

**CULTURAL HERITAGE EVALUATION REPORT**

**PATTERSON SIDE ROAD BRIDGE NUMBER 1 (STRUCTURE ID B22162016) AND  
PATTERSON SIDE ROAD BRIDGE NUMBER 2 (STRUCTURE ID B22164017)  
PATTERSON SIDE ROAD OVER THE HUMBER RIVER**

**AND**

**DUFFY'S LANE BRIDGE (STRUCTURE ID B22072010)  
DUFFY'S LANE OVER THE HUMBER RIVER**

**TOWN OF CALEDON  
REGION OF PEEL, ONTARIO**

**FINAL REPORT**

**R.J. Burnside & Associates Limited**  
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ASI File: 20CH-115

January 2021 (Revised February 2021)



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**TOWN OF CALEDON  
REGION OF PEEL, ONTARIO**

### EXECUTIVE SUMMARY

ASI was contracted by R.J. Burnside & Associates Limited, on behalf of the Town of Caledon, to prepare a Cultural Heritage Evaluation Report (CHER) for three bridges located at the intersection of Patterson Side Road and Duffy's Lane as part of multiple Municipal Class Environmental Assessments followed by Detailed Design for the Town's bridges and culverts. The Town of Caledon is undertaking a comprehensive assessment of all asset categories so as to formulate an Asset Management Strategy to manage the wide range of assets that need repair and rehabilitation. One key category is the Town's inventory of 139 bridges and culverts. Three bridges are evaluated in this report: Patterson Side Road Bridge Number 1, Structure ID B22162016 (Bridge No. 1); Patterson Side Road Bridge Number 2, Structure ID B22162016 (Bridge No. 2); and Duffy's Lane Bridge, Structure ID B22072010.

Bridge No. 1 is a single span cast-in-place concrete slab structure supported by concrete beams, built in 1950, that is located approximately 0.1 km west of Duffy's Lane; Bridge No. 2 is a single span cast-in-place rigid frame concrete structure, built in 1956, that is located approximately 0.03 km east of Duffy's Lane; and the Duffy's Lane Bridge is a single span cast-in-place rigid frame concrete structure, built in 1957, that is located 0.03 km south of the intersection with Patterson Side Road. All three of the subject bridges carry their respective roadways over the Humber River in the Town of Caledon, Ontario. The subject bridges are not identified as a heritage structures by the Town of Caledon and thus are not designated under Part IV of the *Ontario Heritage Act*, and are not currently on the *Ontario Heritage Bridge List*. The Humber River is a Canadian Heritage River System. This CHER is intended to evaluate the cultural heritage value of the subject bridges based on the evaluation criteria set under Ontario Regulation (O. Reg.) 9/06 of the *Ontario Heritage Act*.

This report includes an evaluation of the cultural heritage value of each bridge as determined by the criteria in O. Reg. 9/06. This evaluation determined that Bridge No. 1 and Bridge No. 2 did not meet the criteria outlined in O. Reg. 9/06. The evaluation for Duffy's Lane Bridge determined that the structure has design and physical value as well as contextual value.

The following recommendations are proposed for all three bridges:





1. This report should be submitted by the proponent to heritage staff at the Town of Caledon and with the Ministry of Heritage, Tourism, Sport and Cultural Industries for review.

The following recommendations are proposed for the Duffy's Lane Bridge:

1. A Heritage Impact Assessment should be completed for the Duffy's Lane Bridge prior to construction, as early as possible during detailed design. This assessment should be completed by a qualified person who has relevant and recent experience in the conservation of road bridges (see Section 3.0 of the Standards and Guidelines for Conservation of Provincial Heritage Properties [MHSTCI 2014] as a guide for best practice) and submitted to heritage staff at the Town of Caledon for review and approval.



## PROJECT PERSONNEL

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## 1.0 INTRODUCTION

ASI was contracted by R.J. Burnside & Associates Limited, on behalf of the Town of Caledon, to prepare a Cultural Heritage Evaluation Report (CHER) for three bridges located at the intersection of Patterson Side Road and Duffy's Lane as part of multiple Municipal Class Environmental Assessments followed by Detailed Design for the Town's bridges and culverts. The Town of Caledon is undertaking a comprehensive assessment of all asset categories so as to formulate an Asset Management Strategy to manage the wide range of assets that need repair and rehabilitation. One key category is the Town's inventory of 139 bridges and culverts. Three bridges are evaluated in this report: Patterson Side Road Bridge Number 1, Structure ID B22162016 (Bridge No. 1); Patterson Side Road Bridge Number 2, Structure ID B22162016 (Bridge No. 2); and Duffy's Lane Bridge, Structure ID B22072010. Bridge No. 1 is located approximately 0.1 km west of Duffy's Lane, Bridge No. 2 is located approximately 0.03 km east of Duffy's Lane, and the Duffy's Lane Bridge is located 0.03 km south of the intersection with Patterson Side Road. All three of the subject bridges carry their respective roadways over the Humber River in the Town of Caledon, Ontario. The subject bridges are not identified as a heritage structures by the Town of Caledon and thus are not designated under Part IV of the *Ontario Heritage Act*, and are not currently on the *Ontario Heritage Bridge List*. This CHER is intended to evaluate the cultural heritage value of the subject bridges based on the evaluation criteria set under Ontario Regulation (O. Reg.) 9/06 of the *Ontario Heritage Act*.

The Bridge No. 1 is a single span cast-in-place concrete slab structure supported by concrete beams with a northeast-southwest orientation that carries two lanes of vehicular traffic over a small branch of the Humber River. Bridge No. 1 is located approximately 0.1 km west of the intersection of Patterson Side Road and Duffy's Lane. According to Ontario Structure Inspection Manual (OSIM) report, this bridge was constructed in 1950. The bridge measures 7.15 m long and has an overall width of 7.34 m (Town of Caledon 2019a). The structure was built following undated designs drawn by J. H. Beatty, an engineer based in Orangeville. 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*.

The Bridge No. 2 is a single span cast-in-place rigid frame concrete structure with a northeast-southwest orientation that carries two lanes of vehicular traffic over a branch of the Humber River. Bridge No. 2 is located to the east of Bridge No. 1. Constructed in 1956 by Lloyd P. Finnegan Construction Co. based on designs by Duncan Hopper & Associates, Consulting Engineers, the bridge measures 14.51 m long and has an overall width of 8.47 m (Town of Caledon 2019b). 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*.

The Duffy's Lane Bridge is a single span cast-in-place rigid frame concrete structure with a northwest-southeast orientation that carries two lanes of vehicular traffic over a branch of the Humber River. Duffy's Lane Bridge is located along Duffy's Lane to the south of Patterson Side Road. The OSIM report notes that the bridge was constructed in 1950 however an examination of original bridge drawings and Town records revealed the structure to have been constructed in 1957 by J. M. Fuller Ltd. based on designs by Duncan Hopper & Associates, Consulting Engineers. The bridge measures 10.6 m long and has an overall width of 8.9 m (Town of Caledon 2019c). 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*.





Figure 1: Location of the study area

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

As these structures were constructed prior to 1956 and/or span a Canadian Heritage River Watershed, a CHER is required to determine if the bridges retain cultural heritage value (Municipal Engineers Association 2014). Research was completed to investigate, document, and evaluate the cultural heritage value of the subject bridges. The CHER was conducted by Johanna Kelly, with field work completed by Meredith Stewart, under the senior project management of Annie Veilleux, all of ASI.

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 detailed research outlining a historical overview of the design and construction of the bridge within the broader context of the surrounding township and bridge construction generally; and
- Evaluate the bridge using *O. Reg. 9/06, Criteria for Determining Cultural Heritage Value or Interest*, of the *Ontario Heritage Act* and the Ontario Heritage Bridge Guidelines and draw conclusions about the cultural heritage value or interest of the structure.

The information contained in this report is organized in such a way to inform the evaluation of the subject bridge against criteria outlined in *O. Reg. 9/06*. These criteria are divided into three sections: Historical and Associative Value, Design and Physical Value, and Contextual Value.

## 1.1 Location and Study Area Description

A field review was undertaken by Meredith Stewart, Cultural Heritage Technician, ASI, on October 22, 2020 to conduct photographic documentation of the Patterson Side Road bridge crossings from the existing right-of-way and to collect data relevant for completing a heritage evaluation of the structure. A second field visit was conducted by Meredith Stewart on November 24, 2020 to photograph the Duffy's Lane Bridge. Photographic plates illustrating the conditions of each bridge are available in Appendix A (Bridge No. 1), Appendix B (Bridge No. 2), and Appendix C (Duffy's Lane Bridge).

Bridge No. 1 and Bridge No. 2 are located approximately 150 m from each other, on Patterson Side Road, on either side of Duffy's Lane. The Duffy's Lane bridge is located just southeast of this intersection (Figure 2). The bridges are surrounded by natural vegetation. All three bridges are currently owned and maintained by the Town of Caledon. The Toronto Region Conservation Authority (TRCA) property at 16500 Highway 50 is Listed on the Town of Caledon's Heritage Register and is adjacent to Bridge No. 1 and Duffy's Lane Bridge, located in part at the south corner of Patterson Side Road and Duffy's Lane. It was noted that because of the expansive nature of this property its cultural heritage resources and/or attributes are not in the vicinity of Patterson Side Road (S. Drummond, email communication, 28 October 2020). Worthy of note are the stone culvert located to the northwest of Bridge No. 1 along the Caledon Trailway Path, designated under Part IV of the *Ontario Heritage Act* (By-law 96-31) and the bridge carrying the Caledon Trailway Path over Duffy's Lane to the northwest of the intersection of Patterson Side Road and Duffy's Lane, which is Listed on the Town of Caledon's Heritage Register (S. Drummond, email communication, 28 October 2020). While both structures are in close proximity to all three subject bridges, neither are directly adjacent. All three bridges cross branches of the Humber River, which is designated as a Canadian Heritage River System (Canadian Heritage Rivers System n.d.).

According to the 2019 inspection report, Bridge No. 1 carries two lanes of motor traffic across a total deck length of 7.15 m (Town of Caledon 2019a). The deck has a travel width of 6.29 m with an overall structure width of 7.34 m. The OSIM report indicates the posted speed limit is 60 km/hr (Town of Caledon 2019a). Bridge No. 2 carries two lanes of motor traffic across a total deck length of 14.51 m (Town of Caledon 2019b). The deck has a travel width of 7.83 m with an overall structure width of 8.47 m. The OSIM report indicates the posted speed limit is 60 km/hr (Town of Caledon 2019b). The Duffy's Lane Bridge carries two lanes of motor traffic across a total deck length of 10.6 m (Town of Caledon 2019c). The deck has a travel width of 7.4 m with an overall structure width of 8.9 m. The OSIM report indicates that the posted speed limit is 60 km/hr (Town of Caledon 2019c).







Figure 2: Aerial photo. The subject bridges are depicted in red

Base Map: Google

The superstructure of Bridge No. 1 consists of a single-span cast-in-place concrete T-beam and slab (Figure 3). The deck structure consists of a cast-in-place concrete slab with an asphalt wearing surface. The deck slab is integrated with and supported by longitudinal concrete T-beams, reinforced with twisted steel rods. The abutments and wingwalls are cast-in-place concrete. The bridge includes a barrier system consisting of wooden posts with steel jackets and flexbeam guard railings. The east and west approaches consist of cast-in-place concrete slabs, an asphalt wearing surface, with galvanized steel posts and flexbeam guiderails.



Figure 3: Patterson Side Road Bridge No. 1 (ASI 2020)



The superstructure of Bridge No. 2 consists of a single-span cast-in-place concrete rigid frame structure (Figure 4). The deck structure consists of a reinforced cast-in-place concrete deck with an asphalt wearing surface. The abutments and wingwalls are cast-in-place concrete and form the legs of the deck system. The bridge includes a concrete and steel barrier system consisting of cast-in-place concrete parapet walls with steel hand railings. The east and west approaches consist of cast-in-place concrete slabs, an asphalt wearing surface, with galvanized steel posts and flexbeam guiderails.



Figure 4: Patterson Side Road Bridge No. 2 (ASI 2020)

The superstructure of Duffy's Lane Bridge a single-span cast-in-place concrete rigid frame structure (Figure 5). The deck structure consists of a reinforced cast-in-place concrete deck with an asphalt wearing surface. The abutments and wingwalls are cast-in-place concrete and form the legs of the deck system. The bridge includes a concrete and steel barrier system consisting of cast-in-place concrete posts with a welded steel barrier consisting of top and bottom rails with diagonal balusters welded between, in a zig-zag pattern. The west approach consists of cast-in-place concrete slabs, an asphalt wearing surface, with galvanized steel posts and flexbeam guiderails. The railing at the northeast corner of the intersection of Duffy's Lane and Patterson Side Road connects the approach guardrail for Duffy's Lane Bridge and Bridge No. 2. The east approach consists of an asphalt wearing surface with no barrier system.





Figure 5: Duffy's Lane Bridge (ASI 2020)

## 1.2 Policy Framework

The authority to request this CHER arises from the *Ontario Heritage Act* (1990), *Environmental Assessment Act* (1990), the Town of Caledon Official Plan (2018a), and the Region of Peel Official Plan (2018).

The following resources were among those reviewed in the preparation of this CHER:

- *Environmental Assessment Act* (Ministry of the Environment 1990)
  - *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MHSTCI 1992)
  - *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (MHSTCI 1980)
  - *Municipal Heritage Bridges: Cultural, Heritage and Archaeological Resources Assessment Checklist* (Municipal Engineers Association 2014)
- *Ontario Heritage Act* (MHSTCI 1990) and the following documents prepared by the Ministry of Tourism and Culture (MTC), now administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI):
  - 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*
  - *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (MHSTCI 2016)
- Ministry of Transportation's (MTO) *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* (2008)

### 1.3 Cultural Heritage Evaluation Process

The purpose of the CHER is to examine a property as whole, its relationship to surrounding landscapes, and its individual elements. Conducting archival 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 MHSTCI 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 *Ontario Heritage Toolkit* (Ministry of Tourism, Culture and Sport 2006, now administered by the Ministry of Heritage, Sport, Tourism and Culture Industries). 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) (Ministry of Culture and Ministry of Transportation, Ontario (MTO) 2008) and the *Ontario Heritage Bridge Program* (MHSTCI 1991) were consulted as points of reference.

The OHGB 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.

Additionally, during the site visit and as part of the evaluation process, attention is paid to surrounding cultural heritage resources that are situated in close proximity to the bridge. The identification of cultural heritage resources within the study area is based on the following definitions and concepts:

*Built heritage resources* mean one or more buildings, structures, monuments, installations or remains associated with architectural, cultural, social, political, economic, or military history, identified as being important to a community, or reflective of contextual values.

*Cultural heritage landscapes* mean a defined geographical area of heritage significance that has been modified by human activities. Such an area is valued by a community and is of significance to the understanding of the history of a people or place.

The term “significant” in the context of cultural heritage and archaeology resources refers to those that are valued for the important contribution they make to our understanding of the history of a place, an event, or a people.

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.

#### 1.4 Project Consultation

The following organizations, websites, online heritage documents, and online heritage mapping tools were consulted to confirm the existing or potential cultural heritage value of the subject bridges and to request additional information generally:<sup>1</sup>

- Caledon Heritage Register (Town of Caledon 2019d);
- The Town of Caledon Cultural Heritage Landscape Inventory (Scheinman 2009);
- The *Ontario Heritage Act Register* (Ontario Heritage Trust n.d.);
- The inventory of Ontario Heritage Trust easements (Ontario Heritage Trust n.d.);
- The *Places of Worship Inventory* (Ontario Heritage Trust n.d.);
- The Ontario Heritage Trust's *Ontario Heritage Plaque Database* (Ontario Heritage Trust n.d.);
- *Ontario's Historical Plaques* website (Brown 2019);
- Database of known cemeteries/burial sites curated by the Ontario Genealogical Society (Ontario Genealogical Society n.d.);
- Parks Canada's *Canada's Historic Places* website (Parks Canada n.d.);
- Parks Canada's *Directory of Federal Heritage Designations* (Parks Canada n.d.);

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<sup>1</sup> Reviewed 15 October 2020 and 1 December 2020



- Canadian Heritage River System (Canadian Heritage Rivers Board and Technical Planning Committee n.d.);
- United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites (UNESCO World Heritage Centre n.d.).

The following stakeholders and archives were contacted with inquiries regarding the heritage status and for information concerning all three bridges and any additional adjacent cultural heritage resources (Table 1).

Table 1: Results of Stakeholder Consultation

Contact	Organization	Date(s) of Communications	Description of Information Received
Sally Drummond, Heritage Resource Officer	Town of Caledon	21, 28, and 30 October and 9 December 2020	A response confirmed the non-heritage status of the Patterson Side Road bridges and provided information on adjacent TRCA Albion Hills Conservation Area, culverts along the former railway to the northwest, and the historical community of Palgrave. No response was received specifically regarding the heritage status Duffy's Lane Bridge however it was noted in earlier correspondence that the Duffy's Lane Bridge is the most striking of the three.
Karla Barboza, (A) Team Lead, Heritage	Ministry of Heritage, Sport, Tourism, and Culture Industries	21 and 28 October 2020	Response received. Confirmed that there are no properties designated by the Minister and no provincial heritage properties adjacent to the bridges. No concerns regarding the bridges were noted.
Kevin DeMille, Natural Heritage Coordinator	Ontario Heritage Trust	21 October and 4 November 2020	A response confirmed that the Ontario Heritage Trust does not have any conservation easements relating to the bridges and there are no Trust-owned properties adjacent.
Kyle Neill, Senior Archivist	Peel Art Galley, Museum + Archives (PAMA)	21-23, 26, 30 October and 9 and 10 December 2020	Provided digital copies of archival materials relating to the bridges and history of Palgrave.
Reference inbox	Archives of Ontario	21 October and 4 November 2020	A response indicated that any archival material that is not digitized is unavailable.

## 2.0 HISTORICAL AND ASSOCIATIVE RESEARCH

A review of available primary and secondary source material was undertaken to produce a historical overview of the study area, including a general description of Indigenous and Euro-Canadian settlement and land-use and transportation history. In addition, a review of the contractors and engineers involved in the construction of the subject bridges is also presented in this section. The following section provides the results of this research.



## 2.1 Overview of Indigenous Land Use

Southern Ontario has a cultural history that begins approximately 11,000 years ago. The land now encompassed by the Town of Caledon has a cultural history which begins approximately 10,000 years ago and continues to the present. Table 2 provides a general summary of the history of Indigenous land use and settlement of the area.<sup>2</sup>

Table 2: Outline of Southern Ontario Indigenous History and Lifeways

Period	Archaeological/ Material Culture	Date Range	Lifeways/ Attributes
<b>PALEO-INDIAN PERIOD</b>			
Early	Gainey, Barnes, Crowfield	9000-8500 BCE	Big game hunters
Late	Holcombe, Hi-Lo, lanceolate	8500-7500 BCE	Small nomadic groups
<b>ARCHAIC</b>			
Early	Nettling, Bifurcate-base	7800-6000 BCE	Nomadic hunters and gatherers
Middle	Kirk, Stanley, Brewerton, Laurentian	6000-2000 BCE	Transition to territorial settlements
Late	Lamoka, Genesee, Crawford Knoll, Innes	2500-500 BCE	Polished/ground stone tools (small stemmed)
<b>WOODLAND PERIOD</b>			
Early	Meadowood	800-400 BCE	Introduction of pottery
Middle	Point Peninsula, Saugeen	400 BCE-CE 800	Incipient horticulture
Late	Algonkian, Iroquoian	CE 800-1300	Transition to village life and agriculture
	Algonkian, Iroquoian	CE 1300-1400	Establishment of large palisaded villages
	Algonkian, Iroquoian	CE 1400-1600	Tribal differentiation and warfare
<b>POST-CONTACT PERIOD</b>			
Early	Huron, Neutral, Petun, Odawa, Ojibwa	CE 1600-1650	Tribal displacements
Late	Six Nations Iroquois, Ojibwa	CE 1650-1800's	
	Euro-Canadian	CE 1800-present	European settlement

The subject bridges are located within Treaty 19, the Ajetance Purchase, signed in 1818 between the Crown and the Mississaugas (Crown-Indigenous Relations and Northern Affairs 2016). The Ajetance purchase, or Treaty #19, included 648,000 acres of land occupying portions of present-day Halton and Peel Region as well as Dufferin and Wellington County. This area was the last large tract of land ceded by the Mississaugas of the Credit First Nation, following the settlement of the Head of the Lake purchase (Treaty #14) in 1806, and is also surrounded by Treaty #3 (1784/1792) to the west, Treaty #13 (1788/1805) to the east, and Treaty #18 (1818) to the north (Government of Canada 2016). By 1818, the Mississaugas were experiencing a rapid decline in population due to increased encroachment by settlers, and declining resources and the area to the north had just been ceded by Chippewa nations (Mississaugas of the Credit First Nation 2017a).

<sup>2</sup> While many types of information can inform the precontact settlement of Town of Caledon, this summary table provides information drawn from archaeological research conducted in southern Ontario over the last century. As such, the terminology used in this review related to standard archaeological terminology for the province rather than relating to specific historical events within the region. The chronological ordering of this summary is made with respect to two temporal referents: BCE – before Common Era and CE – Common Era.





On October 23, 1818, Deputy Superintendent William Claus met with Chief Ajetance and other delegates of the Mississaugas of the Credit First Nation to negotiate the sale of this tract of land. The payment offered for this land consisted of the yearly sum of £522 and 10 shillings in goods annually. By 1820, the Mississaugas of the Credit negotiated the sale of the remainder of their lands except for a 200-acre parcel near the mouth of the Credit River (Surtees 1984; Mississaugas of the Credit First Nation 2017b).

The Ajetance Purchase is also significant due to its relationship to the Haldimand Tract. On October 25, 1784, the Governor of Quebec Sir Frederick Haldimand signed a proclamation that allotted land six miles (10 km) on either side of the Grand River to the Six Nations People for their assistance during the American revolutionary war (Filice 2018; Surtees 1984). Upon review of the Haldimand Proclamation, however, politician and Indian Department official Sir John Johnson noted an error involving the location of the northern boundary of the tract. Governor Haldimand had mistakenly assumed in 1784 that the headwaters of the Grand River resided within the area negotiated under Treaty #3. However, the headwaters of the Grand River extend to the present-day community of Dundalk, Ontario, in Grey County, which was not negotiated until 1818 under Treaty #18. Additionally, the northern reach of the Grand River crosses through the northwestern corner of the Ajetance Purchase lands in Dufferin and Wellington County (Crown-Indigenous Relations and Northern Affairs 2016; Surtees 1984; Filice 2018). Due to this inconsistency, the northern boundaries of the Haldimand Tract were redefined in 1793 under Treaty #4 to end at Jones Base Line in Fergus, Ontario – at the boundary of Treaty #3 and Treaty #19. This decision to end the Haldimand tract within Treaty #3 lands rather than continuing the tract up to the headwaters of the Grand River is still disputed by Six Nations of the Grand River and the community continues to contest the redefined territory with the Government of Canada (Filice 2018).

## **2.2 Township and Settlement History**

Historically, the subject bridges are located in the former Township of Albion, Regional Municipality of Peel. Bridge No. 1 is located on the border between Lots 25 and 26 in Concession 5, Bridge No. 2 is located at the intersection of Lots 25 and 26, Concession 5 and 6, and Duffy's Lane Bridge is located on the border between Lots 25, Concession 5 and 6. The bridges are located to the southwest of the historical Village of Palgrave and to the east of the former Hamilton and Northwestern Railway line.

### **2.2.1 Township of Albion**

In 1788, the County of Peel was part of the extensive district known as the "Nassau District". Later called the "Home District", its administrative centre was located in Newark, now called Niagara. After the province of Quebec was divided into Upper and Lower Canada in 1792, the Province was separated into nineteen counties, and by 1852, the entire institution of districts was abolished and the late Home Districts were represented by the Counties of York, Ontario and Peel. Shortly after, the County of Ontario became a separate county, and the question of separation became popular in Peel. A vote for independence was taken in 1866, and in 1867 the village of Brampton was chosen as the capital of the new county.

The land within Albion Township was acquired by the British from the Mississaugas in 1818. The first township survey was undertaken in 1819, by surveyor James G. Chewett, and the first legal settlers



occupied their land holdings in the same year. Eleven concessions comprised the township and were laid out west to east. Early settlement and development in the area is attributed to the emergence of water-power mill sites located near the Humber River, which ran through the whole length of the township. Albion was initially settled by the children of Loyalists, soldiers who had served during the War of 1812, and by immigrants from England, Scotland and Ireland. In 1821 the population of the entire township totalled 110 and by 1848, the population had increased to 3,567. By the 1840s, the township was noted for its good farms. The census of 1871 records that the population of the Township of Albion had reached 4,857 (Smith 1846; Armstrong 1985; Rayburn 1997; Pope 1877).

The Township of Albion remained a part of the County of Peel until 1973. In 1974, the Township of Albion became a part of the Town of Caledon (Ministry of Municipal Affairs and Housing 2018).

### **2.2.2 Village of Palgrave**

Access to the northeastern portion of Albion Township was difficult during the years soon after it was surveyed, with access made difficult by the hilly terrain and dense forestation. Palgrave is one of the last villages to develop as a settlement centre in Albion for these reasons. Originally known as 'Buckstown, after 'Buck' Dolan, the inn keeper of a log hotel built in 1846 by John Boyle, the postal authorities named the village Palgrave in 1869. Two sources of this name are put forth, suggesting the village was possibly named for Francis Turner Palgrave, an English poet and professor, or possibly after Sir Robert Palgrave, a prominent English politician at the time (Morrison 2011; McLean and Mundy 2005).

The Hamilton and Northwestern Railway was extended through the area in 1877 and quickly contributed to the economic growth of Palgrave. The population doubled a year after the railways arrival. Businesses opened around this time include a new hotel, stores, a grain elevator, stockyard, and potato grading station. Lumbering was a key driver of the local economy in the late 1800s in thanks to the densely forested land and the operation of the mill and railway. Palgrave Station became a trans-shipment point for farmers shipping grain to markets in Hamilton and Toronto (Morrison 2011). The Hamilton and Northwestern Railway Company was absorbed by the Grand Trunk Railway in 1888 and later absorbed by the Canadian National Railway. Today the former rail corridor serves residents as the Caledon Trailway Path (Ontario Trails Council 2020).

Renowned Canadian landscape painter, David B. Milne (1882-1953), resided in the Village between 1929 and 1932 and depicted Palgrave in much of his work (Morrison 2011; N.A. 2020). With a population of 190 in 1971, Palgrave was one of the larger centres in Albion Township well into the late twentieth century (Roulston 1978).

Patterson Side Road was named after a longstanding local family from the north half of Albion Township (S. Drummond, email communication, 28 October 2020).

### **2.2.3 The Hamilton and North Western Railway**

The Hamilton and North Western Railway (H&NW) was formed in 1872. Construction began in 1877 and by late that year had reached Barrie and by mid-1879, Collingwood. Due to economic recession and railway politics, the H&NW merged with the Northern Railway of Canada to form the Northern &



Northwestern Railway. The Northern & Northwestern Railway was acquired by the Grand Trunk Railway in 1888, which eventually became part of the Canadian National Railway in 1923 (Cooper 2001). The rails adjacent to the subject bridges were removed in 1986 and the Town purchased the line in 1989.

The Caledon Trailway Path was constructed in 1994, after being purchased by the Town of Caledon to convert a 35 kilometre section of the former H&NW corridor into a gravel multi-use trailway from Winston Churchill Boulevard north of King Street in Terra Cotta, through Caledon East, to Mill Street west of Queen Street in Tottenham. The Caledon Trailway became the first designated portion of the Trans Canada Trail, re-named to the Great Trail (Town of Caledon 2018b).

#### **2.2.4 Review of Nineteenth and Twentieth-Century Mapping**

Historically, the subject bridges are located in the former Township of Albion, Regional Municipality of Peel. Bridge No. 1 is located on the border between Lots 25 and 26 in Concession 5, Bridge No. 2 is located at the intersection of Lots 25 and 26, Concession 5 and 6, and Duffy's Lane Bridge is located on the border between Lots 25, Concession 5 and 6.

The 1877 *Illustrated Historical Atlas of the County of Peel* (Walker and Miles 1877) was examined to determine the presence of historical features within the study area during the nineteenth century (Figure 6).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases. For instance, they were often financed by subscription limiting the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases. The use of historical map sources to reconstruct or predict the location of former features within the modern landscape generally begins by using common reference points between the various sources. The historical maps are geo-referenced to provide the most accurate determination of the location of any property on a modern map. The results of this exercise can be often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including differences of scale and resolution, and distortions introduced by reproduction of the sources.

Nineteenth century mapping indicates that Patterson Side Road and Duffy's Lane were present, in their current alignment, by the late nineteenth-century (Figure 6). The two branches of the Humber River are also illustrated, suggesting that bridges would have been present at this time to carry the roadways over the watercourses, though none are shown specifically. The Hamilton and Northwestern Railway is illustrated extending in an approximately north-south orientation to the north and west of the subject bridges. Farmsteads are illustrated on surrounding properties, suggesting that much of the land around the bridges are agricultural in nature.

In addition to nineteenth-century mapping, historical topographic mapping and aerial photographs from the twentieth century were examined. This report presents maps and aerial photographs from 1926, 1954, 1968, and 1994 (Figure 7 to Figure 10). These do not represent the full range of maps consulted for the purpose of this study but were judged to cover the full range of land uses that occurred in the area during this period.





Early twentieth century mapping suggest the area surrounding the bridges remained rural and agricultural in nature into the twentieth century. Farmsteads, orchards, and natural waterway vegetation is illustrated around the intersection of Patterson Side Road and Duffy's Lane (Figure 7). Both Patterson Side Road and Duffy's Lane are shown to be unmetalled (unpaved) roads in 1926. Bridges are depicted carrying Patterson Side Road and Duffy's Lane over the Humber River tributaries in the locations of the subject bridges but are unlabelled as to type or material. The rail corridor located to the north and west of the subject bridges is operated by the Canadian National Railways as the Hamilton, Beeton, and Allandale Branch at this time. Few changes are seen through the twentieth century. Aerial photography from the mid-twentieth century shows the bridges in much the same context, surrounded by agricultural and natural lands (Figure 8). Natural vegetation can be seen following the river courses. Detail of the bridges themselves are not visible. Topographic mapping from 1968 show Patterson Side Road and Duffy's Lane are both indicated as "loose surface, dry weather roads consisting of 2 lanes or more" (Figure 9). The surrounding context continues to be mostly agricultural and natural. The bridges are not labelled as to material or type. Topographic mapping from 1994 shows the boundary of Albion Hills Conservation Area along Patterson Side Road to the southeast of the subject bridges (Figure 10). Patterson Side Road is illustrated as a hard surface road consisting of 2 or more lanes. The subject bridges are illustrated but unlabelled as to type or material.

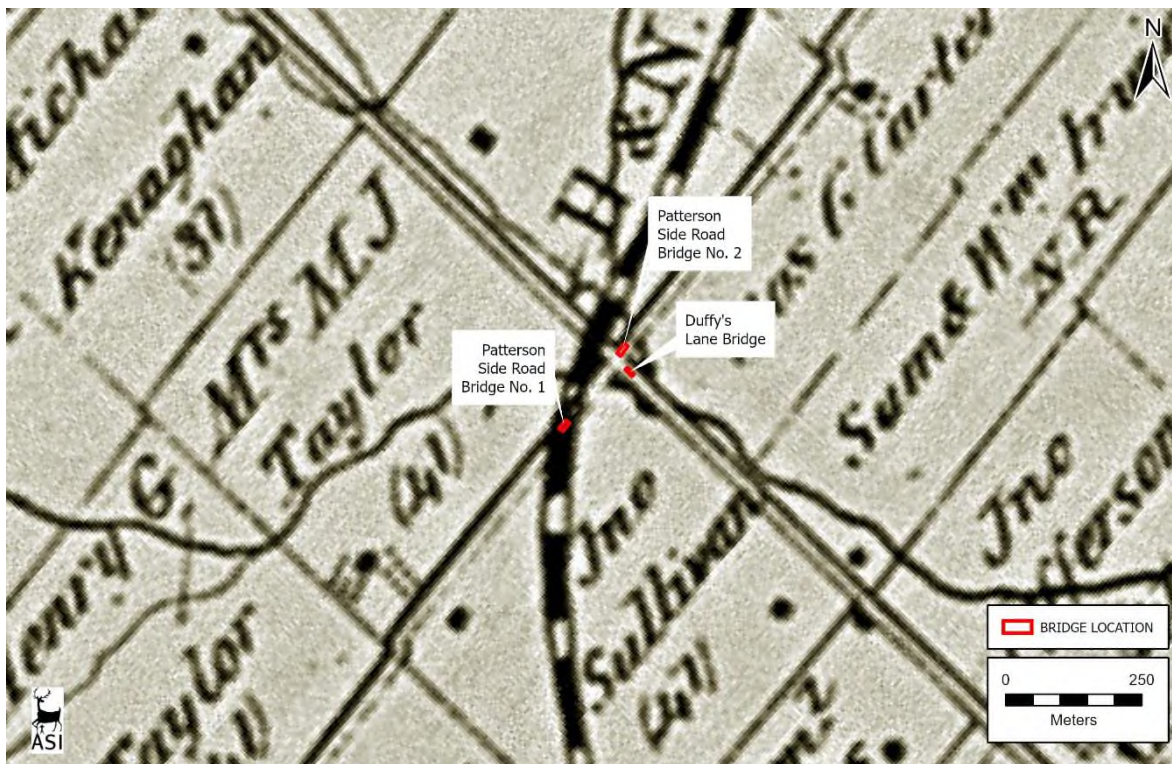


Figure 6: The study area overlaid on the 1877 Historical Atlas of the County of Peel

Base Map: (Walker and Miles 1877)



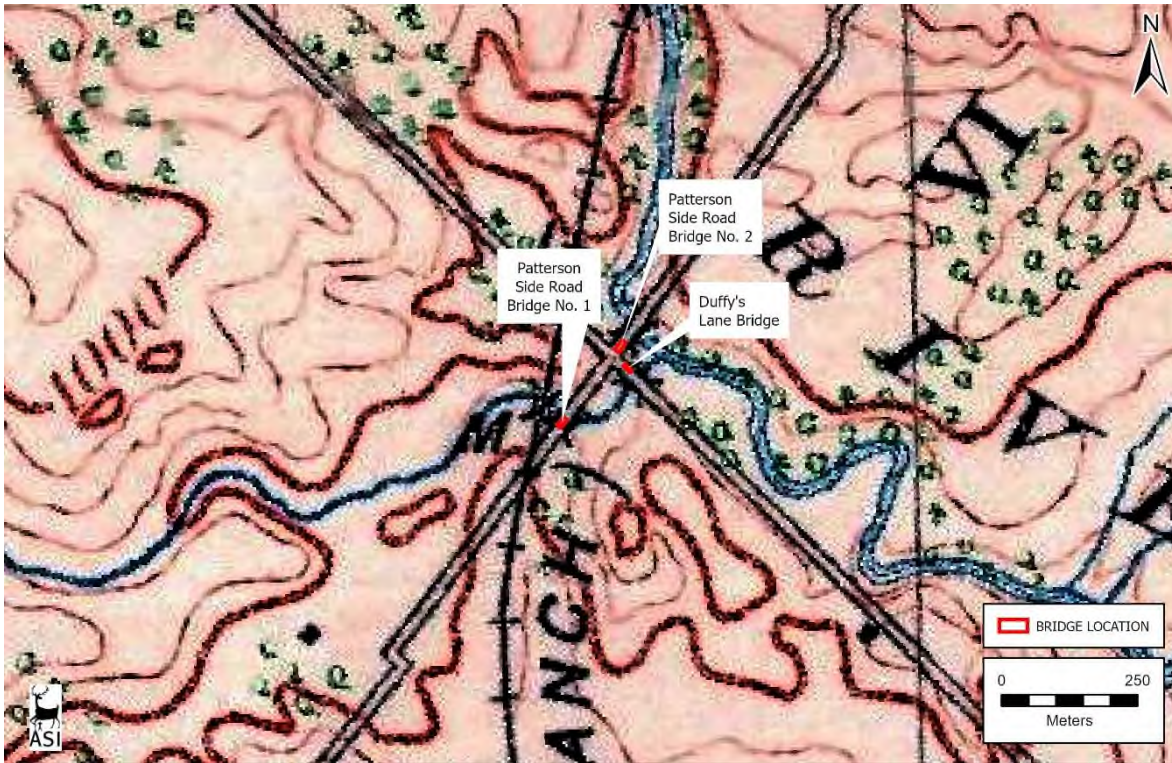


Figure 7: The study area overlaid on the 1926 topographic map of the area

Base Map: (Department of National Defence 1926)

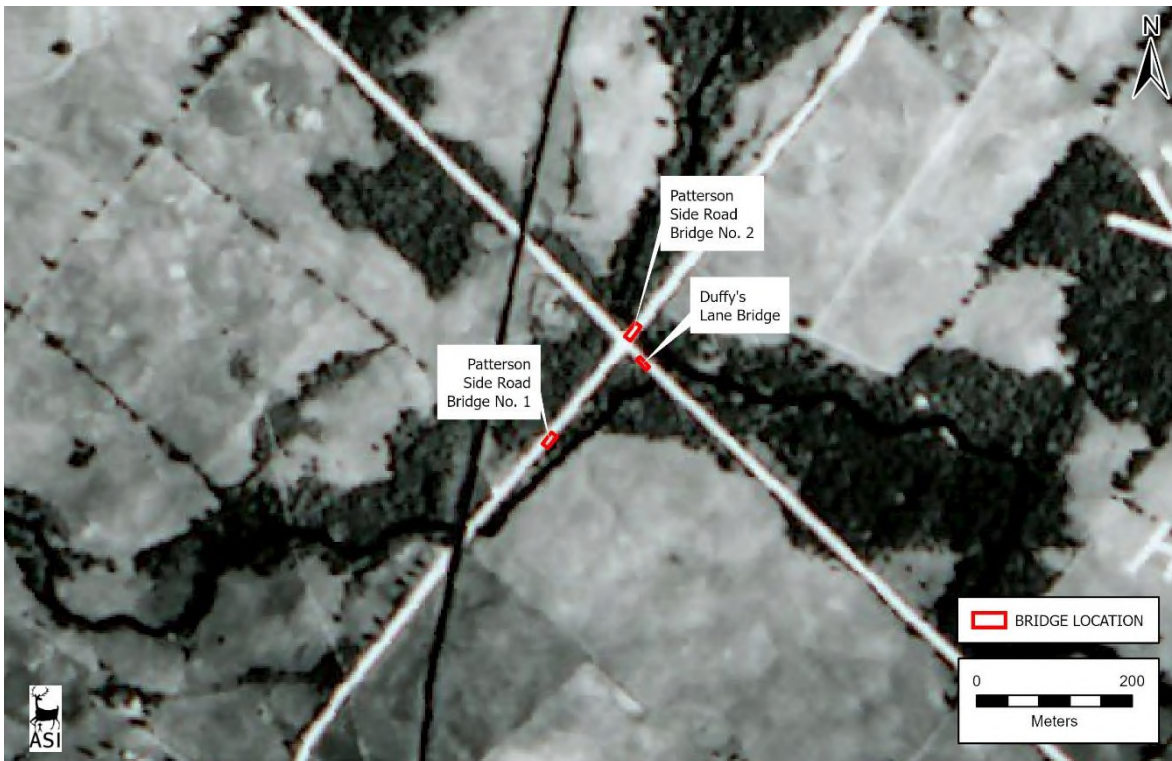


Figure 8: The study area overlaid on the 1954 aerial photograph of the area

Base Map: (Hunting Survey Corporation Limited 1954:438.794)



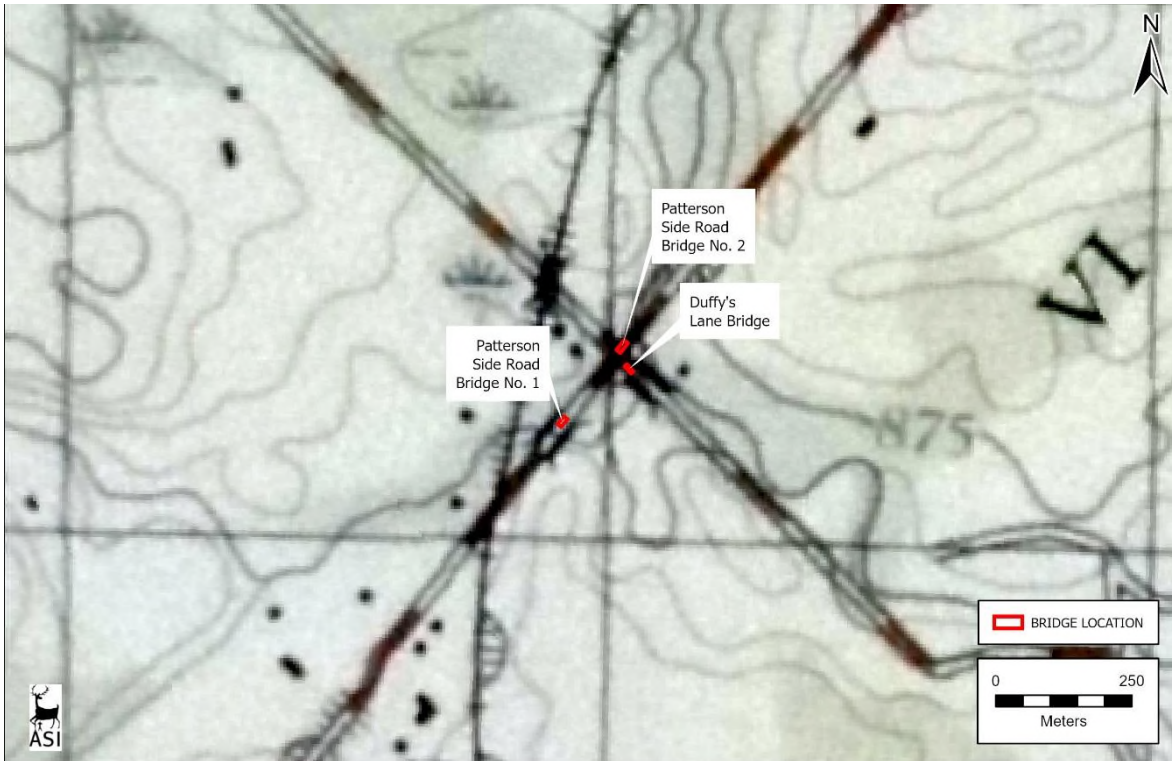


Figure 9: The study area overlaid on the 1968 topographic map of the area  
Base Map: (Department of National Defence 1968)

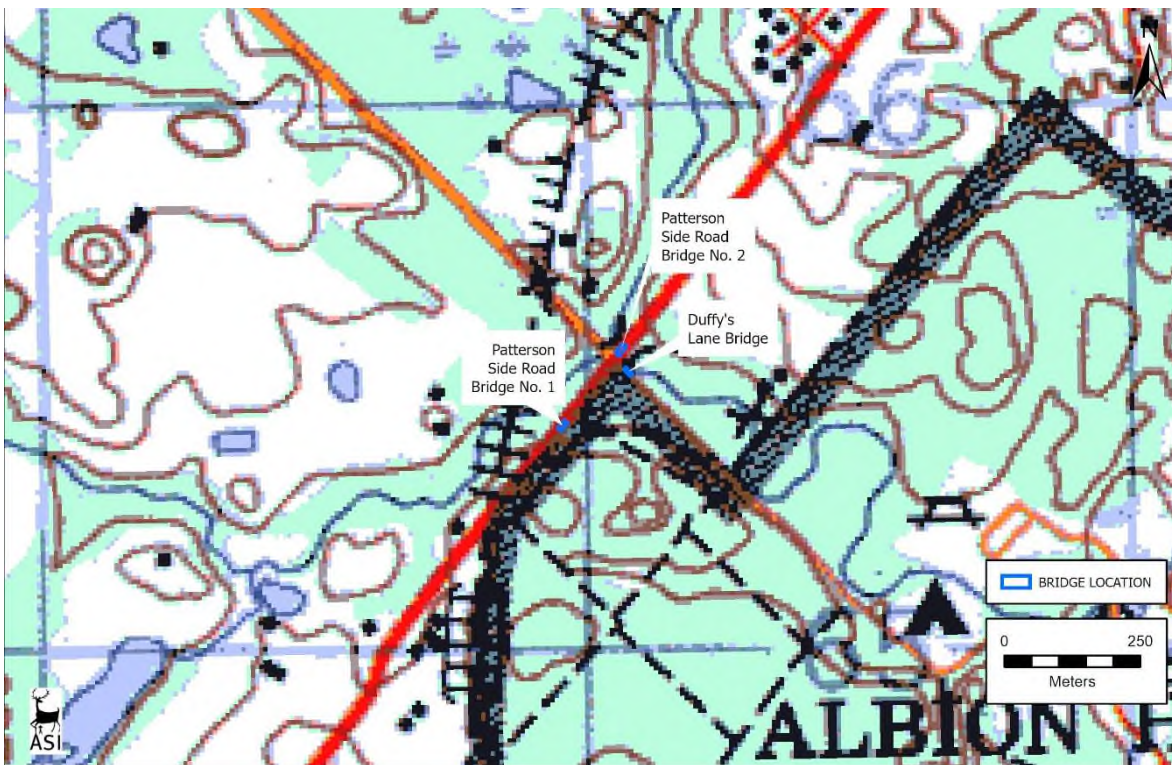


Figure 10: The study area overlaid on the 1994 NTS map of the area  
Base Map: (Department of Energy, Mines and Resources, Canada 1994)

## **2.3 Transportation History**

### **2.3.1 Previous Bridges**

The 1926 topographic map (Figure 7) and 1940 topographic map (Department of National Defence 1940) indicate that a bridge was present in the same location as each subject bridge, carrying Patterson Side Road and Duffy's Lane over the Humber River and its tributaries, prior to the construction of the subject bridges, but these are not identified as to type or material.

Council minutes dated August 30, 1956, indicate that the previous bridge which was replaced by Bridge No. 2 had collapsed on August 29 of that year (Township of Albion 1956). Township records do not indicate the style or material of this previous structure.

Council minutes dated October 17, 1957 indicate that the bridge predating the current Duffy's Lane bridge was damaged by a truck on October 15, 1957 (Township of Albion 1957a). Township records do not indicate the style or material of this previous structure however remnants of wooden piles present beneath the standing structure in the riverbed suggest that at least one earlier structure was likely wooden.

No information was found regarding bridges predating Bridge No. 1.

### **2.3.2 Early Bridge 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 their higher costs and a lack of skilled craftsman, these structures were generally restricted to market towns. By the 1890s, steel was becoming the material of choice when constructing bridges given that it 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 (Heritage Resource Centre 2008).

Factors impacting bridge design included increasing road allowances and clearance requirements, heavier traffic, higher speeds, safety standards, and most importantly, cost limitations (Cuming 1983). From the 1930s to the early 1950s, fewer bridges were constructed as a result of a steel shortage, and builders were challenged to develop more efficient ways to build structures with a heavier emphasis on concrete and minimal steel usage. 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 (Region of Waterloo: Planning, Housing, and Community Services (PHCS)) 2007). Some of the new techniques developed included: pre-casting concrete components off site; "Hi-bond type" of reinforcing concrete; and pre-stressed concrete beam construction (Heritage Resource Centre 2008). The rigid frame, hollow concrete box beam and post-tensioned voided slab are some of the bridge types to develop during this period.



### **2.3.3 T-Beam Concrete Bridge Construction**

Bridge No. 1 was constructed in 1950 and is a single-span concrete slab over concrete T-beam structure. 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.

### **2.3.4 Rigid Concrete Frame Bridge Construction**

Bridge No. 2 and Duffy's Lane Bridge are two single-span cast-in-place concrete rigid frame structures, constructed in 1956 and 1957 respectively. The rigid frame bridge design was first pioneered by German engineers and the Brazilian Emilia Baumgart and then introduced to the United States by engineer Arthur G. Hayden in the early 1920s (Troyano 2003). Hayden is credited with developing the rigid frame design for the construction of the Bronx River Parkway. In 1921, he presented the rigid frame design, distinguished by its monolithic construction technique with a rigid connection between vertical posts and horizontal beams. It would become the bridge of choice on parkways and highways. In Canada during the 1920s, the rigid frame design had not yet been widely adopted, as it employed "a complex design that was beyond the resources, or inclination of many engineers" (Andreae 1997). By the 1930s, a Canadian engineer, Hardy Cross, standardized the rigid frame design, then becoming widely used, as it provided several financial and engineering advantages. Rigid frame bridges were first constructed in Canada in 1931 by the DHO (Historica Research Limited and Archaeologix Inc. 2005). This type of bridge quickly gained popularity through the 1930s.

Introduction of the rigid frame bridge allowed for the construction of a thinner, lower deck, and required less earth piling to build up the embankments. Unlike truss style bridges, this type of bridge presented a flexible construction design that could be widened with comparative ease. The rigid frame design presented a cost-effective yet attractive bridge design that would be able to respond to the new designs and demands of highway construction throughout the 1920s and 1930s in North America. The hollow concrete box beam form became a popular choice for rigid frame bridges with longer spans and was introduced in the late 1940s and early 1950s (Ministry of Culture and Ministry of Transportation, Ontario (MTO) 2008).





## **2.4 Relevant People and Organizations**

### **2.4.1 Patterson Side Road Bridge No. 1 (B22162016)**

*J. H. Beatty, Engineer*

No information could be found about the engineer of Bridge No. 1.

### **2.4.2 Patterson Side Road Bridge No. 2 (B22164017)**

*Duncan Hopper & Associates*

The engineering firm, operated by Mr. Duncan and Mr. Hopper, collected engineering fees from the Township for many projects in the middle of the twentieth century. Council Minutes indicate that in addition to the designs for Bridge No. 2 and the Duffy's Lane Bridge, the firm was responsible for various township projects involving a municipal garage, machine shed, culvert, and subdivision road construction (Township of Albion 1956; Township of Albion 1957b).

*Department of Highways Ontario*

The Department of Highways Ontario (DHO) and Arthur Sedgwick, DHO Chief Engineer from 1929-1954, are credited with introducing the concrete rigid frame to Canada in the 1930s (Unterman McPhail Associates 2012). Sedgwick is also known for his involvement in the construction of the Spandrel Arch bridges along the Queen Elizabeth Way (St. Catharines Museum 2016). Prior to his role as DHO Chief Engineer, Sedgwick was recognized as an authority on culvert construction in Ontario. He presented at conferences and was published in the *Canadian Engineer* where he discussed culverts along with appropriate construction methods, materials, and dimensions of culverts used along roadways. He also discussed how the shape of a culvert is an important consideration to ensure proper waterflow (Sedgwick 1917). During his time as DHO Chief Engineer Arthur Sedgwick reviewed and approved the designs of many bridges and culverts within Ontario.

### **2.4.3 Duffy's Lane Bridge (B22072010)**

See Section 2.4.2 for a discussion of the engineering firm of Duncan Hopper & Associates and the DHO.

## **3.0 DESIGN AND PHYSICAL VALUE RESEARCH**

The following documents relating to Bridge No. 1 were reviewed as part of this assessment:

- Original structural drawings (Beatty n.d.),
- Rehabilitation drawings (Paul Theil Associates Ltd. 2001),
- Detailed Condition Survey Report (DCSR) (Bridge Check Canada Ltd 2019a), and



- 2019 OSIM report (Town of Caledon 2019a).

The following documents relating to Bridge No. 2 were reviewed as part of this assessment:

- Original structural drawings (Duncan Hopper & Associates 1956),
- DCSR (Bridge Check Canada Ltd 2019b),<sup>3</sup> and
- 2019 OSIM report (Town of Caledon 2019b).

The following documents relating to Duffy's Lane Bridge were reviewed as part of this assessment:

- Original structural drawings (Duncan Hopper & Associates 1957),
- Rehabilitation Drawings (Paul Theil Associates Ltd. 2000), and
- 2019 OSIM report (Town of Caledon 2019c).

A field review was undertaken by Meredith Stewart, Cultural Heritage Assistant, ASI, on October 22, 2020 to conduct photographic documentation of Bridge No. 1 and 2 and to collect data relevant for completing a heritage evaluation of the structures. A field visit for Duffy's Lane Bridge was conducted on November 24, 2020. The following description of the construction, including the dates of the interventions, and existing conditions is based on a combination of the results of the field review and historical background research on the subject bridges. Photographic plates documenting the existing conditions of the subject bridges are available in the Appendices A to C (Bridge No. 1, Appendix A; Bridge No. 2, Appendix B; Duffy's Lane Bridge, Appendix C). A selection of available original structural and rehabilitation drawings for the bridges are provided in Appendices D (Bridge No. 1), E (Bridge No. 2), and F (Duffy's Lane Bridge).

### **3.1 Patterson Side Road Bridge No. 1 (B22162016)**

#### ***3.1.1 Construction and Integrity of the Subject Bridge***

To construct this bridge, concrete was poured into wooden formwork around reinforcing steel to give the girders their characteristic T-shape. After casting, the formwork was removed and the T-beams were joined to form the deck (Region of Waterloo 2004). This style of bridge is described as representing "the next evolution in bridge technology" (Region of Waterloo 2004:1.79 and 1.23).

Original bridge drawings are undated and prepared by J. H. Beatty, Engineer, Orangeville, Ontario (Beatty n.d.). The 2019 OSIM report states that the bridge was constructed in 1950. A review of council minutes from the same year did not reveal any bridge construction projects awarded or completed and so independent confirmation of this construction date was not possible. Despite a review of Council Minutes, county and township histories, and sundry available archival documents, no further information could be gleaned about the construction of the structure.

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<sup>3</sup> The DCSR for Bridge No. 2 notes that evidence of rehabilitation work was present however rehabilitation drawings were unavailable for review.

Observations based on visual inspection and comparison to the original structural drawings reveal alterations to the original structure. The barrier and railings illustrated in the 1956 structural drawings consist of a concrete post and steel pipe and welded lattice barrier system, which has since been replaced with the current cast-in-place concrete parapet walls with steel hand railings.

Rehabilitation work on the bridge took place in 2001, including: asphalt and granular fill replacement and concrete deck patch repairs (Paul Theil Associates Ltd. 2001; Bridge Check Canada Ltd 2019a). General arrangement drawings from 2001 indicate that rehabilitation work at the time included plans to widen the bridge, install new concrete parapet walls, and place new waterproofing on deck, however, the 2019 DCSR notes no evidence of this work having taken place and these improvements were similarly noted to be absent during the 2020 field visit for this evaluation (Paul Theil Associates Ltd. 2001; Bridge Check Canada Ltd 2019a). The 2019 OSIM report notes that the railings were replaced in 2018 (Town of Caledon 2019a).

The 2019 OSIM Inspection Form recommended rehabilitation and presented the following recommendations for bridge elements in need of repairs (Town of Caledon 2019a):

- Deck top – patch and waterproof;
- Abutment walls – patch repairs;
- Abutment wingwalls – patch repairs and repair broken sections;
- Soffit, thick slab, interior – patch repairs;
- Soffit, thick slab, exterior – patch repair;
- Girders – patch repairs; and
- Embankments – restore embankment at approach.

### **3.1.2 Comparative Analysis**

Bridge No. 1 is a single span cast-in-place concrete slab bridge supported by cast-in-place reinforced concrete beams with a northeast-southwest orientation that carries two lanes of vehicular traffic across a small branch of the Humber River. This bridge is presumed to have been constructed in 1950, and measures 7.15 m in overall length with a width of 7.34 m.

The overall structure was compared with similar structures found in the Town of Caledon's OSIM Inventory, MTO's Bridge Inventory for the Central Region, the Ontario Heritage Bridge List, and the historical bridge inventory on *Historicbridges.org*. According to this comparative sample, there are 31 known cast-in-place concrete beam structures in the Southern Ontario (this list of comparative bridges is contained in Appendix G). Of these Bridge No. 1 is one of seven known structures of this type in the Town of Caledon. The closest structures from a geographic and temporal perspective include:

- Duffy's Lane Bridge (Structure ID B22068009), constructed in 1950 with a length of 14.1 m over a single span, carries Duffy's Lane over a waterway, approximately 1.3 km north of Castlederg Sideroad in the Town of Caledon (See Appendix C for images).
- Quarry Road Bridge (Structure ID B26222058), constructed in 1950 with a length of 12.9 m over a single span, carries Quarry Road over a rail corridor, approximately 0.7 km west of McLaughlan Road in the Town of Caledon.



- McLaughlin Road Bridge (Structure ID B26046055), constructed in 1960 with a length of 34 m across three spans, carries McLaughlin Road over a waterway, approximately 0.3 km north of Old Base Line in the Town of Caledon.

Glass's Bridge (Plate 11) in the Town of Innisfil is the earliest example of a cast-in-place concrete beam bridge in the comparative sample. It was built in 1913, predating the subject bridge by more than 35 years. Of the bridges in the comparative sample within the Town of Caledon, Bridge No. 1 is one of three bridges built in 1950, the oldest in the comparative sample (Plate 12). Of the 29 bridges in the comparative sample with a known construction date, 11 (or approximately 38%) were constructed in 1942 or earlier, prior to the subject bridge. Bridge No. 1 could be considered significant in terms of age within the Town of Caledon but considering the replacement of original elements, such as the barrier system, there are likely better maintained examples from the same time period in the township.

Bridge No. 1, measuring 7.2 m in overall length, is the shortest of the 10 single span bridges in this comparative sample. The Boston Mills Road Bridge (Structure ID B20104036) in the Town of Caledon, with a total length of 30 m, is the longest of the single span beam bridges. The Highway 401/Lakeridge Road Underpass is the longest bridge in the comparative sample, with a length of 118 m over seven spans. The subject bridge is not significant in terms of the overall length or number of spans.

Based on the review and comparison of the available bridges in this comparative sample, the subject bridge is not considered to be significant in terms of age, overall length, and overall number of spans.

Images are included to provide a comparison between Bridge No. 1 and other concrete beam bridge structures in Southern Ontario in Appendix A (Plate 11).

### **3.2 Patterson Side Road Bridge No. 2 (B22164017)**

#### **3.2.1 Construction and Integrity of the Subject Bridge**

Original bridge drawings are dated between September 3-5, 1956, prepared by unknown engineers (initials H. K., and J. L. H., checked by A. O. D.) at Duncan Hopper & Associates, Consulting Engineers, and approved on September 15, 1956 by A. (Arthur) Sedgwick, Chief Bridge Engineer for the Department of Highways Ontario (Duncan Hopper & Associates 1956). This structure is identified as the Humber Bridge. Township records indicate that tenders were requested on September 4, 1956, with the contract to construct the bridge awarded to Lloyd P. Finnegan Construction Co. on October 1 for a cost of \$22,200 (Township of Albion 1956). An interim payment was made in November 1956, indicating construction was underway for Bridge No. 2 at this point. Despite a review of Council Minutes, county and township histories, and sundry available archival documents, no further information could be gleaned about the construction of the structure.

No drawings were available beyond 1956 for the bridge but observations based on visual inspection and comparison to the original structural drawings reveal alterations to the original structure. The barrier and railings illustrated in the 1956 structural drawings consist of a concrete post and steel pipe barrier system, which has since been replaced with the current cast-in-place concrete parapet walls with steel hand railings. The DCSR notes that in addition to the replacement of the barrier walls, patching of the





concrete deck occurred at some point, indicating rehabilitation work had taken place prior to the condition survey in 2019 (Bridge Check Canada Ltd 2019b).

The 2019 OSIM Inspection Form recommended rehabilitation and presented the following recommendations for bridge elements in need of repairs (Town of Caledon 2019b):

- Deck top – patch, waterproof, and pave deck;
- Soffit, thick slab, interior – patch repairs;
- Soffit, thick slab, exterior – patch repair;
- Deck drainage – replace deck drain;
- Abutment walls – patch repair; and
- Abutment wingwalls – patch repair.

### 3.2.2 Comparative Analysis

Bridge No. 2 is a single span cast-in-place rigid frame concrete bridge with a northeast-southwest orientation that carries two lanes of vehicular traffic across a branch of the Humber River. This subject bridge was constructed in 1956, and measures 14.51 m in overall length with a width of 8.47 m.

The overall structure was compared with similar structures found in the Town of Caledon's OSIM Inventory, MTO's Bridge Inventory for the Central Region, the Ontario Heritage Bridge List, and the historical bridge inventory on *Historicbridges.org*. According to this comparative sample, there are 215 known cast-in-place rigid frame structures in Southern Ontario (this list of comparative bridges is contained in Appendix H). Of these, Bridge No. 2 is one of 16 structures constructed in the 1950s of this type in the Town of Caledon.<sup>4</sup> The closest structures from a geographic and temporal perspective are the following bridges constructed in the 1950s in the Town of Caledon:

- Centreville Creek Road Bridge, constructed in 1950 with a length of 5.3 m across a single span, carries Centreville Creek Road over a waterway approximately 0.2 km south of Highway 9.
- Caledon King Townline Bridge, constructed in 1950 with a length of 9.2 m across a single span, carries Caledon King Townline over a waterway approximately 0.86 km north of King Street East.
- Caledon King Townline Bridge, constructed in 1950 with a length of 7.5 m across a single span, carries Caledon King Townline over a waterway approximately 0.7 km north of King Street East.
- Caledon King Townline Bridge, constructed in 1950 with a length of 9.5 m across a single span, carries Caledon King Townline over a waterway approximately 0.6 km north of King Street East.
- Columbia Way (10<sup>th</sup> Sideroad) Bridge, constructed in 1950 with a length of 10.6 m across a single span, carries Columbia Way (10<sup>th</sup> Sideroad) over a waterway approximately 0.48 km west of Caledon King Townline South.
- Duffy's Lane Bridge, constructed in 1957 with a length of 10.6 m across a single span, carries Duffy's Lane over an unnamed tributary of the Humber River approximately 0.03 km south of Patterson Side Road.

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<sup>4</sup> The Town of Caledon's OSIM Inventory lists 15 rigid frame bridges as being built in 1950, including Bridge No. 2. Archival research indicates that Bridge No. 2 was constructed in 1956. It is possible that any of the 14 other bridges have a construction date that is not 1950 exactly, but rather within this decade, as is the case with Bridge No. 2.



The Kennedy Road Bridge (Plate 23) in the Town of Caledon is the earliest example of a cast-in-place concrete rigid frame structure in the comparative sample. It was built in 1915, predating the subject bridge by more than 40 years. This bridge is a considerable outlier as an early example of a concrete rigid frame structure in the Town, predating the second oldest bridge, built in 1950, by 35 years. The decade between 1950 and 1960 saw a significant rise in popularity of this type of structure, with 16 rigid concrete frame bridges built in the 1950s. Nine additional rigid frame bridges were built in the following decade, between 1960 and 1969. Of the 212 total bridges in the comparative sample with a known construction date, 87 (or approximately 41%) were constructed in 1955 or earlier, prior to the subject bridge. Bridge No. 2 is not considered significant in terms of age.

The subject bridge, measuring 14.2 metres in overall length, is longer than 77 of the 162 single span bridges in this comparative sample. The Mill Street Underpass in the Municipality of Clarington, with a total length of 40.6 m, is the longest of the single span rigid frame bridges. The Highway 404/401 N-W HOV Ramp Tunnel is the longest bridge in the comparative sample, with a length of 90 m. The Bloor Street underpass at Highway 401 is the longest bridge in the comparative sample with a recorded span, measuring 44.9 m in length across two spans. Bridge No. 2 is not significant in terms of the overall length or number of spans.

Based on the review and comparison of the available bridges in this comparative sample, the subject bridge is not considered to be significant in terms of age, overall length, and overall number of spans.

Images are included to provide a comparison between Bridge No. 2 and other concrete rigid frame structures in Southern Ontario in Appendix B (Plate 23).

### **3.3 Duffy's Lane Bridge (B22072010)**

#### **3.3.1 Construction and Integrity of the Subject Bridge**

Original bridge drawings are dated October 29, 1957, prepared by Duncan Hopper & Associates Ltd. (Duncan Hopper & Associates 1957). Township records indicate that the bridge on Duffy's Lane (6<sup>th</sup> Line) at 25 Sideroad (Patterson Side Road) had been "broken by a truck on October 15 1957 belonging to H. M. Young of Alliston" (Township of Albion 1957a). The Township hired the firm of Duncan & Hopper to prepare plans and estimates for the bridge. Required specifications included that the structure be of "concrete construction" and "steel re-inforced" (Township of Albion 1957c). Tenders were requested on October 21, 1967, with the contract to construct the bridge awarded to J. M. Fuller Ltd. (also recorded in Township records as J. M. Fuller & Co.) on November 18 for a cost of \$14,808.40 (Township of Albion 1957d). Despite a review of Council Minutes, county and township histories, and sundry available archival documents, no further information could be gleaned about the construction of the structure.

Rehabilitation drawings are dated 2000. General arrangement drawings indicate that the rehabilitation work included plans to replace the asphalt and gravel deck surface as well as the existing handrails, including concrete posts (Paul Theil Associates Ltd. 2000). Drawings indicate that additional repairs included: concrete patches on the deck, modification of existing deck drains, installation of new concrete posts (requiring installation of dowels on deck and wingwalls), as well as repairs to the deck underside and surfaces of abutments and wingwalls (Paul Theil Associates Ltd. 2000). The rehabilitation



drawings note that the galvanized railing elements shall be reused and they are present in the same arrangement as the original 1957 drawings.

Worthy of note are the unique railings associated with the Duffy's Lane Bridge. This barrier, consisting of top and bottom rails with diagonal balusters welded between, in a zig-zag pattern, is in contrast to 'typical' barrier systems encountered for rigid concrete frame structures. Most often this type of structure exhibits solid concrete barriers or a cast in place concrete post and railing system. The reuse of this unique railing system in 2000 during rehabilitation work is notable as it represents a sympathetic upgrade to the structure.

The 2019 OSIM Inspection Form recommended rehabilitation and presented the following recommendations for bridge elements in need of repairs (Town of Caledon 2019c):

- Abutment walls – patch repairs;
- Abutment wingwalls – patch repairs;
- Deck top – patch, waterproof, and pave;
- Soffit, thick slab, interior – patch repairs;
- Soffit, thick slab, exterior – patch repairs; and
- Curbs – patch repairs.

### **3.3.2 Comparative Analysis**

Duffy's Lane Bridge is a single span cast-in-place rigid frame concrete bridge with a northwest-southeast orientation that carries two lanes of vehicular traffic over a small branch of the Humber River. The bridge was constructed in 1957, and measures 10.6 m in overall length and 8.9 m wide (Town of Caledon 2019c).

The overall structure was compared with similar structures found in the Town of Caledon's OSIM Inventory, MTO's Bridge Inventory for the Central Region, the Ontario Heritage Bridge List, and the historical bridge inventory on *Historicbridges.org*. According to this comparative sample, there are 215 known cast-in-place rigid frame structures in Southern Ontario (this list of comparative bridges is contained in Appendix H). Of these, the Duffy's Lane Bridge is one of 16 structures constructed in the 1950s of this type in the Town of Caledon. The closest structures from a geographic and temporal perspective are the following bridges constructed in the 1950s in the Town of Caledon:

- Centreville Creek Road Bridge, constructed in 1950 with a length of 5.3 m across a single span, carries Centreville Creek Road over a waterway approximately 0.2 km south of Highway 9.
- Caledon King Townline Bridge, constructed in 1950 with a length of 9.2 m across a single span, carries Caledon King Townline over a waterway approximately 0.86 km north of King Street East.
- Caledon King Townline Bridge, constructed in 1950 with a length of 7.5 m across a single span, carries Caledon King Townline over a waterway approximately 0.7 km north of King Street East.
- Caledon King Townline Bridge, constructed in 1950 with a length of 9.5 m across a single span, carries Caledon King Townline over a waterway approximately 0.6 km north of King Street East.
- Columbia Way (10<sup>th</sup> Sideroad) Bridge, constructed in 1950 with a length of 10.6 m across a single span, carries Columbia Way (10<sup>th</sup> Sideroad) over a waterway approximately 0.48 km west of Caledon King Townline South.



- Patterson Side Road (Bridge No. 2), constructed in 1956 with a length of 14.5 m across a single span, carries Patterson Side Road over an unnamed tributary of the Humber River approximately 0.03 km east of Duffy's Lane.

The Kennedy Road Bridge (Plate 23) in the Town of Caledon is the earliest example of a cast-in-place concrete rigid frame structure in the comparative sample. It was built in 1915, predating the subject bridge by more than 40 years. This bridge is a considerable outlier as an early example of a concrete rigid frame structure in the Town, predating the second oldest bridge, built in 1950, by 35 years. The decade between 1950 and 1960 saw a significant rise in popularity of rigid concrete frame types of bridges, with 16 of these structures built in the 1950s. In other words, 50% of the 33 rigid concrete frame bridges in the Town of Caledon's inventory with a known construction date were built between 1950 and 1959. A visual review of Google Streetview photos of these bridges shows that only one other structure from this decade retains its original barrier system. The Highpoint Sideroad bridge, located east of Shaws Creek Road, features a concrete post and railing system that appears to be original to the structure and indicative of the kind of barrier system more typically seen associated with concrete rigid frame structures (Plate 36). Nine additional rigid frame bridges were built in the following decade, between 1960 and 1969. Added together with the previous decade, these bridges comprise 76% of the total rigid concrete frame bridges in the Town of Caledon's inventory. Of the 212 total bridges in the comparative sample with a known construction date, 95 (or approximately 45%) were constructed in 1956 or earlier, prior to the subject bridge. The Duffy's Lane Bridge is not considered significant in terms of age as the earliest example of concrete rigid frame construction in the Town of Caledon. However, if consideration is given to the intact nature of the bridge relative to contemporaneous structures with less sympathetic upgrades, it can be considered significant as a representation of a surge in popularity of this type of structure during the mid-twentieth century in the municipality.

The subject bridge, measuring 10.6 m in overall length, is longer than 19 of the 162 single span bridges in this comparative sample. The Mill Street Underpass in the Municipality of Clarington, with a total length of 40.6 m, is the longest of the single span rigid frame bridges. The Highway 404/401 N-W HOV Ramp Tunnel is the longest bridge in the comparative sample, with a length of 90 m. The Bloor Street underpass at Highway 401 is the longest bridge in the comparative sample with a recorded span, measuring 44.9 m in length across two spans. The Duffy's Lane Bridge is not significant in terms of the overall length or number of spans.

Based on the review and comparison of the available bridges in this comparative sample, the subject bridge is considered to be a representative example of this bridge type built in the 1950s, and was built during a period of significant popularity of this type of bridge construction in the Town of Caledon.

Images are included to provide a comparison between the Duffy's Lane Bridge and other concrete rigid frame structures in Southern Ontario in Appendix B (Plate 23).

## **4.0 CONTEXTUAL RESEARCH**

### **4.1 Setting and Character**

Bridge No. 1, Bridge No. 2, and Duffy's Lane Bridge are all located around the intersection of Patterson Side Road and Duffy's Lane, crossing branches of the Humber River in the Town of Caledon. Each





structure carries two lanes of vehicular traffic across the Humber River tributaries. The Humber River, designated as a Canadian Heritage River System, is recognized for its historical and contextual value as a significant waterway that connects Lake Ontario to the upper Great Lakes which has been settled by people for almost 10,000 years (Canadian Heritage Rivers System n.d.). The bridges are surrounded by greenspace and residential land, with dense wooded land prominently surrounding the intersection and bridges. The Caledon Trailway Path is located close by to the north, with a number of heritage structures located along its length including: a stone culvert, designated under Part IV of the *Ontario Heritage Act* (By-law 96-31), located approximately 80 m to the west of Bridge No. 1 (Appendix A, Plate 13); and a trailway bridge, listed on the Town of Caledon's Heritage Register, located approximately 180 m northwest of Bridge No. 2 and 200 m northwest of Duffy's Lane Bridge (Appendix B, Plate 24). Located to the south of Patterson Side Road and Duffy's Lane is the Albion Hills Conservation Area (16500 Highway 50), a Toronto Region Conservation Authority property that includes a historical log cabin built by the Jefferson family in 1833 and is listed on the Town of Caledon's Heritage Register (Figure 11).<sup>5</sup>



Figure 11: Heritage properties surrounding the three subject bridges.

Bridge No. 1 is one of several concrete T-beam bridges in the Town of Caledon. Concrete T-beam bridges were commonly constructed to carry roadways due to their low cost, ease of construction, and readily-available construction materials. Popular in the early to mid-twentieth century they were commonly used to replace aging nineteenth-century structures. As such, concrete slab and girder type bridges are a ubiquitous part of rural road networks, and their physical and functional connection to the roadway is not regarded as an exceptional contributor to their contextual value.

<sup>5</sup> Because of the expansive nature of this property its cultural heritage resources and/or attributes are not in the vicinity of Patterson Side Road

Bridge No. 2 and Duffy's Lane Bridge are two concrete rigid frame structures in the Town of Caledon. Similarly ubiquitous in Ontario from the 1930s onward due to their cost effective and attractive bridge design. Concrete rigid frame structures saw a surge of popularity in the Town of Caledon during the 1950s, the subject bridges are two of a total of 17 such structures constructed during this decade. Concrete rigid frame structures are a widespread part of rural road networks, and their physical and functional connection to the roadway is not regarded as an exceptional contributor to their contextual value.

## 4.2 Community Landmark

The three subject bridges are located within a rural setting along roadways extending through wooded corridors. Patterson Side Road and Duffy's Lane are not considered to be high-traffic thoroughfares and the bridges are obscured from most vantage points throughout the area. The bridges are not considered to be gateway features or to act as a significant physical or contextual division between neighbourhoods or streetscapes. Bridge No. 1 and Bridge No. 2 are not likely to be considered significant landmarks to the local community. As such, Bridge No. 1 and Bridge No. 2 are not considered to be significant community landmarks.

The Duffy's Lane Bridge is a prominent feature of the intersection of Patterson Side Road and Duffy's Lane due to the unique arrangement of the railings. This would have been even more striking before the replacement of the original railings of Bridge No. 2 as the drawings indicate these would have matched those on Duffy's Lane. Given the prominence of the railings, the Duffy's Lane Bridge could be considered to be a significant landmark.

## 5.0 CULTURAL HERITAGE VALUE

### 5.1 Patterson Road Bridge No. 1 (B22162016)

#### 5.1.1 Ontario Regulation 9/06 Evaluation

Table 3 contains the evaluation of Bridge No. 1 within the framework set out in O. Reg. 9/06. Within the Municipal EA process, O. Reg. 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 3: Evaluation of Patterson Road Bridge No. 1 (B22162016) using Ontario Regulation 9/06

<b>1. The property has design value or physical value because it:</b>	
<i>Ontario Heritage Act</i> Criteria	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	<p>The subject bridge does not meet this criterion.</p> <p>While Bridge No. 1 is one of three bridges listed on the Town of Caledon's inventory built in 1950, the relative condition of the bridge and the replacement of the original elements, such as the barrier system, diminish the bridge as a candidate for an early and intact example of a single-span cast-in-place concrete slab and beam structure.</p>





<p>ii. displays a high degree of craftsmanship or artistic merit, or;</p>	<p>The subject bridge does not meet this criterion.</p> <p>This bridge exhibits a low degree of craftsmanship or artistic merit as it is a standard example of a single-span cast-in-place concrete slab and beam structure.</p>
<p>iii. demonstrates a high degree of technical or scientific achievement.</p>	<p>The subject bridge does not meet this criterion.</p> <p>This bridge exhibits a low degree of technical achievement given its short span, easy access, and gentle water flow in the tributary below.</p>

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

<i>Ontario Heritage Act Criteria</i>	Analysis
<p>i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;</p>	<p>The subject bridge does not meet this criterion.</p> <p>The structure was constructed in 1950 in a rural agricultural area that maintained its rural character into the twenty-first century. Though the structure maintains a direct connection with Patterson Side Road, an historically surveyed road, the bridge is not an original crossing and therefore not associated with settlement, growth, and/or development in the region.</p>
<p>ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;</p>	<p>The subject bridge does not meet this criterion.</p> <p>This criterion is not satisfied given that the structure does not contribute to an understanding of a community or culture.</p>
<p>iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.</p>	<p>The subject bridge does not meet this criterion.</p> <p>No information could be found about J. H. Beatty, the engineer named on the original bridge drawings, to demonstrate this individuals local contribution to bridge design or construction in the community.</p>

**3. The property has contextual value because it:**

<i>Ontario Heritage Act Criteria</i>	Analysis
<p>i. is important in defining, maintaining or supporting the character of an area;</p>	<p>The subject bridge does not meet this criterion.</p> <p>The subject bridge carries Patterson Side Road over a tributary of the Humber River in a rural area in the Town of Caledon. The subject structure is not original to the crossing and is a replacement to an earlier bridge of unknown type. The subject bridge is not considered to define or maintain the rural character of the area.</p>
<p>ii. is physically, functionally, visually or historically linked to its surroundings, or;</p>	<p>The subject bridge does not meet this criterion.</p> <p>The location of the subject bridge has served as an historical bridging point for vehicles over the Humber River tributary and is physically associated with Patterson Side Road. However, the</p>



	subject bridge is not original to the crossing, and replaced an earlier, unknown structure.
iii. is a landmark.	The subject bridge does not meet this criterion.  The subject structure is not considered to be an important landmark or gateway structure within the Town of Caledon and is not considered to meet this criterion.

As the subject bridge was determined not to meet the criteria outlined in O. Reg. 9/06 following an evaluation, a Statement of Cultural Heritage Value was not prepared.

## 5.2 Patterson Road Bridge No. 2 (B22164017)

### 5.2.1 Ontario Regulation 9/06 Evaluation

Table 4 contains the evaluation of Bridge No. 2 within the framework set out in O. Reg. 9/06. Within the Municipal EA process, O. Reg. 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 4: Evaluation of Patterson Side Road Bridge No. 2 (B22164017) using Ontario Regulation 9/06

<b>1. The property has design value or physical value because it:</b>	
<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 bridge does not meet this criterion.  There are 15 other bridges of this type built within the 1950s in the Town of Caledon. Bridge No. 2's construction and build date are common within the Town of Caledon.  The original railing system would have matched that of the Duffy's Lane Bridge at the same intersection and the two would have stood out as a matching pair. The relative condition of the bridge and the replacement of the original elements, such as the barrier system, diminish the bridge as a candidate for an early and intact example of a single-span cast-in-place concrete rigid frame structure.
ii. displays a high degree of craftsmanship or artistic merit, or;	The subject bridge does not meet this criterion.  This bridge exhibits a low degree of craftsmanship or artistic merit as it is a standard example of a single-span cast-in-place rigid frame structure.
iii. demonstrates a high degree of technical or scientific achievement.	The subject bridge does not meet this criterion.  This bridge exhibits a low degree of technical achievement given its short span, easy access, and gentle water flow in the tributary below.



<b>2. The property has historical value or associative value because it:</b>	
<i>Ontario Heritage Act Criteria</i>	Analysis
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	<p>The subject bridge does not meet this criterion.</p> <p>The structure was constructed in 1956 in a rural agricultural area that maintained its rural character into the twenty-first century. Though the structure maintains a direct connection with Patterson Side Road, an historically surveyed road, the bridge is not an original crossing and therefore not associated with settlement, growth, and/or development in the region.</p>
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	<p>The subject bridge does not meet this criterion.</p> <p>This criterion is not satisfied given that the structure does not contribute to an understanding of a community or culture.</p>
iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	<p>The subject bridge does not meet this criterion.</p> <p>The engineering firm of Duncan, Hopper &amp; Associates was responsible for numerous bridge and culvert projects in addition to other municipal projects in the Town of Caledon however there is no evidence that this firm was significant to the community.</p>
<b>3. The property has contextual value because it:</b>	
<i>Ontario Heritage Act Criteria</i>	Analysis
i. is important in defining, maintaining or supporting the character of an area;	<p>The subject bridge does not meet this criterion.</p> <p>The subject bridge carries Patterson Side Road over a tributary of the Humber River in a rural area in the Town of Caledon. The subject structure is not original to the crossing and is a replacement to an earlier bridge of unknown type. The subject bridge is not considered to define or maintain the rural character of the area.</p>
ii. is physically, functionally, visually or historically linked to its surroundings, or;	<p>The subject bridge does not meet this criterion.</p> <p>The location of the subject bridge has served as an historical bridging point for vehicles over the Humber River tributary and is physically associated with Patterson Side Road. However, the subject bridge is not original to the crossing, and replaced an earlier, unknown structure.</p>
iii. is a landmark.	<p>The subject bridge does not meet this criterion.</p> <p>The subject structure is not considered to be an important landmark or gateway structure within the Town of Caledon and is not considered to meet this criterion.</p>



As the subject bridge was determined not to meet the criteria outlined in O. Reg. 9/06 following an evaluation, a Statement of Cultural Heritage Value was not prepared.

### 5.3 Duffy's Lane Bridge (B22072010)

#### 5.3.1 Ontario Regulation 9/06 Evaluation

Table 5 contains the evaluation of the Duffy's Lane Bridge within the framework set out in O. Reg. 9/06. Within the Municipal EA process, O. Reg. 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 5: Evaluation of Duffy's Lane Bridge (B22072010) using Ontario Regulation 9/06

<b>1. The property has design value or physical value because it:</b>	
<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 bridge meets this criterion.  The Duffy's Lane Bridge was constructed during a surge of concrete rigid frame structures in the 1950s in the Town of Caledon. The bridge is unique within the Town of Caledon in that rehabilitation work in 2000 succeeded in reusing the original galvanized railing elements and reinstalled them in their original arrangement, thus maintaining the original appearance of the bridge. The bridge can be considered a good representative example of a concrete rigid frame structure, a popular type in the 1950s in the Town of Caledon.
ii. displays a high degree of craftsmanship or artistic merit, or;	The subject bridge does not meet this criterion.  This bridge exhibits a low degree of craftsmanship or artistic merit as it is a standard example of a single-span cast-in-place rigid frame structure.
iii. demonstrates a high degree of technical or scientific achievement.	The subject bridge does not meet this criterion.  This bridge exhibits a low degree of technical achievement given its short span, easy access, and gentle water flow in the tributary below.
<b>2. The property has historical value or associative value because it:</b>	
<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 subject bridge does not meet this criterion.  The structure was constructed in 1957 in a rural agricultural area that maintained its rural character into the twenty-first century. Though the structure maintains a direct connection with Duffy's Lane, an historically surveyed road, the bridge is not an original crossing and therefore not associated with settlement, growth, and/or development in the region.



<p>ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;</p>	<p>The subject bridge does not meet this criterion.</p> <p>This criterion is not satisfied given that the structure does not contribute to an understanding of a community or culture.</p>
<p>iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.</p>	<p>The subject bridge does not meet this criterion.</p> <p>The engineering firm of Duncan, Hopper &amp; Associates was responsible for numerous bridge and culvert projects in addition to other municipal projects in the Town of Caledon however there is no evidence that this firm was significant to the community.</p>
<p><b>3. The property has contextual value because it:</b></p>	
<p><i>Ontario Heritage Act</i> Criteria</p>	<p>Analysis</p>
<p>i. is important in defining, maintaining or supporting the character of an area;</p>	<p>The subject bridge does not meet this criterion.</p> <p>The subject bridge carries Duffy's Lane over a tributary of the Humber River in a rural area in the Town of Caledon. The subject structure is not original to the crossing and is a replacement to an earlier bridge of unknown type. The subject bridge is not considered to define or maintain the rural character of the area.</p>
<p>ii. is physically, functionally, visually or historically linked to its surroundings, or;</p>	<p>The subject bridge does not meet this criterion.</p> <p>The location of the subject bridge has served as an historical bridging point for vehicles over the Humber River tributary and is physically associated with Duffy's Lane. However, the subject bridge is not original to the crossing, and replaced an earlier, unknown structure.</p>
<p>iii. is a landmark.</p>	<p>The subject bridge meets this criterion.</p> <p>The Duffy's Lane structure is a prominent feature of the intersection of Patterson Side Road and Duffy's Lane. The original and unique arrangement of the railing system stands out in contrast to the modern steel post and flexbeam guard rails of the surrounding bridges.</p>

The above evaluation confirms that the Duffy's Lane Bridge meets at least one of the criteria set out in O. Reg. 9/06 of the *Ontario Heritage Act*. In particular, it is determined that the bridge is a representative example of an intact cast-in-place concrete rigid frame structure constructed during a significant surge in construction of this bridge type, which occurred in the 1950s in the Town of Caledon. Additionally, the subject bridge is a landmark, as the unique barrier system is a prominent feature of the intersection of Patterson Side Road and Duffy's Lane. Given that the subject bridge meets at least one of the criteria contained in O. Reg. 9/06, this structure is considered to be a cultural heritage resource and is eligible for designation under the *Ontario Heritage Act*.





### **5.3.2 Proposed Statement of Significance**

#### *Description of Property*

The Duffy's Lane Bridge is located on Duffy's Lane, immediately to the south of the intersection with Patterson Side Road, in the Town of Caledon. Constructed in 1957 by J. M. Fuller Ltd. based on designs by Duncan Hopper & Associates, Consulting Engineers, the bridge is a single span cast-in-place rigid frame concrete structure measuring 10.6 m long and with an overall width of 8.9 m.

The bridge carries Duffy's Lane across a smaller branch of the Humber River, a Canadian Heritage River.

#### *Draft Statement of Significance*

The Duffy's Lane Bridge is valued for physical and contextual reasons.

Duffy's Lane Bridge was built in 1957 and is one of 16 cast-in-place reinforced concrete rigid frame structures built between 1950 and 1960 in the Town of Caledon. A single bridge of this type is listed on the Town of Caledon's bridge inventory as being constructed prior to this time, in 1915, indicating a significant surge in popularity of this bridge type in Caledon during the mid-twentieth century. Rehabilitation work to many of these bridges have included unsympathetic barrier systems, making the Duffy's Lane Bridge a uniquely representative example of bridges built during this mid-century surge in concrete rigid frame construction, as the structure retains much of its original form and appearance.

The bridge is a prominent feature of the intersection of Patterson Side Road and Duffy's Lane. The structures unique railing arrangement stands in contrast to the modern steel post and flexbeam guard rails of the surrounding bridges, a common modern upgrade to aging bridge barrier systems.

#### *Description of Heritage Attributes:*

Heritage attributes associated with Duffy's Lane Bridge include but are not limited to:

- Rehabilitated concrete and steel barrier system which reuses galvanized railing elements from the original system, in the same arrangement as the original 1957 drawings; and
- cast-in-place concrete rigid frame construction.

## **6.0 CONCLUSION AND RECOMMENDATIONS**

### **6.1 Patterson Road Bridge No. 1 (B22162016)**

Bridge No. 1 is a single span cast-in-place concrete slab structure supported by concrete beams located on Patterson Side Road in the Town of Caledon. Located approximately 0.1 km west of the intersection of Patterson Side Road and Duffy's Lane, the bridge carries two lanes of vehicular traffic over a small branch of the Humber River. Original bridge drawings are undated however the OSIM report indicates that this bridge was constructed in 1950. The bridge was constructed based on designs drawn by J. H.



Beatty, an engineer based in Orangeville. Rehabilitation work was planned for 2001 however no improvements were noted during the site visit for this evaluation. The bridge measures 7.15 m long and has an overall width of 7.34 m.

Based on the results of archival research, an analysis of bridge design and construction in Ontario, field investigations, and application of O. Reg. 9/06 of the *Ontario Heritage Act*, Bridge No. 1 was determined not to have cultural heritage value.

The following recommendations are proposed for Bridge No. 1:

1. This report should be submitted by the proponent to heritage staff at the Town of Caledon and with the Ministry of Heritage, Tourism, Sport and Cultural Industries for review.

## **6.2 Patterson Road Bridge No. 2 (B22164017)**

Bridge No. 2 is a single span cast-in-place rigid frame concrete structure located on Patterson Side Road in the Town of Caledon. Located approximately 150 m to the east of Bridge No. 1, the bridge carries two lanes of vehicular traffic over a branch of the Humber River. Constructed in 1956 by Lloyd P. Finnegan Construction Co. based on designs by Duncan Hopper & Associates, Consulting Engineers, the bridge was rehabilitated at some point prior to 2019. Rehabilitation work included replacement of the original barrier system, which would have matched the original railings for the Duffy's Lane Bridge. The bridge measures 14.51 m long and has an overall width of 8.47 m.

Based on the results of archival research, an analysis of bridge design and construction in Ontario, field investigations, and application of O. Reg. 9/06 of the *Ontario Heritage Act*, Bridge No. 2 was determined not to have cultural heritage value.

The following recommendations are proposed for Bridge No. 2:

1. This report should be submitted by the proponent to heritage staff at the Town of Caledon and with the Ministry of Heritage, Tourism, Sport and Cultural Industries for review.

## **6.3 Duffy's Lane Bridge (B22072010)**

Duffy's Lane Bridge is a single span cast-in-place rigid frame concrete structure with a northwest-southeast orientation that carries two lanes of vehicular traffic over a small branch of the Humber River. The bridge is located immediately south of Patterson Side Road, on Duffy's Lane, in the Town of Caledon. The Duffy's Lane bridge was designed by Duncan Hopper & Associates Ltd., consulting engineers for the Town, and constructed by J. M. Fuller Ltd. In November of 1957. It was rehabilitated in 2000. The structure measures 10.6 m in overall length and 8.9 m in overall width.

Based on the results of archival research, an analysis of bridge design and construction in Ontario, field investigations, and application of O. Reg. 9/06 of the *Ontario Heritage Act*, the Duffy's Lane Bridge was determined to have cultural heritage value for physical and contextual reasons. The bridge is considered an intact and representative example of a concrete rigid frame structure, a type which saw a surge of



popularity during the 1950s in the Town of Caledon. The bridge is also a prominent feature of the intersection of Patterson Side Road and Duffy's lane due to the unique arrangement of the railing system.

Given the identified cultural heritage value of the Duffy's Lane Bridge, the following recommendations should be considered:

1. A Heritage Impact Assessment should be completed for the Duffy's Lane Bridge prior to construction, as early as possible during detailed design. This assessment should be completed by a qualified person who has relevant and recent experience in the conservation of road bridges (see Section 3.0 of the Standards and Guidelines for Conservation of Provincial Heritage Properties [MHSTCI 2014] as a guide for best practice) and submitted to heritage staff at the Town of Caledon for review and approval.
2. This report should be submitted by the proponent to heritage staff at the Town of Caledon and with the Ministry of Heritage, Tourism, Sport and Cultural Industries for review.

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**APPENDIX A: PHOTOGRAPHIC PLATES, PATTERSON SIDE ROAD BRIDGE NO. 1 (B22162016)**



Plate 1: Southern approach towards Bridge No. 1, looking northeast along Patterson Side Road.



Plate 2: Northern approach towards Bridge No. 1, looking southwest.





Plate 3: Bridge No. 1 flexbeam guiderails with galvanized steel posts lining the approach and wooden posts on the bridge.



Plate 4: Oblique view of northwest elevation of Bridge No. 1, showing concrete slab and updated barrier system.





Plate 5: Northwest elevation of Bridge No. 1, concrete slab is clearly visible sandwiched between asphalt deck and concrete support beams.



Plate 6: North abutment of Bridge No. 1.





Plate 7: South abutment of  
Bridge No. 1.



Plate 8: South abutment of  
Bridge No. 1 and view of  
concrete T-Beams



Plate 9: Cast-in-place concrete beams supporting the superstructure of Bridge No. 1.



Plate 10: View southeast beneath the bridge structure, along the waterway





Plate 11: Glass' Bridge, photographed in 2015, in the Town of Innisfil (Bevers 2020)



Plate 12: Duffy's Lane Bridge, constructed in 1950, located 1.7 km north of Castleberg Side Road (Google Street View 2016).



Plate 13: Caledon Trailway  
Stone Culvert, Designated  
Part IV (By-law 96-31)  
(Holth 2020)



**APPENDIX B: PHOTOGRAPHIC PLATES, PATTERSON SIDE ROAD BRIDGE NO. 2 (B22164017)**



Plate 14: Northeastern approach, looking southwest towards Bridge No. 2.



Plate 15: View northeast across the intersection of Patterson Side Road and Duffy's Lane, towards Bridge No. 2.





Plate 16: Southeast elevation of Bridge No. 2



Plate 17: Oblique view of northwest elevation of Bridge No. 2, south end.





Plate 18: Northwest elevation of Bridge No. 2, north end.



Plate 19: Detail of guard rail, as well as concrete parapet and steel rail barrier system.





Plate 20: View west, of the southeast elevation of the south abutment.



Plate 21: South abutment and underside of the superstructure. The seams indicating the location of formwork used to create the cast-in-place concrete is visible.





Plate 22: Underside of superstructure and north abutment



Plate 23: Kennedy Road Bridge, Town of Caledon  
(Google Maps, 2015)



Plate 24: Caledon Trailway Bridge over Duffy's Lane, located approximately 180 m northwest of Bridge No. 2 (Google Maps, 2015)



**APPENDIX C: PHOTOGRAPHIC PLATES, DUFFY'S LANE BRIDGE (B22072010)**



Plate 25: Southeastern approach, looking northwest towards Duffy's Lane Bridge



Plate 26: View southeast along western approach, from the intersection of Patterson Side Road and Duffy's Lane, towards Duffy's Lane Bridge.





Plate 27: Oblique view of northeast elevation of Duffy's Lane Bridge.



Plate 28: Oblique view of southwest elevation of Duffy's Lane Bridge.





Plate 29: Southwest elevation of the east abutment of Duffy's Lane Bridge.



Plate 30: Northeast elevation of the east abutment of Duffy's Lane Bridge.





Plate 31: Detail of guard rail, as well as cement post and steel rail barrier system.



Plate 32: Detail of cement post and steel barrier system, rehabilitated in 2000 using recycled material and designs from original 1957 structure.





Plate 33: Oblique view of cement post and steel barrier system.



Plate 34: East abutment and underside of the superstructure. Wooden piles from a previous structure are visible within the waterway.



Plate 35: Underside of superstructure and west abutment



Plate 36: Highpoint Sideroad Bridge, located 0.02 km east of Shaws Creek Road (Google Earth 2016)

**APPENDIX D: SELECT STRUCTURAL DRAWINGS FOR PATTERSON SIDE ROAD BRIDGE NO. 1 (B22162016)**







METRIC  
 CONT No. 01-02  
 MP No. 01-02  
 LONDON BRIDGE  
 WEST OF PATTERSON ROAD  
 (SEE SHEET 01-01)  
 R  
 pull legal associates limited  
 15 Glen View Blvd., Toronto, Ontario

- GENERAL NOTES:**
1. FINISH OF CONCRETE
  2. REINFORCING STEEL SHALL BE GRADE AND TYPE AS SPECIFIED ON DRAWINGS
  3. ALL REINFORCING STEEL SHALL BE PROTECTED WITH 25mm MINIMUM CLEARANCE FROM CONCRETE
  4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS
  5. ALL CONCRETE SHALL BE CAST AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS
  6. ALL CONCRETE SHALL BE CAST AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS
  7. ALL CONCRETE SHALL BE CAST AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS
  8. ALL CONCRETE SHALL BE CAST AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS

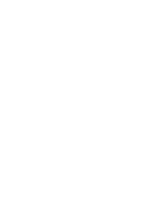
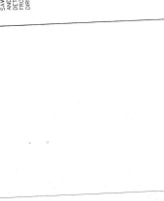
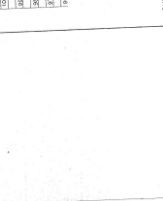
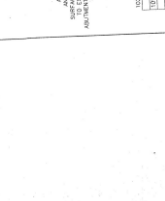
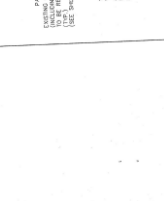
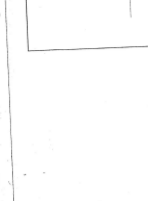
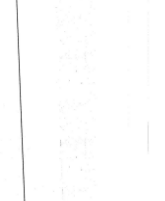
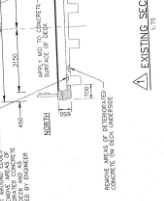
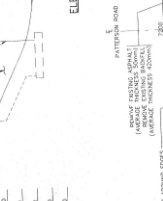
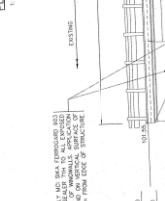
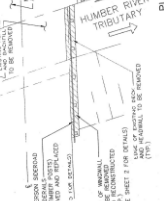
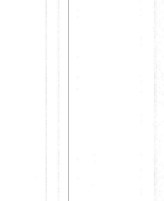
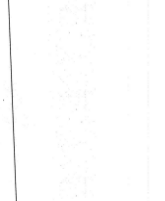
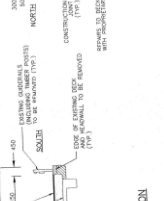
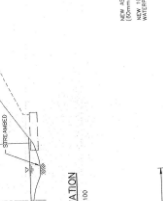
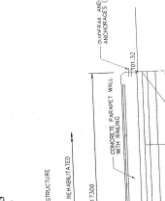
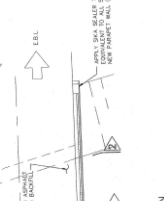
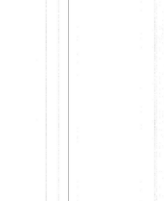
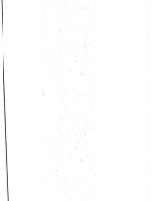
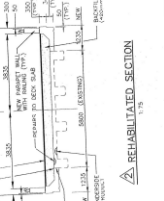
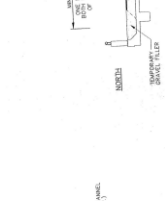
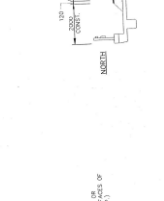
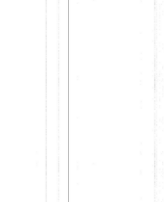
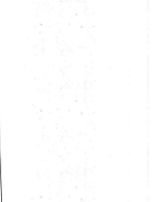
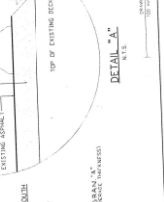
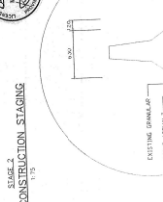
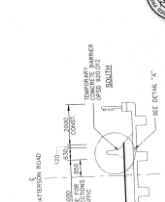
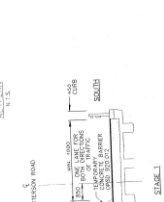
- NOTICE TO CONTRACTOR:**
- APPLICABLE STANDARD DRAWINGS  
 01-01-01 TO 01-01-10  
 01-01-11 TO 01-01-20  
 01-01-21 TO 01-01-30  
 01-01-31 TO 01-01-40  
 01-01-41 TO 01-01-50  
 01-01-51 TO 01-01-60  
 01-01-61 TO 01-01-70  
 01-01-71 TO 01-01-80  
 01-01-81 TO 01-01-90  
 01-01-91 TO 01-01-100

- LIST OF DRAWINGS:**
- SHEET 1: GENERAL INFORMATION  
 SHEET 2: TRAFFIC CONTROL PLAN  
 SHEET 3: TRAFFIC CONTROL PLAN  
 SHEET 4: TRAFFIC CONTROL PLAN  
 SHEET 5: TRAFFIC CONTROL PLAN  
 SHEET 6: TRAFFIC CONTROL PLAN  
 SHEET 7: TRAFFIC CONTROL PLAN  
 SHEET 8: TRAFFIC CONTROL PLAN  
 SHEET 9: TRAFFIC CONTROL PLAN  
 SHEET 10: TRAFFIC CONTROL PLAN

- STAGE 1: SUGGESTED SEQUENCE OF WORK IN DECK**
1. REMOVE EXISTING CURBS AND SIDEWALKS
  2. REMOVE EXISTING ASPHALT SURFACE
  3. REMOVE EXISTING REINFORCING STEEL
  4. REMOVE EXISTING CONCRETE
  5. REMOVE EXISTING CURBS AND SIDEWALKS
  6. REMOVE EXISTING ASPHALT SURFACE
  7. REMOVE EXISTING REINFORCING STEEL
  8. REMOVE EXISTING CONCRETE
  9. REMOVE EXISTING CURBS AND SIDEWALKS
  10. REMOVE EXISTING ASPHALT SURFACE
  11. REMOVE EXISTING REINFORCING STEEL
  12. REMOVE EXISTING CONCRETE
  13. REMOVE EXISTING CURBS AND SIDEWALKS
  14. REMOVE EXISTING ASPHALT SURFACE
  15. REMOVE EXISTING REINFORCING STEEL
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  17. REMOVE EXISTING CURBS AND SIDEWALKS
  18. REMOVE EXISTING ASPHALT SURFACE
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  95. REMOVE EXISTING REINFORCING STEEL
  96. REMOVE EXISTING CONCRETE
  97. REMOVE EXISTING CURBS AND SIDEWALKS
  98. REMOVE EXISTING ASPHALT SURFACE
  99. REMOVE EXISTING REINFORCING STEEL
  100. REMOVE EXISTING CONCRETE

- STAGE 2: REPAIRS TO DECK**
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- STAGE 3: FINISH WORK**
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  100. FINISH WORK









**APPENDIX E: SELECT STRUCTURAL DRAWINGS FOR PATTERSON SIDE ROAD BRIDGE NO. 2 (B22164017)**





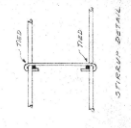
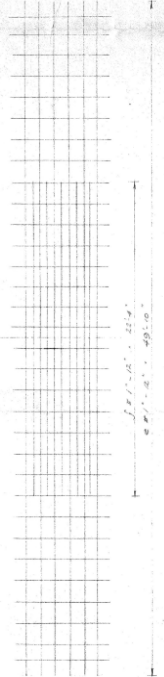
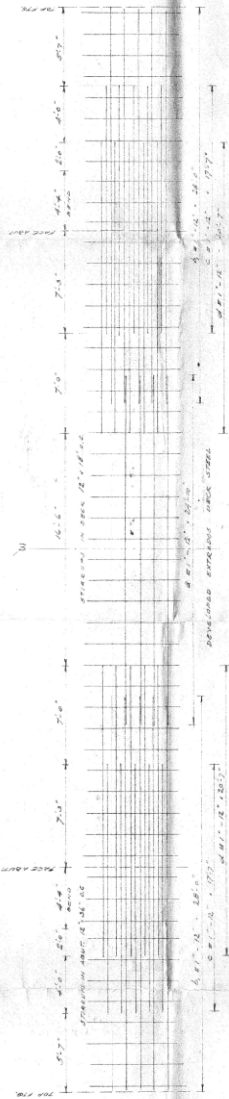
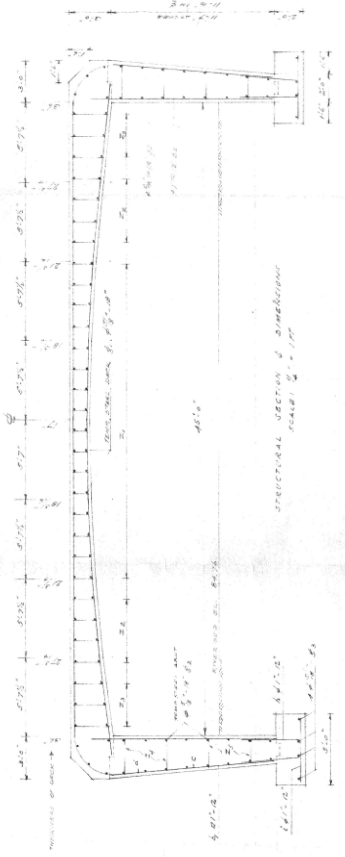
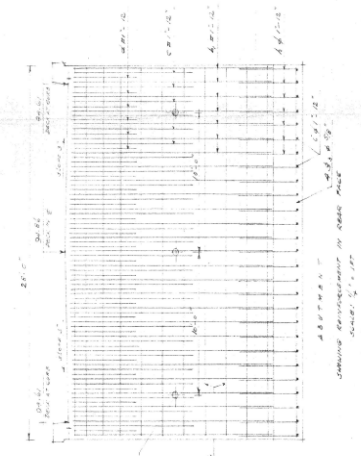


24-34

Submitted and approved  
 By: *[Signature]*  
 DEPARTMENT OF MUNICIPAL AFFAIRS  
 TORONTO

DATE	1/4	SCALE	1/4" = 1'-0"
PROJECT	HUMBER BRIDGE	CONTRACTOR	W. J. HOFFER & ASSOCIATES
LOCATION	TOWNSHIP OF ALBION	ENGINEER	W. J. HOFFER
LOT	LOTS 25 & 26 CON. 6.	DATE	SEP 15 1956
CITY	TORONTO	PROJECT NO.	8195-2

PLAN No. 8195-2



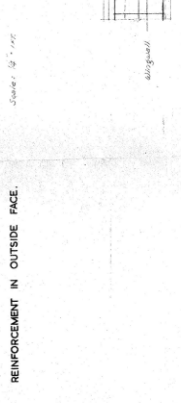
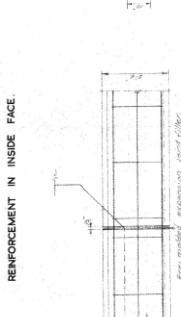
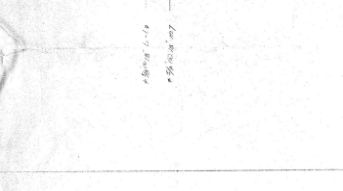
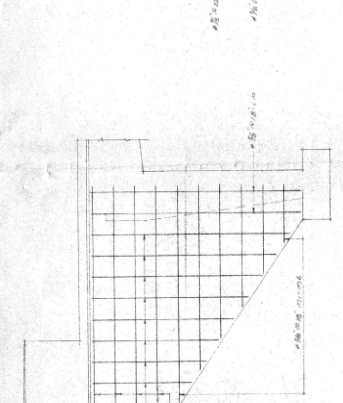
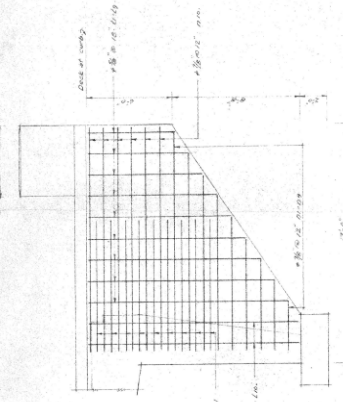
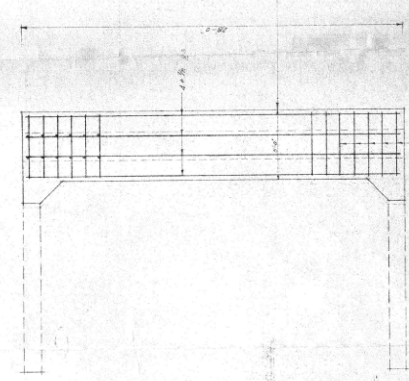
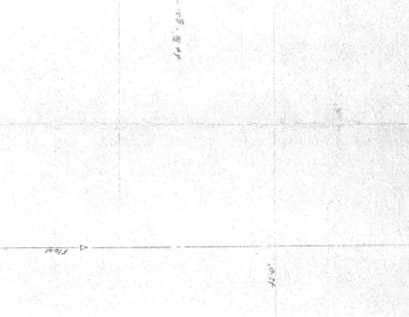
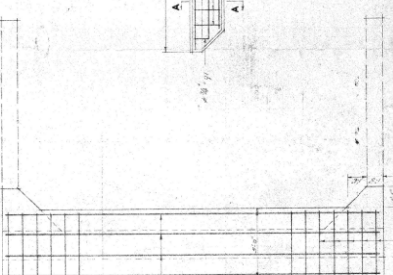
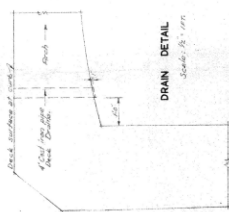
STRENGTH DETAIL  
 STRENGTH DETAIL

CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCIES TO ENGINEERS BEFORE PROCEEDING WITH THE WORK

FRAME DETAILS

HUMBER BRIDGE  
 TOWNSHIP OF ALBION  
 LOTS 25 & 26 CON. 6.

W. J. HOFFER & ASSOCIATES  
 CONSULTING ENGINEERS  
 TORONTO, CANADA



FOUNDATION, WINGWALLS, & DETAILS

DATE: 2-25-29

BY: H. W. HARRIS

CHECKED BY: H. W. HARRIS

DESIGNED BY: H. W. HARRIS

SCALE: AS SHOWN

PROJECT: TOWNSHIP OF ALBION

LOT: 25 & 26, CON. 6.

ENGINEER: H. W. HARRIS & ASSOCIATES

24-34

DETAIL OF REINFORCEMENT AT TOP OF WINGWALL

DETAIL OF REINFORCEMENT AT BOTTOM OF WINGWALL

CONCRETE END POST

SECTION A-A

REAR VIEW OF WINGWALL SHOWING REINFORCEMENT

REINFORCEMENT IN INSIDE FACE

REINFORCEMENT IN OUTSIDE FACE

CURB EXPANSION JOINT

ELEVATION

PLAN OF CURB

FOUNDATION PLAN SHOWING REINFORCEMENT

DRAIN DETAIL

PLAN No 8196-3

24-34

Submitted and approved for design by *Approved Dept of Highways*  
 Prepared by *W. Hebrack*

DATE: 10/1/50

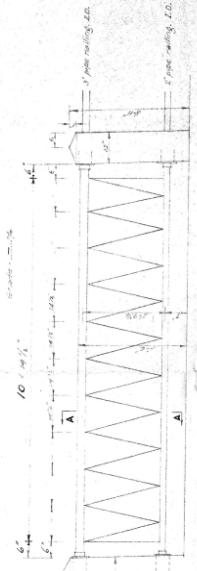
CONTRACT TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB AND REPORT ANY DISCREPANCY TO ENGINEERS BEFORE PROCEEDING WITH THE WORK.

**HANDRAIL DETAILS**

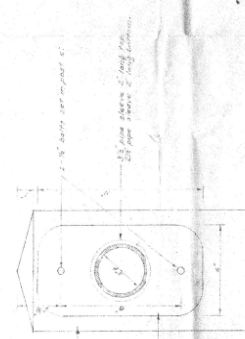
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NO. 39	NO. 40
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NO. 97	NO. 98
NO. 99	NO. 100

DUNCAN HIPPER & ASSOCIATES  
 CONSULTING ENGINEERS

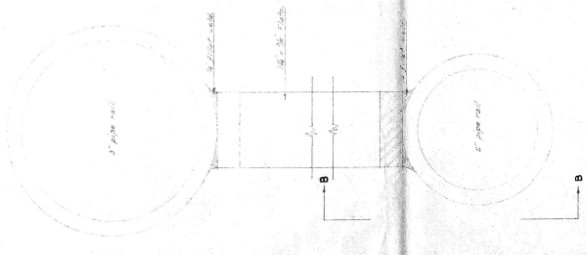
PLAN No 8196-5



ELEVATION

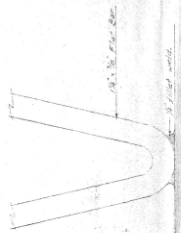


POST CONNECTION



SECTION A-A

Scale: Full Size



SECTION B-B

Scale: Full Size



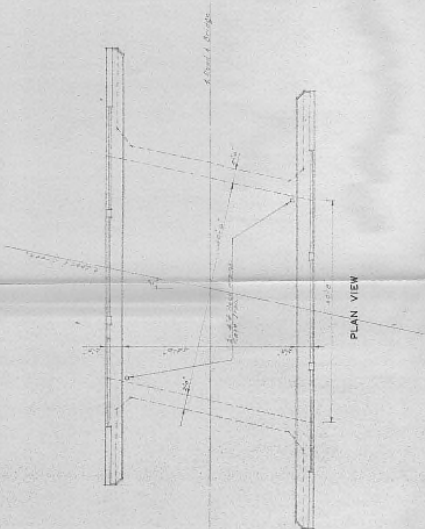
**APPENDIX F: SELECT STRUCTURAL DRAWINGS FOR DUFFY'S LANE BRIDGE (B22162016)**







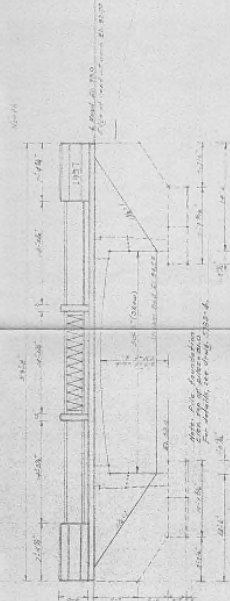
LOCATOR PLAN  
Scale: 1" = 100'



PLAN VIEW



SECTION THROUGH SPAN



ELEVATION

Examined and approved for design this 22<sup>nd</sup> day of August 1927  
 ENGINEER OF PUBLIC WORKS  
 Department of Public Works  
 TORONTO  
*(Signature)*  
 24-35 # 81841

GENERAL ARRANGEMENT PLAN	
BRIDGE	57783
LOT 35	CON. E 16
TOWNSHIP OF ALBION	16-1-11-1
DORLAND ENGINEERING CORPORATION	

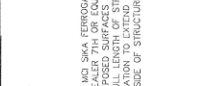
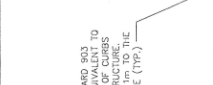
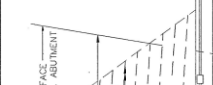
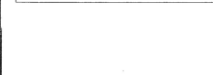
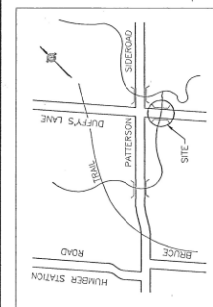


**METRIC**  
DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN

CONT No  
WP No  
TOWN OF CALEDON  
DUFFY'S LAKE (6TH LINE) SOUTH  
BRIDGE REHABILITATION  
GENERAL ARRANGEMENT

paul thell associates limited  
consulting engineers  
131 Dale Park Blvd., Burlington, Ontario

1997  
Patterson



**GENERAL NOTES:**  
1. CLASS OF CONCRETE  
- 30 MPa  
2. REINFORCING STEEL SHALL BE GRADE 400. PREFIX 'C' DENOTES COATED BARS.  
3. ALL DESIGN REQUIREMENTS SHALL BE IN ACCORDANCE WITH ONTARIO HIGHWAY BRIDGE DESIGN CODE, 3RD EDITION, 1991.  
4. THE CONTRACT DRAWINGS SHALL BE CLASS 'B' UNLESS NOT INDICATED ON INDICATED OTHERWISE.  
5. BAR HOOKS SHALL BE MINIMUM LENGTH UNLESS INDICATED OTHERWISE.  
6. CLEAR COVER TO REINFORCING STEEL: 70±20  
7. DIMENSIONS IN CONCRETE SHALL BE 25mm DEEP OR TO FIRST LAYER OF REINFORCING STEEL, WHICHEVER IS LESS.  
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF THE EXISTING WORK AND ALL DETAILS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

**NOTES ON VERTICAL CONTROLS**  
1. EXISTING VERTICAL PROFILE OF THE ROAD TO BE MAINTAINED.

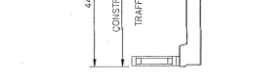
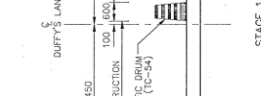
**APPLICABLE STANDARD DRAWINGS**  
SPSD-3904.01 MODIFICATION OF ROUND, VERTICAL DECK DRAIN  
SPSD-3906.00 BRIDGE DECK WATERPROOFING DETAILS  
SPSD-4010.00 GUIDE RAIL & CHANNEL ANCHORAGE  
SPSD-4670.00 TYPICAL JOINT DETAILS

**LIST OF DRAWINGS**  
SHEET 1 GENERAL ARRANGEMENT  
SHEET 2 REMOVALS  
SHEET 3 BARRIER AND RAILING RECONSTRUCTION  
SHEET 4 STANDARD AND MISCELLANEOUS DETAILS

**SCOPE & SUGGESTED SEQUENCE OF WORK IN DECK**  
**STAGE 1**  
1. PLACE TRAFFIC CONTROLS FOR STAGE 1 CONSTRUCTION.  
2. REMOVE EXISTING ASPHALT AND GRAVEL FROM DECK.  
3. REMOVE EXISTING HANDRAILS, INCLUDING CONCRETE POSTS.  
4. REMOVE ALL LUBES AND DETERRIATED CONCRETE IN DECK.  
5. APPLY MO-SHA FERROGRAD 903 TO CONCRETE SURFACES OF DECK UNDERSIDE.  
6. MAKE REPAIRS ON DECK WITH CONCRETE PATCHES.  
7. INSTALL NEW CONCRETE POSTS.  
8. INSTALL NEW ASPHALT BINDER COURSE - HL-8) AND WATERPROOFING SYSTEM ON DECK.

**STAGE 2**  
1. MOVE TRAFFIC CONTROLS FOR STAGE 2 CONSTRUCTION.  
2. REPEAT STEPS 2 TO 9 FROM STAGE 1 CONSTRUCTION.  
3. REMOVE TEMPORARY BARRIER AND PLACE NEW SURFACE COURSE (HL-4) ASPHALT ON DECK AND APPROACHES.  
4. RESTORE TRAFFIC TO ENTIRE STRUCTURE.

**OTHER COMPONENTS**  
1. MAKE REPAIRS TO HANDRAILS.  
2. APPLY MCI AND SEALER TO SURFACES OF ABUTMENTS, VINCYALLS AND DECK UNDERSIDE.



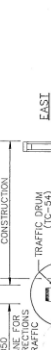
**TRAFFIC & CONSTRUCTION STAGING**  
1:7.5



**TRAFFIC & CONSTRUCTION STAGING**  
1:100



**EXISTING SECTION**  
1:7.5



**REHABILITATED SECTION**  
1:7.5



**EXISTING SECTION**  
1:100



**REHABILITATED SECTION**  
1:100



**METRIC**

DIMENSIONS ARE IN METRES  
UNLESS OTHERWISE SHOWN  
UNLESS OTHERWISE SHOWN

CONT No  
WP No

TOWN OF CALEDON  
DUFFY'S LANE (6TH LINE) SOUTH  
OF PATTERSON SIDEROAD

SHEET  
2

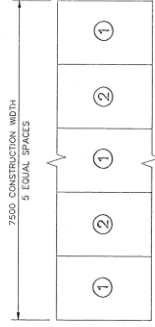
REMOVALS  
paul ihell associates limited  
consulting engineers  
131 Delta Park Blvd., Brampton, Ontario



**LEGEND**

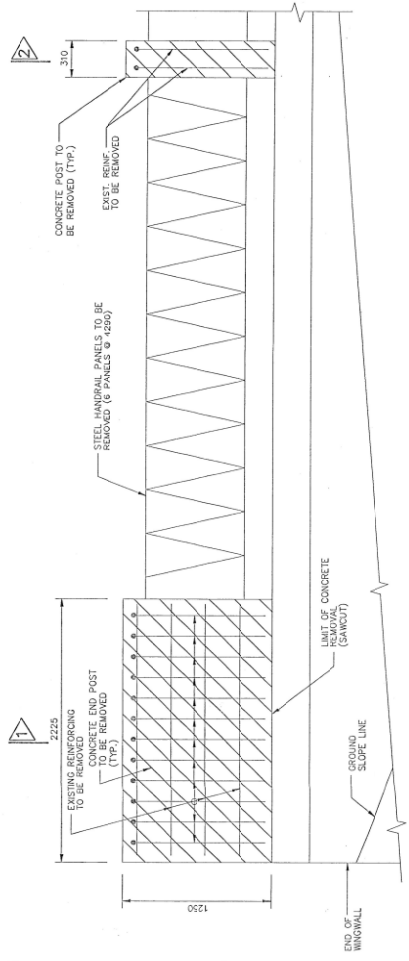


CONCRETE REMOVAL AREAS

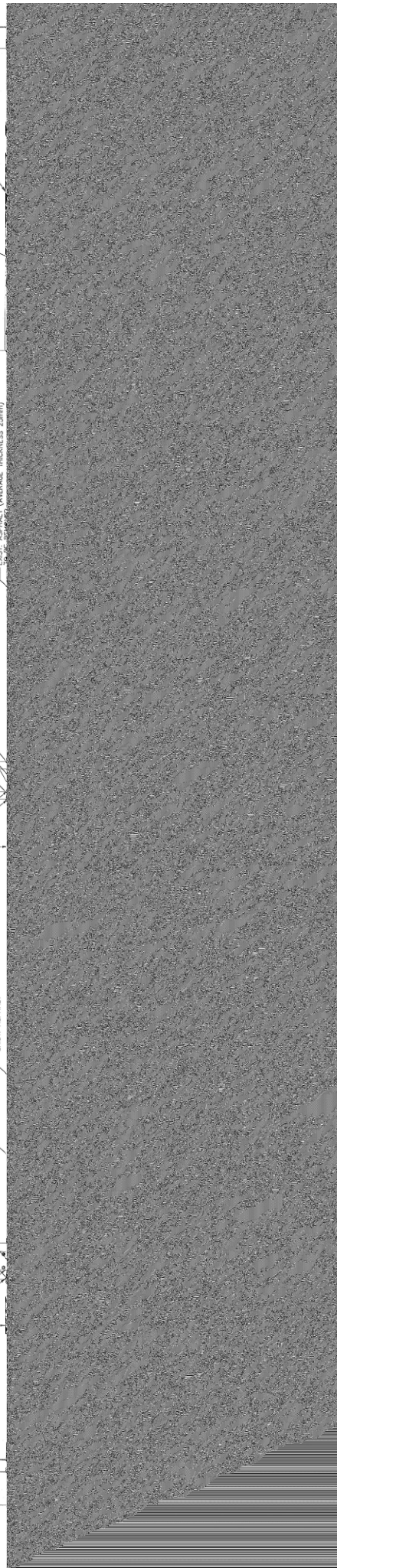
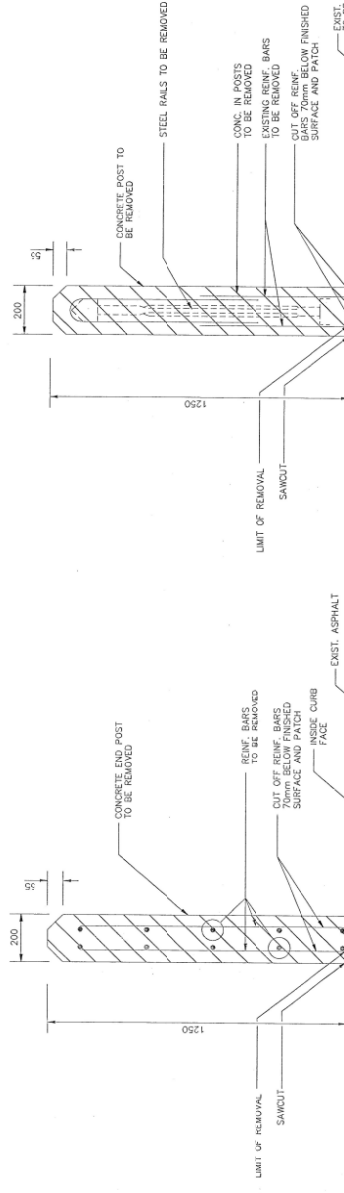


**SEQUENCE OF CONCRETE REMOVAL/PATCHING IN DECK FOR SEVERELY DETERIORATED AREAS**

- NOTES:**
1. CONCRETE REMOVAL/PATCHING TO BE AS PER INDICATED SEQUENCES UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
  2. PATCHING IN EACH AREA SHALL BE ALLOWED TO CURE FOR THREE DAYS BEFORE ANY REMOVALS AREA MADE IN THE FOLLOWING AREA.



**ELEVATION**  
1:20



**APPENDIX G: COMPARATIVE CAST-IN-PLACE CONCRETE BEAM TYPE BRIDGES**

Compiled by ASI from the Town of Caledon's OSIM Inventory (Town of Caledon 2020), the Ontario Heritage Bridge List (Ministry of Transportation 2008), MTO Central Region Structural Inventory (Ministry of Transportation n.d.), and information available at [Historicbridges.org](http://Historicbridges.org)

Table 6: Comparative Cast-in-Place Reinforced Concrete Slab on I-Girders Bridges in the Town of Caledon OSIM Inventory

No.	Name	Roadway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
B22068009	Duffy's Lane, 1.3 km North of Castlederg Sideroad	Duffy's Lane	1950	1	14.1	5.9
B22162016	Patterson Side Road (Bridge No. 1), 0.1 km West of Duffy's Lane	Patterson Side Road	1950	1	7.2	7.3
B26222058	Quarry Road, 0.7 km West of McLaren Road	Quarry Road	1950	1	12.9	7.0
B26046055	McLaughlin Road, 0.3 km North of Old Base Line	McLaughlin Road	1960	3	34.0	11.7
B20104036	Boston Mills Road, 0.02 km West of Chinguacousy Road	Boston Mills Road	1964	1	30.0	12.2
B22136014	Castlederg Sideroad, 0.8 km East of Humber Station Road	Castlederg Sideroad	1981	1	17.3	9.5
B22062008	Humber Grove Structure, Duffy's Lane, 1.2 km North of Glasgow Road	Duffy's Lane	1985	1	16.8	10.5

Table 7: Comparative Cast-in-Place Concrete T-Beam Bridges in the MTO Central Region Structural Inventory

Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
1109262	Glass's Bridge	89	1913	1	8.7	10.7
1231790	Lyons Creek - SBL	1	1941	3	30.2	12.36
1231936	Tee Creek Bridge NBL	1	1941	3	30.2	13.89
1231675	Lyons Creek Bridge (NBL)	1	1941	3	30.2	14.4
1627112	Black Creek Bridge, WBL	1	1942	3	30.2	14.48
1626827	Black Creek Bridge, EBL	1	1942	3	30.2	14
1230839	Dixie Road Underpass. At Q.E.W	1	1953	3	61.6	18
1609100	6th Line West Underpass	401	1958		62.8	10.5
1311631	Esquesing Twp Br No 5	401	1960	2	43	17.28
1212776	Hwy. 401/Lakeridge Road Underpass	401	1961	7	118	10.36
1200150	Hwy 405 - Mewburn Rd. Underpass (Formerly GRAVEL RD. BR.)	405	1962	4	64.5	10.5

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1312017	Hwy 405/NIAGARA TWP. QEW. INT.O/P	405	1962	3	116	11.03
1150530	Flamborough E. Br. #12 U/P	403	1962	4	72.2	17.98
1311818	King's Rd. U'pass	403	1962	4	75.3	10.36
1635099	Bayview Ave O/P EB Coll	401	1966	2	31	21.33
1635460	Bayview Avenue O/P WB Coll	401	1967	2	31	21.33

Table 8: Comparative Concrete T-Beam Bridges in the Heritage Bridge List

Bridge List No.	Bridge Name	Roadway	Location	Bridge Type	Length (m)	No. Spans	Year Constructed	Ownership	MTO Region	Heritage Recognition
105	Englehart River Bridge (East) Site No. 47-30	Hwy 573	Charlton and Dack (Timiskaming)	Concrete T Beam	n/a	3	1927	Province	Central	Ontario Heritage Bridge List
110	QEW Overpass at Black Creek Site No. 34-128	QEW	Fort Erie (Niagara Falls)	Single span variable depth T-beam, cantilevered end spans	30.2	3	1941	Province	Central	Ontario Heritage Bridge List

Table 9: Comparative Concrete T-Beam Bridges in Ontario found in Historic Bridges.org.

Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
Base Line Road Bridge	Over Local Creek/Drain in Rural Algoma District	n/a	1	n/a	n/a	This bridge is an example of small scale bridge construction in Ontario
Euphasia St. Vincent Townline Bridge	Over Grier Creek in Meaford and Grey Highlands	n/a	1	n/a	n/a	This is a small unaltered concrete bridge on a dead end road.
Inholmes Bridge	Broadbent Road over Manitouwabing River in Inholmes, Township of Mckeller	1920s	1	24.99	n/a	This bridge is an early and unaltered surviving example of a concrete t-beam in Ontario of decent span length for this type of bridge. The bridge stands out as locally significant.





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Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
Madawaska KH-60 Bridge	Over Madawaska River in Madawaska, Nippissing District	1942	3	48 Main Span: 17.9	n/a	Although altered and not visually remarkable, this t-beam design is uncommon in Ontario.
McDougal Line Bridge	Over Government Drain Number 1 in Chatham-Kent Region	1940	2	22.01 Main Span: 10.49	7.19	An interesting bridge with good structural integrity and attractive railings.
Queen Street Bridge	Over Teeswater River in Paisley, Bruce County	1935	3	n/a	n/a	This is a rare example of a curved t-beam in Ontario.



**APPENDIX H: COMPARATIVE CAST-IN-PLACE CONCRETE SLAB ON RIGID FRAME TYPE BRIDGES**

Compiled by ASI from the Town of Caledon's OSIM Inventory (Town of Caledon 2020), the Ontario Heritage Bridge List (Ministry of Transportation 2008), MTO Central Region Structural Inventory (Ministry of Transportation n.d.), and information available at [Historicbridges.org](http://Historicbridges.org)

Table 10: Comparative Cast-in-Place Reinforced Concrete Rigid Frame Bridges in the Town of Caledon OSIM Inventory

No.	Name	Roadway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
B26064020	Kennedy Road, 1.4 km North of Old Base Line	Kennedy Road	1915	1	13.4	5.4
B20036035	Black Creek Bridge, McLaughlin Road, 1.38 km South of Old School Road	McLaughlin Road	1950	1	10.4	8.4
B20072328	Old School Road, 0.18 km West of Heritage Road	Old School Road	1950	1	3.6	12.0
B20094245	Old School Road, 0.2 km West of Airport Road	Old School Road	1950	1	14.6	6.5
B22034035	Centreville Creek Road, 0.2 km South of Highway 9	Centreville Creek Road	1950	1	5.3	7.3
B22110003	Caledon King Townline, 0.86 km North of King Street East	Caledon King Townline	1950	1	9.2	12.9
B22110004	Caledon King Townline, 0.7 km North of King Street East	Caledon King Townline	1950	1	7.5	12.6
B22110005	Caledon King Townline, 0.6 km North of King Street East	Caledon King Townline	1950	1	9.5	14.5
B22198001	Columbia Way (10th Sideroad), 0.48 km West of Caledon King Townline South	Columbia Way (10th Sideroad)	1950	1	10.6	9.2
B26060021	Willoughby Road, 0.14 km North of Highpoint Sideroad	Willoughby Road	1950	1	9.5	8.4
B26180048	Beechgrove Sideroad, 1.0 km East of Main Street	Beechgrove Sideroad	1950	3	20.9	10.5
B26202049	Highpoint Sideroad, 0.02 km East of Shaws Creek Road	Highpoint Sideroad	1950	1	10.6	10.0
B26218346	East Garafraxa/Caledon Townline, 0.31 km East of Shaws Creek Road	East Garafraxa/Caledon Townline	1950	1	6.0	10.9
B26220347	East Garafraxa/Caledon Townline, 1.7 km East of Shaws Creek Road	East Garafraxa/Caledon Townline	1950	1	6.3	11.0
B20092243	Old School Road, 0.45 km West of Torbram Road	Old School Road	1955	1	5.8	13.4

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No.	Name	Roadway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
B22164017	Patterson Side Road (Bridge No. 2), 0.03 km East of Duffy's Lane	Patterson Side Road	1956 <sup>6</sup>	1	14.5	8.5
B22072010	Duffy's Lane, 0.03 km South of Patterson Side Road	Duffy's Lane	1957	1	10.6	8.9
B22180018	Finnerty Sideroad Bridge, 0.35 km West of Highway 50	Finnerty Sideroad	1960	1	17.4	8.7
B22302015	Mill Lane, 1.0 km East of The Gore Road	Mill Lane	1960	1	10.0	8.9
B25016043	Hickman Street Structure, 0.2 km West of Queen Street North	Hickman Street	1960	1	20.0	11.0
B26016029	Shaws Creek Road, 0.13 km North of Highpoint Sideroad	Shaws Creek Road	1960	1	6.7	10.4
B26050022	McLaughlin Road, 1.0 km North of The Grange Sideroad	McLaughlin Road	1960	1	10.9	10.4
B26146032	Grange Side Road, 0.4 km East of McLaughlin Road	The Grange Side Road	1960	1	18.6	7.7
B27326026	Dominion Street, 0.03 km North of Forks of the Credit Road	Dominion Street	1960	1	14.0	6.2
B27634041	Amelia Street, 0.03 km North of Queen Street West	Amelia Street	1960	1	10.7	10.4
B26030042	Main Street, 0.02 km North of Queen Street	Main Street	1969	1	10.5	10.9
B26024028	Mississauga Road, 0.48 km North of Queen Street	Mississauga Road	1970	1	12.4	9.9
B26050023	McLaughlin Road, 0.75 km North of the Grange Sideroad	McLaughlin Road	1980	1	16.6	8.6
B22110006	Caledon Townline South, 0.1 km North of King Road	Caledon Townline South	1982	1	12.0	17.7
B26146031	The Grange Sideroad, 0.8 km West of Hurontario Street	The Grange Sideroad	1983	1	12.2	9.4
B22002037	Innis Lake Road over West Humber River, 1.8 km South of King Street	Innis Lake Road	2012	1	6.7	17.5
B27082236	Kennedy Road, 0.4 km North of Charleston Sideroad	Kennedy Road	2016	1	8.4	11.8
B26012324	Shaws Creek Road, 0.45 km North of Charleston Sideroad	Shaws Creek Road	2017	1	6.5	13.0

Table 11: Comparative Single Span Cast-in-Place Concrete Slab Rigid Frame Bridges in the MTO Structural Inventory

Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
52767365	Cubert Street Overpass, Hwy 401 Westbound	401	1940	1	13.8	17.1
52767358	Cubert Street Overpass, Hwy 401 Eastbound	401	1940	1	13.9	17.1
52767371	Ritson Road Overpass Eastbound Lane	401	1941	1	14.5	20.8

<sup>6</sup> The date for this bridge is 1950 in the Town of Caldeon's OSIM Inventory. As the bridge drawings were dated 1956, this date has been used for the comparative analysis for the purposes of this assessment.



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Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
52767377	Ritson Road Overpass Westbound Lane	401	1941	1	14.5	20.8
52767257	Liberty Street Overpass - Eastbound	401	1950	1	13.1	24
52767263	Liberty Street Overpass - Westbound	401	1950	1	13.1	24
52772204	INNISFIL BEACH ROAD OVERPASS - N.B.L.	400	1950	1	16.1	17.43
52772210	INNISFIL BEACH ROAD OVERPASS - S.B.L.	400	1950	1	16.1	17.48
1312944	HUMBER R BR AT BALLYCROY	9	1951	1	13.5	24
52772079	HIGHWAY #93 OVERPASS - N.B.L.	11	1951	1	17.5	17.42
52772115	TIFFIN STREET OVERPASS - N.B.L.	400	1951	1	18.8	15.34
52772121	TIFFIN STREET OVERPASS - S.B.L.	400	1951	1	18.8	15.34
52772103	DUCKWORTH STREET OVERPASS - E.B.L.	400	1951	1	14.1	21.03
52772109	DUCKWORTH STREET OVERPASS - W.B.L.	400	1951	1	14.1	21.03
52772232	WEST GUILLIMBURY 9TH LINE OVERPASS - N.B.L.	400	1951	1	13.1	15.3
52772238	WEST GUILLIMBURY 9TH LINE OVERPASS - S.B.L.	400	1951	1	13.1	15.3
52772216	INNISFIL 6TH LINE OVERPASS - N.B.L.	400	1951	1	13	15.34
52772222	INNISFIL 6TH LINE OVERPASS - S.B.L.	400	1951	1	13	15.34
52772085	HIGHWAY #93 OVERPASS - S.B.L.	11	1951	1	17.5	15.29
52772141	C.N.R. OVERHEAD AT BARRIE - N.B.L.	400	1951	1	11.7	15.35
52772147	C.N.R. OVERHEAD AT BARRIE - S.B.L.	400	1951	1	11.7	15.35
52767228	BOWMANVILLE CR.BR. WIDENING	401	1951	1	20.7	41.14
52767251	BOWMANVILLE CR.BR. WIDENING	401	1951	1	20.7	41.14
52767274	Soper Creek Bridge - Westbound	401	1952	1	20.7	21.1
52767269	Soper Creek Bridge - Eastbound	401	1952	1	20.7	20.6
52772041	C.N.R. OVERHEAD AT ORILLIA - N.B.L.	11	1954	1	21.2	11.05
52772047	C.N.R. OVERHEAD AT ORILLIA - S.B.L.	11	1954	1	21.2	11.05
1992651	Highway 35/CPR Overhead, Northbound Lane	35	1954	1	21.5	12.3
1218794	CNR O'HEAD EB & WB CORE	401	1954	1	13.6	18.9
57001738	CNR O'HEAD EB & WB CORE	401	1954	1	13.6	18.9
1992657	Highway 35/CPR Overhead, SBL	35	1954	1	22.6	13.05
52767389	Wilson Road Overpass Westbound Lane	401	1955	1	14.7	20.96
1992499	Hwy 401 Lynde Creek Bridge at Whitby, WBL	401	1955	1	17.3	19
1992493	Hwy 401 Lynde Creek Bridge at Whitby, EBL	401	1955	1	17.3	22.68
52772066	WILLOW CREEK (NORTH BRIDGE) - N.B.L.	11	1955	1	13.3	13.55





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Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
52772072	WILLOW CREEK (NORTH BRIDGE) - S.B.L.	11	1955	1	13.3	13.55
52767383	Wilson Road Overpass Eastbound Lane	401	1955	1	14.7	17.3
52767346	Park Road Overpass, Hwy 401 Eastbound	401	1955	1	14.9	20.42
52767352	Park Road Overpass, Hwy 401 Westbound	401	1955	1	14.9	20.42
1311694	QEW SB COLLECTOR - HWY 2 O'PASS	1	1956	1	22	15
1311702	QEW & HWY 2 BURLINGTON O'PASS	1	1956	1	21.1	32
1311686	QEW NB COLLECTOR - HWY 2 O'PASS	1	1956	1	22.9	15.9
52767040	QEW NB COLLECTOR - HWY 2 O'PASS	1	1956	1	22.9	15.9
52767046	QEW NB COLLECTOR - HWY 2 O'PASS	1	1956	1	22.9	15.9
52767412	TORONTO TWP. BR. #15 CPR.O/H	401	1957	1	12.6	37.24
52767418	TORONTO TWP. BR. #15 CPR.O/H	401	1957	1	12.6	37.24
52767282	Clarke Township Bridge #12 CPR. O/H - Eastbound Lane	401	1958	1	18	16.5
52767291	Clarke Township Bridge #12 CPR. O/H - Westbound Lane	401	1958	1	18	16.5
52767297	Newtonville Road Overpass - Eastbound Lane	401	1958	1	21	17.39
52766861	HWY 401 & OAKVILLE CK. - EBL	401	1958	1	26.5	20.4
52766867	HWY 401 & OAKVILLE CK. - WBL	401	1958	1	26.5	20.4
1992667	Highway 401/Wilmot Creek, Eastbound Lane	401	1958	1	17.5	14.33
1992673	Highway 401/Wilmot Creek Bridge, Westbound Lane	401	1958	1	17.5	14.33
1179016	OAKVILLE CREEK/16th Mile Creek, NASSAGAWEYA TOWN SHIP - EBL	401	1958	1	19.2	16.84
1179116	OAKVILLE CR/16th Mile Creek, NASSAGAWEYA TWP, WBL	401	1958	1	19.2	16.84
52767303	Newtonville Road Overpass - Westbound Lane	401	1958	1	21	17.4
52766849	TRAFALGAR TWP BR #10 - EBL	401	1958	1	12.8	18.8
52766855	TRAFALGAR TWP BR #10 - WBL	401	1958	1	12.8	18.8
1312936	CREDIT RIVER-SOUTH BRANCH	10	1958	1	14	28.26
1613430	MILL STREET UNDERPASS	401	1958	1	40.6	16.15
52766524	HIGHWAY 401 CROSSING AT GUELPH JUNCTION EXPRESS OVERPASS-EBL	401	1959	1	19.3	16.76
52766546	HIGHWAY 401 CROSSING AT GUELPH JUNCTION EXPRESS OVERPASS-WBL	401	1959	1	19.3	16.76
1311597	CAMPBELLVILLE ROAD BRIDGE, EBL	401	1959	1	13.7	16.9
1311605	CAMPBELLVILLE ROAD BRIDGE, WBL	401	1959	1	13.7	16.9
52767004	TRAFALGAR TWP. BR. #7 EBL	401	1959	1	16.5	18.95
52767010	TRAFALGAR TWP. BR. #7 WBL	401	1959	1	16.5	18.95
52766584	NASSAGAWEYA TWP. BR. #5 O/P	401	1959	1	12.2	33.52



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Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
52766761	NASSAGAWAYA TWP. BR. #5 O/P	401	1959	1	12.2	33.52
52772192	INNISFIL TOWNSHIP C.N.R. OVERHEAD - N.B.L.	400	1960	1	12.8	15.24
52772198	INNISFIL TOWNSHIP C.N.R. OVERHEAD - S.B.L.	400	1960	1	12.8	15.24
52772029	SUNDIAL DRIVE OVERPASS - N.B.L.	11	1960	1	20.7	11.09
52772035	SUNDIAL DRIVE OVERPASS - S.B.L.	11	1960	1	20.7	11.09
1239180	O/P AT GUELPH RD., C.A.H., TWIN - EBL	403	1961	1	14.9	15.84
1313786	YORK BLVD/CHEDOKE BR #12	6	1961	1	12.2	20.72
1239208	O/P AT GUELPH RD., C.A.H., TWIN - WBL	403	1961	1	14.9	23.16
1158043	DESIARDINS CANAL BRIDGE, E.B.L.	403	1962	1	11.9	33.5
1313828	DESIARDINS CANAL BRIDGE, W.B.L.		1962	1	11.9	33.5
52772244	WEST GUILLIMBURY 13TH LINE OVERPASS - N.B.L.	400	1963	1	11.7	19.35
52772250	WEST GUILLIMBURY 13TH LINE OVERPASS - S.B.L.	400	1963	1	11.7	19.35
1650552	HWY #401 OPASS/RAMP W-N WB CORE	401	1965	1	17.1	20.4
1314802	YONGE ST BR #4	401	1965	1	21.6	12
1650268	HWY #401 O'PASS/RAMP W-N EB COL	401	1965	1	17.1	14.3
1208614	E.B.CORE TO DON VALLEY S.B OVERPASS	401	1965	1	11.1	68.87
1650386	HWY #401 O'PASS/RAMP W-N WB COL	401	1965	1	17.1	14.3
1650491	HWY #401 OPASS/RAMP W-N EB CORE	401	1965	1	17.1	27.9
1217410	CPR O/H, EASTBOUND COLLECTORS	401	1969	1	30.8	25.45
1312952	LITTLE CREDIT R. BR.	10	1969	1	10.4	29.68
1657921	BR. 2 HWY 427 NB OVER HWY 27 SB	427	1970	1	15.2	74.6
1261151	CONCESSION ROAD OVERPASS WBL	1	1972	1	29	24.93
1260639	THOMPSON ROAD OVERPASS EBL.....	1	1972	1	24.7	19.2
1260796	THOMPSON ROAD OVERPASS WBL.....	1	1972	1	24.7	19.2
1311580	CREDIT R. BR.	7	1973	1	36.5	12.2
6298221	SHAFT ROAD OVERPASS BRIDGE #11-WBL	409	1974	1	16.9	18.29
1315088	CNR OVERHEAD (MOUNT ALBERT)	48	1974	1	18.8	64.34
1199116	SHAFT ROAD OVERPASS BRIDGE #11 EBL	409	1974	1	16.8	36.57
52767400	Farwell Creek - Hwy 401- Eastbound Lane	401	1976	1	14	17.2
52767406	Farwell Creek - Hwy 401 - Westbound	401	1976	1	14	17.2
1197991	HIGHWAY 427 OVERPASS AT CAMPUS ROAD SOUTH BOUND LANE	427	1976	1	15.8	24
1197787	HIGHWAY 427 OVERPASS AT CAMPUS ROAD NORTH BOUND LANES	427	1976	1	15.8	21



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Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
1154571	RAMP E-S OVER DIXIE ROAD	401	1977	1	14.6	89.61
1224475	N-W RAMP OVER JOSHUA CREEK	1	1979	1	19.1	10.67
1224531	W-N.S Ramp over Joshua Creek	1	1979	1	19.1	8.23
1237889	Hwy 12/Vrooman Creek Bridge	12	1979	1	9.9	18.53
1237787	Vrooman Creek Bridge	12	1979	1	9.8	14.6
52766780	CNR OVERHEAD WIDENING AT HIGHWAY 401 (North Structure) WBL	401	1981	1	15.9	16.46
52766774	CNR OVEHEAD WIDENING AT HIGHWAY 401 (South Structure) EBL	401	1981	1	15.9	19.94
52767321	Fourth Line Overpass - Northbound Lane	35	1984	1	14.2	14.5
52767327	Fourth Line Overpass - Southbound Lane	35	1984	1	14.2	14.5
52767309	Third Line Overpass Hwy 35/115 - Northbound Lane	35	1984	1	13.8	14.8
52767315	Third Line Overpass Hwy 35/115 - South	35	1984	1	13.8	12
52767334	Regional Road. 4 Overpass - Northbound Lane	35	1985	1	27.1	19.3
1940634	Hwy 401 TIS Ramp Bridge	401	1985	1	12.9	44
52767340	Regional Road 4 Overpass - Southbound Lane	35	1985	1	20.3	10.8
1118377	FESSERTON ROAD OVERPASS NORTH BOUND LANE	400	1988	1	12.2	11.9
1118536	FESSERTON ROAD OVERPASS SOUTH BOUND LANE	400	1990	1	12.2	11.9
1126437	SEVERN RIVER BRIDGE PORT SEVERN SOUTH BOUND LANE	400	1991	1	30.1	11.98
2674696	Ramp FGGE E- Brown's Line S Bridge #4	1	2001	1	18.2	31.8
1313180	CNR OVERHEAD BRIDGE #3	1	2002	1	18.4	31.4
2674544	Guelph Line over NSR	1	2003	1	22.7	34.46
57050322	Caledon Creek Bridge	10	2009	1	13.9	28.5
1238386	Albert Street Underpass	401	1939	2	30.4	13.36
1238509	CNR SUBWAY AT HWY 401, OSHAWA	401	1940	2	31.3	18.3
1312904	HENRY ST -KINGSTON RD U'PASS	401	1940	2	36.5	11.67
1171201	Simcoe Street Underpass	401	1941	2	30.8	16.56
1627998	BOWEN ROAD UNDERPASS	1	1942	2	44.7	11.06
1107748	10th LINE STROUD SIDEROAD UNDERPASS	400	1947	2	32.8	10.95
1623104	BLOOR STREET U'PASS AT HWY 401	401	1952	2	44.9	12.19
52772000	SEVERN RIVER BRIDGE-WEST BRANCH - N.B.L.	11	1954	3	32	11.28
52772008	SEVERN RIVER BRIDGE-WEST BRANCH - S.B.L.	11	1954	3	32	11.28
1311589	NASSAWAGEYA TWP. #9 INT.	401	1959	2	44	11.27
1112116	ANNE STREET UNDERPASS	400	1959	2	39.3	17.07



Structure OID	Name	Highway	Year Constructed	No. Spans	Deck Length (m)	Deck Width (m)
1231200	HWY #20 UNDERPASS - LUNDY'S LANE	1	1963	2	34.7	27.12
52767028	N-W RAMP OVER JOSHUA CREEK	1	1979	2	19.1	10.67
52767034	N-W RAMP OVER JOSHUA CREEK	1	1979	2	19.1	10.67
1228481	Welland Vale Road Underpass	406	1981	2	32.6	43.7
2670160	Hwy 404/401 N-W HOV Ramp Tunnel	401	2003	n/a	90	15.4
1237694	Beaverton River Bridge	12	2007	3	37	28.49
1237514	White's Creek Bridge	12	2007	3	33	25.64

Table 12: Comparative Concrete Rigid Frame Bridges in the Heritage Bridge List

Bridge List No.	Bridge Name	Roadway	Location	Bridge Type	Length (m)	No. Spans	Year Constructed	Ownership	MTO Region	Heritage Recognition
104	Albert Street Site No. 22-177	Hwy 401	Oshawa (Durham)	Solid Slab/rigid frame, 2 span	n/a	2	1939	Province	Central	Ontario Heritage Bridge List
39	Henry Street	Henry Street	Whitby	Concrete rigid frame, double span design	n/a	2	1940	Province	Central	Ontario Heritage Bridge List
103	Simcoe Street Site No. 22-176	Hwy 401	Oshawa (Durham)	Solid Slab/rigid frame, 2 span	29	2	1941	Province	Central	Ontario Heritage Bridge List
107	Brock Street Underpass Site No. 22-151	Hwy 401	Toronto	Rigid Frame, slab 2 span	n/a	2	1942	Province	Central	Ontario Heritage Bridge List
99	400 Underpass at 89	Hwy 89 (Hwy 400)	Innisfil (Simcoe)	Concrete Rigid Frame, single span	33	1	1949	Province	Central	Ontario Heritage Bridge List



Bridge List No.	Bridge Name	Roadway	Location	Bridge Type	Length (m)	No. Spans	Year Constructed	Ownership	MTO Region	Heritage Recognition
102	400 Underpass at 88 Site No. 30-309	Hwy 88 (Hwy 400)	Innisfil (Simcoe)	Concrete Rigid Frame, single span	n/a	1	1949	Province	Central	Ontario Heritage Bridge List
101	400 Underpass at Aurora Sideroad	Aurora Sideroad (Hwy 400)	King (York)	Concrete Rigid Frame, single span	37	1	1950	Province	Central	Ontario Heritage Bridge List
100	400 Underpass at 5th Line (Pennville Road)	5th Line (Hwy 400)	W. Gwillumbury (York)	Concrete Rigid Frame, single span	29	1	1950 <sup>7</sup>	Province	Central	Ontario Heritage Bridge List

Table 13: Comparative Concrete Rigid Frame Bridges in Ontario found in Historic Bridges.org.

Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
1 <sup>st</sup> Line Bridge	Over KH 401, Halton Region	1959	2	36	10.4	One of a couple overpasses on this section of the 401 that offer a double-span configuration instead of the single span design.
6 <sup>th</sup> Concession Dougall Parkway Bridge	Over Dougall Parkway, Windsor, Essex County	1956	1	n/a	n/a	This attractive bridge is an excellent and locally rare example of a standard rigid-frame overpass in Ontario.
Allan Park Camp Creek Bridge	Over Camp Creek in West Grey, Grey County	1934	1	n/a	n/a	This bridge has railing post designs that are found on earlier 1930s rigid-frame bridges in Ontario.

<sup>7</sup> According to Historic Bridges.org this bridge no longer exists



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Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
Brimstone Bridge	Over Credit River, Caledon, Peel Region	n/a	1	14	n/a	This unaltered concrete rigid-frame bridge is noted for the concrete railing post details which differ from most rigid-frame bridges in Ontario.
Campbell Bridge	Over 20 Mile Creek, Lincoln, Niagara Region	1962	1	n/a	n/a	This is a locally noteworthy example of an unaltered standard Ontario rigid-frame bridge.
CR-109 East Bridge	Over Conestogo River, Wellington North, Wellington County	1931	1	16	11.49	One of several old and unaltered concrete bridges along this stretch of road that document a transition period in Ontario bridge design.
CR-109 Far East Bridge	Over Conestogo River, Wellington North, Wellington County	1934	1	14	11.4	One of several old and unaltered concrete bridges along this stretch of road that document a transition period in Ontario bridge design.
CR-109 West Bridge	Over Conestogo River, Wellington North, Wellington County	1931	1	19	11.58	One of several old and unaltered concrete bridges along this stretch of road that document a transition period in Ontario bridge design.
CR-74 Bridge	Over Hwy 401, Middlesex County	1956	1	n/a	n/a	One of a shrinking number of remaining attractive heritage overpass bridges crossing this highway with good historic integrity.
Domtar Line Bridge	Over South Branch of the Thames River, Oxford County	n/a	1	n/a	n/a	A relatively large single span concrete bridge.
Dorchester Road Bridge	Over Hwy 401, Middlesex County	1955	1	n/a	n/a	One of a number of remaining similar structures, this bridge is both old and unusual as an attractive expressway overpass.
Glanworth Drive Bridge	Over Hwy 401, Tempo, Middlesex County	1958	1	n/a	n/a	This beautiful vintage overpass stands out among the few surviving bridges of this type because of its skew.



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Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
Glen Miller Road Bridge	Over Hwy 401, Hastings County	1957	1	n/a	n/a	An example of a less common Ontario rigid frame overpass design which visually has a smooth arch arch, but does not blend into the abutment like other rigid frame bridges.
Grand River Street Bridge	Over Nith River, Paris, Brant County	1932	2	n/a	n/a	This bridge is an early and well-decorated example of its type. Built by Keystone Contractors.
Harriston Road Bridge	Over Maitland River	n/a	3	n/a	n/a	Multi-span rigid-frame bridges like this one are less common than single span examples in Ontario.
KH-40 Bear Creek Bridge	Over Bear Creek, Chatham-Kent Region	1959	2	n/a	n/a	This bridge is larger and features slightly different design than other bridges on this stretch of road between Chatham and Wallaceburg.
KH-40 Big Creek Bridge #1	Over Big Creek, Chatham-Kent Region	1959	1	n/a	n/a	One of several nearby, nearly identical, KH-40 bridges; while individually undistinguished, together form a unique image of the past.
KH-40 Big Creek Bridge #2	Over Big Creek, Chatham-Kent Region	1959	1	n/a	n/a	One of several nearby, nearly identical, KH-40 bridges; while individually undistinguished, together form a unique image of the past.
KH-40 Big Creek Bridge #3	Over Big Creek, Chatham-Kent Region	1959	1	n/a	15.2	One of several nearby, nearly identical, KH-40 bridges; while individually undistinguished, together form a unique image of the past.
KH-40 Big Creek Bridge #4	Over Big Creek, Chatham-Kent Region	1959	1	n/a	n/a	One of several nearby, nearly identical, KH-40 bridges; while individually undistinguished, together form a unique image of the past.
KH-40 Big Creek Bridge #5	Over Big Creek, Chatham-Kent Region	1960	1	n/a	n/a	One of several nearby, nearly identical, KH-40 bridges; while individually undistinguished, together form a unique image of the past.



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Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
						individually undistinguished, together form a unique image of the past.
KH-89 Bridge	Over Hwy 400, Simcoe County	1950	1	n/a	n/a	One of a decreasing number of attractive overpass bridges on Highway 400.
Lloydtown-Aurora Road Bridge	Over Hwy 400, York Region	1950	1	n/a	n/a	One of a decreasing number of attractive overpass bridges on Highway 400.
Mill Street Bridge	Over Hwy 401, Newcastle, Durham Region	1958	1	n/a	n/a	This bridge displays an uncommon appearance among surviving rigid frame overpass bridges.
Morgans Corners Road Bridge	Over Hwy 401, Clarington, Durham Region	1958	1	n/a	n/a	An example of a less common Ontario rigid frame overpass design which visually has a smooth arch arch, but does not blend into the abutment like other rigid frame bridges.
Roy Bridge	Over Wolf Creek, City of Hamilton	1947	1	n/a	n/a	This rigid-frame bridge has unusual cable and concrete railings.
Royal Windsor Drive Rigid-Frame Overpass	Over Royal Windsor Drive, Oakville, Halton Region	1952	2	n/a	n/a	One of two parallel railway over highway overpasses of strongly different appearance and design, this one looks more like a highway bridge.
Simcoe Street Bridge	Over Hwy 401, Oshawa, Durham region	1941	2	29	n/a	This bridge is one of a few extremely early expressway overpass bridges in Oshawa, and is recognized as a heritage bridge.
St. Clair Parkway Bridge	Over Clay Creek, Lambton County	1965	1	n/a	n/a	This bridge is a good representation of Ontario's frequently built concrete rigid-frame bridge design.
Steele's Bridge	Over Ouse River, Peterborough County	1939	2	n/a	n/a	This is a fairly old, and multi-span example of a rigid-frame bridge in Ontario.





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Name	Location	Year Constructed	No. Spans	Structure Length (m)	Structure Width (m)	Notes
Thousand Islands Bridge	Over St. Lawrence River, Leeds and Grenville United Counties, Canada, and Jefferson County, New York, United States	1938	1	31	9.14	This central portion of the Thousand Islands Bridge system is noted as one of the smallest international bridges.
Tobin Bridge	Over McGregor Creek, Chatham, Chatham-Kent Region	1957	1	26	7.01	This is a relatively large example of the rigid-frame bridge type that Ontario built so much of.
Victoria Avenue Bridge	Over Hwy 420 (Roberts Street), Niagara Falls, Niagara Region	1941	1	n/a	n/a	This beautiful overpass is the only known example of a stone faced rigid frame overpass in Ontario.
Watson Road Bridge	Over Hwy 401, Puslinch, Wellington County	1959	1	40	n/a	One of a couple overpasses on this section of the 401 that offer a double-span configuration instead of the single span design.
Webster's Falls Rigid-Frame Bridge	Residential access drive over Spencer Creek Trubutery, West Flamborough, City of Hamilton	1953	1	n/a	n/a	This is one of three old bridges to be found in the Webster's Falls Park area.
Whitebread Line Drain Bridge	Over Whitebread Drain, Lambdon County	1934	1	n/a	n/a	Appearing to be a very old unaltered example a bridge with this railing design, this is a small rigid-frame on a scenic route.

