BUILDING CONDITION ASSESSMENT REPORT

Nurses Residence Building 51
370 South Street, London, ON
For
City of London
Policy Planning & Programs
P.O. Box 5035,
London, Ontario, N6A 4L9

SJ MA Project #1335
January, 2014
# Table of Contents

1.0 Executive Summary  
2.0 Introduction  
  2.1 Purpose of Report  
  2.2 Consultant Team  
  2.3 List of Resources  
  2.4 Definitions  
3.0 Historical & Cultural Status  
4.0 Existing Building Drawings  
5.0 Observations of Existing Building Envelope  
  5.1 Current Function / Use  
  5.2 Building Data  
  5.3 Exterior Masonry Walls  
  5.4 Windows + Doors  
  5.5 Insulation  
  5.6 Roofing  
6.0 Architectural Assessment  
  6.1 Barrier free Accessibility  
  6.2 Interior Heritage Features  
7.0 Hazardous Materials Assessment  
8.0 Structural Assessment  
9.0 Mechanical / Electrical Systems Assessment  
10.0 Adaptive Reuse  
11.0 Embodied Energy & Heritage Buildings  
12.0 Cost Area Analysis  
13.0 Conclusions  
Appendices
1. Executive Summary

The existing concrete and masonry building is structurally sound and of high quality of construction. It should also be noted that the exterior masonry is considered an important heritage character defining element. The existing infrastructure, (mechanical, electrical) is outdated and will need to be replaced if the facility is to be readapted to a new use.

From the building condition assessment, the building does contain asbestos and possibly other hazardous materials. While these materials have to be handled and removed under provincial regulations it should not be viewed as an overwhelming or deciding factor because the cost of hazardous materials remediation is a constant value whether the building is demolished or retained.

We concur with the cultural heritage assessment by Nancy Tausky, the building does have substantial architectural and historical value and adds value to the overall streetscape. We also feel the interior heritage features noted above are worthy of retention in any adaptive reuse proposal.

There are a number of probable adaptive reuses for the facility including residential apartments, seniors’ care apartments, live / work loft style units, and commercial office.

The economic viability of each of these adaptive reuse opportunities needs to be tested with the preparation of a detailed business model. The sustainability of the use may be reinforced by the expansion of the gross area to provide additional complimentary uses to the design model.

For the purposes of the report, expanded areas have been identified for consideration for the long term sustainability of the project. These additional areas could also be phased in our time for the project. The report also provides for cursory conceptual site ideas to increase the density of the site.

Based on the observations of the existing structure by the consulting team, and the review of the supporting reports and documentation, we are of the opinion that the building is an important heritage asset, structurally sound, and viable building for adaptive reuse.

Respectfully submitted,

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Principal Architect + Heritage Consultant
Dipl. Arch, RAIC, dipl. Arch. Tech.,
Heritage Consultant, CAHP, ICOMOS

Timothy M. Finch
Project Coordinator
Licensed Technologist OAA, A.Sc. T., CAHP (intern)
2. Introduction

2.1 Purpose of Report

SJMA was retained to survey the building and assess the current conditions of the facility. The report was to review the exterior building envelope, hazardous building materials found on site, the building structural systems, mechanical & electrical conditions, interior heritage features, and provide a cost analysis for possible adaptive reuse of the building.

The current condition of the exterior elements was reviewed and a summary of the repair work required to restore the exterior facades is included in the report. Elements of the building envelope reviewed include exterior masonry, windows, roofing, and insulation.

Exterior and interior heritage features worthy of conservation/restoration are identified in the heritage report summary attached in the appendix of this report. These items are typically known as character defining elements.

Hazardous building materials were reviewed by the environmental consultant.

Barrier free access was reviewed.

Mechanical & electrical systems were reviewed by Melex Engineering.

Cost analysis for adaptive reuse proposals is included in this report.

2.2 Consultants

Architectural & Heritage Consultant:
SJMA Architecture Inc.
126 Wellington Road
London, Ontario
N6C 4M8
T: (519) 649-0220
F: (519) 649-1453

Structural:
Gray & Fick Ltd.,
Consulting Structural Engineers
133 Consortium Court
London, Ontario
N6E 2S8
T: (519) 681-6475
F: (519) 681-1248

Mechanical & Electrical:
Melex Engineering Inc.
P.O. Box 22089
London, Ontario
N6C 5Y3
T: (519) 652-1193
F: (519) 652-0112

Environmental Consultant:
Pinchin Environmental
702-150 Dufferin Ave.
London, Ontario
N6A 5N6
T: (519) 646-1145
F: (519) 646-1172

Building Envelope Consultant:
IRC Building Sciences Group
4026 Meadowbrook Dr., Unit 131
London, Ontario
N6L 1C7
T: (519) 652-5985
F: (519) 652-9926

2.3 List of Resources

1. Standards and Guidelines for Conservation of Historic Places in Canada
2. U.S. National Parks Service, Preservation Briefs:
   www.cr.nps.gov/hps/tps/briefs/presbh om.htm
3. National Research Council Canada: Canadian Building Digest CBD-163 Masonry Mortar
2.4 Definitions

Character-defining elements: The materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of an historic place, which must be retained in order to preserve its heritage value.

Conservation: All actions or processes that are aimed at safeguarding the character defining elements of a cultural resource so as to retain its heritage value and extend its physical life. This may involve Preservation, Rehabilitation, Restoration, or a combination of these actions or processes.

Dry Rot: A decay of seasoned timber, resulting in it becoming brittle and crumbling to a dry powder, caused by various fungi. In building construction it usually occurs when wood members are subjected to repeated wetting and drying cycles.

Efflorescence: A whitish, powdery deposit on the surface of masonry or stone. It is formed as mineral-rich water rises to the surface through capillary action and then evaporates. Efflorescence usually consists of gypsum, salt, or calcite.

Galvanic Corrosion: A form of electrochemical corrosion that occurs when two dissimilar metals come together in the presence of an electrolyte to form an electrical couple, known as a galvanic couple. In building systems, the electrolyte is usually ordinary moisture, whether rainwater of high atmospheric humidity.

Lag Shields: Lag Shield Anchors are designed for anchoring into concrete, brick and block. Lag Screws are used to expand the Lag Shield Anchor against the concrete, brick or block creating a mechanical bond to the surrounding material.

Lead Came: A soft metal U-shaped cross section divider bar, used between small pieces of glass to make a larger glazing panel such as in stained glass. Came are mostly made of soft metals such as lead, zinc, copper or brass.

Mortar Fines: The fine granular particles of masonry mortar which are leached out of the mortar joints with moisture migration through the wall.

Preservation: The action or process of protecting, maintaining, and/or stabilizing the existing materials, form, and integrity of a historic place or of an individual component, while protecting its heritage value.

Restoration: The action or process of accurately revealing, recovering or representing the state of a historic place or of an individual component, as it appeared at a particular period in its history, while protecting its heritage value.

Spalled: Breaking up of a masonry surface into chips or fragments.

Vernacular: Indigenous, made locally by inhabitants; made using local materials and traditional methods of construction and ornament; specific to a region or location.

3. Historical & Cultural Status

Building 51 (originally known as the Nurses Residence) was included in the “Cultural Heritage Assessment: Buildings in the South Street Hospital Complex, London, Ontario” prepared by Nancy Z. Tausky, dated May 2011 Revised Version. Based on the reported historical, architectural and contextual values, the Nurses Residence Building was assigned a Priority 1 rating in terms of it remaining on the City of London’s Inventory of Heritage Resources.

The Tausky report states that “the property has considerable design value because it displays a high degree of artistic merit and was designed by a prominent local architectural firm. The second-floor lounge/library is notable for its period components. The building’s considerable historical value derives from its connections to the nursing school, Victoria Hospital, Colonel William Gartshore (one of London’s most influential citizens), and to John M. Moore (one of the city’s most influential architects). The former Nurses’ Residence is also significant contextually: it has played a crucial role in determining the character of the hospital precinct and it forms the centerpiece and important connecting link in establishing the remarkable continuity of the streetscape, north of South Street between Colborne and Waterloo Streets.”
4. Existing Building Drawings

The following drawings are record drawings obtained from London Health Sciences Center.

Heritage features have been located as identified in the heritage report.
5. Observations

5.1 Current Function / Use

The building is in an H shaped plan with the long spine facing and set back from South Street creating; the prominent facade.

Currently, the building is used as medical offices and clinics but is not fully occupied.

The main entrance to the facility is located in the middle of the plan on the South Street spine. Other minor entrances and exits are located to the ends of the wings. The floors are connected to additions constructed to the ends of the north wings in 1946 and 1962. These additions are not part of the scope of this report.

Stair exit towers were added to the original building to improve fire and life safety features of the facility. The stair tower was constructed in 1969 by the local architectural firm of Nolan & Glover Architects.

This building is linked to the Health Services Building to the west and the War Memorial Children’s Hospital to the east by an underground tunnel at the ground floor level.

The building is a three storey high structure, with a basement level.

5.2 Building Data

The building areas noted in the following chart are approximate.

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>Gross Floor Area Sq.Ft.</th>
<th>Usable Floor Area Sq.Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
<td>17,290</td>
<td>15,265</td>
</tr>
<tr>
<td>First</td>
<td>17,200</td>
<td>15,040</td>
</tr>
<tr>
<td>Second</td>
<td>17,200</td>
<td>15,230</td>
</tr>
<tr>
<td>Third</td>
<td>16,700</td>
<td>14,880</td>
</tr>
<tr>
<td>Total</td>
<td>68,390</td>
<td>60,415</td>
</tr>
</tbody>
</table>

5.3 Exterior Masonry Walls

The composition of the exterior masonry walls consist of clay face brick fully bonded to masonry backup, interior air cavity and interior plaster finish. The building is enhanced with decorative limestone base units and trim elements.

The exterior masonry is considered a heritage defining element and should be conserved where it is existing and where missing, restored to its original design.

The exterior masonry is in reasonably good condition. There are evidences of previous, poorly executed, repairs and minor modifications. The most concerning elements showing signs of deterioration are the upper roof parapets. The parapets will need to be dismantled and rebuilt. The east wall of the east wing has been previously repointed with the old mask & grout method of repointing.

Identified deficiencies are as follows:

1. Brick parapet walls on the original 1926 and secondary 1927 sections of the building require rebuilding and the parapet capstones will require resetting on through-wall flashings. However, the parapet walls on the newest portions of the building appear in better condition. Further inspection is needed to determine if rebuilding is required, see photographs 1 & 2 below.

2. Heavy shrubbery against building requires removal, see photographs 3 & 4 below.

3. The original decorative stepped stone frontispiece pediment above the main entrance has been removed and replaced with a contemporary faux stucco finish system on rigid insulation board, commonly known as exterior insulating finishing system (E.I.F.S) with simulated stone pattern and brick. The cap flashing is pre-painted segmented metal cap flashing and provides inadequate protection, new cap flashings using historically appropriate material are required, see photographs 5 & 6. Below. It is recommended to reinstate the frontispiece pediment to its original design, using heritage appropriate materials. There are verbal reports that the remaining original decorative stone urns from the parapet have been retained by London Health Sciences Centre (LHSC) and it is recommended that they be
reinstated into the rebuilt pediment.

4. Mortar joints have opened up on the corners of the building between the water table/corner quoin stones and the adjacent brickwork. This is most likely caused by water infiltration through the parapet walls and/or flashings above. Recommend resetting of water table stones and possibly some of the corner quoin stones, see photographs 7 & 9, below.

5. The upper watertable stone band requires new flashings, see photograph 1.

6. All stone elements on the building require vine removal, where present, cleaning as required, and 100% repointing recommended, caulk/ing of all windows and window sills and skyward facing joints, see photographs 8 & 9, below.

7. Steel lintels exist above windows, and may require rust removal and refinishing.

8. Brickwork throughout the general field of the building is in good condition; assume maximum 5% repointing required.

9. Restoration of rear lounge recommended, including all windows and painted surfaces, as well as new fascia, gutters, and downspouts, see photograph 10, below.
7. Open joints in mortar joints.

8. Open joints in watertable stone band.

9. The watertable stone band is approximately 1" out of plane and will require removal and resetting.

10. Rear lounge.


1. Typical window with out storm window.

2. Typical window with screen.

5.4 Windows + Doors

The existing windows appear to be original to the building and are typically wood framed single hung units with single pane glazing and without storm windows. Some units do have screen window units but not all.

Wood windows throughout have failing paint finish, however, wood components in general appear in good/sound condition, with replacement/repairs of some of the lowest components (sills, bottom rails of lower sash, and lower portion of frames) required. Restoration of wood sash and frames, with introduction of new exterior vented sull sash, (storm sash) is recommended, if funds permit. However, it should be expected that restoring the existing units and providing new storm units will be more expensive then replacing the windows with new period style windows.
5.5 Insulation

The building is currently not insulated. The exterior walls are solid masonry around a concrete frame and are approximately 18’ thick.

Adding insulation in the future can be done; however, it will result in a loss of all interior finishes on the exterior walls and will require a full thermal analysis report to determine optimal thermal efficiency, cost effectiveness, and wall performance.

A thermal analysis report is recommended for any future adaptive reuse proposal and should be performed by an architect and building envelope consultant.

5.6 Roofing

The existing roofs were reviewed and found to be in poor condition and need to be replaced.

A summary of the roof sections is attached in the appendix of this document. The summary identifies the roof sections, estimated year of installation, size, height, roof system type, current condition, and estimated replacement cost in 2013 dollars.

All roof areas at these facilities are in poor condition and have exceeded serviceable life expectancy.

Some roofs may contain hazardous materials including asbestos in the felts and PCBs in the waterproofing (if they are coal tar pitch).

Budget estimates provided are based on expected costs of complete replacement of roof systems including improvements to insulation, installation of a high performance membrane system, and new metal flashings. Additional costs for removal of hazardous materials (if present), deteriorated deck, etc., are not included in the estimates. Estimates are based on doing several roofs at once in logical staging. If the work is done one section at a time, increase the budget estimate by 20%.

Engineering Fees to oversee the replacement of the roof should be budgeted at 10% of construction cost.
6. Architectural Assessment

6.1 Barrier Free Accessibility

Providing barrier free accessibility to existing buildings is often difficult to do in a sensitive and honoring way. Traditional and, especially, institutional building main floors were raised up above grade to indicate their formal importance; using grand steps and stone bases. Along with grade changes, there were different standards for door widths, hardware, corridor sizes, handrails and door glazing. Depending on the extent of re-use, new standards can be applied to ensure accessibility. This will be subject to a complete detail plan once the adaptive reuse is established. Currently some of the room entrance doors may meet barrier free access clearances while others will not. Barrier free door operators and push buttons may be required in various locations. Elevators, that will likely need upgrading or replacement, will need to be upgraded to CSA Barrier Free standards.

The main concern for the Nurses’ residence is the height of the main floor level above grade. The first floor is approximately 8'-0" above the grade and the basement floor is 3 to 4' below grade. The existing heritage entrance has an internal stair in the foyer which prohibits it from being used for barrier free access.

We have reviewed two options to mitigate the grade to floor differential:

Option 1: create an entrance at the basement level at the end of the south west wing with an enclosure and a ramp access from the public sidewalk along South Street. This will provide wheelchair access to the lower building floor and elevator access to the remaining floors. A new barrier free accessible elevator will be required to provide access to the floor levels.

Option 2: create a new grade level entrance with new front to back elevator, to the west of the existing front entrance. A through entry elevator that also opens to the corridor will be required to provide access to all floors. The exterior entrance is essentially an elevator lobby but could be visually linked to the existing main foyer.

The choice of the best option is subject to the decisions of what happens to the attached north buildings and if the group of three buildings are separated or are linked into a future larger complex. This decision is outside the scope of this report. The choice is also predicated on what the extent of interior modifications are anticipated for the adaptive reuse proposals. For example: if all the interior is demolished then barrier free accommodations will be provided with the new design. However, if the interior is kept then many doors will need modifications.

6.2 Interior Heritage Features

The interior heritage features are identified in the Cultural Heritage Assessment report prepared by Nancy Z. Tausky, Heritage Consultant and are listed here as follows:

1. The main entrance hall and foyer with its Greek key detail, decorative columns, coved ceiling cornice, and terrazzo flooring.
2. The former reception (Living) room and beamed ceiling.
3. The second floor lounge, windows, and fireplace.
4. The original stairwells.
5. The unusual early period ceiling and lighting fixtures.
6. The interior window trims.
7. The original ceiling heights.

We are of the opinion that most of these interior heritage features could be successfully integrated into any new adaptive reuse proposal.
7. Hazardous Materials Assessment

Pinchin completed a detailed review of the existing asbestos assessment reports and a site visit of the Nurses Residence Building on Wednesday October 2, 2013. The site visit included access to most common areas, mechanical rooms, and portions of the roofs. The visit was performed to identify potential designated substances that may be present within the buildings.

After careful review of the existing asbestos assessment reports and completion of a limited site visit, Pinchin recommends that a designated substance assessment be completed at the above mentioned buildings prior to planned renovations or demolition. Pinchin understands that due to the current occupancy of both buildings the assessments will be limited to non-intrusive testing. Concealed locations such as spaces above solid ceilings, and within shafts and pipe chases will be accessed via existing access panels only. Walls, solid ceilings, flooring, structural items, interior finishes or exterior building finishes will not be removed to determine the presence of concealed materials.

The non-intrusive assessment will include assessment and sampling for the eleven Ontario designated substances as required under section 30 of the Ontario Health and Safety Act. The assessments will include supplemental sampling of suspect asbestos-containing materials in the buildings, which were not previously sampled during the initial asbestos assessment. The designated substance assessment should include investigation into previously inaccessible areas including roofing, and exterior sealants.

Pinchin identified the following suspect hazardous materials during the site walkthrough:
- Asbestos
- Lead
- PCB’s
- Mercury
- Silica

The following Designated Substances are not typically found in building materials in a composition/state that is hazardous and will not be included in the assessment. Pinchin did not identify any of the materials below during the site tour but our access to rooms was very limited. Should the Client have any information regarding the use of these materials in processes, it should be reported to Pinchin prior to the start of the assessments:
- Arsenic
- Acrylonitrile
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Vinyl chloride (vinyl chloride monomer, not PVC)

The assessments are intended to determine if these hazardous building materials are present and identify their location, condition and approximate quantity. The assessment will provide sufficient detail to allow for the preparation of specifications for removal of these materials.

The building was constructed in 1926 with multiple renovations completed over the past years.

Pinchin will also include a unit rate schedule for approximate abatement costs based on local market values at the time of the report. These unit rates and estimated total cost of hazardous material abatement are subject to market fluctuations by local contractors and the limitations of the non-intrusive investigation. Inaccessible building materials not identified in the report will not be reflected in the quoted abatement estimates.

7.1 Regulatory Requirements

Section 30 of the Ontario Occupational Health and Safety Act requires building owners or their agents (architects, general contractors, construction managers, etc.) to prepare (or have prepared) a list of designated substances present in the area of construction or in the facility. There are eleven designated substances subject to special regulation under the Occupational Health and Safety Act. Of these eleven, asbestos, lead, mercury, and silica are commonly found in buildings and can impact health and safety during construction, demolition, and renovation projects. The owner must ensure that a prospective contractor has received a report detailing designated substances before...
tendering a construction project. The owner or the owner’s agent is liable to every contractor and subcontractor for damages and costs arising from unreported materials (of which the owner should reasonably have been aware), and could also be subject to orders and fines from the Ministry of Labour (MOL). The Ministry of Labour requires the contractor to report any Designated Substances likely to be used (asbestos is a Designated Substance), handled or disturbed during the project. This information is required when contractors submit the Notice of Project form to the MOL.

The disturbance of asbestos-containing materials (ACM) on construction projects is regulated by Ministry of Labour Regulation 278/05. Section 10 of the Regulation describes the information that building owners must provide to Constructors, prior to requesting tenders or arranging/contracting for work. In addition, the Regulation classifies all disturbance of ACM as Type 1, Type 2, or Type 3, each of which has defined work practices.

The Ministry of Labour has issued construction guidelines, for the control of exposure to mercury, lead and silica on construction projects: meant to assist contractors in establishing safe work procedures. While these are not regulations, these guidelines and hazard alerts recommend work practices that contractors can employ to meet their general duty to protect workers on a project from known hazards, as required by the Occupational Health and Safety Act.

Management, handling and transfer of PCBs are controlled by R.R.O. 1990, Reg. 362, Waste Management-PCB’s Regulation; made under the Ontario Environmental Protection Act, and the PCB Regulation (SOR/2008/273) made under the federal Environmental Protection Act.

The Ontario Ministry of Labour published the hazard alert “Mould in Workplace Buildings,” in December 2000. To quote from the alert, “The sustained and/or extensive growth of any visible mould on the interior surfaces of a building is unacceptable. Mould growth on the interior surfaces of buildings is a risk factor for health problems.” The MOL has enforced work stoppages as a result of indoor mould growth and has enforced removal using work practices similar to those required for asbestos abatement.

7.2 Scope of Assessment

The assessments would be performed to establish the location and type of Hazardous Building Materials incorporated in the structure(s) and its finishes. For the purpose of this proposal (and subsequent work), Hazardous Building Materials are defined as follows:

- Asbestos
- Lead
- Mercury
- Silica (free crystalline silica)

The investigation will also include an examination for the presence of:

- Polychlorinated Biphenyls (PCB’s)
- Mould or microbial contamination (visible growth only)

The following Designated Substances are not typically found in building materials in a composition/state that is hazardous and will not be included in the assessment. Should the Client have any information regarding the use of these materials in processes, it should be reported to Pinchin, prior to the start of the assessment:

- Arsenic
- Acrylonitrile
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Vinyl chloride (vinyl chloride monomer, not PVC)

The assessments will not include occupant processes (other than any stated), articles within the building such as stored items, furniture, etc., subsurface materials or equipment (vessels, drums, underground storage tanks, pipes, etc.), possible contaminants in the soil and groundwater on the site, and sampling of materials that could result in a hazard to the surveyor or damage to the building.

7.3 Methodology

The surveyor will make reference to any available as-built drawings, construction specifications or existing reports. To identify the location of hazardous building materials, and develop any recommendations required, it is necessary to inspect every accessible part of the structure(s) within the scope of the assessment. Pinchin will record relevant information regarding the approximate quantity, location, and
condition of any hazardous building material encountered.

The assessments will be limited to non-intrusive testing at the request of the Client. Concealed locations such as spaces above solid ceilings and within shafts and pipe chases will be accessed via existing access panels only. Walls, solid ceilings, flooring, structural items, interior finishes or exterior building finishes will not be removed to determine the presence of concealed materials.

### 7.3.1 Asbestos

The surveyor will review the available asbestos assessment report and conduct a gap analysis based on field observations. The previously unidentified materials will be sampled and analyzed. The surveyor will inspect for the presence of friable and non-friable asbestos containing materials (ACM). The number of asbestos bulk samples obtained will be in compliance with the requirements of Table 1 of O.Reg. 278/05, which identifies the minimum number of samples which must be analyzed (1, 3, 5, or 7 depending on quantity, application and friability) for a material to be considered non-asbestos. Sample locations will be recorded on drawings.

The use of asbestos in drywall joint compound was banned in Canada under the Federal Hazardous Products Act of 1980 but it could possibly contain asbestos as late as 1986 (due to stored material and non-compliance with the ban). Most buildings undergo constant renovation, including the removal and replacement of drywall partitions. Attempts to distinguish and delineate asbestos-containing drywall compound from new non-asbestos drywall compound is often unachievable. Therefore, drywall joint compound will be sampled at exterior walls, columns or other locations which are unlikely to have been renovated in an attempt to determine the presence of asbestos in the original drywall compound.

Asbestos cement products and asbestos vibration dampers will be visually identified as ACM where present.

Roofing felts and exterior caulking will be sampled at the client’s request. The Client must ensure that sampling the roof will not void any current warranty. Roof patching by Pinchin will not be completed. Pinchin recommends a certified roofer complete the repair immediately after the sampling has been completed. Pinchin is not responsible or liable for leaks or water damage caused by sampling/repair.

Ontario was the first Canadian Province to ban the use of friable asbestos (March 1986, O.Reg. 654/85). Of the many non-friable materials, only drywall joint compound has been banned in Canada. Therefore, in theory, all other non-friable materials and surfaces in which asbestos could have been used should be sampled for total certainty that it is non-asbestos, even to the present day. In practice, however, asbestos ceased being used in most materials by manufacturers as a result of asbestos concerns. Pinchin is aware of many of the dates that certain materials ceased being manufactured with asbestos.

Based on this knowledge, we suggest that sampling of certain materials is not required after specific dates and our sampling strategy is based on this knowledge. In addition, to be conservative we allow several years past these dates in our strategy. This allows additional time so that stored ACM products would have worked through the supply chain, and allows for some uncertainty in the exact start/finish date of construction and associated usage of ACM. We believe this is a prudent and responsible limitation and that this sampling strategy is appropriate.

A number of materials which might contain asbestos will not be sampled during our assessment and will be presumed to be ACM in our report. Reasons for not sampling these materials include:
- Sampling the materials may be hazardous to the surveyor (ex. electrical hazard);
- Sampling the materials may cause consequential damage to the property (ex. sampling
  - Various materials may cause leaks, ex. roofing and caulking);
  - The material is inaccessible without major demolition (ex. inside boilers etc.)
  - The material is present in such an inconsistent fashion that without complete removal of finishes, the extent of ACM could not be determined (ex. floor leveling compound).

If present, the following materials will be presumed to be asbestos-containing and are best sampled immediately prior to commencing renovation/disturbance:
- components or wiring within motor control centers, breakers, motors or lights
- concrete leveling compound (for floors)
• fire resistant, metal clad finishes
• elevator and lift brakes
• exterior cladding
• soffit and fascia boards at elevated heights
• fire-door cores
• insulation on or in high voltage wiring
• mastics, adhesives and tar mechanical packing, ropes and gaskets
• moulded plastic components (laboratory bench tops)
• paper products where inaccessible (ex. under wood flooring or under metal or slate roofing)
• refractory materials in boilers or incinerators

Summary of the identified ACM in the Golder report is below:

Both assessments were not invasive in nature. Additional materials containing asbestos are likely present within inaccessible areas. Quantities listed in their reports only include accessible materials. None of the results, materials, quantities etc. has been confirmed by Pinchin. Other designated substances, including but not limited to Lead, PBCs, Mercury are also likely to be present and cannot be confirmed to be present without a detailed assessment, sampling program, and analysis.

- Plaster Ceiling Basement (Component 2551);
- Parging Cement on Fittings (Component 2554);
- Transite Asbestos Cement Pipe (Component 2556);
- Tan 9” x 9” Vinyl Floor Tile (Component 2560);
- Parging Cement on Boiler (Component 2566);
- Parging Cement on Domestic Cold Water Pipe Fittings (Component 2570);
- Parging Cement on Hot Water Pipe Fittings (Component 2571);
- Parging Cement on Stream Supply Pipe Fittings (Component 2572);
- Parging Cement on Condensate Pipe Fittings (Component 2573);
- White Preformed Block on Straight Run Pipe (Component 2574);
- Texture Coat on Stairwell Ceiling (Component 2578);
- Aircell on Straight Run Pipe (Component 2586);
- Preformed Block on Straight Run Pipe (Component 2590);
- Transite Fume Hood (Component 2595);
- Transite Cement Board (Component 2596);
- Brown Insulation on Cold Water Straight Run Pipe (Component 2598);
- Heat Shield Over Radiator (Component 2603);
- Transite Asbestos Cement Panel (Component 2604);
- Off White 12” x 12” Vinyl Floor Tile (Component 2608);
- Grey Transite Asbestos Cement Panel (Component 2611);
- Plaster Column Enclosure – Presumed ACM (Component 2613);
- Wiring Insulation – Presumed ACM (Component 2614);
- Transite Counter Top (Component 2615);
- Off White with Black Streaks 12’ x 12” Vinyl Floor Tile (Component 2623);
- Gold Acoustic Material Under Sink (Component 2624);
- Silver Acoustic Material Under Sink (Component 2639);
- Fissures with Spots 2’ x 4’ Ceiling Tile (Third Floor) (Component 2648);
- Black Duct Insulation (Component 2659);
- Flex Duct Connector (Component 2660);
- Exterior Black Duct Insulation (Component 2827); and
- Exterior Window Caulking (Component 2829).

7.3.2 Lead
Each distinctive paint finish present, in more than very limited application, will be sampled for lead content. Paint chips will be collected and submitted to a laboratory for analysis. Locations at which lead paint samples are collected will be recorded on small scale plans.

Possible lead-containing building materials (ex. lead sheeting, batteries, solder) will be identified by appearance and age, and knowledge of historic applications.

7.3.3 Mercury
Building materials suspected of containing mercury will be identified by appearance, age, and knowledge of historic applications. Sampling will not be performed. Dismantling of equipment suspected of containing mercury will not be performed.
7.3.4 Silica
Building materials suspected of containing crystalline silica will be identified by knowledge of current and historic applications. Sampling will not be performed.

7.3.5 Polychlorinated Biphenyls (PCBs)
Light ballasts will not be examined for PCB content. Instead, we will determine if the building has been re-lamped with new energy efficient ballasts. If the building has not been completely re-lamped, we will make the assumption that some PCB ballasts will still be in service.

Exterior caulking and sealants will be analyzed for PCB content.

7.3.6 Visible Mould Growth
The assessments will also include a review for visible mould growth and water damage. The assessment is not intended to be a detailed mould investigation, as would be undertaken to assess occupant indoor air quality issues. Pinchin will not be performing an intrusive investigation for hidden mould growth and will not be able to identify the locations of deposition of mould spores or particles or minor mould growth on building materials which do not exhibit any characteristics of spotting or staining.

7.4 Analysis and Identification of Materials

7.4.1 Asbestos
Asbestos bulk samples will be analyzed at a NVLAP accredited laboratory. Preliminary identification of asbestos fibres will be made using polarized light microscopy, with confirmation of the presence and type of asbestos made by dispersion staining optical microscopy. The analysis will be performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, June 1993. Pinchin Laboratories are certified under the National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos analysis of bulk samples.

Since only one sample of a material is required to determine that the material is asbestos containing, but all samples must be analyzed to state that a material is non-asbestos, the laboratory will stop analyzing samples from a homogeneous material once a result of greater than 0.5% asbestos is detected in any of the samples of that homogeneous material. All samples will be analyzed if asbestos is not detected. This is often referred to as the stop positive approach.

7.4.2 Lead
The bulk analysis for lead will be performed in accordance with EPA Test Method No. 3050B/Method No. 7420; flame atomic absorption at Scientific Analytical Institute (SAI). SAI is accredited by the AIHA, and ELLAP.

7.4.3 PCBs
The bulk analysis for PCBs will be performed using the ASTM test method appropriate to the sample matrix, at ALS Laboratories. ALS Laboratories are accredited by CALA.
8. Structural Assessment

From dates indicated on original drawings, Building 51 was built approximately in 1926. These drawings indicated the structure consists of varying multi-wythe load bearing brick masonry walls (interior and exterior) with stone accents supporting steel joists, pans and concrete in the resident rooms and poured concrete floors in the corridors.

Based on the existing drawings provided by the client, we can not fully ascertain the existing design live load of the building. Information on the drawings indicated poured concrete slabs over the corridors but the rooms consisted of steel joists at varying centres and spans supporting poured concrete slabs on metal pans. From historical records for design live loads, we determined that residential rooms should have been designed to 40 psf and the remainder of the rooms and corridors should have been designed to 100 psf live load. Our analysis of the corridors has confirmed the 100 psf live load in the corridors.

Observations from our site review were:
1. Various cracks observed thru-out the terrazzo flooring would identify some past movement, but not a critical structural issue.
2. 95% of the structure was buried under finishes, but observations indicated no visible cracks in the finishes, which would suggest movement.
3. All parapets require remedial work. Our observations from the exterior side suggest that many years of moisture penetration has caused excessive damage and would suggest all parapets above the roof deck to be re-built. Observations of the parapets from the roof were obstructed with newer roofing applied to the back of the parapets and were probably the major contributor to moisture penetration prior to the roofing installation.
4. Stone parapet caps require re-setting and sealants, but would end up re-built upon the parapet re-building.
5. Steel stairs to the roof should be replaced.
6. Roof surface-mounted wood walkways with wood railings should be re-built.
9. Mechanical / Electrical Systems Assessment

9.1 Mechanical

9.1.1 General

The existing Mechanical Systems in this building have been surveyed by MELEX Engineering Ltd. and evaluated on site on October 8, 2013. In addition, archived Mechanical drawings have been reviewed to establish past renovations in this building. The oldest Mechanical drawings provided by LHSC, were dated at 1961, when major plumbing and HVAC system installations were completed for the old Nurses’ Residence building. No major upgrades of the HVAC or plumbing system were performed since that year, except overhaul or replacement of failing individual pieces of the equipment as described below.

9.1.2 HVAC System

The heating system for this building is provided by a high pressure (60 PSI) steam supplied from the power plant, located in the old hospital building across the street. The source of steam supply will be changed by end of the current year to London District Energy plant. The high pressure steam is reduced in the building to 15 PSI and is used for both the space heating and Domestic Hot Water generation with an application of the steam to water heat exchangers controlled by pneumatically operated steam valves working in 5-15 PSI steam pressure range.

Currently, the building is equipped with two packaged, rooftop type air conditioners and one indoor air handler, serving partial floor areas. All the units exceeded the service life expectancy and some are non-operational. Local room cooling is provided by window type air conditioners. The building is heated by a centrally controlled, perimeter hydronic heating system using cast iron and fin-tube radiators. The heat for perimeter heating is supplied from Building 52, here is generated by steam to water heat exchanger. The heating system is pneumatically controlled with outdoor temperature reset. The individual pieces of the existing HVAC equipment are listed in Appendix A attached at the end of this report.

The majority of the HVAC equipment is non-operational due to its age, as it well exceeded the usable service life. All HVAC equipment needs replacement with a new system suited for the type of occupancy and meeting the current Codes and Standards. The building does not have sufficient fresh air supply as required by current Ontario Building Code and ASHRAE 62 ventilation requirements, even if the existing air handling equipment operation were to be restored to its original condition. Pipes, valves, and fittings of the heating system have reached the end of usable service life and need replacement due to the internal and external corrosion and isolated leaks.

The pipe insulation contains asbestos. The building is equipped only with a very basic, partially deteriorated, pneumatic control system and needs an upgrade to a modern electronic Building Automation System to conserve the energy usage.

9.1.3 Plumbing

Most of drainage and vent piping is transite or cast iron. Condition of all concealed piping could not be established. There are reports of pipe leakage, but considering age of the installation, all piping would require replacement. The Domestic Hot and Cold Water piping has been only partially upgraded over the years from galvanized steel to copper piping. The building is fed with Domestic Cold Water by a 2" main and equipped with a 2" Trident water meter (Picture 1). In addition there is a 2" by-pass main interconnecting water main with North part of the building. There is no backflow preventer downstream of the water meter, as required by the current Codes and Regulations. This water main also serves the standpipe system as described in the Fire Protection section of this report.

![Picture 1 – Domestic Cold Water Meter](image-url)
Domestic Hot Water is generated by steam to water AERCO B-103 water heater (Picture 2), located in the Mechanical Room 047. This water heater was built in 1995 and refurbished in 2010. The heating capacity of the water heater is sufficient for the current needs. The steam condensate from the water heater is pumped to the central condensate return system by Bell & Gossett Model 153C9D condensate pump (Picture 3). This pump is about 25 years old, still operating, but it exceeded the service life expectancy.

Washroom plumbing fixtures consist of elongated, floor mounted, flush tank type toilets and vitreous china, wall hung lavatories with deck mounted faucets (Picture 4a/4b). Due to their age, the replacement parts may be difficult to obtain. The plumbing fixtures do not meet the current water efficiency standards and need replacement.

Cold Water main and connected upstream of the water meter (Picture 1). The fire hose cabinets are equipped with fire extinguishers and appear to be in good condition (Picture 5). The standpipe system is not equipped with a backflow preventer. This installation does not meet the current Ontario Building Code and NFPA standards. Addition of sprinklers will require upgrade of the existing 2" water main from the street to the building to 6" or 8" main.

9.1.4 Fire Protection
This building is not sprinklered. The Fire Protection System consists of a 1-1/2" standpipe system fed from 2" Domestic Cold Water main and connected upstream of the water meter (Picture 1). The fire hose cabinets are equipped with fire extinguishers and appear to be in good condition (Picture 5). The standpipe system is not equipped with a backflow preventer. This installation does not meet the current Ontario Building Code and NFPA standards. Addition of sprinklers will require upgrade of the existing 2" water main from the street to the building to 6" or 8" main.

9.1.5 Summary
The existing Mechanical Systems for this building are obsolete and require replacement with the new HVAC, Plumbing, and Fire Protection systems; tailored to the needs of the future occupants. Depending on the proposed use of the building the retrofit cost can vary between $1.3 Million for Residential occupancy and $2.4 Million for the Commercial/Office occupancy. If THE building IS to be sprinklered, the above costs will increase by $180,000.

9.2 Electrical
9.2.1 Review of Existing Electrical Systems

An initial site visit occurred on October 8, 2013, which included a visual inspection of all power systems including lighting and fire alarm, throughout the building.

Visual Assessment
A site walk-through was conducted to view the electrical systems. All components were examined visually and the condition of the systems was assessed.

Maintenance Reports
Previous maintenance and inspection reports were not found at the facility. It was confirmed by the maintenance manager that very little electrical maintenance was conducted. Only Infrared scans were conducted on the main High Voltage Switchgear to detect any hot spots in the system. No hot spots were found, according to the maintenance manager.

9.2.2 Electrical Distribution System Components

High Voltage Electrical Service Entrance
The incoming power distribution in this facility is rated at 4.16 KV, which is later stepped down via transformers to accommodate a 120/208V power (Picture 1).

The incoming feeders have been replaced by London Hydro to accommodate 27.6KV primary feeders, which are terminated into an outdoor transformer that step down the voltage to 4.16KV. This installation was recently completed by London Hydro recently.

![Picture 1 - 27.6KV/4.16KV Transformer Installed by London Hydro](Image)

The main hydro meter is installed in the Electrical Room #11 (Picture 2). Power is then terminated into S&C switchgear (Picture 3). The switchgear is consists of 9 Cells that distribute power to the following areas in the buildings:

- Cell #1 S&C Fusible switch type SM-5 65E, which feeds Nurses’ Residence (Building 51)
- Cell #2 S&C Fusible switch type SM-AB 65E, which feeds TS8 School of Nursing (Building 50)
- Cell #3 S&C Fusible switch type SM-4 50E, which feeds W.M.C.H (Building 50)
- Cell #4 S&C Fusible switch in Off Position
- Cell #5 S&C Fusible switch type SM-4 50E, which feeds TS1 Substation B
- Cell #6 S&C Fusible switch type SM-4 50E, which feeds TS1 Substation A
- Cell #7 PUC Metering cabinet
- Cell #8 Abandoned feed
- Cell #9 S&C Main incoming breaker (retrofitted recently, when the primary hydro service was upgraded).

![Picture 2 – Hydro Meter](Image)

![Picture 3 – High Voltage Switchgear](Image)

It was noted during the site visit that the buildings on South side of South Street are being fed off Cell 5 & 6 (Picture 4). These buildings are scheduled to be demolished. Facility Manager to note that substations TS1 and TS2 will be affected by this demolition. Feeds to these substations via Cell 5 & 6 shall be isolated prior to demolition work. Demolition contractors are to coordinate shutdown with utility company.
Since S&C switchgear acts as the core of the electrical distribution to various buildings within the facility, we recommend that a comprehensive Electrical Study be performed to determine the useful life of this switchgear. The study called MP4 provides identification of safety risks to facility personnel, identification of reliability weaknesses in the electrical distribution system, identification of non-compliance with current electrical standards, and quantifies business risk due to electrical problems. In addition, the study provides an action plan to address all of the above points. The outcome of this study will cover the following:

1. Electrical System Modernization - prioritization of the investment to address the identified issues in regards to equipment conditions (age, obsolesces, operation, etc.) and/or to increase the reliability of the electrical system (by avoiding single point of failure, etc.)
2. Electrical Distribution Equipment Maintenance – procedures, polices and recommendation for improvement.
3. Management procedures & polices and recommendations for improvement

Based on the outcome of this detailed study, a retrofit plan can be recommended to maintain the operation of the facility, without unexpected power interruption due to failure in main switchgear cells.

**Electrical Distribution**

Power is stepped down from Cell #1 41.6KV to 120/208 via a 225KVA transformer that feeds the Nurses’ Residence switchboard (Picture 5). This switchboard currently feeds a 400A switch that distributes power to the Nurses’ Residence Distribution Center (Picture 6). The distribution center panel which is rated 800A – 120/208V, 3 phase 4 wire manufactured by Siemens ITE and it’s located in the corridor adjacent to Electrical Room #11 (Picture 7). There are 8 electrical panels throughout the space that are fed from this panel. The switchboard and distribution center are over 50 years old and are considered obsolete.
Electrical Panels
Currently, the electrical panels in the building are installed in corridor spaces and service rooms. They provide power to lighting, receptacles, small mechanical equipment, etc. Most of the electrical panels have been upgraded over time; however, presence of old fused panels still exists in some service rooms (Picture 8). Also Taylor panels, which are now obsolete due to lack of replacement breakers, are spotted in few corridors. It is assumed that all the branch wirings are original to the building and are considered obsolete, due to their age.

Recommendation
Based on our visual inspection of the facility, the electrical distribution systems are past their service life expectancy. No maintenance work had been conducted on the main high voltage switchgear, Nurses’ Residence switchboard, distribution center, or electrical panels. It is recommended that all of the electrical systems in the building, including branch circuits and wiring, are to be demolished and redesigned to accommodate the new building use. The main incoming power to the Nurses’ Residence should be removed from the high voltage switchgear and redesigned to accommodate a standalone service, with a separate hydro metering compartment.

The existing high voltage switchgear in Electrical Room #11, which is not in the Nurses’ Residence building, should be studied by an electrical manufacturer to determine the service life expectancy and to provide an upgrade solution.

9.2.3 Fire Alarm
The main fire alarm panel in this facility was replaced earlier this year. The fire alarm currently monitors all the surrounding buildings with the exception of the Health Services Building as it has its own fire alarm system. The new fire alarm panel is located in the main entrance to the Nurses’ Residence building (Picture 9). This panel model is Simplex Grinnell has 19 fire alarm zones that are as follows:

Zone 1: Business Office
Zone 2: GND Floor West Cafeteria Education Building
Zone 3: 1st Floor West A, B, C Wings
Zone 4: 2nd Floor West A, B, C Wings
Zone 5: 3rd Floor West A, B, C Wings
Zone 6: GND Floor East Lunch & Change Rooms
Zone 7: 1st Floor West C, D, E Wings
Zone 8: 3rd Floor West C, D, E Wings
Zone 9: Penthouse B Wing
Zone 10: 6th Floor B Wing
Zone 11: 5th Floor B Wing
Zone 12: 4th Floor B Wing
Zone 13: 2nd Floor Education Building
Zone 14: 1st Floor Education Building
Zone 15: Sub-Basement B Wing Rm (8)

Each of these fire alarm zones consist of groups of smoke/heat detectors and fire alarm bells. The existing fire detection coverage in the facility is very minimal and does not comply with the current Code. New smoke and heat detectors in the all corridors and storage rooms should be installed accordingly.

The existing fire alarm system is currently shared with the building adjacent to Nurses’ Residence. We recommend the relocation of the fire alarm to adjacent space and installation of a new addressable fire alarm panel and detectors to accommodate the new building occupancy.

9.2.4 Lighting
The building is primarily illuminated by recessed acrylic lens fluorescent fixtures with T12 lamps. These lamps are considered to be obsolete and require frequent replacement due to their short life expectancy and low efficiency levels (Picture 10). The exit signs at the facility are about 50 years old, illuminated by incandescent lamps that have also short life expectancy.

We recommend demolishing all the light fixtures, as they cannot be reused in the new building design.

Picture 10 – Obsolete Light Fixtures

9.2.5 Summary
The existing electrical equipment for this building is obsolete and requires replacement with the new Power, Fire Alarm and Lighting systems tailored to the needs of the future occupants. Depending on the proposed use of the building the retrofit cost could vary between $1.16 Million for Residential occupancy and $2.12 Million for a Commercial/Office occupancy.
10. Adaptive Reuse

Adaptive Reuse and Development Opportunities

There are a number of adaptive reuse opportunities for the former LHSC Nurses Residence Building 51. This facility totals approximately 68,390 sf. These opportunities include apartments, mixed use live / work loft style apartments, seniors care apartments units, and commercial office space. Building 51 would adapt to house seniors units due to the existing wall systems in place. There is also opportunity to house public amenity space within an enclosed courtyard feature with balconies increasing the area to 75,740 sf.

The existing building should be restored to maintain a prominent role on the street fabric. Balconies could be added with an independent structure, extended the existing spaces into the courtyard. Figure 3.

Also, there is opportunity to provide an additional design component in the form of an independent structural glazed atrium enclosing the courtyard and the balconies to provide interior year round green space for the units or common amenity space. Figure 4. The atrium would also provide natural light into the units on the existing restored building.

Figures 1 to 4 indicate a possible massing scenario for the restoration and redevelopment of LHSC Building 51. As well, thumbnails including LHSC Building 50 and the adjacent site east of the property on the same block, present a concept development indicating possible expansion of the density for the project site.
Figure 1 Existing Context
Figure 2  Building 51 Restored with Links Removed
Figure 3  Building 51 Restored + Additional Balconies
Figure 4 Building 51 Restored + Additional Balconies + Glazed Atrium
**Historic Case Studies**
There are a number of examples where restored heritage buildings have become successful conversion projects.

The Kemper Lofts in Lynchburg, VA, was developed from an old historic 4 story industrial building was converted into affordable housing. The historic fabric was preserved.
The George Washington School in Kingsport, TN, was a project consisting of a historic rehabilitation and conversion of a 1920’s school into units for elderly housing. As well additional units of new housing were attached to the existing structure to make the project financially sustainable.

A project in Grainger Place, Kinston, NC involved the rehabilitation of an old high school resulting in the development of mixed use apartments combined with a senior center.
Proponents for the restoration and reuse of the former Cook County Hospital Project in Chicago’s West Side developed a proposal for the conversion of the significant structure.

The redevelopment proposal prepared in collaboration with the Chicago architectural firm, included the following building features and components: restoration of the beautiful exterior façade, renovation of the building interior, construction of 320 loft residential units within the building, construction of a health and wellness facility.
11. Embodied Energy & Heritage Buildings

There is a direct correlation between the reduction in embodied energy, heritage preservation, and positive impact to the environment.

In general, there are two forms of embodied energy in buildings: initial embodied energy which is the non-renewable energy consumed in the acquisition of raw materials, their processing, manufacturing, transportation to site, and construction; and recurring embodied energy in buildings representing the non-renewable energy consumed to maintain, repair, restore, refurbish or replace materials, components or systems during the life of the building.

The ratio of embodied energy to lifetime consumption increases as buildings become more energy-efficient. Embodied energy is measured as a quantity of non-renewable energy per unit of building material, component or system. What is very important in the measure of embodied energy are the associated environmental implications of resource depletion, greenhouse gases, environmental degradation and reduction of biodiversity. As a rule of thumb, embodied energy is a reasonable indicator of the overall environmental impact of building materials, assemblies or systems.

The amount of embodied energy in buildings varies considerably. Initial embodied energy consumption depends on the nature of the building, the materials used and the source of these materials. The recurring embodied energy is related to the durability of the building materials, components and systems installed in the building, how well these are maintained, and the life of the building. The longer the building survives, the greater the expected recurring energy consumption.

For most building materials, the major environmental impacts occur during the initial processes. The total amount of embodied energy may account for 20% of the building’s energy use, so reducing embodied energy can significantly reduce the overall environmental impact of the building. Heritage buildings reduce the initial processes due to reuse of major components and elements.

Embodied energy must be considered over the lifespan of a building, and in many situations, a higher embodied energy building material or system may be justified because it reduces the operating energy requirements of the building. A durable material with a long lifespan such as aluminum may be the appropriate material selection despite its high embodied energy. As the energy efficiency of a building increases, the embodied energy of the building materials will also become increasingly important.

There are key criteria in calculating and reducing the amount of embodied energy in a building. During the building design process, there are a number of considerations particularly in respect to:

- the durability of building materials
- how easily materials can be separated
- use of locally sourced materials
- use of recycled materials
- specifying standard sizes of materials
- avoiding waste
- selecting materials that are manufactured using renewable energy sources.

Heritage buildings should be a key consideration in the reduction of embodied energy as they are generally constructed of more durable local materials, the main building components are reused, and waste is being avoided. The calculation of the amount of embodied energy in a particular building is very complex. Furthermore, the cost savings in association with both initial embodied energy and recurring embodied energy is also difficult to calculate. What is important is that there is a reduction in the use embodied energy and a positive correlation between heritage buildings and the impact on the environment.

References:
2. Level: The authority on sustainable buildings www.level.org.nz;
12. Cost Area Analysis

12.1 Estimate of Construction Costs
The estimate of probable costs has been developed based on four (4) types of adaptive reuse projects for the building for the year 2013. The costs vary based on the use and the number of units developed for that use. Higher costs are generally associated with Seniors Care Units due to the smaller unit size, increased mechanical and electrical requirements and required support amenities. Estimates have not been prepared for new building areas providing higher density.

The items which are not included in costs are as follows:
- the cost of land acquisition
- furniture, furnishings, and equipment
- harmonized sales tax
- possible rebates
- development charges
- cost of annual inflation

General Contractors overhead and profit is based on 10% of the estimate of probable costs.

Soft costs for legal, surveying, testing is based on 5% of the estimate of probable costs.

The project contingency is based on 8% of the estimate of probable costs.

The consultant fees are based on 10% of the estimate of probable costs.

12.2 Estimate Assumptions
The estimates for Building Condition Assessments as prepared are considered Class ‘C’ Estimates. Class ‘C’ Estimates are general defined as i) ballpark estimates used only in preliminary discussion of feasibility of projects and ii) sufficient for selecting correct investment decisions, but not used for making contractual commitments. These include the completion of all work necessary to undertake preliminary design, knowledge of site conditions adequate to enable identification of site related risks, and development of corresponding contingency costs. This level of estimate typically carries an expected precision variance -15% to +25%.

In terms of assumptions, in general we have viewed this building as an adaptive reuse with a new occupant for example should office space be the determined use it would house a new tenant or multiple tenants in lieu of LHSC. The following are our assumptions as per the estimate line items:

1. Site Work – services to the building exist but may need to be upgraded due to the increased use of the building and age of the services. This includes, gas, electrical, water, sanitary and storm systems.
2. Selective Demolition & Remediation – Elements of the building would be removed to the structure including wall, floors, and ceiling finishes. Selective demolition would be required to incorporate barrier free requirements.
3. Asbestos Abatement – wall, floors, ceiling finishes as well as mechanical and electrical abatement would be required.
4. Masonry Restoration – costs are based on estimates provide to us by a masonry restoration contractor who was involved during the onsite BCA review. Masonry repair is required on the exterior of the building.
5. Windows – windows are being restored.
6. Doors & Hardware – existing doors are reused where possible and modified to accommodate required hardware and fire ratings. New doors are installed with new hardware and will match the aesthetic of the existing building.
7. Barrier Free Access Entrance / Ramps – presently non-existent. Barrier free access will be incorporated to meet AODA, FADS, and OBC.
8. Interior Renovations – insulation, new walls where required for program, new wall, ceiling, and floor materials and finishes.
9. Elevator – upgraded to meet FADS, AODA, and barrier free standards.
10. Fire Sprinkler System – inclusion of a new sprinkler system to minimize the impact of the new construction on the heritage features of the building ie. provide
relief on fire rating and fire separation requirements.


12.3 Estimate Methodology

The estimates were prepared utilizing standard SJMA proprietary methods to determine the costs for these projects including;

1. Discussions with local general contractors.
2. Discussions with local trades.
3. Comparison with database of project costs for similar projects (15 years).
4. Comparison with similar projects completed by colleagues.
5. References to RS Means Construction Cost Data.

Based on our experience, it is our opinion that the construction of a new building on this site of the same size, area, quality, and aesthetic would cost approximately 15 to 25% in additional capital costs compared to the restoration of the existing building. The reasons for this would be the higher costs for site work preparation, demolition, and abatement. This also presumes that the quality of the heritage aesthetic is duplicated in the new construction.

The costs are for existing building areas only and do not include for additional area or buildings as indicated in the options for possible site expansion.
## Estimate of Construction Cost

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## Area / Density Analysis

### Existing Building

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<tr>
<td>Basement</td>
<td>17,290</td>
</tr>
<tr>
<td>First</td>
<td>17,200</td>
</tr>
<tr>
<td>Second</td>
<td>17,200</td>
</tr>
<tr>
<td>Third</td>
<td>16,700</td>
</tr>
<tr>
<td><strong>Total Existing</strong></td>
<td><strong>68,390 sf</strong></td>
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</table>

### Additional Density

<table>
<thead>
<tr>
<th>Additional Type</th>
<th>Square Feet</th>
</tr>
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<tbody>
<tr>
<td>Glass enclosure</td>
<td>5,450</td>
</tr>
<tr>
<td>Balconies</td>
<td>1,900</td>
</tr>
<tr>
<td><strong>Total Existing</strong></td>
<td><strong>7,350 sf</strong></td>
</tr>
</tbody>
</table>

| **Total Area** | **75,740 sf** |
13. Conclusions

The existing concrete and masonry building is structurally sound and of high quality of construction. It should also be noted that the exterior masonry is considered an important heritage character defining element. The existing infrastructure, (mechanical, electrical) is outdated and will need to be replaced if the facility is to be readapted to a new use.

From the building condition assessment, the building does contain asbestos and possibly other hazardous materials. While these materials have to be handled and removed under provincial regulations it should not be viewed as an overwhelming or deciding factor because the cost of hazardous materials remediation is a constant value whether the building is demolished or retained.

We concur with the cultural heritage assessment by Nancy Tausky, the building does have substantial architectural and historical value and adds value to the overall streetscape. We also feel the interior heritage features noted above are worthy of retention in any adaptive reuse proposal.

There are a number of probable adaptive reuses for the facility including residential apartments, seniors’ care apartments, live / work loft style units, and commercial office.

The economic viability of each of these adaptive reuse opportunities needs to be tested with the preparation of a detailed business model. The sustainability of the use may be reinforced by the expansion of the gross area to provide additional complimentary uses to the design model.

For the purposes of the report, expanded areas have been identified for consideration for the long term sustainability of the project. These additional areas could also be phased in our time for the project. The report also provides for cursory conceptual site ideas to increase the density of the site.

Based on the observations of the existing structure by the consulting team, and the review of the supporting reports and documentation, we are of the opinion that the building is an important heritage asset, structurally sound, and viable building for adaptive reuse.
Appendices

A  Existing HVAC Equipment
B  Existing Roof Assessment Summary List
C  Photographs
APPENDIX “A”

Existing HVAC Equipment
<table>
<thead>
<tr>
<th>Drawing reference #</th>
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</thead>
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<td>Location</td>
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<tr>
<td></td>
<td>Room #</td>
</tr>
<tr>
<td>Area served:</td>
<td>Basement Locker Rooms</td>
</tr>
<tr>
<td>Equipment type:</td>
<td>Air Handler</td>
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<td>Make</td>
<td>n/a</td>
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<tr>
<td>Model #</td>
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</tr>
<tr>
<td>Heating capacity:</td>
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</tr>
<tr>
<td>Year installed:</td>
<td>1961</td>
</tr>
<tr>
<td>Cooling capacity:</td>
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</tr>
<tr>
<td>Service life expectancy:</td>
<td>25</td>
</tr>
<tr>
<td>CFM rating:</td>
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</tr>
<tr>
<td>Remaining service life:</td>
<td>0</td>
</tr>
<tr>
<td>Comments:</td>
<td>Unit obsolete. Not operating since 1990.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
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<td></td>
<td>Room #</td>
</tr>
<tr>
<td>Area served:</td>
<td>Building 51</td>
</tr>
<tr>
<td>Equipment type:</td>
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</tr>
<tr>
<td>Make</td>
<td>B &amp; G</td>
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<td>Year installed:</td>
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<tr>
<td>Head:</td>
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<tr>
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<td>Comments:</td>
<td>Pump obsolete, but in working condition</td>
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<td></td>
<td>Room # outside</td>
</tr>
<tr>
<td>Area served:</td>
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</tr>
<tr>
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<tr>
<td>Make</td>
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<tr>
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<td></td>
<td>Room # outside</td>
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<td>Area served:</td>
<td>Telecommunications</td>
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<td>Unit obsolete, but in working condition</td>
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<td>5</td>
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<tr>
<td>---------------------</td>
<td>---</td>
</tr>
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<tr>
<td>Location</td>
<td>Building # 51</td>
</tr>
<tr>
<td></td>
<td>Room # perimeter</td>
</tr>
<tr>
<td>Area served:</td>
<td>Building 51</td>
</tr>
<tr>
<td>Equipment type:</td>
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<td>n/a</td>
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<tr>
<td>Year installed:</td>
<td>1961</td>
</tr>
<tr>
<td>Cooling capacity:</td>
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<tr>
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<td>20</td>
</tr>
<tr>
<td>CFM rating:</td>
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<tr>
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<td>Comments:</td>
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</table>

<table>
<thead>
<tr>
<th>Drawing reference #</th>
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</thead>
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</tr>
<tr>
<td>Location</td>
<td>Building # 51</td>
</tr>
<tr>
<td></td>
<td>Room # perimeter</td>
</tr>
<tr>
<td>Area served:</td>
<td>Building 51</td>
</tr>
<tr>
<td>Equipment type:</td>
<td>Cast iron radiator</td>
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<tr>
<td>Make</td>
<td>n/a</td>
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<td>Model #</td>
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<tr>
<td>Heating capacity:</td>
<td>n/a</td>
</tr>
<tr>
<td>Year installed:</td>
<td>&gt;1961</td>
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<td>Cooling capacity:</td>
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<td>Comments:</td>
<td>Radiator obsolete, but in working condition.</td>
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<tr>
<td>Drawing reference #</td>
<td>7</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------</td>
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<tr>
<td>Field inventory #</td>
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<tr>
<td>Location</td>
<td>Building # 52</td>
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<td>Room #</td>
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<tr>
<td>Area served:</td>
<td>Buildings 51 and 52</td>
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<tr>
<td>Equipment type:</td>
<td>Heat exchanger</td>
</tr>
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<td>Make</td>
<td>Armstrong</td>
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<td>WS-1</td>
</tr>
<tr>
<td>Flow</td>
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<td>Head</td>
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<tr>
<td>Horsepower</td>
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<tr>
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<td>24</td>
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<td>Comments:</td>
<td>Heat exchanger rebuilt last year, in good working condition.</td>
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<table>
<thead>
<tr>
<th>Drawing reference #</th>
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<td>Field inventory #</td>
<td>052-22002</td>
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<td>Room #</td>
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<tr>
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<td>Building 51 perimeter heat</td>
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<td>Armstrong</td>
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<td>250</td>
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<td>Head</td>
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<td>1991/2012</td>
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<tr>
<td>Remaining service life:</td>
<td>14</td>
</tr>
<tr>
<td>Comments:</td>
<td>Pump rebuilt last, in working condition.</td>
</tr>
</tbody>
</table>
Notes:

1. Minor exhaust fans are not included in this report.

2. Service life expectancy for the HVAC equipment is based on AHRAE and CIBSE published data.
APPENDIX “B”
Existing Roof Assessment
<table>
<thead>
<tr>
<th>LHSC - Bldg. 51 (formerly Nurses Residence)</th>
<th>Roof Section</th>
<th>Year of Installation</th>
<th>Size (ft²)</th>
<th>Height (ft)</th>
<th>Roof Type</th>
<th>Condition</th>
<th>Replacement Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>51.1.1</td>
<td>1995</td>
<td>217</td>
<td>8</td>
<td>Asphalt Shingles</td>
<td>Poor</td>
<td>$976.50</td>
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<tr>
<td></td>
<td>51.2.1</td>
<td>1995</td>
<td>810</td>
<td>28</td>
<td>Modified Bituminous Membrane Roofing (SBS)</td>
<td>Poor</td>
<td>$16,200.00</td>
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<tr>
<td></td>
<td>51.3.1</td>
<td>1981</td>
<td>218</td>
<td>37</td>
<td>Conventional BUR - Hot applied</td>
<td>Poor</td>
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</tr>
<tr>
<td>51.3.2</td>
<td>1981</td>
<td>217</td>
<td>37</td>
<td>Conventional BUR - Hot applied</td>
<td>Poor</td>
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<tr>
<td>51.4.1</td>
<td>1981</td>
<td>11,869</td>
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<td>Poor</td>
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<td>40</td>
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<td>Poor</td>
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<td>Section</td>
<td>Year</td>
<td>Square Feet</td>
<td>Age</td>
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<td>Condition</td>
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<td>Poor</td>
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<tr>
<td>51.7.1</td>
<td>1981</td>
<td>14</td>
<td>50</td>
<td>Asphalt Shingles</td>
<td>Poor</td>
<td>$560.00</td>
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</table>
APPENDIX “C”
Photographs