

**CULTURAL HERITAGE EVALUATION REPORT
HAZLEY BAY DRIVE STONE CULVERT CROSSING**

**Watercourse under Hazley Bay Drive
Lot 2, Concession II
Township of Laurentian Valley, Renfrew County, Ontario**

Prepared for:

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EXECUTIVE SUMMARY

ASI was contracted by Morrison Hershfield, on behalf of the Ministry of Transportation, Ontario (MTO) to conduct a Cultural Heritage Evaluation of the Stone Culvert on Hazley Bay Drive as part of CPR bridge replacement and transportation improvements to Highway 148 from Greenwood Road to the Quebec Border in the Township of Laurentian Valley. During this rehabilitation of Highway 148, Hazley Bay Drive will be used as a temporary vehicular detour route. The subject structure carries a small watercourse under two lanes of northbound and southbound Hazley Bay Drive vehicular traffic approximately 1.8 km south of Highway 148 in the Township of Laurentian Valley, Renfrew County. The Hazley Bay Drive Stone Culvert is municipally owned.

This report will evaluate the cultural heritage significance of the Hazley Bay Drive Stone Culvert and assess impacts of the proposed undertaking in consideration of its determined cultural heritage value. The subject culvert was constructed *circa* 1876 as part of the former alignment of the Canada Central Railway line connecting the Town of Pembroke with Ottawa and Brockville.

Based on the results of archival research, an analysis of culvert design and construction in Ontario, field investigations, and heritage evaluation, the Hazley Bay Drive culvert was determined to retain cultural heritage value following application of Regulation 9/06 of the *Ontario Heritage Act*, and therefore can be considered for municipal designation.

The proposed alternative is not anticipated to result in any direct impacts to the subject resource. While the proposed undertaking will result in an increase in traffic on Hazley Bay Drive, this impact is considered minor due to the short duration of the detour route and will be suitably mitigated with the proposed installation of protection measures such as steel plates on the wearing surface above the subject culvert.

1. Staging and construction activities should be suitably planned and undertaken to avoid impacts to the identified cultural heritage resource;
2. This report should be submitted to heritage staff at the Township of Laurentian Valley, the Ministry of Transportation, and the Ministry of Tourism, Culture, and Sport for review and comment.



PROJECT PERSONNEL

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1.0 INTRODUCTION

ASI was contracted by Morrison Hershfield, on behalf of the Ministry of Transportation, Ontario (MTO) to conduct a Cultural Heritage Evaluation of the stone culvert on Hazley Bay Drive as part of CPR bridge replacement and transportation improvements to Highway 148 from Greenwood Road to the Quebec Border in the Township of Laurentian Valley. During this rehabilitation of Highway 148, Hazley Bay Drive will be used as a temporary vehicular detour route. The subject structure carries a small watercourse under two lanes of northbound and southbound Hazley Bay Drive vehicular traffic approximately 1.8 km south of Highway 148 in the Township of Laurentian Valley, Renfrew County (Figure 1). The Hazley Bay Drive Stone Culvert is municipally owned.

This report will evaluate the cultural heritage significance of the structure and assess impacts of the proposed undertaking in consideration of its determined cultural heritage value.



Figure 1: Location of the Study Area.

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

The following report is presented as part of an approved planning and design process subject to Environmental Assessment (EA) requirements. This portion of the EA study is intended to address the proposed replacement/rehabilitation of the subject structure. 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 over 40 years old;



- Provide a historical overview of the design and construction of the structure within the broader context of the surrounding township and bridge construction generally;
- Describe existing conditions and heritage integrity;
- Evaluate the bridge using Regulation 9/06 of the *Ontario Heritage Act* and draw conclusions about the heritage attributes of the structure; and
- Assess impacts of the undertaking, ascertaining sensitivity to change in the context of identified heritage attributes and recommend appropriate mitigation measures.

2.0 BUILT HERITAGE RESOURCE AND CULTURAL HERITAGE LANDSCAPE ASSESSMENT CONTEXT

2.1 Legislation and Policy Context

This cultural heritage assessment considers cultural heritage resources in the context of improvements to specified areas, pursuant to the *Environmental Assessment Act*. This assessment addresses above ground cultural heritage resources over 40 years old. Use of a 40-year-old threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources (Ministry of Transportation 2006; Ministry of Transportation 2007; Ontario Realty Corporation 2007). 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.

For the purposes of this assessment, the term cultural heritage resources was used to describe both cultural heritage landscapes and built heritage resources. A cultural landscape is perceived as a collection of individual built heritage resources and other related features that together form farm complexes, roadscares and nucleated settlements. Built heritage resources are typically individual buildings or structures that may be associated with a variety of human activities, such as historical settlement and patterns of architectural development.

The analysis throughout the study process addresses cultural heritage resources under various pieces of legislation and their supporting guidelines. Under the *Environmental Assessment Act* (1990) environment is defined in Subsection 1(c) to include:

- cultural conditions that influence the life of man or a community, and;
- any building, structure, machine, or other device or thing made by man.

The Ministry of Tourism, Culture and Sport is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of the heritage of Ontario and has published two guidelines to assist in assessing cultural heritage resources as part of an environmental assessment: *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (1992), and *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (1981). Accordingly, both guidelines have been utilized in this assessment process.

The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (Section 1.0) states the following:



When speaking of man-made heritage we are concerned with the works of man and the effects of his activities in the environment rather than with movable human artifacts or those environments that are natural and completely undisturbed by man.

In addition, environment may be interpreted to include the combination and interrelationships of human artifacts with all other aspects of the physical environment, as well as with the social, economic and cultural conditions that influence the life of the people and communities in Ontario. The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* distinguish between two basic ways of visually experiencing this heritage in the environment, namely as cultural heritage landscapes and as cultural features.

Within this document, cultural heritage landscapes are defined as the following (Section 1.0):

The use and physical appearance of the land as we see it now is a result of man's activities over time in modifying pristine landscapes for his own purposes. A cultural landscape is perceived as a collection of individual man-made features into a whole. Urban cultural landscapes are sometimes given special names such as townscapes or streetscapes that describe various scales of perception from the general scene to the particular view. Cultural landscapes in the countryside are viewed in or adjacent to natural undisturbed landscapes, or waterscapes, and include such land uses as agriculture, mining, forestry, recreation, and transportation. Like urban cultural landscapes, they too may be perceived at various scales: as a large area of homogeneous character; or as an intermediate sized area of homogeneous character or a collection of settings such as a group of farms; or as a discrete example of specific landscape character such as a single farm, or an individual village or hamlet.

A cultural feature is defined as the following (Section 1.0):

...an individual part of a cultural landscape that may be focused upon as part of a broader scene, or viewed independently. The term refers to any man-made or modified object in or on the land or underwater, such as buildings of various types, street furniture, engineering works, plantings and landscaping, archaeological sites, or a collection of such objects seen as a group because of close physical or social relationships.

The Minister of Tourism, Culture, and Sport has also published *Standards and Guidelines for Conservation of Provincial Heritage Properties* (April 2010; Standards and Guidelines hereafter). These Standards and Guidelines apply to properties the Government of Ontario owns or controls that have cultural heritage value or interest. They are mandatory for ministries and prescribed public bodies and have the authority of a Management Board or Cabinet directive. Prescribed public bodies include:

- Agricultural Research Institute of Ontario
- Hydro One Inc.
- Liquor Control Board of Ontario
- McMichael Canadian Art Collection
- Metrolinx
- The Niagara Parks Commission.
- Ontario Heritage Trust
- Ontario Infrastructure and Lands Corporation



- Ontario Lottery and Gaming Corporation
- Ontario Power Generation Inc.
- Royal Botanical Gardens
- Toronto Area Transit Operating Authority
- St. Lawrence Parks Commission

The Standards and Guidelines provide a series of definitions considered during the course of the assessment:

A provincial heritage property is defined as the following (14):

Provincial heritage property means real property, including buildings and structures on the property, that has cultural heritage value or interest and that is owned by the Crown in right of Ontario or by a prescribed public body; or that is occupied by a ministry or a prescribed public body if the terms of the occupancy agreement are such that the ministry or public body is entitled to make the alterations to the property that may be required under these heritage standards and guidelines.

A provincial heritage property of provincial significance is defined as the following (14):

Provincial heritage property that has been evaluated using the criteria found in Ontario Heritage Act O.Reg. 10/06 and has been found to have cultural heritage value or interest of provincial significance.

A built heritage resource is defined as the following (13):

...one or more significant buildings (including fixtures or equipment located in or forming part of a building), structures, earthworks, monuments, installations, or remains associated with architectural, cultural, social, political, economic, or military history and identified as being important to a community. For the purposes of these Standards and Guidelines, “structures” does not include roadways in the provincial highway network and in-use electrical or telecommunications transmission towers.

A cultural heritage landscape is defined as the following (13):

... a defined geographical area that human activity has modified and that has cultural heritage value. Such an area involves one or more groupings of individual heritage features, such as structures, spaces, archaeological sites, and natural elements, which together form a significant type of heritage form distinct from that of its constituent elements or parts. Heritage conservation districts designated under the Ontario Heritage Act, villages, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trails, and industrial complexes of cultural heritage value are some examples.

Additionally, the *Planning Act* (1990) and related *Provincial Policy Statement (PPS)*, which was updated in 2014, make a number of provisions relating to heritage conservation. One of the general purposes of the *Planning Act* is to integrate matters of provincial interest in provincial and municipal planning decisions. In order to inform all those involved in planning activities of the scope of these matters of provincial interest, Section 2 of the *Planning Act* provides an extensive listing. These matters of provincial interest shall be regarded when certain authorities, including the council of a municipality, carry out their responsibilities under the *Act*. One of these provincial interests is directly concerned with:



2.(d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest

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.

Those policies of particular relevance for the conservation of heritage features are contained in Section 2-Wise Use and Management of Resources, wherein Subsection 2.6 - Cultural Heritage and Archaeological Resources, makes the following provisions:

2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

A number of definitions that have specific meanings for use in a policy context accompany the policy statement. These definitions include built heritage resources and cultural heritage landscapes.

A *built heritage resource* is defined as: “a building, structure, monument, installation or any manufactured remnant that contributes to a property’s cultural heritage value or interest as identified by a community, including an Aboriginal community” (PPS 2014).

A *cultural heritage landscape* is defined as “a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Aboriginal community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association” (PPS 2014). Examples may include, but are not limited to farmscapes, historic settlements, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, railways, and industrial complexes of cultural heritage value.

In addition, significance is also more generally defined. It is assigned a specific meaning according to the subject matter or policy context, such as wetlands or ecologically important areas. With regard to cultural heritage and archaeology resources, resources of significance are those that are valued for the important contribution they make to our understanding of the history of a place, an event, or a people (PPS 2014).



Criteria for determining significance for the resources are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used. While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation (PPS 2014).

Accordingly, the foregoing guidelines and relevant policy statement were used to guide the scope and methodology of the cultural heritage assessment.

2.2 Municipal Policies

The Township of Laurentian Valley has developed an Official Plan (June 2004, Section 2: Cultural Heritage and Archaeological Resources), which sets out a number of policies with regard to cultural heritage resources. Policies that are relevant to this study are included below.

Significant built heritage resources and cultural landscapes will be conserved.

The Ontario Heritage Act may be utilized to identify, conserve, protect and enhance the cultural heritage resources in the Township through the designation by by-law of individual properties, conservation districts and landscapes and archaeological sites. A Local Architectural Conservation Advisory Committee (LACAC) may be established under the Act to advise on heritage matters within the Township. Council may designate under the Ontario Heritage Act, specifically a Heritage Conservation District(s) containing significant heritage properties or cultural heritage landscape features located within the Township. Council shall have regard for all cultural heritage resources in the undertaking of a municipal public works and during the management of lands or properties owned by the Township. When necessary, Council will require satisfactory measures and/or impact assessments to mitigate any negative effects on these significant heritage resources as outlined in those heritage conservation policies contained within this Plan.

2.2.2 Municipal Consultation

The Township of Laurentian Valley was also consulted for additional information on the subject culvert.¹ Email and phone correspondence with planning staff at the Township of Laurentian Valley confirmed that the structure is not on any municipal heritage registers, or subject to any local heritage recognition. Mark Behm, Public Works Manager at the Township of Laurentian Valley, confirmed that Hazley Bay Drive was constructed in the 1980s on an abandoned Kingston and Pembroke (K and P) Railway line, and that the subject culvert was constructed for use on the rail line².

¹ Correspondence with the Township of Laurentian Valley was conducted by Morrison Hershfield on behalf of ASI.

² Email correspondence on 1 November, 2017.



2.3 Cultural Heritage Evaluation and Heritage Impact Assessment Report

The scope of a Cultural Heritage Evaluation (CHE) is guided by the Ministry of Tourism, Culture and Sport's *Ontario Heritage Toolkit* (2006). Generally, CHEs include the following components:

- A general description of the history of the 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 exterior and interior of a building or structure, and character-defining architectural details;
- A cultural heritage resource evaluation guided by the *Ontario Heritage Act* criteria;
- A summary of heritage attributes;
- Historical mapping, photographs; and
- A location plan.

Using background information and data collected during the site visit, the cultural heritage resource is evaluated using criteria contained within Regulation 9/06 of the *Ontario Heritage Act*.

Ontario Heritage Act Regulation 9/06 provides a set of criteria, 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 potential heritage resource meet one or more of the above mentioned criteria, a Heritage Impact Assessment (HIA) is required and the resource considered for designation under the *Ontario Heritage Act*.

3.0 HISTORICAL CONTEXT AND CONSTRUCTION

3.1 Introduction

The Hazley Bay Drive culvert is a stone box structure constructed *circa* 1876, and carries a small watercourse under two lanes of Hazley Bay Drive vehicular traffic in an east-west orientation in the Township of Laurentian Valley, Ontario. Historically, the study area is located within Lot 2, Concession II in the Township of Pembroke, Renfrew County (Figure 2).

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. The following section 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 culvert within its historical context.



3.2 Local History and Settlement

3.2.1 Renfrew County

Renfrew County is situated on the western shores of the Ottawa River, adjacent to the Province of Quebec. The County is comprised of 36 townships, and was named in honour of the Scottish County of Renfrewshire. Renfrew County was initially surveyed in 1825, with pioneer families arriving shortly after. Joseph Brunette occupied and cleared a homestead in the area that is the present day Town of Renfrew, which marked the first Euro-Canadian construction in the county. In 1830, the population of the county numbered only 21, and by 1848 a post office had been established. The construction of the railway through the area increased population growth focused on the dairy industry, and by 1895 the settlement of Renfrew was elevated to the status of town. Lumber, dairy, and other agriculture were the main economic drivers in the nineteenth-century (Mika and Mika 1983, Rayburn 1997).

3.2.2 Canadian Pacific, Kingston & Pembroke and Canadian Central Railways

Construction of the Kingston and Pembroke Railways (K & P) began in 1872 to link Kingston with the profitable lumber stands north in the Ottawa Valley and service local communities with passenger and mail service. Due to the difficulties in traversing the rocky landscape and multitude of lakes north of Kingston, the K & P eventually stopped construction when it reached Renfrew in 1884 (Kennedy 2015; Kick and Push Railway n.d.).

The Canada Central Railway Company (CCR) was founded in 1861 with the intention of constructing a railroad from Ottawa through Pembroke and west toward Lake Huron. The CCR merged with the Brockville and Ottawa Railway (B&O) line that connected Brockville on Lake Ontario to Ottawa. The CCR line to Renfrew was completed in 1873, to Pembroke in 1876, and Mattawa in 1881. In 1882, the CCR was merged with the Canadian Pacific Railway, which took over all former CCR lines, and completed the link to North Bay the same year. The K & P Railway briefly acquired rights of the CP line from Renfrew to Pembroke (Hughes 1998; Railwaybob.com n.d.).

3.3 History of the Stone Culvert and the Study Area

Historically, the study area is located within Lot 2, Concession II in the Township of Pembroke, Renfrew County. A review of historic mapping, and municipal records suggests that Hazley Bay Drive was not constructed until the 1980s, with a portion utilizing an abandoned rail line constructed by the CCR (Mark Behm, Public Works Manager, Township of Laurentian Valley).

The 1863 *Walling Map of the Counties of Lanark and Renfrew* (Walling 1863) and the 1879 *Map of the County of Renfrew* (Miles and Co. 1879) were examined to determine the presence of historic features within the study area during the nineteenth century (Figures 2 and 3).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases. In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in



order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

The 1863 *Walling Map* depicts the study area in a rural context adjacent to the Ottawa River. Hazley Bay Drive is not illustrated, though Highway 40 (Greenwood Road) to the west is depicted with several residences and land owners listed. The 1879 *Map of the County of Renfrew* demonstrates that this area retained a rural character into the late nineteenth century, with Hazley Bay Drive similarly absent. The notable addition to earlier mapping is the addition of the CCR line connecting Brockville and Ottawa to Pembroke, completed several years earlier in 1876. The alignment of the CCR line is depicted further north of the extant rail alignment, suggesting the rail line was moved from its former alignment at an unknown date.

In addition to nineteenth-century mapping, topographical maps from 1936 and 1996 were examined as part of this study.

The 1936 topographical map (Figure 4) does not depict Hazley Bay Drive, although Greenwood Road is illustrated to the west of the study area in its present location. The CP rail line is also present, carried through the area on raised embankments and with Government Road Station to the south of the study area in its extant alignment. Highway 148 to the north of the subject culvert is depicted as terminating at the Ottawa River, with no bridge carrying the roadway into Quebec. The general study area is depicted as wooded with low and wet areas nearby. There are no structures depicted in the vicinity of the subject culvert.

The 1996 topographical map (Figure 5) demonstrates that the study area underwent significant changes during the latter half of the twentieth century. Hazley Bay Drive is illustrated in its current alignment with numerous residences along the east side fronting on the Ottawa River, however, the subject culvert is not depicted. The CP rail line is illustrated in the same alignment as earlier mapping, supported by elevated embankments. Highway 148 is carried over the Ottawa River by a series of bridges into Quebec. In general, the study area is shown to retain a rural character into the late twentieth century.





Figure 2: The study area overlaid on the 1863 Walling Map of the Counties of Lanark and Renfrew
Base Map: Walling 1863



Figure 3: The study area overlaid on the 1879 Map of the County of Renfrew
Base Map: Miles and Co. 1879

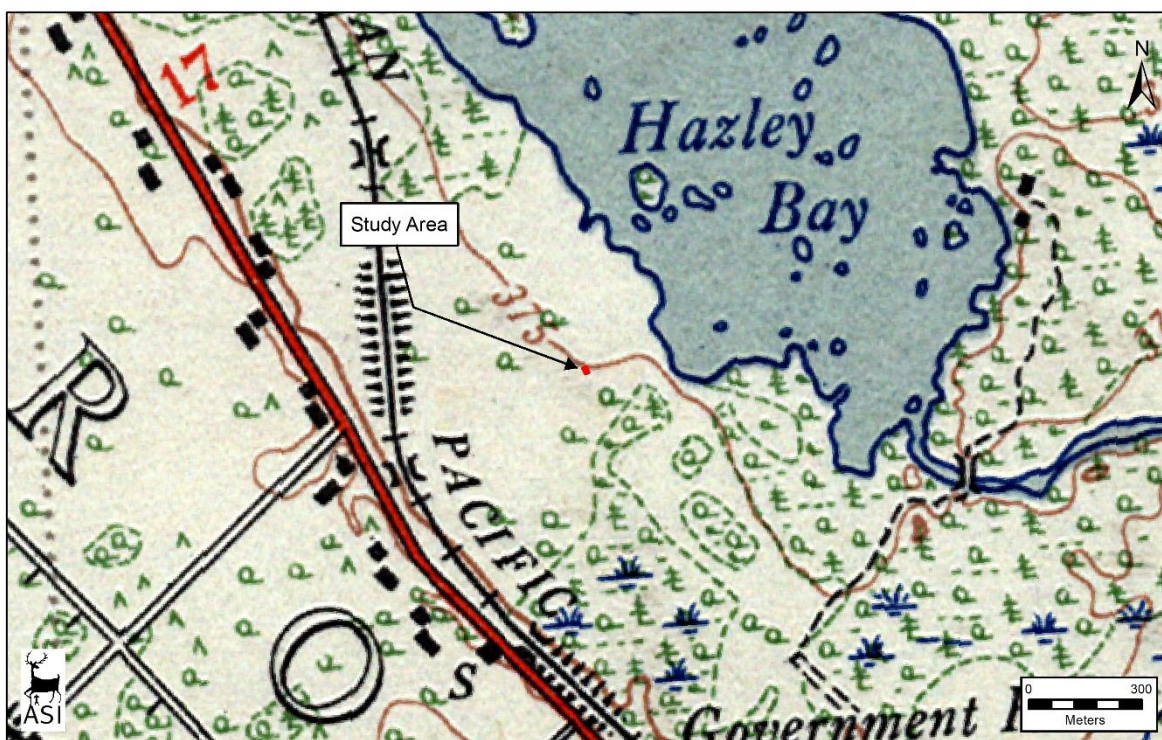


Figure 4: The study area overlaid on the 1936 NTS map
Base Map: NTS Sheet 31F-14 (Pembroke) (Department of National Defense 1936)

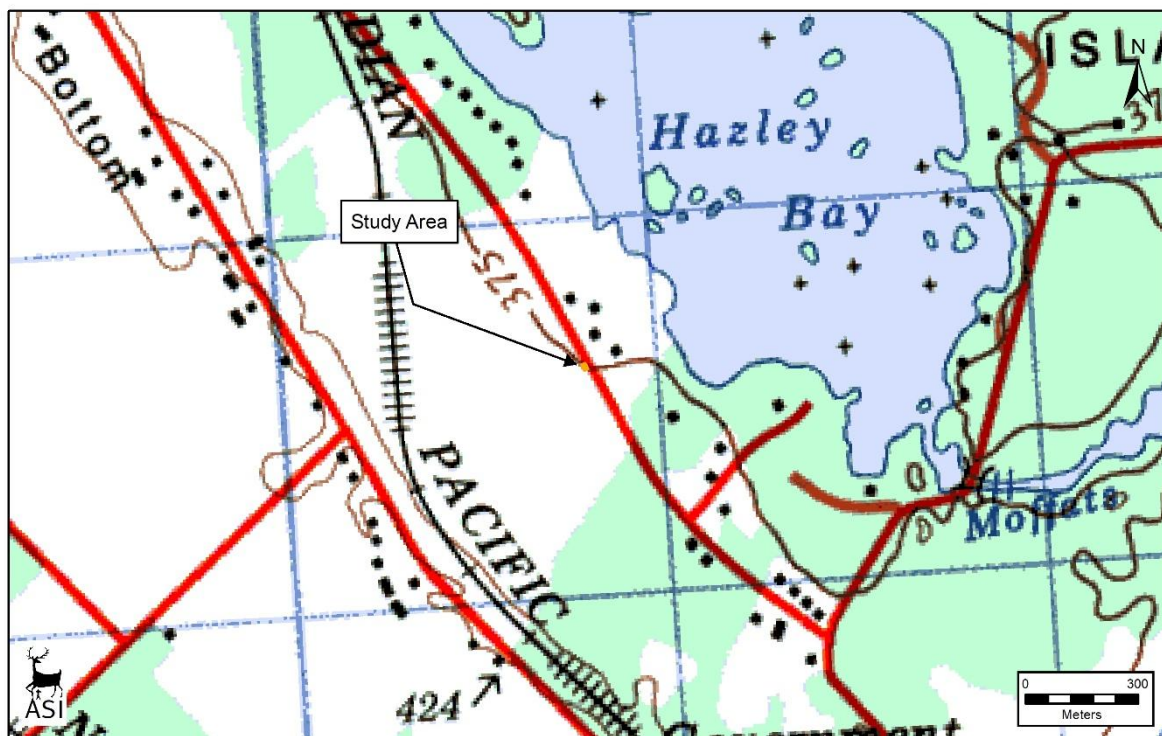


Figure 5: The study area overlaid on the 1996 NTS Map
Base Map: NTS Sheet 31F-14 (Pembroke)(Department of Energy, Mines, and Resources 1996)

3.4 Bridge Construction

3.4.1 Early Bridge and Culvert Building in Ontario

Up until the 1890s, timber truss bridges were the most common bridge type built in southern Ontario. Stone and wrought iron materials were also employed but due to higher costs and a lack of skilled craftsmen, these structures were generally restricted to market towns. By the 1890s, steel was becoming the material of choice when constructing bridges given that concrete was less expensive and more durable than its wood and wrought iron predecessors. Steel truss structures were very common by 1900, as were steel girder bridges. The use of concrete in constructing bridges 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.]:7-8).

Wooden structures were generally used for short span bridges and culverts, due to the relative ease of reconstruction and the low costs associated. According to the 1899 Annual Report, cedar was principally used for culvert construction, however, even with the rot-resistant properties the cedar structures were subject to warping, frost displacement, and decay making them structurally unsound generally after eight years (Ontario Department of Public Works 1899:38). Beginning in the late nineteenth-century, these simple wooden box-culverts and sluices were replaced with more durable concrete pipe, arch, and box culverts as supplies of inexpensive quality lumber dwindled, and population growth caused increased traffic on roadways (Ontario Department of Public Works 1899). By the early twentieth-century, wooden culverts were largely replaced by more durable cast-in-place concrete structures. These cast-in-place concrete culverts were in turn increasingly replaced with precast concrete culverts in the late twentieth century due to the ease of installation, low cost, and minimal site disturbance (Stelsel 2014).

Rail culverts were generally constructed to a higher technical standard than municipal road culverts, with improved durability required due to the increased weight of rail traffic and the necessity for decreased maintenance and disruption to rail services (AREMA 2006). Because of the emphasis on durability and the speed of construction, stone arch and stone box culverts persisted in popularity on rail lines into the late nineteenth century, as they required less construction time than cast-in-place concrete structures.

3.4.2 Construction of the Hazley Bay Drive Stone Culvert

The original structural culvert drawings are not available and were therefore not reviewed as part of this assessment. Further, according to the local planners at the Township of Laurentian Valley, there are no extant records at the township that could provide information on the construction of the subject culvert. Planning staff with the township was able to determine that Hazley Bay Drive was constructed in the 1980s, with part of the alignment occupying a former K & P Railway railbed. However, given the K & P terminated at Renfrew, the former rail alignment is suspected to be part of the CCR alignment that was constructed between Renfrew and Pembroke in 1876. Based on a review of available data, the designers and builders are unknown. However, the designs and specifications for the culvert were most likely completed in-house by a CCR engineer *circa* 1876 using standard railway materials and construction methods.

Based on archival research and field review of similar stone box culverts in rail corridors on the Northern Railway (current GO Barrie rail corridor), stone box culverts were commonly constructed due to their strength and durability. Based on an examination and comparison of the 1879 *Map of the County of Renfrew* with landscape features observed in modern satellite orthoimagery, the original orientation of the



CPR line (former CCR line) is demonstrated to be further north of the extant line, with a portion of Hazley Bay Drive constructed on the former rail alignment. This former alignment was confirmed by Mark Behm, Public Works Manager, Township of Laurentian Valley.

4.0 EXISTING CONDITIONS AND INTEGRITY

A field review was undertaken by John Sleath on 11 October 2017 to conduct photographic documentation of the crossing and to collect data relevant for completing a heritage evaluation of the structure. Results of the field review and secondary documentation received from the client were then utilized to describe the existing conditions of the culvert crossing. This section provides a general description of the bridge crossing and associated cultural heritage features. Photographic documentation of the culvert crossing (Plate 1- Plate 15) is provided in Appendix A.

Historically, the study area is located within Lot 2, Concession II in the Township of Pembroke, Renfrew County (Figure 7). The subject culvert carries a small watercourse in a south-north orientation under two lanes of Hazley Bay Drive vehicular traffic. This small watercourse drains the low and swampy area to the west, and leads to Hazley Bay in the Ottawa River approximately 300 metres northeast. The subject culvert was constructed *circa* 1876 as part of the original alignment of the CCR line, and has not been subject to any documented repairs.

The subject culvert is a single-barrel stone box culvert with individual cut blocks that appear to be soft and poorly consolidated stone. The west headwall (inlet) is composed of three courses of cut stone blocks, while the interior of the culvert barrel features four courses of thinner stone blocks. The sidewalls rest on stone footings, and it is unclear if there is a stone block bottom constituting a closed footing or aggregate with an open footing due to silt accumulation. The east headwall (outlet) of the subject culvert has a similar appearance to the west elevation, with the northeast sidewall featuring three courses of stone, and the southeast sidewall featuring two courses of stone beneath the cap stone.

The subject culvert is constructed of large cut stone blocks, with a two courses of stones forming the sidewalls and a single stone forming the culvert roof. The opening is tapered with the top course of stones on the sidewalls overhanging the lower course. The stones are rough hewn, and appear to be poorly consolidated two courses forming the sidewalls and a single course forming the culvert top. The culvert is approximately eight metres in length, though no information regarding the height or width is available. No mortar or concrete is visible, but it is unclear if the stones were dry laid or if the mortar has eroded over time. The culvert roof appears to be topped with a shallow layer of gravel bedding, with the asphalt wearing surface directly above.

The subject culvert and Hazley Bay Drive are currently owned/maintained by the Township of Laurentian Valley. Hazley Bay Drive consists of two lanes of northwest-southeast vehicular traffic with an asphalt wearing surface 6.21 metres wide (Figure 14, Appendix B). The roadway lacks shoulders and curbs, and features ditches on both the east and west side in the area of the culvert. The roadway above the culvert lacks any furniture or signage.

According to the data received from the client, there is no indication that the subject culvert has ever been rehabilitated by the Township of Laurentian Valley. The subject culvert is not anticipated to be directly impacted by the proposed undertaking.





Figure 6: Orthographic image of the subject stone box culvert on Hazley Bay Drive.

Base Map: ESRI DigitalGlobe



4.1 Comparative Geographic and Historic Context of Concrete Box Culverts

The subject culvert is a short-span single barrel stone box culvert constructed *circa* 1876 to carry the former alignment of the CCR line over a small watercourse measuring approximately eight metres in length.

An inventory of municipal culverts in the Township of Laurentian Valley was not available for a comparison of similar structures in the local context. However, an inventory of similar late nineteenth-century stone box culverts on the former Northern Railroad (presently the GO Barrie rail corridor), constructed in 1853 was consulted (ASI 2017a, 2017b, 2017c; and GTR 1907). While this data does not lend itself to useful comparative analysis, it does provide examples of similar structures found in Ontario. Similar late nineteenth-century stone box culverts include:

- Mile 20.86 Culvert of the GO Barrie rail corridor: a single-span stone box culvert originally constructed in 1887 to carry to Northern Railway over a small watercourse in the City of Vaughan that measures 72 feet (22.3 metres) in length (ASI 2017a, Figure 8).
- Mile 28.10 Culvert of the GO Barrie rail corridor: a single-span stone box culvert originally constructed in 1886 to carry to Northern Railway over a small watercourse in the Town of Aurora that measures 65.6 feet (20 metres) in length (ASI 2017b, Figure 9).
- Mile 53.95 Culvert of the GO Barrie rail corridor: a single-span stone box culvert originally constructed in 1886 to carry to Northern Railway over a small watercourse in the Town of Innisfil that measures 36feet (11 metres) in length (ASI 2017c, Figure 10).

The following images are included to provide a comparison between like structures (Figures 7–10).

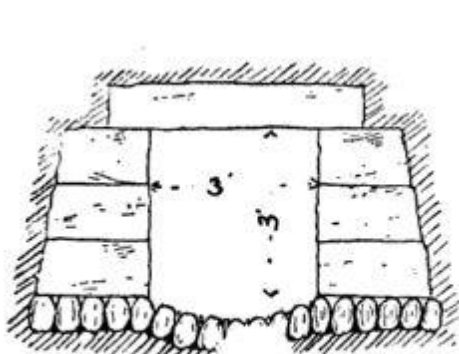


FIG. 4. 3 x 3 feet, Box Culvert.

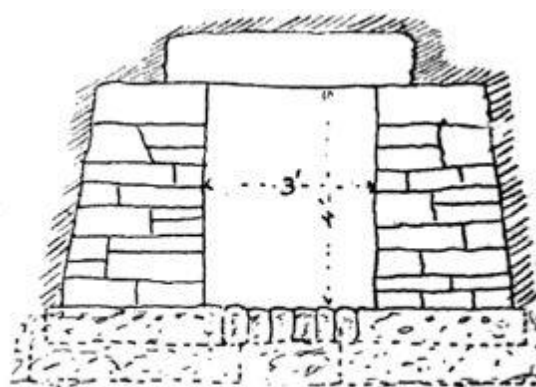


FIG. 5. 3 x 4 feet, Box Culvert.

Figure 7: Suggested construction techniques for stone box culverts in 1894 Ontario Legislature Sessional Papers

(Ontario Legislative Assembly 1984:56).



Figure 8: Stone Box Culvert constructed by the Northern Railway in 1887 in Vaughan, Ontario at Mile 20.86 of the GO Barrie Rail Corridor (ASI 2017a).



Figure 9: Stone Box Culvert constructed by the Northern Railway in 1886 in Aurora, Ontario at Mile 28.10 of the GO Barrie Rail Corridor (ASI 2017b).



Figure 10: Stone Box Culvert constructed by the Northern Railway in 1886 in Innisfil, Ontario at Mile 53.95 of the GO Barrie Rail Corridor (ASI 2017c).

4.2 Additional Cultural Heritage Resources

There are no previously identified cultural heritage resources located adjacent to the subject culvert.

5.0 HERITAGE EVALUATION OF THE SUBJECT CULVERT

Table 1 contains the evaluation of the subject culvert against criteria as set out in Regulation 9/06 of the *Ontario Heritage Act*. Within the Municipal EA process, Regulation 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a culvert, has cultural heritage value.

Table 1: Evaluation of the Hazley Bay Drive Stone Culvert using Ontario Regulation 9/06

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

<i>Ontario Heritage Act Criteria</i>	<i>Analysis</i>
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	The subject culvert meets this criterion. The Hazley Bay Drive Culvert is an early and representative example of a single-span stone box culvert. The culvert retains original cut stone vault and headwalls. Stone box culverts were commonly constructed by railroad companies in the mid-late nineteenth century to provide drainage under rail corridors because of their durability and strength.
ii. displays a high degree of craftsmanship or artistic merit, or;	The subject culvert was designed by an unknown engineer at the CCR. Stone box culverts were commonly used for short-spans to facilitate drainage of minor watercourses under railway lines. Accordingly, there is no evidence of exemplary craftsmanship or artistic merit in the design or construction of this structure. The subject culvert does not meet this criterion.
iii. demonstrates a high degree of technical or scientific achievement.	Following review of secondary source material and comparing this culvert to similar structures in the comparative data, it was determined that this structure does not demonstrate a high degree of technical or scientific achievement.

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

<i>Ontario Heritage Act Criteria</i>	<i>Analysis</i>
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	The culvert is historically associated with the CCR, which was built between Pembroke and Renfrew in 1876 and later absorbed by the CPR. The subject culvert is an early example of a structure that is associated with the original alignment of the rail corridor that was re-oriented in the early twentieth-century. The abandoned alignment of the rail corridor is not considered to be significant to the community, and therefore, the subject culvert 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;	This criterion is not satisfied given that the structure does not contribute to an understanding of a community or culture.



iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	The subject culvert was designed by an unknown engineer at the CCR, and is not known to hold any particular significance to the local community. The subject culvert does not meet this criterion.
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3. The property has contextual value because it:

<i>Ontario Heritage Act</i> Criteria	Analysis
i. is important in defining, maintaining or supporting the character of an area;	The subject culvert is small in scale and has low visibility to motorists and pedestrians from the public right of way, and is not considered to define, maintain, or support the rural character of the area. The subject structure does not meet this criterion.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	The subject culvert retains physical and visual links to the original alignment of the CCR rail corridor, which provided a vital transportation and communication link to the residents of Renfrew County.
iii. is a landmark.	While visible to motorists and pedestrians on Hazley Bay Drive, the subject culvert is not considered a defining element to the setting or a waypoint along the roadway, and does not meet this criterion.

Based on available information, the Hazley Bay Drive Stone Culvert meets at least one of the criteria set out in Ontario Regulation 9/06. Accordingly, this structure is considered to retain cultural heritage value and should be considered for municipal designation under the *Ontario Heritage Act*.

6.0 ENVIRONMENTAL ASSESSMENT OPTIONS

The proposed alternative is not anticipated to result in any direct impacts to the subject resource (Figure 11). The proposed undertaking will result in an increase in traffic on Hazley Bay Drive as a temporary detour route for motorists using the Highway 148 Interprovincial Bridge to the north of the study area. This impact is considered to be minor due to the short duration of the detour, and will be suitably mitigated with the installation of protection measures such as steel plates on the wearing surface above the subject culvert as proposed by the proponent³.

7.0 CONCLUSIONS

Based on the results of archival research, an analysis of culvert design and construction in Ontario, field investigations, and application of Regulation 9/06 of the *Ontario Heritage Act*, the Hazley Bay Drive Stone Culvert was determined to possess heritage value. The subject culvert was constructed *circa* 1876 using cut stone box construction, which was common for railroads at the time. However, these structures

³ Email communication from Morrison Hershfield, 2 November, 2017.



are becoming increasingly rare as drainage features are modified and replaced with more modern culvert styles.

7.1 Statement Of Cultural Heritage Value

7.1.1 Description of Property

The Hazley Bay Drive Stone Culvert is on the original alignment of the Canada Central Railway (CCR) rail corridor in Renfrew County. The structure is a single-barrel stone box culvert with individual cut limestone blocks that carries an unnamed watercourse in a north- south direction under the former rail corridor that is now serving as Hazley Bay Drive.

7.1.2 Cultural Heritage Value

The Hazley Bay Drive Stone Culvert is an early, rare, and representative example of a single-barrel stone box culvert. The structure was constructed *circa* 1876, measures approximately 8 metres in length, and is not known to have undergone any structural modifications. Stone box culverts were commonly constructed by railroad companies in the mid-late nineteenth century to provide drainage under rail corridors because of their durability and strength. However, these structures are becoming increasingly rare as drainage features are modified and replaced with more modern culvert styles.

The Hazley Bay Drive Stone Culvert is directly associated with the original alignment of the Canada Central Railway corridor in the late nineteenth century. While the alignment of the rail line was altered sometime before 1936, the original alignment on which the subject culvert is located is directly associated with the late nineteenth-century rail developments in Ontario, and at one time formed a link in the transcontinental Canadian Pacific Railroad line that was constructed to connect the provinces in the newly established nation of Canada.

7.1.3 List of Heritage Attributes

A list of heritage attributes that contribute to the cultural heritage value of the Hazley Bay Drive Stone Culvert as a Provincial Heritage Property include its:

- Individual cut limestone block headwalls; and,
- Interior culvert barrel with cut limestone top and sides.

8.0 RECOMMENDATIONS

Based on the results of archival research, an analysis of culvert design and construction in Ontario, field investigations, and heritage evaluation, the Hazley Bay Drive Stone Culvert was determined to retain cultural heritage value following application of Regulation 9/06 of the *Ontario Heritage Act*, and therefore should be considered for municipal designation.

The proposed alternative is not anticipated to result in any direct impacts to the subject resource. While the proposed undertaking will result in an increase in traffic on Hazley Bay Drive, this impact is



considered minor due to the short duration of the detour route, and will be suitably mitigated with the proposed installation of protection measures such as steel plates on the wearing surface above the subject culvert.

1. Staging and construction activities should be suitably planned and undertaken to avoid impacts to the identified cultural heritage resource;
2. This report should be submitted to heritage staff at the Township of Laurentian Valley, the Ministry of Transportation, and the Ministry of Tourism, Culture, and Sport for review and commentary.



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APPENDIX A: Photographic Plates



Plate 1: West headwall (inlet) of the subject culvert, looking east.



Plate 2: West headwall (inlet) of the subject culvert, looking northeast.



Plate 3: West headwall (inlet) of the subject culvert, looking northeast.



Plate 4: Southwest sidewall (inlet) of the subject culvert



Plate 5: Northwest sidewall of the culvert barrel, with footings visible below the waterline, looking north.



Plate 6: Culvert barrel interior, looking northeast.



Plate 7: underside
of cap stones on
culvert barrel
interior.



Plate 8: East
headwall (outlet)
looking southwest.



Plate 9: East
headwall (outlet)
looking southwest.



Plate 10: West side
of Hazley Bay Drive,
looking southeast
from the subject
culvert. Note the
small watercourse
in the foreground.



Plate 11: West side of Hazley Bay Drive, looking northwest with the subject culvert in the foreground.



Plate 12: Area west of the subject culvert, with agricultural fields in the background and low-lying woodlot in the foreground.



Plate 13:
Watercourse with
overgrown reeds
and grasses to the
north of the subject
culvert, with
residences on both
sides.



Plate 14: Residence
north of the subject
culvert, looking
northwest on
Hazley Bay Drive
from the subject
culvert.



Plate 15: Hazley Bay Drive, looking southeast towards the subject culvert.