



**Environmental Assessment  
Project File**

**Mary Street East, Omemee, ON**

**Mill Pond Bridge #100018  
Rehabilitation / Replacement –  
Environmental Assessment**

**D.M. Wills Project Number 9213**



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**Prepared for:  
City of Kawartha Lakes**

### Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions
1	Draft EA Project Report	22/05/2019	Initial issuing of report

This report/proposal has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

## Executive Summary

Mill Pond Bridge (#100018), having deteriorated to a state of structural concern, is expected to be unable to fulfill its functional requirements in the near future. If a secondary bridge crossing over the Pigeon River in Omemee, ON, is to be maintained, intervention in the form of replacement or rehabilitation is required.

A Schedule 'B' Class Environmental Assessment was initiated by the City of Kawartha Lakes in accordance with the Municipal Class Environmental Assessment, an approved document under the Environmental Assessment Act. D.M. Wills Associates Ltd. has been retained by the City of Kawartha Lakes to undertake the Class Environmental Assessment and subsequent Detailed Design phase of the project. This document forms the Project File for the Class Environmental Assessment.

The existing conditions of the bridge and study area were analyzed with respect to road and bridge geometry, hydraulics, natural environment, utilities, archaeology, and built heritage. Archaeological Services Inc. was retained as a consultant to conduct research and prepare the Cultural Heritage Evaluation Report, Heritage Impact Assessment, and Stage 1 Archaeological Assessment, all of which form part of this document.

The public, as well as various ministries and agencies (including First Nations communities), were notified of the project at the initiation of the Class Environmental Assessment and a Public Information Centre was held on February 4, 2019, to gain feedback from the public, review agencies, and First Nations communities. The Public Information Centre was primarily attended by members of the general public, with representatives of City Council and Village of Omemee community group members also in attendance. Comments were used to understand the local use of the bridge and obtain feedback on the proposed alternatives.

Five (5) alternatives were developed for evaluation and presented to the public:

1. Rehabilitation and addition of pedestrian walkway with two-way traffic flow.
2. Rehabilitation and addition of pedestrian walkway with one-way (westbound) traffic flow.
3. Close bridge to vehicular traffic and maintain as pedestrian bridge only.
4. Replace bridge with widened cross-section and open to two-lane two-way traffic and pedestrian use.
5. Decommission and remove bridge.

The evaluation of the alternatives listed above was based on several criteria. Namely, public opinion; relative cost; severity of perceived impact to the natural environment; severity of perceived impact to built heritage; likelihood for required ground disturbance during construction triggering further archaeological investigation; and effectiveness of solution to address the entirety of the Problem Statement.

The Recommended Design Alternative is to rehabilitate Mill Pond Bridge and add a pedestrian walkway to the south side of the bridge while maintaining the existing two-way (yield-to-oncoming) traffic. Due to the very severe state of deterioration of the existing bridge, the recommended rehabilitation will include full superstructure replacement (4 concrete spans and the steel truss) and repair of the existing concrete piers and abutments. The replacement truss design will be sympathetic to the original truss and, to the extent possible, will provide similar appearance. The cost to implement the Recommended Design Alternative is estimated to be approximately \$1,488,779.00.

Through the Class Environmental Assessment process, mitigation measures were developed with respect to impact to the natural environment, built heritage, and existing utilities.

Through adherence to the findings and recommendations presented herein, as well as continued consultation with review agencies and First Nations communities, the City of Kawartha Lakes is expected to enter the Detailed Design phase for the rehabilitation of Mill Pond Bridge in accordance with the Recommended Design Alternative.

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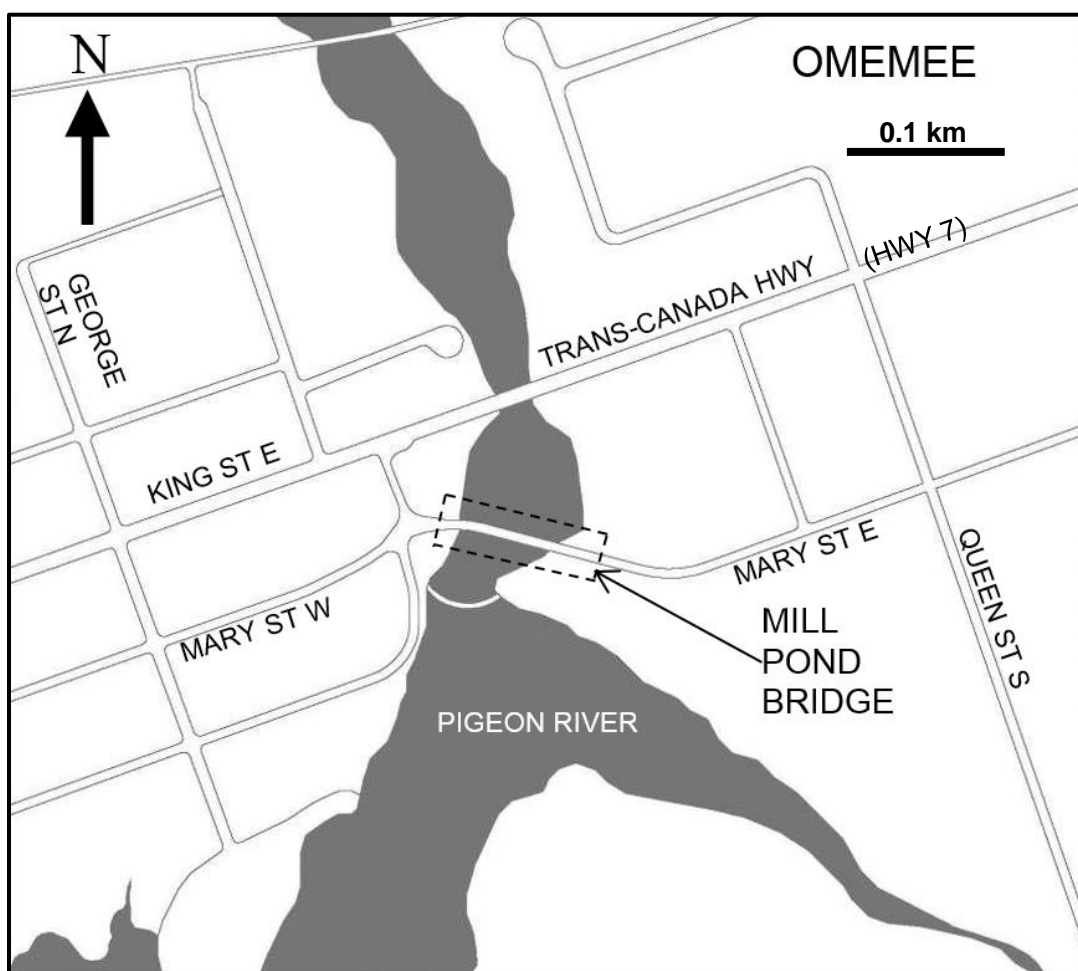
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## 1.0 Introduction

The City of Kawartha Lakes (CKL, City) has retained D.M. Wills Associates Ltd. (Wills) to complete an Environmental Assessment in accordance with the Municipal Class Environmental Assessment (MCEA, EA) for the proposed rehabilitation / replacement of Mill Pond Bridge #100018 (Mill Pond Bridge) in Omemee, ON.

Mill Pond Bridge is located on Mary Street East in Omemee, ON, and conveys single-lane east-west traffic over the Pigeon River. The bridge is located approximately 0.1 km south of the Highway 7 (King Street East) river crossing, see **Figure 1** below.

**Figure 1 - Key Map of Bridge Location**



Land use in the area surrounding Mill Pond Bridge is primarily composed of Residential and Commercial lands, with small areas of Provincially Significant Wetlands (MNRF) located immediately downstream of the bridge crossing at the east shore of the Pigeon River.

Mill Pond Bridge, constructed in 1952, is a four-span ( $\pm 24.4$  m,  $\pm 9.6$  m,  $\pm 9.6$  m,  $\pm 9.6$  m) reinforced concrete deck on steel I-girder bridge with its longest span reinforced by an additional truss structure. The bridge rests on reinforced concrete piers and abutments. The bridge cross-section provides single lane passage over the Pigeon River with an overall structure width of  $\pm 4.3$  m and a roadway width of  $\pm 3.8$  m between concrete curbs and steel guide rail.

The most recent OSIM bridge inspection, completed in September of 2017 (found in **Appendix B**), indicated that the bridge superstructure is in generally poor condition with the substructure described as being good to fair condition. All exposed steel elements are experiencing medium to severe corrosion with some areas of section loss and localized perforation of steel. The bridge deck is generally in good condition with localized areas of deterioration, however, the deck soffit is heavily deteriorated with extensive delamination and spalling with exposed corroded reinforcement. **Photos 3-12 in Appendix D** depict the deterioration of the superstructure.

Subsequent to the 2017 OSIM, a more detailed inspection revealed a critical defect and the bridge was closed to vehicular traffic on May 7, 2019.

As a result of the inspections and severe deterioration of the bridge elements, it was recommended that the superstructure be replaced.

This report presents the process of the City's MCEA for the replacement / rehabilitation of the Mill Pond Bridge, including the requirements of the MCEA, an outline of the existing conditions, a discussion on the design alternatives and the evaluation leading to a recommended solution, as well as the incorporation of public feedback and recommended mitigation measures to effectively implement the preferred solution.

## 1.1 Reference Documents

The following documents were referenced in the preparation of this document:

- Ontario Environmental Assessment Act, R.S.O. 1990, c. E. 18.
- Municipal Class Environmental Assessment document, as amended in 2015.
- OSIM Structural Inspection, dated September 9, 2017.

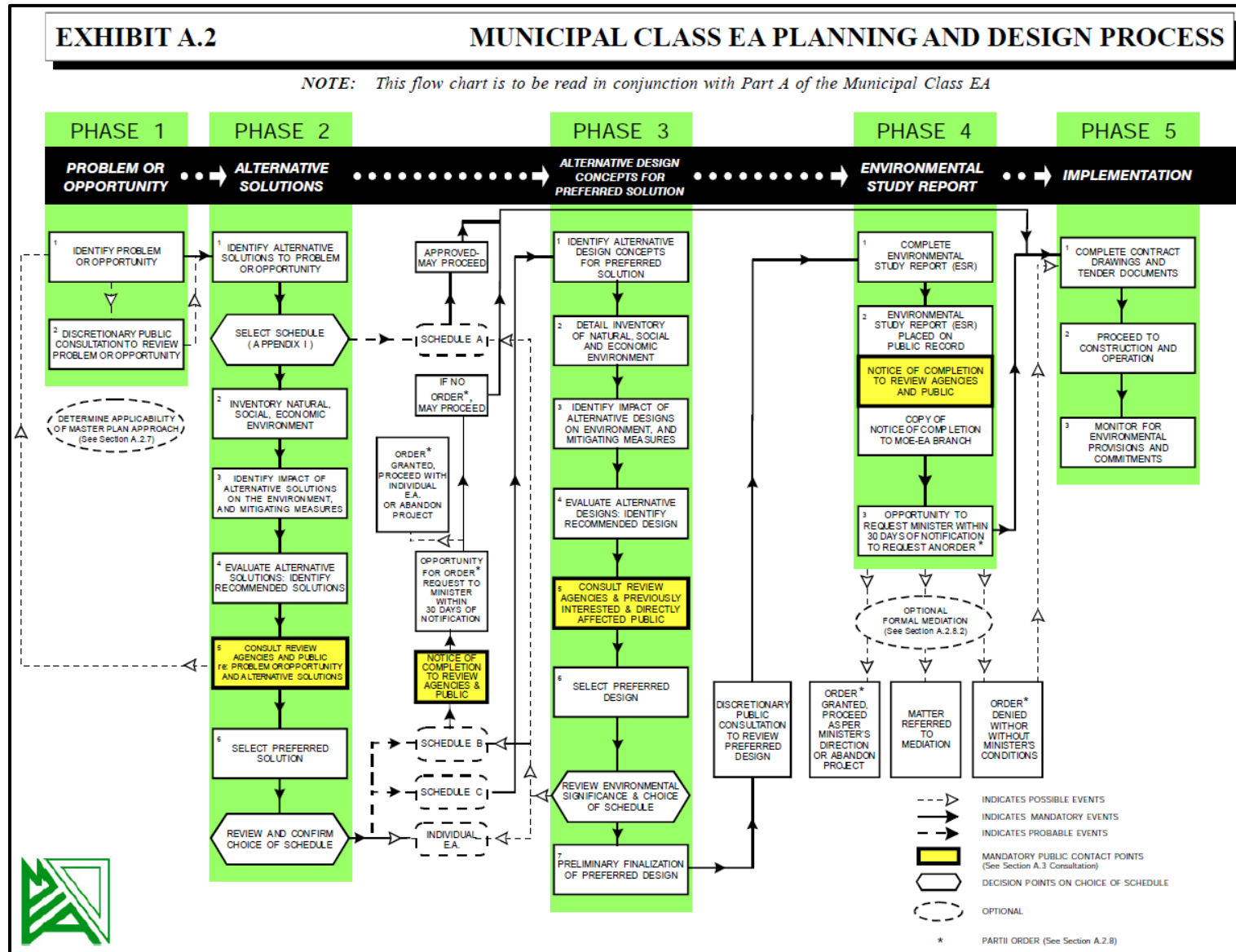
## 2.0 Municipal Class Environmental Assessment Process

Projects such as road improvement and new construction, bridge improvement and new construction, and other forms of infrastructure construction are subject to the Act. The replacement or rehabilitation of the Mill Pond Bridge is considered a new bridge construction or improvement and is therefore subject to the requirements of the Act.

The MCEA was developed by the Municipal Engineers Association (MEA) in order to provide municipalities with a streamlined method for determining the minimum requirements they need to meet in order for their projects to meet the governing requirements of the Act (i.e. their obligations under the Act). Schedules (A, A+, B, and C) were developed in order to differentiate and simplify the requirements under the Act. Projects meeting the description of Schedule 'A' (high simplicity and frequency) are considered 'pre-approved' and would therefore not require additional assessment under the Act. Projects meeting the Schedule 'C' description are those that are of a greater complexity and anticipated environmental impact and therefore require extensive assessment and environmental study under the Act.

The primary elements of the MCEA have been categorized into five (5) phases. One or all of the phases apply to a given project, depending on the Schedule identified during Phase 2. **Figure 2** depicts the five-phase flowchart. Regardless of the project and at the initiation of an environmental assessment, a Notice of Study Commencement, outlining the project and proponent contact information, must be advertised and issued to applicable review agencies and the public. The MCEA document provides guidance with regard to which review agencies should be contacted for a given EA.

Figure 2 - MCEA Five-Phase Planning and Design Process.



The first steps of Phase 1 & 2 require the proponent to identify the problem or opportunity and identify alternative solutions to the problem or opportunity. In the case of Mill Pond Bridge, the problem is defined as follows.

**Problem Statement:** Mill Pond Bridge, having deteriorated to a state of structural concern, is expected to be unable to fulfill its functional requirements in the near future. If a secondary bridge crossing over the Pigeon River in Omemee, ON, is to be maintained, intervention in the form of replacement or rehabilitation is required.

## 2.1 Identification of Solution Options

Alternative solutions to the problem include solution options developed at a macro scale. The details of how a particular solution is to be implemented are developed further on in Steps 4-6 of Phase 2 (refer to **Figure 2**). With respect to Mill Pond Bridge, the following solutions to the problem have been identified.

### Solutions to the Problem:

1. Do nothing.
2. Close or remove bridge.
3. Replace or rehabilitate bridge.

**Option 1**, the option to 'Do Nothing', allows for the bridge to remain open for the remainder of its service life. Continued inspection would be conducted and the bridge would remain open until its structural capacity is deemed to be no longer adequate by an engineer. After consideration, the City decided that the option to do nothing was not acceptable and that physical intervention is required.

**Option 2** does not address the entirety of the Problem Statement. Closure of the bridge to vehicle traffic repurposes the bridge to be a pedestrian crossing alone, effectively reducing the service load on the bridge and negating the need for structural intervention. Bridge removal or closure to vehicular traffic does not address the need for a secondary vehicular crossing of Pigeon River in Omemee, ON. Vehicular traffic would be restricted to the Highway 7 crossing of the Pigeon River.

The remaining option includes the replacement or rehabilitation of the bridge. **Option 3** best addresses the entirety of the Problem Statement as it allows for the continued use of the bridge for both vehicular and pedestrian traffic and therefore maintains a secondary crossing over the Pigeon River.

Options 2 & 3 address the Problem Statement to different extents, and thus considered for further evaluation. Alternative Design Methods, being the various design methods developed at a micro scale, are developed and evaluated in **Section 5.0**.

## 2.2 MCEA Schedule Selection

Appendix 1 of the MCEA document outlines sample project descriptions against which a given project can be compared to determine the appropriate EA schedule. **Table 1** outlines the sample project descriptions that Mill Pond Bridge satisfies:

**Table 1 - MCEA Sample Project Descriptions Applicable to Mill Pond Bridge**

Project Description No.	Description	Applicability
24	Reconstruction of a water crossing where the reconstructed facility will be for the same purpose, use, capacity and at the same location. (Capacity refers to either hydraulic or road capacity but does not include alterations to include or remove facilities for cycling, pedestrians or to support utilities.) This includes ferry docks.	Mill Pond Bridge project includes the potential for rehabilitation/reconstruction of the existing structure with no change to its current purpose, use, or capacity.
25	Reconstruction of a water crossing where the reconstructed facility will not be for the same purpose, use, capacity or at the same location. (Capacity refers to either hydraulic or road capacity but does not include alterations to include or remove facilities for cycling, pedestrians or to support utilities.) This includes ferry docks.	Mill Pond Bridge project includes the potential for replacement of the existing bridge structure with an additional lane, increasing its capacity.
30	<b>Reconstruction or alteration of a structure or the grading adjacent to it when the structure is over 40 years old, which after appropriate evaluation is found to have cultural heritage value and cost of the project is less than \$2.4M.</b>	<b>Mill Pond Bridge is over 40 years old and may have cultural heritage value. Project cost for most complex alternative (replacement) not anticipated to cost more than \$2.4M.</b>
31	Reconstruction or alteration of a structure or the grading adjacent to it when the structure is over 40 years old which after appropriate evaluation is found not to have cultural heritage value.	Mill Pond Bridge is over 40 years old may have no cultural heritage value.

In addition to the MCEA, a Checklist was developed by the MEA in 2013 (rev. 2014) to assist proponents in further identifying their obligations under the Act with respect to bridges that are more than 40 years old. Having been constructed in 1952, Mill Pond Bridge meets this criteria, and the Checklist was therefore used to confirm Schedule selection as well as identify requirements for Cultural Heritage and Archaeological Assessment. It was determined through the Checklist that a Cultural Heritage Evaluation Report (with provisional Heritage Impact Assessment) and Stage 1 Archaeological Assessment are required for the project. The completed Checklist can be found in **Appendix E**.

Through the completion of Phase 1 and initial steps of Phase 2 of the flow chart (Appendix 1 of the MCEA document, **Table 1**), the replacement or rehabilitation of the Mill Pond Bridge has been assessed as a Schedule 'B'. As a Schedule 'B', the City need only complete the remainder of Phase 2 before proceeding to Phase 5.

Under the MCEA, Schedule 'B' projects are approved subject to screening and require a Project File to be published at the completion of the study. This document shall be considered to be the Project File for the Mill Pond Bridge project at the completion of the EA.

After completing the Schedule 'B' EA, a Notice of Completion must be published to review agencies and the public. A 30 day comment period commences upon publishing of the Notice of Completion. Within the comment period, review agencies and members of the public who do not believe the MCEA process has been followed adequately may submit a Part II Order to the Minister of the Environment, Conservation and Parks requesting a review of the MCEA process completed by the proponent. The appropriate mailing addresses for the submission of Part II Order requests will be included in the Notice of Study Completion.

Though it is the right of review agencies and the public to submit a Part II Order, this is not the preferred method for dealing with concerns related to the MCEA process. The following is the preferred procedure (chronologically) for resolving concerns:

1. Resolve concerns through consultation and discussion in Step 5 of Phase 2 of the MCEA process;
2. Directly request that the proponent upgrade the project to a Schedule 'C' MCEA during 30 day comment period after issuance of the Notice of Completion; and
3. Should direct correspondence with the proponent reach an impasse, submit Part II Order to the Minister of Environment, Conservation and Parks within the 30 day comment period.

### 3.0 Public and Agency Contact

Section A.3.6 and Appendices 3 and 7 of the MCEA document provide guidance on the ministries, agencies, and other entities that represent stakeholders in a given project and should be contacted and consulted throughout the EA process. The following is a list of stakeholders circulated for consultation with regard to this EA:

- City of Kawartha Lakes (various contacts);
- Kawartha Conservation Authority;
- Kawartha Trans-Canada Trail;
- Ministry of Environment, Conservation and Parks (MECP);
- Ministry of Natural Resources and Forestry (MNRF Peterborough District);
- Ministry of Tourism, Culture, and Sport (MTCS);
- First Nations;
- Trilium Lakelands District School Board;
- Peterborough, Victoria, Northumberland and Clarington Catholic School Board;
- Student Transportation Services of Central Ontario;
- Kawartha Lakes Police Service;
- Kawartha Lakes Paramedic Service;
- Kawartha Lakes Fire Department;
- Member of Provincial Parliament;
- Member of Parliament;
- Utility Service Provider (various); and
- Public and Businesses of Omemee, ON.

The Notice of Study Commencement was posted and sent to all of the above review agencies and stakeholders on January 23, 2019. The Notice of Study Commencement outlined the project and background information and invited the reader to attend an upcoming Public Information Centre (PIC).

#### 3.1 Public Information Centre

On February 4, 2019, a PIC was held at the Royal Canadian Legion (Branch 497) in Omemee, ON, during which members of the public could provide feedback on the proposed alternative solutions to the problem (discussed in **Section 2.0**). The purpose of this PIC was to gain an understanding of the local use of the bridge and obtain feedback on preliminary solutions.

## **4.0 Existing Conditions**

### **4.1 Road and Bridge Geometry**

Mill Pond Bridge is located on Mary Street East (Mary St. E.), which conveys traffic in the east and west directions. The vertical and horizontal alignment of Mill Pond Bridge is flat and straight, respectively, however, the vertical and horizontal alignment of Mary St. E. varies on either side of the bridge. Mary St. E. accommodates two lanes of traffic on either side of Mill Pond Bridge and a single lane of traffic over the bridge. The east approach to the bridge is comprised of an asphalt roadway measuring  $\pm 5.4$  m wide before tapering to  $\pm 3.8$  m at the interface with the bridge deck. The west approach measures  $\pm 5.8$  m wide before tapering to  $\pm 3.8$  m wide at the interface with the bridge deck. The bridge roadway width measures  $\pm 3.8$  m between concrete curbs and steel guide rail.

### **4.2 Hydraulics**

Pigeon River, a tributary watercourse to Pigeon Lake, flows from south to north under Mill Pond Bridge. Flow of the river primarily passes under the longest span of the bridge. A hydraulic dam is located approximately 45 m upstream of the bridge. The Trans-Canada Highway (Hwy 7) crosses over Pigeon River via a bridge structure located approximately 73 m downstream of Mill Pond Bridge.

Hydraulically, Mill Pond Bridge does not present any obstruction to the flow of the Pigeon River, with the exception of the piers, which feature angled bullnoses where flow is moving fastest in order to mitigate impact to the local flow regime.

A recent floodplain study for the Omemee Dam revealed that the channel opening at the Highway 7 river crossing controls the flow of Pigeon River during the regulatory storm. It was determined in the study that Mill Pond Bridge is overtopped with water by approximately two metres during the regulatory event. The hydraulic forces resulting from this event are a concern given the current state of the bridge.

### **4.3 Environment**

Mill Pond Bridge is located within a provincial fish sanctuary that extends from the Omemee Dam south of Mill Pond Bridge, northward to the Trans-Canada Trail Bridge (formerly C.N.R. bridge), which prohibits fishing from January 1 to Friday after the second Saturday in May and November 16 to December 31. In some environments, dams provide high-quality spawning habitat by influencing watercourse hydrology and habitat characteristics. This specific fish sanctuary is recognized by the City of Kawartha Lakes Official Plan as an Environmentally Sensitive Feature area that supports the Natural Heritage System. According to publicly available records (NHIC) with respect to the subject area, large networks of Provincially Significant Wetlands (PSW) occupy the Pigeon River immediately north of Mill Pond Bridge and approximately 280 m south, including Emily Park Wetland and Pigeon River No. 23 Complex, respectively. Land use within the Pigeon River subwatershed is dominated by agricultural practices (47.9%),

followed by forest (20.5%) and treed wetland (11.5%). Streamside vegetation in the Pigeon River subwatershed is lacking; riparian vegetation cover is below the threshold identified by Environment Canada as being conducive to healthy watercourses. Records of Ecological Land Classification mapping indicate that the immediate area of the Mill Pond Bridge is primarily urban development.

The Pigeon River is one of two major tributaries that flow into Pigeon Lake that are documented as providing spawning habitat for migratory lake-dwelling fishes, including; walleye, muskellunge, and white sucker, and recreationally-important resident fish such as smallmouth and largemouth bass. Populations of muskellunge in Pigeon Lake have been documented utilizing spawning habitat in the Pigeon River upstream to the Omemee Dam. Furthermore, the Pigeon River is confirmed to provide habitat for 34 fish species, however, no species at risk fish or their habitat have been documented. Brook trout, a sensitive coldwater fish species, is known to occur in the headwater portions of the Pigeon River.

The Pigeon Lake watershed hosts 27 wildlife species at risk, and their habitat, with seven species dependant on Pigeon Lake and its tributaries, including: black tern, Blanding's turtle, cyrano darner, least bittern, northern map turtle, snapping turtle, and western chorus frog. The NHIC database yielded no records of Species at Risk within four 1 km<sup>2</sup> Grids that intersect the Subject Area (17PK9407, 17PK9408, 17PK9507, 17PK9508). The Ontario Reptile and Amphibian Atlas 10 km<sup>2</sup> grid encompassing the Subject Area (17PK90) contains records for midland painted turtle and snapping turtle, which are listed as Special Concern under the *Endangered Species Act*, however, no immediate species or habitat protection is included for these species. Furthermore, citizen scientists within close proximity to the Subject Area have observed barn swallows. Barn swallows, listed as Threatened in Ontario, build nests almost exclusively on human-made structures such as bridges, culverts and barns.

#### **4.4 Traffic**

Adjacent to the Highway 7 crossing of Pigeon River, Mill Pond Bridge provides a secondary crossing of the river to local residents of Omemee. As previously mentioned, traffic on either side of the bridge is two lanes wide, but is constricted to a single lane of two-way traffic over the bridge.

There is no traffic data for Mary St. E. available at the time of this study.

Mill Pond Bridge is load posted to 11, 14, and 23 tonnes for truck, truck and trailer, and truck and double trailer trucks respectively.

#### **4.5 Utilities**

Several utilities are located within the right-of-way of the bridge and approaches. Hydro poles form junctions for hydro and telecommunications utilities. An overhead telecommunication line runs parallel with the north side of the bridge. In addition, a buried gas line runs parallel with the south side of the bridge under Pigeon River in close

proximity to the bridge. Ontario One Call utility location was used to obtain information related to the utilities within the vicinity of the bridge. Plans depicting the various utilities and their general locations can be found in **Appendix B**.

#### **4.6 Archaeology**

A property inspection was conducted by Archaeological Services Inc. (ASI) on March 26, 2019, and subsequent Stage 1 Archaeology Assessment report was completed in April, 2019. The following is a summary of the findings.

The Standards and Guidelines for Consultant Archaeologists (S & G) Section 1.3.1 lists criteria that indicate archaeological potential. Through investigation and historical research, the following criteria were found to apply to Mill Pond Bridge:

- Water sources: primary, secondary, or past water source (Pigeon River).
- Early historic transportation routes (Mary St.).
- Proximity to early settlements (Omemee, ON).

Furthermore, the residential yard adjacent to the west side of the river and the northwest quadrant of the bridge site was identified to have archaeological potential and requires Stage 2 Archaeological Assessment prior to any development (if impacted).

The Stage 1 Archaeological Assessment concluded that no previously registered archaeological sites are located within 1 km of the study area (bridge site).

The entirety of the Stage 1 Archaeological Assessment, prepared by ASI in April 2019, can be found in **Appendix F**.

#### **4.7 Built Heritage**

The Ontario Heritage Bridge Guidelines (interim, 2008) was used to evaluate the heritage value of Mill Pond Bridge against three main criteria derived from O. Reg. 9/06. These criteria being: Design/Physical Value, Contextual Value, and Historic/Associative Value. A bridge which receives a score of 60 or greater is considered provincially significant and may be included in the Ontario Heritage Bridge List. When evaluated against the Ontario Heritage Bridge Guidelines, Mill Pond Bridge received a score of 38 and is therefore not considered to be provincially significant.

Though not considered to be provincially significant, Mill Pond Bridge was determined to have some heritage value when evaluated based on the three aforementioned criteria. Having met at least one of the criteria for heritage value set out in O. Reg. 9/06 of the Ontario Heritage Act, a Heritage Impact Assessment is required.

The Cultural Heritage Evaluation Report, prepared by ASI in April 2019, can be found in **Appendix E**.

## 5.0 Alternative Design Methods

The following alternatives were developed to further evaluate the aforementioned options of 'bridge closure or removal' and 'bridge rehabilitation or replacement':

1. Rehabilitation and addition of pedestrian walkway with two-way traffic flow.
2. Rehabilitation and addition of pedestrian walkway with one-way (westbound) traffic flow.
3. Close bridge to vehicular traffic and maintain as pedestrian bridge only.
4. Replace bridge with widened cross-section and open to two-lane two-way traffic and pedestrian use.
5. Decommission and remove bridge.

### 5.1 Evaluation of Alternatives

#### Alternatives 1 and 2

Alternatives 1 and 2 both include the rehabilitation of the bridge to address the structural concerns raised during the previous inspection. Additionally, the current cross-section of the bridge does not allow for safe pedestrian use. For this reason, Alternatives 1 and 2 include to addition of a separated pedestrian walkway to allow for simultaneous use of the bridge by vehicles and pedestrians.

Alternatives 1 and 2 received the most positive feedback from the public during the PIC held on February 4, 2019 (refer to **Table 3** in **Section 6.1**). Relative to the other alternatives' scope of work, Alternatives 1 and 2 represent the least perceived impact to the natural environment and heritage aspects of the existing bridge, with the exception of Alternative 3, which does not address the entirety of the problem statement. Given that work related to Alternatives 1 and 2 is focused on the strengthening of the superstructure of the bridge, it is not likely that any significant ground disturbance will be made, reducing the likelihood for archaeological impact.

#### Alternative 3

Alternative 3 addresses the structural concerns of the bridge by reducing the service load of the bridge to only pedestrian traffic. Under this condition there is no need for major structural rehabilitation, however, vehicular traffic would be restricted to the Highway 7 crossing of the Pigeon River or a detour crossing located approximately 7.5-8 km north of Omemee.

Alternative 3 received little positive feedback from the public during the aforementioned PIC. Given that no changes to the existing bridge structure are necessary to facilitate the intended functionality of Alternative 3, this alternative will have little to no impact to the built heritage, natural environment, and archaeology of the site. However, it does not address the need for a secondary vehicular crossing over the Pigeon River in Omemee.

#### Alternative 4

Alternative 4 provides the most functional benefits to the problem. Two-way traffic is maintained and improved by the addition of a second lane, and a pedestrian walkway allows for safe simultaneous use of the bridge for both vehicular and pedestrian traffic. Given the complexity and design challenges of this alternative, this option would be completed at the highest cost relative to the other alternatives.

Alternative 4 received a similar amount of positive feedback to Alternative 2 during the PIC. This alternative best addresses the functional needs of the crossing in that it improves the existing functionality of the bridge crossing through the addition of a second lane for vehicular traffic. However, the scope of work required to implement this alternative is far greater than any other alternative. The associated risk of impact to the natural environment (aquatic and terrestrial), built heritage, and archaeology of the site is high.

#### Alternative 5

Alternative 5 includes the decommissioning and removal of the bridge in its entirety. Traffic flow would be impacted similarly to Alternative 3, but pedestrian traffic would likewise be directed to the Highway 7 crossing of Pigeon River. Road improvements would be recommended to be added to the cross-section of Division Street South to facilitate pedestrian traffic flowing to or from the Highway 7 crossing of Pigeon River.

In order to facilitate the removal of the bridge superstructure and substructure, a similar scope of removal work is required to that of Alternative 4. The associated risks of impact to built heritage, natural environment, and site archaeology are likewise similar to Alternative 4 (high).

The following table outlines the relative monetary cost of each of the alternatives.

**Table 2 - Relative Alternative Monetary cost**

Alternative	1	2	3	4	5
Relative Cost	Medium	Medium	Low	High	Low

## 6.0 Public and Agency Feedback

As previously mentioned, consultation is an integral part of the EA process. For the Mill Pond Bridge EA, a combination of the PIC and electronic correspondence were used to obtain feedback from stakeholders and review agencies.

## 6.1 Public Information Centre

The five alternative design methods were brought to the public for review and comment. A feedback form was handed out to members of the public who attended the PIC on February 4, 2019. This feedback form was used to gather input from the public during the session. Members of the public were also encouraged to submit the feedback form at a later date if they required more time to formulate their comments. The feedback form used at the PIC can be found in **Appendix A**.

Responses resulting from the PIC varied. Approximately 20-25% of responses indicated a concern over illegal fishing and expressed a need to mitigate the potential for continued illegal fishing activity. Additionally, 15-20% of responses expressed an interest in traffic lights, temporary or permanent, being installed at the intersection of Highway 7 and Queen Street.

With regard to the alternative designs presented at the PIC, the **Table 3** summarizes the responses from the public.

**Table 3 - Summary of Public Feedback.**

Alternative	Alternative Description	Indicated as Preferred Alternative
1	Rehabilitation and addition of pedestrian walkway with two-way traffic flow	64% *
2	Rehabilitation and addition of pedestrian walkway with one-way (westbound) traffic flow	16%
3	Close bridge to vehicular traffic and maintain as pedestrian bridge only	4%
4	Replace bridge with widened cross-section and open to two-lane two-way traffic and pedestrian use	16% *
5	Decommission and remove bridge	0%
* Approximately 20% of responders indicated that Alternative 4 is the Preferred Alternative, but Alternative 1 is the realistic Preferred Alternative when considering monetary costs. Values tabulated above depict the Preferred Alternative when monetary costs was considered.		

## 6.2 Agency Comments

The ministries and agencies listed in **Section 3.0** were contacted for feedback during the EA process. Utility companies consisting of Bell, Eastlink, Enbridge, and Hydro One all responded to the Notice and utility locate request and provided information on their respective utility services in the area. Kawartha Conservation also responded and has opened a project file. Additionally, comments were received from the Ontario Ministry of Environment, Conservation and Parks (MECP) on March 4, 2019. Feedback from the MECP was grouped under three general headings; Class EA Process; MECP technical review issues; and Aboriginal Consultation. The MECP comments can be found in **Appendix A**.

Comments regarding the Class EA process were general in nature and intended to ensure the proper Class EA process would be observed.

Similar to those regarding the Class EA process, comments regarding Aboriginal Consultation were made to ensure proper consultation with the appropriate First Nations communities was conducted (see **Section 6.3** below).

Comments regarding MECP technical review issues were made to highlight the Ministry's interest in bridge projects, environmental issues which should be addressed through the Class EA process, and standard comments which may or may not apply to the Mill Pond Bridge Class EA project.

## 6.3 Aboriginal Consultation

The Notice of Study Commencement and PIC was circulated to the following identified First Nations (FN) communities at the initiation of the EA:

- Curve Lake First Nation.
- Hiawatha First Nation.
- Mississaugas of Scugog Island First Nation.
- Alderville First Nation.
- Williams Treaty First Nations Communications/Claims Coordinator.

A letter was received on February 1, 2019 from Curve Lake FN stating that the project is situated on their traditional lands and expressed their concern for the project and requested a response on how the project would address areas of concern; environmental impact to drinking water, endangerment to fish and wild game, impact on Aboriginal heritage and cultural values, and impact to endangered species and lands. A letter response was issued as requested in March 2019, the letter can be found in **Appendix G**.

In addition to the expression of concern over the project, Curve Lake FN requested to be consulted in the preparation of the Stage 1 Archeological Assessment prepared by ASI (see **Appendix F**).

## 7.0 Preferred Solution

While all of Alternatives 1-5 were considered separately by the City and brought to the public for feedback, it became evident that Alternative 1 best addressed the entirety of the Problem Statement.

**Recommended Design Alternative:** Rehabilitation/reconstruction of Mill Pond Bridge including a separate pedestrian walkway. Maintain two-way (single lane) traffic flow.

Due to the advanced deterioration of the truss structure over the western span, rehabilitation through refurbishment is not considered to be a viable option. Rather, replacement of the truss is the recommended rehabilitation method. In order to retain the heritage features of the structure, a truss of sympathetic design is recommended.

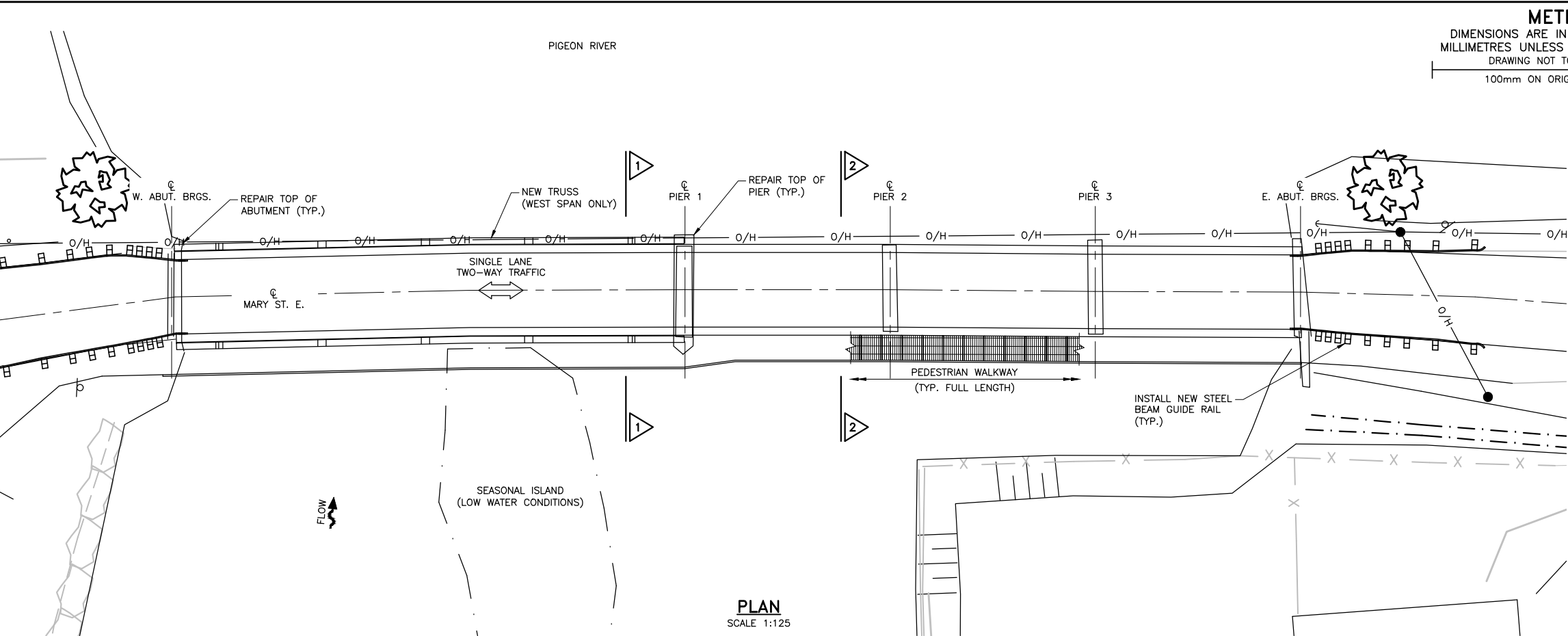
Given the deterioration identified in the most recent bridge inspection, as well as the general condition of the bridge, the following scope of work is anticipated for the rehabilitation of Mill Pond Bridge:

- Complete replacement of superstructure over the entirety of the bridge.
- Design and installation of code compliant barrier system with sympathetic design characteristics to the existing steel 'lattice' barrier system;

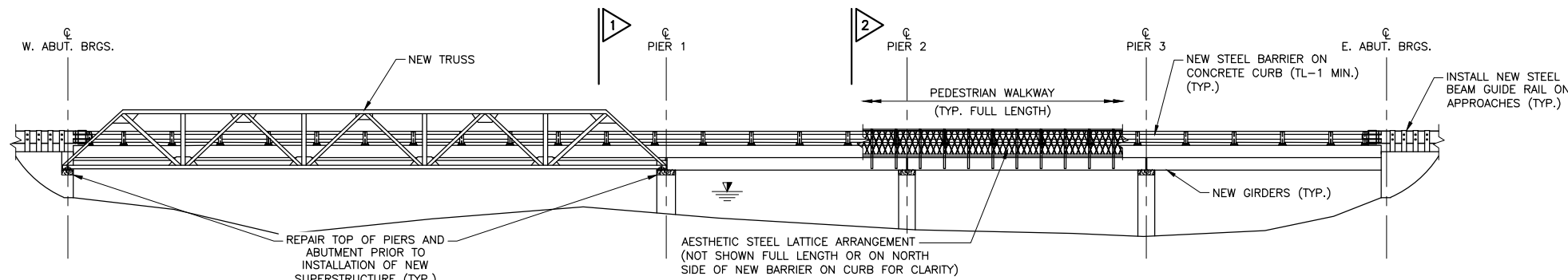
This includes the installation of a new deck. This deck will be supported by a new truss over the western span, and new girders over the eastern spans. A code compliant barrier system (minimum TL-1) and cantilevered pedestrian sidewalk with railing on the south side of the bridge will also be installed. To the extent possible, the design of the barrier system and sidewalk railing will be chosen to be sympathetic to the steel 'lattice' design of the existing barrier system. Furthermore, design of the replacement truss structure over the western span shall likewise be sympathetic to the existing truss design so as to maintain the aesthetic appearance of this heritage feature.

The estimated cost to implement the Recommended Design Alternative is \$1,488,779.00. The detailed cost estimate can be found in **Appendix C**.

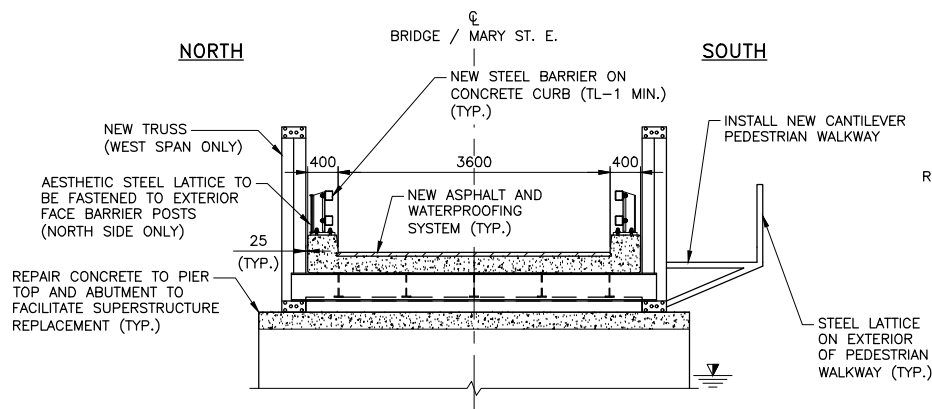
A General Arrangement drawing (Drawing R01) has been developed to depict the aforementioned scope of work for the Recommended Design Alternative. The drawing is shown below and can be found in **Appendix C**.



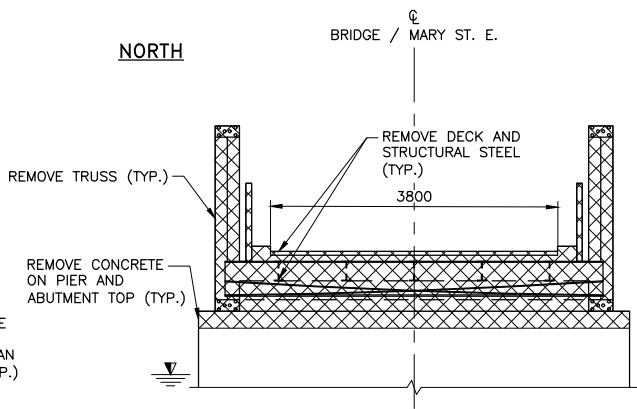
PLAN  
SCALE 1:125



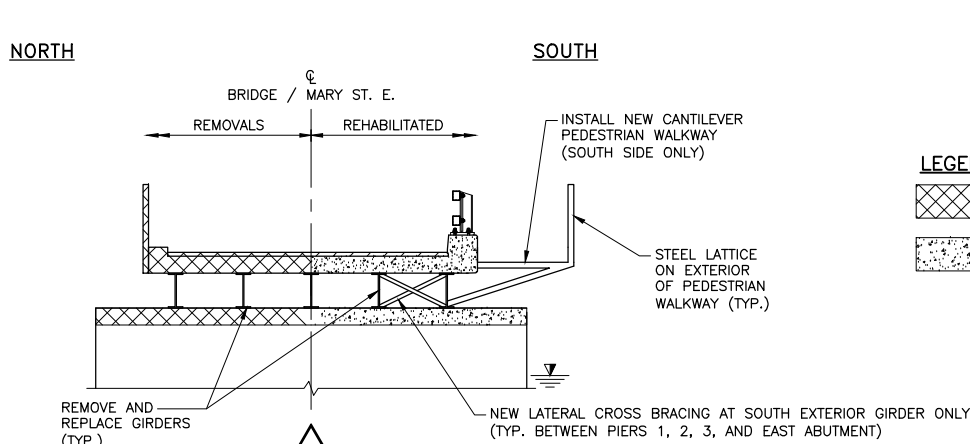
ELEVATION  
SCALE 1:125



1 REHABILITATED  
SCALE 1:50



1 REMOVALS  
SCALE 1:50



2  
SCALE 1:50

LEGEND

	REMOVAL
	NEW CONCRETE

REVISIONS		DATE	BY	DESCRIPTION
DESIGN	D.B.	CHK	G.Z.	CODE
DRAWN	T.R.	CHK	D.B.	SITE
		LOAD	CL-625-ONT	DATE
		100018		MAY 2019
		DWG	R01	

METRIC  
DIMENSIONS ARE IN METRES AND/OR  
MILLIMETRES UNLESS OTHERWISE SHOWN  
DRAWING NOT TO BE SCALED  
100mm ON ORIGINAL DRAWING

CONT  
WP

MILL POND BRIDGE  
REHABILITATION  
GENERAL ARRANGEMENT



SHEET  
01

D.M. Wills Associates Limited  
150 Jameson Drive  
Pelee Island, Ontario  
Canada, K9J 0B9  
P: 705.742.2297  
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E: wills@dmwills.com

GENERAL NOTES

- ALL CONCRETE TO BE 35MPa; CSA A23.1 EXPOSURE CLASS C-1
- CLEAR COVER TO REINFORCING STEEL:  
ALL: 50 ±10 UNLESS OTHERWISE NOTED
- REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
- UNLESS OTHERWISE SHOWN, TENSION LAP FOR REINFORCING STEEL BARS SHALL BE CLASS B.
- ALL EXPOSED CONCRETE EDGES SHALL HAVE 20mm CHAMFER.
- CONTRACTOR TO COMPLY WITH ENVIRONMENTAL PROTECTION REQUIREMENTS AND ALL ENVIRONMENTAL CONSTRAINTS TO PREVENT CONTAMINATION OF THE WATERCOURSE.
- BAR HOOKS SHALL HAVE STANDARD HOOK DIMENSIONS USING MINIMUM BEND DIAMETERS; WHILE STIRRUPS AND TIES SHALL HAVE MINIMUM HOOK DIMENSIONS. ALL HOOKS SHALL BE IN ACCORDANCE WITH THE STRUCTURAL STANDARD DRAWING SS12-1, UNLESS INDICATED OTHERWISE.

CONSTRUCTION NOTES

- ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, DETAILS, AND ELEVATIONS OF THE EXISTING STRUCTURE THAT ARE RELEVANT TO THE WORK SHOWN ON THE DRAWING PRIOR TO COMMENCEMENT OF THE WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR AND THE PROPOSED ADJUSTMENT OF THE WORK REQUIRED TO MATCH THE EXISTING STRUCTURE SHALL BE SUBMITTED FOR APPROVAL.
- ANY DAMAGE DONE TO THE EXISTING STRUCTURE DURING REMOVALS OR RECONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR AND AT NO COST TO THE OWNER.

## **7.1 Mitigation Measures**

### **7.1.1 Natural Environment**

The Recommended Design Alternative includes the rehabilitation/reconstruction of the bridge as well as the addition of a cantilevered walkway to the south side of the bridge superstructure. This work will require machinery and heavy equipment to work on the bridge and over the river. There are several risks associated with the scope of work in terms of impact to the natural environment, such as the direct destruction of species and their habitat, and watercourse sedimentation and/or contamination. In order to mitigate the potential for impact to the natural environment, best management practices, and applicable environmental protection standards will be used.

#### **Working Window Timing Restrictions**

To prevent impact on local and migratory fish species, turtles, and birds who may use the aquatic, riparian and/or structural habitat in the immediate vicinity of the Mill Pond Bridge, the following mitigation measures based on MNRF best practices with respect to timing windows should be used:

- The MNRF has established timing window guidelines to restrict in-water work in order to protect fish during seasonal migrations and critical life stages. Based on the presence of walleye, muskellunge, and large/smallmouth bass in the Pigeon River, in-water construction work would be restricted to occur outside of the timing window of March 15 – July 15.
- Turtle habitat is present within the Pigeon River and the Subject Area, and records of midland painted turtles and snapping turtles have been documented. If work is to be completed during the turtle breeding season (May 1 – July 30), turtle exclusionary fencing should be installed around the watercourse to exclude turtles from the work areas prior to May 1. Turtle nests that are observed in close proximity to the construction site should be protected.
- If barn swallows are found to utilize the existing Mill Pond Bridge structure, the project should be registered with MNRF and effective exclusionary methods and/or timing windows (April 1 – August 31) for construction should be applied.

#### **Isolation of Work Areas**

- All work areas should be isolated from flowing water and work will be completed in the dry.
- If in-water work is required, operation of equipment within such areas should be kept to the minimum necessary to perform the work.
- The replacement of the truss structure over the western span may be completed in a separate location to minimize potential for debris and excess construction material from entering the watercourse. A new deck may be partially or fully prefabricated off-site as part of the replacement truss. Care should be taken during the installation of the replacement deck and truss to ensure isolation of the

work area is achieved and no construction material is allowed to enter the watercourse.

### **Erosion and Sediment Controls**

An Erosion and Sediment Control Plan (ESCP) should be developed and implemented to minimize the risk of sedimentation into Pigeon River during all phases of the Project. The following erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized and runoff water is clear:

- Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the water body.
- Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering the waterbody.
- Site isolation measures (e.g. silt boom or silt curtain) for containing suspended sediment where in-water work is required.
- Measures for containing and stabilizing waste material.
- Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction and monitoring of downstream turbidity levels.
- Repairs to erosion and sediment control measures and structures if damage occurs.
- Removal of non-biodegradable erosion and sediment control materials once site is stabilized.

### **Monitoring**

Due to the prolonged nature of construction activities, monitoring programs should be implemented to ensure that mitigation measures are being utilized properly and that no impacts to wildlife and fish communities, or their associated habitats, have occurred:

- Baseline studies prior to construction to establish potential habitat for species at risk and utilization of habitat by fish species such as walleye (i.e. spawning surveys).
- Sediment and Erosion control monitoring during construction.
- Monitoring during turtle nesting to ensure exclusionary methods are kept intact and effective to ensure that if nesting occurs that nesting sites are protected.
- Nest sweeps should be conducted prior to removal of any vegetation if found nests should be protected and monitored until the nest is no longer active.
- Development of an offsetting plan for turtle nesting habitat if construction activities or staging is anticipated to impact turtle nesting habitat.

### **Site Restoration and Remediation**

- Exposed slopes should be protected by limiting the length of time that such areas are exposed prior to final application of topsoil and seed. All seeding will be completed prior to October 1 to ensure suitable germination prior to winter dormancy period.
- All areas where vegetation has been removed should be stabilized via seeding prior to erosion and sediment control measures being removed.
- Clearing of riparian vegetation should be kept to a minimum. Where practicable, vegetation is to be pruned or topped instead of grubbed / uprooted.
- Disturbed banks should be immediately stabilized with native plant species to prevent erosion and / or sedimentation.
- Minimize the removal of natural woody debris, rocks, sand or other materials from the banks and the bed of the waterbody below the ordinary high water mark. If material is removed from the watercourse, set it aside and return it to the original location once construction activities are completed.
- Immediately stabilize banks disturbed by any activity associated with the Project to prevent erosion and / or sedimentation, preferably through re-vegetation with native species suitable for the site.
- Restore banks of the waterbody to their original contour and gradient, if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage should be restored.
- If replacement rock reinforcement / armoring is required to stabilize eroding or exposed areas, then ensure that appropriately-sized, clean rock is used; and that rock is installed at a similar slope to maintain a uniform bank / shoreline and natural stream / shoreline alignment.
- Once the Project is completed, all construction materials are to be removed.
- Once stabilized, all erosion and sediment control measures should be removed to restore wildlife corridors and connectivity.

### **Regular Equipment Maintenance and Refueling, and Setbacks from Water Bodies**

The use of industrial equipment has the potential to cause pollution into the adjacent watercourse. The following mitigation measures should be implemented to ensure that accidental contamination (from sediment, fuel, lubricants, oil, etc.) does not occur:

- An emergency spill response kit, including the appropriate absorbency materials, should be on site at all times. Proper containment, clean up and reporting, in accordance with provincial requirements, is required.
- All equipment operating near the watercourse should have the appropriate spill kit, accessible to the operator and the operator will be trained in its use.
- Equipment refueling should take place at least 30 m from the watercourse to prevent water contamination due to fuel spills.

- Any equipment that is not easily moved (generators, pumps, etc.) should be refuelled using appropriate methods to prevent fuel spillage and all operating equipment will have the appropriate sized drip pans located underneath.
- Regular equipment maintenance and inspections should be performed to avoid contaminant leakage and should be free of excess oil / grease.

### 7.1.2 Built Heritage

As identified in **Section 4.7**, Mill Pond Bridge was found to have heritage value in accordance with O. Reg. 9/06 of the Ontario Heritage Act. With heritage value being identified, a Heritage Impact Assessment was conducted for Mill Pond Bridge and considered the impacts of all alternatives outline herein.

At the time the Heritage Impact Assessment was completed, a preferred solution had not been identified, thus a number of recommendations and mitigation measures were presented for consideration. The following is a summary of the recommendations and mitigation measures presented within the document:

- The preferred alternative, when selected, should ensure the fewest direct and permanent impacts to the identified heritage attributes of Mill Pond Bridge (preferred solution identified herein satisfies this recommendation).
- Rehabilitation methods should be selected based on which methods impact the identified heritage aspects to the least extent possible while addressing the structural concerns of the bridge.
- Construction staging and staging areas should be appropriately planned in such a manner so as to minimize potential for damage to the identified heritage attributes, or avoid areas with heritage value in their entirety.
- Should rehabilitation in the form of superstructure replacement be selected during preliminary and detailed design, the half-through truss component of the bridge structure should be protected and retained to the maximum extent possible for use in the replacement superstructure. Furthermore, the replacement superstructure should be sympathetically designed to mimic the functionality and appearance of the existing superstructure.
- Sufficient documentation should be conducted for the existing bridge prior to any work which may significantly impact the appearance or functionality of the existing bridge (the Cultural Heritage Evaluation Report and Heritage Impact Assessment prepared by ASI are considered sufficient documentation).

The complete Cultural Heritage Evaluation Report and Heritage Impact Assessment reports prepared by ASI, and the recommendations and mitigation measures identified therein, can be found in **Appendix E**.

### **7.1.3 Utilities**

Utilities in the vicinity of the bridge are comprised of hydro, telecommunication, and natural gas (buried). Should the project progress to construction tendering, the appropriate utility stakeholders will be consulted to formulate the necessary utility protection and/or relocation measures to facilitate construction. The resulting protection and impact mitigation measures will be included in the tender documents.

## **8.0 Project Schedule**

Concurrent with publication of the Notice of Completion, and conclusion of the 30 day comment period, the City will present the Project File to City Council for approval. At this time, the City will proceed to the Detailed Design stage of the project where the details of the design solution will be developed in conjunction with mitigation measures. Upon completion of the Detailed Design, the City's final steps include:

- Preparation of detailed cost estimate for budget approval.
- Complete permit application(s).
- Preparation of Tender and Contract Documents.
- Issue Tender and award construction project to successful bidder.
- Implement and monitor design alternative.

## **9.0 Summary**

Mill Pond Bridge, having deteriorated to a state of structural concern, can no longer fulfill its functional requirements. If a secondary bridge crossing over the Pigeon River in Omemee, ON, is to be maintained, intervention in the form of replacement or rehabilitation is required.

D.M. Wills Associates Ltd. has conducted a Class EA in accordance with the MCEA at the request of the City of Kawartha Lakes for the proposed replacement or rehabilitation of the Mill Pond Bridge (#100018) in Omemee, ON.

Through Phase 1 and 2 of the MCEA process, the Class EA was determined to be a Schedule 'B'. This document forms the Project File for the Class EA.

The existing conditions of the bridge and study area were analyzed with respect to road and bridge geometry, hydraulics, natural environment, utilities, archaeology, and built heritage. ASI was retained as a consultant to conduct research and prepare the Cultural Heritage Evaluation Report, Heritage Impact Assessment, and Stage 1 Archaeological Assessment, all of which form part of this document.

The public as well as various ministries and agencies (including FN communities) were notified of the project at the initiation of the Class EA and a PIC was held on February 4,

2019, to gain feedback from the public, review agencies, and FN communities. The PIC was primarily attended by members of the general public, with representatives of City Council and Village of Omemee community group members also in attendance. Comments from the PIC were used to understand the local use of the bridge and obtain feedback on the proposed alternatives.

Five (5) alternatives were developed for evaluation:

1. Rehabilitation and addition of pedestrian walkway with two-way traffic flow.
2. Rehabilitation and addition of pedestrian walkway with one-way (westbound) traffic flow.
3. Close bridge to vehicular traffic and maintain as pedestrian bridge only.
4. Replace bridge with widened cross-section and open to two-lane two-way traffic and pedestrian use.
5. Decommission and remove bridge.

The evaluation of the alternatives listed above was based on several criteria. Namely, public opinion; relative cost; severity of perceived impact to the natural environment; severity of perceived impact to built heritage; likelihood for required ground disturbance during construction triggering further archaeological investigation; and effectiveness of solution to address the entirety of the Problem Statement.

A Recommended Design Alternative (Alternative 1) was determined through evaluation. The Recommended Design Alternative is to rehabilitate Mill Pond Bridge and add a pedestrian walkway to the south side of the bridge. The rehabilitation design shall maintaining two-way (single lane) traffic flow. The total project cost is estimated to be \$1,488,779.00 (refer to **Appendix C**).

Through the Class EA process, mitigation measures were developed with respect to impact to the natural environment, built heritage, and existing utilities.

Through adherence to the findings and recommendations presented herein, as well as continued consultation with review agencies and FN communities, the City of Kawartha Lakes is expected to enter the Detailed Design phase for the rehabilitation of Mill Pond Bridge in accordance with the Recommended Design Alternative.

## **Appendix A**

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### **Contact and Consultation Records**

**Public Information Centre Material**

## **Public Feedback**

## **Agency Feedback**

## Appendix B

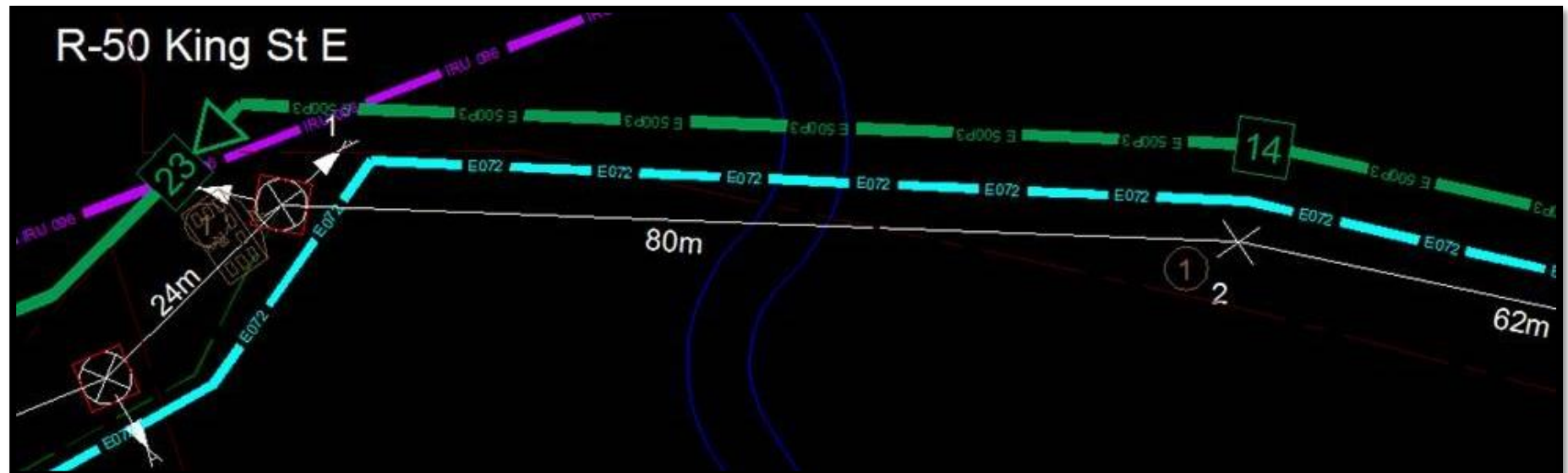
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Existing Data

## **2017 OSIM Structural Inspection**

## **Existing Utility Location Drawings**

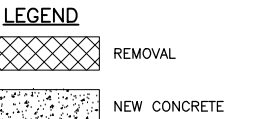
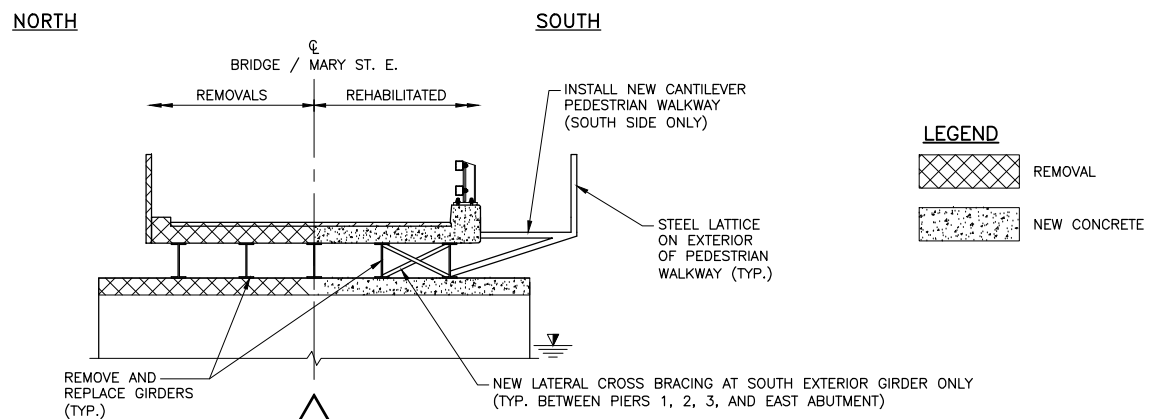
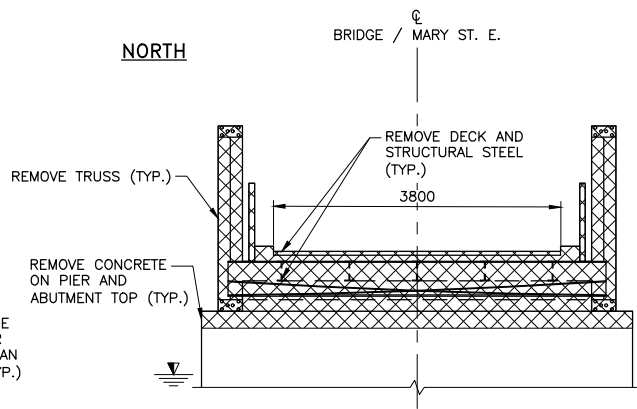
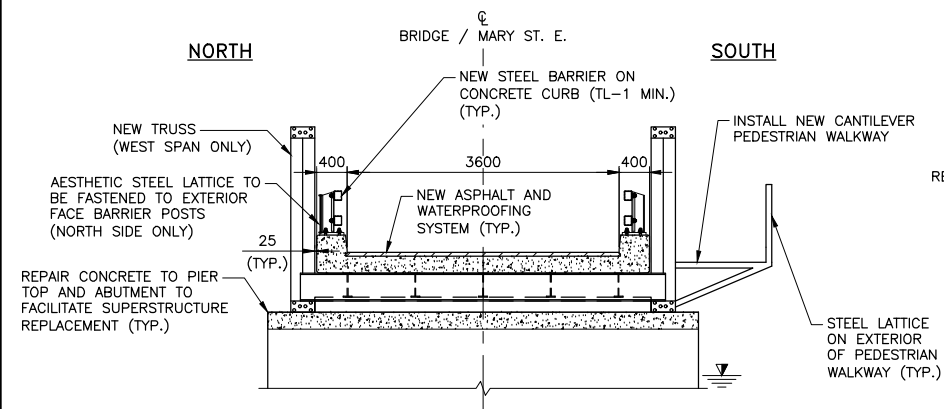
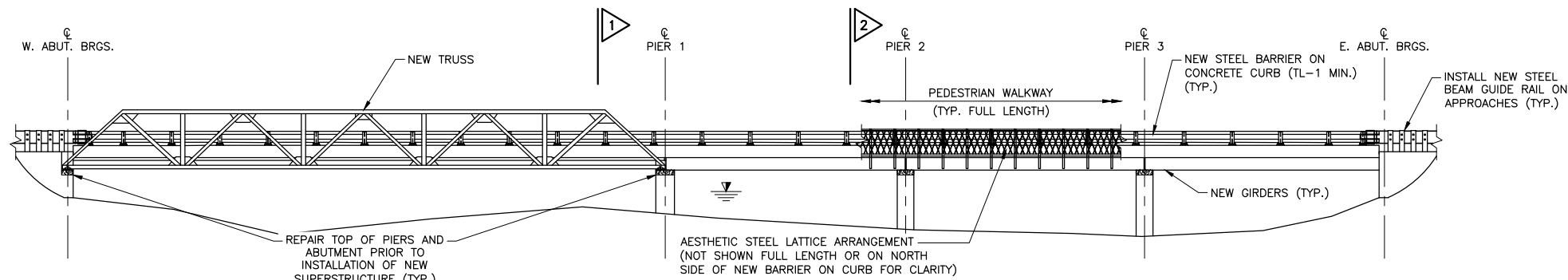
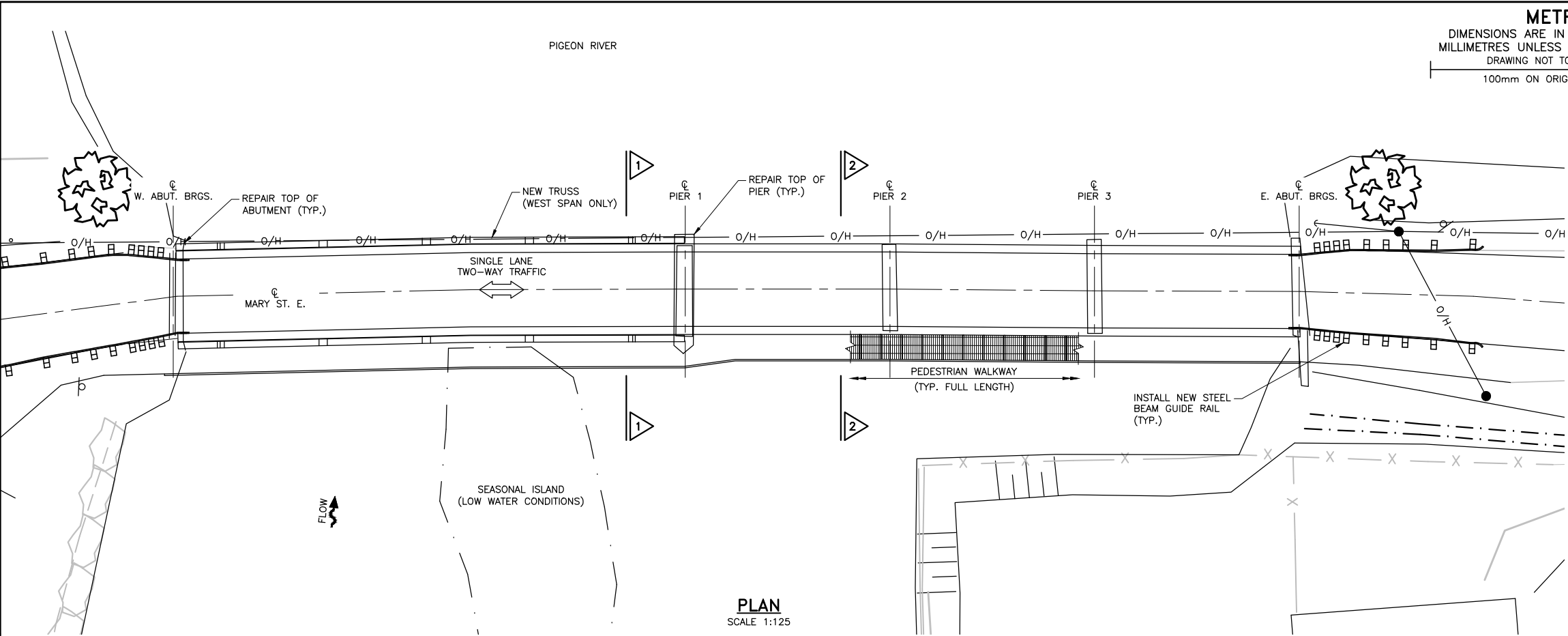
## Eastlink Utilities



## **Appendix C**

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### **General Arrangement Drawing and Cost Estimate**



GENERAL NOTES

- ALL CONCRETE TO BE 35MPa; CSA A23.1 EXPOSURE CLASS C-1
- CLEAR COVER TO REINFORCING STEEL:  
ALL: 50 ±10 UNLESS OTHERWISE NOTED
- REINFORCING STEEL SHALL BE GRADE 400W UNLESS OTHERWISE SPECIFIED.
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CONT  
WP

MILL POND BRIDGE  
REHABILITATION  
GENERAL ARRANGEMENT

SHEET  
01



REVISIONS	DATE		BY		DESCRIPTION		DATE	DWG	R01
DESIGN	D.B.	CHK	G.Z.	CODE	CHBDC-14	LOAD CL-625-ONT	MAY 2019		
DRAWN	T.R.	CHK	D.B.	SITE	100018				

## Preliminary Cost Estimate - Mill Pond Bridge Rehabilitation

Item No.	Description	Unit	Est. Qty.	Est. Unit Price	Extension
1	Mobilization and Demobilization	L.S.	1	\$20,000.00	\$20,000.00
2	Contract Bond and Insurance	L.S.	1	\$5,000.00	\$5,000.00
3	Construction Layout	L.S.	1	\$4,500.00	\$4,500.00
4	Bird Nesting Preventative Measures	L.S.	1	\$2,500.00	\$2,500.00
5	Traffic Control	L.S.	1	\$10,000.00	\$10,000.00
6	Environmental / Watercourse Protection	L.S.	1	\$15,000.00	\$15,000.00
7	Hot Mix HL-3	t	46	\$275.00	\$12,739.00
8	Removal of Asphalt Pavement, Full Depth	m <sup>2</sup>	51	\$50.00	\$2,550.00
9	Removal of Bridge Structure	L.S.	1	\$90,000.00	\$90,000.00
10	Removal of Steel Beam Guide Rail	m	79	\$20.00	\$1,580.00
11	Single Rail Steel Beam Guide Rail	m	79	\$180.00	\$14,220.00
12	Metal Traffic Barrier	m	109	\$650.00	\$70,850.00
13	Steel Beam Guide Rail Structure Connections	Each	4	\$1,000.00	\$4,000.00
14	Concrete in Deck	m <sup>3</sup>	66	\$2,300.00	\$151,800.00
15	Reinforcing Steel Bar	t	8.0	\$7,400.00	\$59,200.00
16	Prefabricated Truss Structure	L.S.	1	\$300,000.00	\$300,000.00
17	Cantilever Pedestrian Walkway	m	55	\$2,500.00	\$137,500.00
18	Fabrication of Structural Steel	t	13	\$6,500.00	\$84,500.00
19	Delivery of Structural Steel	t	13	\$300.00	\$3,900.00
20	Erection of Structural Steel	t	13	\$1,500.00	\$19,500.00
22	Bridge Deck Waterproofing	m <sup>2</sup>	198	\$80.00	\$15,840.00
23	Bearings	Each	34	\$400.00	\$13,600.00
24	Pier and Abutment Renewal	L.S.	1.0	\$200,000.00	\$200,000.00
Subtotal:					<u>\$1,238,779.00</u>
10% Contingency					\$125,000.00
10% Design and Construction					\$125,000.00
<b>Total Estimated Project Cost</b>					<b><u>\$1,488,779.00</u></b>

## **Appendix D**

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### **Site Photographs**

## **Appendix E**

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**Cultural Heritage Evaluation Report and Heritage Impact  
Assessment**

**Municipal Heritage Bridges; Cultural, Heritage, and  
Archaeological Resources Assessment Checklist**

## **Cultural Heritage Evaluation Report**

## **Heritage Impact Assessment**

## **Appendix F**

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### **Archaeological Assessment**

## **Appendix G**

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### **Aboriginal Consultation**