



MORRISON HERSHFIELD

# Butternut Lane Bridge – Renewal Options Study

August 8, 2023

# Presentation Outline

1. Existing Structure
2. Design Criteria
3. Renewal Options
4. Costs
5. Next Steps



# Existing Structure - Location





# Existing Structure

---

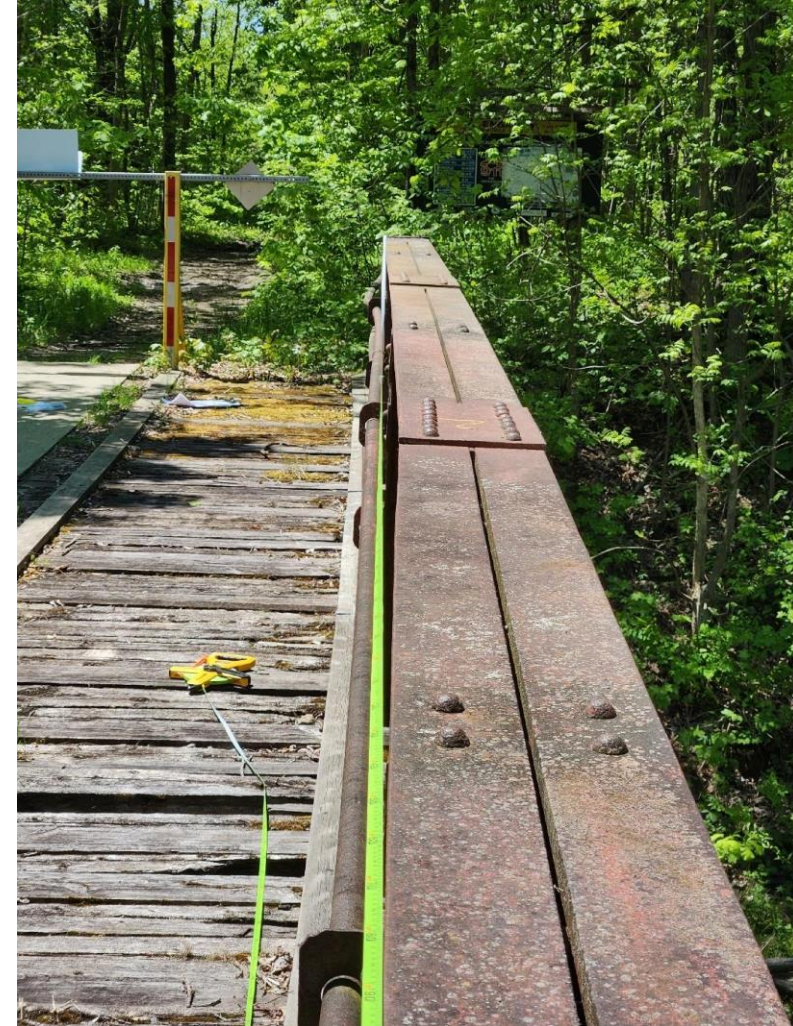
- 16.4 m Span Pony Truss
- 5.5 m wide (4.9 m clear)
- Masonry abutments
- No original drawings, foundation conditions unknown
- Supports ATV's, Snowmobiles, Pedestrians and Equestrian Users





# Existing Structure – Condition

*Chord / Global Buckling:*





# Existing Structure – Condition

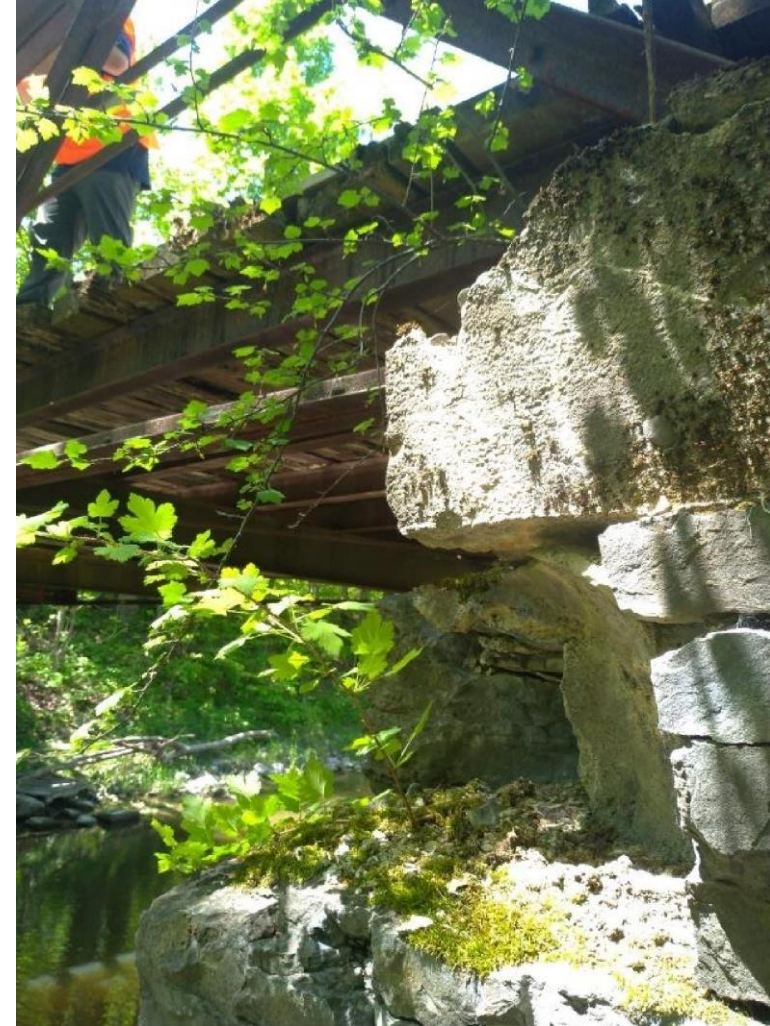
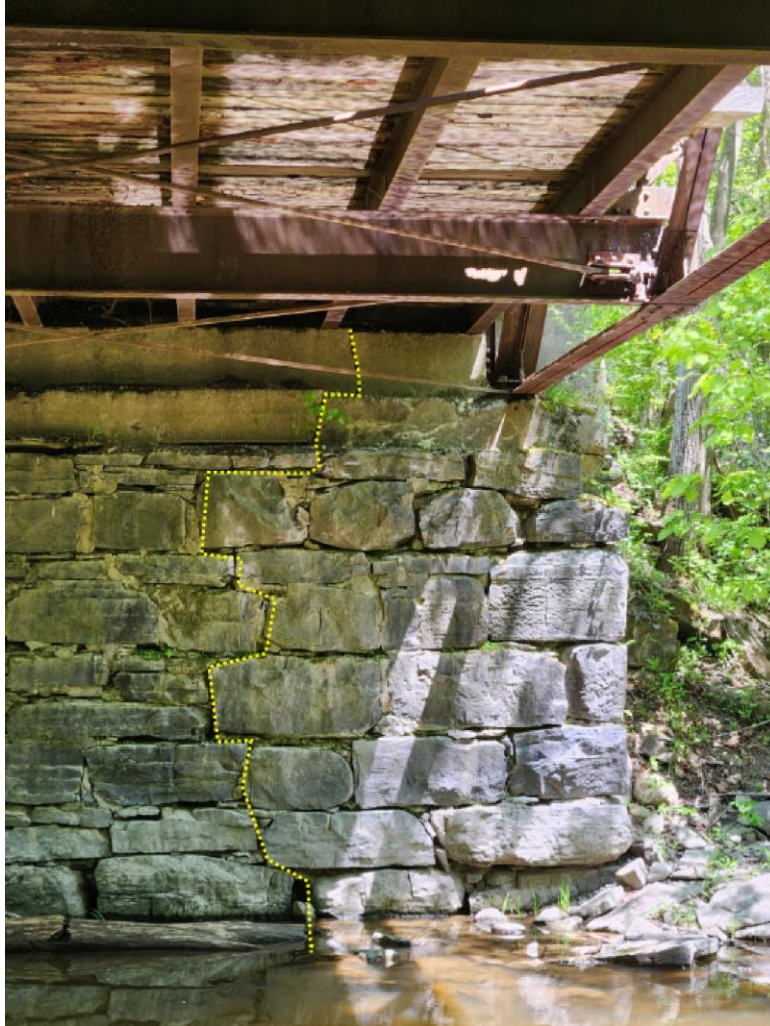
*Perforation in Bottom Chord:*





# Existing Structure – Condition

## *Abutments*





# Design Criteria

## Clear Width



## Maintain Hydraulic Opening

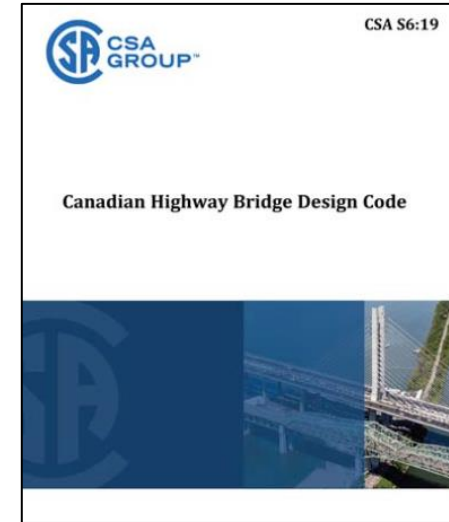




# Design Criteria

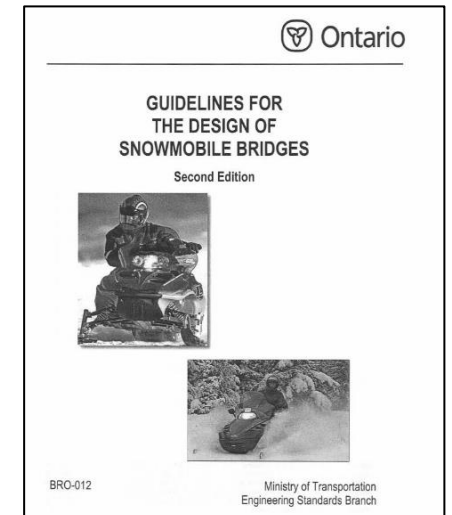
## Canadian Highway Bridge Design Code:

- *Pedestrian Loading*
- *Maintenance Vehicle*



## MTO Guidelines for the Design of Snowmobile Bridges:

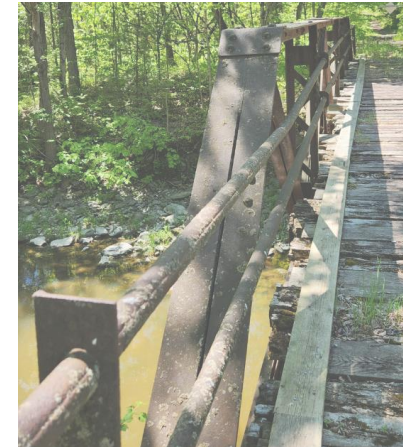
- *Groomer Live Load*
- *Snow Loading*





# Renewal Options – Initial Development

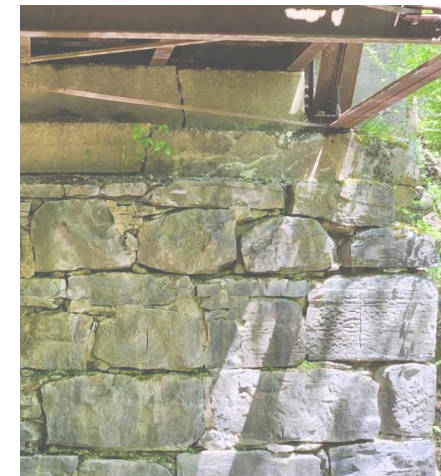
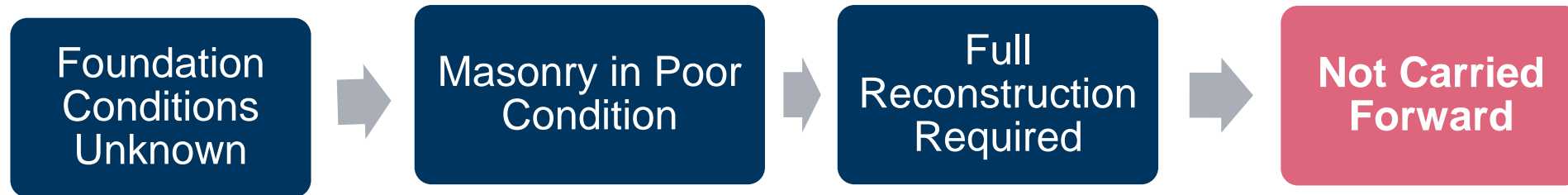
## 1. Comprehensive Superstructure Rehabilitation





# Renewal Options – Initial Development

## 2. Abutment Re-Use





# Renewal Options – Initial Development

## 3. Superstructure Type



Precast Concrete Girders

Cost Prohibitive for non-vehicular Structures

Not Carried Forward



Prefabricated Steel Plate Girder Structure

Moderately Cost Effective

Not Carried Forward



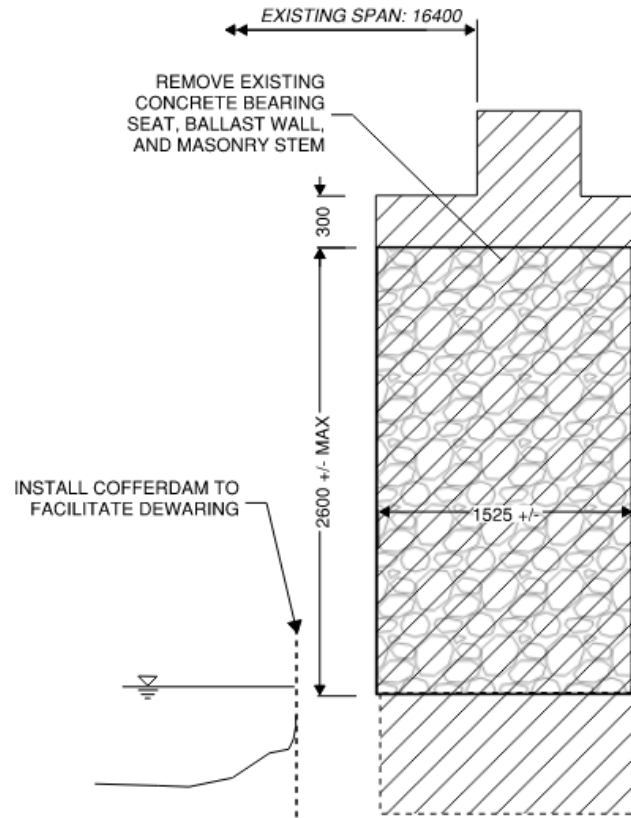
Prefabricated Truss

Most Cost Effective

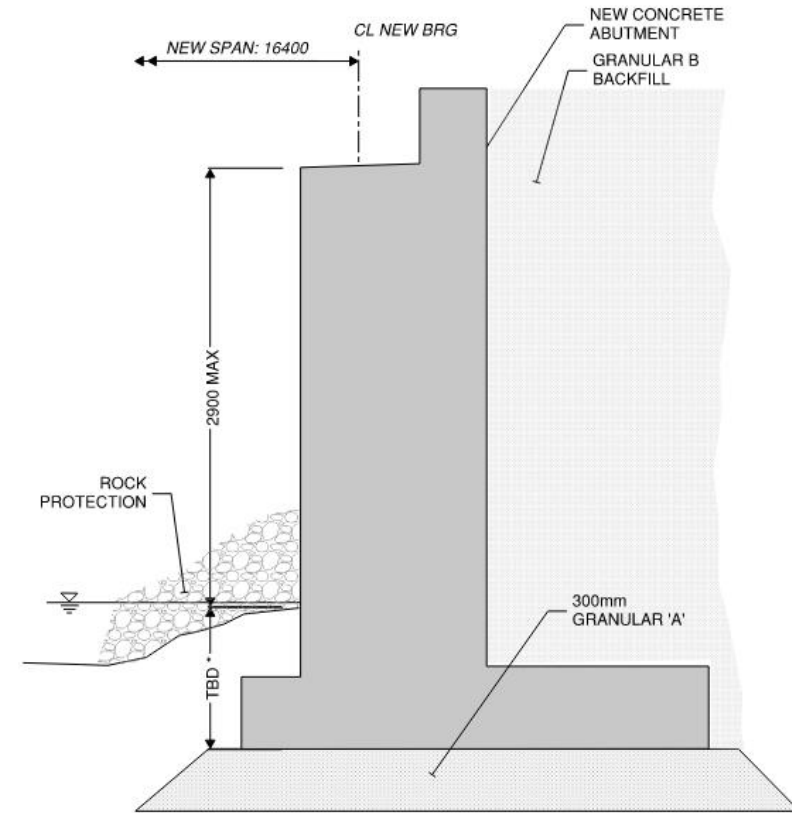
**Preferred**

# Renewal Options Analysis

## Option 1: Replacement In-kind



REMOVALS

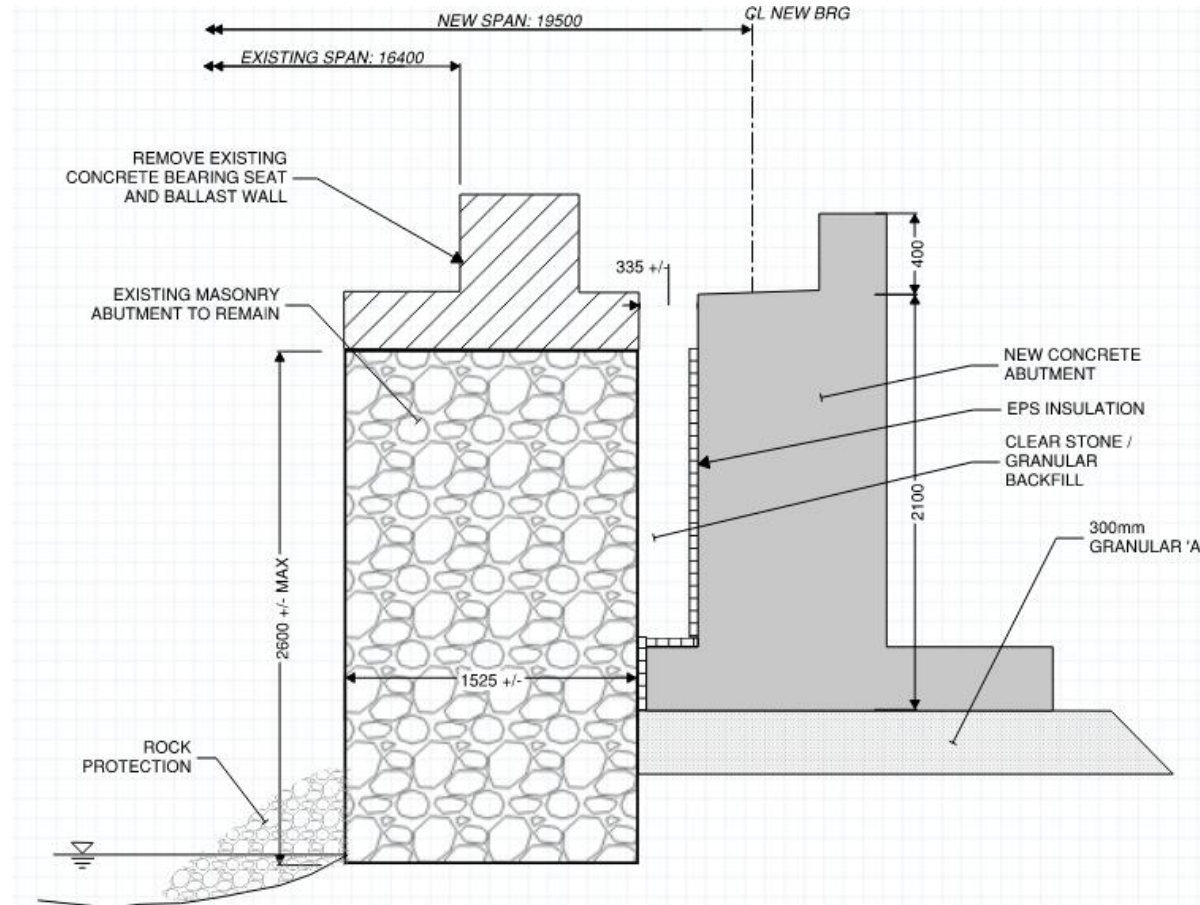


NEW CONSTRUCTION



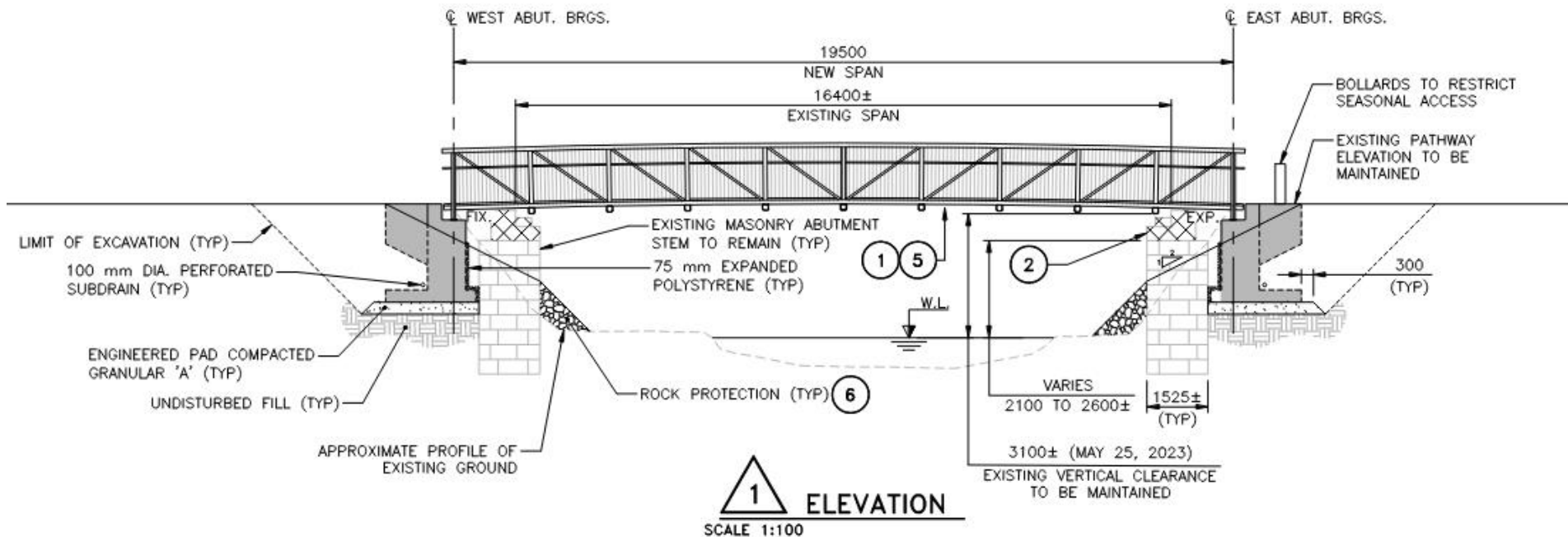
# Renewal Options Analysis

## Option 2: Perched Abutments Behind Existing Masonry



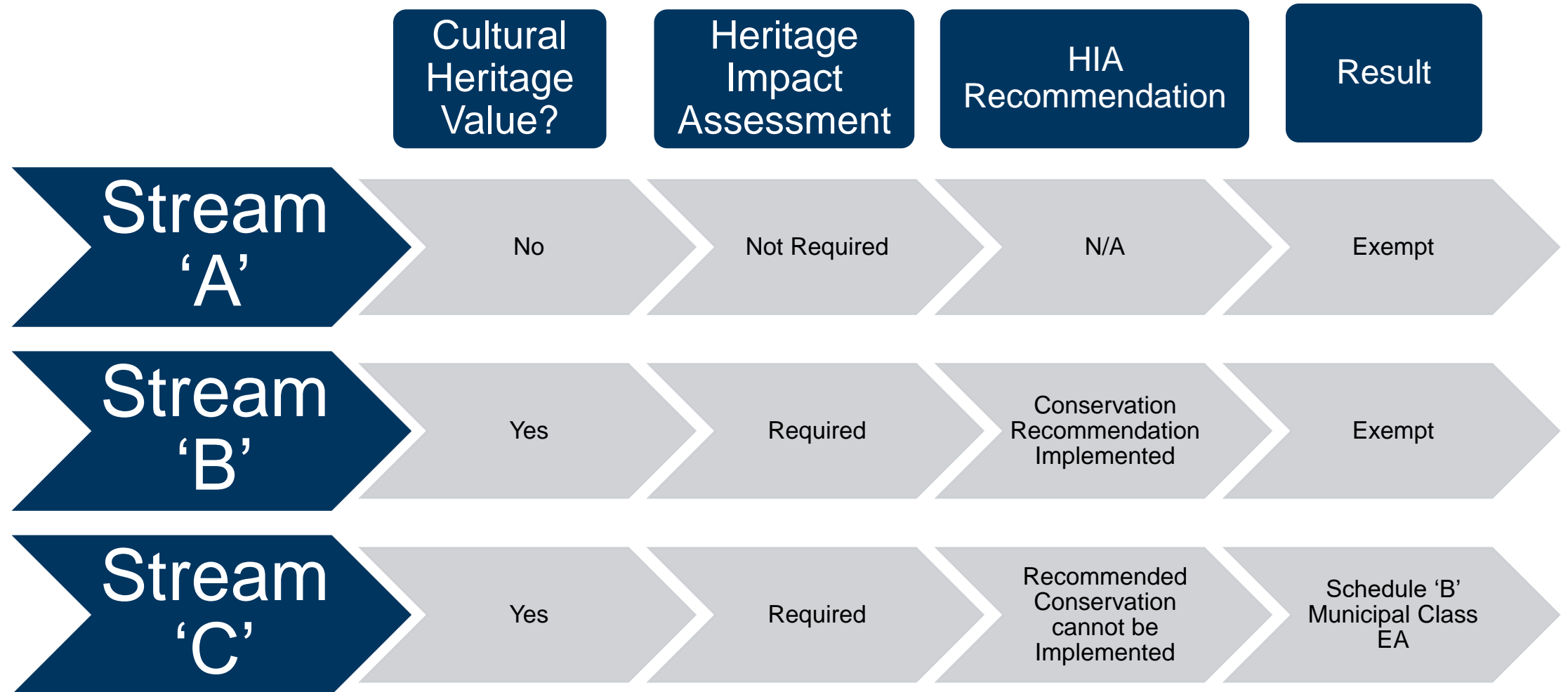
# Costs

	Option 1 <i>Replacement in-kind (16.4 m span)</i>	Option 2 <i>19.5 m span on perched abutments</i>
<b>TOTAL (Rounded):</b>	<b>\$640,000.00</b> (+34%)	<b>\$478,000.00</b> ( - )





# Next Steps - Heritage



# Next Steps

---

- Stakeholder Consultation
- Utility Coordination / Engagement
- Geotechnical Investigation
- Topographic Survey
- Heritage Assessment
- Environmental Review





MORRISON HERSHFIELD