60 Victoria Street North, Kitchener

Draft

Heritage Conservation Plan

Project Location:

60 Victoria Street North, Kitchener, ON

Prepared for:

Region of Waterloo
150 Frederick Street, 4th Floor
Kitchener, ON N2G 4J3

Prepared by:

MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

February 28, 2025
Revised: April 8, 2025

MTE File No.: 33223-301

Engineers, Scientists, Surveyors.

Contents

Appendices

1.0 EXECUTIVE SUMMARY

MTE Consultants, Inc. has been retained by the Region of Waterloo to prepare a Heritage Conservation Plan for the existing building at 60 Victoria Street North, Kitchener. The subject property contains the Rumpel Felt building, a three-storey felt factory that was built c. 1913 with three additions constructed in 1942, 1962, and 1968, respectively. The Region of Waterloo desires to demolish the three additions while preserving the 1913 building in preparation for the adjacent future transit hub (Kitchener Central Transit Hub). The existing additions will impede the plans for the Transit Hub and the demolition will allow the transit hub to proceed while conserving the heritage resource on the site, which is the 1913 structure. The plans for the restoration and redevelopment or adaptive reuse of the original Rumpel Felt building can then proceed separately. The Heritage Impact Assessment, prepared by The Landplan Collaborative Ltd. with John MacDonald Architect Inc., outlines the character defining element of the site as the 1913 building which will be maintained during reuse or redevelopment. The remaining additions to the site are not considered to be character defining elements. This Conservation Plan is intended to serve as fulfillment of the requirements of the conditional approval of site Plans application for the following items.

- **Conservation Plan** including a condition survey of the existing 1913 façade and guidance for the stabilization and removals during demolition, as well as guidance on repairs and long term maintenance of the façade following demolition.

This plan, although providing a basis for the development of the reports listed below, does not constitute these reports. These reports shall be provided separately, prior to commencement of any demolition, grading or construction activity on the site.

- **Risk Management Plan** commenting on the means and methods to mitigate vibration damage.
- **Temporary Protection Plan**, including a **Demolition and Stabilization Plan** showing the means and methods to be used to minimize potential damage to the existing façade during construction.
- **Structural Condition Assessment Report** showing existing condition of the structure, recommendations for repairs needed to address deterioration, and its capacity to withstand the proposed changes

  As part of this plan, a structural condition assessment of the existing façade was completed in 2011 and an updated report completed April 2025. These reports are included in **Appendix B** and **Appendix C** of this plan. This assessment focuses on the original 1913 building façades, select interior original components, and the massing of the original structure for its contribution to the spatial and historical experience for the public, which represent the heritage resource of this building. This conservation plan outlines the means by which these heritage resources, in the form of the existing façades, shall be conserved and the requirements for that conservation for the short, medium and long term. As preservation of the façades were deemed the method of conservation to be employed for this site, protecting and shoring the structure in place during the demolition of the additions is necessary. Necessary repairs for preservation are recommended to stop worsening deterioration from roof leaks and weathering as part of this project. This plan is outlined in the descriptions below.

2.0 OWNER CONTACT INFORMATION

Multimodal Hub Project Coordinator- Christa De Wys
CDeWys@regionofwaterloo.ca

Regional Municipality of Waterloo
150 Frederick Street
Kitchener, ON N2G 4J3

3.0 EXISTING CONDITIONS

The subject property is a three-storey felt factory located at 60 Victoria Street North in Kitchener, Ontario. The original building was built in 1913 and has three later additions built in 1942, 1962, and 1968. The original 1913 structure is a combination of load bearing brick masonry and steel framing bearing on steel columns and beams infilled with board-formed concrete floor slabs. The original 1913 roof is constructed with sloped steel beam and purlin framing with joist infill. There are large arched openings around the building façade with a combination of various window vintages and infilled sections of split face architectural concrete block, along with red metal cladding. The Boiler house portion of the original building is of similar construction.

The 1942 addition was constructed with similar techniques however the floors are panel-formed in contrast to the board-forms of the original structure. The west face of this addition has been removed with the additions of the 1962 and 1968 sections. The foundation wall can still be observed at the main floor level. The south wall now serves as an interior wall. Part of this addition contains a large brick chimney that is not part of the original 1913 construction.

The 1962 and 1968 additions are steel framed and the exterior perimeter walls are not load bearing which can be seen through the continuous architectural strip windows and fiberglass translucent panes. Muli-wythe terra cotta masonry units, also known as speedtile, clad the exterior walls. Existing foundations consist of poured in place concrete.

On the west side of the 1913 structure, there is an undated shed addition that is not original to the building and detracts from the heritage resources of the façade. There are also remnants of a salt storage silo.

The 1913 building will be preserved with restoration of the east wall, currently forming part of the 1942 addition. As the 1913 building was in place prior to the addition, demolition is not expected to largely affect the structure except where beam and other connections were made along the east wall. There is a stairwell structure part of the 1942 addition which will remain in place and not be demolished. The 1962 and 1968 additions are connected to the 1942 addition and have no sharing walls with the original structure.

The east wall of the 1913 building has been generally sheltered from weather and is in serviceable condition; however, localized damage was noted in several areas and repairs are expected when the structural connections of the 1942 addition are removed. The east wall is also finished with green and white paint which will be exposed after demolition takes place. The paint is to remain until the building is repurposed.

Along the remaining façades of the 1913 building there is localized brick deterioration, and the mortar joints are in varying states of repair, with some joints and bricks having been previously repaired with non-matching modern materials. There is noted concrete deterioration of the entrance canopy as well. These are further discussed in the updated Structural Condition Assessment, 2025.

It is concluded that the existing façades (north, east, west and south) are adequate to sustain the demolition work required.

4.0 HERITAGE RESOURCES

4.1 Heritage Description

60 Victoria Street North is a three-storey 20th century brick building. The 1913 original building is listed on the Heritage Kitchener Committee Inventory of Heritage Buildings. It is an example of the vernacular industrial construction of its time and contains distinct columns and porch entry. It is located on the corner of Duke Street (formerly Edward Street) and Victoria Street, built tight to the street. The building is located within an area centred around the main rail corridor and industrial sector where many factory sites, worker housing, and prominent industrialists once lived. Buildings along this landscape typically contain the physical character of the main building being constructed close to the public way which it fronts, bearing an architectural design highlighting the main entrance. It is within the Warehouse District of the City of Kitchener within the Region of Waterloo. The principal resource that contributes to the heritage value is the building. The legal description is PT LOTS 10, 11 &12, LTS 13, 14 &15, PT LANE CLOSED BY BY-LAW #971978 PL374, PTS 2-9 58R6453: Kitchener. S/T INT IN 983885. S/T983887.

4.2 Statement of Cultural Heritage Value or Interest

60 Victoria Street North is recognized for its design/physical, and historical/associative value.

The Property at 60 Victoria Street North demonstrates design or physical value as an early example of an early 20th century vernacular industrial construction. The building has many intact original elements including brick, original boiler, door hardware, arched window openings, load bearing brick walls and original entry porch.

The Property has historical and associative value because it is an example of an industrial building in this section of Victoria Street North and contributes to the public spatial and historical experience of the rail corridor.

4.3 Heritage Attributes

The heritage attributes supporting the cultural heritage value of the Property are represented in the c. 1913 three-storey, brick building. As reported in the Heritage Impact Assessment, they include:

- Original 1913 façade (Victoria Street, adjacent to 50 Victoria, and rail side);
- Riveted shear plate column construction;
- Goods lift (circa 1913);
- Door hardware;
- Original boiler;
- Wood timbers (presently used as the top course of the north retaining wall to the north parking lot, further discussion below on the removal of these timbers);
- Multi-paned window with metal mullions and pivoting panels;

- Red brick walls;
- Painted sign above the first storey of the front façade that reads “The Rumpel Felt Co. Limited”;
- Painted sign below the roof line of the rear façade that reads “The Rumpel Felt Co. Limited Felts for Every Purpose”;
- Entry columns and architrave to the roof of the entry porch;
- The massing of the building itself, fronting onto Victoria Street north, for its larger contribution to public spatial and historical experience;
- The north-south orientation of the building; and,
- The proximity to the rail line.

5.0 CONSERVATION PRINCIPALS AND GUIDELINES

This Plan follows recognized heritage conservation standards and guidance from the *Standards and Guidelines for the Conservation of Historic Places in Canada* (*S&G*), and *Ontario’s Eight Guiding Principles for the Conservation of Built Heritage Properties* (*Eight Guiding Principles*). The applicable standards from the *S&G* and the applicable principles from the *Eight Guiding Principles* are identified below.

5.1 Standards and Guidelines for the Conservation of Historic Places in Canada

The *S&G* has been adopted by most federal agencies, provinces, heritage agencies, and many municipalities as the guiding document for heritage work. They are considered best practice guidance for heritage conservation in Canada.

The *S&G* document is a tool to help guide change for cultural heritage resources. It provides an overview to the conservation decision-making process, identifies appropriate conservation treatments, and provides standards and guidelines appropriate for conservation. In the context of the *S&G*, conservation is understood to embrace several key concepts including preservation, rehabilitation, and restoration. These terms are defined as follows:

Conservation: All actions or processes that are aimed at safeguarding the character-defining elements of an historic place 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;

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

Rehabilitation: The action or process of making possible a continuing or compatible contemporary use of an historic place, or an individual component, while protecting its heritage value; and.

Restoration: The action or process of accurately revealing, recovering or representing the state of an historic place, or of an individual component, as it appeared at a particular period in its history, while protecting its heritage value.[1]

The proposed redevelopment is a ***Preservation*** project. Preservation involves the maintaining and protecting a building's heritage value by retaining the heritage attributes of the place. Preservation is considered as a primary approach when materials, features and spaces of the historic place are essentially intact and convey the historic significance without extensive repair or replacement. The preservation standards applicable to this project are identified in the table below.

Standard #	Standard
1	Conserve the heritage value of a historic place. Do not remove, replace or substantially alter its intact or repairable character defining elements. Do not move a part of an historic place if its current location is a character-defining element. • *The 1942, 1962, and 1968 additions, the chimney, the salt delivery system, three sheds, and a concrete beam over two concrete pillars on the north side are being demolished. These elements do not have heritage value. Wood timbers found over a retaining wall were noted as having heritage value in the HIA however; they were referred to as wooden pipes. After site review, it has been determined these are not pipes, rather just additional timbers forming the top of the wall. As these are not connected to the 1913 building nor do they form part of the building's construction, these will be removed in the demolition process. The original 1913 structure is to remain intact with minimal restoration after the demolition.*
2	Conserve changes to an historic place that over time, have become character-defining elements in their own right. • *Per the HIA, there are no changes over time that have become character defining, although the additions over time have compromised the character of the original building. Through demolition of the additions, minor masonry restoration will be carried out on the east wall where structural connections of the building additions will be severed from the original 1913 structure. Wall openings will also be infilled with salvaged brick from the chimney. The east wall is currently painted green and white which will remain and the brick repairs and infills will be the colour of the chimney brick. A section of the east wall will also be overclad with sheet metal siding to match the siding at infill areas on the other façades. Three sheds will be removed, as well as the salt delivery system and the chimney which have not been deemed heritage attributes.* • *Reversing past changes on other façades is reserved for the planned future developer.*
3	Conserve heritage value by adopting an approach calling for minimal intervention.

[1] Canada's Historic Places, "*Standards and Guidelines for the Conservation of Historic Place in Canada*," Second Edition, 2010, https://www.historicplaces.ca/media/18072/81468-parks-s+g-eng-web2.pdf, 15-16.

Standard #	Standard
	• *As per the HIA, intervention will likely be required to adaptively re-use the building. This is currently unknown and outside the scope of the demolition project as the original building will remain in place and unoccupied after demolition. However, in the future redevelopment, the 1913 building is to remain in full and in-situ. It is recommended that the new construction be compatible with but distinct from the exiting architectural design complete with appropriate setbacks and stepbacks so focus is retained on the heritage resource. Conservation of the heritage resource is expected to inform future site design and follow best conservation practices*
4	Recognize each historic place as a physical record of its time, place and use. Do not create a false sense of historical development by adding elements from other historic places or other properties, or by combining features of the same property that never coexisted. • *Temporary sheet metal siding is to be installed over part of the east brick façade where it will become exposed during the demolition of the additions. This will be used as temporary protection of the façade until the final redevelopment plans are completed. New cladding is to match already installed sheet metal cladding infills of windows at other façades. This is in addition to other brick infills on the east wall and repairs where the existing beams connect to the building.*
5	Find a use for an historic place that requires minimal or no change to its character-defining elements. • *Temporary sheet metal siding to be installed over the east existing brick façade where it will become exposed during the demolition of the additions. Cladding is to match already installed sheet metal cladding infills of windows at other façades. Additional masonry infills and repairs on the same east elevation will be completed using the salvaged masonry from the chimney.*
6	Protect, and if necessary, stabilize an historic place until any subsequent intervention is undertaken. • *The original 1913 structure was built as a stand-alone structure and is inherently stable. The 1913 building is being protected from any damage that could result from the demolition. The building will be maintained by the Region until the redevelopment/reuse plans are implemented.*
7	Evaluate the existing condition of character-defining elements [heritage attributes] to determine the appropriate intervention needed. Use the gentlest means possible for any intervention. Respect heritage value when undertaking an intervention. • *Temporary sheet metal siding to be installed over the existing brick façade where it will become exposed during the demolition of the additions. Cladding is to match already installed sheet metal cladding infills of windows at other façades. No other significant alterations are planned for the remaining façades.*

Standard #	Standard
8	Maintain character-defining elements on an ongoing basis. Repair character-defining elements by reinforcing their materials using recognized conservation methods. Replace in kind any extensively deteriorated or missing parts of character-defining elements, where there are surviving prototypes. • *The building is currently unoccupied and generally maintained by the Region. The roof has several leaks which are recommended for immediate repair to mitigate deterioration of the building. Shoring is also installed on the third floor to support the roof structure from current snow load. This shoring will remain in place during demolition and be monitored. Brick from the chimney demolition will be used to infill the beam pockets on the east façade.*
9	Make any intervention needed to preserve character-defining elements physically and visually compatible with the historic place and identifiable on close inspection. Document any intervention for future reference. • *The updated structural condition Assessment has outlined recommendations for future intervention at the time of adaptive reuse. These include repairs to the front porch canopy, removing the vines over the brick, and completing localized brick and mortar repairs. More immediate recommendations include roof membrane repairs to mitigate ongoing leakage.*

5.2 Eight Guiding Principles in the Conservation of Built Heritage Properties

The Eight Guiding Principles, compiled by the Ministry of Tourism, Culture and Sport (now the Ministry of Citizenship and Multiculturalism) are useful as a tool to help guide change to cultural heritage resources. These principles are intended to provide a basis for decisions concerning "good practice" in heritage conservation. The applicable principles are identified in the table below.

5.2.1 Conservation Approach and Recommendations

The General Conservation Plan outlines the conservation approach and recommendations for short-, medium-and long-term conservation work. This section incorporates recommendations based on the professional experience and expertise of this Plan's author and reviewers.

Principle #	Principle
1	Respect for documentary evidence: Do not base restoration on conjecture. Conservation work should be based on historic documentation such as historic photographs, drawings and physical evidence. *(Please see the HIA for documentary evidence.)*
2	Respect for the original location: do not move buildings unless there is no other means to save them. Site is an integral component of a building or structure. Change in site diminishes the cultural heritage value considerably. *(The building is planned to remain in its original location.)*
3	Respect for historic materials: repair/conserve–rather than replace building materials and finishes, except where absolutely necessary. Minimal

Principle #	Principle
	intervention maintains the heritage content of the built resource. *(Original materials will be repaired and reused.)*
4	Respect for original fabric: repair with like materials. Repair to return the resource to its prior condition, without altering its integrity. *(Like materials shall be utilized in all repairs.)*
6	Reversibility: alteration should be able to be returned to original conditions. This conserves earlier building design and technique, e.g. When a new door opening is put into a stone wall, the original stones are numbered, removed and stored, allowing for future restoration. *(Original materials shall be salvaged and stored.)*
7	Legibility: new work should be distinguishable from old. Buildings or structures should be recognized as products of their own time, and new additions should not blur the distinction between old and new. *(New work will be part of the redevelopment plan for the site and is beyond the scope of this portion of the current project.)*
8	Maintenance: with continuous care, future restoration work will not be necessary. With regular upkeep, major conservation projects and their high costs can be avoided. *(Maintenance and upkeep plan will be part of the future adaptive reuse or redevelopment.)*

6.0 GENERAL CONSERVATION PLAN

It is the intent of the conservation plan to protect the original 1913 building during the demolition of the 1942, 1962, and 1968 additions. As part of the demolition, masonry repairs and infilling select openings will be required where structural connections of the additions are severed at the original building. This is to take place only on the east façade. All other façades of the 1913 building will remain.

In order to better illustrate the conservation plan, we have broken it down into short-, medium- and long-term requirements.

6.1 Short Term Conservation Work

1. There is no need for immediate repair or stabilization of the heritage attributes and, therefore, there is no cost associated with this work.

6.2 Medium Term Conservation Work

1. Shoring and demolition shall be performed per the requirements of the contract documents prepared by the design team. These plans are attached for reference.
2. Shoring and demolition shall be performed under the direction of both a professional engineer and the Heritage Professional.
    - Sound brick, similar to the existing 1913 building, will be salvaged from the demolished chimney in a secure manner. Brick shall be covered and protected from weather. Bricks shall be segregated between sound and unsound brick.

3. Where existing doorways and openings along the east wall are exposed, they are to be infilled as per the demolition details with localized sheet metal siding, colour and profile to match the other existing siding infills at other façades. As sheet metal siding is not being installed over the entirety of the east façade, there will be masonry repairs at beam connection points and other wall openings will be infilled with masonry. Full thickness wall infills are to match the exiting adjacent wall construction. These are detailed in the demolition drawings.
    - Where beams connect to the 1913 masonry wall, unbolt beams and remove clips. Cut away beam and infill pocket left behind by the removed beam with salvaged brick. Salvaged brick from the chimney will be used to complete infills where there are currently beam connections to the 1948 addition, and for other façades that require brick repairs.
4. Existing shoring on the third floor of the original building is to be reviewed to note original position and conditions. It is to be periodically reviewed during demolition to ensure the shoring remains sound. The shoring is currently in place to provide additional support to the roof structure to manage current snow loads.
5. Saw cut and chip away existing floor slabs in the 1942 addition where it abuts the wall of the 1913 building. Care is to be taken to minimize damage to existing wall masonry. Complete localized masonry repairs with salvaged brick. Match mortar type, hardness and colour. Match grout colour and joint profile. The contractor will be required to do a mock-up for review and approval by a Professional Member of the CAHP.
6. Complete localized masonry repointing and replacement prior to installing the z-girts for the new sheet metal cladding to ensure sound anchorage of the cladding system.
7. At the roof level, build up the lower parapet wall to match the existing height of the 1913 parapet following details and tie-ins as per the demolition details.
8. All new materials proposed for use in the restoration of the façade shall be submitted for review and approval of a Professional Member of CAHP prior to incorporation into the design of the new façade. Metal cladding is to match profile and color of existing metal cladding located around the 1913 building.
9. Restoration shall be performed under the direction of the Engineer of Record and a Professional Member of CAHP.
10. No changes will be made to the painted signage on the north and south façade.
11. The front entry porch architecture will receive a hoarding enclosure to minimize potential of damage from the removal of rubble and debris from demolition. Recommended repairs indicated in the updated Structural Assessment are to be undertaken in the future and are not required for the demolition process.
12. Interior boiler, door hardware, riveted shear plate column connections, goods lift, and other remaining façade will remain unaltered from their existing conditions.
    - Make repairs to the roof around drains and any noted open seams to address water leakage. Install new roofing membrane flashing where the parapet wall is to be built up.
    - Carry out a roof investigation to fully assess the roofing membrane and structural deck members at leak locations of the 1913 building.

6.3 Long Term Conservation Work

1. The property shall be regularly reviewed and maintained in keeping with good conservation practices until plans for future adaptive reuse or redevelopment are in place. If redevelopment plans are delayed, the property shall be reviewed by the Heritage Professional at least every two years to confirm the structure remains stable and is not in need of any immediate repairs.

7.0 REPORT PREPARER

This report has been authored by Kurt Ruhland, P.Eng., CAHP and Cassandra Fusato, P.Eng., CAHP-Intern. Kurt has been a professional consulting engineer in the building industry for over 30 years and a member of the Canadian Association of Heritage Professionals (CAHP) since 2016. Kurt has been involved in the structural restoration of dozens of designated and non-designated heritage buildings across Southern Onterio. Notable projects include the Elora Mill restoration in Elora, the restoration of Devereaux House in Halton Hills and the renovation of Creelman Hall at the University of Guelph. Cassandra has 10 years of industry experience within building restoration and building science. She has been a CAHP Intern since 2024 and has worked on building and façade restoration of various types. She has been involved in helping with the heritage restoration planning of the Kingston City Hall clock tower and front entrance stone stairs along with the Kingston Courthouse entrance column capitals.

8.0 SUMMARY

The property at 60 Victoria Street North, Kitchener contains a three-storey felt factory that was built c. 1913 with three additions constructed in 1942, 1962, and 1968, respectively. It is understood that the intention is to demolish the 1942, 1962, and 1968 additions while maintaining the original 1913 Rumpel Felt building which contains heritage value. The demolition serves as preparation for Region of Waterloo to develop a future transit hub (Kitchener Central Transit Hub). The plans for the restoration and redevelopment or adaptive reuse of the original Rumpel Felt building can then proceed separately (after the demolition). It is proposed to preserve the heritage of the 1913 building by completing repairs to its east façade where structural connections to the additions are removed. Additionally, existing openings along the east façade are to be infilled and sheet metal cladding installed to make the building weather tight for protection until full restoration and redevelopment is planned for the building.

All of which is respectfully submitted,

MTE Consultants Inc.

DRAFT

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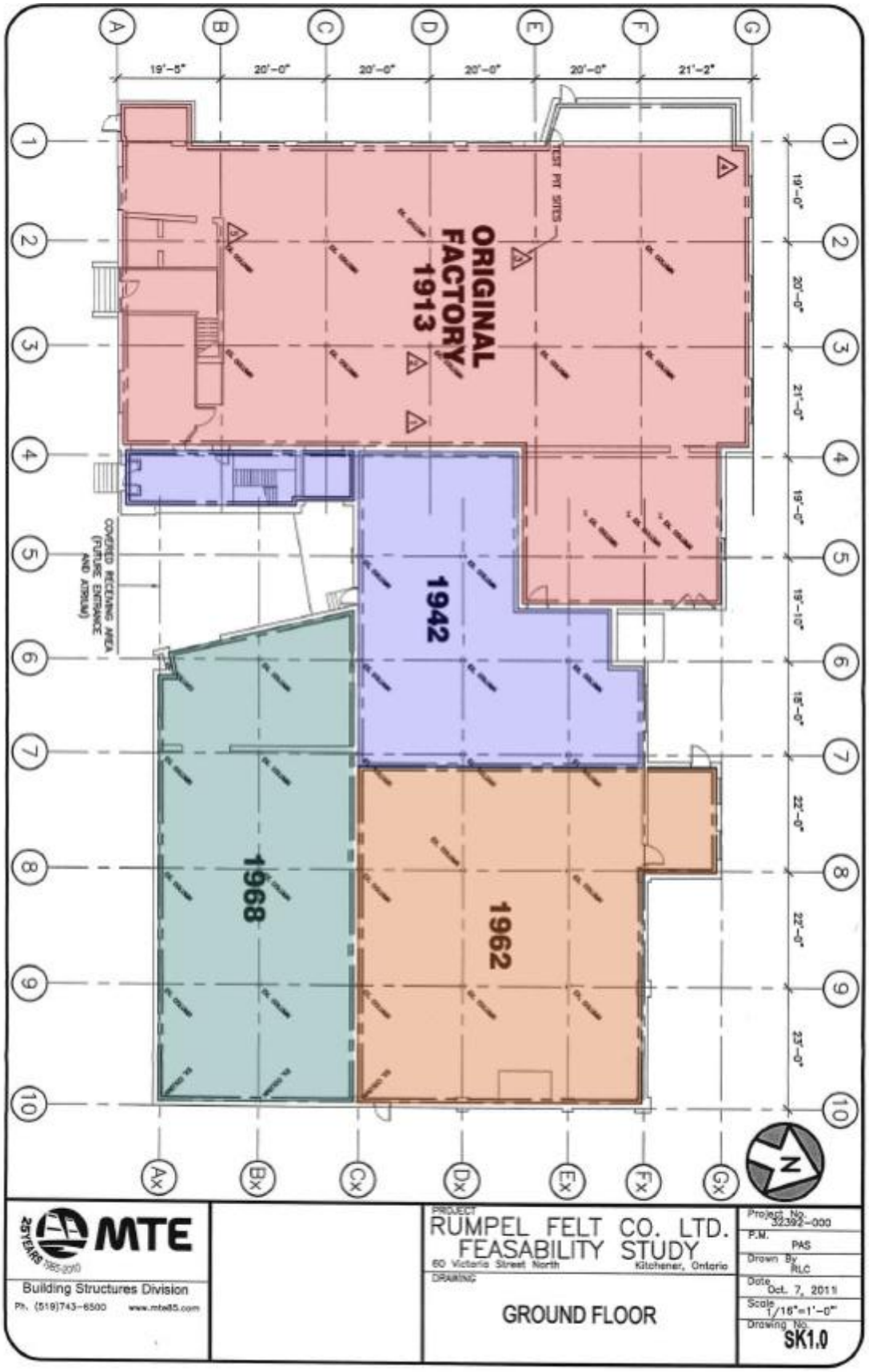
https://mte85.sharepoint.com/sites/33223-301/Shared Documents/Heritage/Conservation Plan/Conservation Plan/33223-301_rpt_Hertitage Conservation Plan_Draft Rev.01.docx

Appendix A

Photographic Log



Photograph No. 1 – 60 Victoria Steet North Additions

Photograph No. 2 – 60 Victoria Steet North within the Warehouse District (Photo retrieved from the HIA completed by The Landplan Collaborative Ltd)

Photograph No. 3 – Character Defining Painted "Rumpel Felt Co. Limited Felts for Every Purpose" on the Original 1913 Building

Photograph No. 4 – Character Defining Front Porch and Entrance Tight to Victoria Street North

Photograph No. 5 – Overview of the 1913 Building with Addition on the Right

Photograph No. 6 – Overview of the Original 1913 (left) and 1942/1968 Addition (Right)

Photograph No. 7 – Overview of Non-matching Split Face Architectural Block and Red Sheet Metal Cladding Window Infills

Photograph No. 8 – Third Floor Interior Shoring (within Original Building) to be Monitored during Demolition

Photograph No. 9 –Chimney to Be Demolished and Brick Salvaged for Reuse

Photograph No. 10 – 1942 Addition Beams Bearing on the 1913 East Wall

Appendix B

Structural Assessment Report, dated October 11, 2011

October 11, 2011
MTE file: 33223-300

Kari Feldmann, P. Eng.
Sr. Project Manager, Environmental, Corporate Properties
Region of Waterloo
150 Frederick St., 5th Floor
Kitchener, ON N2G 4J3

Dear Mr. Feldmann:

Re: Structural Assessment
Rumpel Felt Building
60 Victoria St. N., Kitchener, ON

Per your request we have conducted a structural assessment of the above noted building and are pleased to provide the following report.

It is our understanding that the Region of Waterloo wishes to convert the use of the former Rumpel Felt building from factory to office and would like to ascertain the feasibility of doing so as well as investigating the feasibility of adding floors to the existing structure.

A new main entrance on Victoria St. with atrium is envisioned as well as making façade changes and adding new windows.

We understand that primarily the original building has had some interest by some to become listed as a heritage building but it has not presently been designated as such.

Our scope of work includes a structural assessment of the existing building, foundations and soil bearing with respect to the proposed addition of up to three additional floors above the existing three floors.

It is assumed that the existing roof will be converted to or replaced by a new floor.

Our scope of work does not include a review of the required exiting facilities, the life safety systems, and early warning and evacuation systems. Budgetary cost estimating for the structural work was deleted from our scope.

Please note that our descriptions of the building orientation reference the long side of the building (parallel with Victoria St.) as running east-west.

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1.0 EXISTING STRUCTURE

The existing 3 storey building was constructed in 4 stages: the original portion of the factory was built in 1913 with three additions in 1942, 1962 and 1968. The Region of Waterloo has provided some structural drawings for the additions. However, no drawings were available for the original building. We have enclosed sketches based on these plans to illustrate the various additions; please refer to the ground floor plan, sketch SK1.0, as well as partial framing plans and a south elevation, sketches SK1.1, SK1.2, SK1.3. The factory has several pits on the ground floor but the building does not have a basement.

The building is comprised of poured in place concrete floors on steel beams and columns with load-bearing and non load-bearing masonry wall construction.

2.0 THREE STOREY OFFICE BUILDING

The following is our assessment of the existing building and comments regarding the conversion of the building to office occupancy ***without the addition of floors***.

2.1 Floors above Ground

The Ontario Building Code specifies floor loading for office areas (not including record storage and computer rooms) to be 4.8kPa (100psf) for the first storey and 2.4kPa (50psf) for floors above the first storey.

The drawings for the 1968 addition indicate a design live load of 200psf (9.6kPa) for the second and third floors; and a design live load of 48psf (2.3kPa) for the roof. The drawings also state that the footings were to be placed on natural undisturbed soil capable of safely sustaining 3000psf.

Based on our site measurements of the beams and columns in the 1962 and 1942 additions it appears that the floor framing was designed for this live loading as well (200psf).

We have reviewed the steel floor framing in the original 1913 portion of the building, assuming a steel grade typically used for this period (Fy = 210 MPa) and estimate that the floor framing was designed for a minimum of 100psf (4.8kPa).

Several cracks were observed in the floor slabs throughout the building (see Picture 16). It is our opinion that these cracks do not require repair and that the floor is capable as-is to support the proposed office floor loading. The floors should be reviewed again for specific areas if the Region wishes to place higher loads than those noted above, such as for computer rooms or high density shelving or storage.

2.3 Roof Framing

The roof framing and supporting columns in the third storey of the 1913 building are insufficient to support the current design snow load (see Picture 17). We recommend that these columns and beams be reinforced. Alternatively it is recommended that shoring jacks be placed temporarily under the roof beams to reduce the load on the columns and the stresses in the beams until reinforcement can be done. Upon your request, MTE can provide a reinforcement design or shoring plan.

The roof framing and columns in the remainder of the building additions are adequate to support the current snow load without reinforcement.

2.4 Stairway and Elevators

There are two stairways within the 1913 building. The main stairway is constructed of wood and is in fair to poor condition and will need to be replaced with non combustible construction when converting the building to Office Use. We could not review the one stairway to the front office area due to limited accessibility.

It is anticipated that additional stairs will be required at other locations within the building to satisfy egress and exiting from the building.

The elevator in the 1913 building area was inoperable and inaccessible and as such we did not review the applicable structure or pit for its suitability for reuse. A second mechanical lift is located within the 1962 addition on the east wall, serving all three floors (see Picture 22). Review of this mechanical lift system was not part of our scope. The present opening through the floors could possibly be used for stairs.

2.5 Foundations

LVM was employed to conduct a geotechnical investigation of the existing soil supporting the footings and ground floor slab. Their report is included in the Appendix.

As there was no design information available for the 1913 building we employed a contractor to excavate down to the existing footings at 5 locations to determine the footing size as well as provide opportunity for LVM Geotechnical Engineers to assess the soil capacity. Excavations were made to reveal three (3) interior footings, which were measured to be tapered piers approximately 48" square x 46" tall (see Picture 9). However, assuming a soil bearing capacity of 3000psf this footing size is insufficient to support the gravity load of the building. This leads us to believe there may be deeper foundations units such as caissons or piles of greater capacity supporting the piers that we were unable to detect and measure at the time of excavation. LVM determined through test pits and boreholes that fill, unsuitable for bearing, exists at and below these footings which could also suggest that caissons or piles may be present.

Excavations at two other locations in the 1913 building were made to uncover (from one side) strip footings supporting the masonry walls. Based on the projection of the footing beyond the wall and the masonry wall thickness we estimate the strip footing to be approximately 42" wide x 12" thick (see Picture 23). Again, no caissons were observed in the excavation.

Despite not having complete foundation information for the 1913 building, we can reasonably assume, given the historical performance, that the foundations that supported the original floor and roof loads will continue to support the proposed office floor and roof loads. However, without further investigation to determine the presence and capacity of the probable caissons we cannot recommend that additional load of floors be added.

2.6 Slab on Grade

The geotechnical investigation suggests that the floor slab on grade is supported in areas on fill and that voids within the fill were also detected. Settlement of this fill may be partially responsible for several cracks observed in the floor slab throughout the building.

LVM states that the successful reuse of the existing ground floor slab "as-is" will depend on the floor finish as there is potential for future cracking and settlement given the nature of the supporting material. If carpet is proposed the floor may be re-used without noticeable problems. However if ceramic tile or other floor finishes susceptible to cracking are proposed, complete replacement of the existing fill and slab on grade is recommended. An alternative to the removal and disposal of the existing fill material is to construct a new reinforced concrete structural floor slab, in place of the existing, supported on helical piers (see LVM's recommendations in their report). A cost comparison should be done between this option and a simple slab on new compacted fill.

There is a difference in floor elevation between the 1913 building and the rest of the building additions. As well, the floor steps down approximately 8" within the north east portion of the 1913 area (i.e. boiler room adjacent to the chimney). The majority of the 1913 floor slab is badly cracked, has several pits and raised machine pads as well as the excavations made for the present geotechnical investigation. It is envisioned that the entire floor slab within the 1913 building will be removed and replaced. The supporting fill will need to be sub-excavated at this time as well.

2.7 Existing Pits

There are several pits within the 1913 and 1962 building areas. These will need to be filled in to provide a level office floor. See LVM's recommendations in their report (enclosed).

2.8 Lateral Load Resisting System

The lateral load resisting system is comprised of unreinforced masonry in which the majority of lateral load is resisted by the interior north-south and east-west shear walls located in the mid section of the building, located along the east limit of the 1913 building. The balance of lateral

load will be resisted by the exterior masonry walls. The existing unreinforced masonry shear walls do not meet the seismic load requirement and reinforcement provisions of the 2006 Ontario Building Code.

OBC 11.4.2.1 (Renovation) states that the structural performance level of an existing building is reduced where after the proposed construction:

1. The major occupancy will change to a different major occupancy,
2. The occupant load will increase by more than 15%, ***or***
3. The live load will increase due to change in use,

and where the structural floor and roof framing systems are not adequate to support the proposed dead loads and live loads.

As such the performance level of the building will be reduced and a new lateral load resisting system will be required for the building in order to make the change in use.

Some cracks were observed in the brick masonry (see Picture 13). In addition bricks were cut and/or removed to make passages for doorways and ducts (See Picture 21). Generally the building masonry appears to be in good condition without significant signs of structural distress.

The drawings for the 1968 building addition indicate a steel braced frame introduced for this addition adjacent to the adjoining east wall of the 1913 building. We were unable to confirm the presence of this bracing as there is masonry or other finishes covering this area (see Picture 18). We have checked the design loads labeled on this "wind" brace (as it is called on the drawings) and it does not have sufficient capacity to meet the current seismic design forces.

2.9 Chimney/ Proposed New Entrance and Atrium

Though not an absolute requirement at this stage, it is recommended to remove the existing chimney above the existing roof to reduce the need for continued future maintenance as well as reducing the seismic load and hazard to the building.

Consideration has been given by the Region to add a new entrance and atrium to the building along Victoria St. The most logical place appears to be the sheltered receiving area mid way along the building where the exterior wall steps back within the 1968 addition.
It should be noted there is a 13' deep truss spanning approximately 45' supporting the second and third floors over this receiving area along the exterior wall. If the new entrance and atrium is to be taller than the ground floor storey height (approximately 15') significant structural modification to this exterior wall will be required.

3.0 ADDITIONAL FLOORS

Part of our scope is to comment on the feasibility of adding up to three floors to the existing building. This would include the conversion or replacement of the existing roof framing to floor flaming.

Due to the nature of this proposal a thorough structural analysis of the building will be required including the design of new elements as well as a building reinforcement plan which is beyond the scope of our assessment. As the proposal will add building height and mass as well as replace some exterior masonry with office windows, it is our opinion that a new lateral load resisting system will be required in both north-south and east-west directions, including new foundations or supplements to the existing foundations.

We have reviewed the structural capacity of the existing footings and columns in the building for the proposed addition of up to three (3) floors and have identified which elements are adequate or will require reinforcement. Refer to Table 1 in the Appendix.

Table 1a indicates that without further investigation into the existing foundations it is not feasible to add floors to the 1913 building. If the foundations have sufficient capacity the second and third floor columns will need to be reinforced. The exterior walls have sufficient capacity to add one floor. Also note that if additional storeys are added only to other areas of the building adjacent to the 1942 building it will create a potential for snow drifting and accumulation on the 1942 building roof, for which the 1913 foundations and building structure will need to be assessed.

We have no foundation information available for the 1942 building addition. Table 1b indicates what footing sizes would be needed depending on how many floors are added. The columns have sufficient capacity for the addition of up to 3 floors.

Table 1c indicates for the 1962 building addition that the exterior footings have sufficient capacity for the addition of up to 2 floors; while some of the interior footings would require some underpinning and enlargement for the addition of one more floor. The interior columns have sufficient capacity for the addition of one floor. Some columns would require reinforcement for the addition of a 5^{th} and 6^{th} floor.

Table 1d indicates for the 1968 building addition that the exterior footings have sufficient capacity for the addition of up to 3 floors, while some of the interior footings would require some underpinning and enlargement for the addition of two or three floors. The interior columns have sufficient capacity for the addition of one floor. Some columns would require reinforcement for the addition of a 5^{th} and 6^{th} floor. Note that the existing Brace (3 storey braced frame) at the west limit of the 1968 building addition does not have adequate strength for any of the additional floor options. As mentioned earlier in our report the 45' long span truss will not accommodate additional load from new floors above.

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. A new lateral load resisting system will be required given the change of use of the building to Office. With the exception of the 1913 roof framing, there is sufficient capacity to support gravity loads for the conversion of the existing three storey building to office space.

2. The roof framing and supporting columns in the third storey of the 1913 building are insufficient to support the current design snow load. We recommend that these columns and beams be reinforced. Alternatively it is recommended that shoring jacks be placed temporarily under the roof beams to reduce the load on the columns and the stresses in the beams until reinforcement can be done.

3. Generally the building masonry appears to be in good condition without significant signs of structural distress.

4. Further investigation of the foundations of the 1913 building will be required if additional loading is proposed on this portion, including new snow accumulation and drifting from additional new storeys built on the adjacent building additions.

5. A new lateral load resisting system will be required if new floors are added to the building.

6. It is recommended that preliminary reinforcement design plans be drawn up and a cost estimate for the proposed structural work of any of the options be completed prior to moving forward.

5.0 LIMITATIONS

This report has been prepared by MTE Consultants Inc. (MTE) at the request of Region of Waterloo. The material in it reflects the best judgment of MTE in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. MTE accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This assessment 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. We 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. The Consultant may use such specific information obtained in performing its services and is entitled to rely upon the accuracy and completeness thereof.

Responsibility for detection of or advice about pollutants, contaminants or hazardous materials is not included in our mandate. In the event the Consultant or any other party encounters any hazardous or toxic materials, or should it become known to the Consultant that such materials may be present on or about the jobsite or any adjacent areas that may affect the performance of the Consultant's services, the Consultant may, at its option and without liability for consequential

or any other damages, suspend performance of its services under this Agreement until the Client retains appropriates consultants to identify and abate or remove the hazardous or toxic materials and warrants that the jobsite is in full compliance with all applicable laws and regulations.

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. Any time frame given for undertaking work represents an educated guess based on apparent conditions existing at the time of our report. Failure of the item, or the optimum repair/replacement process, may vary from our estimate. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time. Any user of this report specifically denies any right to claims against the Consultant, Sub-Consultants, their Officers, Agents and Employees in excess of the fee paid for professional services.

If you require any further information please contact our office.

Yours truly,

MTE CONSULTANTS INC.

Paul Slater, P.Eng.
Structural Engineer

Attach: Table 1
Photograph Log
LVM, Geotechnical Report

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TABLE1: FEASIBILITY OF ADDING FLOORS

Table 1: Rumpel Felt Building Assessment - Feasibility of Adding Floors

Table 1a) 1913 Original Building

	Footings allowable soil capacity = 3000 psf assumed				Masonry Walls		Columns Fy = 210 MPa (assumed)	
	Exterior		Interior		Exterior		Interior	
	Size	Evaluation	Size (site measurement)	Evaluation	Size	Evaluation (gravity loads)	Size (site measurement)	Evaluation
Existing Building	N/A	N/A	4'-0" x 4'-0"	N.G.	Varies	O.K.	W200x52 (1st floor) WF 7x7 (2nd floor) W100's (3rd floor)	O.K. O.K. N.G.
1 additional storey	N/A	N/A	4'-0" x 4'-0"	N.G.	Varies	O.K.	W200x52 (1st floor) WF 7x7 (2nd floor) W100's (3rd floor)	O.K. N.G. N.G.
2 additional storeys	N/A	N/A	4'-0" x 4'-0"	N.G.	Varies	O.K.	W200x52 (1st floor) WF 7x7 (2nd floor) W100's (3rd floor)	N.G. N.G. N.G.

Table 1b) 1942 Addition

	Footings allowable soil capacity = 3000 psf assumed				Columns Fy = 230 MPa (assumed)			
	Exterior		Interior		Exterior		Interior	
	Size	Evaluation (Req'd size)	Size	Evaluation (Req'd size)	Size (site measurement)	Evaluation	Size (site measurement)	Evaluation
Existing Building	N/A	6'-0" x 6'-0"	N/A	(A) 8'-0" x 8'-0" (B) 7'-0" x 7'-0"	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.
1 additional storey	N/A	6'-0" x 6'-0"	N/A	(A) 9'-0" x 9'-0" (B) 8'-0" x 8'-0"	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.
2 additional storeys	N/A	7'-6" x 7'-6"	N/A	(A) 8'-0" x 8'-0" (B) 7'-0" x 7'-0"	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.
3 additional storeys	N/A	8'-0" x 8'-0"	N/A	(A) 8'-0" x 8'-0" (B) 7'-0" x 7'-0"	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.	W310x97 (1st floor) W310x97 (2nd floor) W250x73 (3rd floor)	O.K. O.K. O.K.

Table 1c) 1962 Addition

	Footings allowable soil capacity = 3000 psf assumed				Columns Fy = 280 MPa (assumed)			
	Exterior		Interior		Exterior		Interior	
	Size	Evaluation	Size	Evaluation	Size	Evaluation	Size (site measurement)	Evaluation
Existing Building	Varies	O.K.	Varies	O.K.	N/A along grid Cx	N/A O.K.	W310x97 (1st floor) W200x46 (2nd floor) W200x46 (3rd floor)	O.K. O.K. O.K.
1 additional storey	Varies	O.K.	Varies	(A) 9'-0" x 9'-0" N.G. (B) 8'-8" x 8'-8" O.K.	N/A along grid Cx	N/A O.K.	W310x97 (1st floor) W200x46 (2nd floor) W200x46 (3rd floor)	O.K. O.K. O.K.
2 additional storeys	Varies	O.K.	Varies	N.G.	N/A along grid Cx	N/A O.K.	W310x97 (1st floor) W200x46 (2nd floor) W200x46 (3rd floor)	O.K. N.G. O.K.
3 additional storeys	Varies	N.G.	Varies	N.G.	N/A along grid Cx	N/A O.K. (except @Cx/9)	W310x97 (1st floor) W200x46 (2nd floor) W200x46 (3rd floor)	O.K. N.G. N.G.

Table 1d) 1968 Addition

	Footings allowable soil capacity = 3000 psf assumed				Columns Fy = 300 MPa (assumed)				Truss & Brace (Fy = 300 MPa)
	Exterior		Interior		Exterior		Interior		
	Size	Evaluation	Size	Evaluation	Size	Evaluation	Size (site measurement)	Evaluation	
Existing Building	Varies	O.K.	Varies	O.K.	W200x52 (1st floor) W200x36 (2nd floor) W200x36 (3rd floor)	O.K. O.K. O.K.	Varies (1st floor) W200x42 (2nd floor) W200x42 (3rd floor)	O.K. O.K. O.K.	Truss O.K. Brace N.G.
1 additional storey	Varies	O.K.	Varies	O.K.	W200x52 (1st floor) W200x36 (2nd floor) W200x36 (3rd floor)	O.K. O.K.(except@Ax/8,9) O.K.	Varies (1st floor) W200x42 (2nd floor) W200x42 (3rd floor)	O.K. O.K.(except@Bx/6) O.K.	Truss N.G Brace N.G.
2 additional storeys	Varies	O.K.	Varies	(A) 9'-3" x 9'-3" N.G. (B) 9'-0" x 9'-0" O.K.	W200x52 (1st floor) W200x36 (2nd floor) W200x36 (3rd floor)	O.K.(except@Ax/8,9,10) N.G. N.G.	Varies (1st floor) W200x42 (2nd floor) W200x42 (3rd floor)	O.K. N.G. O.K.(except@Bx/6)	Truss N.G. Brace N.G.
3 additional storeys	Varies	O.K.	Varies	N.G.	W200x52 (1st floor) W200x36 (2nd floor) W200x36 (3rd floor)	N.G. N.G. N.G.	Varies (1st floor) W200x42 (2nd floor) W200x42 (3rd floor)	N.G. N.G. N.G.	Truss N.G. Brace N.G.

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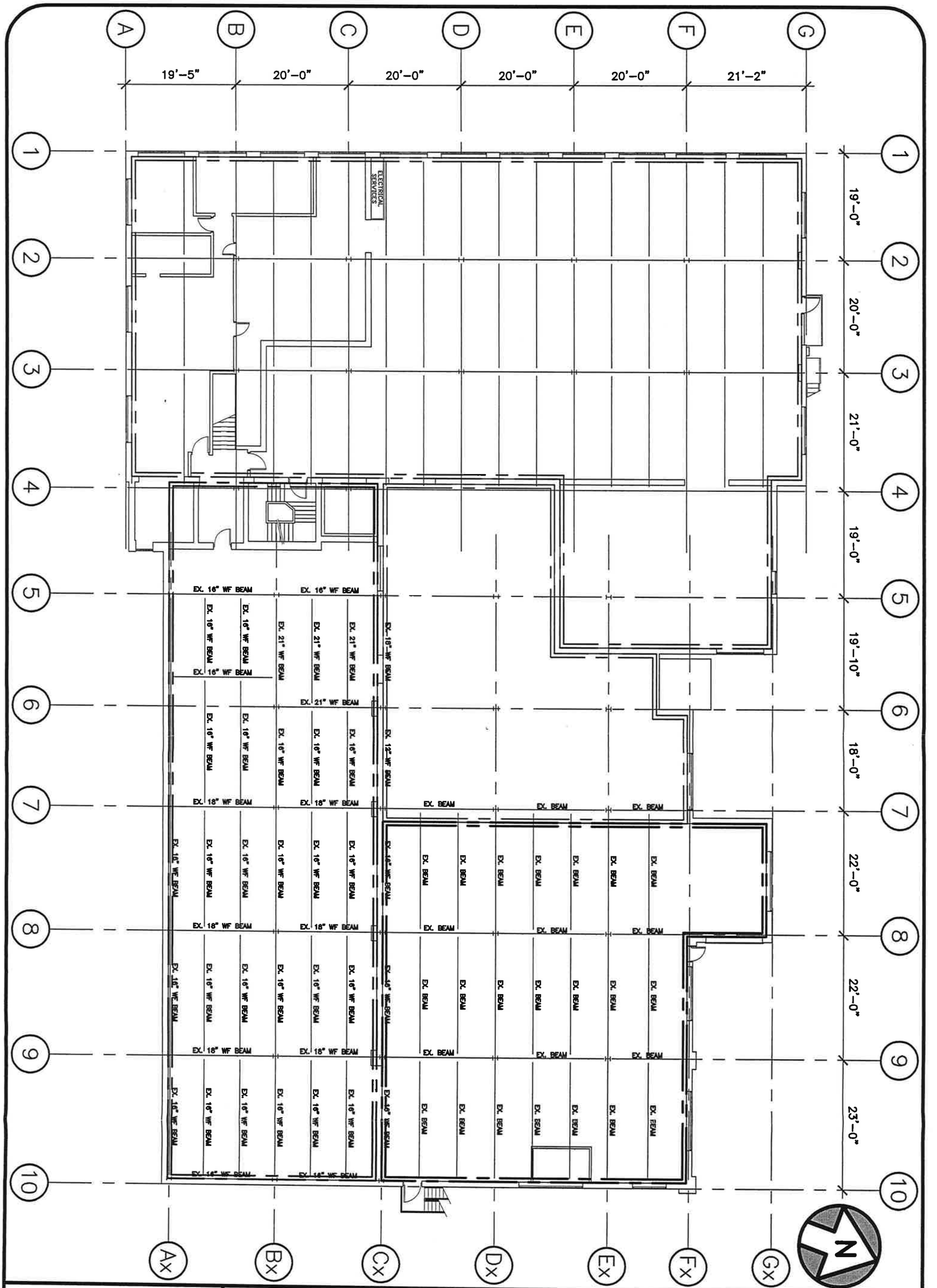
TABLE 1:FEASIBILITY OF ADDING FLOORS



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Building Structures Division
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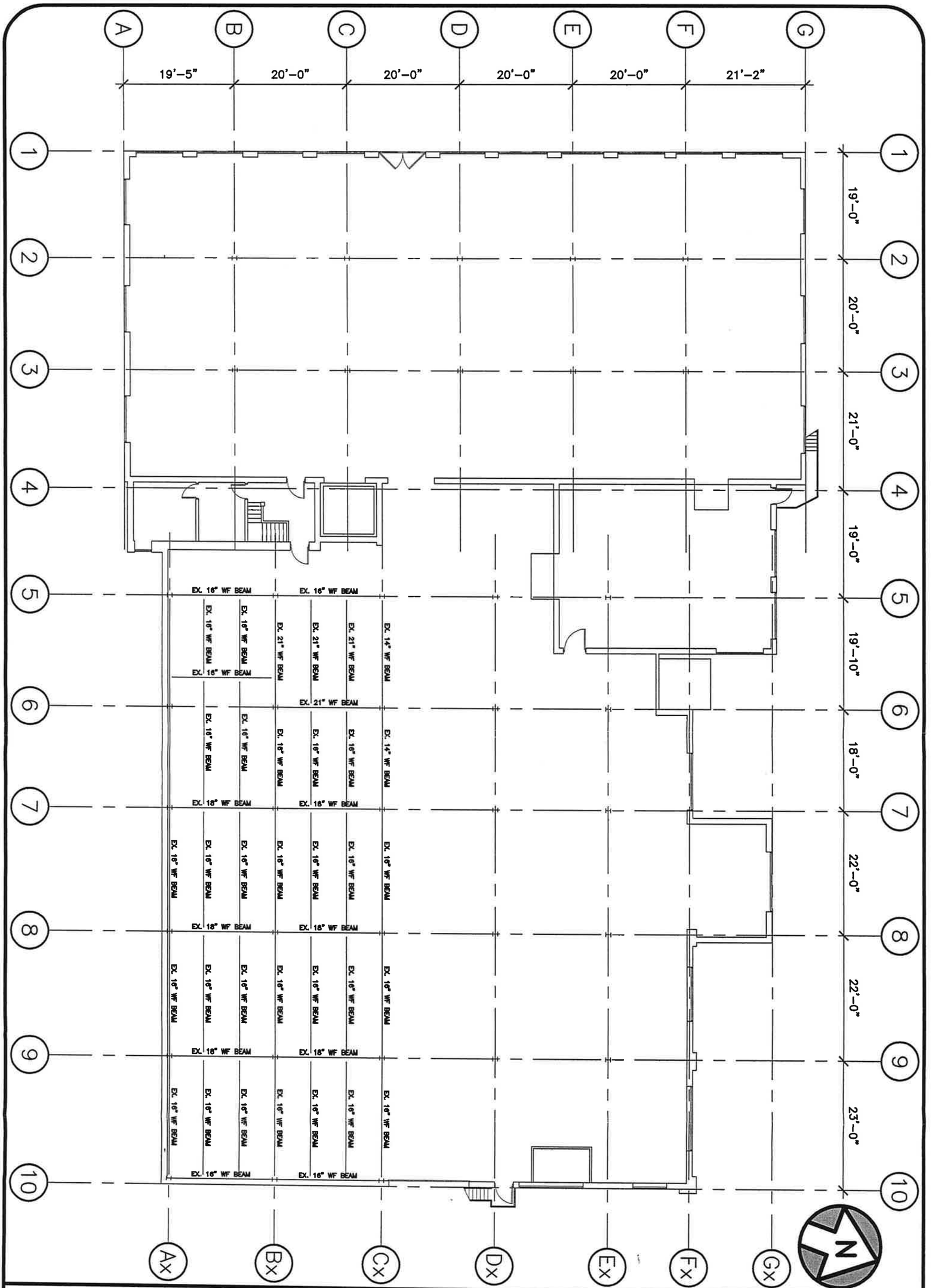
PROJECT
RUMPEL FELT CO. LTD.
FEASABILITY STUDY
60 Victoria Street North Kitchener, Ontario

DRAWING

SECOND FLOOR FRAMING (PARTIAL - 1962, 1968)

Project No.	32392-000
P.M.	PAS
Drawn By	RLC
Date	Oct. 7, 2011
Scale	1/16"=1'-0"
Drawing No.	SK1.1



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PROJECT
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FEASABILITY STUDY
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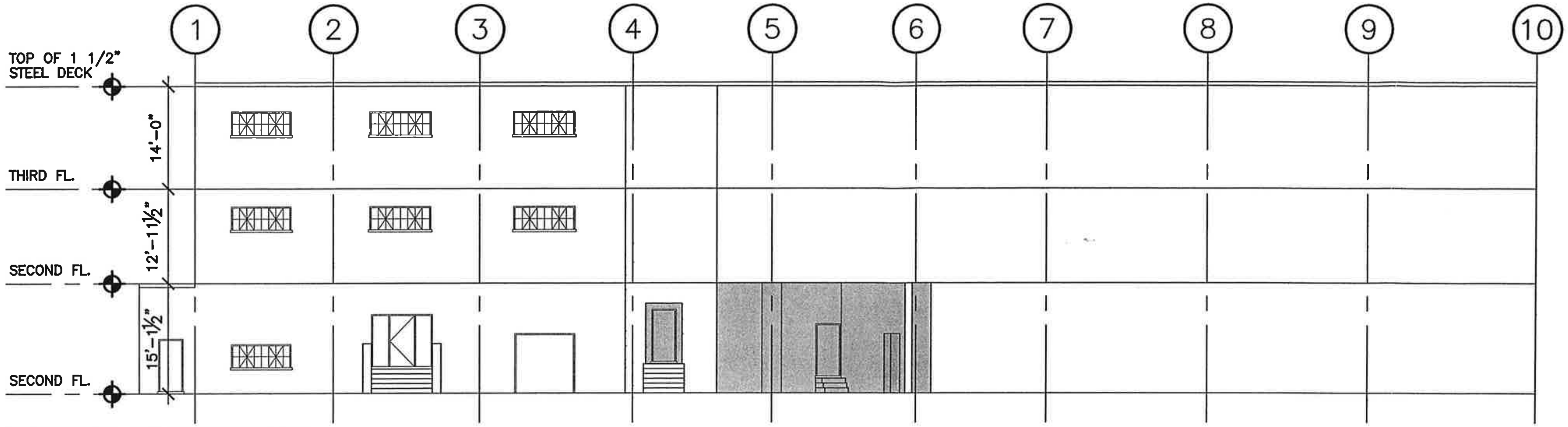
DRAWING
THIRD FLOOR FRAMING
(PARTIAL - 1968)

Project No.	32392-000
P.M.	PAS
Drawn By	RLC
Date	Oct. 7, 2011
Scale	1/16"=1'-0"
Drawing No.	SK1.2



SOUTH ELEVATION

1/16"=1'-0"

Project No. 32392-000
P.M. PAS
Drawn By RLC
Date Oct. 7, 2011
Scale 1/16"=1'-0"
Drawing No. **SK1.3**

PROJECT
RUMPEL FELT CO. LTD.
FEASABILITY STUDY
60 Victoria Street North Kitchener, Ontario

DRAWING
SOUTH ELEVATION

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PHOTO LOG

Picture 1: Building South Elevation

Picture 2: Building North Elevation

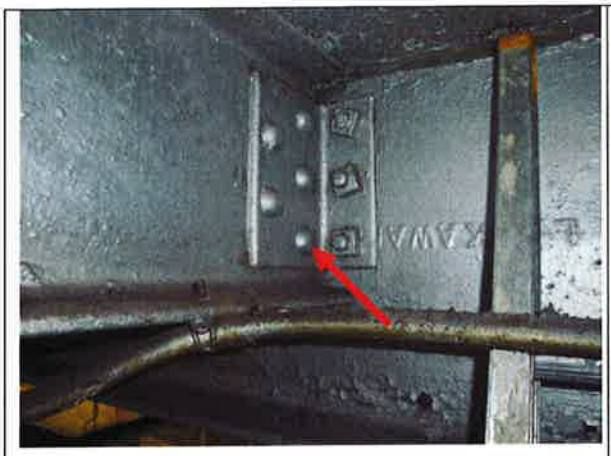
Picture 3: West Exterior Brick Wall

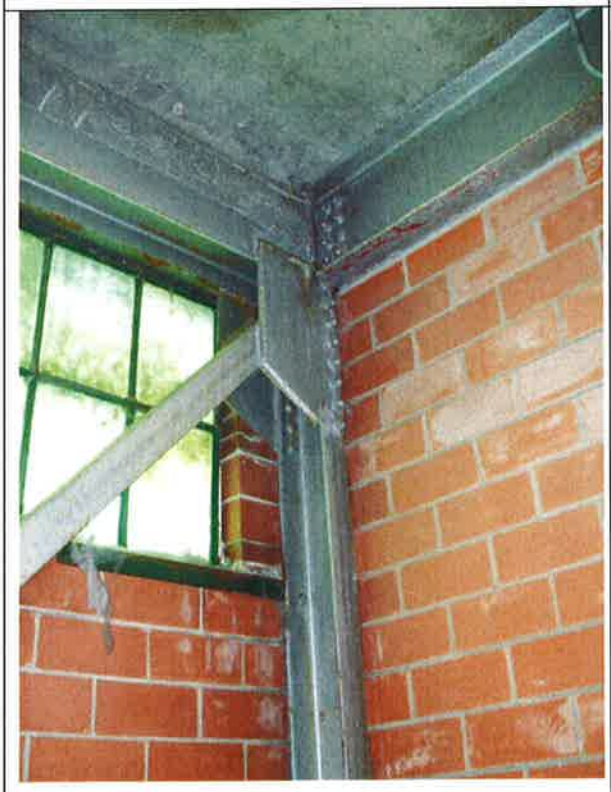
Picture 4: East Exterior Brick Wall

Picture 5: Exterior Steel Stair, North wall

Picture 6: Chimney

	Picture 7: Loading Dock at North East
	Picture 8 Building Interior (1913 portion)
	Picture 9 Excavation at existing column base to investigate the column footing in the 1913 portion of the building

	Picture 10 Steel Beam Rivet Connection (1913 Portion)
	Picture 11 Steel Column Splice with Rivets (1942 Portion)
	Picture 12 Interior Load Bearing Shear Wall

	Picture 13 Crack in the load bearing shear wall
	Picture 14 Truss at second floor in 1962 Portion
	Picture 15 Truss connection

Picture 16

Crack in the floor slab

Picture 17

Roof Framing (1913 portion)

Sloped roof with wood deck

Slender columns

Picture 18

Exposed steel framing at the building south entrance from Victoria St.

Steel braced frame location as shown in 1968 drawings, possibly hidden by brick

	Picture 19 South wall brick façade in 1968 Portion
	Picture 20 Brick wall at interior loading dock of 1968 portion

	Picture 21 Holes made through masonry 1942 addition
	Picture 22 Opening through floors for mechanical lift 1962 addition, east wall.
	Picture 23 Strip footing under interior masonry wall (east wall, 1913 building)

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LVM, GEOTECHNICAL REPORT

Region of Waterloo
c/o MTE Consultants Inc.

Rumpel Felt Building
60 Victoria Street North
Kitchener, Ontario

Geotechnical Investigation Report

Date: October 6, 2011
Ref. N°: 160-P041895-0100-GE-0001-00

LVM
1961 50 2011

Region of Waterloo
c/o MTE Consultants Inc.

Rumpel Felt Building
60 Victoria Street North
Kitchener, Ontario

Geotechnical Investigation Report

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Reviewed by:

for

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TABLE OF CONTENTS

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Kitchener, Ontario N2BG 3X9
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INTRODUCTION

LVM inc. (LVM) was retained by the Region of Waterloo (ROW), through MTE Consultants Inc. (MTE), to conduct a geotechnical investigation for the above referenced project. Authorization was provided by Mr. Paul Slater of MTE in an email received on July 27, 2011.

The project involves the proposed refurbishment of the former Rumpel Felt factory into a municipal use building, and this may include the addition of as many as two storeys to the structure. The building is located on the fringe of the Kitchener downtown core between Victoria Street and the railway tracks, west of Duke Street, as shown on the appended Location Plan. The current three-storey building was constructed in four parts; the original structure was constructed in 1913; with three additions constructed in 1942, 1962, and 1968.

The purpose of the geotechnical investigation was to explore the subsurface soil and groundwater conditions at the site. Based on the findings, we have prepared this report with geotechnical design and construction recommendations for the proposed works.

1 INVESTIGATION METHODOLOGY

The fieldwork for this assignment was carried out on July 20, August 22, and September 12, 2011. Five test pits and eight boreholes were advanced to depths between 0.9 and 5.0 m below existing grade, at the locations shown on the appended Site Plan. Boreholes 01-11 to 04-11 were advanced at the locations of Test Pits 01-11 to 04-11, respectively.

The test hole locations were established by MTE following consultation with LVM.

The test pits were advanced using a mini excavator supplied and operated by a local contractor, hired by the client. Seven boreholes were advanced using a GeoProbe 6620 compact tracked drillrig, equipped with percussive casing and continuous flight solid stem augers. The drilling equipment was supplied and operated by a specialist contractor. The floor slab was cored for Boreholes 06-11 to 09-11, in the addition areas, by LVM in advance of drilling. Due to space constraints the planned Borehole 01-11 was completed using manual sampling equipment supplied and operated by LVM.

Upon completion, the boreholes were backfilled with bentonite in accordance with the Water Resources Act. The four boreholes in the addition areas were capped with concrete.

In the boreholes, soil samples were recovered at regular intervals throughout the depths explored. Split spoon sampling was conducted simultaneously with standard penetration testing (SPT) to assess the strength of the insitu soil. Pocket penetrometer testing was conducted on samples of cohesive soils to determine the undrained shear strengths.

The fieldwork was supervised by a member of LVM's engineering staff who directed drilling and sampling operations, documented the subsurface conditions encountered, and processed recovered samples.

Samples recovered during the investigation were returned to LVM's laboratory for further visual examination and moisture content testing.

The borehole locations were tied in by LVM, and referenced to the finished floor level of the Rumpel Felt Building, Elevation 100.00 (metric, assigned).

2 SUMMARIZED CONDITIONS

Reference is given to the appended borehole and test pit logs for details of the subsurface stratigraphy encountered. In general, the subsurface stratigraphy comprised the surficial floor slab, over fill, over layers of native silt and sand, over layered tills.

The concrete floor slab in the building ranged from 100 to 260 mm thick at the test hole locations. Voids were frequently encountered directly beneath the slab in the 1913 building area. Granular fill was found under the slab in most test holes; the under-slab granular was 80 to 180 mm thick in Test Pits 02-11 to 05-11 and in Boreholes 06-11 to 08-11.

Fill was encountered below the floor slab, and extended to depths between 1.2 and 2.3 m. The fill typically comprised dark brown sand and silt soils with occasional pieces of glass, brick, coal and topsoil.

Topsoil was encountered below the fill in Borehole 09-11, from 1.5 to 2.3 m depth.

Layered deposits of native sand and silt were encountered below the fill, and extended to depths between 4.6 m and termination depth of the boreholes. These soils were loose to dense with SPT N-values ranging between 9 and 41 blows per 0.3 m of the split spoon sampler. These soils were moist to saturated with laboratory moisture contents between 5 and 22%; however, wet and saturated conditions encountered at the bottom of these deposits above the underlying till.

Silt till and clay till were encountered at the bottom of Boreholes 02-11, 04-11 to 07-11. These deposits comprised silt with some clay, clayey silt and silty clay. SPT N-values were between 19 and 47 blows per 300 mm penetration; and, pocket penetrometer shear strengths were greater than 225 kPa. The non-cohesive silt was moist while the cohesive clayey silts and silty clay were about the plastic limit (APL), corresponding to laboratory moisture contents between 12 and 21.

Wet to saturated soil conditions were encountered in the native silt and sand deposits, above the tills. This is attributed to surface water which has infiltrated into the native soils, and has become perched on top of the relatively impermeable silt, clayey silt, and silty clay tills. A definitive long-term ground water level was not encountered within the depths explored. Fluctuations in the groundwater level and development perched of groundwater will occur respective to seasonal and short term precipitation events.

The existing footings were exposed in the five test pits, excavated in the original 1913 building area; and reference is given to the test pit logs for details of the findings. Fill soils were observed below the footings in Test Pits 02-11, 03-11, and 04-11; below the interior column footings.

3 DISCUSSION AND RECOMMENDATIONS

3.1 FOUNDATIONS

In general, no bearing problems are expected for conventional footings founded on native mineral soils. However, footings underlain by the existing fill or loose deposits may undergo settlement if additional loads are applied. If additional loads are to be applied to the interior column footings in the 1913 building section, underpinning will be necessary to prevent settlement. Only a limited number of the 1913 footings were inspected; so during construction all of the 1913 interior footings should be exposed and examined prior to underpinning. Reference is given to the Typical Underpinning Procedure drawing, appended.

Spread footings supported on the compact native sand and silt deposits may be proportioned for a geotechnical bearing resistance of 150 kPa at serviceability limit states (SLS); and, a factored resistance of 225 kPa at ultimate limit states (ULS). Properly constructed/retrofitted footings, proportioned for the SLS bearing resistance noted are expected to undergo settlements of less than 25 mm, with differential settlements less than 12 mm.

A Seismic Site Class D may be used for design in accordance with the Ontario Building Code.

Helical piers may be considered as an alternative to conventional underpinning, or if higher column bearing resistances are required. For preliminary design, a helical pier founded at 3 m depth in the native sand and silt soils may support a factored load of 150 kPa at ULS. Higher bearing resistances may also be achieved depending on the bearing plate configuration and with deeper founding depths. Reference is given to the Typical Helical Pier Installation drawing for a sketch of a typical helical pier underpinning system.

3.2 EXCAVATION AND BACKFILLING

Excavations to the existing footing levels will be required to underpin foundations or install helical piers. Excavations will extend trough the existing fills into the underlying sand and silt soils; these would be considered Type 3 soils under the occupational health and safety act. Excavations in Type 3 soils must be cut with a maximum side slope inclination of 1 horizontal to 1 vertical from the base of the excavation.

Excavations may extend below the level of existing foundations or buried utilities. The need for underpinning and utility support may be determined from the appended Drawing 5.

Minor groundwater inflow into excavations should be expected, and excavations less than 4 m deep may be dewatered using conventional sump pumping techniques. Dewatering rates for underpinning excavations are not expected to exceed 50,000 L per day, and a Permit to Take Water should not be required.

Backfill should be placed as engineered fill, in lifts with a maximum thickness of 300 mm and be compacted to at least 95% SPMDD. The existing fill and native soils may be reused, subject to inspection and approval, and provided they do not become too wet or mixed with other deleterious soils during construction. Otherwise, imported sand and gravel should be used for backfill.

3.3 FLOOR SLABS

Voids were frequently encountered below the 1913 building area floor slab. This is attributed to settlement of the existing fill soils. The existing 1913 floor slab should be rehabilitated. Rehabilitation may involve filling the voids with grout or polyurethane foam; however, it should be noted that the existing fill soils may continue to settle and associated cracking of the slab may occur.

In the addition areas (Boreholes BH06-11 to 09-11) voids were not found below the slab, very loose fill and topsoil were present. Generally the addition floors appear to have better support (no voids) compared to the original 1913 floor; however, there is still potential for settlement in the additional areas.

If potential settlement and cracking cannot be tolerated, full depth reconstruction or a structural slab would be required. Full depth reconstruction would involve removal of the existing floor and fill, placement of engineered fill to establish grades, and construction of a new floor slab. Construction of the structural slab may require removal of the existing floor, installing helical piers into the native soils for support of the new reinforced floor slab.

New floor slab construction will be necessary over underpinning excavations, where pits have been backfilled, and in areas where full depth floor reconstruction is planned. In these areas, the new floor slab subgrade materials are expected to comprise onsite soils or imported granular placed as engineered fill. Geotechnically, most of the existing non-organic sand and silt soils should be reusable for engineered fill provided they do not become mixed wet or mixed with other deleterious materials. Imported sand and gravel is recommended if onsite soils can not be reused, and if additional fill materials are required. Engineered fill or foundation backfill below floor slabs should be placed in lifts with a maximum thickness of 300 mm and be compacted to at least 95% SPMDD.

Prior to floor slab construction the subgrade should be proof rolled and inspected, any loose soils should be subexcavated and replaced with engineered fill. Following proof rolling, inspection and approval of the subgrade, a 150 mm thick layer of Granular A should be placed and compacted to 100% SPMDD to provide uniform support for the slab. If a moisture sensitive floor finish is planned, a polyethylene vapour barrier should be placed beneath the slab.

4 STATEMENT OF LIMITATIONS

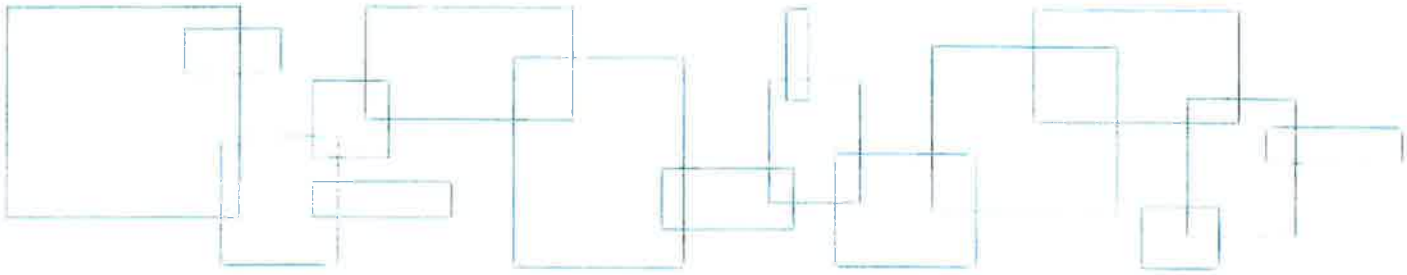
The geotechnical recommendations provided in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known at the time of report preparation, we recommend that we be retained during the final design stage to verify that the geotechnical recommendations have been correctly interpreted in the design. We also recommend that LVM be retained during construction to confirm that the subsurface conditions do not deviate materially from those encountered in the test holes and to ensure that our recommendations are properly understood.

The geotechnical recommendations provided in this report are applicable only to the project described in the text and are intended for the use of the project designer. They are not intended as specifications or instructions to contractors. Any use which a contractor makes of this report, or decisions made based on it, are the responsibility of the contractor. The contractor must also accept the responsibility for means and methods of construction, seek additional information if required, and draw their own conclusions as to how the subsurface conditions may affect them.

It is important to note that the geotechnical investigation involves a limited sampling of the site gathered at specific test hole locations and the conclusions in this report are based on this information gathered. The subsurface conditions between and beyond the test holes will differ from those encountered at the test holes. Should subsurface conditions be encountered which differ materially from those indicated at the test holes, we request that we be notified in order to assess the additional information and determine whether or not changes should be made as a result of the conditions.

Appendix 1 Borehole/Test Pit Logs

List of Abbreviations
Boreholes 01-11 to 09-11
Test Pits 01-11 to 05-11



LVM

Borehole Number: 01-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-09-12*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 225 mm					
	FILL: compact dark brown silt, some sand and coal, trace gravel and brick, moist			1	SS	8
1.00	brown and dark brown silt, some sand and clay, trace gravel and bricks, moist		99.00	2	SS	8
				3	SS	12
2.00	***SAND:*** compact brown silty fine sand, moist		98.00	4	SS	25
	SILT: very dense brown fine sandy silt, moist			5	SS	35
3.00			97.00	6	SS	35
	trace clay, very moist to wet					
	SAND: brown fine to medium sand, some silt, moist			7	AS	
4.00	Borehole terminated at 3.96 m		96.00			
5.00			95.00			

Dynamic Cone: X 20 40 60 80 X

Standard Penetration: ● 20 40 60 80 ●

Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲

Shear Strength (FV) kPa: ■ 50 100 150 200 ■

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

native backfill

No free groundwater encountered

Reviewed by: *WLoghrin*

Drill Method: *Manual SPT - Sampler*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 02-11

Ground Elevation: *100.00 m*

Project: ***Rumpel Felt Factory***

Job No.: *P041895-100*

Location: ***60 Victoria Street North, Kitchener, Ontario***

Drill Date: *2011-08-22*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 150 mm					
	FILL: very loose dark brown, black and grey silt and sand, some coal , glass, brick and gavel, moist			1	SS	2
1.00	brown and black sandy silt, some coal, tar and gravel, moist		99.00	2	SS	3
	SILT: compact brown sandy silt, some to very moist			3	SS	12
2.00			98.00			
	some sand, trace clay			4	SS	19
3.00			97.00			
	SAND: compact brown silty fine sand, trace gravel, moist			5	SS	23
4.00			96.00			
	SILT: compact brown sandy silt, moist			6	SS	29
5.00	***SILT TILL:*** compact brown and grey silt, some clay, trace sand and gravel, moist		95.00			
	Borehole terminated at 5.03 m					

Dynamic Cone (X) 20 40 60 80
Standard Penetration (●) 20 40 60 80
Shear Strength (PP) kPa ▲ 50 100 150 200
Shear Strength (FV) kPa ■ 50 100 150 200
WP WL
Water Content (%) 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

native cave

At drilling completion, dry cave at 4.57 m

No free groundwater encountered

Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 03-11

Ground Elevation: *100.00 m*

Project: ***Rumpel Felt Factory***

Job No.: *P041895-100*

Location: ***60 Victoria Street North, Kitchener, Ontario***

Drill Date: *2011-08-22*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 150 mm; Granular 'A': 100 mm					
	FILL: loose dark brown silt, some sand, trace gravel, pieces of brick, coal, tarl and topsoil, moist			1	SS	9
1.00			99.00			
	compact brown silty sand, some gravel, moist			2	SS	16
2.00			98.00			
	SILT: compact brown fine sandy silt, damp			3	SS	20
3.00			97.00			
	some sand, moist			4	SS	24
4.00			96.00	5	SS	24
	SAND: dense brown silty sand, very moist			6	SS	35
5.00	Borehole terminated at 5.03 m		95.00			

Dynamic Cone: X 20 40 60 80 X

Standard Penetration: ● 20 40 60 80 ●

Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲

Shear Strength (FV) kPa: ■ 50 100 150 200 ■

WP WL

Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

bentonite seal

No free groundwater encountered

Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 04-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-08-22*

Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		0.00			
	FLOOR SLAB: Portland cement concrete: 150 mm Granular 'A': 100 mm					
	FILL: loose dark brown silt and sand, trace topsoil and gravel, moist					
1.00			-1.00	1	SS	4
				2	SS	6
2.00	***SILT:*** compact grey brown silt, some fine sand and clay, very moist to wet		-2.00			
				3	SS	16
3.00	brown sandy silt, moist		-3.00			
				4	SS	15
4.00			-4.00			
	CLAY TILL: hard grey silty clay, APL			5	SS	11
5.00	Borehole terminated at 5.03 m		-5.00			

Dynamic Cone (X) 20 40 60 80 — Standard Penetration (●) 20 40 60 80

Shear Strength (PP) kPa (▲) 50 100 150 200 — Shear Strength (FV) kPa (■) 50 100 150 200

Water Content (%) WP WL 10 20 30

Groundwater Observations and Standpipe Details: bentonite seal

No free groundwater encountered

Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 06-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-08-22*

Depth (m)	Description	Elevation (m)	Number	Type	N-Value
0.00	Ground Elevation	100.00			
	FLOOR SLAB: Portland cement concrete; 150 mm Granular 'A': 150 mm				
	FILL: very loose dark brown silt and sand, some topsoil, coal, trace gravel, moist		1	SS	2
1.00		99.00	2	SS	1
	SILT: compact brown silt, some sand, trace gravel, very moist		3	SS	22
2.00		98.00			
	SAND: dense brown silty sand, some gravel, moist		4	SS	33
3.00		97.00			
	SILT: dense brown sandy silt, some gravel, moist to very moist		5	SS	30
4.00		96.00			
	SAND: dense brown silty sand, saturated		6	SS	49
5.00		95.00			
	SILT TILL: dense brown and grey silt, some clay, trace sand, moist				

Dynamic Cone: X 20 40 60 80 X
Standard Penetration: ● 20 40 60 80 ●

Shear Strength (PP) kPa: ▲ 50 100 150 200 ▲
Shear Strength (FV) kPa: ■ 50 100 150 200 ■

WP WL
Water Content (%): 10 20 30

Groundwater Observations and Standpipe Details

Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 07-11

Ground Elevation: *100.00 m*

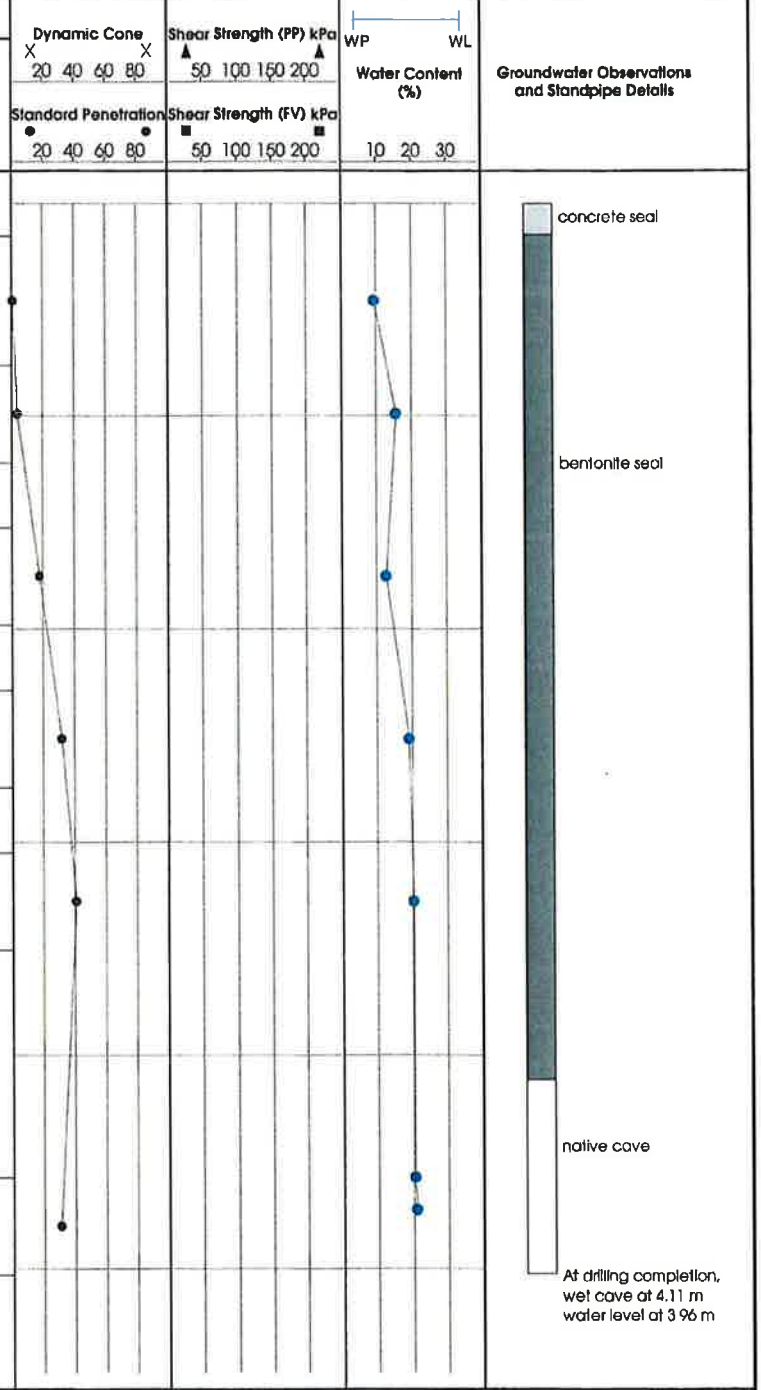
Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-08-22*

Depth (m)	Description	Symbol	Elevation (m)	Number	Type	N-Value
	Ground Elevation		100.00			
0.00	***FLOOR SLAB:*** Portland cement concrete: 120 mm Granular 'A': 100 mm					
	FILL: loose dark brown silt and sand, some topsoil, trace gravel, moist			1	SS	1
	some gravel					
1.00			99.00	2	SS	4
	SILT: compact brown fine sandy silt, trace gravel, moist			3	SS	18
2.00			98.00			
	dense			4	SS	32
	trace clay, moist to very moist					
3.00			97.00			
	some fine sand, trace clay, moist			5	SS	41
	wet					
4.00			96.00			
	saturated					
	SILT TILL: dense grey silt, some clay, trace sand and gravel, moist			6	SS	31
5.00	Borehole terminated at 5.03 m		95.00			



Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 08-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-08-22*

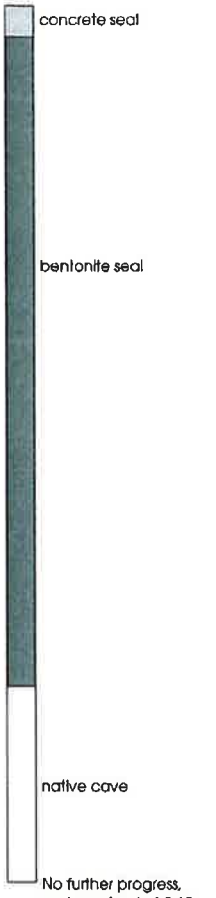
Depth (m)	Description	Symbol	Elevation (m)	Sample Number	Sample Type	N-Value
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 150 mm; Granular 'A': 150 mm					
	FILL: very loose dark brown sandy silt, some topsoil, trace gravel, moist			1	SS	3
1.00			99.00	2	SS	1
	SILT: compact brown fine sandy silt, moist					
	very moist			3	SS	16
2.00			98.00			
	moist to very moist			4	SS	27
3.00			97.00			
	dense, moist			5	SS	36
	SAND: dense brown silty fine sand, moist					
4.00			96.00	6	SS	47
	Borehole terminated at 4.11 m					
5.00			95.00			

Dynamic Cone (X) 20 40 60 80 — Standard Penetration (●) 20 40 60 80

Shear Strength (PP) kPa (▲) 50 100 150 200 — Shear Strength (FV) kPa (■) 50 100 150 200

Water Content (%) WP WL 10 20 30

Groundwater Observations and Standpipe Details



No further progress, casing refusal at 3.65 m due to dense sand. At drilling completion, dry cave at 3.20 m. No free groundwater encountered

Reviewed by: *WLoghrin*

Drill Method: *Percussive Casing*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Borehole Number: 09-11

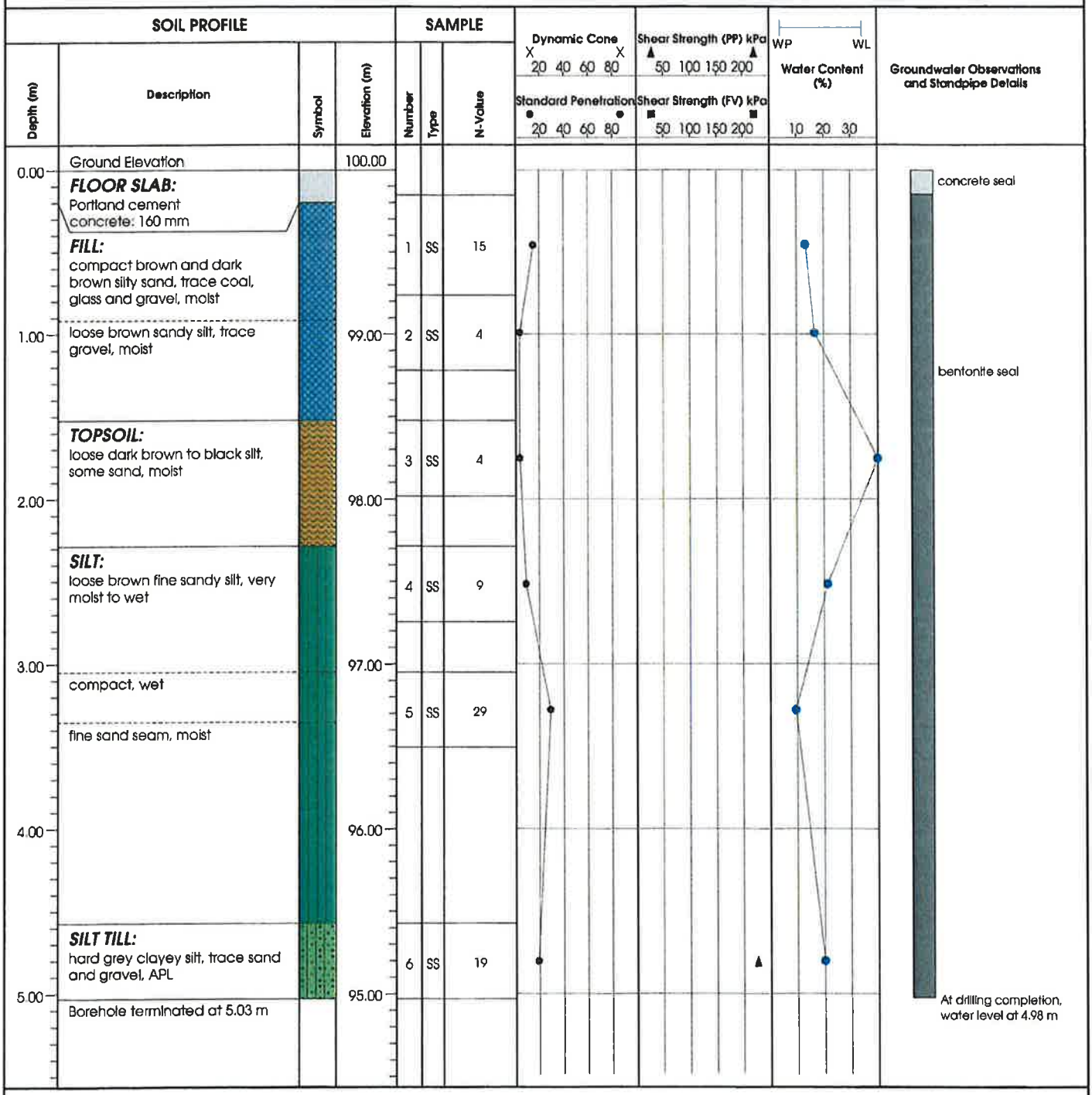
Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Drill Date: *2011-08-22*



Reviewed by: *WLoghrin*

Drill Method: *Solid Stem Auger*

Notes:

Field Tech.: *DSouter*

Sheet: *1 of 1*

Drafted by: *SMeteer*

LVM

Test Pit Number: 01-11

Project: *Rumpel Felt Factory*

Ground Elevation: *100.00 m*

Location: *60 Victoria Street North, Kitchener, Ontario*

Job No.: *P041895-100*

Excavation Date: *2011-07-19*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 260 mm					
	FILL: brown and grey silt, some clay and sand, trace wood and brick, very moist		99.50			
1.00	dark brown and white layers of silt, some topsoil		99.00			
			98.50			
	SILT: compact brown silt, some sand, moist					
2.00			98.00			
	Test Pit terminated at 2.2 m					Upon completion of excavation, test pit sidewalls unstable with cave at 1.0 m No free groundwater encountered

Reviewed by: *KThrams*

Drafted by: *SMeteer*

Field Tech: *DSouter*

Sheet: *1 of 1*

Notes: *Bottom of footing at ~2.1 m*

LVM

Test Pit Number: 02-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Excavation Date: *2011-07-19*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 100 mm; Air void: 80 mm; Granular 'A': 100 mm					
	FILL: dark brown and grey silt, some sand, topsoil, bricks, insulation and gravel, trace wood, moist		99.50			
1.00			99.00			
	120 mm concrete slab					
	loose granular layer					
	stiff to very stiff dark brown silt, some clay, APL (Possible Fill)					
	SILT: compact brown fine sandy silt, moist		98.50			Upon completion of excavation, test pit sidewalls unstable with minor caving in fill
	Test Pit terminated at 1.45 m					No free groundwater encountered
2.00			98.00			

Reviewed by: *KThrams*

Drafted by: *SMeteer*

Field Tech: *DSouter*

Sheet: *1 of 1*

Notes: *Bottom of footing at ~1.05 m*

LVM

Test Pit Number: 03-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Excavation Date: *2011-07-19*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 110 mm; Granular 'A': 80 mm					
	FILL: dark brown silt, some sand moist; black silty sand layers; 0.15 m thick brick layer at 0.45 m and 0.85 m		99.50			
1.00			99.00			
	silt, some sand and gravel, trace brick, moist					
	Test Pit terminated at 1.45 m		98.50			Upon completion of excavation, test pit sidewalls unstable with minor cave in southwest walls No free groundwater encountered
2.00			98.00			

Reviewed by: *KThrams*

Drafted by: *SMeteer*

Field Tech: *DSouter*

Sheet: *1 of 1*

Notes: *Bottom of footing at ~1.05 m. Native soil was contacted at 1.2 m in the east test pit wall*

LVM

Test Pit Number: 04-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Excavation Date: *2011-07-20*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 120 mm Granular 'A': 100 mm					
	FILL: brown silt, some sand, trace gravel and clay; rootlets, black stained layers		99.50			
1.00	120 mm concrete slab		99.00			
	stiff dark brown silt, some clay, APL (Possible Fill)					
	SILT: compact brown sandy silt, moist					
	Test Pit terminated at 1.35 m		98.50			Upon completion of excavation, test pit sidewalls unstable with minor cave in fill No free groundwater encountered
2.00			98.00			

Reviewed by: *KThrams*

Drafted by: *SMeteer*

Field Tech: *KThrams*

Sheet: *1 of 1*

Notes: *Bottom of footing at ~1.05 m.*

LVM

Test Pit Number: 05-11

Ground Elevation: *100.00 m*

Project: *Rumpel Felt Factory*

Job No.: *P041895-100*

Location: *60 Victoria Street North, Kitchener, Ontario*

Excavation Date: *2011-07-20*

SOIL PROFILE				SAMPLE		
Depth (m)	Description	Symbol	Elevation (m)	Number	WP — Water Content (%) — WL (10, 20, 30)	Groundwater Observations and Measurements (m)
0.00	Ground Elevation		100.00			
	FLOOR SLAB: Portland cement concrete: 100 mm; Air void: 80 mm; Granular 'A': 180 mm					
	FILL: dark brown silty sand, some brick and gravel, moist		99.50			
	SILT: compact brown fine sandy silt, very moist to wet					Upon completion of excavation, test pit sidewalls stable
	Test Pit terminated at 0.85 m					Minor groundwater seepage encountered at north end of excavation
1.00			99.00			
			98.50			
2.00			98.00			

Reviewed by: *KThrams*

Drafted by: *SMeteer*

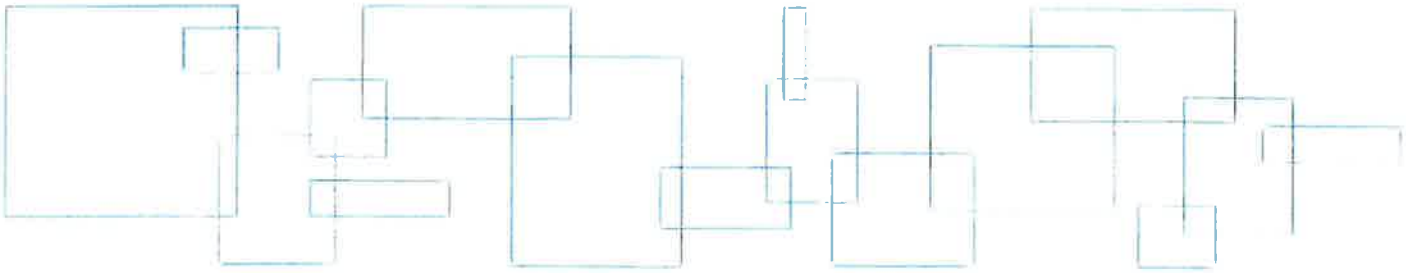
Field Tech: *KThrams*

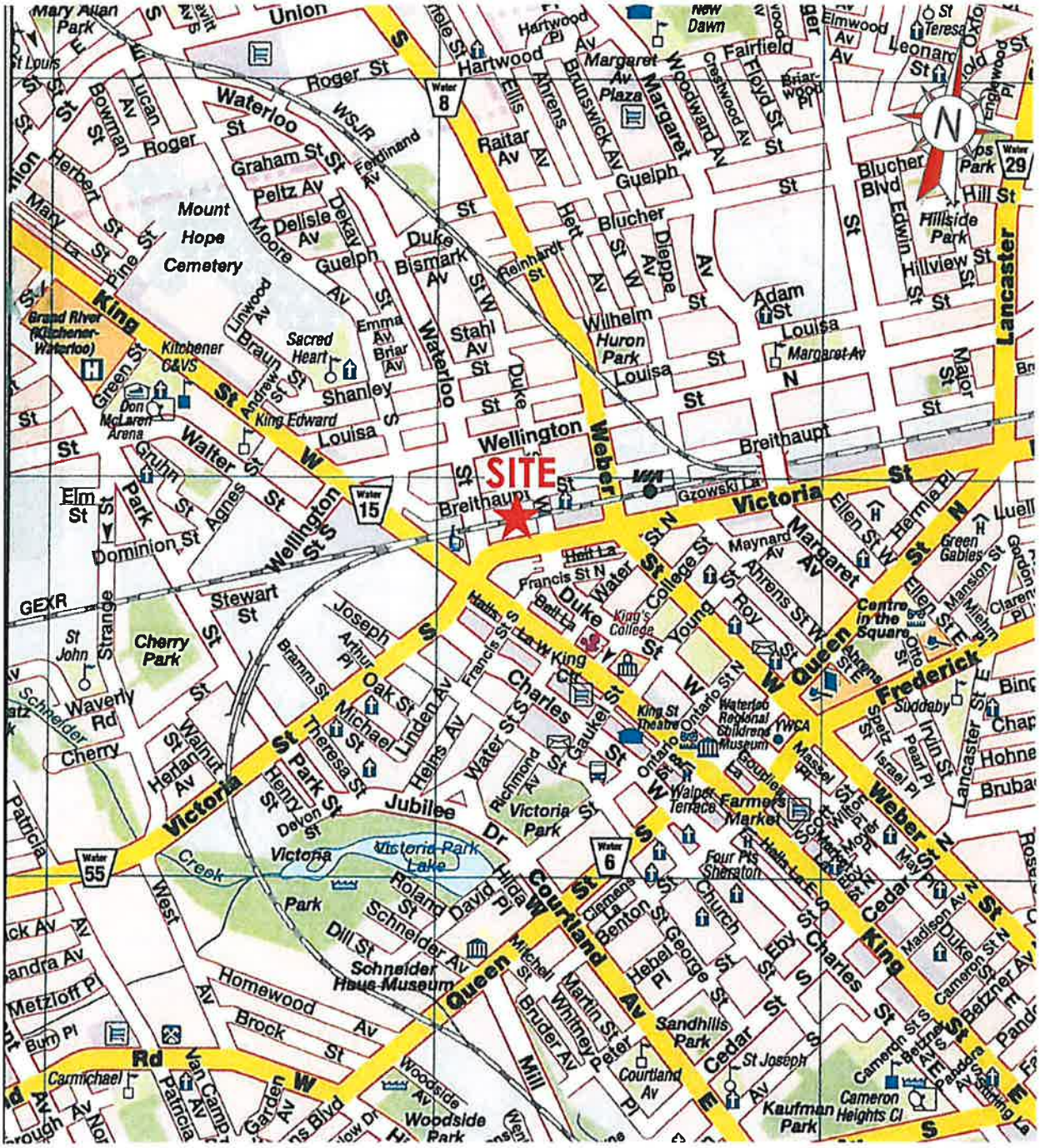
Sheet: *1 of 1*

Notes: *Bottom of footing at ~0.75 m.*

Appendix 2 Drawings

Drawing 1: Location Plan
Drawing 2: Site Plan
Drawing 3: Underpinning Procedure
Drawing 4: Typical Helical Pier Installation
Drawing 5: Underpinning Requirements





NOTES :
1-REFERENCES : MAPART PUBLISHING, Page 42, Kitchener-Waterloo Map Book (2009).

0 100 200 300 400 500 m

SCALE 1:15000

Project

Rumpel Felt Factory

60 Victoria Street North, Kitchener, Ontario

Title

LOCATION PLAN

LVM inc.
12-60 Meg Drive
London (Ontario) N6E 3T6
Telephone : 519.685.6400
Fax : 519.685.0943

Prepared	KThrams	Discipline	GEOTECHNICAL	Project manager	WLoghrin
Drawn	KThrams	Scale	1 : 15000	Sequence no.	01 of 05
Checked	WLoghrin	Date	2011-08-25		

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
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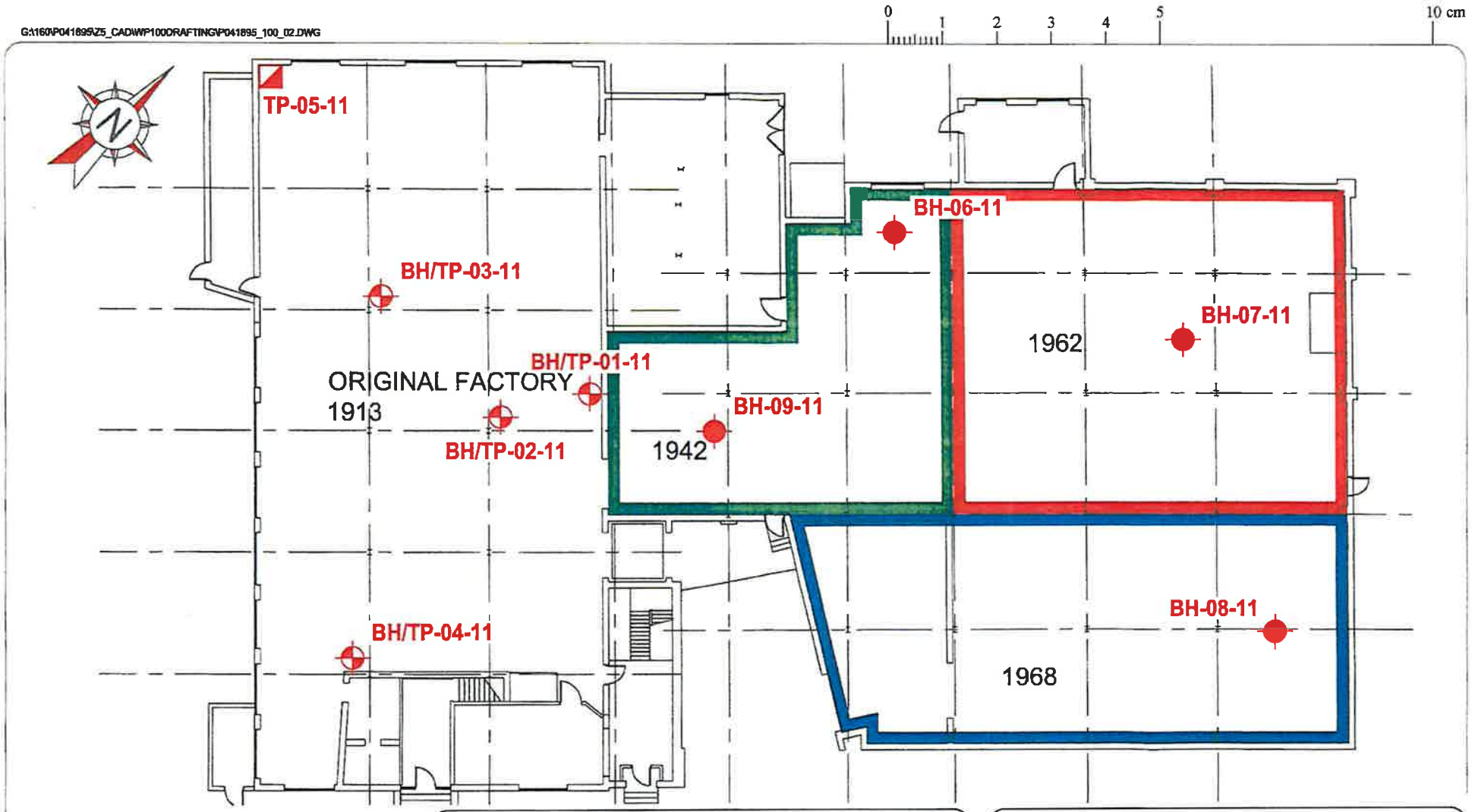
G:\160\P041895\Z5_CAD\WP100\DRAFTING\P041895_100_02.DWG

0 1 2 3 4 5 10 cm



LEGEND :

- TEST PIT LOCATION
- TEST PIT AND BOREHOLE LOCATION
- BOREHOLE LOCATION

NOTES :
1-REFERENCES : Base plan provided on-site by MTE CONSULTANTS INC. (2011-07-20)

Project

Rumpel Felt Factory

60 Victoria Street North, Kitchener, Ontario

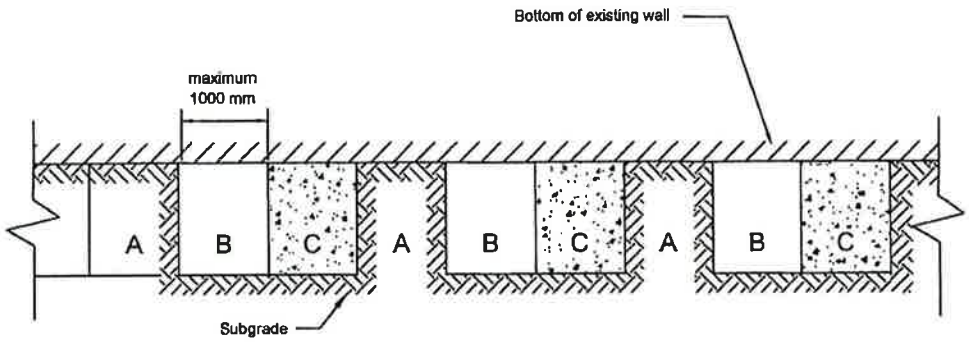
Title

SITE PLAN

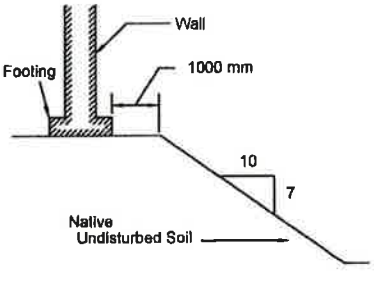
LVM inc.
353, Bridge Street East
Kitchener (Ontario) N2K 2Y5
Telephone : 519.741.1313
Fax : 519.741.5422

Prepared KThrams	Discipline GEOTECHNICAL	Project manager WLoghrin			
Drawn KThrams	Scale NTS	Sequence no. 02 of 05			
Checked WLoghrin	Date 2011-08-25				

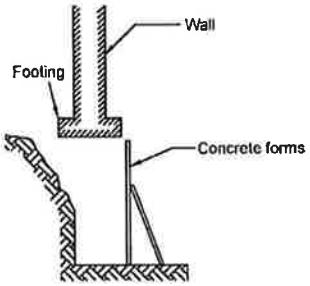
M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
160	P041895	0100		GE	2	00



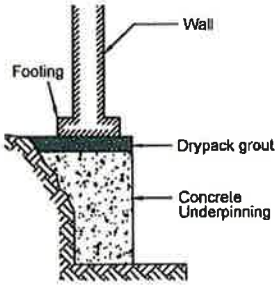
ELEVATION



SECTION A
(BEFORE UNDERPINNING)



SECTION B
(DURING UNDERPINNING)



SECTION C
(COMPLETED UNDERPINNING)

GENERAL REQUIREMENTS FOR UNDERPINNING

1. The underpinning should be carried out in short panels. A maximum width of 1000 mm is recommended.
2. At all times, at least two intact panels must be left between open panels; i.e. only panels denoted with the same letter may be opened at one time.
3. Underpinning may be done by pouring concrete panels up to approximately 80 mm below the underside of the existing footing. Once the concrete has set, the remaining space must be filled tightly with drypack grout.
4. Care must be taken to avoid loss of soil behind the footing.
5. Underpinning operations should be inspected by Naylor Engineering Associates Ltd.

G:\160\P041895\25_CAD\WP\100DRAFTING\P041895_100_03.DWG

Project

Rumpel Felt Factory

60 Victoria Street North, Kitchener, Ontario

Title

UNDERPINNING PROCEDURE

LVM inc.
353, Bridge Street East
Kitchener (Ontario) N2K 2Y5
Telephone : 519.741.1313
Fax : 519.741.5422

Prepared KThrams	Discipline GEOTECHNICAL	Project manager WLoghrin
Drawn KThrams	Scale NTS	Sequence no. 03 of 05
Checked WLoghrin	Date 2011-08-25	

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
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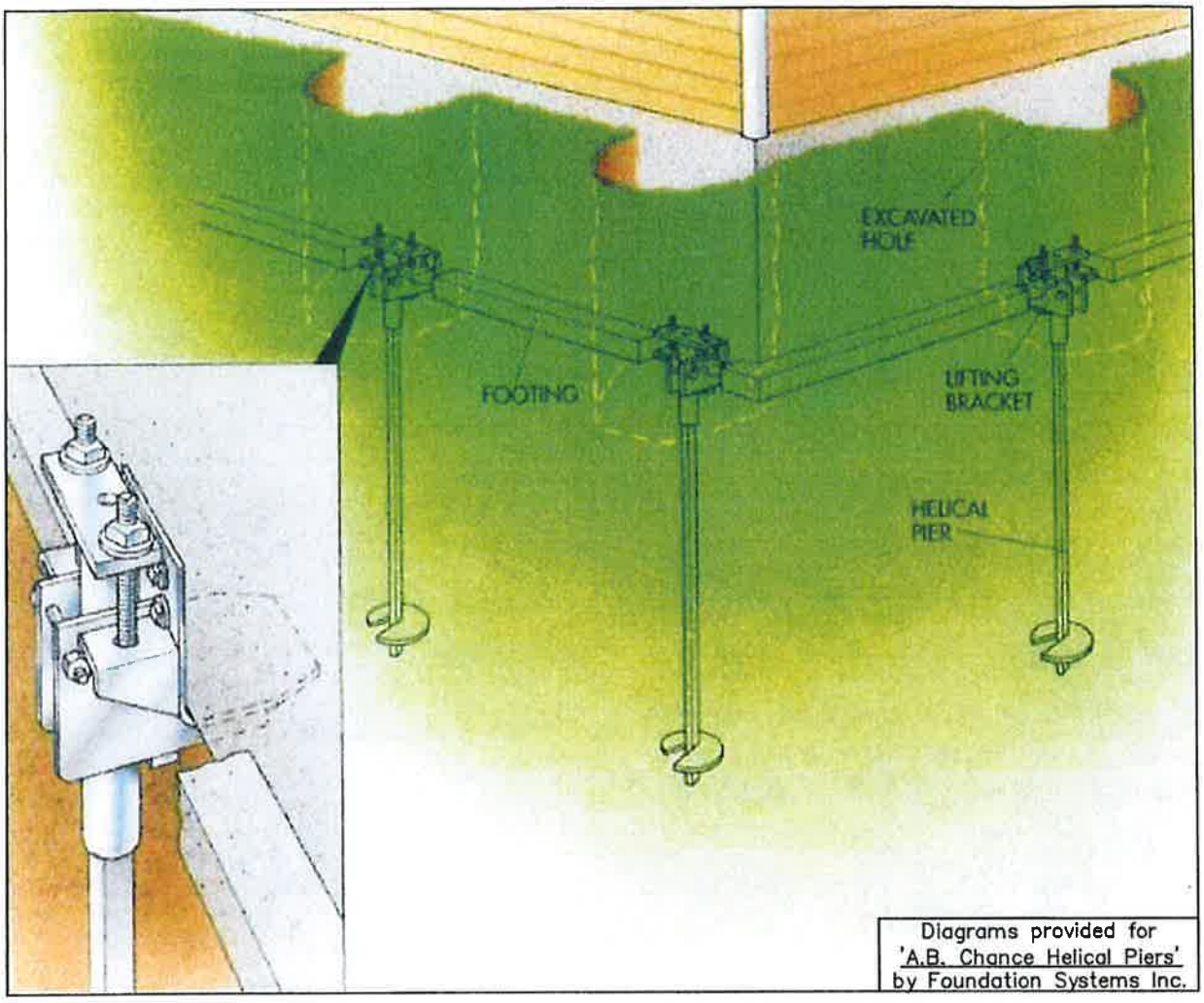

Helical Pier Installation

1. A narrow trench or hole is excavated at the site of the new structure.
2. A steel shaft with a larger diameter helix is screwed into the ground to the level of competent soil.
3. A special bracket is used to connect the steel shaft to the existing foundation.
4. The trench is backfilled and compacted.

Notes:

The capacity of the helical pier anchor must be determined by a Professional Engineer.

Project

Rumpel Felt Factory

60 Victoria Street North, Kitchener, Ontario

Title

TYPICAL HELICAL PIER INSTALLATION

LVM inc.
353, Bridge Street East
Kitchener (Ontario) N2K 2Y5
Telephone : 519.741.1313
Fax : 519.741.5422

Prepared KThrams	Discipline GEOTECHNICAL		Project manager WLoghrin		
Drawn KThrams	Scale NTS		Sequence no. 04 of 05		
Checked WLoghrin	Date 2011-08-25				
M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
160	P041895	0100		GE	4	00

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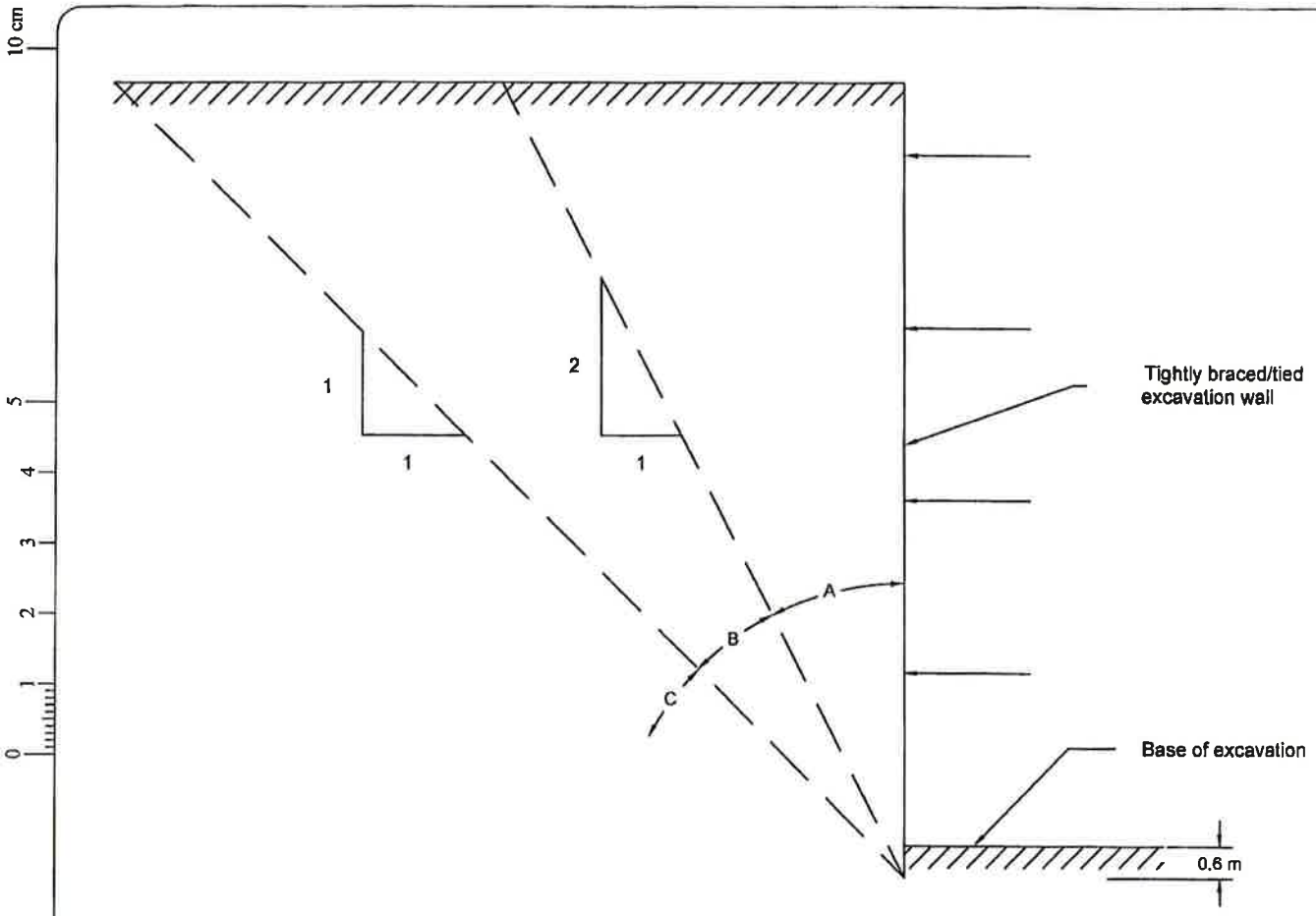

ZONE A: Foundations located within this zone normally require underpinning. Horizontal and vertical pressures on the excavation wall from non-underpinned foundations must be considered. Horizontal and vertical deformations of foundations within this zone must be considered relative to underpinned and non-underpinned foundations.

ZONE B: Foundations located within this zone do not normally require underpinning. Horizontal and vertical forces on the excavation wall for non-underpinned wall from non-underpinned foundations must be considered. Horizontal and vertical deformations of foundations within this zone must be considered relative to underpinned and non-underpinned foundations.

ZONE C: Underpinning to structures is normally founded in this zone. Lateral pressure from underpinning is not normally considered.

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Project

Rumpel Felt Factory

60 Victoria Street North, Kitchener, Ontario

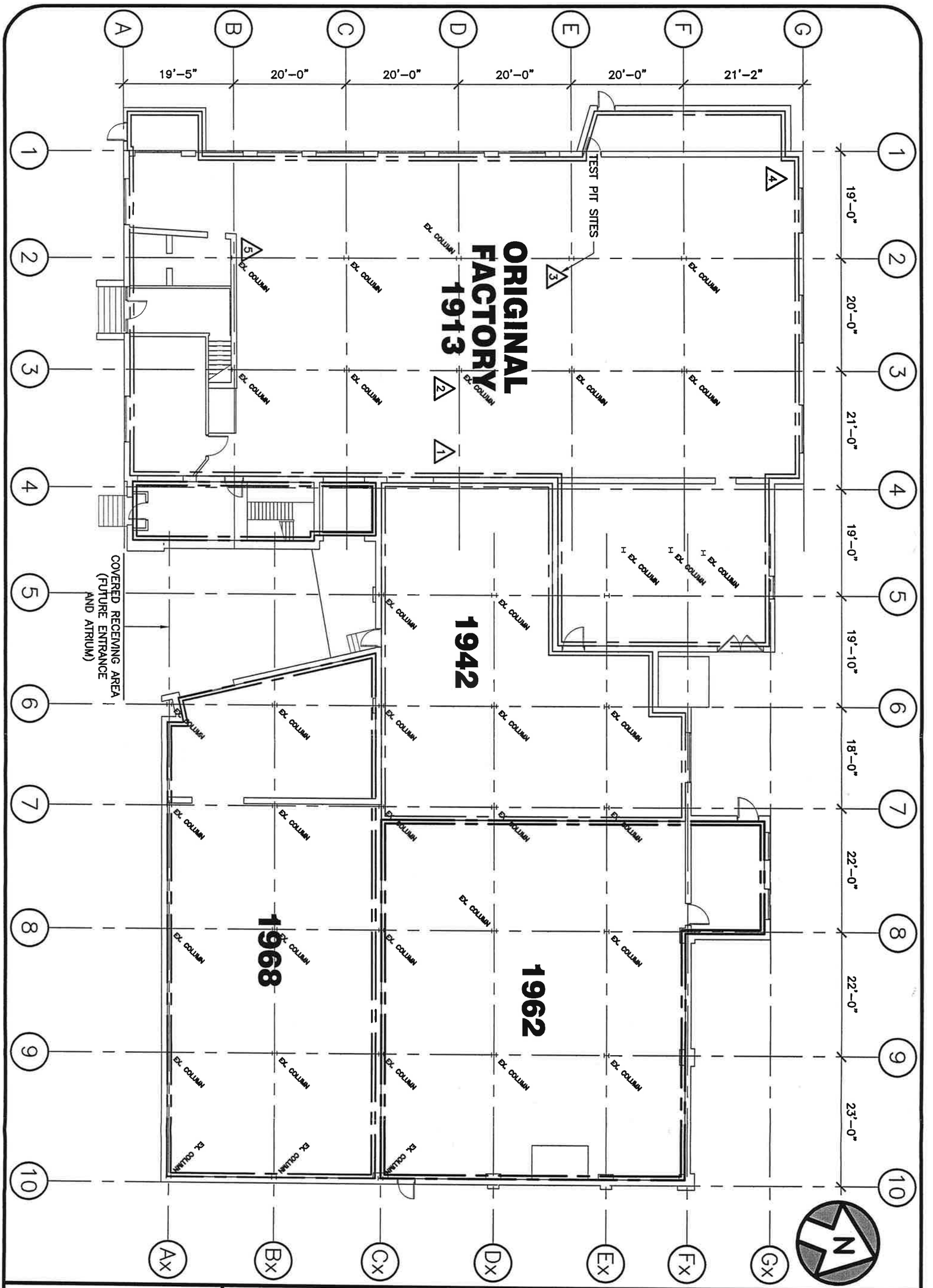
Title

UNDERPINNING REQUIREMENTS

LVM inc.
353, Bridge Street East
Kitchener (Ontario) N2K 2Y5
Telephone : 519.741.1313
Fax : 519.741.5422

Prepared KThrams	Discipline GEOTECHNICAL	Project manager WLoghrin
Drawn KThrams	Scale NTS	Sequence no. 05 of 05
Checked WLoghrin	Date 2011-08-25	

M. dept.	Project	Work pckg.	Sub-w.p.	Disc.	Drawing no.	Rev.
160	P041895	0100		GE	5	00



MTE
25 YEARS 1985-2010
Building Structures Division
Ph. (519)743-6500 www.mte85.com

PROJECT
RUMPEL FELT CO. LTD.
FEASABILITY STUDY
60 Victoria Street North Kitchener, Ontario

DRAWING
GROUND FLOOR

Project No.	32392-000
P.M.	PAS
Drawn By	RLC
Date	Oct. 7, 2011
Scale	1/16"=1'-0"
Drawing No.	SK1.0

Appendix C

Structural Assessment Report Update, dated April 3, 2025

MTE Consultants
520 Bingemans Centre Dr., Kitchener, Ontario N2B 3X9

April 3, 2025

MTE File No.: C33233-301

Christa De Wys, P.Eng., M.Eng.
Senior Project Manager
Region of Waterloo
20 Weber Street East, 3rd Floor
Kitchener ON N2H 1C3

Dear Christa:

RE: Rumpel Felt 1913 Heritage Building – Structural Assessment
60 Victoria Street North, Kitchener, Ontario

1.0 INTRODUCTION

MTE Consultants Inc. (MTE) was retained by the Region of Waterloo to conduct a structural condition assessment of the 1913 Rumpel Felt building structure in preparation for the proposed partial demolition of the 1942, 1962, and 1968 additions. The purpose of this assessment is to identify any structural distress observed and comment on the feasibility and implications of the proposed demolition of the additions and make any recommendations for improvement given the observations.

Paul Slater, P.Eng. of MTE Consultants Inc. visited the building at the above noted address on March 5, 2025 to conduct the assessment. Observations are made below and shown in the Photographic Log attached.

2.0 BACKGROUND

Paul Slater, P.Eng. completed a previous structural condition assessment of the building in 2011. Reference is made to letter report dated Oct 11, 2011, and subsequent roof shoring design drawing in 2012.

The 1913 Building is designated as a Heritage asset. Reference is made to the Heritage Conservation Plan and Risk Management Plan presently being proposed by MTE to the City of Kitchener. MTE has prepared demolition plans that describe the demolition sequence and call for temporary bracing of the additions while they are demolished to protect the 1913 building.

The work completed is a visual condition assessment. No structural analysis or testing (destructive or non-destructive), or Building Code review, was undertaken.

3.0 STRUCTURAL CONDITION

3.1 Building Construction

Three building additions were made to the original 1913 building in 1942, 1962 and 1968, which were steel framed construction with reinforced concrete floors. Other than a few pits, there is no basement in the additions or the original 1913 building. All rubberized roof membrane exists over all building areas. A tall brick chimney at the northeast corner of the 1913 building is a separate independent structure and is included in the proposed demolition. The steel floor and roof beams bear on the multi-wythe load bearing masonry wall along the east walls of the 1913 building. The second entrance, stair shaft and elevator were added to the east wall of the 1913 building, as part of the 1962 building addition. It serves the 1913 building as an exit and is not part of the proposed demolition but will be preserved.

General observations are made below and are limited to the 1913 building grouping them in the following four building areas: Exterior Façade, Roof, Interior, Courtyard. The Exterior façade section includes the original east wall of the 1913 building, presently an interior wall. Although the purpose of our scope is the building structure, some useful observations regarding the building envelope and architectural facade are included.

3.2 Building – Exterior

The following observations were made reviewing the exterior of the 1913 Building:

1. The masonry is generally in good condition with limited cracks and mortar deterioration. Newer brick has been added to infill window areas, in satisfactory condition. (Photograph 1).
2. East Entrance (Victoria St) - Concrete steps and landing slab badly cracked, heaved (door has trouble opening). Recommend repair, and/or partial reconstruction. (Photograph 2). Hollow metal door is badly corroded (non structural, recommend replacement).
3. Central Entrance (Victoria St) – Concrete entrance posts & canopy are cracked; paint badly cracked/peeling; Concrete piers badly deteriorated (Photograph 3). The concrete steps are also badly deteriorated. Recommend further investigation to determine the extent of delamination and deterioration and to decide on restoration or replacement. Recommend providing hoarding enclosure as soon as possible to protect the structure from further deterioration until structure can be assessed.
4. Brick mortar has deteriorated in areas; brick veneer cracked at entrance (Photograph 4).
5. Vines growing on the west wall hold moisture and are a threat to the long term durability of the brick and should be removed. (Photograph 7).
6. Window caulking worn/brittle; needs to be replaced/redone.
7. West shed was an addition; see door through blocked up window (Photographs 7-10).
8. Very few cracks in masonry; some windowpanes missing or cracked. (Photographs 11-13). Evidence of step cracking and repointing of mortar (Photograph 13).
9. Painted brick masonry is generally in good condition; interior sheltered by additions (Photographs 13-31).; some openings through brick will need to be infilled with reclaimed brick from the Chimney (Photographs 22,23).

3.3 Building - Roof

All areas of the roof are covered with EPDM (black membrane) and TPO (grey/white) The following observations are made:

1. Roof is leaking badly through the grey TPO membrane raining down through the roof/structure to third, second and ground floors. The leak is suspected at the two south drains of the 1913 building (Photographs 32), but this should be confirmed through investigation. Roofing repair is needed. The condition of the wood deck structure should be assessed for rot damage. Similarly, potential corrosion of the concealed portion of the steel roof beams should also be investigated. This will require a separate investigation requiring the removal of the plywood ceiling, for the extent of the portion of roof where the leak is found to be.
2. Roof is leaking badly through obvious holes in the black EPDM membrane at the 1962 addition near the chimney (Photographs 36-38).
3. Standing water was observed on the main stair roof (Photographs 34,35).
4. Roof EPDM of 1913 building is not well supported at parapets particularly at corners, which could be a leak source (Photographs 34,35). Recommend further investigation by roofing consultant.
5. Some brick mortar deterioration was observed on the hoist shaft (Photograph 39). Recommend repointing mortar.

3.4 Building Interior

The following observations are made regarding the interior of the 1913 building. Refer to Photographs 41 to 60 in the Photographic Log.

1. Water is infiltrating down through the concrete floors from leaks in the roof (Photographs 41,42,43,53,56,60). At least two sources of water leaks were observed. Refer to the Roof Section, above.
2. The brick is generally in good condition with very few cracks (Photographs 44-47, 52, 54, 57-60).
3. Standing water from roof leaking above was found on the second floor (Photographs 48-49). Floor Structure did not show any distress or deterioration as a result of the leak.
4. Some cracking observed in plaster in the southeast corridor on second floor (Photographs 50). Assuming only surficial and do not suspect structural concern; However, further investigation would be required to assess whether structural in nature.
5. Brick is in good condition in stair to third floor (Photograph 51).
6. Doorway and other openings in walls should be infilled as the east wall will become an exterior wall exposed to the elements (Photographs 44,46).
7. In the past 2011 structural assessment report, the steel roof beams were identified as insufficient to support the snow loads and were shored. Shoring of the roof beams should be monitored during demolition (Photographs 53-55). Moving forward if the Region wants to remove the shoring, then the beams and columns will need to be replaced or reinforced.
8. Damage to ceiling board from rain leak (Photograph 55). Further investigation is recommended to confirm integrity of wood roof joists. This will require removal of ceiling board to properly assess wood condition throughout, at roof leak locations.

3.5 Courtyard

The following observations are made regarding the Courtyard at the northeast of the 1913 building. Refer to Photographs 61 to 67 in the Photographic Log.

1. Timbers on retaining wall are leaning due to earth pressure, laneway and tree; some timbers are in poor condition; rot observed. Photographs 62-66. Roof shown in Photograph 61 bears on the masonry block and timbers, but ineffectively braces the timbers from leaning. These timbers will need to be restored in alignment and anchorage, and some replaced that have rotted.
2. Lose laid masonry blocks are on top of the timbers. Only spikes are holding them from falling. Photograph 62.
3. Concrete buttress of retaining wall show signs of deterioration and should be repaired. Photographs 63, 65.
4. Free standing concrete beam on columns show signs of spalling. Photograph 66. This concrete beam and column structure is to be demolished, so no repair is recommended.
5. Drainage of the courtyard is believed to be natural, through soil infiltration, near center of courtyard. At first exploration, snow was vacant in local hole, likely thought be from heat. Snow was removed (prior to taking Photograph 67), but no catch basin or grate was found.

4.0 DISCUSSION

The 1913 building structure is generally in good condition. The primary structural system comprised of load bearing masonry, interior steel framing, floor and roof diaphragms is intact. Although some cracks were observed in the brick, they were few in number and none of a significant structural concern. The concrete of second and third floors was as well as the steel beams were in good condition with no signs of structural distress or deflection. The wood decking on steel beams did not show any signs of structural distress such as sagging or deflection. However, further investigation at roof leaks is recommended to rule out rot of wood deck or roof joists.

The exterior brick mortar has deteriorated in localized areas and should be repointed for proper maintenance and to restore integrity.

Vines on the building should be removed since they hold moisture and provide a means for brick and mortar deterioration through seasonal freeze-thaw action.

The steel beams of the westerly additions framing into the 1913 masonry wall structure of the east wall will need careful support and extraction during demolition. This has been identified on the demolition plans.

The front entrance stair and canopy structure are in poor condition and require restoration.

4.1 Stability of the 1913 Building

The demolition plans prepared by MTE call for temporary building bracing to be installed by the demolition contractor within the westerly additions and for it to remain in place until the floors and roof framing are disconnected and removed from the 1913 building. This will safe guard the 1913 Building from being damaged as a result of the beams pulling away during demolition.

The structural stability of the 1913 Building is provided by its own structural system and is intact as noted above. Gravity and lateral load resisting structures are in place within the 1913 building, and are not dependent upon the additions proposed to be demolished. There is no

expectation for the 1913 building structure to conform to present day building code prescribed loads.

5.0 CONCLUSIONS AND RECOMMENDATIONS

We did not observe any structural distress in the building of concern.

The structural performance level of the original 1913 building prior to the three additions will be maintained following the proposed demolition.

The following is recommended:

- The front entrance concrete structure has undergone significant deterioration. Further investigation is required to determine the extent of delamination and deterioration and to decide on restoration or replacement. A hoarding enclosure should be placed as soon as possible to protect the structure from further deterioration until structure can be assessed.
    1. The front entrance concrete landing slab and stairs have significant deterioration and should be rehabilitated.
- Roof leaks should be addressed as soon as possible. Engage a roofing consultant to assess the roofing membranes and parapet details to ensure longevity.
    2. The condition of the roof members and deck at leak sites should be investigated and confirmed or remedied if found to be deficient.
    3. Remove vines from brick masonry.
    4. Repoint all brick mortar deterioration. Monitor thru brick cracks or replace brick (Photograph 2).
    5. Infill all masonry holes and openings, toothing in to match existing courses. (e.g. Photographs 22,23).
    6. Remove tree which is applying pressure to the retaining wall.
    7. Restore or replace timber members along courtyard retaining wall. Remove lose laid concrete blocks from timbers.
    8. Restore the deteriorated areas of the concrete buttress of the courtyard retraining wall.

6.0 LIMITATIONS

This report has been prepared by MTE Consultants Inc. (MTE) at the request of the Region of Waterloo. The material in it reflects the best judgment of MTE in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. MTE accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This assessment 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. We 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. The Consultant may use such specific information obtained in performing its services and is entitled to rely upon the accuracy and completeness thereof.

Responsibility for detection of or advice about pollutants, contaminants or hazardous materials is not included in our mandate. In the event the Consultant or any other party encounters any hazardous or toxic materials, or should it become known to the Consultant that such materials may be present on or about the jobsite or any adjacent areas that may affect the performance of the Consultant's services, the Consultant may, at its option and without liability for consequential or any other damages, suspend performance of its services under this Agreement until the Client retains appropriates consultants to identify and abate or remove the hazardous or toxic materials and warrants that the jobsite is in full compliance with all applicable laws and regulations.

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time. Any user of this report specifically denies any right to claims against the Consultant, Sub-Consultants, their Officers, Agents and Employees in excess of the fee paid for professional services.

Yours truly,

MTE Consultants Inc.

Paul Slater, P.Eng.
Division Manager, Building Structures
519-743-6500 ext. 1240
pslater@mte85.com

PAS:smk
Attach.
cc: Jessica Vieira, Heritage Planner, City of Kitchener
https://mte85.sharepoint.com/sites/33223-301/Shared Documents/Structural Assessment 2025/33223-301_ltr rpt_Rumpel 60 Victoria Assesment_2025-04-03 - DRAFT.docx

Exterior Façade

Photograph No. 1 – South Façade

Photograph No. 2 – Right Entrance Floor Slab Deterioration

Photograph No. 3 – Left Entrance Column Deterioration

Photograph No. 4 – Brick Mortar Deterioration

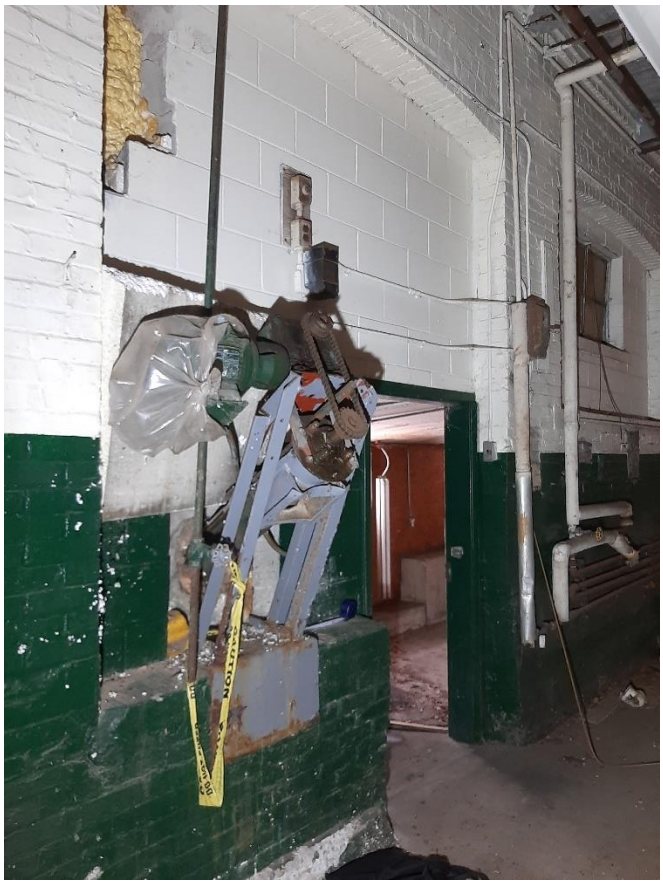
Photograph No. 5 – Salt Storage Delivery System

Photograph No. 6 – West Shed Addtion

Photograph No. 7 – West Elevation

Photograph No. 8 – West Shed Addition, to be Removed

Photograph No. 9 – West Shed Addition Foundations, to be Removed



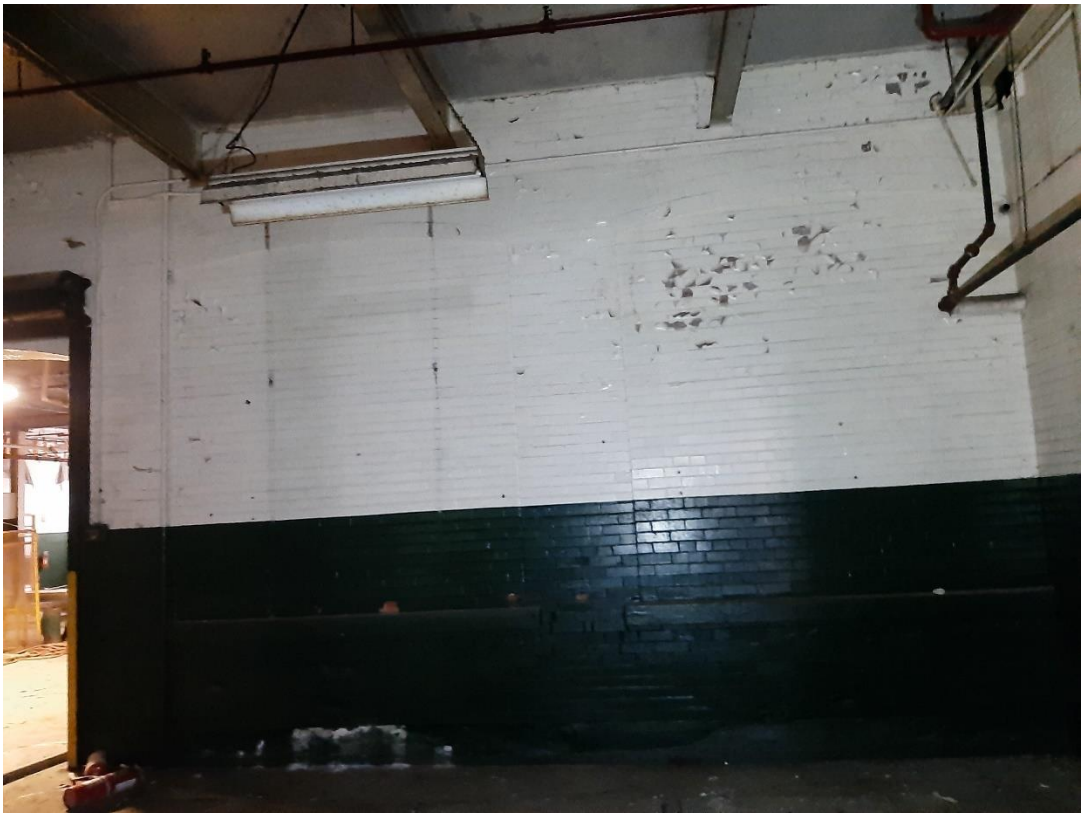
Photograph No. 10 – West Shed Entrance Within Former Window

Photograph No. 11 – North Elevation - West Corner

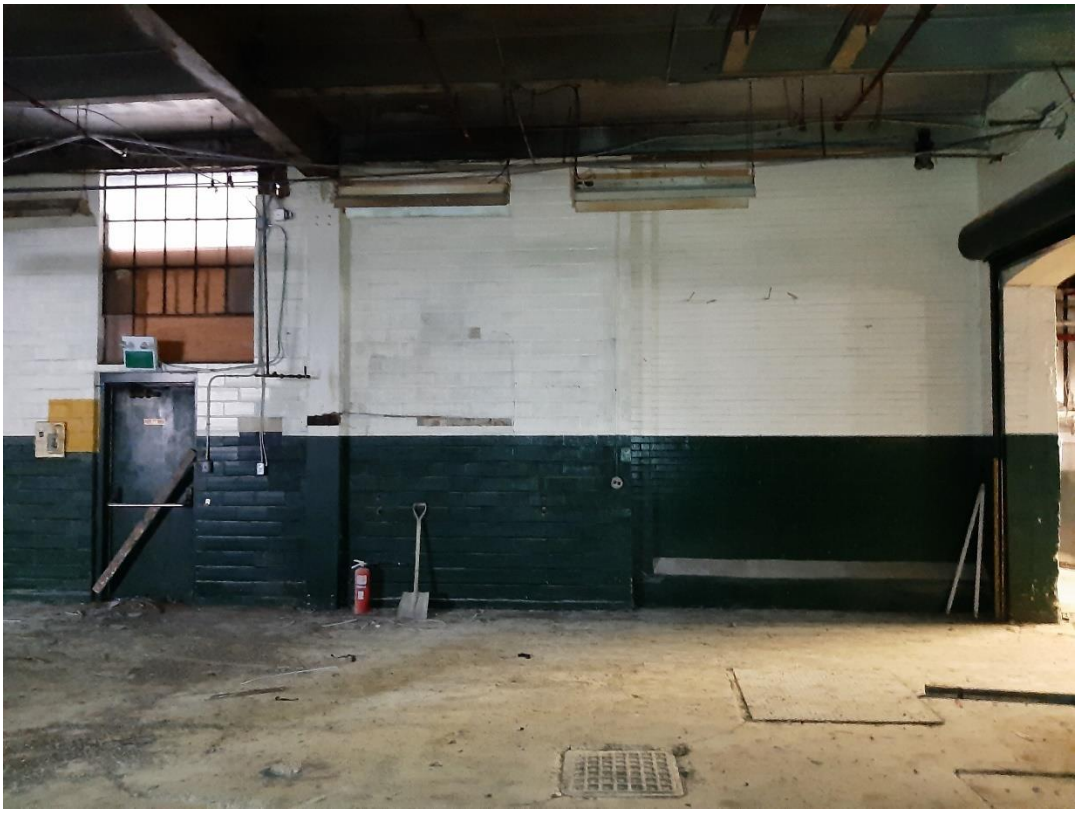
Photograph No. 12 – North Elevation - Middle

Photograph No. 13 – North Elevation - East Corner

Photograph No. 14 – Ground Floor Door to be infilled



Photograph No. 15 – Ground Floor Painted Wall to Become Exposed East Facade



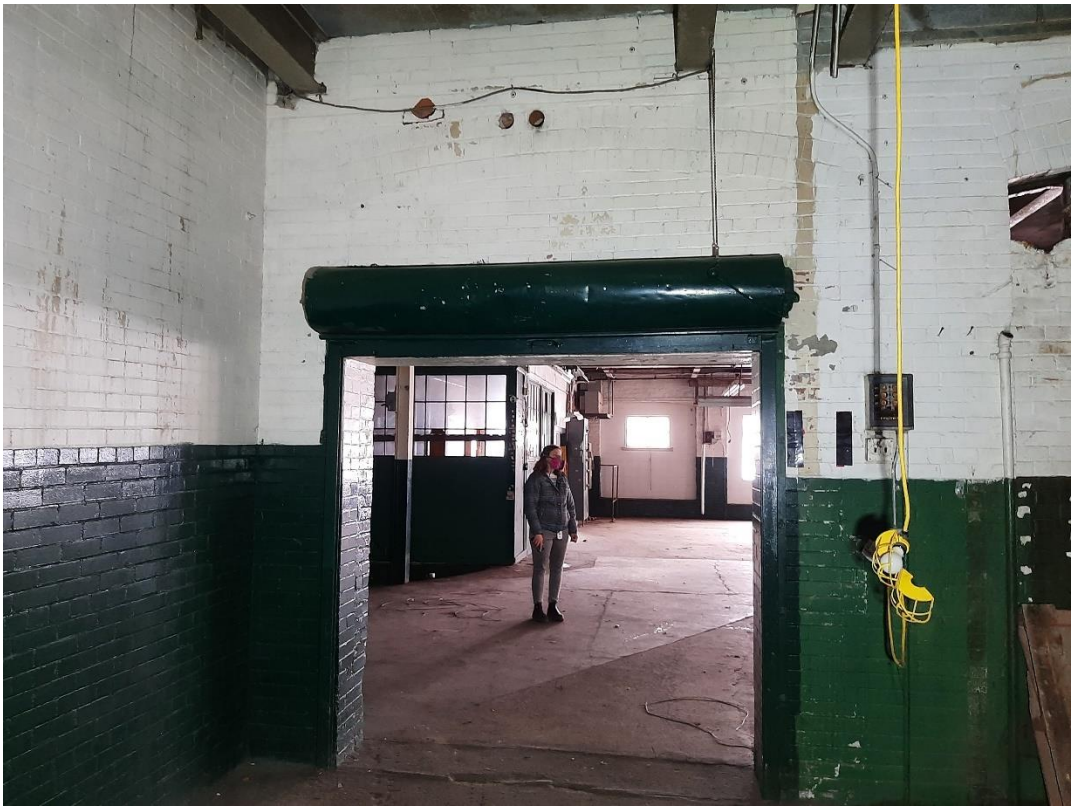
Photograph No. 16 – Ground Floor - Looking South

Photograph No. 17 – Ground Floor - Looking North

Photograph No. 18 – Ground Floor - Looking West

Photograph No. 19 – Ground Floor - Looking West

Photograph No. 20 – Ground Floor - Wall Wrapping Chimney



Photograph No. 21 – Second Floor Door to be infilled

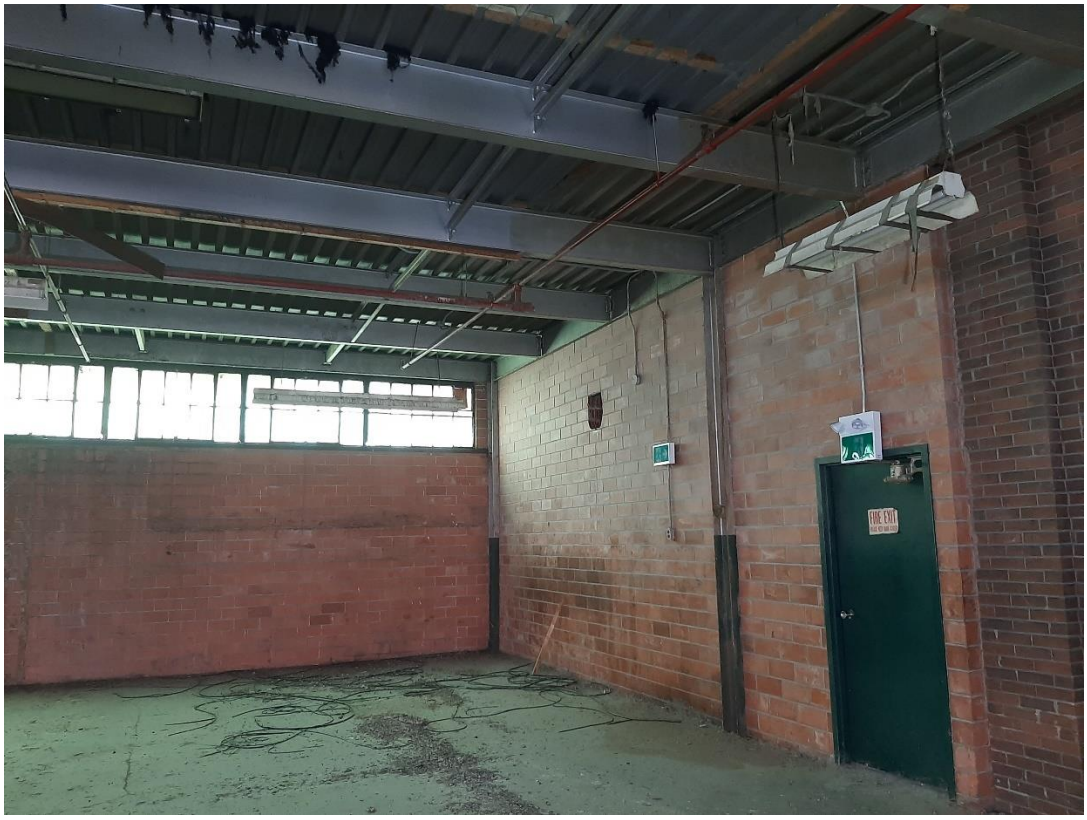
Photograph No. 22 – Second Floor Wall

Photograph No. 23 – Second Floor - Looking North

Photograph No. 24 – Second Floor - Looking North

Photograph No. 25 – Second Floor - Looking West

Photograph No. 26 – Second Floor (Looking South) - North wall of Stair



Photograph No. 27 – Second Floor - East Wall of Main Stair

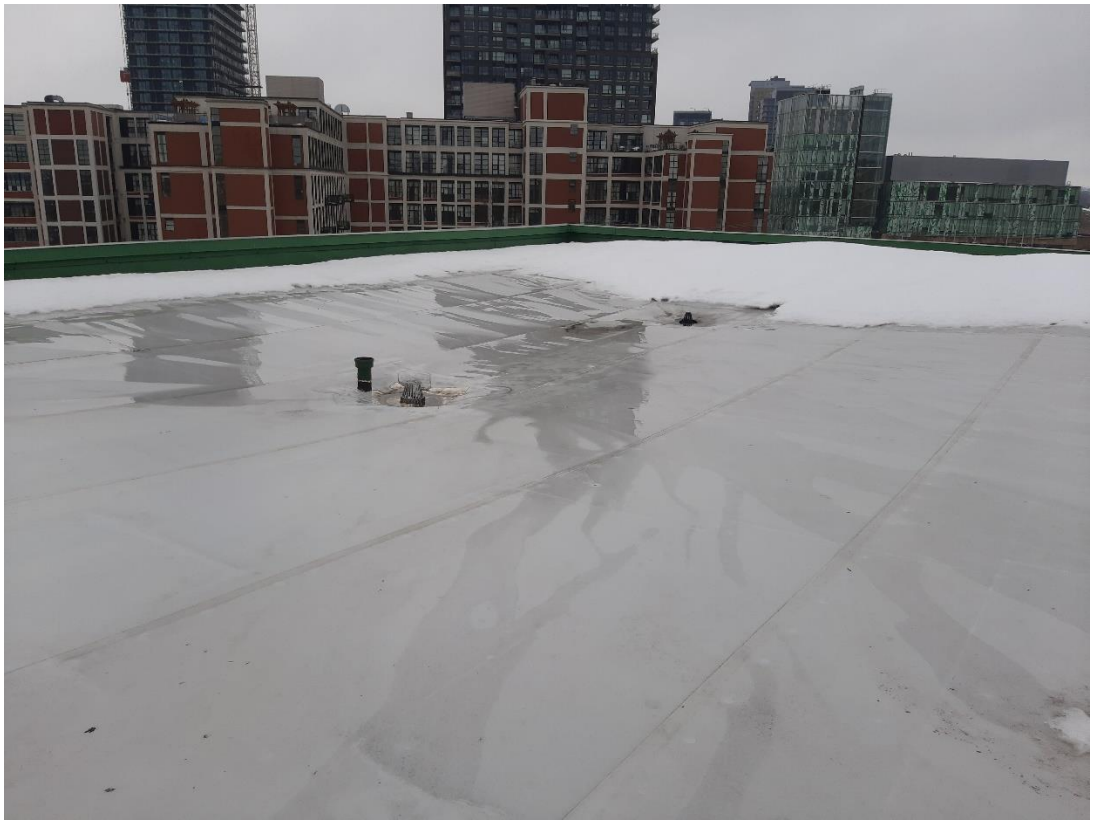
Photograph No. 28 – East Wall of Main Stair

Photograph No. 29 – Third Floor Opening to be infilled

Photograph No. 30 – Third Floor East wall

Photograph No. 31 – Third Floor East wall

Roof



Photograph No. 32 – Roof, Suspected source of water leak thru building

Photograph No. 33 – Roof looking northwest

Photograph No. 34– Small roof over entrance stair, poor drainage

Photograph No. 35 – Small roof over entrance stair, poor drainage

Photograph No. 36 – Edge of 1913 east wall, source of leak

Photograph No. 37 – Edge of 1913 east wall, source of roof leak

Photograph No. 38 – Edge of 1913 east wall, source of roof leak

Photograph No. 39 – Lift Hoist shaft

Photograph No. 40 – Looking west

Interior

Photograph No. 41 – Ground Floor - Rain water leaking thru Concrete floor slab above

Photograph No. 42 – Ground Floor - Water from Roof Leak

Photograph No. 43 – Ground Floor, Water Leak from Second Floor above

Photograph No. 44 – Ground Floor looking at 1913 East Wall

Photograph No. 45 – Ground Floor Looking East

Photograph No. 46 – Ground Floor Looking East, No Distress

Photograph No. 47 – Second Floor Masonry in Good Condition

Photograph No. 48 – Second Floor, Water leak from roof

Photograph No. 49 – Second Floor, Water leak from roof

Photograph No. 50 – Second Floor - cracks in wall plaster

Photograph No. 51 – Stair to Third Floor

Photograph No. 52 – Third Floor - masonry cracks

Photograph No. 53 – Third Floor - shoring in place since 2012

Photograph No. 54 – Third Floor, Masonry in Fair Condition

Photograph No. 55 – Third Floor - Ceiling Board damage from roof leak

Photograph No. 56 – Third Floor - Water from Roof Leak

Photograph No. 57 – Third Floor - looking east, Masonry in fair condition

Photograph No. 58 – Third Floor, looking south

Photograph No. 59 – Third Floor - looking west

Photograph No. 60 – Third Floor - looking northwest

Courtyard

Photograph No. 61 – Courtyard looking east

Photograph No. 62 – Courtyard, Timbers leaning, CMU Block at top

Photograph No. 63 – Courtyard Wall, Looking west, Timbers leaning, Vulnerable CMU Block at top

Photograph No. 64 – Courtyard Wall, Timbers leaning, Tree pushing

Photograph No. 65 – Courtyard, Timbers leaning, concrete deterioration

Photograph No. 66 – Courtyard, Timbers leaning, rot

Photograph No. 67 – Courtyard, drainage in centre