



Heritage Impact Assessment, 5961
Hurontario Street, Part of Lot 5,
Concession 1 East of Center Road,
Toronto Township, Peel County, now
City of Mississauga, Regional
Municipality of Peel, Ontario

Project number: PHC-2020-49

Report Type: Revised

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City of Mississauga

Proponent: Mobilinx – Hurontario LRT.

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HULRT-MBLX-ENV-RPT-00378 RB
Heritage Impact Assessment –
Britannia Church

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1. Executive Summary

Parslow Heritage Consultancy, Inc. (PHC) was retained by Mobilinx (the Project Co.) to prepare a Heritage Impact Assessment (HIA) for Britannia United Church and Cemetery located at 5961 Hurontario Street, Mississauga, Ontario. The Project Co. is undertaking the HIA in advance of the installation of the Hurontario Light Rail Transit (HuLRT).

Britannia United Church and Cemetery are located on part of Lot 5, Concession 1 East of Hurontario Street (EHS). The property is municipally known as 5961 Hurontario Street, City of Mississauga, Ontario. The Subject Property is currently designated and is owned by the City of Mississauga.

This HIA has been prepared at the request of the Project Co. and conducted in accordance with the Standards and Guidelines for Conservation of Provincial Heritage Properties Information Bulletin 3 (MHSTCI, 2010) and the City of Mississauga Heritage Impact Assessment Terms of Reference (City of Mississauga 2017). Communication with the John Dunlop of the City of Mississauga has allowed for the exclusion of some standard Terms of Reference requirements to facilitate compliance between the City and Provincial standards.

The purpose of this assessment is to review relevant historical documents, assess potential impacts, and recommend mitigation options.

Two site visits were conducted, one on December 17, 2020 and another on January 22, 2021 to document the pertinent areas of the property, structure, and surrounding landscape; only the exterior of the building was assessed as internal assessment was not deemed necessary, a position supported by John Dunlop of the City of Mississauga. The development plan requires the alteration of the extant concrete steps leading to the main entrance of Britannia United Church.

The alteration of the extant concrete steps will involve the removal of the first riser at road level. Given the extant stairs and landing are not original to the property, and are not character-defining elements or heritage attributes; the impact of their alteration is negligible.

Given the limited direct impacts the proposed activities pose to the Subject Property, it is recommended that a person knowledgeable in heritage construction monitor the alteration of the steps both from the exterior and interior of the structure. It is further recommended that, due to the proximity of the proposed construction to 5961 Hurontario Street, the property undergo a pre-construction evaluation and a vibration monitoring program be implemented to ensure that construction-related vibrations do not impact the integrity of the Britannia United Church and Cemetery. A vibration memo is included as part of this HIA submission.

In addition, it is recommended that the City of Mississauga undertake a Strategic Conservation Plan for Britannia United Church and Cemetery to ensure the long-term proactive management of the property.

2. Personnel

Carla Parslow, PH.D., CAHP	Project Manager
Wilson West, Ph.D., CAHP	Senior Cultural Heritage Specialist
Christopher Lemon, B.Sc., Dip. Heritage	Cultural Heritage Specialist

CVs for PHC staff are provided in Appendix C.

Acknowledgements

Richard Booth, PH.D.	Mobilinx
Paula Wubbenhorst MA, CAHP	City of Mississauga
John Dunlop, M.A., CAHP	City of Mississauga

3. Introduction

Parslow Heritage Consultancy, Inc. (PHC) was retained by Mobilinx (the Project Co.) to prepare a Heritage Impact Assessment (HIA) for Britannia United Church and Cemetery located at 5961 Hurontario Street, Mississauga, Ontario. The Project Co. is undertaking the HIA in advance of the construction of the Hurontario Light Rail Transit (HuLRT) as per *Mobilinx-Hurontario Cultural Heritage Risk Management Plan* (Mobilinx, 2020) and is in keeping with the commitments stemming from the Cultural Heritage Assessment Report (ASI, 2014) and the Environmental Project Report (Metrolinx, 2014).

The Hurontario Light Rail Transit (HuLRT) will provide communities across Mississauga and Brampton better, more convenient ways in which to live, work, and play. The Project is being delivered by Mobilinx (Project Co.) to the Contracting Authority using a Design-Build-Finance-Operate Maintain (DBFOM) model and includes:

- ▶ 18 km of LRT from Port Credit GO Station to Brampton Gateway Terminal, including 1 Station, 19 Stops, 14 traction power substations, an Operations Control Centre (OCC)/Backup OCC, and a Leadership in Energy and Environmental Design (LEED)-certified Operations, Maintenance and Storage Facility (OMSF);
- ▶ Design, construction, and commissioning of any additional Third-Party Infrastructure;
- ▶ Manufacturing, delivery, storage, and maintenance of Revenue Vehicles; and
- ▶ A 30-year Service Contract to perform operations, maintenance, and rehabilitation per the specifications in the Project Specific Output Specifications (PSOS), Schedule 15-3 – Operations and Maintenance Requirements (Execution Version).

The Britannia United Church and Cemetery is a designated property under Part IV of the Ontario Heritage Act (OHA), having been designated by the City of Mississauga in 1981 under Bylaw 100481 (City of Mississauga, 1981). There is no Strategic Conservation Plan for the Subject Property.

The activities being proposed are limited to the modification of the extant concrete steps that serve the main entrance of Britannia United Church. The proposed activities are necessary to accommodate a minor change in street grade associated with the installation of infrastructure pertaining to the HuLRT.

The proposed activities have the potential to indirectly impact Britannia United Church and Cemetery. The nature of the construction activities that will be occurring in the Hurontario Street ROW will produce vibrations that could impact the property. Vibration directly resulting from construction activities, as well as long-term impacts related to vibrations resulting from traffic patterns, are the primary concern.

The potential impacts to Britannia United Church resulting from the proposed work are negligible and pose no direct impact to the historic fabric of the Britannia United Church or associated Cemetery.

In preparing this HIA the following key documents have been consulted:

- ▶ City of Mississauga, *Heritage Register* (2020)
- ▶ City of Mississauga, *By-Law 100481* (1981)
- ▶ City of Mississauga, *Cultural Landscape Inventory* (2005)
- ▶ City of Mississauga, *Official Plan* (2019)
- ▶ City of Mississauga, *Heritage Impact Assessment Terms of Reference* (2017)
- ▶ Hurontario-Main LRT Project, *Cultural Heritage Assessment Report* (ASI,2014)
- ▶ Hurontario-Main LRT Project, *Preliminary Design/TPAP: Environmental Project Report* (Metrolinx, 2014)
- ▶ *Standards & Guidelines for the Conservation of Provincial Heritage Properties-Information Bulletin 3* (2017)

There is no Strategic Conservation Plan for the Subject Property.

3.1 Site Description and Context

The Subject Property is situated on the east side of Hurontario Street, south of Britannia Road East, in the former Toronto Township, Historic County of Peel, now City of Mississauga, Regional Municipality of Peel, Ontario. The Subject Property is approximately 1 acre (ac) in size and consists of a single red brick church constructed in the high Victorian architectural style, and the associated cemetery. Municipally the property is known as 5961 Hurontario Street, known locally as Britannia United Church and Cemetery. The property was identified as a Cultural Heritage Landscape (CHL) as part of a preliminary assessment of the Hurontario-Main Light Rail Transit Project (ASI 2014).

The Subject Property is located on the northwestern edge of Lot 5, Concession 1 East of Center Road (ECR); Center Road was later renamed Hurontario Street. Historically the Subject Property was part of the community of Britannia and was in the heart of the community, which centered on the intersection of what is now Hurontario Street and Britannia Road. The property is surrounded by commercial buildings and serves as one of the only surviving structures affiliated with the village first known as Gardner's Clearing and later Britannia.

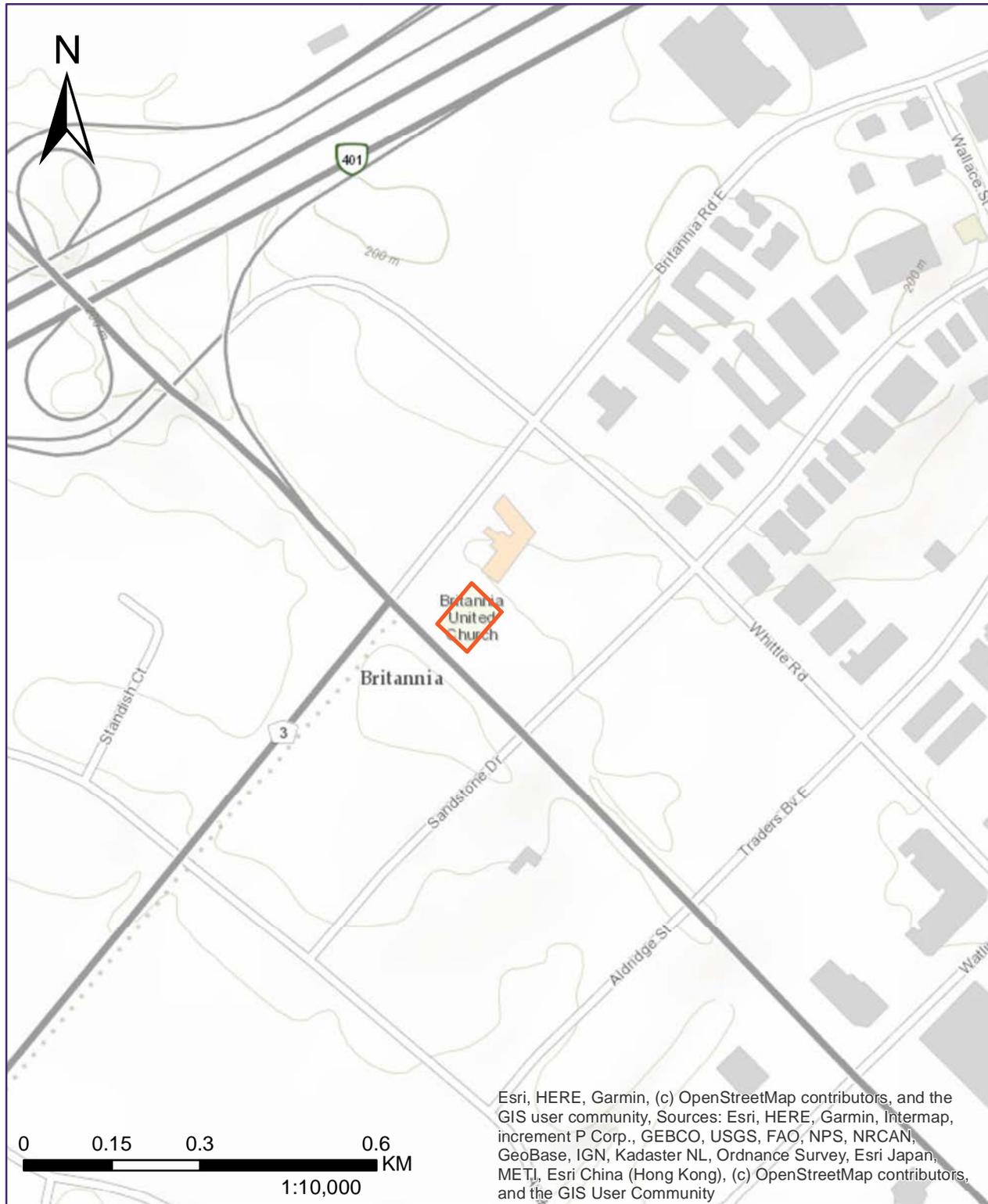
The property containing the church and cemetery are currently zoned OS3-2 (Open Space-Cemetery) and was designated by the City of Mississauga in 1981 for its heritage value under Part IV of the *Ontario Heritage Act* under Mississauga By-law 1004-81 (Appendix A).

3.2 Ownership History

The Subject Property municipally identified as 5961 Hurontario Street, City of Mississauga, and locally known as Britannia United Church and Cemetery was initially part of a 200-acre land grant issued to Joseph Gardner by the Crown on July 14, 1841. Heritage Mississauga publications indicate Joseph Gardner settled in the area c.1821 and that he donated a portion of his lands to the Wesleyan Methodist Church for the establishment of a burial ground and house of worship c.1830 (Heritage Mississauga, 2019). Joseph Gardner's 1830 land gift predates the official land title by over a decade; a situation that is not uncommon seeing that land registry data was not mandatory until 1846. The first church to operate on the property dates to 1821, and the current brick structure replaced the initial wooden church in 1843 (Parks Canada, nd.). After 1843, the church underwent

two historic additions, the first in 1864 and the second in 1897. The confluence of these three construction events resulted in today's extant structure. The cemetery occupies lands that were also part of the 1830 Gardner transaction with the first burial occurring in 1837. The cemetery has undergone two enlargements, the first in 1910 and the second in 1933; the church officially closed on October 31, 2006 (United Church of Canada, n.d). The cemetery remains active and continues to accept interments in preexisting plots (Personal Communication Paula Wubbenhorst, 2021). The City of Mississauga is the current owner of Britannia United Church and Cemetery, as of May 5, 2020 (ONLAND, 2021).

Map 1: Topographic Map Illustrating the Location of the Property and Surrounding Areas



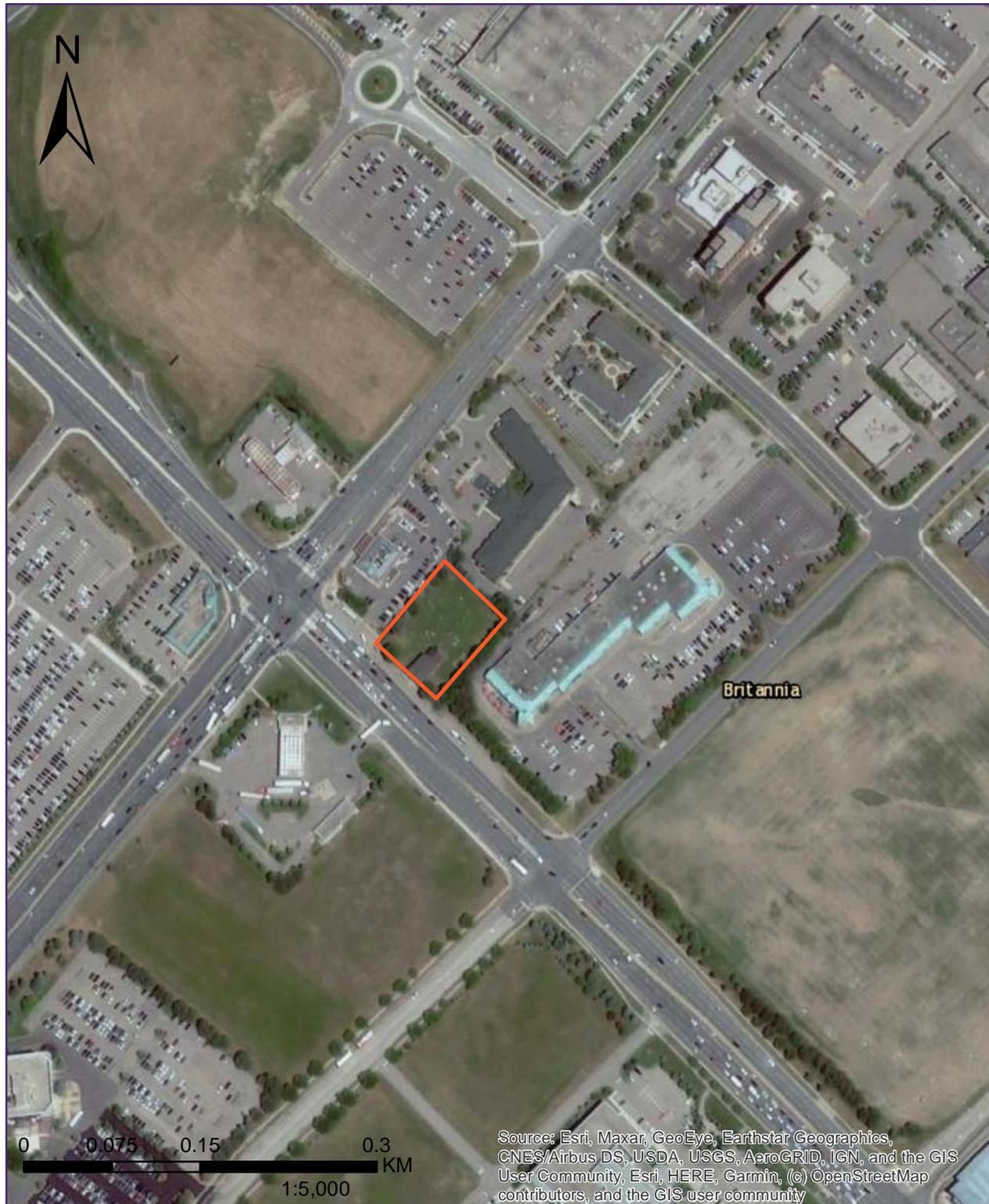
Heritage Impact Assessment - 5961 Hurontario Street Hurontario LRT

Legend

 Britannia Church and Cemetery



Map 2: Aerial Image depicting limits of Subject Property



Heritage Impact Assessment - 5961 Hurontario Street Hurontario LRT

Legend

 Britannia Church and Cemetery



4. Assessment of Cultural Heritage Value or Interest

Ontario Regulation 9/06 prescribes the criteria for determining the Cultural Heritage Value or Interest (CHVI) of a property in a municipality. The regulation requires that, to be designated, a property must meet “one or more” of the criteria grouped into the categories of Design/Physical Value, Historical/ Associative Value and Contextual Value (MHSTCI 2006a). As the Subject Property is already Designated under the *Ontario Heritage Act* the criteria for designation described in City of Mississauga By-Law 1004-81 was compared to the criteria of Ontario Regulation 9/06 (Table 1)

Table 1: Criteria for determining Cultural Heritage Value or Interest (CHVI)

O.Reg.9/06 Criteria	Criteria Met (Y/N)	Justification
The property has design value or physical value because it,		
I. is a rare, unique, representative or early example of a style, type, expression, material, or construction method,	Y	The church is representative of the rural interpretation of the High Victorian Gothic style.
II. displays a high degree of craftsmanship or artistic merit, or	Y	The symmetrical massing of the structure combined with the use of polychromatic decorative brickwork and carved stone accents embody the high level of craftsmanship.
III. demonstrates a high degree of technical or scientific achievement.	N	The design of the church is of a simple rectangular design with steep gable roof and represents the financial practicality of the construction where maximum interior space was achieved with minimal material.
The property has historical value or associative value because it,		
I. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,	Y	The church and associated cemetery are directly associated with the settlement of Gardner’s Clearing (later Britannia) and the desire of the new community to establish a point of cultural stability.
II. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or	Y	The property, particularly the cemetery, has the potential to yield information regarding the early inhabitants of the community.
III. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is	N	None observed. The structure is the result of multiple augmentations to the original 1843 structure and a rural application of the High Victorian Gothic style

significant to a community.		
The property has contextual value because it,		
I.	is important in defining, maintaining or supporting the character of an area,	Y The church and associated cemetery are important in maintaining the historic character of the area.
II.	is physically, functionally, visually or historically linked to its surroundings, or	Y This property embodies one of the few remaining elements that denote the existence of the village of Gardner's Clearing/Britannia.
III.	is a landmark.	Y The property is a distinct landmark. The church proper is highly visible and anchors the former village of Gardner/Britannia.

The above evaluation reiterates the findings of the 1981 Heritage Designation By-Law 1004-81 (City of Mississauga, 1981) and confirms that Britannia United Church continues to present with CHVI.

5. Statement of Cultural Heritage Value

As per the designation statement presented in the City of Mississauga Bylaw 1004-81, the property municipally identified as 5961 Hurontario Street does have cultural heritage value or interest and is currently designated under the terms of the OHA. The current Bylaw states:

The Britannia United Church and the adjoining cemetery are recommended for designation on architectural and historical grounds. The Church is a good example of the rural interpretation of the High Victorian Gothic Style for churches with its dichromatic brickwork, non-structural buttresses, pointed-arch openings and distinct chancel oriented toward the East. The corbel table frieze in the form of polychromatic arcading gives the front facade distinction. Interior features recommended for designation include the gallery, ceiling medallion, and windows. Historically, the church and the cemetery date to 1843, but the church did not assume its present appearance until the extensive renovation programme in 1864.

Both the church and the cemetery stand as a reminder of the nineteenth century hamlet, first known as "Gardner's Clearing", and later as "Britannia".

5.1 Heritage Attributes

The below attributes are as listed in the City of Mississauga's heritage designation Bylaw 1004-81 and based on primary observation during property assessment.

Exterior

- ▶ Date stone
- ▶ Dichromatic brickwork
- ▶ Steeply pitched gable roof line
- ▶ Coursed sandstone foundation
- ▶ Three bay west and east elevations
- ▶ Non-structural buttresses
- ▶ Pointed-arch structural openings
- ▶ Windows with stone lintels and keystones (window condition unconfirmed)
- ▶ Vertical planked door (unconfirmed)
- ▶ Distinct chancel oriented toward the east (unconfirmed)
- ▶ Corbel table frieze
- ▶ Polychromatic arcading
- ▶ Black iron fence surrounding property
- ▶ Central entrance with buttresses
- ▶ Single storey height

Interior

- ▶ Gallery (unconfirmed)
- ▶ Ceiling medallions (unconfirmed)

- ▶ Multi-pained windows with delicate tracery and stained glass (unconfirmed)
- ▶ Plank flooring (unconfirmed)

Landscape

- ▶ Association of church and cemetery
- ▶ Iron fence surrounding the cemetery
- ▶ Cemetery headstones
- ▶ Mature trees

6. Assessment of Existing Conditions

Chris Lemon conducted two property visits, the first on December 17, 2020 and the second on January 22 2021. During the property visits, only the exterior of the building was assessed. Assessment of the interior of the structure was deemed unnecessary given the proposed scope of work will only affect the extant front steps and associated landing. The decision to confine documentation to the exterior was discussed and supported by John Dunlop of the City of Mississauga. It was also agreed that measured drawings and/or floor plans were not necessary (Personal Communication).

6.1 Red Brick Church

During the site visits, the church presented much as described in the 1981 City of Mississauga heritage bylaw. The structure exhibits obvious degradation of the brick and mortar. Many of the bricks exhibit delamination and exfoliation of their outer surface; such degradation occurs as a result of the freeze/thaw cycle and is an indicator of water infiltration. The building shows obvious signs of previous repair attempts. The main 1843 structure now has an asphalt shingle roof. The extant roof needs repair with multiple shingle tabs missing and extensive loss of the granular surface. The rear addition includes a pressed metal roof, which is assumed to be original to the structure, and while rusty, appears to be in fair condition with no missing tabs or lifted seams visible from street level. The easternmost addition includes a flat roof whose surface could not be observed. The pointed structural openings show signs of mortar loss and the north arch on the west façade (front of structure) has recently lost its keystone, which was located on the ground below the structural opening. Overall, the church is in need of repair to all exterior surfaces.

It was not possible to assess the condition the windows and doors during the property visit as they were concealed behind sheets of plywood painted with muntins to resemble multi-pane windows.

The front steps and landing located on the front façade of the structure (west face) are of poured concrete construction and are in poor condition. The steps exhibit a large crack that extends the full width and is approximately five centimeters in width. The stairs have lost most of their railing structure and what remains shows signs of decay resulting from a lack of maintenance and subsequent exposure to water and salt. The stairs and landing do not appear to be connected to the façade or foundation of the church; a gap was observed between the landing and the fabric of the church.

6.1.1 Concrete Steps and Landing

The extant steps and landing date to c.1980. The date of construction of the extant steps and landing was derived from available historic imagery that depict construction activities occurring in the vicinity of Britannia United Church in 1978 (Image 2). At the time of the photo, there are no steps associated with the church, indicating the extant steps were installed post-1978. Image 1 depicts the church in 1975 and clearly shows an earlier set of steps that were replaced by the current steps.

6.2 Cemetery

The cemetery appears to be in fair condition with grave markers exhibiting typical signs of weathering. One grave marker was observed lying on the ground; it was not obvious if this was the result of decay of the mounting surface or the result of vandalism. It was also observed that the Britannia Cemetery sign depicted in Image 3 is no longer standing. The sign was located on the ground adjacent to the support posts. The location of several recent burials was also observed. The cemetery is enclosed by fence with access gates located on either side of Britannia United Church. The fence along the western edge of the property, fronting onto Hurontario Street shows signs of advanced deterioration and needs repair (Image 16). The fence on the other sides of the property is comprised of black chain-link (Image 19).



Image 1: 1975 photo depicting Britannia Church prior to the construction of the extant concrete steps and landing. Note the existence of only two steps in this photo. (Photo on file with the City of Mississauga)



Image 1: Construction activities occurring in 1978. Note the lack of steps associated with the structure as indicated by the placement of the bulldozer (Photo on file with the City of Mississauga)



Image 2: Southwest corner of church with concrete steps and landing in center of photo.



Image 3: Front façade with concrete steps and landing adjacent to main entrance, note presence of four steps in contrast to those depicted in Image 1.



Image 4: Concrete steps and landing with remnant of metal handrail.



Image 5: Split in concrete, running full width of steps, note rusted mounting bracket for missing handrail.



Image 6: Separation between concrete steps, landing and fabric of church.



Image 7: Clear separation between concrete and fabric of church



Image 8: South façade of Britannia United Church and Cemetery



Image 9: Northeast corner of Britannia United Church and Cemetery.



Image 10: Southeast side of Britannia United Church, note the missing mortar, mismatched bricks and grey spot repairs.



Image 11: Recent loss of key stone on north window of main façade.



Image 12: Keystone resting below north window of main façade.



Image 13: Downed grave marker.

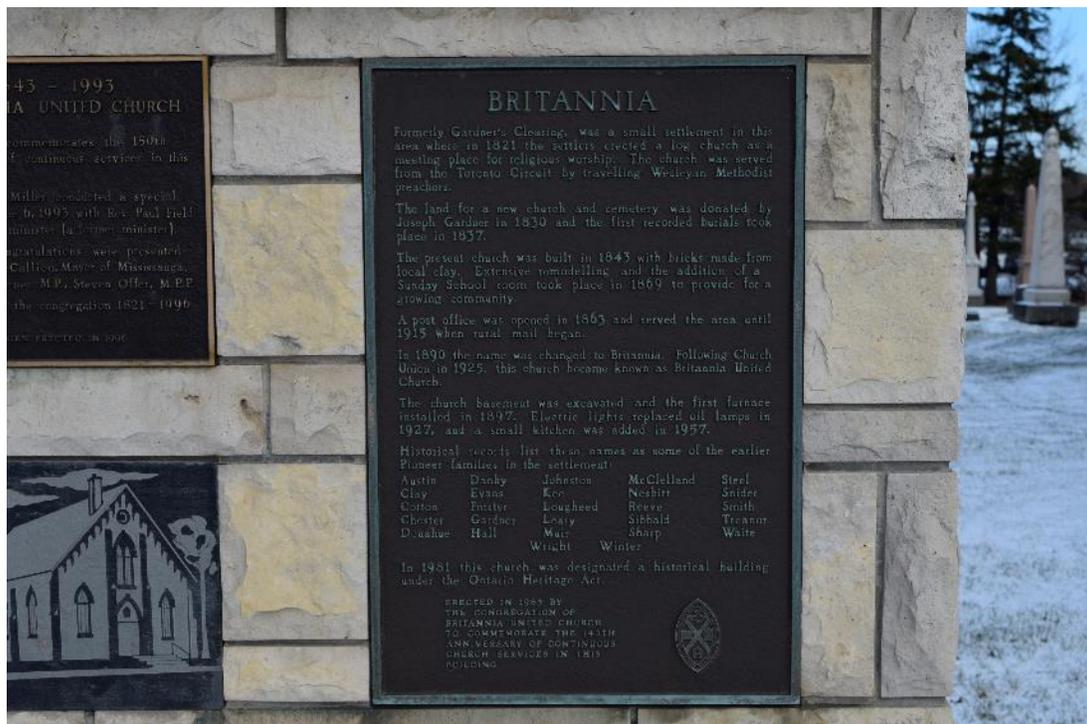


Image 14: Historic plaque located in cemetery.



Image 15: Example of decay observed in the support posts of the fence.



Image 16: Fence surrounding Britannia United Church and Cemetery.

7. Description of Proposed Activity

The proposed activity is the installation of infrastructure associated with the HuLRT. All Work will be undertaken in the existing ROW adjacent to the Britannia Church and Cemetery. To accommodate the HuLRT it will be necessary to alter the existing stairs. Alteration will involve the removal of the first riser at road level in order to accommodate a slight change in road grade. The alteration of the seps will coincide with the construction of the HuLRT infrastructure within the existing Hurontario Street ROW.



Image 17: Blue line shows where alteration of steps will occur

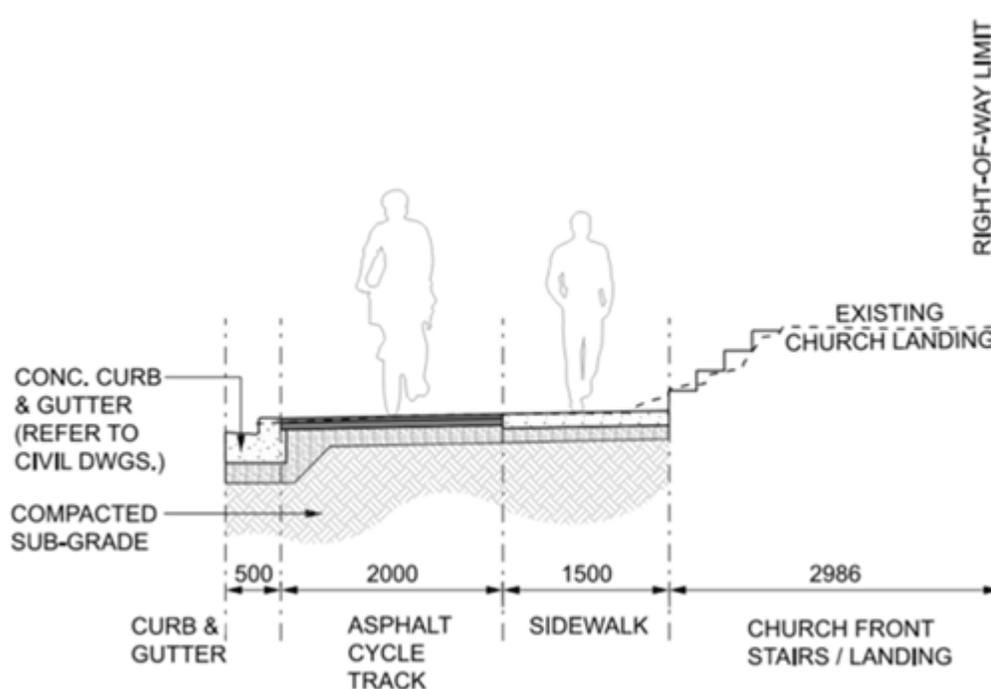


Image 18: Configuration following modification, limits of ROW shown on right of image

The entrance steps and landing are not original to the structure and are not character-defining elements or heritage attributes, as per City of Mississauga By-Law 1004-81. The first riser of the steps will be removed during the resurfacing of the road. The proposed work would occur adjacent to the Subject Property and is necessary to facilitate the installation of support infrastructure related to the HuLRT system. To facilitate the installation of the required infrastructure, excavations will need to be undertaken within the existing Hurontario Street ROW.

Personal communication with Paula Wubbenhorst at the City of Mississauga has indicated that currently there is no Strategic Conservation Plan in place for the property.

Design drawings and specifications for the proposed activity are provided in Appendix B.

As stated in the introduction, the Hurontario LRT consists of 18 km of LRT from Port Credit GO Station to Brampton Gateway Terminal, including 1 Station, 19 Stops, 15 traction power substations, an Operations Control Centre (OCC)/Backup OCC, and a Leadership in Energy and Environmental Design (LEED)-certified Operations, Maintenance and Storage Facility (OMSF)

The City of Mississauga requires that a heritage permit be obtained prior to undertaking any construction activities adjacent to 5961 Hurontario Street.

8. Impact Assessment

This section addressed known and potential impacts to the Britannia Church and Cemetery as per the Standards and Guidelines for Conservation of Provincial Heritage Properties Information Bulletin 3 (MHSTCI, 2010) and the City of Mississauga Heritage Impact Assessment Terms of Reference (City of Mississauga 2017).

8.1 Direct Impacts

The alteration of the steps and landing poses no direct impact to the historic fabric of the Britannia United Church or associated Cemetery. The proposed activity does not require the alteration or modification of any heritage attributes associated with the Britannia United Church and Cemetery.

8.2 Indirect Impacts

The installation of the HuLRT system has the potential to indirectly impact the Britannia United Church and Cemetery. The nature of the construction activities that will be occurring in the Hurontario Street ROW will produce vibrations that could impact the property. Vibration directly resulting from construction activities, as well as long-term impacts related to vibrations resulting from traffic patterns, are the primary concern.

Vibrations can result in unintended damage to the underlying fabric of a structure. Mitigation measures should be employed to assess the existing structural condition of the Subject Property and a “zone of influence” established prior to undertaking construction activities. Following construction, the Subject Property should be subjected to ongoing vibration monitoring to assess the impact of ambient vibrations associated with traffic on Hurontario Street and the LRT system.

To further assess potential impacts resulting from the alteration to the extant steps, MHSTCI *Info Sheet #5 Heritage Impact Assessments and Conservation Plans* were reviewed to assess seven potential negative impacts on the property’s Cultural Heritage Value or Interest (CHVI) arising from the proposed activities (MHSTCI 2006b):

Destruction of any, or part of any, significant heritage attributes or features.

- *The proposed activities do not require the destruction of any part, or part of any, significant heritage attributes or features.*

Alteration that is not sympathetic, or incompatible, with the historic fabric and appearance.

- *The proposed activities will not alter the property in a way that is non-sympathetic, or incompatible, with the historic fabric or appearance of the structure.*

Shadows created that alter the viability of a heritage attribute or an associated natural feature or plantings, such as a garden.

- *No shadow studies were undertaken as a part of this HIA.*

Isolation of a heritage attribute from its surrounding environment, context or a significant relationship.

- *The proposed activities will not result in the isolation of any heritage attributes as they will not impact any of the property’s previously identified heritage attributes or character-*

defining elements

Direct or indirect obstruction of significant views or vistas within, from or of built and natural features.

- *The proposed activities will not result in direct or indirect obstruction of the current heritage attributes or impact lines of site from the structure.*

A change in land use where the change in use may impact the property's cultural heritage value or interest.

- *The proposed activities do not result in a change of land use.*

Land disturbances such as a change in grade that alters soils and drainage patterns that may adversely affect archaeological or cultural heritage resources.

- *The proposed activities will result in temporary changes to grade along the western limits of the property. The proposed excavations will not result in any impact to the existing structure.*

9. Considered Alternatives and Mitigation Measures

9.1 Considered Alternatives

The alteration of the extant concrete steps was the only option considered. The steps are located within the Hurontario ROW and are of no historical significance to Britannia United Church and Cemetery, alternatives to alteration were not deemed necessary.

9.2 Mitigative Measures

As the proposed activities will not be directly impacting the church or cemetery, the mitigative measures for the property should focus on documentation and monitoring to ensure construction activities related to the LRT installation and subsequent operation do not adversely affect this heritage resource.

1. The property should be subjected to a detailed pre-conditions survey to document the condition of the structure, all grave makers, and the surrounding fence prior to any ground disturbance occurring on any lands adjacent to 5961 Hurontario Street. The survey should pay special attention to any pre-existing defects as such defects could be adversely affected by ground vibrations resulting from construction activities (Appendix D).
2. The property should be subject to a vibration assessment prior to the commencement of construction so that a “zone of influence” can be established and appropriate on-site monitoring can be arranged during construction activities. The property should be monitored for vibration to ensure levels remain below the accepted threshold during all construction activities that occur adjacent to the property. This monitoring should be carried out by an individual with previous knowledge of heritage structures and the impact of vibration on heritage resources (Appendix E).
3. The alteration of the stairs should be overseen by a practitioner knowledgeable in heritage architecture and construction practices to ensure that the removal has no impact on the historic fabric of the church.
4. The property limits of 5961 Hurontario Street should be clearly delineated on all construction documents and formal no-go instructions should be issued to all site personnel.
5. A Strategic Conservation Plan should be developed by the City of Mississauga for Britannia United Church and Cemetery. Such an approach will help to ensure the long-term proactive management of the property.

10. Summary of Community Engagement

Attempts were made to contact the United Church of Canada to acquire records pertaining to the Subject Property, specifically pertaining to the initial land gift between Joseph Gardner and the Wesleyan Methodist Church, which amalgamated to form the United Church of Canada in 1925 (United Church of Canada, 2021). Elizabeth Mathews responded to the inquiry on November 26, 2020 and indicated that due to the COVID-19 pandemic, the Canadian archives of the United Church were closed and as a result, they could not comment or provide guidance on the request for information.

Paula Wubbenhorst of the City of Mississauga Heritage Department was contacted in January of 2021 and provided clarification on the ownership status of the Subject Property, indicating that the City had recently acquired the property. At this time, Britannia United Church is not in use and the City does not have a management plan in place for the asset. It was confirmed that interments are still occurring at that cemetery.

A general inquiry for information pertaining to the Subject Property was made to the Ontario Heritage Trust (OHT), given the property is included in their *Places of Worship Inventory*. Thomas Wicks responded in January 2021 and indicated that all information accessible to the OHT was available on their webpage and that they had no further interest in the property.

Metrolinx has been undertaking ongoing community engagements pertaining to the HuLRT project. The engagement involved round table discussions, online media displays, townhall style presentations and anonymous electronic commenting. The community is aware and informed of the HuLRT project and has ongoing opportunity to provide input.

The City of Mississauga has undertaken community engagement as it pertains to the HuLRT project, providing an online presence for community members to engage in the project and remain informed as to its progress and impacts on the community.

As the constructor of the HuLRT project, Mobilinx has undertaken community engagement initiatives providing links and access to information via their webpage.

To date no known concerns have been raised during community engagement related to the front steps.

11. Recommendations

The following recommendations for 5961 Hurontario Street are put forth:

1. The property should be subjected to a detailed pre-conditions survey to document the condition of the structure, all grave makers, and the surrounding fence prior to any ground disturbance occurring on any lands adjacent to 5961 Hurontario Street. The survey should pay special attention to any pre-existing defects as such defects could be adversely affected by ground vibrations resulting from construction activities (Appendix D).
2. The property should be subject to a vibration assessment prior to the commencement of construction so that a “zone of influence” can be established and appropriate on-site monitoring can be arranged during construction activities. The property should be monitored for vibration to ensure levels remain below the accepted threshold during all construction activities that occur adjacent to the property. This monitoring should be carried out by an individual with previous knowledge of heritage structures and the impact of vibration on heritage resources (Appendix E).
3. The alteration of the existing stairs should be overseen by a practitioner knowledgeable in heritage architecture and construction practices to ensure that the removal has no impact on the historic fabric of the church.
4. The property limits of 5961 Hurontario Street should be clearly delineated on all construction documents and formal no-go instructions should be issued to all site personnel.
5. A Strategic Conservation Plan should be developed by the City of Mississauga for Britannia United Church and Cemetery. Development of a Strategic Conservation Plan will help to ensure the long term proactive management of the property.

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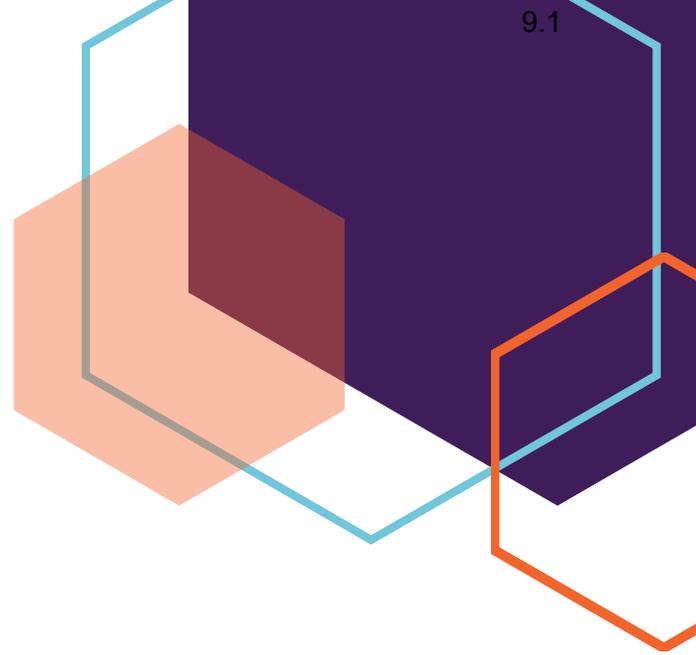
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Appendix A



City of Mississauga By-Law 1004-81



An agency of the Government of Ontario



Un organisme du gouvernement de l'Ontario

This document was retrieved from the Ontario Heritage Act Register, which is accessible through the website of the Ontario Heritage Trust at **www.heritagetrust.on.ca**.

Ce document est tiré du registre aux fins de la *Loi sur le patrimoine de l'Ontario*, accessible à partir du site Web de la Fiducie du patrimoine ontarien sur **www.heritagetrust.on.ca**.



Leonard M. McGillivray
Deputy City Clerk

Terence L. Julian, A.M.C.T., C.M.C.
City Clerk

OFFICE OF THE CLERK

December 22, 1981

Dear [REDACTED]:

Re: Britannia United Church
Hurontario Street, East Side
South of Britannia Road
File: I.10.79012

Further to my letter to you of October 20, 1981, with respect to the designation of the "Britannia United Church".

I enclose for your retention, a certified copy of By-law 1004-81, being a by-law to designate the "Britannia United Church" Part of Lot 5, Concession 1, E.H.S. of architectural value and historical interest.

Yours very truly,

Arthur D. Granum
Arthur D. Granum
Committee Co-ordinator

/pj
encl.

cc. Ontario Heritage Foundation ✓



BY-LAW NUMBER... 1004-81

To designate the "Britannia United Church"
Part of Lot 5, Concession 1, E.H.S., of
architectural value and historical interest.

WHEREAS the Ontario Heritage Act, R.S.O. 1980, Chapter 337,
Section 29(6), authorizes the Council of a municipality to enact
by-laws to designate real property including all the buildings
and structures thereon, to be of historic or architectural value
or interest; and

WHEREAS notice of intention to so designate the "Britannia
United Church" on Part of Lot 5, Conc. 1, E.H.S., having been
duly published and served and no notice of objection to such
designation having been received by the Council of The Corporation
of the City of Mississauga.

WHEREAS the reasons for the said designation are set out
in Schedule "A" hereto;

THEREFORE the Council of The Corporation of the City of
Mississauga ENACTS as follows:

1. That the real property, more particularly described in
Schedule "B" hereto known as the "Britannia United Church" on
Part of Lot 5, Conc. 1, E.H.S., be designated as being of
architectural and historic value or interest.
2. That the City Clerk is hereby authorized to cause a copy of
this by-law to be duly served upon the owner of the aforesaid
property and upon the Ontario Heritage Foundation and to cause
notice of this by-law to be published in a newspaper having general
circulation in the City of Mississauga.

ENACTED AND PASSED this 14 day of December, 1981.

[Signature]
MAYOR

[Signature]
CLERK

CERTIFIED A TRUE COPY

[Signature]
DEPUTY CITY CLERK
CITY OF MISSISSAUGA

APPROVED AS TO FORM City Engineer MISSISSAUGA
<i>[Signature]</i>
DATE: <u>08/12/81</u>

SCHEDULE 'A' TO BY-LAW 1004-81
OF THE CITY OF MISSISSAUGA

REASONS for designation of the "Britannia United Church"
on Part of Lot 5, Conc. 1, E.H.S.

The Britannia United Church and the adjoining cemetery are recommended for designation on architectural and historical grounds. The Church is a good example of the rural interpretation of the High Victorian Gothic Style for churches with its dichromatic brickwork, non-structural buttresses, pointed-arch openings and distinct chancel oriented toward the East. The corbel table frieze in the form of polychromatic arcading gives the front facade distinction. Interior features recommended for designation include the gallery, ceiling medallion, and windows. Historically, the church and the cemetery date to 1843, but the church did not assume its present appearance until the extensive renovation programme in 1864.

Both the church and the cemetery stand as a reminder of the nineteenth century hamlet, first known as "Gardner's", and later as "Britannia".

SCHEDULE "B" TO BY-LAW 1004-81

DESCRIPTION: Part of Lot 5, Concession 1
East of Hurontario Street

ALL AND SINGULAR, that certain parcel or tract of land and premises situate, lying and being in the City of Mississauga, Regional Municipality of Peel, (formerly in the Township of Toronto, County of Peel), Province of Ontario and being composed of part of Lot 5 in the First Concession East of Hurontario Street in the said City and which said parcel may be described as follows:

PREMISING that the Northeasterly limit of The King's Highway No. 10 as widened by deposited plan 59804, (M.T.C. File P-1659-14), has a bearing of North 44 degrees 23 minutes West and relating all bearings herein thereto;

BEGINNING at a point in the Southwesterly limit of said Lot 5, being also the original Northeasterly limit of The King's Highway No. 10, distant 178.96 feet more or less measured Southeasterly thereon from the most Westerly angle thereof, said point of beginning being the most Westerly angle of the road widening by said Plan 59804;

THENCE North 39 degrees 53 minutes 50 seconds East along the Northwesterly limit of the said widening, 8.94 feet to the most Northerly angle thereof and the point of commencement of the hereindescribed parcel;

THENCE North 39 degrees 53 minutes 50 seconds East to and along the Southwesterly limit of Part 1 according to a plan deposited in the Land Registry Office for the Land Titles Division of Peel (No. 43) as 43R-3521, in all a distance of 227.91 feet more or less to an angle in the said limit;

THENCE South 45 degrees 21 minutes 30 seconds East continuing along the Southwesterly limit of said Part 1, 171.96 feet more or less to an angle therein;

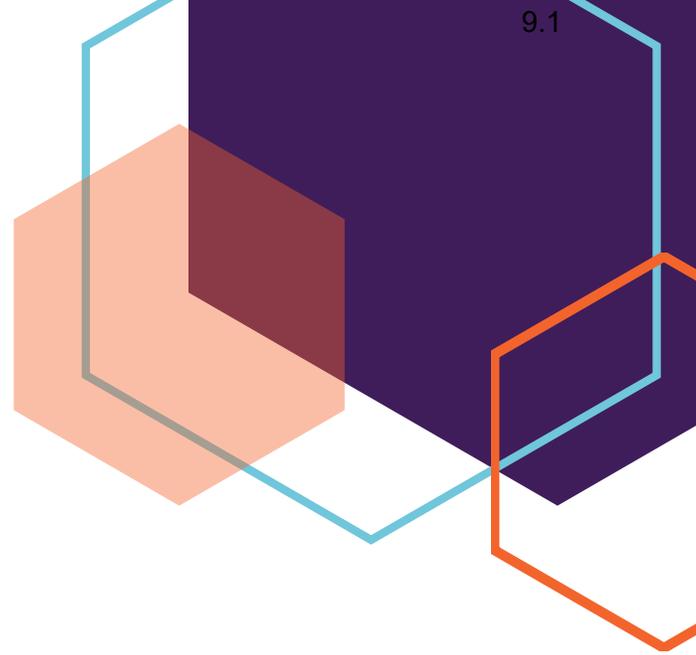
THENCE South 40 degrees 09 minutes 10 seconds West continuing along the last said limit and the production Southwesterly thereof, in all a distance of 229.46 feet more or less to the most Easterly angle of the said road widening by deposited plan 59804;

..2

THENCE North 44 degrees 23 minutes West along the Northeasterly limit of the King's Highway No. 10 as widened by said Plan 59804, 171.07 feet more or less to the point of commencement, the hereindescribed parcel being all of the lands described in Township of Toronto Instrument No. 32765 SAVING AND EXCEPTING the lands expropriated for road widening by said deposited plan 59804.

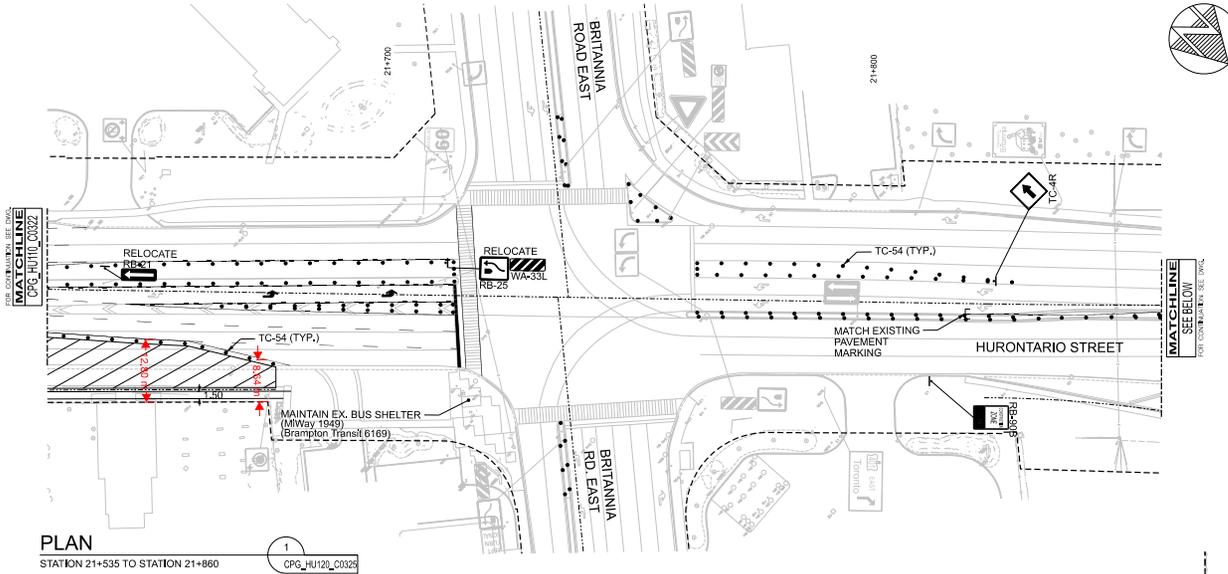

John Wintle,
Ontario Land Surveyor

Appendix B

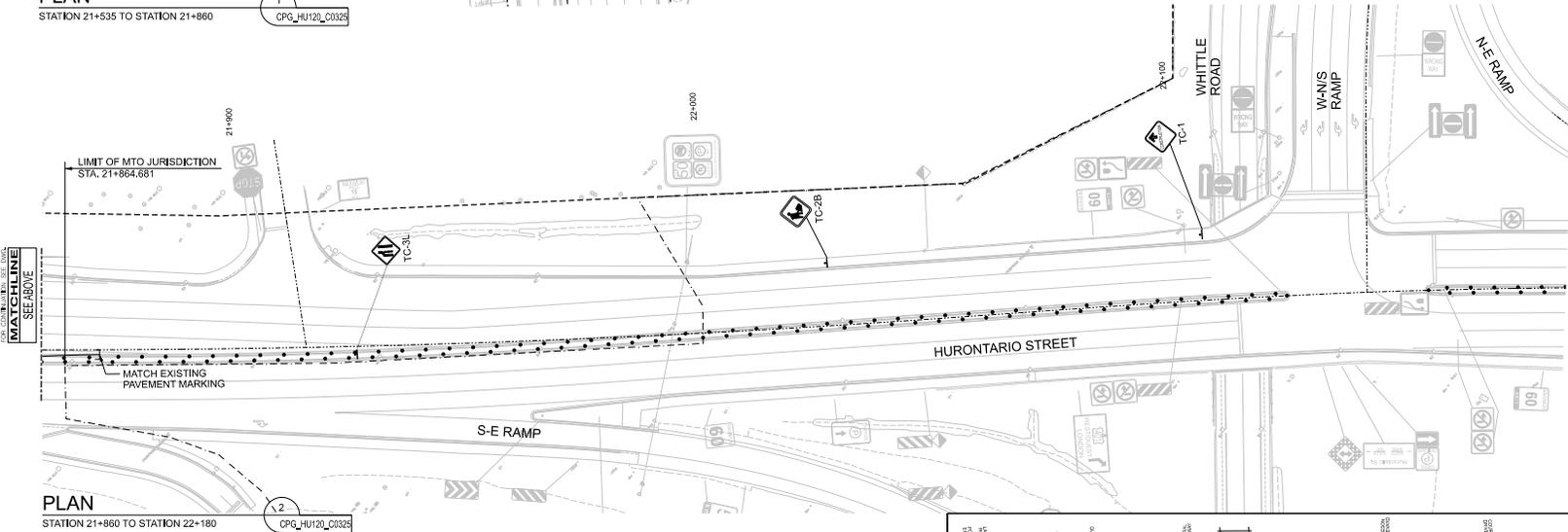


Design Drawings

CADD FILE NAME: \\k4.bentley.com\BIDocuments\HUR\RT Data\led Design\7.0_Production\7.3_Design\CPG_HU120_Workzone\Sheet File\CPG_HU120_CS_TRAF_STAG_204.dgn

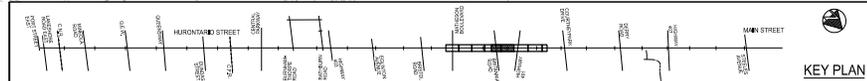


PLAN
STATION 21+535 TO STATION 21+860
CPG_HU120_C0325



PLAN
STATION 21+860 TO STATION 22+180
CPG_HU120_C0325

NOTE: THIS DRAWING IS ISSUED FOR PERMIT AND PARTIAL CONSTRUCTION OF THE IDENTIFIED WATERMAIN, AND SANITARY AND STORM SEWERS ONLY. FOR CLARITY, THIS DRAWING SHALL NOT BE USED TO CONSTRUCT TRACK DRAINAGE, ROADWAY DRAINAGE, ROADWAY DRAINAGE STRUCTURES OR FIRE HYDRANTS.



KEY PLAN

DRAWING No. CPG_HU120_C0325 SHEET No. FILE: CPG_HU120_CS_TRAF_STAG_204.dgn BLDG. REF. No.

REVISIONS	REVISIONS
A WZP05 ISSUED FOR PERMIT AND PARTIAL CONSTRUCTION	

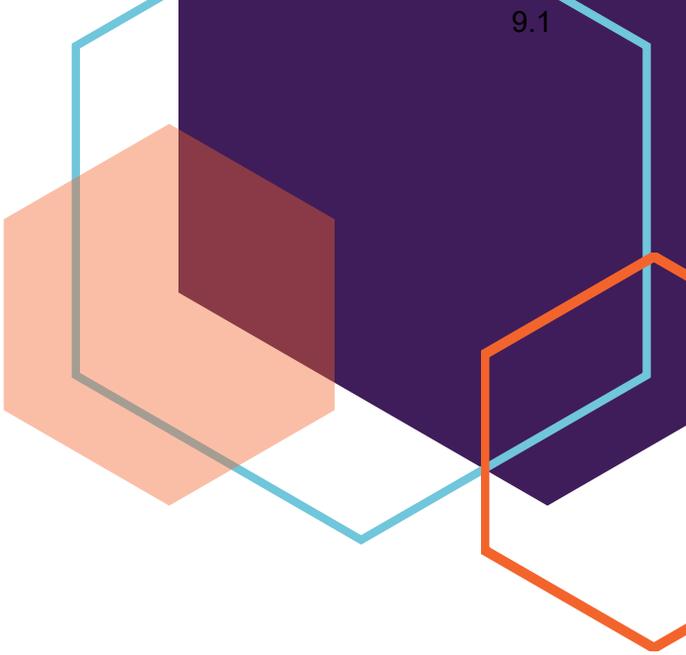
ISSUED FOR PERMIT AND PARTIAL CONSTRUCTION



DESIGNED	A. DALWADI	2020/10/14
DRAWN	J. SHEN	2020/10/14
CHECKED	D. TRAJKOVSKI	2020/10/14
APPROVED	W. SANABRIA	2020/10/14

HURONTARIO LIGHT RAIL TRANSIT		Plot Date: 2020-10-14
HURONTARIO STREET CIVIL ROADWAY - WZP05		METROLINX
TRAFFIC STAGING PLAN - STAGE 2 STA. 21+630 TO STA. 22+180 (WZ 12)		
Dwg. No. CPG_HU120_C0325	Sheet No.	

Appendix C



Qualifications

Project Manager – Carla Parslow, PhD, CAHP Member in Good Standing: Dr. Carla Parslow has over 20 years of experience in the cultural heritage resource management (CHRM) industry in Canada. As the President of PHC Inc., Dr. Parslow is responsible for the for the management of CHRM projects, as well as the technical review and quality assurance of all archaeological and cultural heritage projects completed by PHC. Throughout her career, Carla has managed both large and small offices of CHRM professionals and has mobilized both large (50+) and small (4+) teams of CHRM and Environmental projects offices throughout the province of Ontario. Dr. Parslow has served as either Project Manager or Project Director on hundreds of Archaeological and Cultural Heritage Assessments. Dr. Parslow is a professional member of the Canadian Association of Heritage Professionals (CAHP).

Dr. Parslow is responsible for the overall management of the work and is the primary point of contact. Dr. Parslow is also responsible for the overall quality assurance.

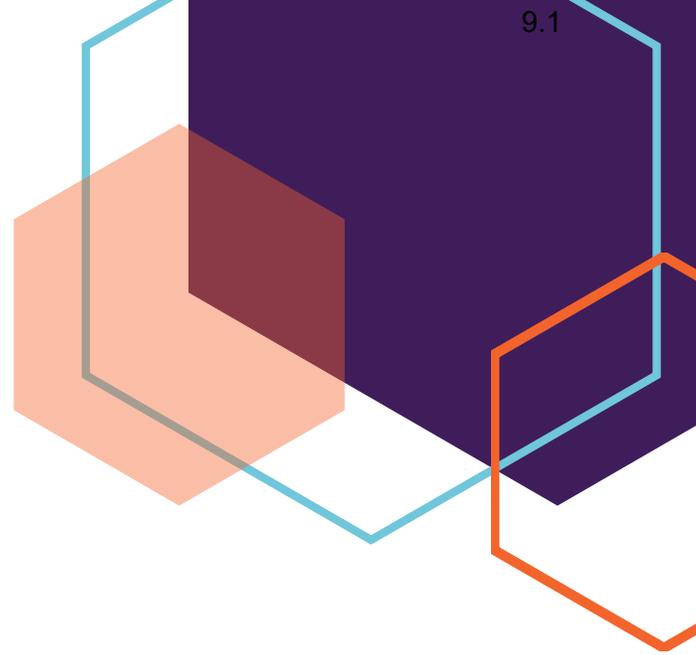
Senior Heritage Specialist – Wilson West, Ph.D., CAHP Member in Good Standing: Dr. West has worked in the heritage/culture sector for over thirty-five years. His background is diverse with experience as a historian, archaeologist, curator, researcher, policy advisor and heritage preservation consultant. These positions were held within many levels of government and in the private sector. This work included research conducted in library, archival, and web-based venues, and policy advice and expertise to ministry offices, stakeholders and other preservation groups concerning the development and implementation of regulations and guidelines for the protection and preservation of Ontario's marine heritage resources. He also has extensive experience researching, writing and editing cultural heritage resource assessments required for compliance with the Ontario Heritage Act and the Standards & Guidelines for Conservation of Provincial Heritage Properties, including, but not limited to, Heritage Impact Assessments, Cultural Heritage Evaluation Reports and Strategic Conservation Plans. Dr. West is a professional member of the Canadian Association of Heritage Professionals (CAHP).

Dr. West is responsible for senior advisory services to the Heritage Specialist and also serves as the senior review for heritage impact assessments.

Heritage Specialist – Chris Lemon, B.Sc., Dip. CAHP Member in Good Standing: Chris Lemon is a Cultural Heritage Specialist and Licensed Archaeologist (R289) with 15 years' experience. He received an Honours B.Sc. in Anthropology from the University of Toronto and has completed course work towards an M.A. from the University of Western Ontario. Mr. Lemon has a Diploma in Heritage Carpentry and Joinery and a Certificate in Heritage Planning from Algonquin College. During his career Mr. Lemon has participated in cultural heritage assessments across Ontario as both a Senior Field Director in archaeology and as a Built Heritage Practitioner. Chris's previous experience includes representation on Joint Health and Safety Committees; he is dedicated to maintaining a safety-first focus on all job sites. Chris has an application for CAHP waiting for approval.

Mr. Lemon is responsible for research, reporting and analysis.

Appendix D



Pre-Inspection Report

OZA INSPECTIONS FIELD REPORT LEGEND

It has been assumed that all roads run in a true north-to-south or east-to-west direction for convenience.

In each room or other convenient parcel, the inspection is carried out clockwise with each room being inspected. Where possible, the compass points are used to denote the wall to which reference is made.

Wall and ceiling surfaces are inspected from a distance of a few feet as room layouts permit and only defects visible at that distance are included in this report. Surfaces and other areas obscured by furniture and storage etc... are not inspected.

A blank square or a square with only window (WN) and/or door (DR) openings, etc... shown is assumed to be no apparent damage.

<u>Crack width</u>		<u>Codes</u>		<u>Codes</u>		<u>Materials</u>	
a	hairline	BK	buckling	PO	painted over	FLR	- floor
b	less than 1/8" / 3mm	CC	crazy cracks	POL	poor lighting	FP	- fireplace
c	over 1/8" / 3mm	CCV	crazy cracks visible	PP	paint peeling	FW	- fibre wall
d	1/4" / 7mm	CUR	curling	PW	patchwork	HW	- hardwood
f	1/2" / 1.3cm	DC	disconnected	SDT	surface deterioration	IN/INS	- insulation
g	3/4" / 1.9cm	DT	deteriorated	SF	squeaky floor	LAM	- laminated
h	1" / 2.5cm	DNT	dent	SMO	snow mostly obscured	LINO	- linoleum
		FL	efflorescence	SNK	sunken	MT	- mirror tiles
		K	caulking	SNV	snow not visible	NA	- not accessible
		KPW	patched caulking	SV	seam visible	OJ	- open joist
		LP	loose material	W	water or water marks/stains	PA	- panelling
		LFT	lifting			PB	- pressboard
		M	moisture			PG	- parging
		MD	molding separation			PL	- plaster
		MJ	mitre joint	ASP	- asphalt	PLY	- plywood
		ML	mold	BB	- baseboard	PRC	- pre-cast
		MP	missing material	BDR	- boarded door	S & C	- stone & concrete
		MO	mostly obscured	BWN	- boarded window	STG	- storage
		MS	misaligned	BR	- brick	STP	- stipple
		NL	no light	C	- concrete	T	- tile
		NP	nail popping	CP/CARP	- carpeting	TZ	- terrazzo
		NV	not visible	CB	- concrete block	V	- vent
		NVC	not visible curtain	CLG	- ceiling	WB	- wallboard
		OG	overgrown - grass	CT	- ceramic tile	WN	- window
		PC	paper crack	DR	- door	WP	- wallpaper
				DTC	- drop tile ceiling	X	- cracked window/glass
				DW	- drywall/gyprock		
							arrow indicates direction of slope

31

Exterior - Condition Field Report

Card # 32614 File No: 20009 City: Musussauge Page 1 of

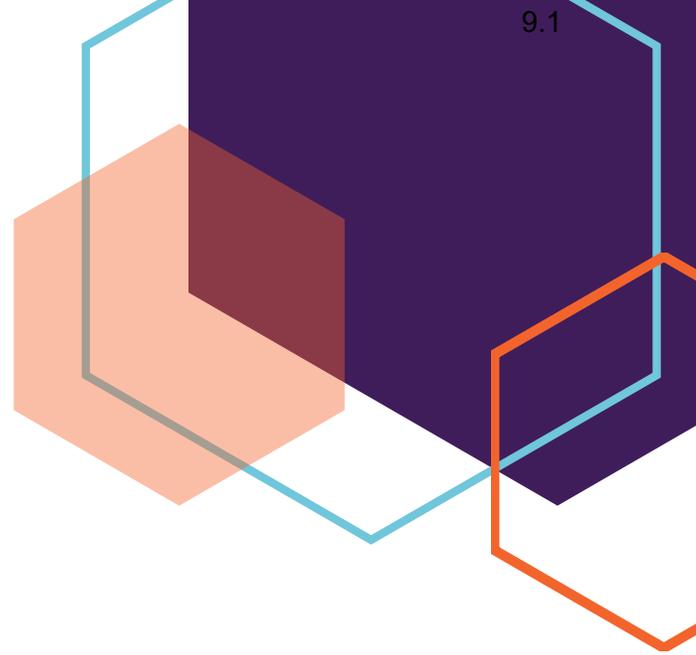
Address: 5961 Hurontario St Inspector: DK
 Unit No:

Date: 06/08/2020 Interior Refusal: Signature: [Signature]
 (DD/MM/YYYY) Full Refusal:

INSPECTION DETAILS	START REF. PHOTO: <u>523</u>	END REF. PHOTO: <u>890</u>	NORTH <u>9</u>
BUILDING TYPE: <u>CHURCH / BR</u> <u>etc.</u>			
FDN: <u> </u>			
ROOF: <u>shingles</u>			
NOTES: <u> </u>			
CRACK GAUGES REQUIRED: YES <u> </u> NO <u> </u>			
EXT. LOCATION: <u> </u>	STREET: <u>HURONTARIO ST</u>		
INT. LOCATION: <u> </u>			
INSTALL PERMISSION GRANTED: YES <u> </u> NO <u> </u>			

KEY	MATERIAL / TYPE	DEFECT / CONDITION DESCRIPTION	PHOTO INDEX	
			Reference	Conditions
S	Wall BR	(Gcd) (DC) (DF) (MP)	524-561	582-588
S	OS: <u>stone / metal</u>		569-572	-
E	Wall BR /	(DF) (DC) (DW) (MP)	573-594	595-612
N	Wall BR	(DC) (DF) (MP) (Gcd)	613-652	653-808
N	Wall OS: <u>concrete</u>		709-724	-
N	OS: <u>stone / metal</u>		725-732	-
W	Wall BR	(DC) (Gcd) (DF) (MP)	733-791	795-811
W	Wall OS: <u>sidewalk / steps</u>	(DC) (LIC)	812-822	823-829
	Wall OS:			

Appendix E



Vibration Monitoring Assessment

To:

Richard Booth, Ph.D.
Environmental Manager
Mobilinx – Hurontario LRT

Copies:

Frederick D. Bernard, M.A., B.A. (Hon.)
René de Vries, P.Geo
Chris MacGillivray P.Eng., CPM

From:

Parnia Lotfi Moghaddam, P.Eng.
Senior Noise and Vibration Lead
Arcadis Canada Inc.

Date:

July 15, 2021

Subject:

Hurontario LRT Project, Construction Vibration Zone of Influence For Britannia
Church and Cemetery

Part of Lot 5, Concession 1 East of Hurontario Street, City of Mississauga

Attachments:

Appendix A – Sample Pre-condition Survey Photos

Appendix B – Zone of Influence Plan

Appendix C – Water Utility Relocation Plan

Introduction

The Britannia Church and Cemetery are located on Part of Lot 5, Concession 1 East of Hurontario Street (EHS) with the municipal address 5961 Hurontario Street in the City of Mississauga, Ontario. The property was designated by the City of Mississauga in 1981 for its heritage value under Part IV of the Ontario Heritage Act under Mississauga By-law 1004-81.

Due to the designated Heritage status of the Church and Cemetery by the City of Mississauga, Mobilinx is required to assess the potential for impacts to the property related to its construction activities. The requirement for completion of a Heritage Impact Assessment (HIA) is also identified in the HuLRT Project Agreement (PA). Mobilinx has retained Parslow Heritage Consultancy (PHC) to undertake the assessment of the Britannia Church and to provide advice on permitting requirements.

An existing condition survey of the church and property was completed by Mobilinx in 2020. The survey identified considerable evidence of existing cosmetic and structural damage. Of note were deterioration and defects to bricks and mortar, damage to existing facades, paint and foundation elements. Interior access was not available, and the interior condition of the church is unknown. Reference photos from the pre-construction assessment of the buildings are provided in Appendix A.

Schedule 17 Article 8 (Table 8.2 and Section 8.6 (a)) of PA stipulates that, due to construction activities, a Vibration Impact Assessment is to be completed in accordance with FTA procedures and a zone of influence established for representative receptors. The applicable vibration damage criterion is 5 mm/sec, as identified in the PA, or as identified in accordance with the Federal Transit Administration's (FTA) Manual (per Table 8.2 - Refer to construction vibration damage criteria in the FTA Transit Noise and Vibration Impact Assessment, Report FTA VA 90 1003 06). The FTA 2018 was referenced in the determination of the Zone of Influence (ZOI) for construction activities near Britannia Church and Cemetery.

This memo provides the results of the vibration ZOI assessment completed by Arcadis for construction activities in the immediate vicinity of the Britannia Church. The findings of this assessment determine the predicted construction vibration levels in accordance with the applicable criterion established by the Professional Engineer, and the corresponding vibration ZOI that dictates the requirement for on-site monitoring during construction.

Construction Equipment, Locations and Activities

Construction of the HuLRT will involve the use of a wide range of machinery employed across a range of activities. Of particular interest for vibration related impacts are various wet utility works that must occur within 10 m of the Church structure. Mobilinx provided Arcadis with a list of all the construction activities and equipment that could create significant vibration near or at the building foundation/structure of the Britannia Church. The equipment that will be used for utilities construction are listed below:

- John Deer Dozer 750
- Hydro Vac
- Excavator M320F, 335FL/FLCR, 336-07B,352-07F, 245G-LC, 85G
- Gas Plate- Wacker WP1550
- Loader – KOMATSU WA250PZ, JD 544L
- Skid steer
- Portable plate tamper (diesel)

- Jumping jack
- 3 ton asphalt roller
- Backhoe-JD 315SL
- Hoepac attachment for the excavator (Unit #37121)
- Tri axles trucks
- Roller- Volvo DD25
- Rubber Tire BH-CAT 420E

In general, the construction staging area will occupy the curb-side north bound lane of Hurontario with the installation of the infrastructure occurring adjacent to the live curb lane for the full extent passing in front of the Church. Work involves pavement and curb removal, excavation of a 1.5 m wide and 2-4 m deep trench and placement of new storm sewer followed by backfill with granular, compaction and finally pavement reinstallation. Due to the design location, the noted works will occur within 10 m of the Church building and cemetery property.

Applicable Criteria

The construction vibration ZOI is established using the specific construction activities and equipment that could create significant vibration as identified in the FTA Manual, and with reference to the City of Toronto By-law 514-2008 [3] methodology and approach. The FTA construction damage criteria for different types of buildings are summarized in Table 1 below.

Table 1 Construction Damage Criteria

Building/ Structural Category	PPV, in/sec	Approximate Lv*
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

*RMS velocity in decibels, VdB re 1 micro-in/sec

As can be seen in Table 1, the PA requirements, as well as City of Toronto By-law are consistent with the vibration damage criteria of 5 mm/sec (0.2 in/sec), which is for typical buildings categorized as Non-engineered timber and masonry buildings. However, as the Britannia Church is considered a heritage building, the construction damage criteria for buildings extremely susceptible to vibration damage of 0.12 in/sec, or 3 mm/sec is applicable to the Britannia Church.

Based on PA requirements, minimum vibration damage criterion is 3 mm/sec relative to a frequency range of 1 Hz to 100 Hz. German DIN 4150 provides more details regarding the PPV levels with a corresponding frequency range. By applying both FTA guidelines and German DIN 4150, the vibration criteria continues to adhere PA requirements. Potential impacts are determined by following thresholds for various frequencies, reference vibration limits (APT BULLETIN, Journal of Preservation Technology / 46:2-3 2015) [4] were identified and are provided in the figure below:

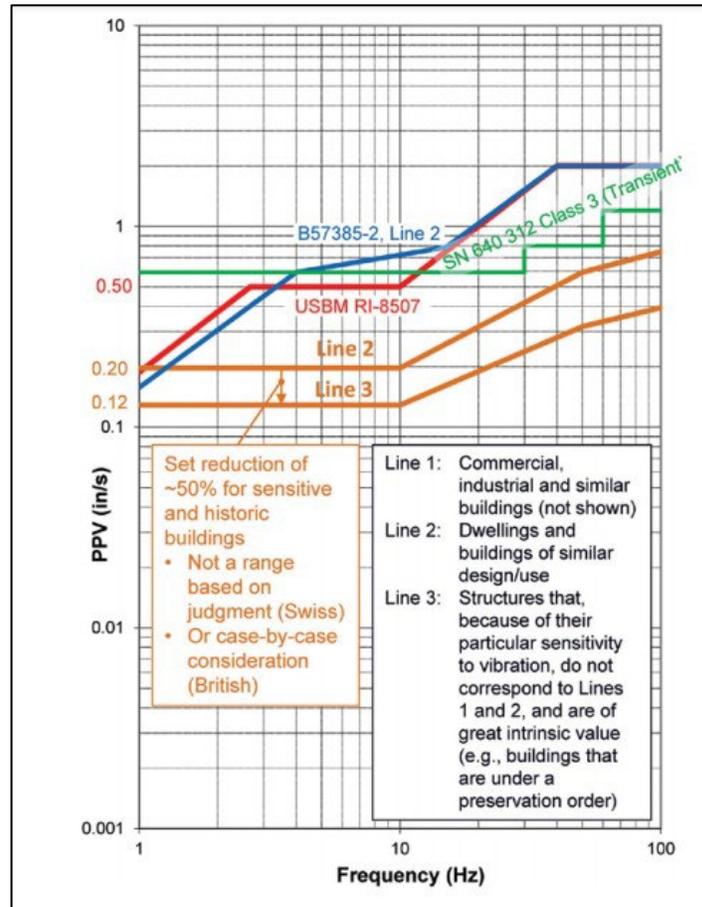


Figure 1 Vibration Limits from German DIN 4150 superimposed on the similar limits from USBM 8507, BS 7385-2, and SN 640 312a

These PPV levels in inch/sec for Line 3 (heritage buildings) which is based on 0.12 in/sec criterion are then tabulated and converted to mm/sec and are presented in Table 2. The values provided in Table 2 are to be adopted for vibration monitoring during construction near the Britannia Church on Hurontario Street.

Table 2 Prohibited Construction Vibration

Frequency (Hz)	PPV (in/sec)	PPV (mm/sec)
Less than 10	0.12	3.048
10 to 20	0.20	5.08
20 to 30	0.24	6.096
30 to 40	0.28	7.112
40 to 50	0.31	7.874
50 to 100	0.35	8.89
above 100	0.40	10.16

Construction Vibration Prediction Methodology

The procedures from the FTA Transit Noise and Vibration Impact Assessment Manual [1] is used in predicting construction vibration and determining the Zone of Influence. The manual provides a distance attenuation equation to estimate vibration levels from reference source levels.

$$PPV_{equip} = PPV_{ref} \times \left(\frac{25}{D}\right)^{1.5}$$

Where:

PPV_{equip} = the peak particle velocity of the equipment adjusted for distance, in/sec;
 PPV_{ref} = the source reference vibration level at 25 ft, in/sec;
 D = distance from equipment to receiver in feet.

Results and Discussions

Vibratory rollers are one of the most significant vibration sources emanating from construction activity. Therefore, the ZOI is prepared based on the vibration damage criterion of 3 mm/sec for heritage building as stated earlier and the construction equipment's reference vibration levels to identify the vibration sensitive receiver within the ZOI requiring monitoring. Table 3 below summarizes the findings of the ZOI.

Table 3 Zone of Influence

According to FTA		Based on 3.0 mm/sec Vibration Damage Criterion	
Equipment	PPV Ref Data @ 25 ft (in/sec)	Zone of Influence (feet)	Zone of Influence (m)
Vibratory roller	0.21	36.71	11.19

As stated earlier, it is anticipated that the construction activities/equipment take place as close as 5 m from the Britannia Church. Based on our assessment and analysis and the results as shown in Table 3, the Britannia Church falls within the ZOI. Therefore, our monitoring program will only focus on the Britannia Church. Continuous vibration monitoring during construction activities near Britannia Church shall be conducted to ensure the applicable Peak Particle Velocity (PPV) Levels do not exceed the vibration damage criterion.

Based on our findings from the activities above, a comprehensive Vibration Monitoring Program is provided to ensure that the Prohibited Construction Vibration is never exceeded. Our Vibration Monitoring Program includes the following:

- a) The number and location of seismographs to be used: The Vibration Equipment "The Rock" will be employed on site approximately 1-2 m away from the building foundation in the same direction of construction equipment and activities.
- b) The sampling frequency: The sampling frequency is 1000 Hz.

- c) The result transmittal protocol: All data will be remotely accessible from any computer with access to the Internet and the exceedance alerts will be sent via email and text messages to the appropriate client/workers/contractors involved in the project.
- d) Ambient vibration levels: Arcadis will undertake background vibration monitoring using our state-of-the-art equipment at 2 representative locations near the Britannia Church foundation, prior to start of construction activities.
- e) A public communications protocol: (by others/Mobilinx)
- f) A complaints protocol during construction: (by others/Mobilinx)
- g) Procedures for construction method alteration to address the occurrence of excessive vibrations: These mitigation recommendations may include the use of alternative equipment, limiting the number of activities being undertaken in close proximity of the Church structure, sequencing operations, maintaining truck/equipment access roads to minimize the formation of potholes.

These mitigation measures and monitoring program shall be implemented so that construction activities do not exceed maximum frequency-based limits for peak particle velocity. These Prohibited Construction Vibration PPV levels in in/sec and mm/sec are presented in Table 2 above which shall be adopted for vibration monitoring during construction.

Monitoring Program of vibration during construction:

The vibration levels caused by construction activities and equipment such as vibratory rollers shall be monitored and reporting on the monitoring is as follows:

- 1) The vibration levels during the entire construction near Britannia Church shall be monitored continuously so that the vibration damage criteria of 3 mm/sec will never be exceeded. If there is any exceedance of the PPV vibration levels over specified frequency range, the construction is to be seized immediately, otherwise, there will be potential cosmetic or structural damages to the building which is already susceptible to damages from construction.
- 2) Construction activity shall not be carried on when it will result in vibration measurements that exceed the prohibited construction levels set out in Table 2 of this report.
- 3) A copy in writing of all vibration measurements recorded as part of the monitoring program will be provided to Mobilinx at the end of each work day.

If mitigation and or conservation strategies are needed for this structure, the building conservation plans for the Britannia Church will be prepared by the project's structural engineer in consultation with a Heritage specialist.

References

- [1] U.S. Federal Transit Administration's Noise and Vibration Impact Assessment Manual, September 2018
- [2] Hurontario-Main LRT Project Environmental Project Report, Noise and Vibration Impact Assessment. J.E. Coulter Associates Ltd. April 2014
- [3] City of Toronto By-law 514-2008
- [4] "Vibration Limits for Historic Buildings and Art Collections", published by APT BULLETIN, Journal of Preservation Technology / 46:2-3 2015
(<https://www.alexandriava.gov/uploadedFiles/special/WaterfrontPlan/info/VibrationLimitsforHistoricBuildings.pdf>)

MEMO

Appendix A

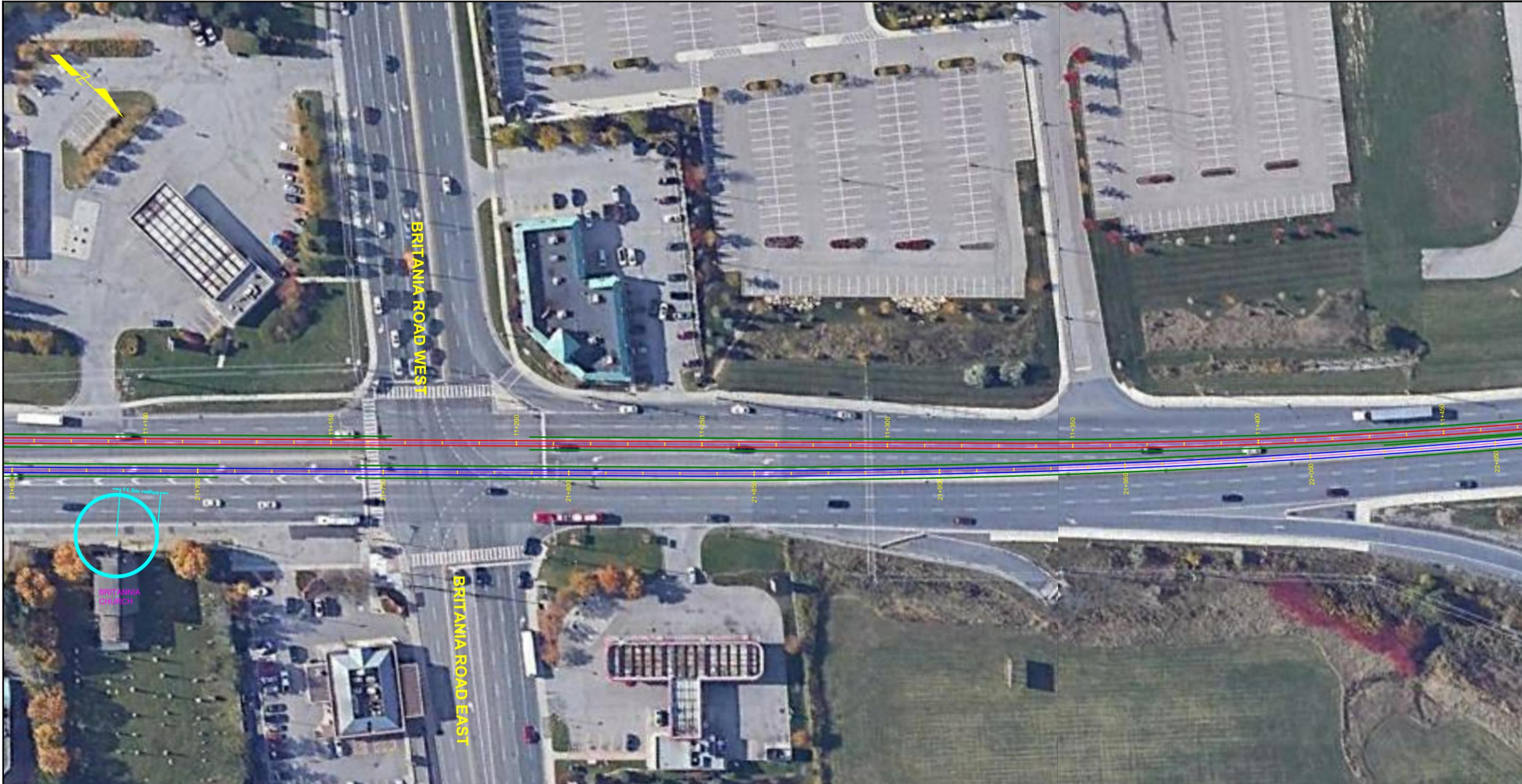
Sample Pre-condition Survey Photos



MEMO

Appendix B

Zone of Influence Plan



LEGEND

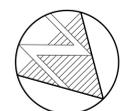
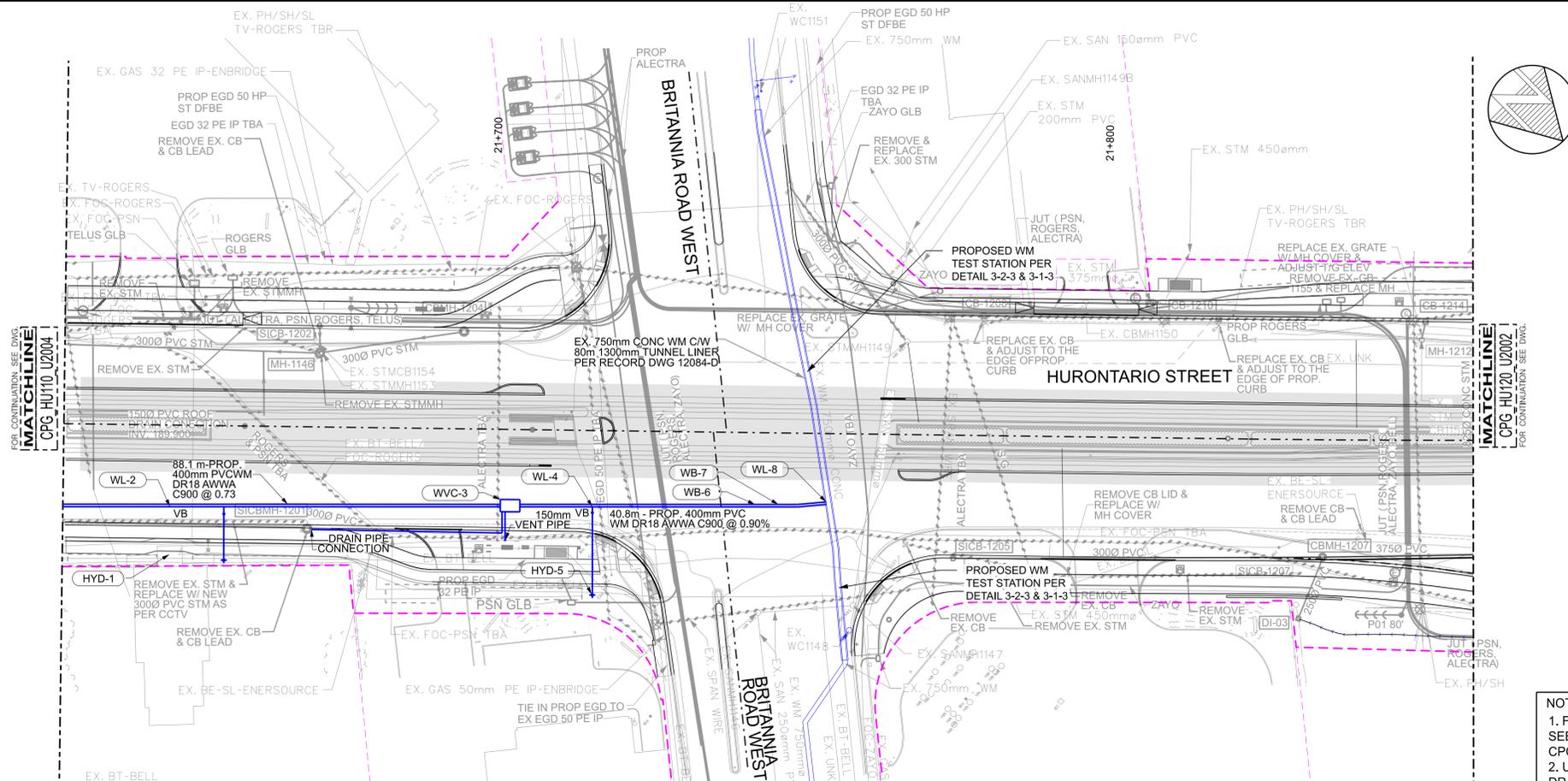
-  ZONE OF INFLUENCE
-  CHAINAGE
-  PROPOSED LRT LINES

Title: Vibration Zone of Influence due to Operation of Vibratory Roller Britannia Church	
	Project: HURONTARIO LRT HURONTARIO STREET
	Client: METROLINX
Date: June 2021	
	
FIGURE 1	

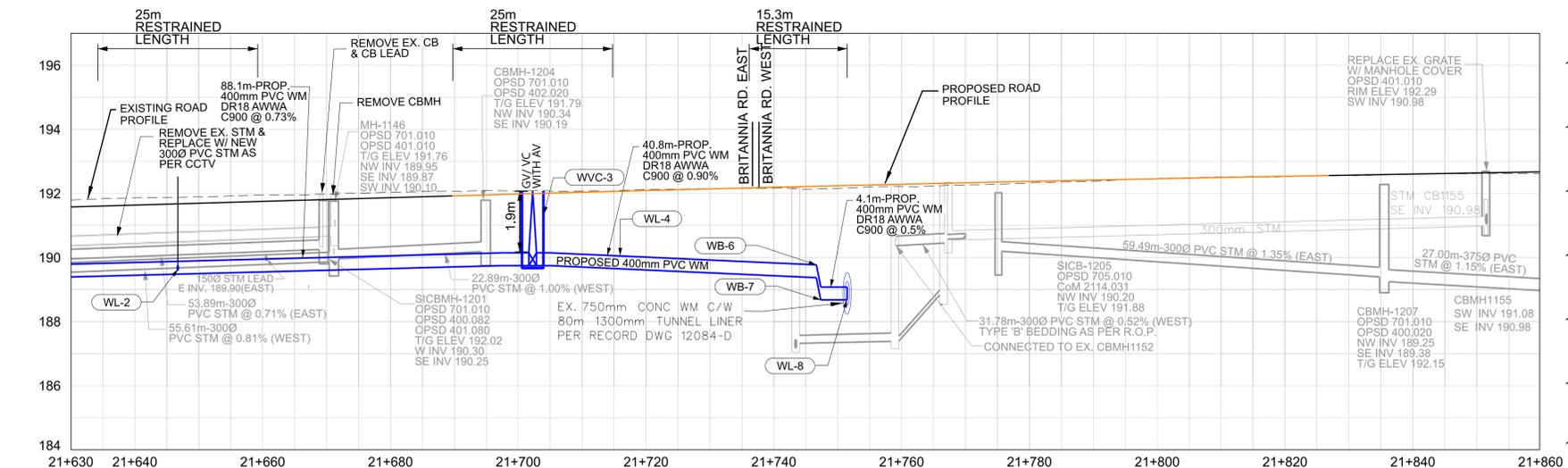
MEMO

Appendix C

Water Utility Relocation Plan



PLAN
STA. 21+630 TO 21+860
CPG_HU120_U2001



PROFILE
STA. 21+630 TO 21+860
CPG_HU120_U2001

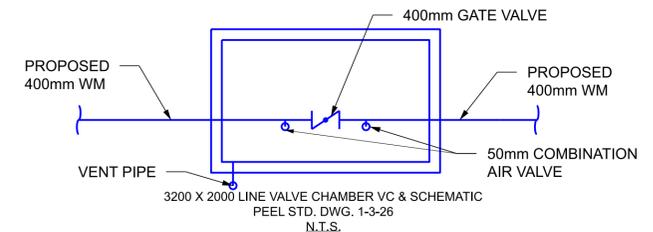
NOTE:
1. FOR LEGEND AND GENERAL NOTES, SEE DWG CPG_HU110_U0011, CPG_HU110_U0013.
2. UTILITY LOCATIONS SHOWN ON DRAWING MAY NOT REPRESENT ACTUAL LOCATION. THE CONTRACTOR TO FIELD LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.

GENERAL NOTES:
THIS DRAWING TO BE USED FOR WATER DESIGN ONLY

ALL WATER AND SANITARY SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD. ALL PIPE SIZES ARE IN MM. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION.

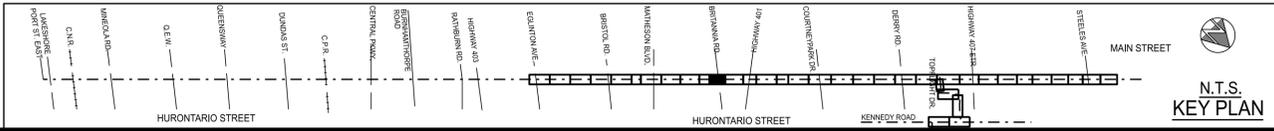
NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY:

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
BELL CANADA
ENBRIDGE GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ALECTRA HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCI BROADBAND)



WATERMAIN DATA TABLE						
ID	W.M SIZE (mm)	FITTINGS / VALVE	NORTHING	EASTING	W.M. INVERT (m)	W.M. RIM (m)
HYD-1	400/150	400 x 150 Lateral	4831164.05	606607.34	189.61	-
WL-2	400/150	400 x 150 Tee	4831158.46	606601.82	189.61	-
WVC-3	400	Valve in Chamber	4831197.50	606562.23	189.74	191.89
WL-4	400/150	400 x 150 Tee	4831206.94	606552.65	189.77	-
HYD-5	400/150	400 x 150 Lateral	4831217.30	606562.87	189.77	-
WB-6	400	45° Vertical Elbow	4831225.62	606533.69	189.40	-
WB-7	400	45° Vertical Elbow	4831228.29	606530.98	189.67	-
WL-8	750/400	750 x 400 Tee	4831233.73	606524.83	189.67	-

Note:
PEO stamp is applicable for UCC Review Process only



REVISIONS	REVISIONS
A WZP05 PRELIMINARY 30% WORK SUBMITTAL 2020/01/23	D WZP05 FINAL 90% DSGN DEVELOPMENT 2020/09/23
B WZP05 PRELIMINARY 30% RE-SUBMISSION 2020/03/10	
C WZP05 PRE-FINAL 50% DSGN DEVELOPMENT 2020/05/19	

90% REVIEW DRAWING
NOT FOR CONSTRUCTION



DESIGNED J. RIANO 2020/09/23
DRAWN S. ISHTIAQ 2020/09/23
CHECKED T. BODERA 2020/09/23
APPROVED J. BARRERA 2020/09/23

HURONTARIO LIGHT RAIL TRANSIT
HURONTARIO STREET UTILITIES - WZP05
WATER UTILITY RELOCATION
PLAN AND PROFILE - STA. 21+630 TO STA. 21+860

Plot Date: 9/23/2020
METROLINX
Dwg. No. CPG_HU120_U2001
Sheet No.

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