

October 20, 2021



AECOM

Victoria Bridge Replacement

London Advisory Committee on Heritage (LACH) Meeting

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Agenda

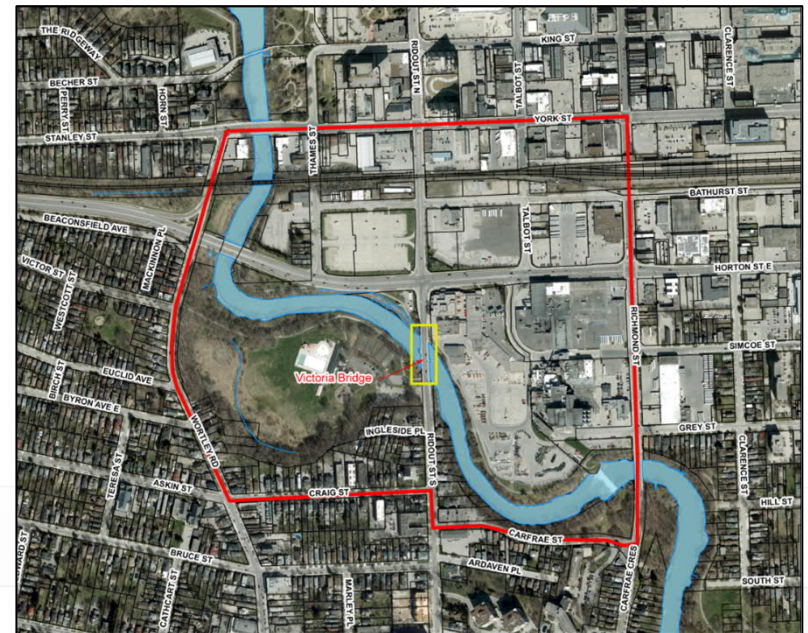
- Introduction
- Previous / Ongoing Work Summary
- Environmental Assessment Summary
- Cultural Heritage Evaluation Report
- Heritage Impact Assessment
- HIA Recommendations and Approach
- Other Considerations



Introduction

Victoria Bridge is located on Ridout St. South, over the South Branch of the Thames River, connecting Old South to the downtown core.

Detailed Design for the replacement of Victoria Bridge is underway, with tendering in November.





Introduction

- The current structure is a two-span steel rivet-connected modified Warren pony-truss structure with a reinforced concrete deck.
- Bridge was built by Hamilton Bridge Company.
- The abutments of the 1875 structure were reused to save cost. Stone abutments and pier were concrete encased.
- Bridge is construction on a shape 41-degree skew.
- Major rehabilitations include:
 - 1956 - Reconstruction of south abutment
 - 1960 - Reconstruction of deck
 - 1983 - Concrete deck overlay
 - 1992 - Steel recoating
 - Misc. more recent repairs
- Kensington Bridge on Riverside Drive is a similar example of a modified Warren pony truss structure.



Introduction

- Multiple bridge structures named after Queen Victoria have been constructed at this location:
 - 1848, wood structure – washed out shortly after construction
 - 1863, unknown structure details – swept away in flood in 1874
 - 1875, wrought iron pin- connected Pratt through truss – closed in 1925 due to condition/safety



Victoria Bridge

- Current bridge: 1926, steel rivet-connected modified Warren pony truss (current structure) – This (and the Kensington Bridge) are rare variations of a Warren truss where the center panel "breaks" the Warren pattern and introduces a panel with two diagonals forming an "X" at this point, rather than continuing the Warren pattern





Previous/Ongoing Work Summary

- Bridge Study (2016)
 - Structural Evaluation and Preliminary Design Report
 - Cultural Heritage Evaluation Report
- Environmental Assessment (2017-2018)
 - Environmental Study Report
 - Heritage Impact Assessment
- Detailed Design (Ongoing)
- Construction in Spring 2022 to Summer 2023.

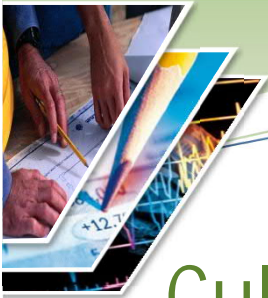


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Environmental Assessment (EA)

- Bridge Study completed in 2016 identified need for replacement or major rehabilitation of the Victoria Bridge.
- EA undertaken in 2017 considered multiple alternatives including:
 - Alt A - Major Rehab. with active transportation improvement
 - Alt B – Keep Bridge and repropose, construct new bridge downstream
 - Alt C – Reconstruct bridge on existing alignment
 - Alt D – Reconstruct Bridge on new Alignment downstream
- Removal and replacement of the bridge on the existing alignment was determined to be the preferred alternative.
 - Improved geometric and safety design for motorist, pedestrians and cyclists.
 - Longer span and higher deck improve river functionality.
 - Similar lifecycle cost impacts as structure rehabilitation.
- Through Arch determined to be the preferred Design Concept



Cultural Heritage Evaluation Report (CHER)

- CHER identified several elements as historic attributes:
 - Riveted, modified Warren truss structure with seven panels.
 - Decorative lamp posts in centre of the bridge spans.
 - Remnants of decorative stone and concrete end post at north abutment.
 - Bridge skew evident in abutments, pier and truss alignments.
 - Hand railings original to the design of the bridge.
- HIA required as part of the EA to assess impact of proposed alternatives





Heritage Impact Assessment (HIA)

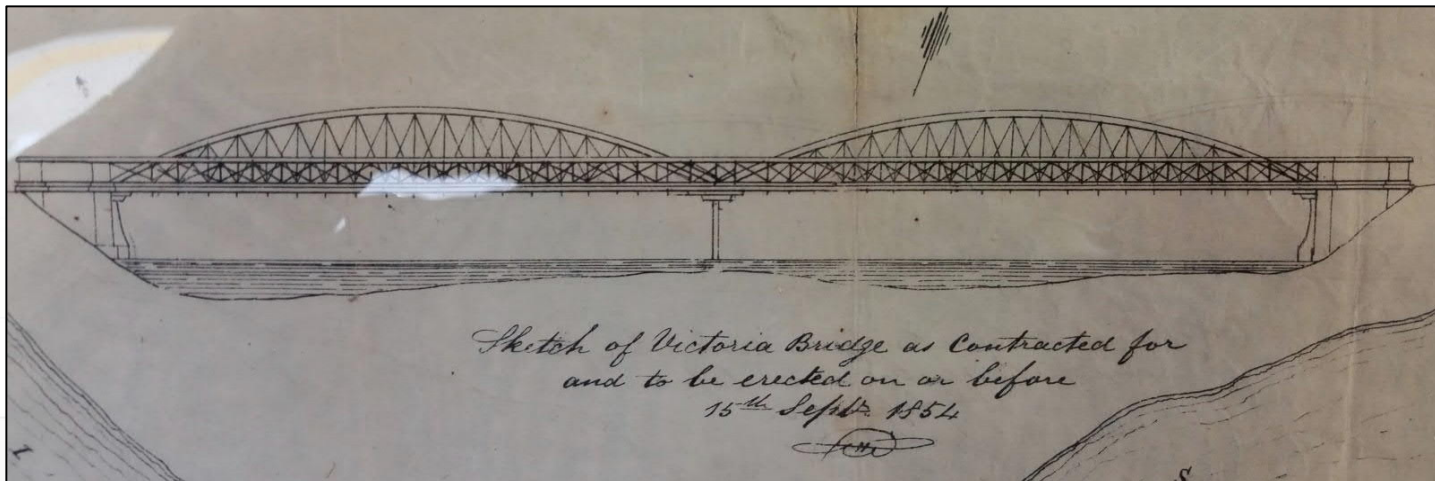
- Draft HIA was presented to LACH in April 2017. At that time the EA was not complete, however the most feasible alternatives for the bridge were:
 - Retention of existing Bridge with sympathetic modifications.
 - Replacement on existing alignment with sympathetic design.
- Replacement with sympathetic design was chosen alternative per EA.
- Recommendations were provided in the HIA for consideration with either a replacement or rehabilitation option.



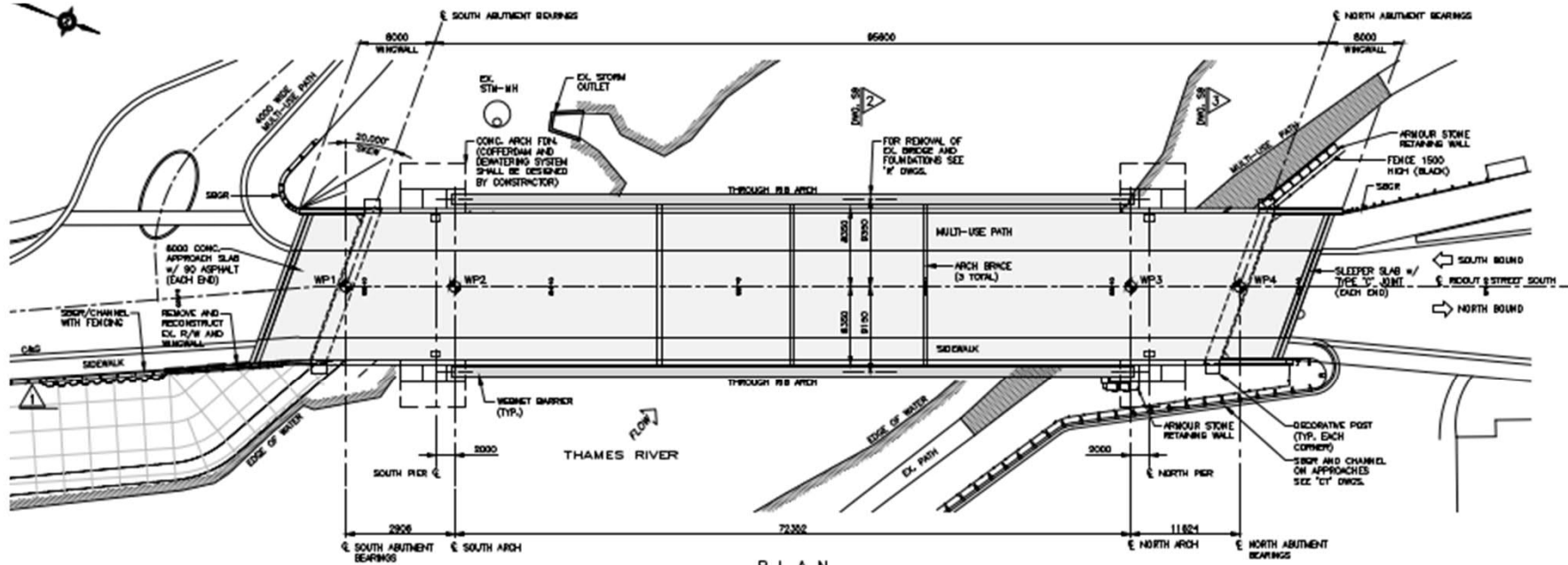
HIA Recommendations and Approach

Recommendation: Sympathetic design consideration with potential to incorporate design aesthetics of previous bridges at this location.

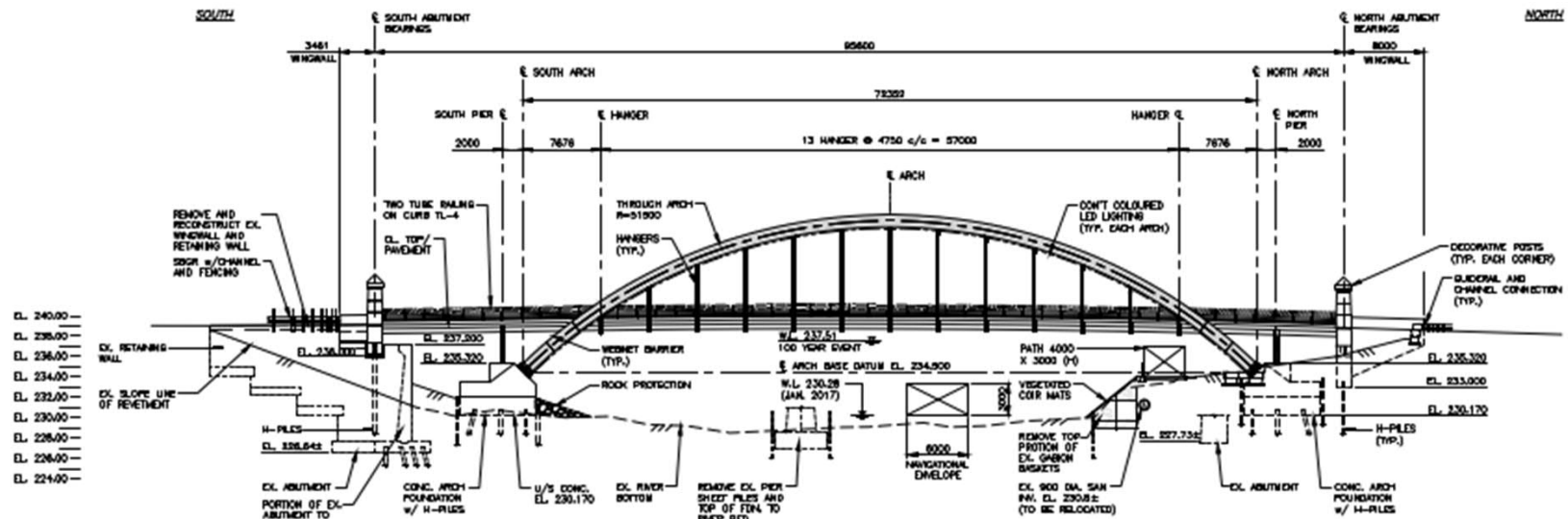
The arch structure has a historic connection to the proposed 1854 design for Victoria Bridge by Samuel Peters which was never constructed. The proposed structure material type (steel) is also reflective of the current Victoria Bridge.



VICTORIA BRIDGE GENERAL ARRANGEMENT

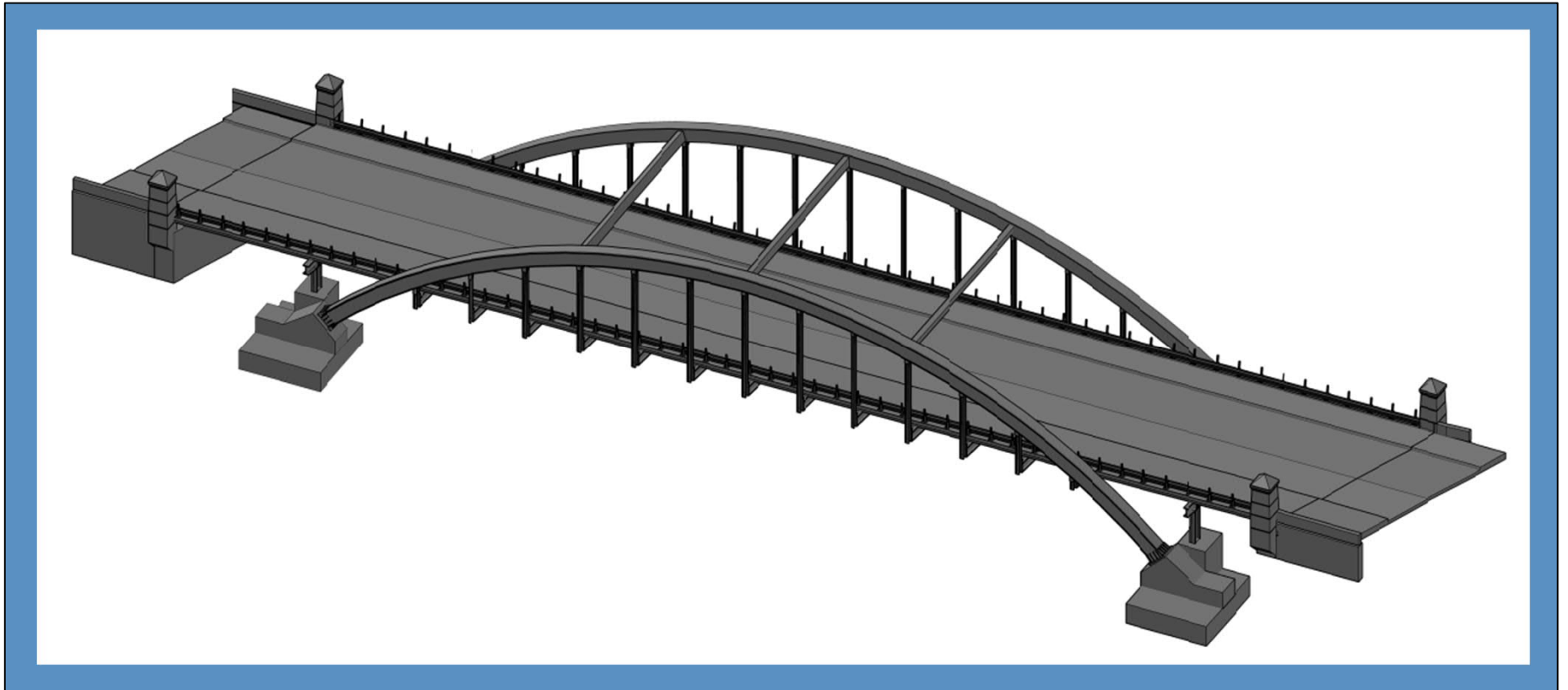


PLAN
1 : 250



ELEVATION
1 : 250

VICTORIA BRIDGE RENDERING



BAYFIELD BRIDGE (HWY 24)

Example of a Through Arch Bridge currently under construction





HIA Recommendations and Approach

Recommendation: Maintain a 76 m span of structure as a symbolic connection to the existing bridge.

The span of the new steel arch structure will be 76.3 m.

Recommendation: Maintain similar arrangement of transverse floor beams, longitudinal stringers and concrete deck, similar to the existing structure.

The new Through Arch Bridge will consist of similar steel transverse floor beams, longitudinal stringers and reinforcing concrete deck.



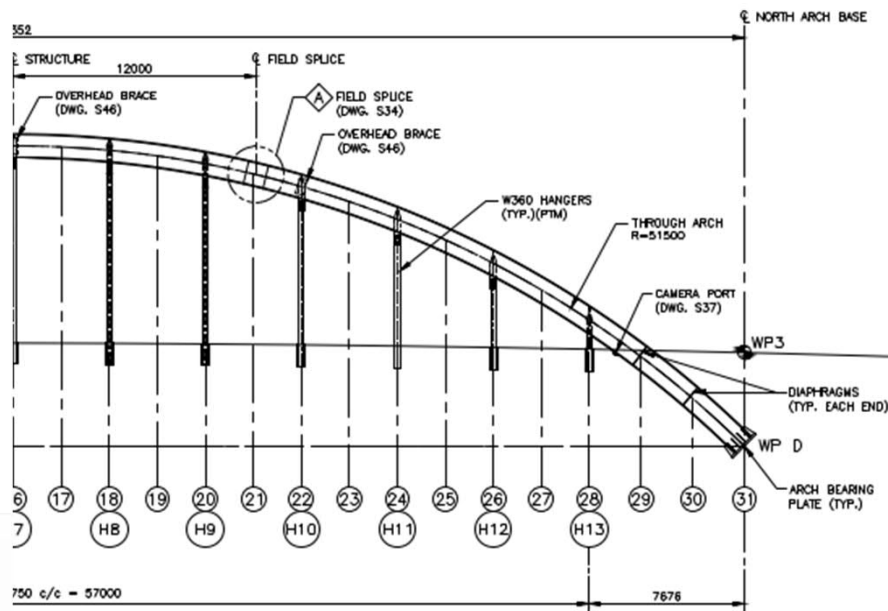
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HIA Recommendations and Approach

Recommendation: Consider heritage attributes when finalizing the design to maximize potential for heritage-related sympathetic design.

- Riveted, modified Warren truss structure with seven panels



Use of faux rivets (i.e. rounded bolt heads) welded to the arches and structural elements was considered. However, based on arrangement and modern styling, rivets would not appear functional and may take away from the sleek appearance.

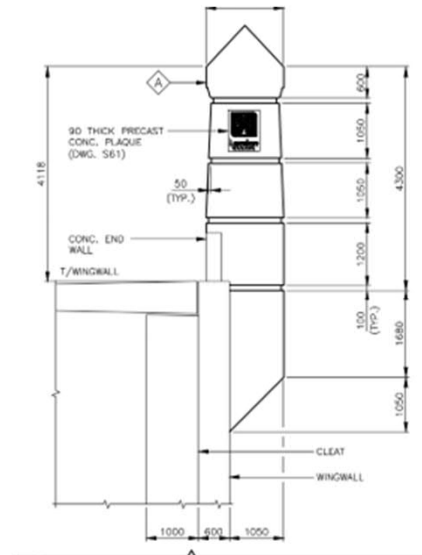
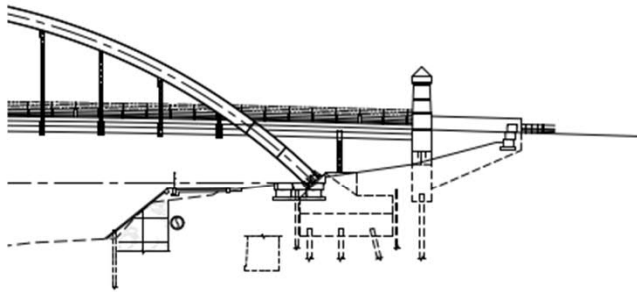
The design incorporates 7 spaces between vertical hangers on each side of centreline of the arch, which references 7 panel truss on each side of the centre pier.



HIA Recommendations and Approach

- Remnants of decorative stone and concrete end post at north abutment

Construct new concrete end posts at 4 corners of the bridge, supported on the abutments similar to the existing bridge. While the posts have a similar shape, they are of larger size to create more prominent limits of the structure which further highlights the bridge skew. The larger post size is reflective of the prominent original stone posts at the ends of the truss that no longer exist. Detailing of the posts is modern to reflect the new structure.





HIA Recommendations and Approach

- Decorative Lamp Posts in centre of bridge spans

Reuse of existing poles on new bridge was reviewed, but not feasible due to unknown condition (cracking evident), durability, anchorage/base details, design criteria or capacity. The current light arm/fixture are modern LED style.

New decorate pole / arm / fixture will be incorporated on bridge.

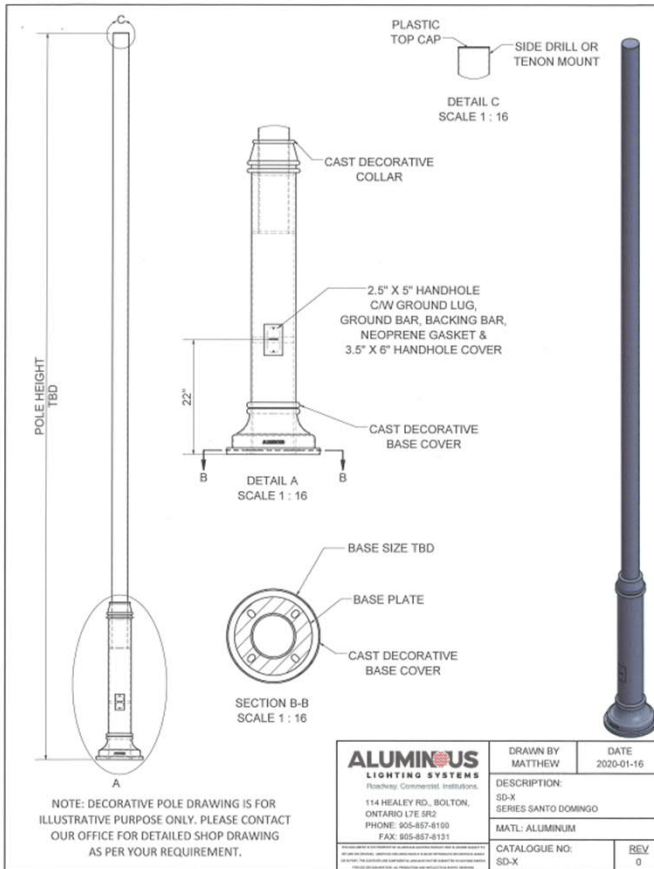




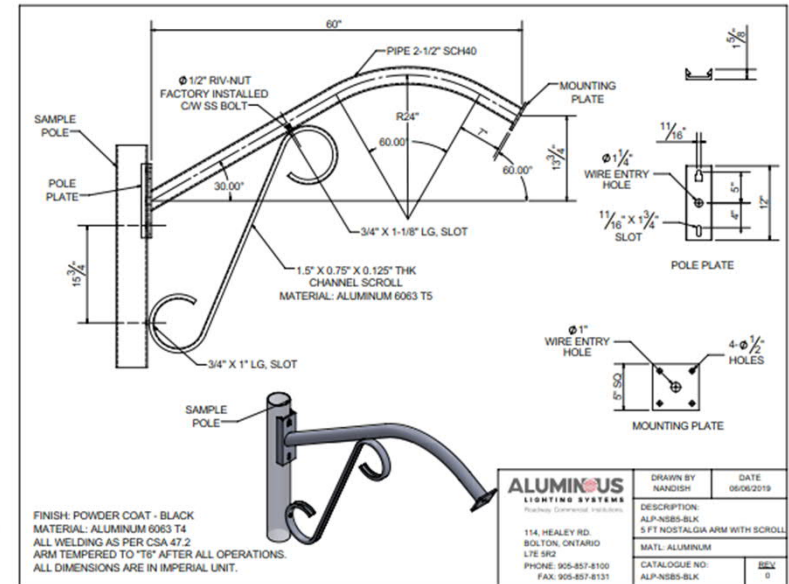
HIA Recommendations and Approach

- Decorative Lighting on Bridge

Proposed lighting on the bridge shown below. Currently reviewing options for new pole with decorative detail at base.



SDL LED
 1 - 4 LightBARs
 DECORATIVE LUMINAIRE

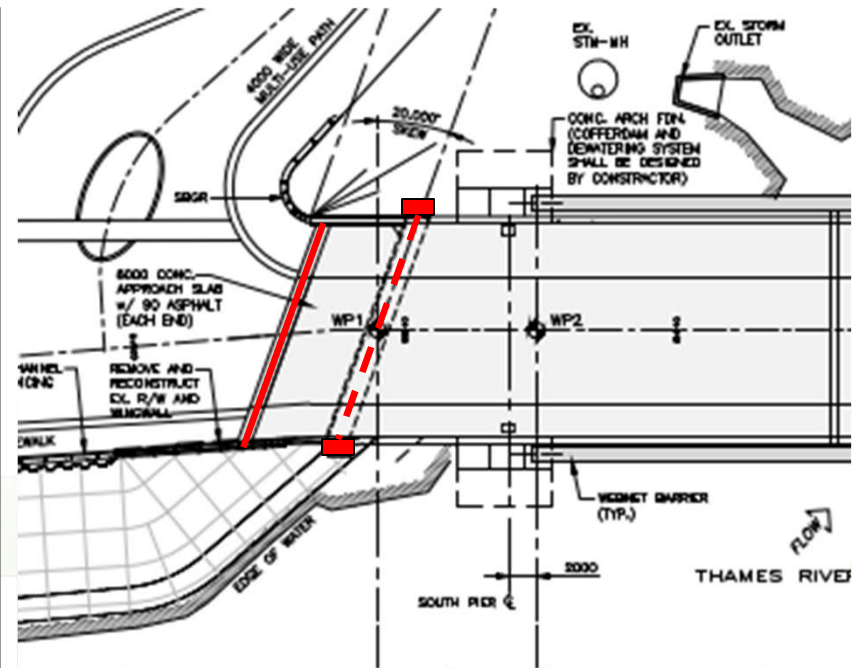




HIA Recommendations and Approach

- Bridge skew evident in abutments, pier and truss alignments

New Bridge will have a 20-degree skew at the abutments and approach slabs. The skew will be highlighted with the position of the end posts and in the expansion joint at the end of the approach slab.





HIA Recommendations and Approach

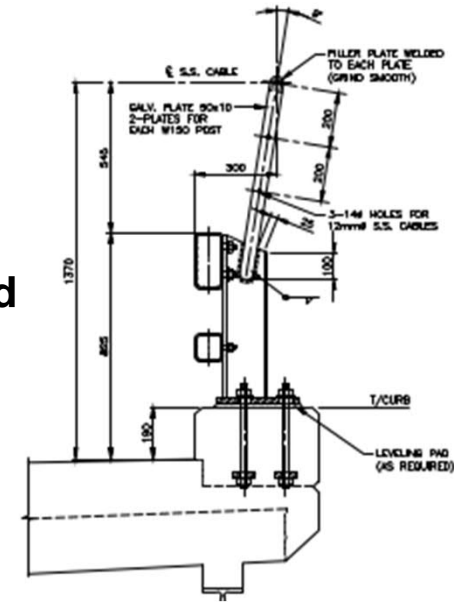
Heritage Impact Assessment:

- Hand railings original to the design of the bridge

Existing bridge railings are pedestrian guards. With the new structure, railing must be vehicular crash rated to current design standard. A more substantial railing is required than the existing structure. A railing design similar to existing is not feasible.

The new railing system will consist of steel box beam barrier with stainless steel cable guard extension to raise the height of the barrier suitably for pedestrians and cyclists.

Proposed Railing



Existing Railing



HIA Recommendations and Approach

Heritage Impact Assessment:

- Hand railings original to the design of the bridge

Similar example: West Broughs Bridge (Richmond St., south of Windermere Rd.)

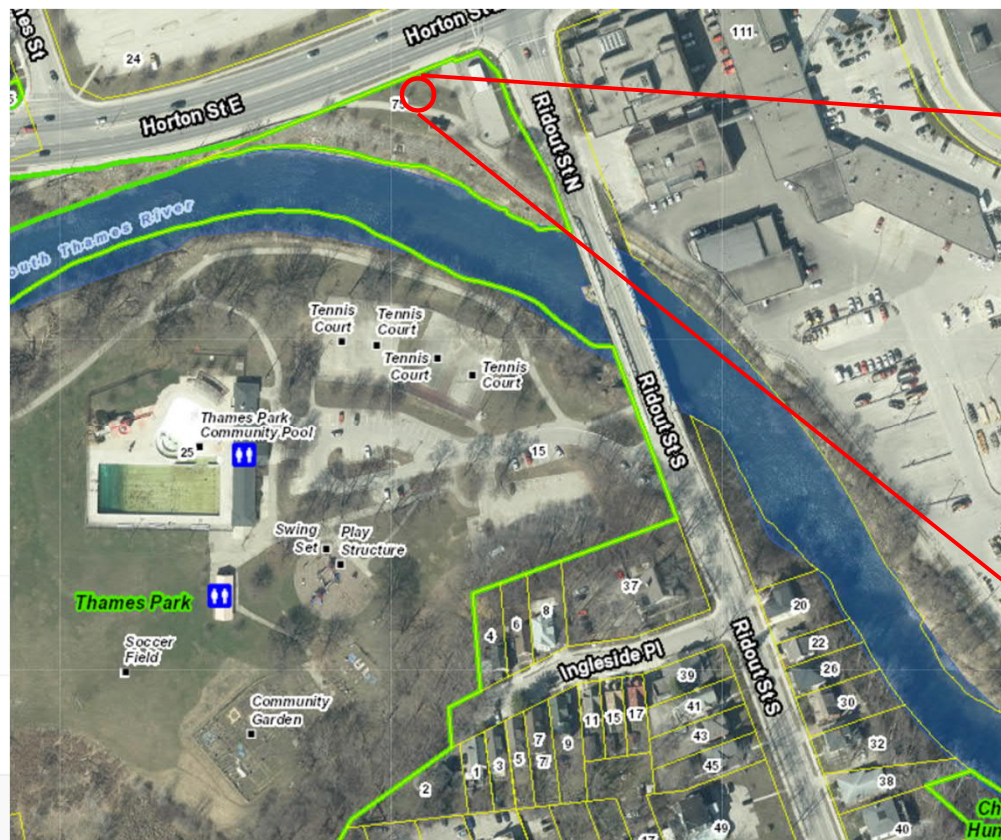




HIA Recommendations and Approach

- Interpretive Signage / Plaque(s) to summarize the history of bridge crossings at this location.

Construct monument with interpretive historical plaque near TVP at the northwest corner of bridge.





HIA Recommendations and Approach

- Interpretive Signage / Plaque(s) to summarize the history of bridge crossings at this location.

Consider salvage and reuse of existing stone from the northeast wingwall (original to the 1875 bridge). The stone could be incorporated as the base of the monument to mount the plaque.

Best efforts will be made during construction to extract and protect the stone. However, if the stone condition is unsuitable for reuse, new similar materials will be utilized.





Other Considerations

- Bridge colour

AECOM recommends a white arch colour, providing a sleek and modern appearance. Other structural steel elements (floor beams, stringers, etc.) would be painted a matching colour.

