



HERITAGE COMMITTEE MEETING

February 9, 2022

5:00 p.m. - 6:00 p.m.

Video Conference - Internal

Zoom Meeting Access Details

Link: <https://us02web.zoom.us/j/83078993941>

Meeting ID: 830 7899 3941

Passcode: 254988

Toll-Free: 855 703 8985

Pages

1. CALL TO ORDER
2. LAND ACKNOWLEDGEMENT
3. DISCLOSURE OF PECUNIARY INTEREST
4. ADOPTION OF MINUTES 1
5. NEW BUSINESS
 - 5.1. Bridge Project Updates (15 Minutes)
 - 5.1.1. West Montrose Bridge Restoration
 - 5.1.2. Middlebrook Bridge
 - 5.1.3. Peel Street Bridge Pedestrian Conversion
 - 5.1.4. Beitz Bridge (Greenhouse Road EA) 7
 - 5.2. Introductory Heritage Training: Township Planning Staff (20 Minutes)
 - 5.3. Heritage Week Discussion (10 Minutes)
 - 5.4. Heritage Registry Review (10 Minutes)
 - 5.5. Regional HPAC Updates (5 Minutes) 82
6. OTHER BUSINESS
7. ADJOURNMENT

8. NEXT MEETING

March 9, 2022

5:00 p.m. - 6:00 p.m.

Township of Woolwich Heritage Committee Minutes

January 12, 2022
Virtual – Zoom Meeting
From 5:00 to 6:25 p.m.

Meeting Chair: Councillor Patrick Merlihan (Chair)

Attended: Bonnie Bryant (Co-Chair)
Emily Brown
Hans Pottkamper*
Kim Hodgson
Marg Drexler
Pat Stortz

Staff Present: David Gundrum, Planner
Ilidia Sa Melo, Deputy Clerk
Robyn Koutrouliotis, Administrative Assistant

Regrets: Ingrid Pottkamper

Item 1 – Call to Order at 5:02 p.m.

Councillor Patrick Merlihan welcomed new members to the Committee.

Item 2 – Disclosure of Pecuniary Interest:

None

Item 3 – Election of Chair and Vice-Chair

Moved by Bonnie Bryant
Seconded by Kim Hodgson

That the Heritage Committee appoint Councillor Patrick Merlihan as Committee Chair for the duration of the 2022 term.

...Carried.

Moved by Marg Drexler
Seconded by Pat Stortz

That the Heritage Committee appoint Bonnie Bryant as Committee Co-Chair for the duration of the 2022 term.

...Carried.

Item 4 – Adoption of Minutes of Previous Meeting of November 10, 2021

Moved by Co-Chair Bryant

Seconded by P. Storz

That the minutes of the Heritage Committee meeting on November 10, 2021 be adopted as presented.

...Carried.

Glasgow Street Bridge

** Hans Pottkamper entered the meeting.*

The Committee discussed considerations relating to horse and buggy traffic on the Glasgow Street Bridge.

Action: The Committee requested D. Gundrum liaise with Engineering Services staff regarding plans for allowing two-way horse and buggy traffic on the Glasgow Street Bridge.

** H. Pottkamper left the meeting.*

Item 5 – Township Heritage Story Map Online Viewer

David Gundrum, Planner, provided the Committee with an overview of the Woolwich Heritage Story Map implemented by Lisa Atkinson, GIS Technician, including an update to include historic bridges and the West Montrose cultural heritage landscape area. D. Gundrum noted the Story Map is a living resource. Moving forward, the Committee can provide updated information to D. Gundrum, who will liaise with L. Atkinson.

Action: The Committee requested D. Gundrum circulate the Woolwich Heritage Story Map weblink to the Committee.

Item 6 – West Montrose Bridge Restoration Update

D. Gundrum provided the Committee with a status update on the West Montrose Bridge restoration project; construction is scheduled to begin Spring 2022 and continue for approximately one year. Conclusion is anticipated for Spring 2023.

Co-Chair Bryant provided the Committee with an update from the December 2021 Regional Heritage Committee Meeting regarding structural issues that have been identified with the West Montrose Bridge; further information will be provided to the Regional Heritage Committee in March 2022. Co-Chair Bryant noted the engagement of a consultant from the U.S. with experience in covered bridges.

Item 7 – Middlebrook Bridge Update

D. Gundrum provided information received from Engineering Services staff regarding the Middlebrook Bridge. D. Gundrum noted Council and staff are awaiting a resolution from joint-owner Township of Centre Wellington's Council in February 2022 before moving forward.

The Committee discussed possible outcomes related to the Township of Centre Wellington's motion.

** H. Pottkamper entered the meeting.*

The Committee discussed other avenues available, including demolition and the relevant financial implications, sale to the Ontario Heritage Trust, fundraising, and considerations unique to shared municipal resources. K. Hodgson noted the incorporation fee is \$500.

Action: The Committee requested D. Gundrum bring information on the feasibility of the Ontario Heritage Trust option in relation to bridges to a future Committee meeting.

Item 8 – Peel Street Bridge Update

D. Gundrum provided an update on information received from Engineering Services staff regarding the proposed pedestrian conversion of the existing Peel Street Bridge. D. Gundrum noted intent to provide Township Council with a design by March 2022; anticipated construction could proceed later this year.

D. Gundrum noted information from the Virtual Public Consultation Session is available on the Township website for the Committee's review. Co-Chair Bryant relayed concerns received from Winterbourne residents regarding the consultation process. K. Hodgson expressed interest in the Session's community engagement statistics.

The Committee discussed snowmobile use on the bridge.

Action: The Committee requested D. Gundrum liaise with Ryan Tucker, Engineering Project Supervisor, regarding D. Gundrum bringing a draft design of the Peel Street Bridge before the Committee, to be reviewed by the Committee in an offline meeting.

Action: The Committee requested D. Gundrum liaise with R. Tucker, Engineering Projects Supervisor, to assess the feasibility of the Committee reviewing a draft report to prepare their comments on the draft prior to the report going before Council.

Action: If the above-referenced draft can be acquired, the Committee will meet for an offline discussion before the February 9th meeting.

Item 9 – Committee Goals Discussion

Heritage Plaque Installations

The Committee identified Heritage Plaque Installation as a high-priority project, with projected completion in Spring 2022.

D. Gundrum provided an update regarding COVID-19 related impact on sign installation.

Conestogo

D. Gundrum noted the installation should occur within the next few weeks and that the homeowner requested a commemorative event attended by Mayor Shantz for Spring 2022.

Maryhill

D. Gundrum noted the corrected plaque should be received by the end of the month due to COVID-19 related delays.

West Montrose

H. Pottkamper noted installations are on-hold until the Region has finished reconstruction work.

H. Pottkamper noted negotiations with the homeowners of one of the properties have resulted in agreement to install the plaque on the house itself, rather than on a road-side signpost, with the caveat that the process be handled discreetly.

Action: D. Gundrum will follow-up with homeowners who have not yet responded to correspondence sent in 2021.

Action: The Committee requested D. Gundrum liaise with H. Pottkamper regarding the second West Montrose installation when timing has been confirmed with the sign installer.

Ghost Signage

The Committee discussed the Ghost Signage project, including: finalizing brief write-ups on the locations, inclusion of the locations in the Story Map, assessing similar signage in area municipalities, requesting costing quotes, the potential implementation of a Ghost Signage historical tour and tourist brochure, the inclusion of folklore in the Story Map, and determining a budget-based installation timeline.

K. Hodgson proposed the inclusion of information on the Township's first Black settlement near Cox Creek; the Committee discussed inclusion of images and/or documentation of a historical context in acknowledgement of the settlement, in lieu of an exact location in the Story Map.

Action: The Committee will send information for the Ghost Signage project to Chair Merlihan for circulation.

Action: Information for inclusion in the Story Map will be sent to D. Gundrum and L. Atkinson, GIS Technician.

Heritage Designations

The Committee discussed updates to the Heritage Designation list, including the addition of the Peel Street Bridge, Elmira Library, and the St. Boniface Church and cemetery; Chair Merlihan noted the identification of heritage buildings during the Elmira Core Area Urban Design Study, including the Commercial Hotel, St. James Church, St. Paul Church, and the Great West Felt Company.

Action: The Committee will determine approximately four Heritage Designations to act on, moving forward.

Online Presence

The Committee discussed the need for, and advantages of, a stronger online presence in the form of a dedicated Heritage webpage. P. Stortz will liaise with Clerk's Division staff and K. Hodgson will provide additional support.

Action: Ilidia Sa Melo, Deputy Clerk, and Robyn Koutrouliotis, Administrative Assistant, will liaise with Clerk's Division staff regarding the status of the webpage project.

Heritage Preservation

H. Pottkamper highlighted the use of heritage preservation to boost the local economy as a future focus area.

Completion of Maryhill CHL Study

The Committee discussed the outstanding Maryhill Cultural Heritage Landscape (CHL) study, including a noise impact assessment, cost, and potential funding through Provincial or national bridge organizations. D. Gundrum confirmed that the cost of the study exceeds the Committee's budget.

The Committee discussed bringing the item forward in the upcoming training with Ministry staff to identify best-practices. H. Pottkamper proposed the Committee assess the feasibility of partnering with a university for the project.

Co-Chair Bryant noted the gravel pit application has gone to the Ontario Land Tribunal (OLT).

Economic Drivers to Heritage Preservation

H. Pottkamper proposed tying in economic drivers to heritage preservation, protection, and utilization as a future focus area.

Historical Walking Tour

The Committee discussed reviving the historical walking tour program. The Committee also discussed the use of QR code, a "ghost walk," and liaising with Explore Waterloo Region.

The Committee discussed liaising with Jenna Morris, Economic Development and Tourism Officer, to promote and execute heritage-related events.

Elmira Core Urban Design Study

Chair Merlihan provided an overview of discussion that occurred at the Elmira Core Area Urban Design Study Virtual Community Information Session and noted a report will be available in March 2022.

Action: The Committee requested D. Gundrum circulate the webpage link for the Elmira Core Area Urban Design Study Virtual Session.

Historical Photographs with Descriptions

The Committee discussed the location of twelve framed photographs with descriptions from 2014 or 2015, most recently housed in the Township Office.

Action: The Committee requested I. Sa Melo liaise with staff regarding the location of the photographs.

Item 10 – Ministry Training Session (Tentative)

D. Gundrum provided a status update on the proposed training session with Ministry of Heritage, Sport, Tourism, and Culture staff, pending completion of the Ministry's Heritage Cultural Toolkit reference document; the training is tentatively scheduled for the Committee's February 9th meeting. The Committee noted an interest in proceeding with the training with a draft version of the Toolkit.

The Committee agreed to dedicate the entirety of the February 9th Committee meeting to the Ministry training, if confirmed; ongoing updates and other discussion would occur via email following circulation of the meeting agenda.

Action: D. Gundrum will contact Ministry of Heritage, Sport, Tourism, and Culture staff next week to confirm a training date.

Action: The Committee requested D. Gundrum assess the feasibility of the Committee accessing and reviewing the Toolkit in advance of the training session.

Motion to Adjourn

Moved by K. Hodgson

Seconded by H. Pottkamper

That the meeting be adjourned to meet again on Wednesday, February 9, 2022.

...Carried



TOWNSHIP OF WOOLWICH



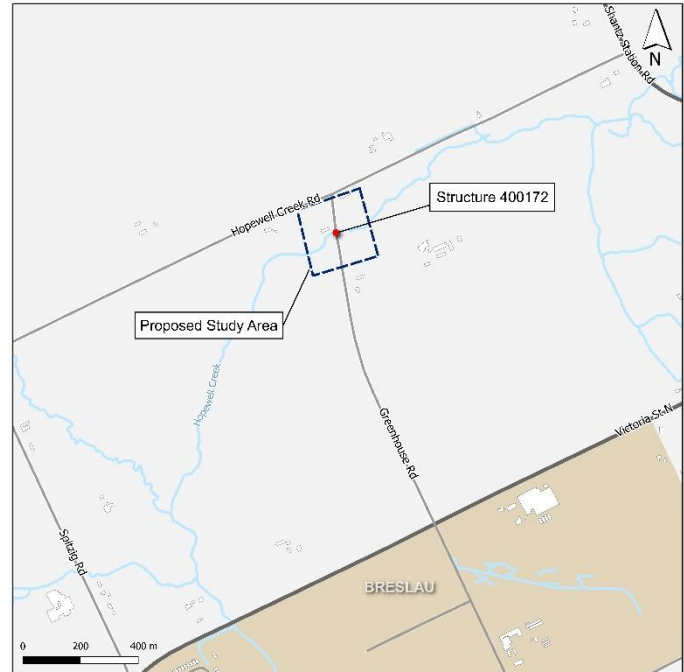
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT Structure 400172 - Greenhouse Road NOTICE OF STUDY COMMENCEMENT

The Township of Woolwich, through their consultant GM BluePlan Engineering Limited, is undertaking a Municipal Class Environmental Assessment (EA) to study the structural and physical deficiencies associated with the Structure 400172 on Greenhouse Road. The purpose of the study is to determine the need and short and long term plan for the crossing.

Several alternatives will be considered for the bridge as part of the study. Preliminary alternatives for the bridge include closure, removal and replacement

The project is being planned as a Schedule 'B' Project in accordance with the "Municipal Class Environmental Assessment" (Municipal Engineers Association, October 2000, as amended in 2007, 2011 and 2015). The Class EA process includes public and agency consultation, an evaluation of alternatives, an assessment of potential environmental effects of the proposed work and identification of reasonable measures to mitigate any potential adverse impacts.

An integral component of this study will be consultation with directly affected stakeholders, agencies and the general public.



In the **spring of 2020**, a Public Consultation Centre will be held to present the project details and to collect community feedback. The meeting date and details will be advertised in the **Woolwich Observer** and on **www.woolwich.ca**. Meeting notices will also be circulated to neighbouring residences and businesses.

Public input and comments are encouraged. If you have any questions or comments about this study, or would like to be contacted about future public events associated with this study, please contact:

Darryl Schwartzentruber, C. Tech.
Township Project Manager
Township of Woolwich
24 Church Street West, P.O. Box 158,
Elmira, ON N3B 2Z6
Tel: 519-669-1647 ext. 6047
E-mail: dschwartzentruber@woolwich.ca

Matt Scott, P. Eng.
Consultant Project Manager
GM BluePlan Engineering Limited
650 Woodlawn Road West, Block C, Unit 2
Guelph, ON N1K 1B8
Tel: 519-824-8150
Email: matt.scott@gmblueplan.ca

Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. With the exception of personal information, please note all comments will become part of the public record.

This Notice first issued January 31, 2020.
<https://www.woolwich.ca/en/township-services/engineering-public-notices.aspx>

**VOLUME 1: CULTURAL HERITAGE EVALUATION REPORT
STRUCTURE 400172 (BEITZ' BRIDGE)**

**GREENHOUSE ROAD
GEOGRAPHIC TOWNSHIP OF WATERLOO
WATERLOO COUNTY
REGIONAL MUNICIPALITY OF WATERLOO, ONTARIO**

Prepared for:

GM BluePlan Engineering Limited
650 Woodlawn Road West
Guelph, ON N1K 1B8

ASI File: 19CH-153

December 2019



**VOLUME 1: CULTURAL HERITAGE EVALUATION REPORT
STRUCTURE 400172 (BEITZ' BRIDGE)**

**GREENHOUSE ROAD
GEOGRAPHIC TOWNSHIP OF WATERLOO
WATERLOO COUNTY
REGIONAL MUNICIPALITY OF WATERLOO, ONTARIO**

EXECUTIVE SUMMARY

ASI was contracted by GM BluePlan Engineering Limited to conduct a cultural heritage evaluation and heritage impact assessment of Structure 400172 (also known as Beitz' Bridge) to determine if future work for the bridge falls under Schedule A, A+, or B definitions of the Municipal Class Environmental Assessment Act. The study is a part of the Woolwich Township 2019 Bridge and Culvert Program. This report, Volume 1, provides the Cultural Heritage Evaluation Report (CHER); Volume 2 provides the Heritage Impact Assessment (HIA) in a separate report. The subject bridge is located over Hopewell Creek on Greenhouse Road in the Township of Woolwich, Regional Municipality of Waterloo.

Structure 400172 is a single-span concrete T-beam and slab bridge built in 1919. It carries a single lane of Greenhouse Road vehicular traffic in a north-south orientation, over Hopewell Creek, a minor tributary of the Grand River. The bridge is located in a rural context approximately 125m south of Hopewell Creek Road near the community of Breslau. The deck has a length of 7.3m, an overall structure width of 4.9m and a roadway width of 4.4m. The bridge has a 14 tonne load limit with an 80km/hr speed limit.

Structure 400172 has not been previously identified as an *Ontario Heritage Bridge*, does not currently have any status under the *Ontario Heritage Act* and is not listed on the *Woolwich Municipal Heritage Register*. However, the bridge has been included as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* (PHCS 2004) and was identified as a non-heritage bridge in *The Grand River Watershed Heritage Bridge Inventory* (Benjamin *et al.* 2013). Based on the results of archival research, an analysis of bridge design and construction in Ontario, a field investigation, and the application of the *Ontario Heritage Act Regulation 9/06*, Structure 400172 is determined to retain cultural heritage value. In particular, Structure 400172 is the earliest example of a cast-in-place T-beam and slab bridge type in the Region of Waterloo. It is a single-lane one-span bridge with a solid parapet concrete barrier along a historic transportation route in a rural setting over a minor tributary of the Grand River. Given that it meets at least one criteria of O. Reg. 9/06, a Draft Statement of Cultural Heritage Value or Interest and a list of heritage attributes have been included in this report.

Given the identified cultural heritage value of Structure 400172, the following recommendations should be considered:

1. A Heritage Impact Assessment should be completed for Structure 400172.
2. This report should be submitted to heritage staff at the Region of Waterloo, Woolwich Heritage Committee, and with the Ministry of Heritage, Sport, Tourism, and Culture Industries (formerly the Ministry of Tourism, Culture, and Sport) for review.

PROJECT PERSONNEL

<i>Senior Project Manager:</i>	Lindsay Graves, MA, CAHP <i>Senior Cultural Heritage Specialist Senior Project Manager, Cultural Heritage Division</i>
<i>Project Manager:</i>	Tara Jenkins, MA, CAHP <i>Cultural Heritage Specialist, Cultural Heritage Division</i>
<i>Project Coordinator:</i>	Sarah Jagelewski, Hon. BA <i>Archaeologist Project Coordinator, Environmental Assessment Division</i>
<i>Field Survey:</i>	Tara Jenkins
<i>Report Preparation:</i>	Tara Jenkins
<i>Graphics Preparation:</i>	Adam Burwell, MSc <i>Geomatics Specialist, Operations Division</i>
<i>Report Reviewers:</i>	Lindsay Graves John Sleath <i>Cultural Heritage Specialist Project Manager Cultural Heritage Division</i>

TABLE OF CONTENTS

EXECUTIVE SUMMARY i
 PROJECT PERSONNEL ii
 TABLE OF CONTENTS iii
 1.0 INTRODUCTION 1
 2.0 LEGISLATION AND POLICY CONTEXT 2
 2.1 Regional Policies 4
 2.2 Cultural Heritage Evaluation Report 8
 3.0 HISTORICAL CONTEXT AND CONSTRUCTION 9
 3.1 Introduction 9
 3.2 Local History and Settlement 10
 3.2.1 *Waterloo Township, Waterloo County* 10
 3.3 History of the Study Area, Structure 400172, and Previous Bridge Crossing 11
 3.3.1 *Review of Nineteenth and Twentieth Century Mapping* 11
 3.3.2 *Previous Bridge Crossings* 15
 3.4 Structure 400172 Construction 15
 3.4.1 *Early Bridge Building in Ontario* 15
 3.4.2 *History of T-Beam Bridges* 16
 3.4.2 *Construction of Structure 400172* 16
 4.0 EXISTING CONDITIONS AND INTEGRITY 16
 4.1 Comparative Geographic and Historic Context of Bridges in the Region of Waterloo and in Ontario 18
 5.0 HERITAGE EVALUATION OF STRUCTURE 170160 19
 5.1 Draft Statement of Cultural Heritage Value 20
 5.1.1 *Description of Property* 20
 5.1.2 *Cultural Heritage Value or Interest* 21
 5.1.3 *Heritage Attributes* 21
 6.0 CONCLUSIONS 21
 7.0 RECOMMENDATIONS 21
 8.0 REFERENCES 23
 APPENDIX A: Photographic Plates 26
 APPENDIX B: OSIM Inspection Form, 2017 31

LIST OF FIGURES

Figure 1: Location of Structure 400172 (in red) on Greenhouse Road, Woolwich Township, Ontario 1
 Figure 2: Photograph of the West Elevation of Structure 400172 (“Beitz’ Bridge), ca. 2017 2
 Figure 3: Location of Structure 400172 overlaid on the 1861 map of the Township of Woolwich 12
 Figure 4: Structure 400172 overlaid on the 1881 Township of Waterloo 13
 Figure 5: Structure 400172 overlaid on 1930 aerial photography 13
 Figure 6: Structure 400172 overlaid on 1935 NTS mapping 14
 Figure 7: Structure 400172 overlaid on 1963 aerial photography 14

LIST OF TABLES

Table 1: Results of Consultation 8
 Table 2: Evaluation of Structure 400172 using Ontario Regulation 9/06 19



1.0 INTRODUCTION

ASI was contracted by GM BluePlan Engineering Limited to conduct a cultural heritage evaluation and heritage impact assessment of Structure 400172 to determine if future work for the bridge falls under Schedule A, A+, or B definitions of the Municipal Class Environmental Assessment Act. The study is a part of the Woolwich Township 2019 Bridge and Culvert Program. This report, Volume 1, provides the Cultural Heritage Evaluation Report (CHER); Volume 2 provides the Heritage Impact Assessment (HIA) in a separate, standalone report. The subject bridge is located over Hopewell Creek on Greenhouse Road in the Township of Woolwich, Regional Municipality of Waterloo.

Structure 400172 is a cast-in-place concrete T-beam and slab bridge built in 1919. It has a north-south orientation 125m south of Hopewell Creek Road, near the community of Breslau (Figure 1). The bridge carries a single lane of predominantly vehicular traffic across Hopewell Creek in one span with a total deck length of 7.3m and an overall structure width of 4.9m. The bridge has not been identified as an *Ontario Heritage Bridge* and does not currently have any status under the *Ontario Heritage Act*. Structure 400172 is not listed on the *Woolwich Municipal Heritage Register* however, it has been included as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* inventory within the Waterloo Region (PHCS 2004). It was also identified as a non-heritage bridge in *The Grand River Watershed Heritage Bridge Inventory* (Benjamin et al. 2013).

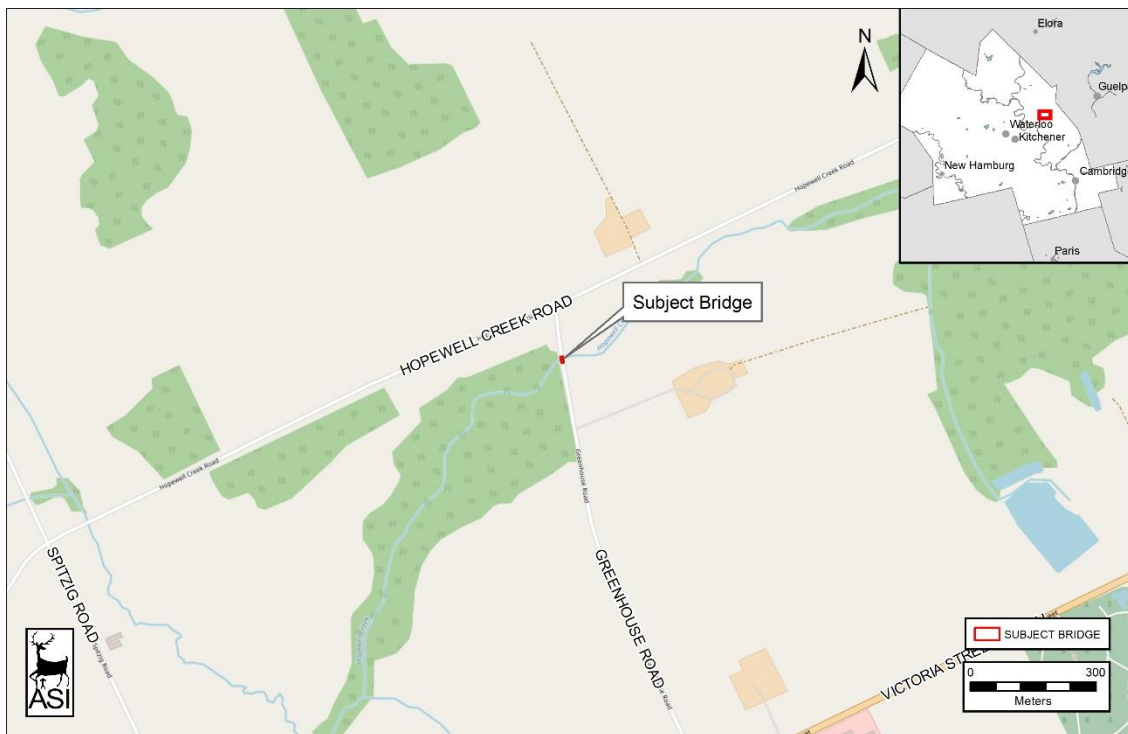


Figure 1: Location of Structure 400172 (in red) on Greenhouse Road, Woolwich Township, Ontario
Base Map: ©OpenStreetMap and contributors, Creative Commons-Share Alike License
(CC-BY-SA ESRI Street Maps)



Figure 2: Photograph of the West Elevation of Structure 400172 ("Beitz' Bridge), ca. 2017
Source: Courtesy of GM BluePlan

As this structure was constructed prior to 1956, a CHER is required to determine if the bridge retains cultural heritage value (Municipal Engineers Association 2014). The principal aims of this report are to:

- Describe the methodology that was employed and the legislative and policy context that guides heritage evaluations of bridges;
- Provide a historical overview of the design and construction of the bridge within the broader context of the surrounding township and bridge construction generally;
- Describe existing conditions and heritage integrity; and
- Evaluate the bridge using *O. Reg. 9/06, Criteria for Determining Cultural Heritage Value or Interest*, of the *Ontario Heritage Act* and draw conclusions about the heritage attributes of the structure.

2.0 LEGISLATION AND POLICY CONTEXT

Infrastructure projects have the potential to impact cultural heritage resources in a variety of ways. These include loss or displacement of resources through removal or demolition and the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

A 40-year-old threshold is used as a guiding principle when considering cultural heritage resources in the context of improvements to specified areas (MHSTCI 2016). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly younger than 40 years old, this does not preclude the resource from retaining heritage value.

The analysis used throughout the cultural heritage resource assessment process addresses cultural heritage resources under various pieces of legislation and their supporting guidelines:

- *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18)
 - *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MCC 1992)
 - *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (MCR 1980)
 - *Municipal Heritage Bridges: Cultural, Heritage and Archaeological Resources Assessment Checklist* (Municipal Engineers Association 2014)
- *Ontario Heritage Act* (R.S.O. 1990, Chapter O.18) and a number of guidelines and reference documents prepared by the Ministry of Tourism and Culture (MTC):
 - *Ontario Heritage Tool Kit* (MCL 2006)
 - *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* (November 2010)

The *Ontario Heritage Act* makes provisions for the protection and conservation of heritage resources in the Province of Ontario. A Cultural Heritage Evaluation Report is intended to identify areas of heritage interest as specified in the *Provincial Policy Statement*. Built heritage concerns are recognized as a matter of provincial interest in Section 2.6.1 of the *Provincial Policy Statement* (PPS) which states:

- Significant built heritage resources and cultural heritage landscapes shall be conserved (PPS 2014:29).

In the *Provincial Policy Statement* the term Conserved means:

the identification, protection, management and use of built heritage resources, cultural heritage landscapes and archaeological resources in a manner that ensures their cultural heritage value or interest is retained under the Ontario Heritage Act. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment and/or heritage impact assessment. Mitigative measures and/or alternative development approaches can be included in these plans and assessments (MMAH 2014:40).

Additionally, Part 4.7 of the PPS states that:

The official plan is the most important vehicle for implementation of this Provincial Policy Statement. Comprehensive, integrated and long-term planning is best achieved through official plans.

Official plans shall identify provincial interests and set out appropriate land use designations and policies. To determine the significance of some natural heritage features and other resources, evaluation may be required.

Official plans should also coordinate cross-boundary matters to complement the actions of other planning authorities and promote mutually beneficial solutions. Official plans shall provide clear, reasonable and attainable policies to protect provincial interests and direct development to suitable areas.

In order to protect provincial interests, planning authorities shall keep their official plans up-to-date with this Provincial Policy Statement. The policies of this Provincial Policy Statement continue to apply after adoption and approval of an official plan.

The Ministry of Heritage, Sport, Tourism, and Cultural Industries (MHSTCI) delivers the *Standards and Guidelines for the Conservation of Provincial Heritage Properties* (MHSTCI 2014). These Standards and Guidelines apply to properties the Government of Ontario owns or controls that have cultural heritage value or interest. The Standards and Guidelines, and associated guidance documents, apply to provincially owned or controlled heritage properties in the areas of identification and evaluation, protection, maintenance, use, and disposal. However, as Structure 400172 is not provincially owned, the Standards and Guidelines can only provide general reference in determining the heritage significance of a property. The *Ontario Heritage Toolkit* (MHSTCI 2006) provides a guide on how to evaluate heritage properties that are subject to or are being considered for municipal designation and/or listing under sections 27, 29 or 41 of the *Ontario Heritage Act*.

2.1 Regional Policies

Section 3 of the *Regional Official Plan* (Consolidated 2015) for the Region of Waterloo sets out a number of policies with regard to cultural heritage resources. Policies that are relevant to this study include:

3.G Cultural Heritage

Cultural heritage resources are the inheritance of natural and cultural assets that give people a sense of place, community and personal identity. Continuity with the past promotes creativity and cultural diversity. The region has a rich and diverse heritage, including distinctive cultures, traditions, festivals, artisans and craftspeople, landmarks, landscapes, properties, structures, burial sites, cemeteries, natural features and archaeological resources. These resources provide an important means of defining and confirming a regional identity, enhancing the quality of life of the community, supporting social development and promoting economic prosperity. The Region is committed to the conservation of its cultural heritage. This responsibility is shared with the Federal and Provincial governments, Area Municipalities, other government agencies, the private sector, property owners and the community.

3.G.1 The Region and Area Municipalities will ensure that cultural heritage resources are Conserved using the provisions of the Heritage Act, the Planning Act, the Environmental Assessment Act, the Cemeteries Act and the Municipal Act.

3.G.2 The Region will prepare and update a Regional Implementation Guideline for Conserving Regionally Significant Cultural Heritage Resources. In accordance with the Ontario Heritage Act, this guideline will outline the criteria and processes the Region will follow to identify and conserve cultural heritage resources of Regional interest including regional roads that have cultural heritage value or interest.

3.G.22 The Region supports the national recognition given to the Grand River as a Canadian Heritage River, including its major tributaries, the Nith River, Speed River and Conestogo River, and will continue to promote appropriate initiatives to maintain, enhance, manage and conserve natural, cultural, recreational, scenic and ecological features.

3.G.27 The Region recognizes that many Regional Roads are characterized by natural, cultural heritage and recreational features that contribute to the scenic value of Regional Roads. During any construction or upgrades, the Region will, wherever feasible, endeavour to protect and/or enhance the scenic value of such features along Regional Roads.

It should be noted that the Region of Waterloo's *Official Plan (OP)* supports built heritage, but does not specify bridges as a part of non-renewable heritage resources.

In addition to the OP, the *Scenic Roads and Special Character Streets, Resource Document* (Region of Waterloo 2011) provides recommendations on the conservation of heritage bridges. Significant bridges contribute to the character of a scenic corridor. Within the Region of Waterloo, over 100 bridges have been inventoried and ranked according to their heritage significance. This document recommends that Heritage Bridges should be conserved. Section 4.3 provides the following specific recommendations on bridges related to this project:

Heritage Bridge Rehabilitation & Conservation:

a) Preserve bridges that are designated under the Ontario Heritage Act and listed on Municipal Heritage Registers. These include the West Montrose Bridge in Woolwich, the Freeport Bridge in Kitchener and the Black Bridge Road Bridge in Cambridge.

b) Conserve other heritage bridges [that are not designated under the *Ontario Heritage Act*] whenever feasible. Information on historically significant bridges within the Region can be found in *Spanning the Generations: A Study of Old Bridges in Waterloo Region* (2004).

c) Protection Strategies for the Region's top 10 historic bridges and collection of steel truss bridges are listed in Phase 2 and 3 of the Bridge Study.

Maintenance: Whenever feasible, heritage bridges should be maintained and kept in regular use. Follow industry standards and known best practices to maintain, with an aim to preserve the heritage bridge.

Alterations/Railing Design: Consider using open style railings on bridges in high pedestrian areas to allow for views of the waterway. The Region has research available on railing options available from Transportation Engineering staff.

Recognition: When possible, provide access for people to visit old bridges, tunnels and overpasses. Refer to Regional Policies and Procedures for Access onto Regional Roads for guidance on appropriate points of access. Cultural heritage staff is available to provide interpretation and to recognize heritage bridges owned by the Region through the Region's Heritage Bridge Recognition Program, Ontario Heritage Act designations, heritage easements or Provincial plaques. The Region is installing interpretive plaques at the top ten historically significant bridges in the Region. Currently there are plaques at the Hartman Bridge in New Hamburg, the Freeport Bridge and the Bridgeport Bridge in Kitchener, and the Mill Creek Bridge, Main Street Bridge and Black Bridge Road Bridge in Cambridge.

Reduction of Load Limit and By-pass Creation and Decommissioned Bridge:

Ideally, when regular use is no longer feasible, a bridge should be kept in use in its original location with a reduced load limit and/or for pedestrians only, with traffic being re-routed to an alternate route or by-pass. As this may not be feasible on a Regional corridor, the bridge may need to be relocated or dismantled. Removing the bridge from its original location reduces its heritage value but is preferred over permanent dismantling. Contact cultural heritage staff prior to relocation or demolition, of an historic bridge.

It may be recommended that the Region collect and preserve documentation, measured drawings and photographs of the historic bridge; incorporate resources from a demolished historic bridge into a new bridge structure; and/or provide interpretation of the heritage resource on a plaque.

Recommendations for the treatment of heritage bridges can be found in *Spanning The Generations: A Study of Old Bridges in Waterloo Region* (2004b:69). The study presents Protection Strategies in Section 5.3.2 and is as follows:

- Creating by-passes or using alternate routes. This option preserves the original location of the bridge and its profile within the community.
- Reduction of Load Limit. There can be a reduction of the load limits, or traffic, or traffic can be reduced to pedestrians only. Planning strategies can then be employed to encourage alternate routes of travel.
- Incorporation. Include the bridge into the development scheme. This might involve constructing a new bridge near the existing one.
- Relocation. The bridge may be moved to a safer location. However, removing the bridge from its original location reduces its heritage value.

2.1.1 The Grand River Heritage River Designation

The Grand River is a 280km long river stretching from Wareham, Ontario in the north to Lake Erie in the south. The Grand travels through a number of major communities in Southern Ontario, including Kitchener, Waterloo, Cambridge and Brantford, and has been a central feature in the history of the area. As such, it is recognized as one of Canada's 42 national heritage rivers (CHRS 2016).

The Grand River and its major tributaries, the Conestogo, Eramosa, Nith and Speed rivers, were recognized as Canadian Heritage Rivers in 1994 for their human and recreational features. Five major themes were listed to describe the human heritage values (GRCA 2014):



- The watershed's cultural mosaic since the mid-nineteenth century;
- The strong association of native peoples with the watershed for thousands of years;
- The Grand River's industrial heritage;
- Human adaptation to fluctuating river flows; and
- The many famous people associated with the watershed.

The nomination for the Heritage River designation noted the many unique historical sites associated with themes. The watershed's cultural significance covers 11,000 years of human history and for its connection with historic communities, buildings, industries and over 800 archaeological sites. The area is associated with a number of important groups of people who contributed to pre- and post-Confederation Canada including the Neutral people, the Iroquois Confederacy, British Loyalists, Pennsylvania Mennonites and Scottish Immigrants. The Grand's recreational heritage is tied to an extensive hiking and cycling trail network and its 37 Conservation Areas, which contain opportunities for recreation.

The subject bridge crosses Hopewell Creek a minor tributary of the Grand River. In 2013, the University of Waterloo *et al.* conducted a study to inventory heritage bridges in the Grand River Watershed. Within this study, 167 heritage bridges and 473 non-heritage bridges were inventoried. Structure 400172 (Beitz' Bridge) was inventoried as a non-heritage bridge.

2.1.2 Review of Heritage Registers and Consultation

As a part of the evaluation undertaken for this report, municipal, provincial and federal heritage registers and inventories were reviewed including:

- Region of Waterloo *Spanning the Generations: A Study of Old Bridges in Waterloo Region* (Phases 1 and 2);
- Woolwich Township *Municipal Heritage Register*;
- *Arch, Truss & Beam, The Grand River Watershed Heritage Bridge Inventory*;
- Ontario Heritage Trust Plaque Guide;
- Canadian Register of Historic Places; and,
- Federal Heritage Designations.

The following stakeholders were contacted with inquiries regarding the heritage status and for information concerning the Structure 400172 and surrounding properties (Table 1).

Table 1: Results of Consultation

Contact	Organization	Date(s) of Communications	Description of Information Received
Bridget Coady, Principal Planner, Cultural Heritage	Region of Waterloo	07 and 13 November 2019	Response received. The Region does not have any other historical documentation on Structure 400172 other than published in <i>Spanning the Generations</i> . The Planner notes that the proposed age of the bridge is significant since concrete bridges rarely last longer than 60 years.
Archive Staff	Archives of Ontario	06 November 2019	Response received. Staff has a Woolwich bridge file but do not have bridge architectural or technical drawings.
Beitz Family	Beitz Horse and Carriage Service	07 and 15 November 2019	Telephone conversation with the Beitz family. Uncle of Herb Beitz, Henry, now passed away, helped build the bridge by pouring concrete.
Simon Green, Project Designer	GM BluePlan	29 November 2019	Simon had contacted MTO to request original drawings of the bridge. No original drawings had been located at the time of this report.
Region of Waterloo Archives	Region of Waterloo	29 November 2019	Online search of the archives did not result in information regarding this bridge. Email was sent to inquire about original drawings or any other historical information on this bridge. A response was not received at the time of this report.

2.2 Cultural Heritage Evaluation Report

The purpose of the CHER is to examine a property as whole, its relationship to surrounding landscapes, and its individual elements. Conducting scholarly research and site visits inform such an examination. Background information is gathered from heritage stakeholders where available, local archives, land registry offices, local history collections at public libraries, and the Ministry of Heritage, Sport, Tourism, and Cultural Industries when appropriate. Once background data collection is complete, a site visit is carried out to conduct photographic documentation and site analysis. These components provide a means to soundly establish the resource's cultural heritage value.

The scope of a CHER is guided by the Ministry of Heritage, Tourism, Sport and Cultural Industries' *Ontario Heritage Toolkit* (2006). Generally, CHERs include the following components:

- A general description of the history of a study area as well as a detailed historical summary of property ownership and building(s) development;
- A description of the cultural heritage landscape and built heritage resources;
- Representative photographs of the structure, and character-defining details;
- A cultural heritage resource evaluation guided by the *Ontario Heritage Act* criteria;
- A summary of heritage attributes;

- Historical mapping and photographs; and
- A location plan.

Using background information and data collected during the site visit, the property is evaluated using criteria contained within O. Reg. 9/06 of the *Ontario Heritage Act*. The criteria are grouped into the following categories which determine the cultural heritage value or interest of a potential heritage resource in a municipality:

- i) Design/Physical Value;
- ii) Historical/Associative Value; and
- iii) Contextual Value.

Should the structure meet one or more of the above-mentioned criteria, a Heritage Impact Assessment (HIA) is required.

When evaluating the cultural heritage significance of the subject bridge, the *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* (OHGB) (MTO 2008) and the *Ontario Heritage Bridge Program* (MHTSCI 1991) were consulted as points of reference.

The OHBG provides rationale for the protection and preservation of heritage bridges and is described as follows (MTO 2008:5-6):

Bridges are important parts of our engineering and architectural heritage. Perhaps more than any other type of structure built by man, they exhibit major historical change and innovation in the development and use of materials, in design, and in construction methods. They can be viewed as important elements and make a positive contribution to their surroundings. In some cases, they are rare survivors of an important bridge type or are revered because of their age, historical associations or other publicly perceived values.

3.0 HISTORICAL CONTEXT AND CONSTRUCTION

3.1 Introduction

Structure 400172 is a single span T-beam and slab bridge built in 1919. The bridge has a north-south orientation and is located on Greenhouse Road, 125m south of Hopewell Creek Road. The bridge carries a single lane of predominantly vehicular and horse and buggy traffic across a small tributary of the Grand River, Hopewell Creek, in one span with a total crossing length of 7.3m, a roadway width of 4.4m, and an overall structure width of 4.9m. The bridge has not been identified as a heritage bridge in the Ontario Heritage Bridge inventory and does not currently have any status under the *Ontario Heritage Act*, however, it has been included as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* inventory within the Waterloo Region (PHCS 2004).

Cultural heritage resources are those buildings or structures that have one or more heritage attributes. Heritage attributes are constituted by and linked to historical associations, architectural or engineering



qualities and contextual values. Inevitably many, if not all, heritage resources are inherently tied to “place”; geographical space, within which they are uniquely linked to local themes of historical activity and from which many of their heritage attributes are directly distinguished today. In certain cases, however, heritage features may also be viewed within a much broader context. Section 3.2 of this report details a brief historical background to the settlement of the surrounding area. A description is also provided of the construction of the bridge within its historical context (Section 3.3).

3.2 Local History and Settlement

Historically, the subject bridge is located in the Horning Tract, in the Geographic Township of Waterloo, Waterloo County.

3.2.1 Waterloo Township, Waterloo County

The Township of Waterloo was originally known as Block Two of the Grand River land grant which was deeded to the Six Nations Iroquois by the British in 1784 for their loyalty to the Crown in the American War of Independence. In 1796, Block Two, a 38,045 hectare tract, was acquired by Colonel Richard Beasley from Joseph Brant on behalf of the Six Nations. He subdivided and sold the land, with approximately a 24,281 ha tract of land going to the German Company of Pennsylvania, in November 1803 (Janusas 1988:2). Company members included Samuel and John Bricker; and Daniel, Jacob, and John Erb. The German Company of Pennsylvania had the lands surveyed by Augustus Jones in order to subdivide the land into 128 farm lots of approximately 181 ha each and 32 farm lots of approximately 34 ha each (Janusas 1988:96).

When Block Two was incorporated into the District of Gore (County of Halton) in 1816, it was named Waterloo Township, in honour of the battle that ended the Napoleonic Wars in Europe. It remained part of Halton County in the District of Gore until 1842 and then part of the District of Wellington. The County of Waterloo did not come into being until 1852 (Janusas 1988:2).

The first immigrants to settle in Waterloo Township were almost exclusively German Mennonites from Pennsylvania who had originally emigrated from Switzerland, Germany and France. Most of these settlers were farmers but many were tradesmen and millers. Later settlers were generally of Scottish, English, Irish, and continental German heritage, many of them farmers, but a majority of them were artisans and tradesmen.

In the mid-1850s, the defining development of Waterloo Township and Waterloo County was the construction of the railway. When the railway was laid through Waterloo Township, it became the leading industrial center of Waterloo County (Janusas 1988:10-12). The first railway line built into the township was a main line of the Grand Trunk Railway from Toronto, laid through in 1856. A number of other railway lines were soon laid across the township including: a Grand Trunk branch between Preston and Berlin in 1857; a Great Western line from Galt, Preston, and Guelph in 1857; a Grand Trunk branch between Berlin (Kitchener) and Galt in 1882; and a Grand Trunk Branch between Waterloo and Elmira in 1891 (Mika and Mika 1983).



The subject bridge is located in the Horning Tract of Waterloo Township. Peter Horning and his wife and nine children came from Montgomery County Pennsylvania in 1788 and initially settled in Barton Township on the Hamilton Mountain. In 1800, Horning purchased 1000 acres from Richard Beasley which became known as the Horning Tract in Waterloo (Waterloo Region Generations n.d.).

3.2.2 Settlement Area of Breslau

The area that became the settlement area of Breslau consisted of lands originally settled into farms with the arrival of families associated with the German Company (Woolwich Township 2019). The village of Breslau was formally established in 1850 when Joseph Erb built a dam, sawmill and grist mill at the outflow of Hopewell Creek into the Grand River. The village was named after Breslau, the capital of Silesia, the modern day city of Wroclaw, Poland (Woolwich Township 2019).

In 1834 the Mennonite congregation of Waterloo Township had outgrown their original meeting house built in 1813 in Berlin. This meeting house was disassembled and moved to Christian Snyder's farm, on the southern limit of what was to become the Village of Breslau (Breslau Mennonite Church 2019). In 1856, the log cabin was moved once again to the northern end of Breslau, where it became the residence of the local brick maker, Fred Schaefer and later a school house (Breslau Mennonite Church 2019). A brick church was erected at the site of the log cabin meeting house on the Snyder farm, elements of which are located within the modern church, located on the same premises. A cemetery, established at approximately the same time as the brick church, is located immediately west of the present-day church.

The village continued to prosper as a railway stop along the Grand Trunk rail line, constructed through Waterloo Township in the 1850s. The railway brought about development of a train station, hotel and general store in the centre of the village.

Breslau continued to prosper throughout the late nineteenth and twentieth centuries but increased little in population or economic growth. The village remained prosperous as the centres of Berlin (now Kitchener) and Waterloo began to dominate the region. Breslau was affected by the political reorganization of the region as it was moved from the now defunct Waterloo Township to Woolwich Township (Region of Waterloo 2019).

3.3 History of the Study Area, Structure 400172, and Previous Bridge Crossing

3.3.1 Review of Nineteenth and Twentieth Century Mapping

The 1861 *Tremaine* map shows that Greenhouse Road was surveyed. The road crosses Hopewell Creek which is shown as a prominent waterway on the map (Figure 3). It is plausible that a bridge was required to cross the creek by horse and buggy. In 1861, the existing bridge falls into a lot owned by Robert Bracey. To the south of Bracey's, the lot is owned by Jacob Betzner. Jacob Betzner, born in 1838, had married Lydia Snyder and resided on "his fathers old farm two miles east of Breslau" (From Pennsylvania to Waterloo n.d).

On the 1881 *Illustrated Historical Atlas* map of Waterloo Township, the location of the bridge is within the Horning Tract (Figure 4). There is no bridge or landowner illustrated, however as previously

discussed the land was owned by Peter Horning from Montgomery County, Pennsylvania. The 1930 aerial photograph shows a bridge crossing Hopewell Creek (Figure 5). Surrounding the creek, the area contains agricultural fields. To the west of the bridge, the creek is surrounded by a forest. A farm is situated just southeast of the bridge. The 1935 NTS map illustrates a bridge, however the type of bridge is not noted (Figure 6). The farm to the southeast of the bridge is depicted as containing a farmhouse and barn. The 1963 aerial photograph of the vicinity of the subject bridge shows that the surrounding context of the bridge had not changed (Figure 7). The aerial shows that the waterway is meandering naturally through the landscape. The current Google map information highlights the adjacent farm as containing the “Beitz Horse & Carriage Service” business, situated southeast of the bridge. The Beitz family has been in Waterloo Region since 1788 when Anna Beitz immigrated from Germany (Waterloo Region Generations 2019).

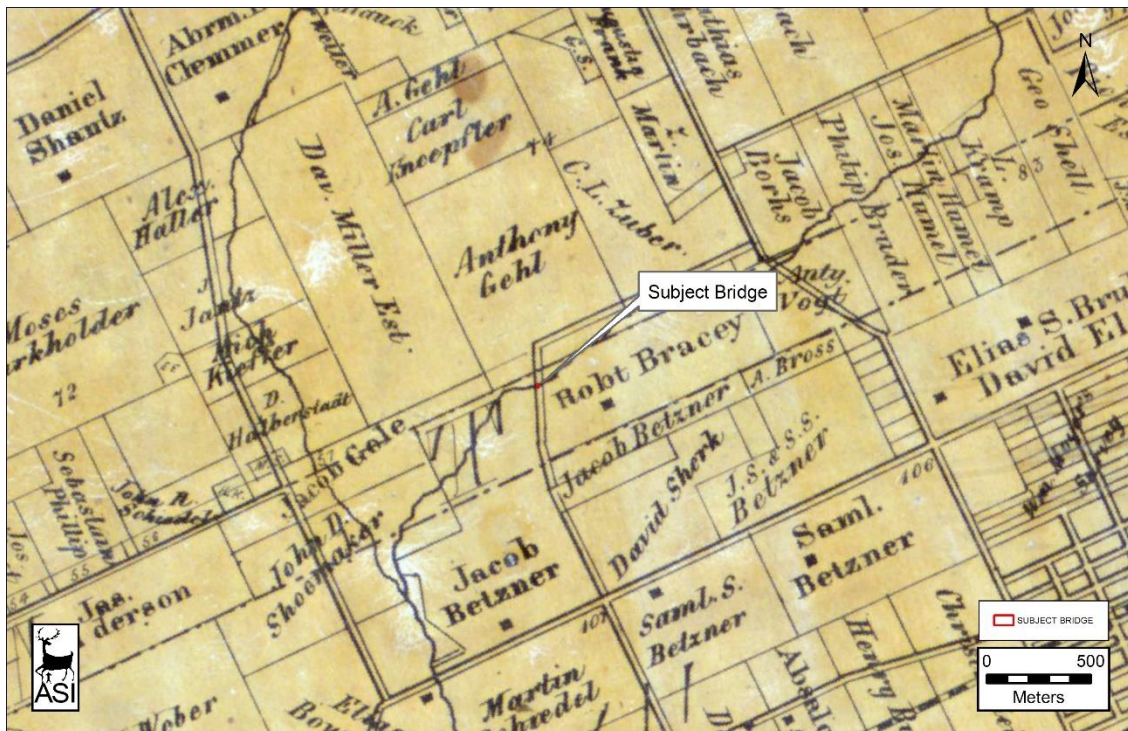


Figure 3: Location of Structure 400172 overlaid on the 1861 map of the Township of Woolwich
Source: *Tremaine's Map of Waterloo County 1861*



Figure 4: Structure 400172 overlaid on the 1881 Township of Waterloo

Source: H. Parsell & Co. 1881



Figure 5: Structure 400172 overlaid on 1930 aerial photography

Source: Digital Historical Air Photos of Waterloo Township (Accessed online at <http://www.lib.uwaterloo.ca/locations/umd/project/IME21.html>)

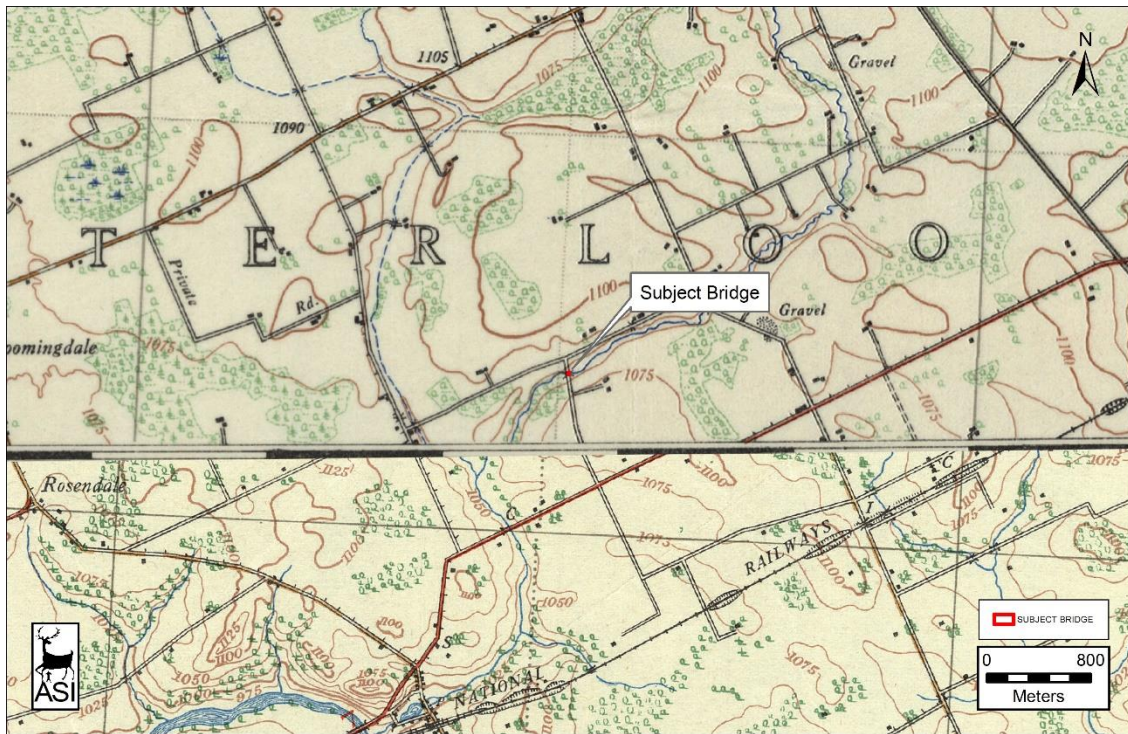


Figure 6: Structure 400172 overlaid on 1935 NTS mapping

Source: Department of National Defence 1935



Figure 7: Structure 400172 overlaid on 1963 aerial photography

Source: Digital Historical Air Photos of Waterloo Township (Accessed online at <http://www.lib.uwaterloo.ca/locations/umd/project/IME21.html>)

3.3.2 Previous Bridge Crossings

Structure 400172 is located on Greenhouse Road, historically in Woolwich Township, County of Waterloo. The bridge on Greenhouse Road is 125m south of Township Road 68 (Hopewell Creek Road), north-east of the Town of Breslau. This bridge was built to carry Greenhouse Road over Hopewell Creek, a minor tributary of the Grand River. The *Spanning the Generations: Phase 1 Inventory* (PHCS 2004) refers to Structure 400172 as Beitz' Bridge, a concrete T-beam and slab bridge that was built in 1919. A review of historic mapping and archival records indicates that a previous bridge was built at this site to assist the mid-nineteenth century transportation route cross the creek, and is drawn as a significant waterway in the nineteenth century. No other information regarding previous crossings at this site could be collected during the course of background historical research.

3.4 Structure 400172 Construction

3.4.1 Early Bridge Building in Ontario

Bridges were a necessity from the earliest days of road construction, and were important to economic and social life, especially as mills were situated along the rivers. Crossing rivers by bridge was easier than fording. Settlements sprang up where the mills were serviced by bridges. Construction of the railway in the 1850s made it necessary to have reliable bridges able to withstand the weight of locomotives. In addition, good road bridges were required so farmers could transport their produce to local railway stations (PHCS 2004b). Most road bridge designs that evolved were based on principles derived from railroad construction. In Ontario, the timber bridge dominated the landscape in rural areas from 1780 to 1880, and persisted into the early twentieth century (Cuming 1983: 38).

Most nineteenth century bridges in southern Ontario were built of timber. Short spans were beam structures, and longer spans employed simple trusses, such as King and Queen Post trusses. Stone and wrought iron materials were also employed, but due to higher costs and a lack of skilled craftsmen such structures were generally restricted to market towns. By the 1890s, steel and concrete were becoming the materials of choice when constructing bridges given that both were less expensive and more durable than their wood and wrought iron predecessors (Ministry of Culture and Ministry of Transportation [n.d.]:7-8). Steel truss structures were very common by 1900, as were steel girder bridges. After World War I the increase in personal vehicles meant that stronger bridges were necessary. The Pratt truss and the Warren truss dominated the early twentieth century, and were typically used for spans up to 400 feet (Comp and Jackson 1977).

The use of concrete in bridge construction was introduced at the beginning of the twentieth century, and by the 1930s, it was challenging steel as the primary bridge construction material in Ontario (Ministry of Culture and Ministry of Transportation [n.d.]:8). The rigid frame concrete bridge style was introduced in 1931 and gained favour for use as a highway overpass (Ministry of Culture and Ministry of Transportation [n.d.]:8). Some of the stronger concrete bridges constructed in the 1930s formed part of the "Depression Era" Public Works Program that created work for the unemployed (PHCS 2004b). In the post war period the trend was toward pre-casting concrete components off-site rather than pouring the concrete in place (Ministry of Culture and Ministry of Transportation [n.d.]:9). Today, concrete is the

primary bridge building material on Ontario roads (Ministry of Culture and Ministry of Transportation [n.d.]:8).

3.4.2 History of T-Beam Bridges

In North America, the first reference to a T-beam bridge in the early twentieth century is attributed to Henry Grattan Tyrrell, a graduate of the University of Toronto, in his book *Concrete Bridges and Culverts* (Tyrrell 1909). Reinforced concrete T-beam construction was in widespread use across the United States by 1920 and was a recommended standard design by the United States Bureau of Public Roads at that time (Ketchum 1920). The construction of reinforced concrete T-beam bridges tapered off in the early 1960s. Reinforcing concrete was typically introduced by laying steel rods or mesh in the formwork before pouring the wet concrete, creating a tension frame with the concrete to eliminate fractures (Chase 2015). This type appeared at the same time as flat slab span, but was more economical for longer lengths. The top of the T-beam constitutes the slab, the bottom of the T-beam (the stem) appears like a girder when viewed from the side elevation. A review of the provincial bridge inventory maintained by the MTO confirms that T-Beam bridges began to appear on Ontario roads prior to 1920 as well.

3.4.2 Construction of Structure 400172

Structure 400172, also referred to as Beitz' Bridge, is a single-span cast-in-place concrete T-beam and slab bridge carrying one lane of Greenhouse Road over an unnamed tributary of the Grand River. According to the *Ontario Structure Inspection Manual- Inspection Form* for Structure 400172 in 2017, the subject bridge was built in 1919. The *Inspection Form* states that the bridge has a total deck length of 7.3m, a roadway width of 4.4m, and an overall structure width of 4.9m (Appendix B). The *Spanning the Generations: Phase 1 Inventory* of the Region of Waterloo bridges documents this bridge as a concrete T-beam and slab type, referring to it as representing "the next evolution in bridge technology" (PHCS 2004:1.23). To construct this bridge, concrete was poured into T-shaped wooden scaffolding. The wood formwork was then removed, and the T-beams were joined to form the deck. The "T" joints and wooden 2X4 marks are visible from underneath the deck of Structure 400172 (PHCS 2004:1.23-1.24). Correspondence with the Beitz family indicated a member of the family helped pour the concrete for the bridge. No further documentation on the construction of this structure, including original structural drawings, were available at the time of report preparation.

4.0 EXISTING CONDITIONS AND INTEGRITY

A field review was undertaken by Victoria Mance, Cultural Heritage Assistant, ASI, on 02 November 2019 to conduct photographic documentation of the bridge crossing from the exiting right-of-way and to collect data relevant for completing a heritage evaluation of the structure. Results of the field review and bridge inspection reports received from the client were then utilized to describe the existing conditions of the bridge crossing. This section provides a general description of the bridge and associated cultural heritage features. The bridge is considered to have a north-south orientation. Photographic documentation of the structure is provided in Appendix A.



The bridge located on Greenhouse Road is surrounded by open agricultural fields. Structure 400172 is roughly 125m south of Hopewell Creek Road. The bridge crosses Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River. When approaching the bridge there are hazard markers indicating a narrow bridge on all sides. There are two load limit signs.

The superstructure of Structure 400172 is described as a single span cast-in-place concrete T-beam and slab. The deck structure consists of a cast-in-place concrete slab with a gravel wearing surface. There are no visible deck drains. The deck slab is integrated with and supported by longitudinal T-beams. The transverse diaphragms (distributor beams) were cast-in-place along with the deck structure, thus forming a monolithic deck system. This gives the bridge a final appearance of a girder bridge when viewed from underneath or from a side elevation.

The abutments are cast-in-place concrete and form the legs of the deck system. The abutments sit on the bridge foundation which is not visible from the right-of-way. The bridge includes its original barrier system consisting of cast-in-place concrete parapet walls without railings. The solid barriers have been embossed to add a decorative element.

Structure 400172 (Beitz' Bridge) has been identified by the Region of Waterloo as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* (PHCS 2004), an inventory and heritage assessment of bridges within the Waterloo Region. It is not listed on the Municipal Register or designated under Part IV of the *Ontario Heritage Act*, nor is it identified as a heritage bridge on the *Ontario Heritage Bridge List*. The bridge was also identified as a non-heritage bridge on the Grand River Watershed Heritage Bridge Inventory (Benjamin *et al.* 2013).

According to the available reference documents, no rehabilitation has been undertaken on the subject bridge. A telephone conversation with the Beitz family, who occupy the farm to the southeast of the bridge, reported that the bridge was hit by a farm machine which resulted in the cracked barrier (personal communication 07 November 2019).

Structure 400172 is currently owned and maintained by Woolwich Township. According to an inspection undertaken in 2017, the bridge carries one lane of motor traffic across an unnamed tributary of the Grand River with a total crossing length of 7.3m. The deck has a travel width of 4.4 with an overall structure width of 4.9m. The Ontario Structure Inspection Manual (OSIM) Inspection Form indicates the posted speed limit is 80km/hr and a current load limit of 14 tonnes (Ontario Structure Inspection Manual- Inspection Form 2017:1). The OSIM Inspection Form completed by GM BluePlan recommended replacement for consideration and that maintenance was required. The following deficiencies were documented in 2017 (GM BluePlan 2017):

- Cast-in-place concrete abutment wingwalls and walls- severe delamination, spalling and disintegration, severe erosion at waterline
- Cast-in-place parapet wall without railing- vertical crack, medium to severe scaling, abrasions
- Cast-in-place diaphragms beams- severe honeycombing with delamination and spalling
- Cast-in-place T-Type girders- severe delamination with wide cracks at girder ends
- Cast-in-place soffit (thin slab exterior and interior)- medium scaling

- Foundations (below ground level)- top of footings exposed, assumed poor condition based on abutment condition

In addition, the bridge is not adjacent to a listed or designated heritage property on the Woolwich Township Municipal Heritage Register.

4.1 Comparative Geographic and Historic Context of Bridges in the Region of Waterloo and in Ontario

According to the *Grand River Watershed Heritage Bridge Inventory* (Benjamin *et al.* 2013), the simple concrete slab was favourable in the early twentieth century. Despite the widespread use of T-beam structures in the United States from the 1920s to the 1960s, there was a limited use of this type in Ontario (Benjamin *et al.* 2013). Around 1930 the rigid frame concrete bridge was introduced is a common bridge design still seen today (Benjamin *et al.* 2013:7). The *Grand River Watershed Heritage Bridge Inventory* documents 678 heritage bridges and of that, seven percent, or roughly 47 heritage bridges, were identified as T-beam. However, Structure 400172, Beitz' Bridge, is listed on the *Grand River Watershed Heritage Bridge Inventory* as a non-heritage bridge.

The Woolwich Structure Inventory indicates that there are two concrete T-beam and slab type bridges in Woolwich Township; the subject bridge and Structure 370143 (Martin Groove Road) built in 1935. Commonly called Martin's Bridge, it is a later example of a single span cast-in-place bridge. It is documented as constructed similar to Beitz' Bridge (PSCH 2004).

According to the *Spanning the Generations: Phase 1 Inventory of bridges within the Waterloo Region*, which includes Woolwich Township, there are a total of six classified "T-beam and slab concrete" bridges in the Region (PHCS 2004). Structure 400172, Beitz' Bridge, belongs to this group. The other T-beam and slab concrete bridges include:

- Martin's Bridge, built in 1935;
- Lot 69 German Company Tract Bridge, built in 1919;
- Floradale Road Bridge, built in 1930;
- King Street Mill Race Bridge, built in 1930; and
- Park Hill Road Bridge, built in 1930.

The *Spanning the Generations: Phase 1 Inventory* refers to Lot 69 German Company Tract Bridge (Structure 250146) in Woolwich Township as similar in comparison to Beitz' Bridge, and notably built the same year. However, the inventory notes that the concrete barrier walls of the Lot 69 German Company Tract bridge had been replaced with a latticed steel barrier (PHCS 2004:1.25). The Township of Woolwich Structure Inventory indicates that the bridge was entirely replaced in 2016.

In summary, Structure 400172 is 100 years old and represents the earliest example of a T-beam and slab type bridge in Woolwich Township and is one of six of its type considered heritage bridges in Waterloo Region. The structure is also an early example of its type for Ontario.

5.0 HERITAGE EVALUATION OF STRUCTURE 400172

Table 2 contains the evaluation of Structure 400172 against criteria as set out in Ontario Regulation 9/06. Within the Municipal EA process, Ontario Regulation 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 2: Evaluation of Structure 400172 using Ontario Regulation 9/06

1. The property has design value or physical value because it:

<i>Ontario Heritage Act</i> Criteria	Yes/No	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	Yes	The subject bridge meets this criterion. Structure 400172, built in 1919, is a cast-in-place concrete T-beam and slab type bridge. It is a single-lane one-span bridge with a solid concrete parapet barrier situated in a rural setting over Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River. According to available documentation, it is the earliest example of a cast-in-place concrete T-beam and slab bridge design in Waterloo Region. Given its early construction date even for Ontario, this bridge may be considered experimental in design and therefore, this structure contributes to the understanding of bridge development in the Region.
ii. displays a high degree of craftsmanship or artistic merit, or;	No	Structure 400172 does not display a high degree of craftsmanship or artistic merit. The subject bridge does not meet this criterion.
iii. demonstrates a high degree of technical or scientific achievement.	No	Structure 400172 does not demonstrate a high degree of technical achievement or scientific achievement. The subject bridge does not meet this criterion.

2. The property has historical value or associative value because it:

<i>Ontario Heritage Act</i> Criteria	Yes/No	Analysis
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	No	This bridge is not considered to have direct association with a theme, event, belief, person, activity, organization or institution that is significant to a community. The subject bridge does not meet this criterion.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	No	This bridge is not considered to have the potential to yield information that contributes to an understanding of a community or culture. The subject bridge does not meet this criterion.

Table 2: Evaluation of Structure 400172 using Ontario Regulation 9/06

iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	No	This bridge is not known to represent the work or ideas of a particular architect or building significant to the community. The subject bridge does not meet this criterion.
3. The property has contextual value because it:		
<i>Ontario Heritage Act</i> Criteria	Yes/No	Analysis
i. is important in defining, maintaining or supporting the character of an area;	No	Structure 400172 is almost invisible in the landscape apart from its barriers. Therefore, it is not significantly important in defining, maintaining, or supporting the character of the area. The subject bridge does not meet this criterion.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	Yes	Structure 400172 is historically linked with its surrounding context specifically to the Beitz family after whom the bridge is commonly named- Beitz' Bridge. The Beitz family farm, located directly adjacent to the southeast of the bridge, has been occupied by the family for over 100 years. A member of the Beitz family helped construct the bridge. Therefore, Structure 400172 is considered physically, functionally, visually and historically linked to its surroundings.
iii. is a landmark.	No	Due to the small scale of Structure 400172, the bridge does not serve as a landmark feature. The subject bridge does not meet this criterion.

The above evaluation confirms that Structure 400172 meets two of the criteria set out in Regulation 9/06 of the *Ontario Heritage Act*. Given that Structure 400172 meets at least one of the criteria, this structure is considered to be a cultural heritage resource and is eligible for designation under the *Ontario Heritage Act*.

5.1 Draft Statement of Cultural Heritage Value

5.1.1 Description of Property

Name: Structure 400172

Alternate Name: Beitz' Bridge

Structure 400172 is located on Greenhouse Road, 125m south of Hopewell Creek Road, in Regional Municipality of Waterloo, near the community of Breslau. Constructed in 1919, Structure 400172 is a single-lane single-span cast-in-place concrete T-beam and slab bridge.

The bridge carries Greenhouse Road across Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River.

5.1.2 Cultural Heritage Value or Interest

Structure 400172 was built in 1919 of concrete and is one of six classified as cast-in-place concrete T-beam and slab bridges located in Waterloo Region and one of two of this type in Woolwich Township. Structure 400172 is the earliest bridge of this type in the Region. Given its early construction date even for Ontario, this bridge may be considered experimental in design.

This concrete T-beam and slab bridge is the earliest documented example in Waterloo Region of a less common bridge design built from the 1920s to 1950s in Ontario. The abutments and deck are one unit cast-in-place, a design that were used on small bridges in the mid-twentieth century. It is a single-lane one-span bridge with a solid concrete parapet barrier situated along a historic transportation route in a rural setting over Hopewell Creek, a minor tributary of the Grand River. As an early example of this bridge type, this structure contributes to the understanding of bridge development in Waterloo Region.

The common name for the bridge, Beitz' Bridge, is referenced to a Mennonite family, the Beitz family, who have farmed in proximity to the bridge for over 100 years. A member of the Beitz family, Henry, helped to build the bridge.

5.1.3 Heritage Attributes

Heritage attributes associated with Structure 400172 include but are not limited to:

- single-lane construction;
- cast-in-place concrete T-beam and slab construction; and
- cast-in-place concrete parapet barrier system.

6.0 CONCLUSIONS

Structure 400172 is 100 years old and in accordance with the Ministry of Heritage, Tourism, Sport and Cultural Industries policy the bridge may have cultural heritage value given its age. Therefore, a Cultural Heritage Evaluation report by a qualified heritage consultant was required.

As a result of this study, Structure 400172 retains heritage value when evaluated using Ontario Regulation 9/06 of the *Ontario Heritage Act*. It is determined that Structure 400172 is the earliest example of a cast-in-place concrete T-beam and slab bridge in Waterloo Region. It is a single-lane one-span bridge with a simple solid concrete parapet barrier along a historic transportation route in a rural setting over Hopewell Creek, a minor tributary of the Grand River.

7.0 RECOMMENDATIONS

Given the identified cultural heritage value of Structure 400172, the following recommendations should be considered:



1. A Heritage Impact Assessment should be completed for Structure 400172.
2. This report should be submitted to heritage staff at the Region of Waterloo, Woolwich Heritage Committee, and with the Ministry of Heritage, Sport, Tourism, and Culture Industries (formerly the Ministry of Tourism, Culture, and Sport) for review.

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APPENDIX A: Photographic Plates



Plate 1: Distant view of Structure 400172 from Greenhouse Road, looking south. Note the Beitz family farm in the background.



Plate 2: View of Structure 400172, looking southwest.



Plate 3: View of Structure 400172, looking south along Greenhouse Road.



Plate 4: View of the east parapet barrier.



Plate 5: Oblique view of the bridge from the northeast quadrant.



Plate 6: Close-up of the west parapet barrier. Note the crack due to the damage caused by the farm machine.



Plate 7: East parapet barrier.



Plate 8: East parapet barrier looking east.



Plate 9: Hopewell
Creek, looking
east.



Plate 10:
Underside view of
bridge- north
girder end. Note
the "T" joints and
2x4 marks visible
under the deck.

Photograph
courtesy of GM
BluePlan (2017).

APPENDIX B: OSIM Inspection Form, 2017



SUMMARY ACTION REPORT

Bridge 400172

Structure: 400172

Greenhouse Road

125m south of Hopewell Creek Road

Bridge Condition Index (BCI): 39

Current Load Limit (t): 14

Inspection Date: 7/20/2017

Next Inspection: 7/12/2019



Overall Comments

Structure is overall in poor condition. Replacement should be considered. Maintenance work required.

Repair / Rehabilitation

Recommended Work	Recommended Timing	Total Recommended & Associated Work Cost
Replace	1-5yr	\$620,000

Additional Investigations

None

Maintenance Needs

<u>Element</u>	<u>Need</u>	<u>Priority</u>	<u>Description</u>
Decks - Wearing Surface	Other		Regrade road
Embankments & Streams - Embankments			Tree/vegetation trimming

DRAFT

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Inventory Data:

Structure Name	Bridge 400172		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Nav Water <input type="checkbox"/> Non Nav Water <input checked="" type="checkbox"/>
Hwy/Road Name	Greenhouse Road	Rail <input type="checkbox"/> Road <input type="checkbox"/> Ped <input type="checkbox"/> Other <input type="checkbox"/>	
Structure Location	125m south of Hopewell Creek Road		
Latitude (decimal degrees)	43.50495	Longitude (decimal degrees)	-80.40431
Owner(s)	Township of Woolwich	Heritage:	Not Cons <input checked="" type="checkbox"/> Cons Not/App <input type="checkbox"/> List/Not Desig <input type="checkbox"/>
Region	Southwestern	Designation:	Desig Not List <input type="checkbox"/> Desig List <input type="checkbox"/>
District	London/Stratford	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
Old County	Waterloo	No. of Lanes	1 Posted Speed <input type="text"/> 80 (km/h)
Geographic Twp	Woolwich	AADT	32 Trucks <input type="text"/> 0 (%)
Structure Type	T-Beam		
Total Deck Length	7.3 (m)		
Overall Str Width	4.9 (m)		
Total Deck Area	35.77 (sq m)	Min. Vertical Clearance	<input type="text"/> (m)
Roadway Width	4.4	Special Routes:	Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input type="checkbox"/>
Skew Angle	0 (deg)	Detour Length	<input type="text"/> (km)
No. of Spans	1	Direction of Structure	North/South
Span Lengths	6.1 (m)	Fill on Structure	<input type="text"/> 0 (m)

Historical Data:

Year Built	1919	Year of Last Rehab	<input type="text"/>
Last OSIM Inspection	8/12/2015	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	14 (tonnes)
Enhanced Access Equipment (ladder, boat, lift, etc)	<input type="text"/>	Load Limit By Law	<input type="text"/>
		By Law expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>	Last underwater Inspection	<input type="text"/>

Rehabilitation History:

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Field Inspection Information:

Date of Inspection: (mm/dd/yyyy)	07/20/2017	Inspection Type:	OSIM
Inspector:	BG		
Others in Party:	SG		
Equipment Used:	Measuring tape, hammer, camera		
Weather:	Overcast		
Temperature °C:	25		

Additional Investigations Required:

	Priority			Estimated Cost
	None	Normal	Urgent	
Detailed Deck Condition Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Non-destructive Delam. Survey of Asphalt-Covered Deck	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Concrete Substructure Condition Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Coating Condition Survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Detailed Timber Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Post-Tensioned Strand Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Underwater Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Fatigue Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Seismic Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Structure Investigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring Deformations, Settlements, Movements	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Monitoring Crack Widths	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$0
Total Cost:				\$0

Investigation Notes:

Overall Structure Notes:

Overall Comments:	Structure is overall in poor condition. Replacement should be considered. Maintenance work required.		
Recommended Work:	Replace		
Next Inspection:	07/12/2019	Recommended Work Time:	1-5yr

Suspected Performance Deficiencies

- 00 None
- 01 Load carrying capacity
- 02 Excessive deformations (deflections & rotations)
- 03 Continuing settlement
- 04 Continuing movements
- 05 Seized bearings

- 06 Bearing not uniformly loaded/unstable
- 07 Jammed expansion joint
- 08 Pedestrian/vehicular hazard
- 09 Rough riding surface
- 10 Surface ponding
- 11 Deck drainage

- 12 Slippery surface
- 13 Flooding/channel blockage
- 14 Undermining of foundation
- 15 Unstable embankments
- 16 Other

Maintenance Needs

- 01 Lift & Swing Bridge Maintenance
- 02 Bridge Cleaning
- 03 Bridge Handrail Maintenance
- 04 Painting Steel Bridge Structures
- 05 Bridge Deck Joint Repair
- 06 Bridge Bearing Maintenance

- 07 Repair to Structural Steel
- 08 Repair to Bridge Concrete
- 09 Repair to Bridge Timber
- 10 Bailey Bridges - Maintenance
- 11 Animal/Pest Control
- 12 Bridge Surface Repair

- 13 Erosion Control at Bridges
- 14 Concrete Sealing
- 15 Rout and Seal
- 16 Bridge Deck Drainage

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Data:

Element Group:	Abutments	Length:	0.00
Element Name:	Abutment Walls	Width:	4.95
Location:	Each end	Height:	1.65
Material:	Cast-in-Place Concrete	Count:	2.0
Element Type:	Conventional Closed	Total Quantity:	16.3
Environment:	Benign	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	0.0	7.1	9.2	

Comments: Severe honeycombing; Severe erosion of north wall at waterlevel; Severe delamination; Light to medium scaling throughout

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Abutments	Length:	2.30
Element Name:	Wingwalls	Width:	0.00
Location:	All corners	Height:	2.20
Material:	Cast-in-Place Concrete	Count:	2.0
Element Type:	Reinforced Concrete	Total Quantity:	10.1
Environment:	Benign	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	0.0	3.9	6.2	

Comments: Severe delamination, spalling and disintegration; Severe erosion at waterline

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Accessories	Length:	0.00
Element Name:	Signs	Width:	0.00
Location:		Height:	0.00
Material:	Steel	Count:	6.0
Element Type:	-	Total Quantity:	6.0
Environment:		Limited Inspection	<input type="checkbox"/>
Protection System:			

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	Each	0.0	2.0	0.0	4.0	

Comments: 4 hazard markers, 2 load limit signs

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Accessories	Length:	0.00
Element Name:	Utilities	Width:	0.00
Location:	West face	Height:	0.00
Material:		Count:	1.0
Element Type:	-	Total Quantity:	1.0
Environment:		Limited Inspection	<input type="checkbox"/>
Protection System:			

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	Each	0.0	1.0	0.0	0.0	

Comments:

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Approaches	Length:	6.00
Element Name:	Wearing Surface	Width:	4.40
Location:	Each end	Height:	0.00
Material:	Gravel	Count:	2.0
Element Type:	-	Total Quantity:	52.8
Environment:	Severe	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	52.8	0.0	0.0	

Comments:

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Barriers	Length:	6.10
Element Name:	Barrier/Parapet Walls	Width:	0.25
Location:	Interior	Height:	1.05
Material:	Cast-in-Place Concrete	Count:	2.0
Element Type:	Parapet Wall without Railing	Total Quantity:	15.9
Environment:	Severe	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	9.4	3.6	2.9	

Comments: Wide vertical crack at SW; 1.5m section @ SW has failed, but remains in place; Medium to severe scaling; Abrasions

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Barriers	Length:	6.10
Element Name:	Barrier/Parapet Walls	Width:	0.00
Location:	Exterior	Height:	1.05
Material:	Cast-in-Place Concrete	Count:	2.0
Element Type:	Parapet Wall without Railing	Total Quantity:	12.8
Environment:	Moderate	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	7.3	3.0	2.5	

Comments: Light to medium scaling; Failed section at SW

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Beams	Length:	1.20
Element Name:	Diaphragms	Width:	0.20
Location:	Each end	Height:	0.45
Material:	Cast-in-Place Concrete	Count:	6.0
Element Type:	Rectangular-solid	Total Quantity:	7.9
Environment:	Benign	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	3.6	3.9	0.4	

Comments: Severe honeycombing with delamination and spalling

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Beams	Length:	6.10
Element Name:	Girders	Width:	0.35
Location:	All	Height:	0.45
Material:	Cast-in-Place Concrete	Count:	4.0
Element Type:	T-Type	Total Quantity:	30.5
Environment:	Moderate	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	17.7	7.0	5.8	

Comments: Severe delamination with wide cracks at girder ends

Recommended Work:	Replace	Maint. Needs:		Maint. Priority:	
Recommended Timing:	1-5 Years	Maint. Desc.:			
Work Details:	Replace structure				

Element Group:	Decks	Length:	7.30
Element Name:	Deck Top	Width:	4.40
Location:		Height:	0.00
Material:	Cast-in-Place Concrete	Count:	1.0
Element Type:	-	Total Quantity:	32.1
Environment:	Moderate	Limited Inspection	<input checked="" type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	0.0	32.1	0.0	

Comments: Not visible; Assumed in fair condition based on age of structure

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Decks	Length:	6.10
Element Name:	Soffit - Thin Slab	Width:	0.00
Location:	Exterior	Height:	0.20
Material:	Cast-in-Place Concrete	Count:	2.0
Element Type:	-	Total Quantity:	2.4
Environment:	Moderate	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	0.0	2.4	0.0	

Comments: Medium scaling throughout

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Decks	Length:	6.10
Element Name:	Soffit - Thin Slab	Width:	3.55
Location:	Interior	Height:	0.00
Material:	Cast-in-Place Concrete	Count:	1.0
Element Type:	-	Total Quantity:	21.7
Environment:	Benign	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	10.9	10.8	0.0	

Comments: Light to medium scaling

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Decks	Length:	7.30
Element Name:	Wearing Surface	Width:	4.40
Location:		Height:	0.00
Material:	Gravel	Count:	1.0
Element Type:	-	Total Quantity:	32.1
Environment:	Severe	Limited Inspection	<input type="checkbox"/>
Protection System:	None		

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	sq.m.	0.0	29.1	0.0	3.0	

Comments: Medium potholes

Recommended Work:		Maint. Needs:	17	Maint. Priority:	
Recommended Timing:		Maint. Desc.:	Regrade road		
Work Details:					

Element Group:	Embankments & Streams	Length:	0.00
Element Name:	Embankments	Width:	0.00
Location:	All corners	Height:	0.00
Material:		Count:	4.0
Element Type:	-	Total Quantity:	4.0
Environment:	Benign	Limited Inspection	<input type="checkbox"/>
Protection System:			

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	Each	0.0	0.0	4.0	0.0	

Comments: Very steep and heavily vegetated; Trees obstructing signs

Recommended Work:		Maint. Needs:	17	Maint. Priority:	
Recommended Timing:		Maint. Desc.:	Tree/vegetation trimming		
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Element Group:	Embankments & Streams	Length:	0.00
Element Name:	Streams and Waterways	Width:	0.00
Location:		Height:	0.00
Material:		Count:	1.0
Element Type:	-	Total Quantity:	1.0
Environment:		Limited Inspection	<input type="checkbox"/>
Protection System:			

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
	All	0.0	1.0	0.0	0.0	

Comments: stream wider than structure

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Element Group:	Foundations	Length:	0.00
Element Name:	Foundation (below ground level)	Width:	0.00
Location:	All	Height:	0.00
Material:		Count:	0.0
Element Type:	-	Total Quantity:	0.0
Environment:		Limited Inspection	<input checked="" type="checkbox"/>
Protection System:			

Condition Data:	Units:	Exc.	Good:	Fair:	Poor:	Performance Deficiencies:
		0.0	0.0	0.0	0.0	

Comments: Top of footings exposed; Assumed poor condition based on abutment condition and structure age

Recommended Work:		Maint. Needs:		Maint. Priority:	
Recommended Timing:		Maint. Desc.:			
Work Details:					

Ontario Structure Inspection Manual - Inspection Form

Site Number: 400172

Structure Name: Bridge 400172

Structure ID: 400172

Repair / Rehabilitation Required

<u>Element Group</u>	<u>Element</u>	<u>Repair / Rehabilitation</u>	<u>Priority</u>	<u>Const Cost</u>
Beams	Girders	Replace structure	1-5 Years	\$470,000

Total Repair/Rehabilitation Cost \$470,000

Associated Work

	<u>Comments</u>	<u>Estimated Cost</u>
Approaches		\$0
Detours		\$0
Traffic Control		\$0
Utilities		\$0
Right-of-Way		\$0
Environmental Study	<i>Environmental Assessment</i>	\$30,000
Other		\$0

Contingencies	\$50,000
Engineering	\$70,000
Total Associated Work Cost	\$150,000
Total Repair / Rehabilitation Cost	\$470,000
Total Cost	\$620,000

Justification

DRAFT

Inspection Photos



West elevation



Plan view, looking north



Wearing surface



East barrier



West barrier



West face



Southwest wingwall



Exterior girder



North abutment



South abutment



North girder end



Northeast wingwall

**VOLUME 2: HERITAGE IMPACT ASSESSMENT
STRUCTURE 400172 (BEITZ' BRIDGE)**

**GREENHOUSE ROAD
GEOGRAPHIC TOWNSHIP OF WATERLOO
WATERLOO COUNTY
REGIONAL MUNICIPALITY OF WATERLOO, ONTARIO**

DRAFT REPORT

Prepared for:

GM BluePlan Engineering Limited
650 Woodlawn Road West
Guelph, ON N1K 1B8

ASI File: 19CH-153

March 2020 (Revised November 2020)



**VOLUME 2: HERITAGE IMPACT ASSESSMENT
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WATERLOO COUNTY
REGIONAL MUNICIPALITY OF WATERLOO, ONTARIO**

EXECUTIVE SUMMARY

ASI was contracted by GM BluePlan Engineering Limited to conduct a cultural heritage evaluation and heritage impact assessment of Structure 400172 (also known as Beitz' Bridge) to determine if future work for the bridge falls under Schedule A, A+, or B definitions of the Municipal Class Environmental Assessment Act. The study is a part of the Woolwich Township 2019 Bridge and Culvert Program. A preliminary draft of this report, Volume 2, provided the preliminary Heritage Impact Assessment (HIA) that was used to provide context for the evaluation of project alternatives. Following the selection of the preferred alternative in October 2020 (complete removal and replacement of the subject bridge), this report was updated to assess the specific impacts of the preferred alternative on the identified heritage attribute of the subject bridge. Volume 1 provides the Cultural Heritage Evaluation Report (CHER) as a separate, stand-alone report. The subject bridge is located over Hopewell Creek on Greenhouse Road in the Township of Woolwich, Regional Municipality of Waterloo.

Volume 1 of this report determined that Structure 400172 retains cultural heritage value following the application of O. Reg. 9/06 of the *Ontario Heritage Act*. In particular, Structure 400172 is the earliest example of a cast-in-place T-beam and slab bridge type in the Region of Waterloo. It is a single-lane one-span bridge with a solid parapet concrete barrier along a historic transportation route in a rural setting over a minor tributary of the Grand River. Given that it meets O. Reg. 9/06, the Draft Statement of Cultural Heritage Value or Interest and the list of heritage attributes prepared during the CHER have been included in this report.

Given the identified cultural heritage value of Structure 400172 and the preferred option being carried forward as part of the Environmental Assessment involving the complete removal of the subject bridge and replacement with a single-span concrete structure, the following recommendations and mitigation measures should be considered and implemented:

1. Where feasible, the preferred alternative should be selected to ensure the fewest direct and permanent impacts to the identified heritage attributes of the subject bridge. As the retention of the subject bridge following rehabilitation was demonstrated to be unviable, the replacement of the subject bridge with a sympathetically designed replacement structure should be

considered. The historical and contextual associations of the subject bridge as a crossing over Hopewell Creek would be maintained in a sympathetically designed replacement structure.

2. According to available documentation, the replacement bridge is anticipated to be a single span concrete rigid frame structure with increased hydraulic capacity and increased road width to meet drainage and traffic requirements in the area. While removal of the existing structure would significantly impact the identified heritage attributes, the use of a concrete replacement structure with a similar scale is considered to be a suitable means of reducing the impacts to the historical and contextual value of the crossing if sympathetic design elements are employed.
3. Where feasible, the replacement structure should be designed in a manner that incorporates physical aesthetic elements that are sympathetic with the original 1919 structure. Consideration should be given to incorporating a solid parapet concrete wall with decorative rectangular elements at deck level, where feasible, as a means of reducing the visual impacts of the replacement structure.
4. Prior to modifications of the subject bridge, the following mitigation measures should be considered and implemented, where feasible :
 - a. The bridge and setting should be documented prior to construction. The CHER (ASI 2019) provides detailed photographic documentation and a clear description of the structure and its setting. The CHER and this HIA completed for the Structure 400172 is considered to be sufficient documentation;
 - b. Salvaged elements of the superstructure should be retained for inclusion in a new structure at another crossing, in future conservation work, or for commemorative displays, where feasible; and
 - c. Consideration should be given to a commemorative strategy, such as developing a plaque in the location of the bridge. In this respect, an interpretive historical plaque/commemoration plan could be prepared including historical information, images and featuring salvaged heritage components from the subject bridge, where feasible. Heritage staff at the Woolwich Heritage Committee should be consulted for input regarding this commemoration.
5. This report should be filed with heritage staff at the Region of Waterloo, Woolwich Heritage Committee, and with the Ministry of Heritage, Sport, Tourism, and Culture Industries for review.

PROJECT PERSONNEL

<i>Senior Project Manager:</i>	Annie Veilleux, MA, CAHP <i>Senior Cultural Heritage Specialist Manager, Cultural Heritage Division</i>
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TABLE OF CONTENTS

EXECUTIVE SUMMARY	ii
PROJECT PERSONNEL.....	iii
TABLE OF CONTENTS	iv
1.0 INTRODUCTION	1
1.1 Description of Property	4
1.1.1 Adjacent Cultural Heritage Resources	4
2.0 STATEMENT OF CULTURAL HERITAGE VALUE	5
2.1 Description of Property	5
2.2 Cultural Heritage Value or Interest.....	5
2.3 Heritage Attributes	5
3.0 ASSESSMENT OF EXISTING CONDITIONS.....	7
4.0 DESCRIPTION AND PURPOSE OF PROPOSED ACTIVITY	8
5.0 IMPACT ASSESSMENT AND ALTERNATIVES CONSIDERED	10
6.0 COMMUNITY ENGAGEMENT	13
7.0 CONCLUSIONS AND RECOMMENDATIONS	13
7.1 Mitigation Measures and Recommendations.....	14
8.0 REFERENCES	16

LIST OF FIGURES

Figure 1: Location of the study area (outlined in red).....	2
Figure 2: Photograph of the West Elevation of Structure 400172 ("Beitz' Bridge), ca. 2017	2
Figure 3: Location of the subject bridge	6
Figure 4: Structure 400172 Replacement, General Arrangement Drawing.....	9

LIST OF TABLES

Table 1: Evaluation of the Potential Impacts of Bridge Improvement Alternatives on the Cultural Heritage Resource and Identified Heritage Attributes	11
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1.0 INTRODUCTION

ASI was contracted by GM BluePlan Engineering Limited to conduct a cultural heritage evaluation and heritage impact assessment of Structure 400172 (also known as Beitz' Bridge) to determine if future work for the bridge falls under Schedule A, A+, or B definitions of the Municipal Class Environmental Assessment Act. The study is part of the Woolwich Township 2019 Bridge and Culvert Program. A preliminary draft of this report, Volume 2, provided the preliminary Heritage Impact Assessment (HIA) that was used to provide context for the evaluation of project alternatives. Following the selection of the preferred alternative in October 2020 (complete removal and replacement of the subject bridge), this report was updated to assess the specific impacts of the preferred alternative on the identified heritage attribute of the subject bridge. Volume 1 provides the Cultural Heritage Evaluation Report (CHER) as a separate, stand-alone report. The subject bridge is located over Hopewell Creek on Greenhouse Road in the Township of Woolwich, Regional Municipality of Waterloo. It has a north-south orientation 125m south of Hopewell Creek Road, near the community of Breslau (Figure 1 and Figure 2).

Structure 400172 is a cast-in-place concrete T-beam and slab bridge built in 1919. The bridge carries a single lane of predominantly vehicular traffic across Hopewell Creek in one span with a total deck length of 7.3m and an overall structure width of 4.9m. The bridge has not been identified as an *Ontario Heritage Bridge* and does not currently have any status under the *Ontario Heritage Act*. Structure 400172 is not listed on the *Woolwich Municipal Heritage Register* however, it has been included as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* inventory within the Waterloo Region (Region of Waterloo 2004). It was also identified as a non-heritage bridge in *The Grand River Watershed Heritage Bridge Inventory* (Benjamin et al. 2013).

Based on the age of the structure and deficiencies observed in 2017, the Class EA process for this bridge is required to address the closure of the structure and identify a short and/or long term plan for the structure.

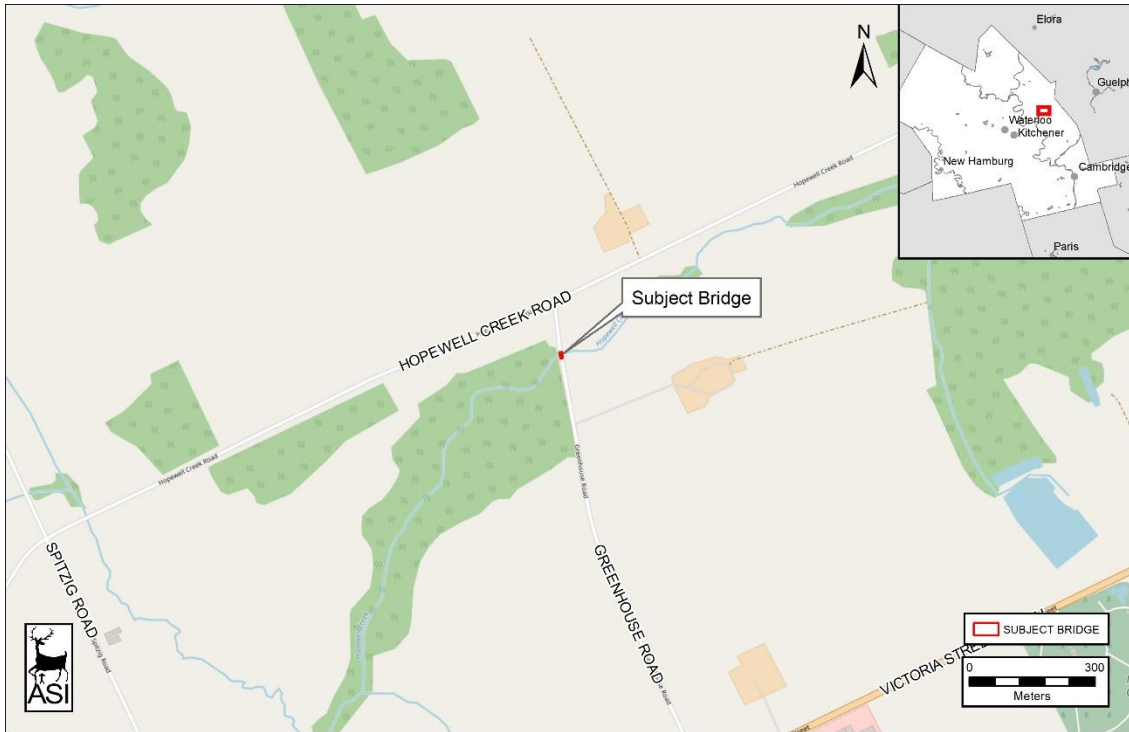


Figure 1: Location of the study area (outlined in red).

Source: ©OpenStreetMap and contributors, Creative Commons-Share Alike License
(CC-BY-SA ESRI Street Maps)



Figure 2: Photograph of the West Elevation of Structure 400172 ("Beitz' Bridge), ca. 2017

Source: Courtesy of GM BluePlan

The research, site visit, and project management (2019) for this assessment was carried out by Tara Jenkins (formerly of ASI), with analysis and project management (2020) conducted by John Sleath, Cultural Heritage Specialist and Project Manager, under the senior project direction of Lindsay Graves, Senior Cultural Heritage Specialist and Senior Project Manager of the Cultural Heritage Division, ASI. The present Heritage Impact Assessment follows the Ministry of Tourism, Culture and Sports' *Ontario Heritage Toolkit* (MHSTCI 2006) and the *Standards and Guidelines for the Conservation of Historic Places in Canada* (Parks Canada 2010). Research was completed to investigate, document, and evaluate the property and to measure the impact of the proposed development on the existing cultural heritage resource.

The scope of an HIA is provided by the MTCS's *Ontario Heritage Tool Kit*. An HIA is a useful tool to help identify cultural heritage value and provide guidance in supporting environmental assessment work. As part of a heritage impact assessment, proposed site alterations and project alternatives are analysed to identify impacts of the undertaking on the heritage resource and its heritage attributes. The impact of the proposed development on the cultural heritage resource is assessed, with attention paid to identifying potential negative impacts, which may include, but not limited to:

- Destruction of any, or part of any, significant heritage attributes or features;
- Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance;
- Shadows created that alter the appearance of a heritage attribute or change the viability of an associated natural feature or plantings, such as a garden;
- Isolation of a heritage attribute from its surrounding environment, context or a significant relationship;
- Direct or indirect obstruction of significant views or vistas within, from, or of built and natural features;
- A change in land use (such as rezoning a church to a multi-unit residence) where the change in use negates the property's cultural heritage value;
- Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect a cultural heritage resource, including archaeological resources.

Where negative impacts of the development on the cultural heritage resource and/or attributes are identified, mitigative or avoidance measures or alternative development or site alteration approaches are considered. Conservation options are outlined in the *Ontario Heritage Bridge Guidelines* (OHBG)(Ministry of Culture and Ministry of Transportation, Ontario (MTO) 2008), which is regarded as current best practice for conserving heritage bridges in Ontario. While intended for use in the assessment of provincially owned structures and not directly applicable to the municipal context, the OHBG ensures that heritage concerns and appropriate mitigation options are considered.

ASI's Volume 1: *Cultural Heritage Evaluation Report: Structure 400172 (Beitz' Bridge)* (ASI 2019), concluded that the subject bridge has cultural heritage value as it meets the criteria outlined in O. Reg. 9/06 of the *Ontario Heritage Act*, and that a resource-specific HIA would be required. The present report satisfies this requirement.

1.1 Description of Property

Structure 400172, also referred to as Beitz' Bridge, is a single-span cast-in-place concrete T-beam and slab bridge that was constructed in 1919. The bridge located on Greenhouse Road is surrounded by open agricultural fields. Structure 400172 is roughly 125m south of Hopewell Creek Road. The bridge carries one lane of Greenhouse Road vehicular traffic over Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River. Historically, the study area is located in the former Horning Tract of Waterloo Township.

According to the 2017 *Ontario Structure Inspection Manual- Inspection Form* for Structure 400172, the bridge has a total deck length of 7.3m, a roadway width of 4.4m, and an overall structure width of 4.9m (Appendix B of the CHER). The structure was designed by an unknown engineer and built by an unknown contractor. Correspondence with the Beitz family indicated a member of the family helped pour the concrete for the bridge. No further documentation on the construction of this structure, including original structural drawings, were available at the time of report preparation.

1.1.1 Adjacent Cultural Heritage Resources

The subject bridge is not adjacent to a listed or designated heritage property on the Woolwich Township Municipal Heritage Register.

2.0 STATEMENT OF CULTURAL HERITAGE VALUE

The following draft Statement of Cultural Heritage Value is taken from the Volume 1 (CHER) of this report prepared by ASI in 2019.

2.1 Description of Property

Name: Structure 400172

Alternate Name: Beitz' Bridge

Structure 400172 is located on Greenhouse Road, 125m south of Hopewell Creek Road, in Regional Municipality of Waterloo, near the community of Breslau. Constructed in 1919, Structure 400172 is a single-lane single-span cast-in-place concrete T-beam and slab bridge. The bridge carries Greenhouse Road across Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River.

2.2 Cultural Heritage Value or Interest

Structure 400172 was built in 1919 of concrete and is one of six classified as cast-in-place concrete T-beam and slab bridges located in Waterloo Region and one of two of this type in Woolwich Township. Structure 400172 is the earliest bridge of this type in the Region. Given its early construction date even for Ontario, this bridge may be considered experimental in design.

This concrete T-beam and slab bridge is the earliest documented example in Waterloo Region of a less common bridge design built from the 1920s to 1950s in Ontario. The abutments and deck are one unit cast-in-place, a design that were used on small bridges in the mid-twentieth century. It is a single-lane one-span bridge with a solid concrete parapet barrier situated along a historic transportation route in a rural setting over Hopewell Creek, a minor tributary of the Grand River. As an early example of this bridge type, this structure contributes to the understanding of bridge development in Waterloo Region. The common name for the bridge, Beitz' Bridge, is referenced to a Mennonite family, the Beitz family, who have farmed in proximity to the bridge for over 100 years. A member of the Beitz family, Henry, helped to build the bridge.

2.3 Heritage Attributes

Key heritage attributes that embody the heritage value of the subject bridge in the local context include:

- single-lane construction;
- cast-in-place concrete T-beam and slab construction; and
- cast-in-place concrete parapet barrier system.

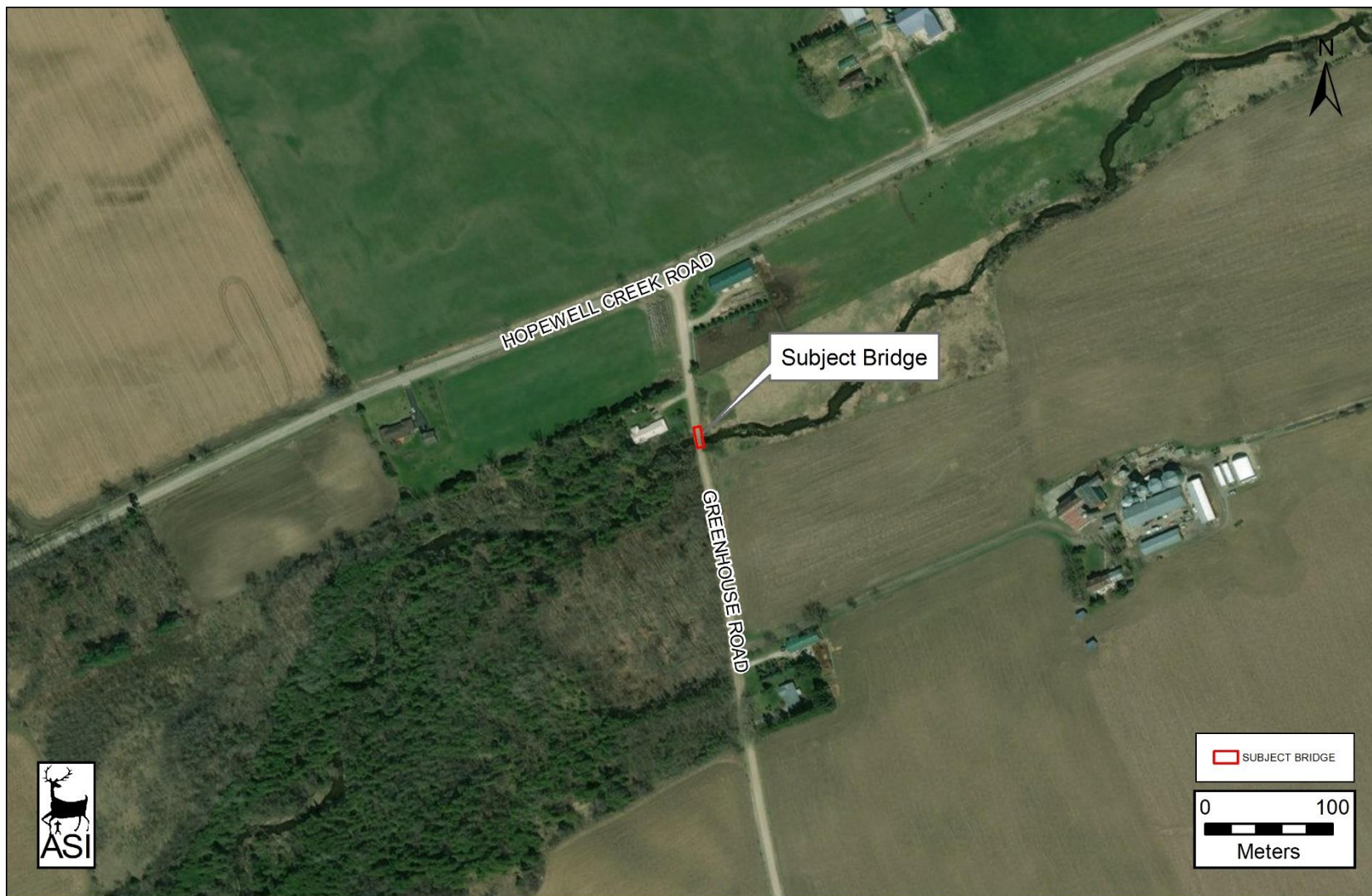


Figure 3: Location of the subject bridge

(ESRI Digital Globe 2018)

3.0 ASSESSMENT OF EXISTING CONDITIONS

A field review was undertaken by Victoria Manse, Survey Technician (formerly of ASI), on 2 November 2019 to conduct photographic documentation of the bridge crossing and to collect data relevant for completing a heritage evaluation of the structure. Results of the field review and bridge inspection report were then used to describe the existing conditions of the bridge crossing. This section provides a general description of the bridge crossing and immediate vicinity. The location of the subject bridge is provided in Figure 3 and photographic documentation of the bridge crossing is provided in Appendix A of the CHER (ASI 2019).

The bridge located on Greenhouse Road is surrounded by open agricultural fields. Structure 400172 is roughly 125m south of Hopewell Creek Road. The bridge crosses Hopewell Creek, a minor tributary of the Grand River, a Canadian Heritage River. Historically, the study area is located in the former Horning Tract, Waterloo Township.

The superstructure of Structure 400172 is described as a single span cast-in-place concrete T-beam and slab. The deck structure consists of a cast-in-place concrete slab with a gravel wearing surface. There are no visible deck drains. The deck slab is integrated with and supported by longitudinal T-beams. The transverse diaphragms (distributor beams) were cast-in-place along with the deck structure, thus forming a monolithic deck system. This gives the bridge a final appearance of a girder bridge when viewed from underneath or from a side elevation.

The abutments are cast-in-place concrete and form the legs of the deck system. The abutments sit on the bridge foundation which is not visible from the right-of-way. The bridge includes its original barrier system consisting of cast-in-place concrete parapet walls without railings. The solid barriers have been embossed to add a decorative element.

Structure 400172 (Beitz' Bridge) has been identified by the Region of Waterloo as a heritage bridge in the *Spanning the Generations, Study of Old Bridges in Waterloo Region* (PHCS 2004), an inventory and heritage assessment of bridges within the Waterloo Region. It is not listed on the Municipal Register or designated under Part IV of the *Ontario Heritage Act*, nor is it identified as a heritage bridge on the *Ontario Heritage Bridge List*. The bridge was also identified as a non-heritage bridge on the Grand River Watershed Heritage Bridge Inventory (Benjamin *et al.* 2013).

According to the available reference documents, no rehabilitation has been undertaken on the subject bridge. A telephone conversation with the Beitz family, who occupy the farm to the southeast of the bridge, reported that the bridge was hit by a farm machine which resulted in the cracked barrier (personal communication 07 November 2019).

Structure 400172 is currently owned and maintained by Woolwich Township. According to an inspection undertaken in 2017, the bridge carries one lane of motor traffic across an unnamed tributary of the Grand River with a total crossing length of 7.3m. The deck has a travel width of 4.4 with an overall structure width of 4.9m. The Ontario Structure Inspection Manual (OSIM) Inspection Form indicates the posted speed limit is 80km/hr and a current load limit of 14 tonnes (Township of Woolwich 2017:1). The OSIM Inspection Form completed by GM BluePlan recommended replacement for consideration and

that maintenance was required, as the bridge was determined to be in poor condition. The following deficiencies were documented in 2017 (Township of Woolwich 2017):

- Cast-in-place concrete abutment wingwalls and walls- severe delamination, spalling and disintegration, severe erosion at waterline
- Cast-in-place parapet wall without railing- vertical crack, medium to severe scaling, abrasions
- Cast-in-place diaphragms beams- severe honeycombing with delamination and spalling
- Cast-in-place T-Type girders- severe delamination with wide cracks at girder ends
- Cast-in-place soffit (thin slab exterior and interior)- medium scaling
- Foundations (below ground level)- top of footings exposed, assumed poor condition based on abutment condition

In addition, the bridge is not adjacent to a listed or designated heritage property on the Woolwich Township Municipal Heritage Register.

4.0 DESCRIPTION AND PURPOSE OF PROPOSED ACTIVITY

Based on the age of the structure and deficiencies observed in 2017, the Class EA process for this bridge is required to address the closure of the structure and identify a short and/or long term plan for the structure. The assessment is required to determine if future work for the bridge falls under Schedule A, A+, or B definitions of the Municipal Class Environmental Assessment Act. The study is a part of the Woolwich Township 2019 Bridge and Culvert Program.

The preferred alternative to address the deficiencies in the subject bridge were selected in October 2020, which includes the complete removal of Structure 400172 and replacement with a single-span concrete rigid frame structure with precast concrete distribution. Preliminary design drawings for the proposed replacement structure were provided in November 2020 and are included below (**Figure 4**).

The replacement bridge is anticipated to be 14 m in overall width and feature a total road and shoulder width of 8.7 m. The increased width of the replacement bridge is required to accommodate two lanes of Greenhouse Road vehicular traffic, the Township of Woolwich's standard road cross section. The replacement bridge is also anticipated to have an increased span length, which will increase the hydraulic capacity of the structure and reduce localized flooding in Hopewell Creek. The proposed replacement bridge is anticipated to be 9.55 m in length with an opening of 9.14 m, an increase in length of approximately 2.2 m from the original structure. The proposed concrete slab structure is anticipated to feature seven precast concrete distribution slabs 9550 mm in length, 2000 mm in width, and 150 mm in thickness. The deck and approaches are anticipated to feature steel beam guiderails.

While the preferred alternative from the heritage perspective involves the retention of the subject bridge with rehabilitation, as identified as part of the preliminary heritage assessment, this is not feasible within the project goals that include road and hydraulic capacity increases. In addition to the insufficient transportation and hydraulic capacity of the existing structure, rehabilitation of the existing bridge was also considered to be cost-prohibitive due to the advanced state of deterioration of structural elements.

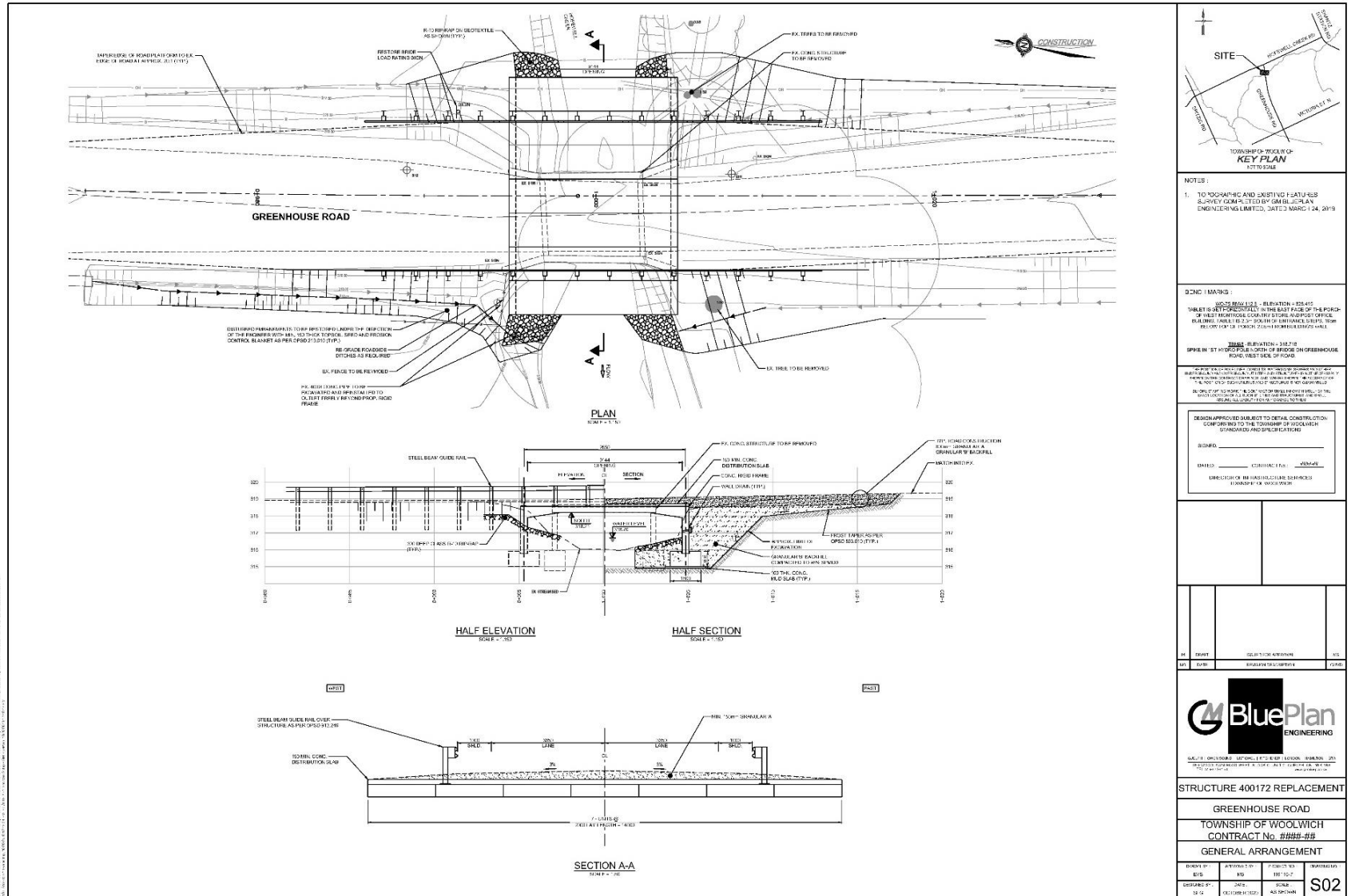


Figure 4: Structure 400172 Replacement, General Arrangement Drawing



5.0 IMPACT ASSESSMENT AND ALTERNATIVES CONSIDERED

To assess the potential impacts of the preferred alternative, the cultural heritage resource and identified heritage attributes were considered against a range of possible impacts (Table 1) as outlined in the Ministry of Tourism and Culture document entitled *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* (Ministry of Tourism and Culture 2010), which include:

- Destruction of any, or part of any, significant heritage attribute or feature (III.1).
- Alteration which means a change in any manner and includes restoration, renovation, repair or disturbance (III.2).
- Shadows created that alter the appearance of a heritage attribute or change the visibility of a natural feature of plantings, such as a garden (III.3).
- Isolation of a heritage attribute from its surrounding environment, context, or a significant relationship (III.4).
- Direct or indirect obstruction of significant views or vistas from, within, or to a built and natural feature (III.5).
- A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces (III.6).
- Soil disturbance such as a change in grade, or an alteration of the drainage pattern, or excavation, etc. (III.7)

To assist in determining the potential impacts to the structure in a wide-range of potential project alternatives, the Conservation Alternatives outlined in the OHBG (Ministry of Culture and Ministry of Transportation, Ontario (MTO) 2008) were used for evaluative purposes. While intended for provincially-owned structures and not directly applicable to municipal undertakings, these conservation options are considered to be best practice in heritage bridge conservation, and outline a wide variety of potential project alternatives for consideration. These conservation options include:

- 1) Retention of existing bridge with no major modifications undertaken
- 2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design
- 3) Retention of existing bridge with sympathetic modification
- 4) Retention of existing bridge with sympathetically-designed new structure in proximity
- 5) Retention of existing bridge no longer in use for vehicle purposes but adapted for pedestrian walkways, cycle paths, scenic viewing etc.
- 6) Retention of bridge as heritage monument for viewing purposes only
- 7) Relocation of bridge to appropriate new site for continued use or adaptive re-use
- 8) Replacement/removal of existing bridge with salvage elements/members of heritage bridge for incorporation into new structure or for future conservation work or displays
- 9) Replacement/removal of existing bridge with full recording and documentation of the heritage bridge

Table 1: Evaluation of the Potential Impacts of Bridge Improvement Alternatives on the Cultural Heritage Resource and Identified Heritage Attributes

Nine Bridge Improvement Alternatives	Destruction, removal or relocation	Alteration	Shadows	Isolation	Direct or indirect obstruction of significant views	A change in land use	Soil disturbance
1) Retention of existing bridge with no major modifications undertaken	No impact.	No impact.	No impact.	No impact.	No impact.	No impact.	No impact.
2) Retention of existing bridge and restoration of missing or deteriorated elements where physical or documentary evidence (e.g. photographs or drawings) can be used for their design	No impact.	No impact.	No impact.	No impact.	No impact.	No impact.	No impact.
3) Retention of existing bridge with sympathetic modification	No impact.	No impact given that alterations would be sympathetic to heritage attributes.	No impact.	No impact.	No impact.	No impact.	No impact.
4) Retention of existing bridge with sympathetically designed new structure in proximity	No impact.	Yes – impacts are expected given that a new bridge in proximity to the existing one will alter the use, immediate setting and context of the bridge site.	No impact.	No impact.	No impact.	Yes – use of the bridge would change, as current traffic levels and loads would continue to be unsuitable, and this traffic would be redirected to the new structure.	Yes – impacts are expected through the construction of a new structure in proximity.
5) Retention of existing bridge no longer in use for vehicle purposes but adapted for pedestrian walkways, cycle paths, scenic viewing etc	No impact.	Yes – a change in use would result in alterations to the heritage resource.	No impact.	No impact.	No impact.	Yes – use of bridge for pedestrian walkways, cycle paths, scenic viewing, et cetera, would result in a change from the original use of the structure.	No impact.
6) Retention of bridge as heritage monument for viewing purposes only	No impact.	Yes – use of the bridge for viewing purposes only would result in a change from the original use of the structure and thus would be considered to be an alteration.	No impact.	No impact.	No impact.	Yes – use of bridge for viewing purposes only would result in a change from the original use of the structure.	No impact.
7) Relocation of bridge to appropriate new site for continued use or adaptive re-use	Yes – impacts to the heritage resource are expected through relocation.	Yes – alterations to the resource are expected through relocation.	No impact.	Yes – relocation of the resource will isolate it from its original context and relationship to Hopewell Creek, a tributary of the Grand River.	No impact.	Yes – the adaptive re-use of the bridge for purposes other than vehicular and horse and buggy purposes would result in a change from the original use of the structure. If the bridge remains in vehicular use, no impact is expected.	Yes – impacts are expected through process of removing the bridge from its current location.
8) Replacement/removal of existing bridge with salvage elements/members of heritage bridge for incorporation into new structure or for future conservation work or displays	Yes - impacts to the cultural heritage values of the subject bridge are expected through the complete removal of the structure.	Yes – alterations to the resource are expected through removal, which would result in significant negative impacts to its design, historical and contextual value.	No impact.	No impact.	No impact.	No impact.	Yes – impacts are expected through removal of the existing bridge and the introduction of a new structure.
9) Replacement/removal of existing bridge with full recording and documentation of the heritage bridge	Yes - impacts to the cultural heritage values of subject bridge are expected through the complete removal of the structure.	Yes – alterations to the resource are expected through removal, which result in significant negative impacts to its design and contextual value.	No impact.	No impact.	No impact.	No impact.	Yes – impacts are expected through removal of the existing bridge and the introduction of a new structure.

The proposed potential options for the rehabilitation or replacement of the subject bridge are anticipated to have a range of potential impacts to the identified heritage attributes described in Section 2.3.

When the preliminary HIA was prepared in March 2020, the preferred alternative for the proposed undertaking had not been selected. The preceding evaluation of potential impacts on the subject bridge (see Table 1) determined that the retention and rehabilitation of Structure 400172 was the preferred alternative from the cultural heritage perspective and should be carried over for further consideration if feasible. Retention with sympathetic rehabilitation is considered the best strategy to ensure the continued use of an identified cultural heritage resource. The preliminary HIA and the evaluation of potential impacts (Table 1) was presented to GM BluePlan in March 2020 to help inform the selection of the preferred alternative and to provide guidance in the preliminary design of any replacement structure, if replacement was selected .

Following the selection of the preferred alternative involving the complete removal and replacement of the subject bridge in October 2020, this preliminary HIA was updated to assess the specific impact of the preferred alternative on the identified heritage attributes of the subject bridge.

While retention with rehabilitation (OHBG Conservation Alternatives 1-3 in Table 1) is preferred from a cultural heritage perspective, this option was eliminated from consideration as it did not satisfy key transportation and drainage goals of the EA (Township of Woolwich email communication, 20 October 2020). Greenhouse Road is currently a single-lane roadway, and the subject bridge could not be rehabilitated to carry two lanes of traffic. Further, the extant bridge does not have sufficient hydraulic capacity to ensure adequate local drainage of Hopewell Creek, and so a new structure with improved hydraulic capacity is required to reduce the risk of flooding. In addition to the insufficient transportation and hydraulic capacity of the structure, rehabilitation of the existing structure was also considered to be cost-prohibitive due to the advanced state of deterioration of structural elements.

Retention of the subject bridge with the construction of a new bridge in close proximity (OHBG Conservation Alternative 4) is not considered to be a viable option as it would result in retention of the subject bridge without major rehabilitations. Retention without rehabilitation is not viable as it would not address the underlying structural deficiencies or improve the hydraulic capacity of the crossing.

Retention of the subject bridge for non-vehicular purposes (OHBG Conservation Alternative 5) or for viewing purposes (OHBG Conservation Alternative 6) are not considered viable options as they would not ensure the continuation of the bridge as a safe crossing over Hopewell Creek. As a vehicular crossing is required in this location to serve local farms and residences, these alternatives are not considered viable.

Relocation of the subject bridge for use at another crossing (OHBG Conservation Alternative 7) is not considered a viable alternative as the cast-in-place concrete elements can not be feasibly relocated, nor can they be used at another crossing due to their poor structural condition.

As the retention or relocation of the subject bridge were determined to be infeasible, replacement was selected as the preferred alternative in October 2020. Where feasible, this replacement structure should be designed to include salvaged elements from the 1919 structure into the new crossing or for use in a

commemorative display (OHBG Conservation Alternative 8). Consideration should be given to salvaging the heritage attributes identified in Section 2.3, where feasible. Where salvage is determined to be infeasible, these elements should be considered for sympathetic replication in the replacement structure. Consideration should be given to incorporating design elements of the 1919 bridge into a new structure, such as decorative rectangular finishes, where feasible.

As replacement is the preferred option, it is important to be mindful of the overall bridge setting when considering removal of the structure. Consideration should be given to design options that will minimize impacts to the overall landscape setting and those that will retain the character of the bridge setting. According to preliminary design drawings, the proposed replacement structure is a single-span concrete rigid frame bridge that features a longer span length and greater width. The substructure and deck of the proposed replacement structure is generally similar in appearance to the 1919 structure, as they both feature simple concrete elements. The steel beam guiderail barrier system on the proposed replacement bridge, however, is considerably different in design that the 1919 concrete parapet wall with rectangular finishes. While the proposed steel beam guiderail is designed to meet modern design codes (noted as OPSD 912.245 in Figure 4), consideration should be given to implementing a concrete parapet wall with decorative rectangular finishes on the exterior of the guiderail, where feasible. Implementing a sympathetically designed concrete parapet wall would suitably maintain the aesthetic of the 1919 structure with the allowance for modern design and materials. The historical and contextual associations of the subject bridge as a crossing over Hopewell Creek would be maintained in a sympathetically designed replacement structure.

6.0 COMMUNITY ENGAGEMENT

Consultation with Bridget Coady, Principal Planner, Cultural Heritage at the Region of Waterloo, Archives of Ontario, and a member of the Beitz family regarding the subject property was undertaken as part of the Volume 1: Cultural Heritage Evaluation Report by ASI in 2019 (ASI 2019). Responses from the various organizations provided additional historical information on the structure. A telephone conversation with the Beitz family, who occupy the farm to the southeast of the bridge, reported that the bridge was hit by a farm machine which resulted in the cracked barrier. Further, a member of the Beitz family, Henry, helped to build the bridge (personal communication 07 November 2019).

7.0 CONCLUSIONS AND RECOMMENDATIONS

The CHER (Volume 1 of this report) determined that Structure 400172 retains cultural heritage value following the application of O. Reg. 9/06 of the *Ontario Heritage Act*. In particular, Structure 400172 is the earliest example of a cast-in-place T-beam and slab bridge type in the Region of Waterloo. It is a single-lane one-span bridge with a solid parapet concrete barrier along a historic transportation route in a rural setting over a minor tributary of the Grand River. Given that it meets O. Reg. 9/06, the Draft Statement of Cultural Heritage Value or Interest and the list of heritage attributes prepared during the CHER have been included in this report.

The preferred alternative to address the deficiencies in the subject bridge were selected in October 2020, which includes the complete removal of Structure 400172 and replacement with a concrete rigid

frame structure. The replacement bridge is anticipated to be wider than the extant bridge in order to carry two lanes of Greenhouse Road vehicular traffic. Also, the replacement bridge is anticipated to have an increased hydraulic capacity to reduce localized flooding in Hopewell Creek. While the preferred alternative from the heritage perspective involves the retention of the subject bridge with rehabilitation, this is not feasible within the project goals that include road and hydraulic capacity increases. In addition to the insufficient transportation and hydraulic capacity of the structure, rehabilitation of the existing structure was also considered to be cost-prohibitive due to the advanced state of deterioration of structural elements.

7.1 Mitigation Measures and Recommendations

Given the identified cultural heritage value of Structure 400172 and the preferred option being carried forward as part of the Environmental Assessment involving the complete removal of the subject bridge and replacement with a concrete rigid frame structure, the following recommendations and mitigation measures should be considered and implemented:

6. Where feasible, the preferred alternative should be selected to ensure the fewest direct and permanent impacts to the identified heritage attributes of the subject bridge. As the retention of the subject bridge following rehabilitation was demonstrated to be unviable, the replacement of the subject bridge with a sympathetically designed replacement structure should be considered. The historical and contextual associations of the subject bridge as a crossing over Hopewell Creek would be maintained in a sympathetically designed replacement structure.
7. According to available documentation, the replacement bridge is anticipated to be a single span concrete rigid frame structure with increased hydraulic capacity and increased road width to meet drainage and traffic requirements in the area. While removal of the existing structure would significantly impact the identified heritage attributes, the use of a concrete replacement structure with a similar scale is considered to be a suitable means of reducing the impacts to the historical and contextual value of the crossing if sympathetic design elements are employed.
8. Where feasible, the replacement structure should be designed in a manner that incorporates physical aesthetic elements that are sympathetic with the original 1919 structure. Consideration should be given to incorporating a solid parapet concrete wall with decorative rectangular elements at deck level, where feasible, as a means of reducing the visual impacts of the replacement structure.
9. Prior to modifications of the subject bridge, the following mitigation measures should be considered and implemented, where feasible :
 - d. The bridge and setting should be documented prior to construction. The CHER (ASI 2019) provides detailed photographic documentation and a clear description of the

- structure and its setting. The CHER and this HIA completed for the Structure 400172 is considered to be sufficient documentation;
- e. Salvaged elements of the superstructure should be retained for inclusion in a new structure at another crossing, in future conservation work, or for commemorative displays, where feasible; and
 - f. Consideration should be given to a commemorative strategy, such as developing a plaque in the location of the bridge. In this respect, an interpretive historical plaque/commemoration plan could be prepared including historical information, images and featuring salvaged heritage components from the subject bridge, where feasible. Heritage staff at the Woolwich Heritage Committee should be consulted for input regarding this commemoration.
10. This report should be filed with heritage staff at the Region of Waterloo, Woolwich Heritage Committee, and with the Ministry of Heritage, Sport, Tourism, and Culture Industries for review.

8.0 REFERENCES

ASI, (Archaeological Services Inc.)

2019 *Volume 1: Cultural Heritage Evaluation Report, Structure 400172 (Beitz' Bridge), Regional Municipality of Waterloo, Ontario.* Report on file with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto.

Benjamin, Lindsay, Dr. Barbara Veale, Dr. Robert Shipley, Kayla Jonas Galvin, and Melissa Davies
2013 *Arch, Truss & Beam: The Grand River Watershed Heritage Bridge Inventory.* Heritage Resource Centre, March. https://www.grandriver.ca/en/our-watershed/resources/Documents/CHRS/CHRS_2013_BridgeInventory.pdf.

MHSTCI, (Ministry of Heritage, Sport, Tourism and Culture Industries)

2006 Ontario Heritage Tool Kit: Heritage Property Evaluation.
http://www.mtc.gov.on.ca/en/publications/Heritage_Tool_Kit_HPE_Eng.pdf.

Ministry of Culture and Ministry of Transportation, Ontario (MTO)

2008 Ontario Heritage Bridge Guidelines (OHBG) (Interim – January 11 2008).

Ministry of Tourism and Culture

2010 Screening for Impacts to Built Heritage Resources and Cultural Heritage Landscapes.
<http://www.rds.oeb.ca/HPECMWebDrawer/Record/382848/File/document>.

Parks Canada

2010 Standards and Guidelines for the Conservation of Historic Places in Canada. Canada's Historic Places. <https://www.historicplaces.ca/media/18072/81468-parks-s+g-eng-web2.pdf>.

Region of Waterloo

2004 *Spanning the Generations: A Study of Old Bridges in Waterloo Region, Phase 1: Inventory.*

Township of Woolwich

2017 *OSIM and Summary Action Report, Bridge 400172, Greenhouse Road 125 m South of Hopewell Creek Road.* OSIM. On file with ASI.



Regional Municipality of Waterloo

Heritage Planning Advisory Committee

Minutes

December 9, 2021

5:00 PM

ONLINE – via ZOOM

Present were: Councilor E. Clarke (Chair), B. Bryant, E. Heinrichs, S. David, A. Carswell, W. Stauch, P. Arens, E. Thorsen, K. Cressman C. Pratt

Members absent: B. Benninger (Vice Chair), L. Cunningham Martz,

Staff in attendance: B. Coady, H. Chimirri Russell

1. Approval of the Agenda and Declaration of Pecuniary Interest under the Municipal Conflict Of Interest Act

Moved by C. Pratt

Seconded by B. Bryant

That the agenda for the Heritage Planning Advisory Committee Meeting December 9, 2021 be approved.

Carried.

2. Delegations

- a. West Montrose Covered Bridge Rehabilitation – John Stephenson, and Michelle Pinto Senior Engineers, Region of Waterloo Design and Construction

Regional staff let HPAC know that the design process has been paused to include the evaluation of an all wooden option for reconstruction/rehabilitation of the West Montrose

Bridge. An expert in wood rehabilitation has been retained by the Region and will evaluate the option against modern engineering requirements and the ability to maintain historic integrity. The Heritage Impact Assessment required to undertake the work will also evaluate option and offer recommendations for conserving the heritage bridge. As soon as the Heritage Impact Assessment is available it will be provided to HPAC for review. The Region's Engage project page for the bridge will also be updated with information as it becomes available, including renderings of both proposed options. Some concerns raised by HPAC through a subsequent discussion included:

- that whatever option is chosen that the appearance of the bridge viewed by the travelling public will remain authentic;
- that horse and buggy will continue to be able to use the bridge, and metal decking can sometimes be an issue for the horses;
- questions as to what the historic 1944 bailey truss (internal to the bridge) will be used for once it is removed;
- that shortages in construction materials as a result of global supply chain issues may affect length of time the bridge is closed to the travelling public; and
- that this delay, to evaluate a second option, might affect the Region's eligibility to receive Federal and Provincial funding for the project.

3. Approval of the Minutes

Moved by W. Stauch

Seconded by E. Thorsen

That the minutes of the Heritage Planning Advisory Committee Meeting of November 18, 2021 be approved.

Carried.

4. Business Arising

None.

5. Initiatives

None.

6. Information Updates

a. West Montrose Bridge Rehabilitation

HPAC discussed the bridge with the delegation of Regional staff. It was determined that any formal comments from the Committee should be deferred until the evaluation of the all wooden option is complete and the Heritage Impact Assessment has been reviewed by HPAC.

b. The Region's Nuclear Bunker

Regional staff reviewed the November 24th Regional Plan and Budget Committee Meeting motion begin immediate stabilization of the Regional Nuclear Bunker. C. Pratt questioned if Council was aware of grants and funding opportunities from Federal and Provincial Governments and staff said that it was included in the report. Many HPAC members noted that they had been engaged in discussions on the Bunker with friends and neighbours and that many community members didn't understand the historical significance of the structure or even why conserving heritage is important to a sense of place, tourism, economic development or quality of life. HPAC members felt this initiative has highlighted a real lack of understanding of why heritage is important and also the Area Municipality's and Region's legislative responsibilities to the province to conserve heritage resources.

B. Bryant suggested that a list of the Regionally owned heritage structures and infrastructure be generated to bring more transparency to the Region's responsibility to maintain its heritage assets.

c. Development Applications

Regional staff let HPAC know that the Forbes Estate development applications, that HPAC previously had provided comments on, has been appealed to the Ontario Land Tribunal. The grounds for both the appeal of the Zoning By-law Amendment Application and the Plan of Subdivision Application was non-decision by an approval authority within statutory timeframes provided under the Planning Act.

7. Other Business

W. Stauch spoke to HPAC about the former High Bank / Riverbank School House that is located on Fountain Street in Cambridge. It recently had a catastrophic fire that has left the stone structure unsafe and the owner is now seeking demolition. At a recent meeting of the Friends of the Ken Seiling Waterloo Region Museum a suggestion was made that reclamation of the original stone might be repurposed for a future school house to be constructed in the Doon Heritage Village. More staff discussions will be needed to find out if storage of this material is feasible or if there is money for the purchase and transport of this material.

W. Stauch also asked staff for an update on the Fischer-Hallman archaeological dig. Staff let the Committee know that work will be ongoing for another season (2022). While this archaeological site has yielded significant findings, it is just one portion of a much larger complex of Indigenous villages and campsites that span thousands of years. HPAC members reiterated their interest in sharing and celebrating the archaeological history of this area and the larger Waterloo Region to the community, and staff indicated that communicating this region's rich Indigenous and archaeological history is important and will be facilitated by the Region's reconciliation work, with HPAC's help.

8. News and Events Roundtable

Regional staff let HPAC know that the Sheave Tower in Blair was recently set on fire and officials believe the fire was intentionally set. Neighbours of the historic site were able to dampen the flames with fire extinguishers before the Fire Department arrived.

9. Adjourn

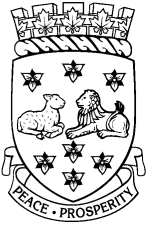
Moved by: C. Pratt

That the meeting adjourn.

Carried

Committee Chair, Councilor E. Clarke

Committee Clerk, B. Coady, Cultural Heritage Principal Planner



Regional Municipality of Waterloo

Heritage Planning Advisory Committee

Agenda

February 10, 2022

5:00 PM

Via ZOOM online meeting.

1. Approval of the Agenda and Declarations of Pecuniary Interest under The Municipal Conflict Of Interest Act

2. Delegations

3. Minutes – December 9, 2021

p.3

4. Business Arising

5. Initiatives

- a. List of Heritage Assets owned by the Region of Waterloo

6. Information Updates

- a. Regional Council Information Request on Ministerial Zoning Orders PDL-CPL-22-03
- b. Housing Affordability Task Force Recommendation Paper (pending its release prior to HPAC meeting)
- c. Monitoring Change in the Central Transit Corridor 2020 Report

7. Other Business**8. News and Events Round Table****9. Monthly Communication**

Cambridge Municipal Heritage Advisory Committee [Meeting Minutes](#)

Heritage Kitchener [Meeting Minutes](#)

Waterloo Municipal Heritage Committee [Meeting Minutes](#)

Wellesley Township Heritage and Historical Society [Meeting Minutes](#)

Wilmot Heritage [Meeting Minutes](#)

Woolwich Heritage Committee [Meeting Minutes](#)

North Dumfries Municipal Heritage Committee [Heritage Landing Page](#)

Waterloo Regional Heritage Foundation [Meeting Minutes](#)

10. Next Meeting

March 10, 2022 – Likely online via ZOOM

11. Adjourn

Regrets to Peggy Walter, 519-575-4757 ext. 3572

PWalter@regionofwaterloo.ca