



**Township of Woolwich
Heritage Committee
Agenda**

November 8, 2023

5:00 p.m. - 6:00 p.m.

Council Chambers & via Video Conference

Chair: Councillor Bonnie Bryant

Access Details

Meeting Link

Meeting ID: 894 4250 8289

Passcode: 068142

Toll-Free: 855-703-8985

Pages

1. Land Acknowledgement

The land on which we meet has been here from time immemorial. People have inhabited southern Ontario for about 10,000 years and we acknowledge the Neutral people also called Attawandaron, Anishinaabe, and Haudenosaunee Peoples who lived here when settlers arrived and who share this land with us. May we together learn to care for and respect each other, our flora and fauna, and the land we inhabit together.

2. Call to Order

3. Disclosure of Pecuniary Interest

4. Adoption of Minutes

4.1 October 11, 2023

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5. Work Plan

5.1 West Montrose Covered Bridge Project Update

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West Montrose Bridge Project Update by the Region of Waterloo.

5.2 Work Plan 2023-2024 Draft

36

6. New Business

6.1 New Planner Sherwin Maloney

New staff liaison for the Heritage Committee.

7. Items for the Next Agenda

7.1 Appointment of 2024 Meeting Chair and Co-Chair

7.2 Meeting Schedule for 2024

8. Adjournment

Township of Woolwich Heritage Committee Minutes

October 11, 2023
5:01 p.m. – 5:23 p.m.
Video Conference
Hosted in Council Chambers
24 Church Street West, Elmira

Meeting Chair: Councillor Bonnie Bryant, Chair
Attended: Colleen Willard-Holt, Co-Chair
Katy Boose
Kim Hodgson
Marg Drexler
Karen Cummings
Staff Present: Natalia Smiarowski, Records and Information Specialist
Regrets: Hans Pottkamper
Allison Gramlow

Land Acknowledgement

Councillor Bonnie Bryant read a land acknowledgement.

Call to Order at 5:01 P.M.

Disclosure of Pecuniary Interest

None.

Adoption of Minutes

Moved by Marg Drexler

Seconded by Co-Chair, Colleen Willard-Holt

That the minutes of May 10, 2023 and September 13, 2023 be adopted as amended.

...Carried.

Work Plan Updates

Work Plan Debrief

The Committee discussed the future Work Plan and the need for preservation of barns in the area. The Committee noted Will Tuft's property may need a heritage designation, and concerns that the barn on the property is situated near a tree.

The Committee remarked on the possibility to use the website to archive the barns and that there was already work done by the Region of Waterloo Barn Inventory which could be used for a digital display.

The Committee discussed that next week they will do a detailed planning session.

Architectural Conservancy of Ontario Update (ACO)

The ACO has been contacted but there were no further updates to report at this time. The Committee highlighted the two properties of interest for designation: the Elmira Library and the Bridgekeeper's Cottage.

ACTION: Councillor Bryant to email back the ACO.

St. Boniface Plaque Update

The Committee discussed the reasons for not replacing the plaque including improper fastening of the original plaque.

New Business

None.

Items for the Next Agenda

Work Plan and Budget Brainstorming Day

The Committee will spend the next session brainstorming and creating actions based on the work plan.

New Committee Members Recruitment

The Committee will contact Township Staff to start the recruitment of new members.

ACTION: Katy Boose to contact Township Staff.

Meet with Center Wellington Historical Group

The Committee discussed meeting with the Center Wellington Historical Committee.

ACTION: Kim Hodgson to email the Committee to create a meeting time.

Adjournment

Moved by Co-Chair Colleen Willard-Holt

Seconded by Katy Boose

That the meeting be adjourned.

...Carried.

West Montrose Covered Bridge Rehabilitation

Township of Woolwich Heritage Committee Meeting



Presented by:

Michelle Pinto, P.Eng., M.B.A.

Region of Waterloo Project Manager

Steve Taylor, P.Eng., M.Eng., CVS-LIFE, P.E.

BT Engineering – EA Project Manager

Andrew Lehan, P.Eng., M.A.Sc.

Entuitive – Senior Bridge Engineer

Richard Unterman, M.A., CAHP

Unterman McPhail Associates – Heritage Consultant

Township of Woolwich, Region of Waterloo

November 8, 2023

ENTUITIVE

BT ENGINEERING
BTE



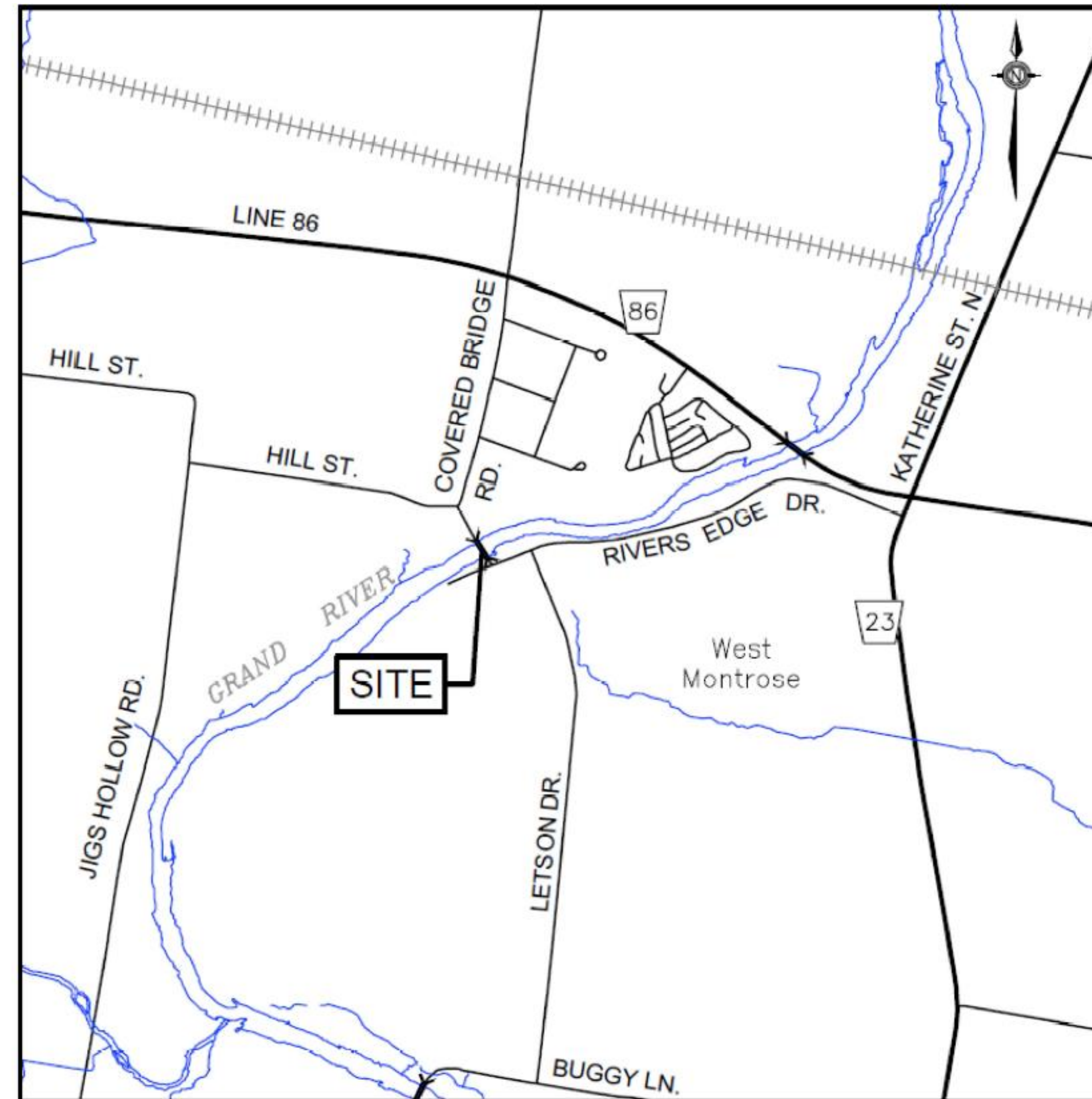
Study Introduction

Project Purpose

The West Montrose Covered Bridge requires a complete structural rehabilitation to ensure the structure will continue to serve the public through the current century.

This study follows the Municipal Class Environmental Assessment (EA) process and is classified as a Schedule C Project.

Project Location



Project Need and Opportunities

The 2014 Preservation Strategy for the West Montrose Covered Bridge and ongoing structural monitoring of the bridge has identified the need to:

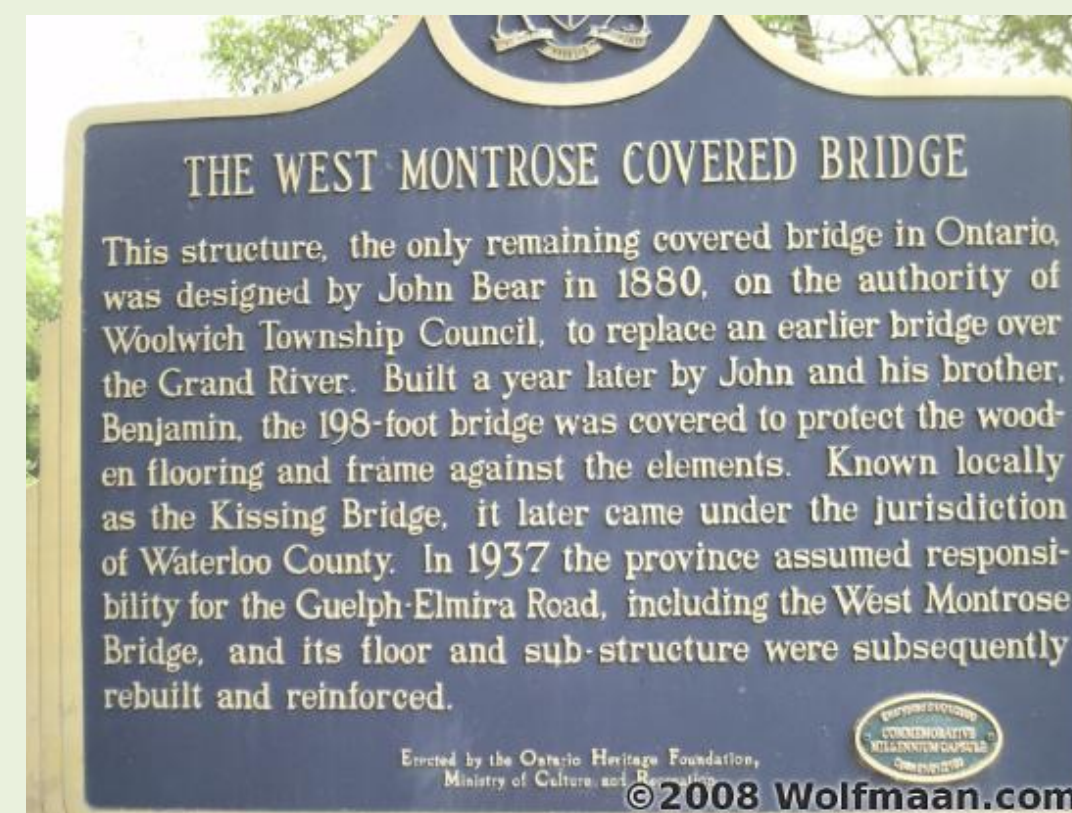
- Remove the Bailey truss system and provide a single robust load bearing system capable of supporting all loads on the bridge.
- Repair the roof and exterior cladding.
- Mitigate other risk factors to the bridge including damage by oversize vehicles, loss by fire, flooding, ice and/or snow damage.

Structural Rehabilitation



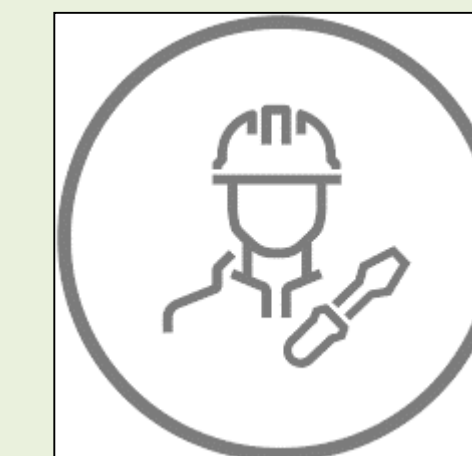
Strengthen the overall structural system to support bridge loads and ensure public safety

Heritage Conservation



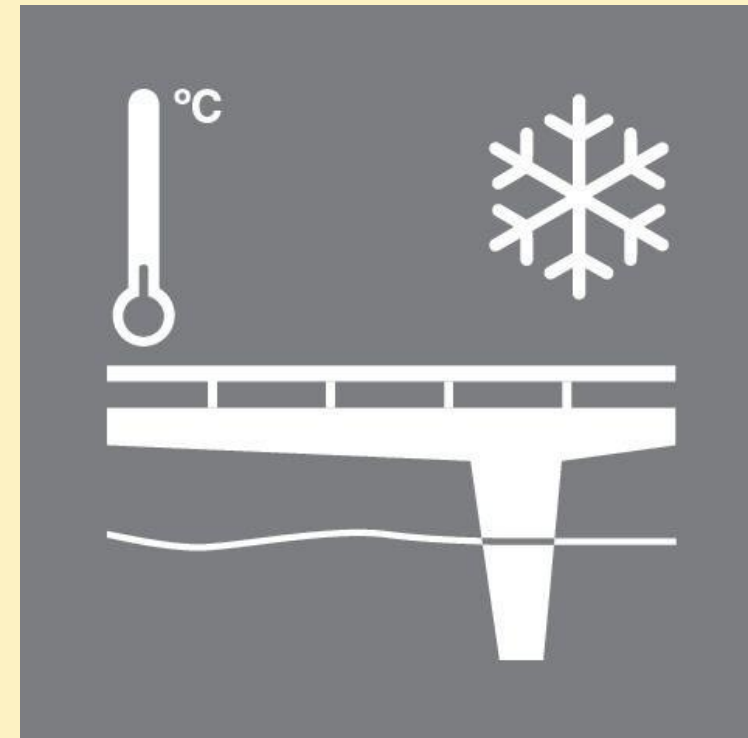
Preserve the heritage designation of the bridge

Ongoing Maintenance



Minimize future maintenance requirements

Existing Challenges



Natural risks (wind, flood, snow, and ice damage)



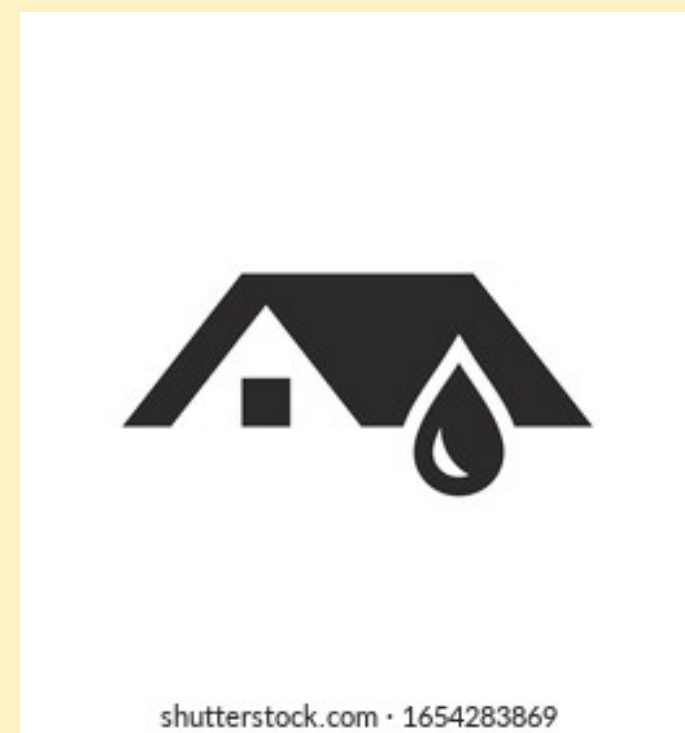
Overloading of the bridge by oversized vehicles



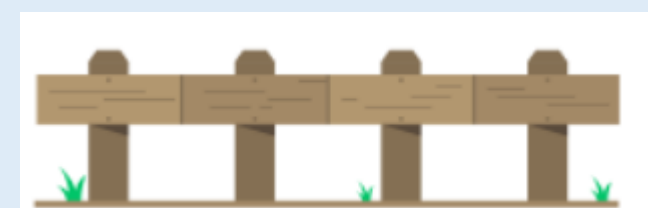
Risk of Vandalism



Water supply for a fire suppression system



Deterioration of the timber truss, with time

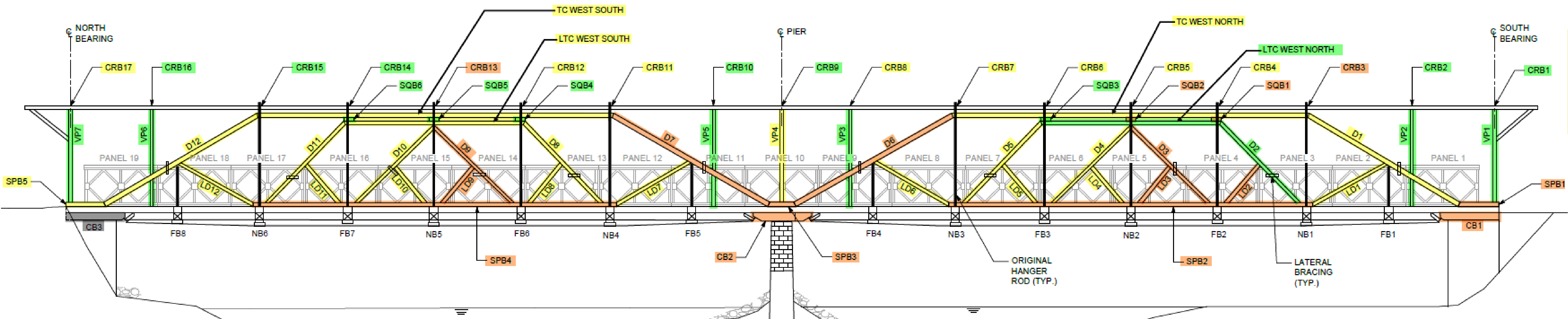


Protection of the wooden truss

Background Studies

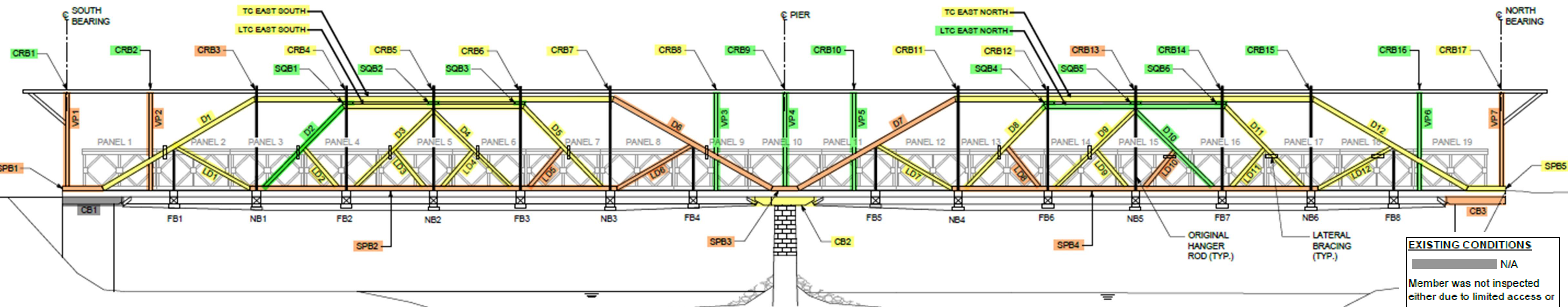
Study	Considerations
Natural Environment Study	Potential impacts on terrestrial species, vegetation, birds, amphibians, bat habitat, aquatic habitat, and fish
Stage 1 Archaeological Assessment	Potential impacts on sites with archaeological potential
Heritage Impact Assessment	Cultural heritage conservation of the bridge
Hydraulic Assessment	Assessment of flood water levels and scour
Geotechnical Study	Composition of the pier, abutments and the underlying soil

Background Studies – Timber Truss Assessment



WEST ELEVATION
1:100

ELEVATION FROM EXTERIOR OF BRIDGE
OBSERVATIONS NOTED IN MEMBER RESULTS IN APPENDIX B ARE REFERENCED FROM THE INTERIOR OF THE BRIDGE LOOKING OUTWARDS



EAST ELEVATION
1:100

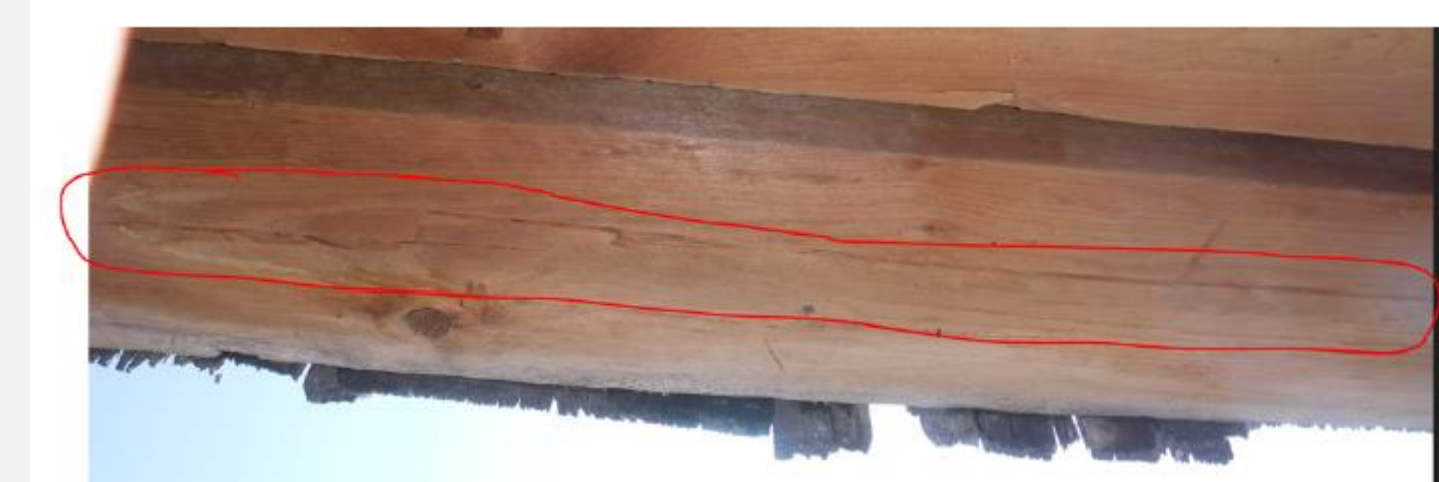
EXISTING CONDITIONS

	N/A
	Member was not inspected either due to limited access or similar members previously inspected adequately represents the existing conditions.
	POOR Severe deterioration.
	FAIR Minor deterioration. Member is still serviceable.
	GOOD No comments from visual review and resistograph readings. Expected MC%.

Background Studies – Existing Wooden Truss Conditions

Elements recommended for replacement based on condition:

- Deck
- Stringers
- Floor beams and needle beams
- Bottom chord
- Steel hanger rods
- Sway bracing
- Exterior red cladding
- Bottom lateral bracing
- End diagonals at the pier
- Roof shingles
- Replace the following items as necessary:
 - Tie beams
 - Squash blocks
 - Vertical posts
 - Roof rafters



Demand to Capacity Ratios

Design Live Load Weight	Top Chord	Lower Top Chord	Main Diagonals		Lower Diagonals	
			1st	2nd/3rd	1st	2nd/3rd
3 t	30%	41%	95%	32%	8%	3%
4 t	33%	51%	105%	36%	9%	3%
5 t	36%	61%	116%	40%	10%	3%
6 t	39%	70%	130%	45%	11%	3%
7 t	42%	80%	139%	50%	12%	3%
8 t	46%	90%	154%	56%	14%	3%
9 t	49%	100%	164%	61%	15%	3%
10 t	53%	110%	178%	67%	17%	3%
11 t	56%	121%	192%	73%	19%	3%
12 t	60%	131%	207%	79%	21%	3%
13 t	64%	141%	222%	86%	23%	3%
14 t	68%	152%	238%	93%	25%	3%
15 t	72%	162%	255%	100%	27%	3%

Public Consultation

Public Consultation Centre #1 October 2021

- 36 Surveys and comments received

Public Consultation Centre #2 June 2022

- 51 Surveys and comments received through EngageWR website and email

Public Consultation Centre #3 November 2023

West Montrose Bridge Rehabilitation - Woolwich

This project supports the Region of Waterloo's [strategic focus area\(s\)](#):

- Thiving economy
- Sustainable transportation
- Environment and climate action
- Healthy, safe and inclusive communities
- Responsive and engaging public service
- Our people

Introduction
Have questions about upgrades to the West Montrose Covered Bridge? We'd like to hear from you. Feedback can be provided online by asking a question under the Questions tab.

Background
The Region of Waterloo is currently undertaking a Schedule "A+" Municipal Class Environmental Assessment for major structural upgrades to strengthen the West Montrose Covered Bridge in the Township of Woolwich.

This work stems from long-term monitoring and evaluation of the load-carrying capacity of the bridge. The full project timeline is shown at the right side of this [Continue reading](#)

Key Documents

- 2020 Council Report TES-DCS-20-14 - West Montrose Bridge - Rehabilitation.pdf (4.77 MB) (pdf)
- 2014 West Montrose Covered Bridge Preservation Plan (7.13 MB) (PDF)
- West Montrose - Deck Rehabilitation Options - April 2021.pdf (2.27 MB) (pdf)
- West Montrose - March 26 2021 Letter to Agencies and Stakeholders.pdf (884 KB) (pdf)
- West Montrose Bridge - 30% Contract Drawings - 2021-05-18 - Not for

Public Consultation Centre Survey

CLOSED: This survey has concluded.

[Complete Form](#)

- Public Consultation Centre #1 and #2 were hosted on the Region's EngageWR Website
- Participants were encouraged to complete the survey, submit questions via the Question and Answer (Q&A) page, submit comment forms / emails and Contact the project team

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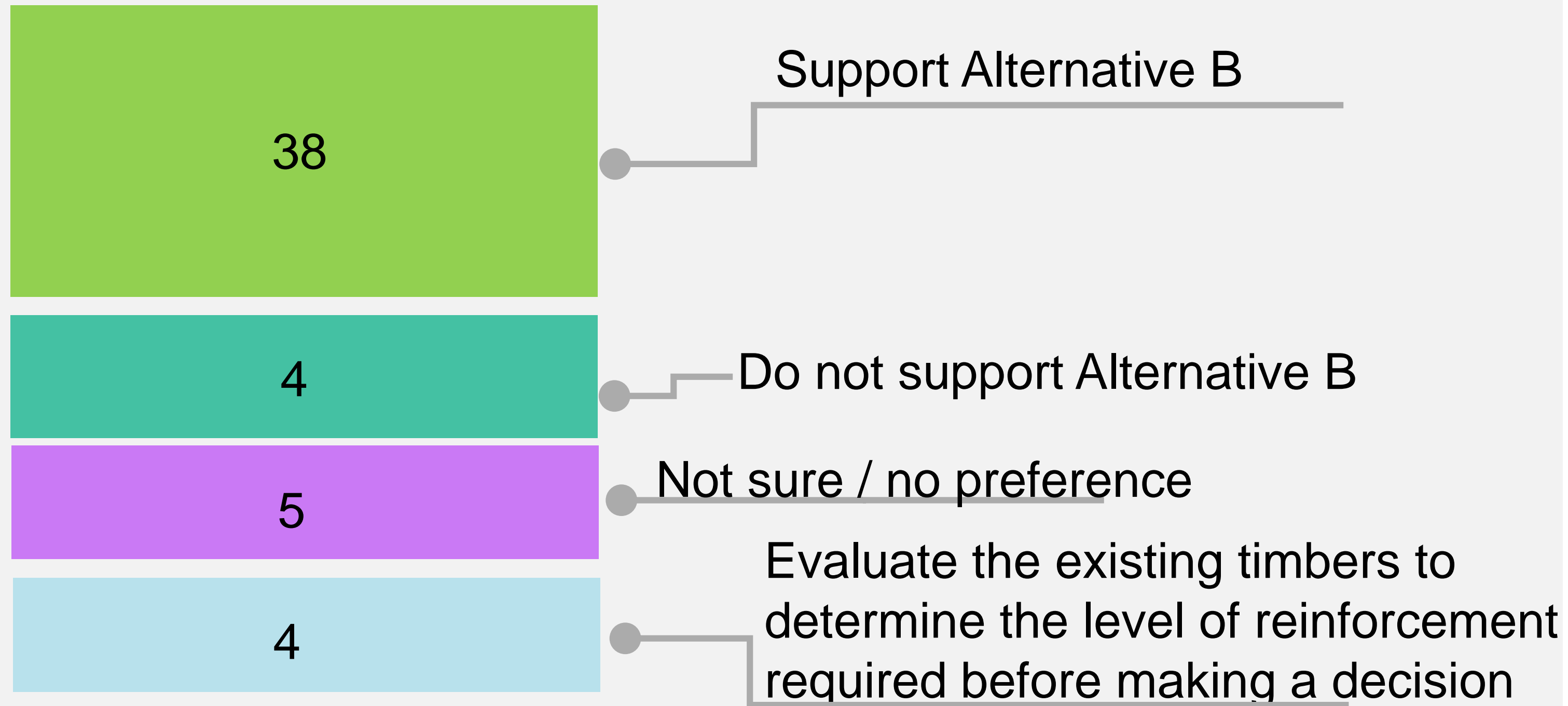
Preferred Alternative

Next Steps

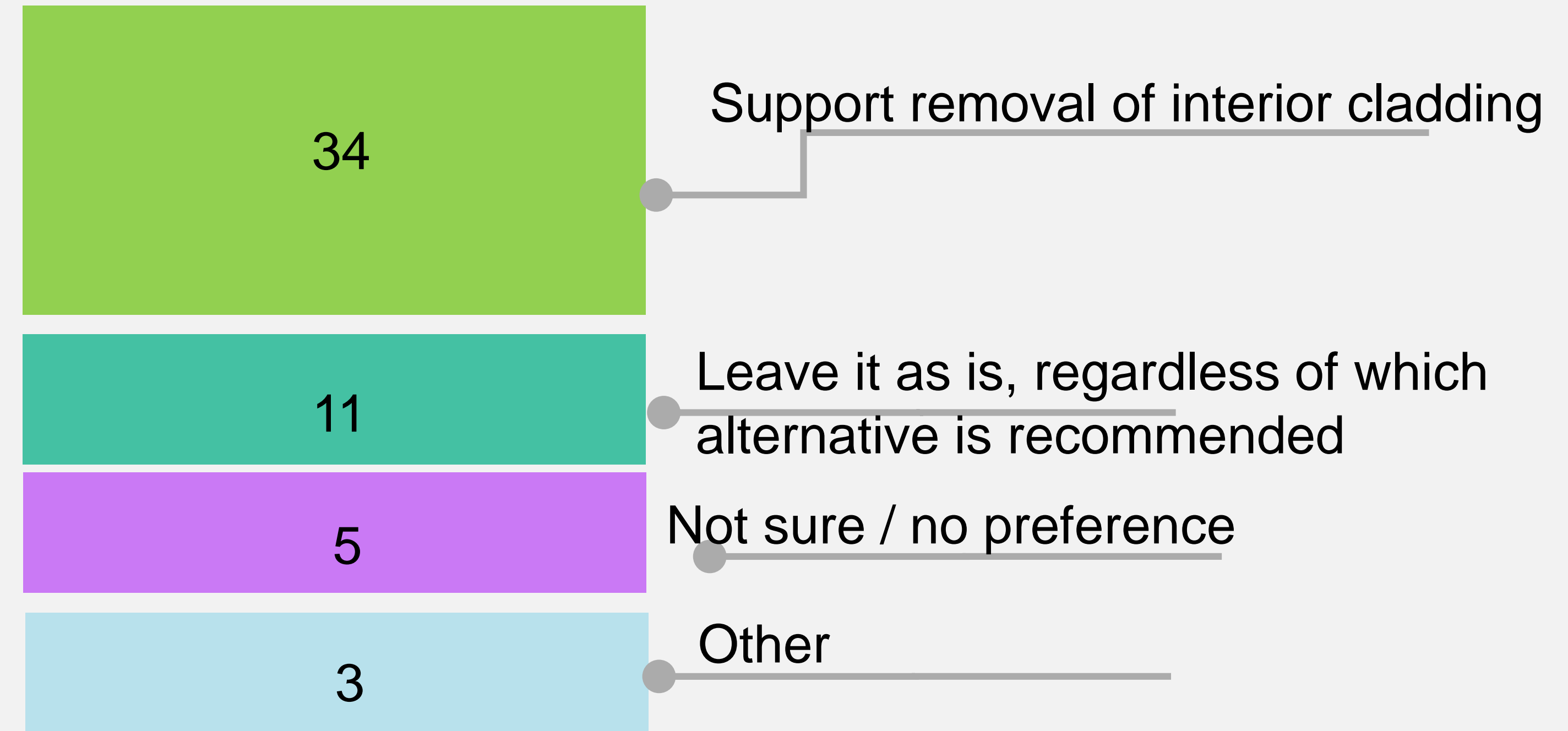
Public Feedback

Public Consultation Centre #2 – June 2022

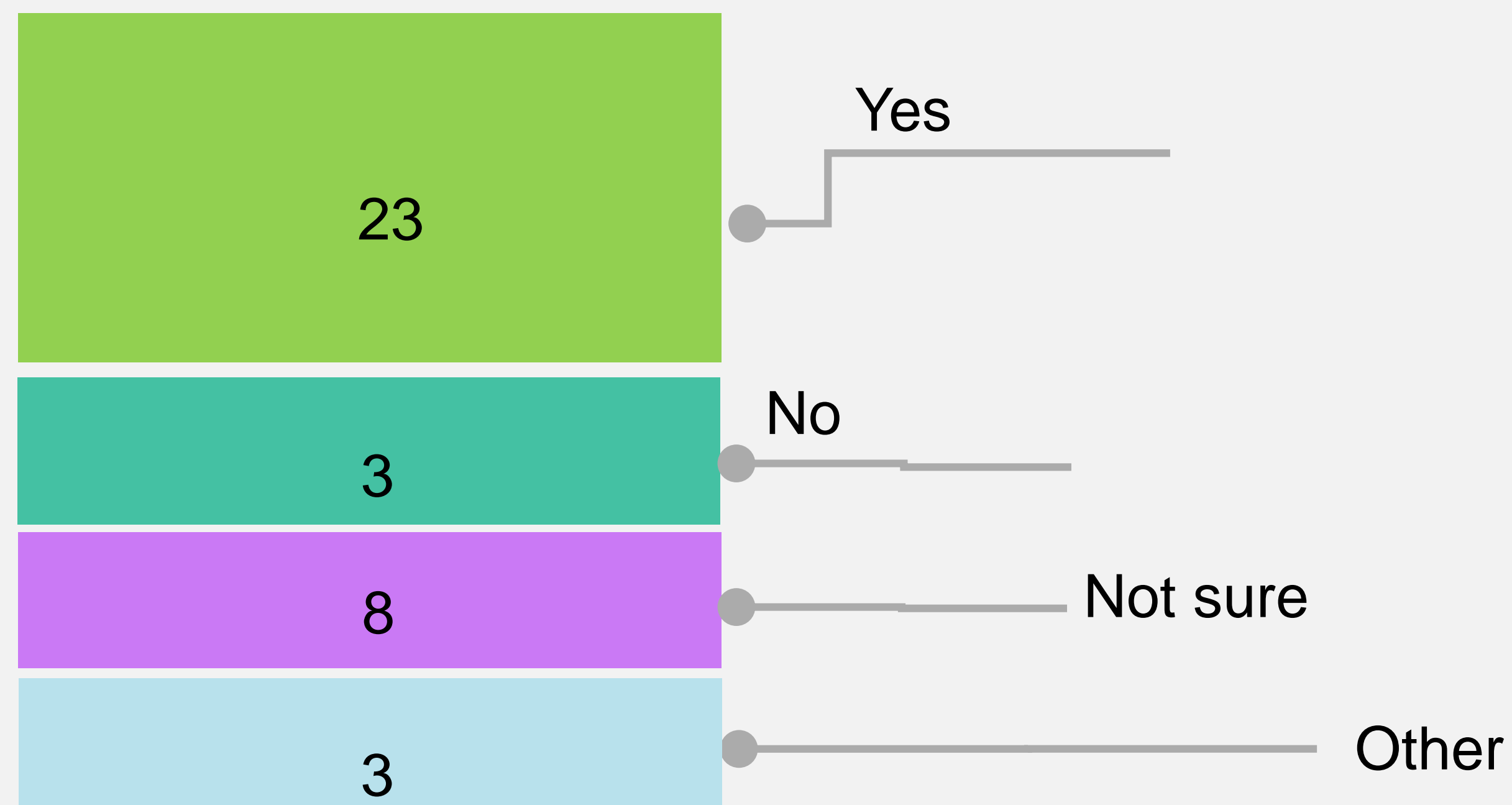
Support for Alternative B – Timber Truss Reinforcement



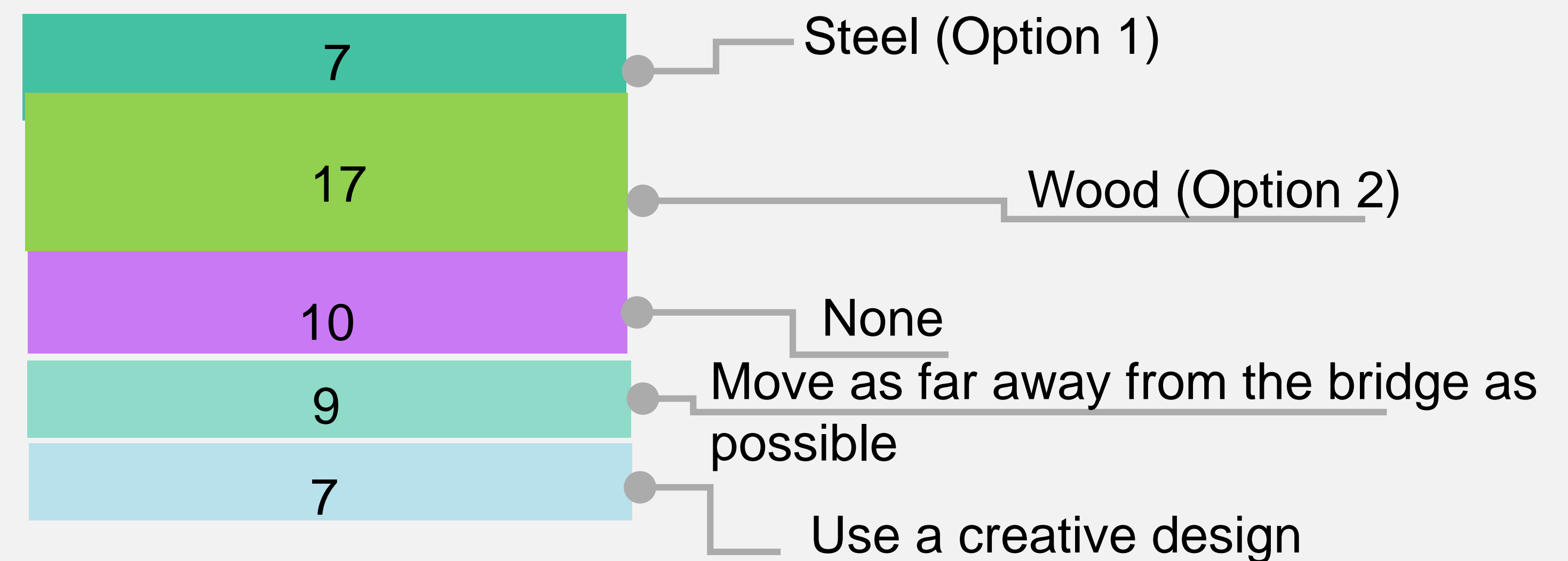
Support for removal of Interior White Cladding



Support Physical Roadside Features to Restrict Oversized Vehicles (PCC#1)



Physical Height Restriction Bar Options

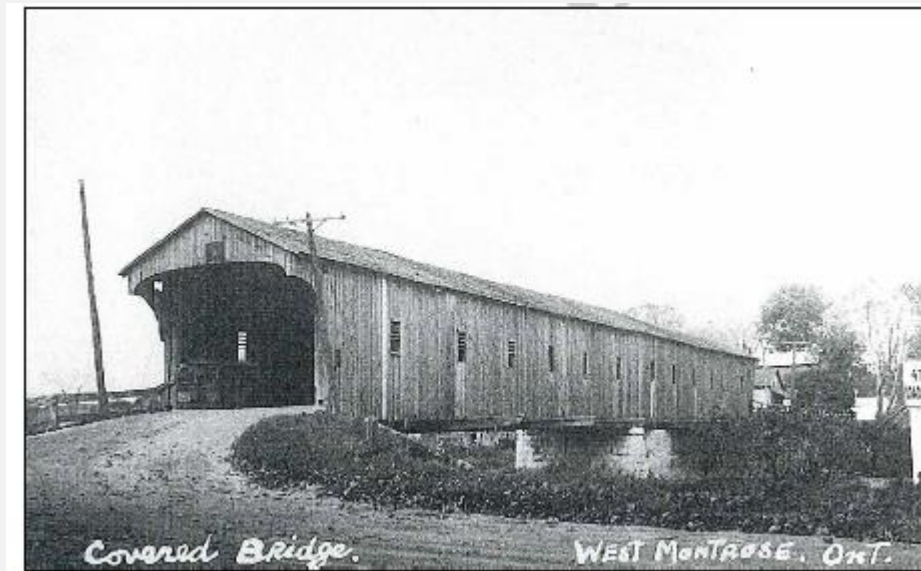


Public Feedback

Public Consultation Centre #2 – Community Priorities



Engage an expert in historic timber bridge restorations to evaluate the existing timbers to determine the level of reinforcement required



Restore the bridge to the way it was built in 1881



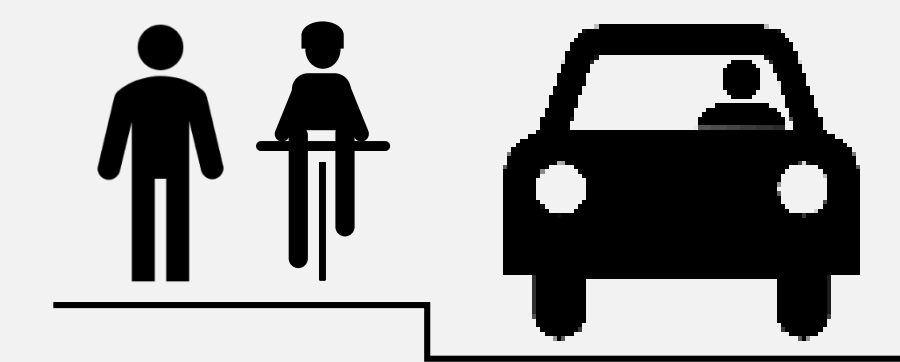
Reuse as much of the existing wood as possible



Dislikes look of truss reinforcements and/or raising the height of the bridge



Bridge capacity and load limit (posted and design)



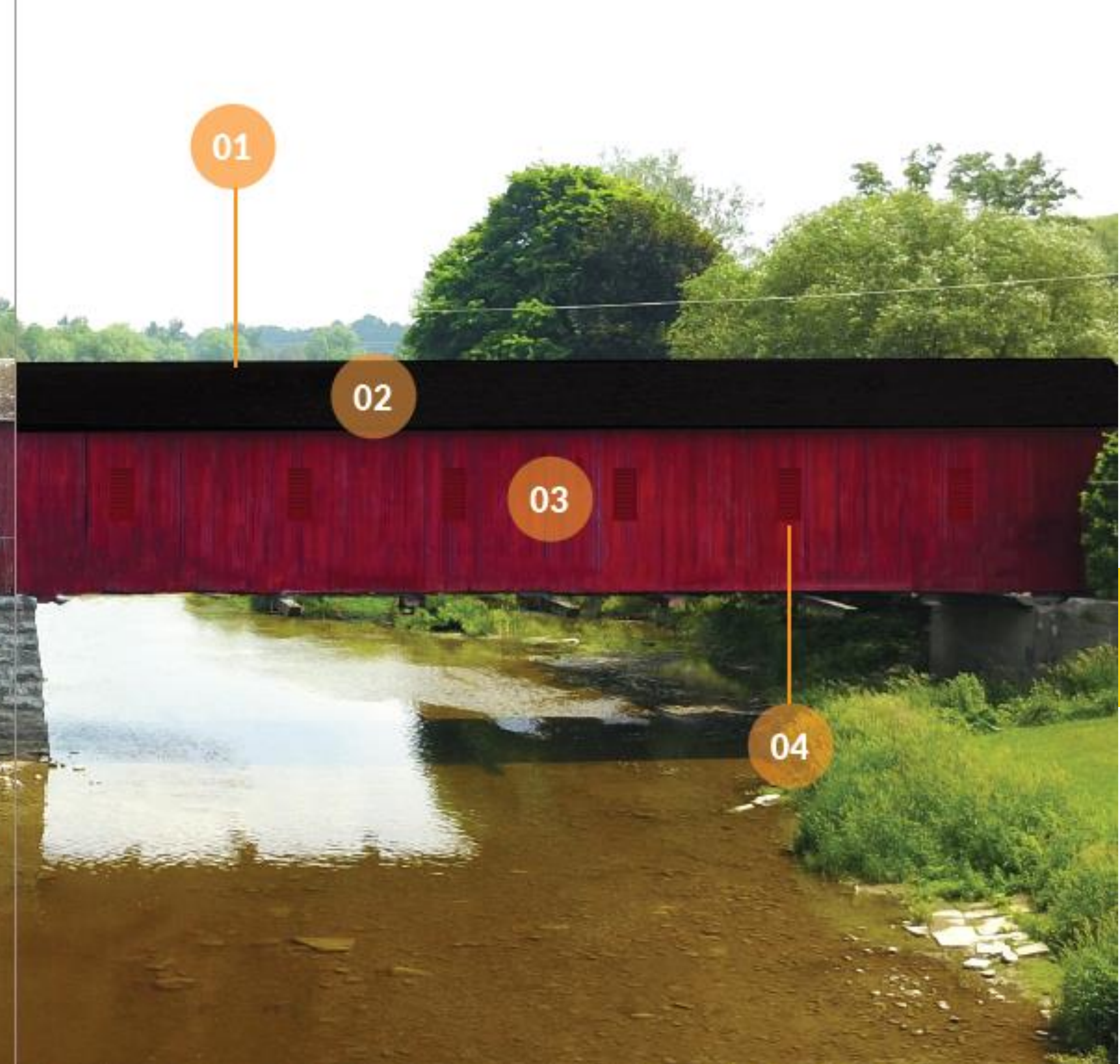
Provide traffic calming for horse & buggies on Line 86

Proposed Rehabilitation – Common to All Alternatives

Existing



Post rehabilitation



1 Bridge sag reduced

2 Replace roof with new cedar shingles

3 Replace exterior wood cladding

4 Replace window louvres

Proposed Rehabilitation – Common to All Alternatives



- 5 Remove steel Bailey truss
- 6 Re-instate tar and chip wearing surface after replacement of nail-laminated deck
- 7 Replace steel hanger rods

Proposed Rehabilitation – Common to All Alternatives



8 Replace rafters as necessary

9 Replace wood curbs

10 Replace tie beams as necessary

11 Replace light bulbs as necessary

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BTE

Proposed Rehabilitation – Common to All Alternatives



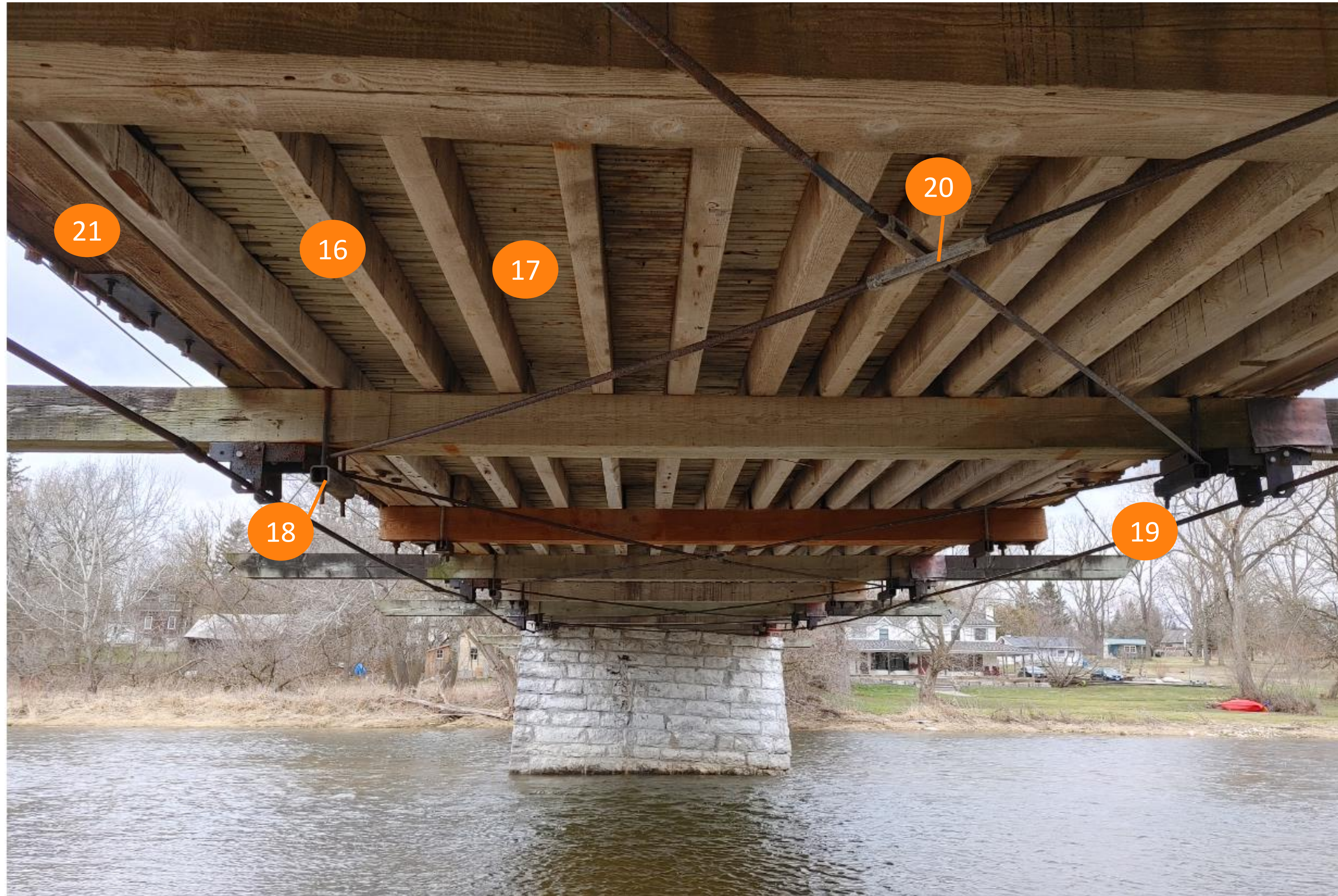
12 Replace needle beams

13 Replace floor beams

14 Repairs to center pier

15 Replace sway bracing

Proposed Rehabilitation – Common to All Alternatives



16 Replace stringers

17 Replace nail-laminated deck

18 Remove Bailey truss hanger system

19 Remove non-functioning tension rods (1959)

20 Replace Bottom lateral bracing

21 Replace bottom chord

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Proposed Rehabilitation – Common to All Alternatives

- 22) Concrete repairs to bridge abutments
- 23) Stone mortar repairs and scour protection at bridge pier
- 24) Bridge deck elevation and approach grades will remain the same
- 25) Height restriction bars to prevent oversized vehicles from using the bridge
- 26) Fire retardant materials applied to various bridge elements

3 tonne posted load limit to be maintained



✓ Small Cars, SUVs, Horse & Buggies	1 - 3 tonnes
✓ ✗ Pick-up Trucks	1.7 – 3.5 tonnes
✗ EMS Vehicles	4 - 8 tonnes
✗ School Bus/Small Truck	6 - 12 tonnes
✗ Large truck	13+ tonnes

Rehabilitation Alternatives

The following alternatives were evaluated by the Project Team:

Alternative	Description
A	Steel Girder Reinforcement Presented at Public Consultation #1 and #2
B	Timber Truss Reinforcement with Fiber Reinforced Polymer (FRP) Presented at Public Consultation #2 as the Preferred Alternative
C1 to C4	Repairs to wooden truss members to achieve a design vehicular live load limit of:
C1	12 tonnes
C2 (Preferred)	10 tonnes
C3	8 tonnes
C4	6 tonnes

Alternative A – Steel Girder Reinforcement

- Remove Bailey trusses and replace with new steel girders
- New steel girders would be the primary structural system
- Replace interior white cladding
- Bridge interior would look similar to the way it looks today
- Width of driving lane would become slightly more narrow
- Includes new steel floor beams
- Can accommodate a design live load of approximately 15 tonnes



Alternative B – Timber Truss Reinforcement with Fibre-reinforced Polymer (FRP)

- Remove Bailey truss and strengthen the existing wooden truss with high-strength fibre reinforcement attached to the bottom chord
- Reinforce deteriorated truss members
- Remove interior white cladding
- Install timber guardrail to protect wooden truss
- FRP bonding to the bottom chord of the truss was determined to be **unsuitable** due to the deteriorated condition of the bottom chord discovered during the timber inspection. The bottom chord is recommended for replacement.



Alternatives C1 to C4 – Wood Repairs

- Remove existing steel Bailey truss and repair/replace deteriorated wooden truss members
- Level of intervention to various truss members varies based on the design live load, as outlined in the table below
- Remove interior white cladding and reinstate in small sections at each end
- Install overhead lateral bracing inside the bridge

Truss Element	Alt. C1 – 12 tonnes	Alt. C2 - 10 tonnes (Preferred)	Alt. C3 - 8 tonnes	Alt. C4 - 6 tonnes
Stringers	Replace with new sawn wood stringers			
Floor and Needle Beams	Replace with new 16" x 16" sawn wood Douglas Fir beams. The current beams are 12" x 12".			
Bottom Chord	Replace with new Douglas Fir chord			
Top Chord	No action			
Lower Top Chord	Make composite with top chord by adding wood plate between top chord and lower top chord and fastening together			No action
End Diagonals	Repair by fastening on new 4 1/2" (102mm) thick wood plank	Repair by fastening on new 4" (89mm) thick wood plank	Repair by fastening on new 3" (64mm) thick wood plank	
Interior Diagonals	Repair by fastening on new 2" (38mm) thick wood plank	No action		
Lower Diagonals	No action			

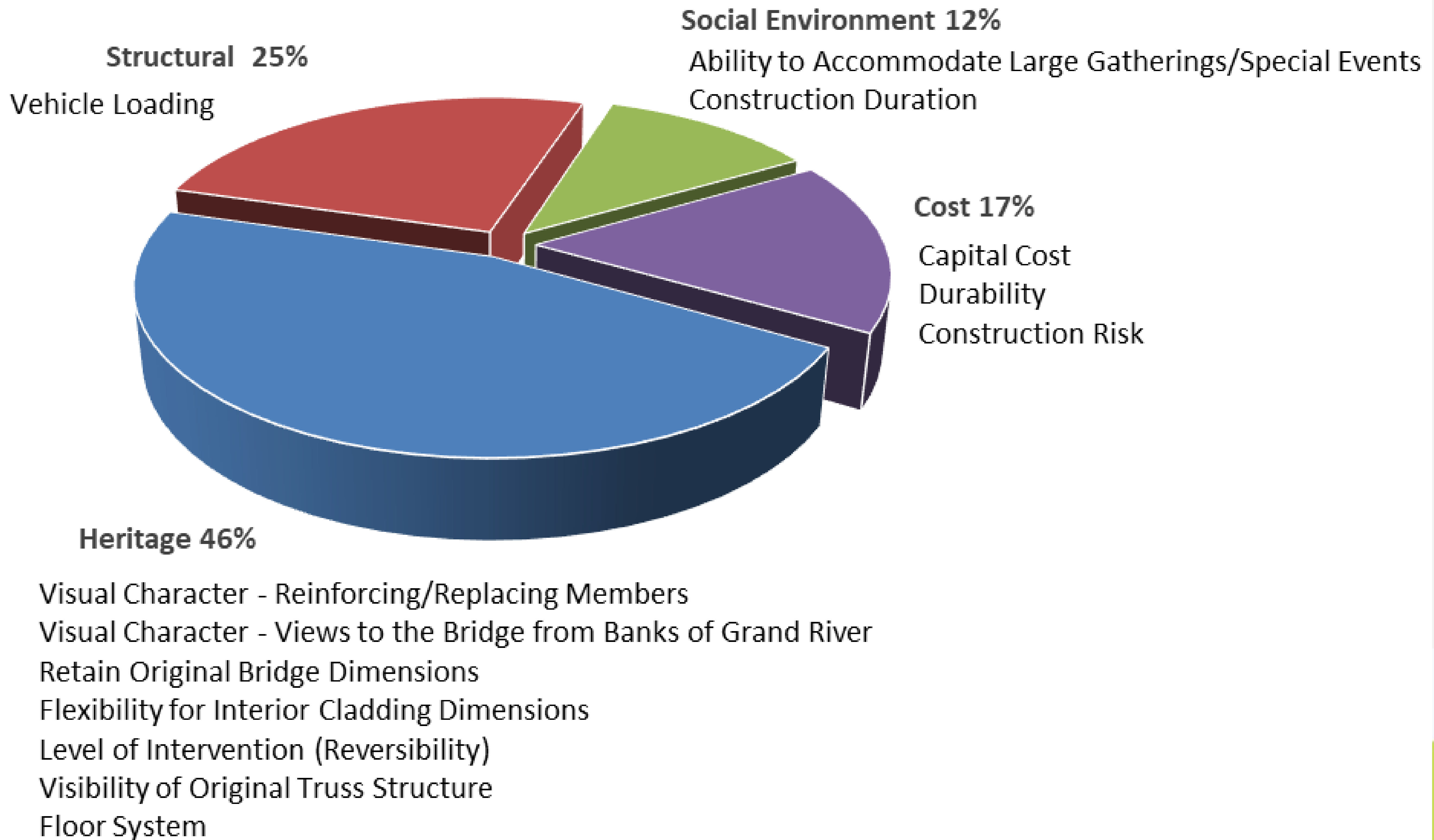
Alternatives Evaluation – Multi-Attribute Trade-off System (MATS)

- Alternatives were assessed using a comprehensive evaluation methodology referred to as the Multi Attribute Trade-off System (MATS) method.
- Four evaluation factor groups were considered: Heritage, Structural, Social Environment and Cost.
- Factor groups are made up of measurable criteria (sub-factors) used to identify relevant benefits and impacts and the relative differences between alternatives.
- The alternatives were evaluated based on the following criteria:

Criteria	Cultural Heritage	Structural Performance	Social Environment	Life-cycle Cost
Sub-Factors	<ul style="list-style-type: none"> • Visual Character – Reinforcing/Replacing Members • Visual Character – view to the bridge from Banks of Grand River • Retain Original Bridge Dimensions • Flexibility for Interior Cladding Dimensions • Level of Intervention (Reversibility) • Visibility of Original Truss Structure • Floor System 	<ul style="list-style-type: none"> • Vehicle Loading 	<ul style="list-style-type: none"> • Ability to accommodate large gatherings/ special events • Construction Duration 	<ul style="list-style-type: none"> • Capital Cost • Durability • Constructability

Alternatives Evaluation - MATS

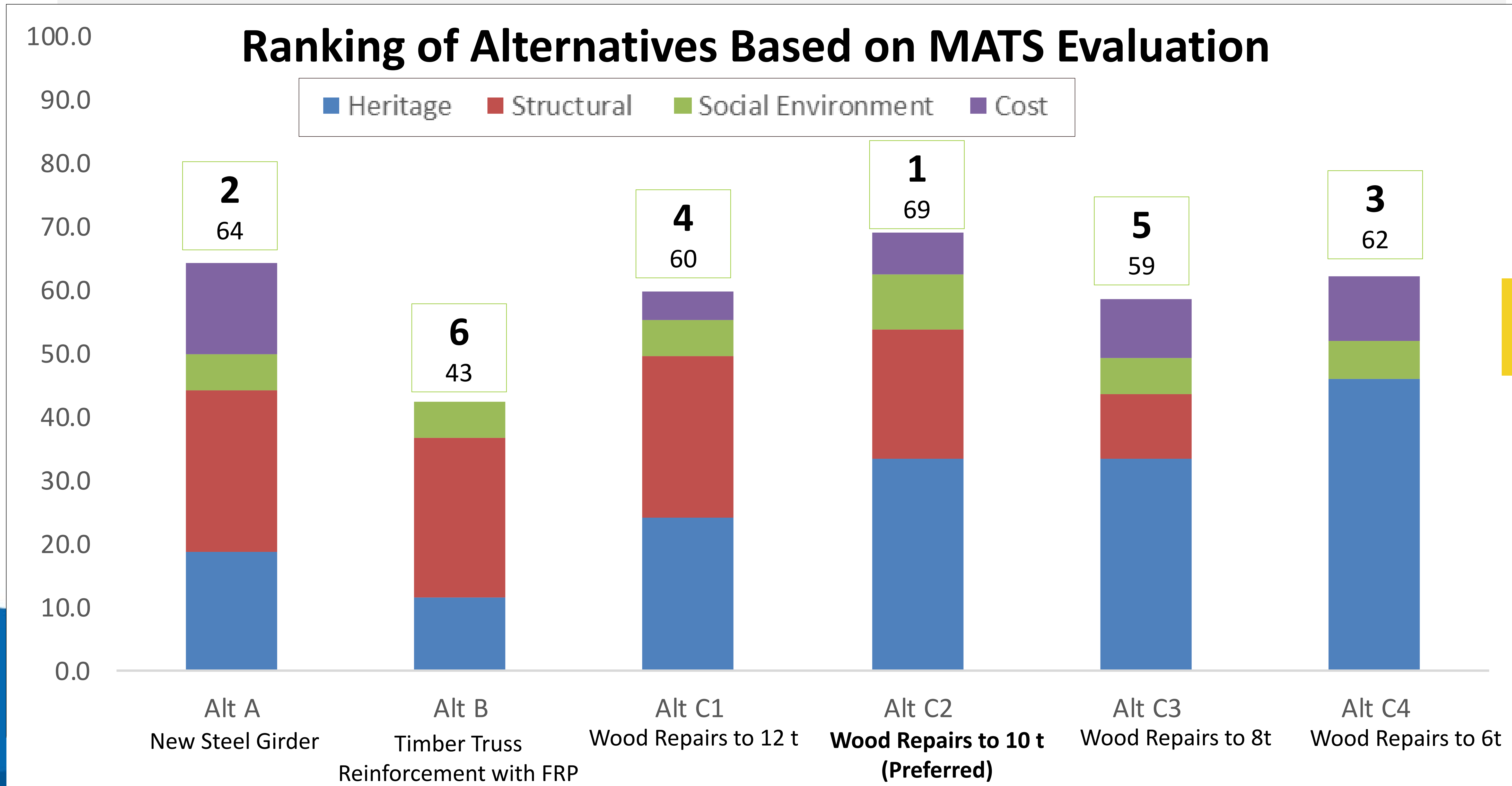
The criteria were assigned weightings in the evaluation by the Project Team:



Alternatives Evaluation - MATS

Alternative scores are determined through the use of a mathematical relationship to equate impacts to scores.

The results of the MATS evaluation are illustrated on the following exhibit.



Alternatives Evaluation – Sensitivity Testing

- Sensitivity testing was conducted to determine if the nature of the evaluation is sensitive to the weights assigned to each criterion.
- A series of tests were completed varying the weight for each global factor.
- Following this series of tests, the results were reviewed to assess whether the preferred alternative changed when the weights were varied.
- The results of the sensitivity test illustrate the trade-offs of the structural and heritage characteristics of the alternatives.
- Alternative A performs best structurally, with trade-offs for impacts to the heritage attributes. Alternative C4 performs best for the heritage attributes, but has the lowest structural loading capacity.
- Alternative C2 provides the best balanced alternative, balancing the structural loading capacity and the heritage attributes of the structure.

Recommended Rehabilitation Alternative

Removal of the existing Bailey truss and strengthening of the existing wooden truss to a **10 tonne design live load**, by replacing and/or strengthening specific wooden truss members, including:

- Replace floor beams and needle beams with new 16"x16" Douglas fir beams
- Replace bottom chord with new Douglas Fir members
- Make lower top chord composite with top chord by adding wood plate between top chord and lower top chord and fastening together
- Strengthen end diagonals by fastening on new 4" (89mm) thick wood planks
- Remove interior cladding and reinstate in short sections in each corner



Recommended Rehabilitation Alternative



- 12 New Douglas Fir 16"x16" needle beams
- 13 New Douglas Fir 16"x16" floor beams
- 16 New sawn wood stringers
- 17 New nail-laminated wood deck
- 20 New steel rod cross-bracing
- 21 New Douglas Fir bottom chord member

Recommended Rehabilitation Alternative



9 New wood curbs

27 Strengthen end diagonals

28 New overhead wood lateral bracing

29 New timber guiderail

Recommended Rehabilitation Alternative



30

30 Reinforce top chord with lower top chord

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Recommended Rehabilitation Alternative – Interior Cladding



31 Reinstate interior cladding in short sections at each end of the bridge

VE

Proposed Improvement #25 – Height Restrictor Bar Options for Public Input

Option 1



Option 2



Option 3



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**Preferred
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Proposed Location of Height Restrictor Bars



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Next Steps



Next Steps

Thank you!

Please email your comments and join our mailing list

Follow the project at: engagewr.ca/west-montrose



A public Open House is planned on **November 22, 2023** from 6:30p.m. – 9:00p.m. at the West Montrose United Church located at 42 Covered Bridge Drive, West Montrose

Project Contacts:

<p>Michelle Pinto, P.Eng., M.B.A. Engineer Region of Waterloo mipinto@regionofwaterloo.ca (519) 575-4400 ext. 3637</p>	<p>Steve Taylor, P.Eng., M.Eng., CVS-LIFE, P.E. Chief Executive Officer BT Engineering stevenj.taylor@bteng.ca 519-672-2222</p>	<p>Andrew Lehan, P.Eng., M.A.Sc. Senior Engineer Entuitive andrew.lehan@entuitive.com 437-219-4715</p>
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Woolwich Township Heritage Committee Work Plan 2023-2024

DRAFT – for discussion only 29/10/23

<p>Heritage Committee Initiatives Total Budget Requested - \$4000.00</p> <ul style="list-style-type: none"> - Education \$1000.00 - Digital Media \$1000.00 - Heritage Designations \$2000.00 				
<p>Increase Community Awareness Develop or revise print and digital resources to be used in a variety of settings to increase awareness of heritage assets and work of Heritage Committee in Woolwich Township</p>				
<p>EDUCATION AND AWARENESS Budget</p> <ul style="list-style-type: none"> - Education - \$1000 - Digital Media - \$1000 	<p>Required Resources</p>	<p>Committee member leads/supports</p>	<p>Stakeholder consultation / Staff support and/or approval</p>	<p>Proposed Timeline</p>
<p>Develop and distribute print and digital Heritage Brochure</p> <ul style="list-style-type: none"> - Content development - # required & costs - Identify and confirm distribution points - Create digital copy - Digital placement on website and promotion 				
<p>Video heritage tour</p> <ul style="list-style-type: none"> - Determine points of interest to be covered - Confirm placement on website and ability to share at community venues 				

<ul style="list-style-type: none"> - Align budget, timelines and points of interest - Draft contract specifics to secure videographer (within Township procurement policies etc.) - Find and contract w/ videographer 				
<p>Slide show</p> <ul style="list-style-type: none"> - Determine which digital assets from brochure and video can be used for a slideshow - Create digital slide show for use by community groups, schools, retirement homes, residents etc. - Determine if in-person support is needed to accompany presentation - Identify individuals interested in presenting (availability etc.) 				
<p>Heritage road show</p> <ul style="list-style-type: none"> - Discuss and clarify target audience, potential venues - Approach leads to determine interest and input on format and content - Determine committee member interest/availability to support initiative before proceeding - Leverage existing digital resources to meet anticipated needs/preference - Determine how best to promote and respond to community requests - Determine mileage costs etc. to support this activity - Monitor uptake and response to inform future efforts 				
<p>Digital sign board at WMC highlighting heritage sites</p>				

<p>-connect with WMC program lead/Rec director to determine interest and availability of digital sign board at WMC, requirements for use, timelines etc.</p> <p>-Identify digital resources to be included</p> <p>-Prepare in required format and provide to WMC management</p> <p>-Promote through local print and digital media</p> <p>-Monitor feedback</p>				
<p>Heritage Designations Budget \$2000 Prepare and present heritage designation documentation and reports to staff and council for approval</p>				
<p>Present identified properties to Council for Heritage Designation: Carnegie Library in Elmira, Maryhill Cemetery</p> <ul style="list-style-type: none"> - Collaborate with ACO WR to complete Heritage Designation forms and reports to Council - Prepare required documentation and sent to staff - Present to Council for approval - Public celebration and media coverage of approved Designation and 				
<p>Priorize properties on Municipal Heritage Properties of Interest List</p> <ul style="list-style-type: none"> - Develop criteria - Apply criteria to listed properties - Determine 10-15 properties that we will focus our efforts on - Determine 'next steps' for each of the prioritized properties 				

- Approach property owners to determine interest in proceeding with designation status				
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