the edges are curling.
- C.A.B.S Inc. observed that the evestrough on the upper portion is a commercial evestrough and the PVC piping is distributing the rain water to a residential evestrough immediately above the overhead door which discharges through a downspout that terminates down the side of the storage shed. (Photo 1)
- The ends of the shingles on both the fire hall and the EMS are bent around the eaves causing cracking and dislodging of the granules on the shingles. (Photo 2)
- C.A.B.S Inc. observed that the granules from the shingles were washed into the eavestrough. (Photo 3)
- In the area above the EMS, the edges of the shingles are curling and some cracking of the shingles was observed. (Photo 4 & 5)
- It was noted that the bottom of the flange for one of the vent stacks is lifting. (Photo 6)
- It appears that the shingles on the backside of the building have been recently replaced.
- C.A.B.S Inc. observed that at the top of the roof, where the antenna is, there is a piece of exposed plywood which is delaminating and should be capped at a minimum. (Photo 7)
- There is also a corner of the metal flashing that is pulling and we observed wasps entering at this location. We suspect that is a wasp nest in there and whenever any maintenance is done, the people doing the work should be advised to proceed with caution. (Photo 8)
- C.A.B.S Inc. noted that that on the side where the antenna is, there are several shingles that are breaking likely due to the wind and lifting and cracking. (Photo 9)
- We observed that the sealant around the collar for the chimney stack above the EMS is failing and rust is starting to appear on the metal. (Photos 10)
- The lower portion of the EMS roof has been reshingled adjacent to the library flat roof. (Photos 11 & 13)
- C.A.B.S Inc. observed that on the lower portion of the new shingled area, the edge of the metal flange for the vent stack is lifting and causing the shingle to lift as well. The flange is rusting indicating that the nail used may not be compatible with the metal flange. Shingles at ridge are lifting. (Photo 12)

- At the location where the rubber flange for one of the vent stacks above the EMS the shingles are bent up and a wind driven rain could allow moisture penetration. (Photo 14)
- We observed a several holes through the shingles just below the chimney on the EMS and the metal flashings are not secured where in a wind driven situation the water could conceivably get in and leak inside.
- Substantial corrosion to the chimney pipes. (Photo 15)
- C.A.B.S Inc. noted that one of the shingles above the vent stack has become dislodged. (Photo 16)

Conclusion:

While the newer portion of shingles in general are in good condition, budgeting for the replacement of the balance of the roofing should allow for new shingles in two years time.

Recommendations:

- We recommend that the areas of rusting metals be coated with Tremco One Coat Aluminum and some of the rusting chimneys as well just to prolong the lifespan of the materials.
- It is our opinion that the shingles will be due for replacement within 2 years.
- All metal and rubber vent stack flanges should be secured to the roof deck with compatible fasteners.
- Lifting and damaged shingles on the newer roof areas should be repaired.
- C.A.B.S Inc. suggests that the Town should verify if the area where the damaged newer shingles are still under warranty.
- Repair failing sealant on chimney collars.

We trust the above is satisfactory. Please direct any questions you may have to my attention.

Yours Truly:

Jim Jennings
Manager
Canadian Academy of Building Sciences Inc.



Wainfleet Fire Station # 2
Roof Assessment
Photographic Summary

Project: 1520A

Photo 1



Photo2



Upper commercial eavestrough drains through PVC pipe into residential trough above overhead doors. Shingles have been bent at eaves and are cracking.

Photo 3



Photo 4



Granules from shingles are seen in eavestrough. Corners of shingles are curling indicating fatigue.

Photo 5



Photo 6



Close up of curling shingles. Flashing for chimneys stacks is lifting and a wind driven rain will allow water penetration to the interior.

Photo 7



Photo 8



Sealant at base is failing. Exposed plywood cap is deteriorating. Wasps were seen nesting at open end of flashing.

Photo 9

Photo 10

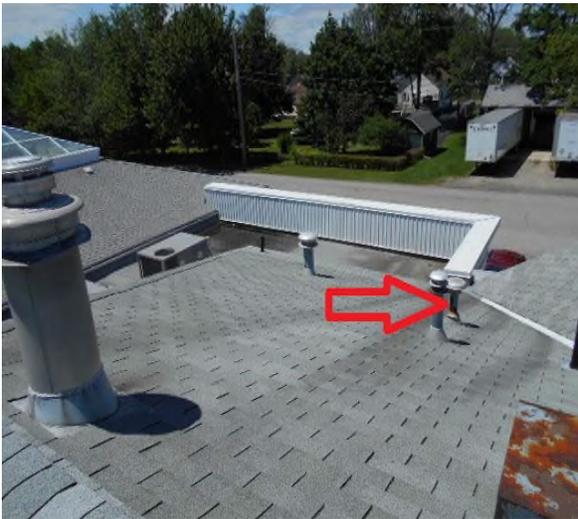


Broken shingle is seen at arrow.



Metal cap is rusting.

Photo 11



Chimney is starting to rust. Sealant on collar is failing. Rust on flange at nail. Shingle lifting at ridge.

Photo 12

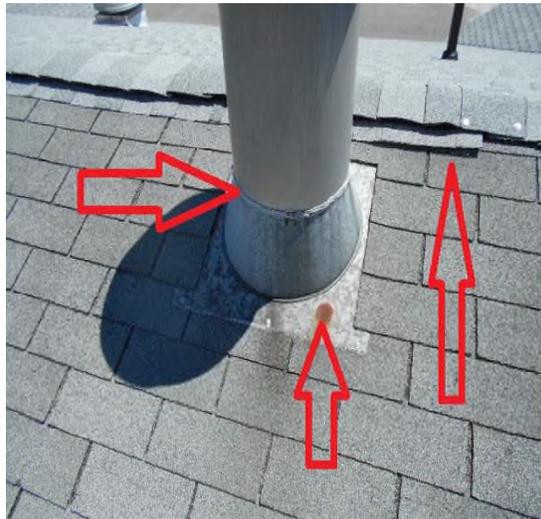


Photo 13



The lower portion of the roof has been resingled. Edge of rubber flange is curling

Photo 14

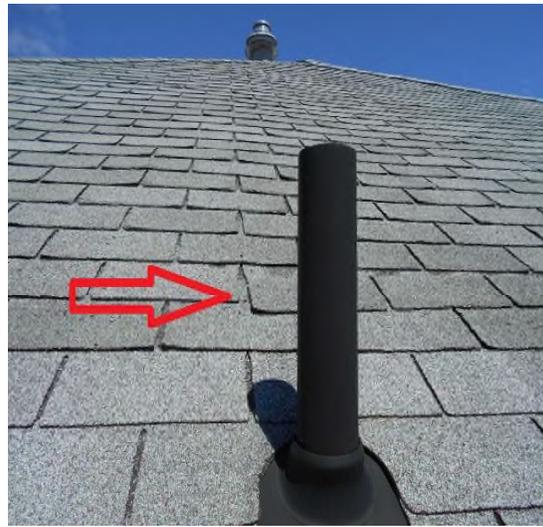


Photo 15

Photo 16



Chimneys are rusting out.



Shingle is loose above vent stack.

APPENDIX E

Cost Estimate

Township of Wainfleet - Building Assessments



Library / Fire Station No. 2

Cost Estimates

31-Jul-15

Item	Description	Estimated Cost (present value) \$CDN			
		Now	<1 year	1 to 5 years	5 to 10 years
<u>Building - Architectural and Structural</u>					
1	Investigate/replace Siporex panels		\$1,500	\$25,000	
2	General repairs		\$5,000	\$5,000	
<u>Mechanical</u>					
	Plumbing and Drainage				
M1	Remove unused water systems/equipment from cistern (fire hall draft port).				\$2,500
M2	Replace the existing plumbing fixtures.			\$5,000	
M3	Provide new barrier free plumbing fixtures.	\$3,000			
M4	We recommend single source gas fired high efficiency hot water heaters for the building (with suitable capacity for the load) complete with re-circulating system and pipe insulation.			\$15,000	
M5	Provide a grease interceptor for the Community Centre Kitchen.system and pipe insulation.		\$15,000		
M6	Repair sewer in EMS office for use of a standard water closet.		\$5,000		
M7	Insulate water piping.			\$7,500	
M8	Resize & replace storm drainage from flat roof area.		\$10,000		
	Heating and Ventilation				
M1	Renovate the rooftop Library HVAC units to provide outdoor air dampers and economizers for fresh air to space and free cooling.	\$7,500			
M2	Expand boiler system to library and remove electric heat.			\$15,000	
M3	Ventilate the library storage room.		\$1,000		
M4	Provide CO/NO2 detection system in fire hall to operate ventilation system.	\$5,000			
M5	Provide ventilation system for fire truck bay.	\$10,000			
M6	Provide furnace/ventilation system for fire hall lounge and EMS office.		\$20,000		

M7	Replace/upgrade the boiler system and expand it to the library.			\$100,000	
M8	Insulate all the heating piping.		\$10,000		
M9	Provide gas to community center HVAC units to allow winter heat and ventilation.		\$25,000		
M10	Replace the existing kitchen hood exhaust system and provide NFPA exhaust hoods, ducts & exhaust fan, and make up air systems.	\$40,000			
	Controls				
M1	Provide a new Building Automation System for the building.			\$75,000	
Electrical					
	Distribution				
E1.1	Upgrade the existing service.			\$12,000	
E1.2	Replace outdated panels.		\$10,000	\$5,000	
E1.3	Upgrade emergency distribution		\$15,000		
	Lighting				
E2.1	Upgrade existing exterior lighting to LED complete with automatic controls.			\$7,500	
E2.2	Upgrade interior lighting to LED.		\$5,000	\$5,000	
E2.3	Provide automatic controls for interior lighting.		\$2,500	\$2,500	
E2.4	Upgrade emergency lighting and exit signage to meet code.	\$3,500			
	Fire Alarm Revisions				
E3.1	Provide a complete fire alarm system for the entire facility.	\$22,000			
	Public Address System				
E4.1	Upgrade the audio system within the community hall.			\$3,500	
	Voice/Data Network				
E5.1	Properly support all existing cabling.		\$3,000		
E5.2	Provide additional voice data to the entire facility to suit users.		\$3,500	\$3,500	
	Distribution				
E6.1	Properly support all AC90 cable.		\$3,000		
E6.2	Provide additional receptacles within the fire hall and community center.		\$2,500	\$2,500	
Roofing					
R1	Replace Shingle Roofing-staged			\$46,720	\$40,000
TOTALS		\$91,000	\$137,000	\$335,720	\$42,500