REPORT

TO:	Council
FROM:	Alysha Milliner, Holly Cullihall
DATE:	February 21, 2024
REPORT:	TPS.24.04
SUBJECT:	2023 Municipal Bridge Inspection Report with Individual OSIM

RECOMMENDATION:
That Council receive report TPS.24.04 regarding the 2023 Municipal Bridge Inspection Report with Individual OSIM inspection reports for information.

BACKGROUND AND ANALYSIS:
R.J. Burnside & Associates Ltd. was retained by the Municipality to complete the biennial site inspections of 36 of the 73 structures and report bridge and culvert condition information in order to meet the requirements of the Ministry of Transportation (MTO) under the Ontario Structure Inspection Manual (OSIM). Individual bridge structure inspections are required to reflect a conditional assessment of each element of a bridge as well as any material deflects, performance deficiencies and/or maintenance rehabilitation needs. The remaining 37 structures are inspected in even-numbered calendar years and were recently completed in 2022.

The objective for the bridge inspections are to protect and prolong the long term life-span of the structures. This report identifies replacement/rehabilitation/maintenance needs and potential timing for the work to be done to protect the structure. The Engineer's report provides the municipality an independent professional review of these structures that will assist the municipality with the planning and budgeting process with a maintenance and rehabilitation program.

Based on the biennial inspection of each structure, the Bridge Condition Index (BCI) is calculated for each structure. Currently, only approximately 47.9% of the municipality's structures are within the "good" range, with 42.5% of structures classified as "fair" and 9.6% as "poor".

Good - BCI Range 70 to 100
A bridge with a BCI greater than 70 is generally considered to be in good to excellent condition, and repair or rehabilitation work is not usually required within the next five

years. Routine maintenance, such as sweeping, cleaning, and washing are still recommended.

Fair - BCI Range 50 to 70

A bridge with a BCI between 50 and 70 is generally considered to be in good to fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next five years. This is the idea time to schedule major bridge repairs for larger and / or critical structures from an economic perspective. This most effective improvement in a structure's service life can be achieved by completing repairs while in this range.

Poor - BCI less than 50

A bridge with a BCI rating of less than 50 is generally considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best schedules to be completed within approximately one year. However, if it is determined that the replacement of the structure would be a more viable, practical, or economical solution than repairing the structure, the structure can be identified for continued monitoring and scheduling for replacement within a one-to-ten-year range. The lower the BCI the more of a priority, within the one-to-ten-year range, the replacement becomes.

Load Postings

Load postings are recommended for structures based on age, condition, noted performance deficiencies, or based on the findings of a structural evaluation. The municipality currently has 8 bridges with load postings; there were no changes recommended for these weight restricted structures.

Continued maintenance and completion of rehabilitative or replacement works as recommended in the report will help in the overall improvement of the municipality's bridge assets.

OPERATIONAL CONSIDERATIONS:

Recommendations have been made based on the data collected and the review of the previous inspection reports. The remedial needs have been provided in three classifications; routine maintenance, additional investigations, and repairs / rehabilitations / replacements (Capital works).

The route maintenance work often requires a minimal scope of work and in most cases can be carried out by municipal staff. The total estimated value of the maintenance work to be done totals $28,750. The report identifies maintenance work to be completed in 2024, prioritized based on the municipality's annual operating budget of $20,000 for bridge repairs and maintenance.

Additional studies, investigations and monitoring programs have been recommended for structures currently demonstrating severe material defects or performance deficiencies. 14 structures have been identified for additional investigations and studies, for an estimated cost of $55,000. These investigations have been identified based on a "normal" or "urgent" priority.

The Capital Works needs include any repair, rehabilitation or replacement work which would typically be completed by a hired Contractor, to assist in extending the service life of a structure and increasing the BCI.

Capital Works Costs and Timeframes

Time Frame	Capital Cost
less than 1 year	$8,164,000
1 - 5 years	$6,622,500
6 - 10 years	$4,409,500
Total	$19,196,000

Several structures have been identified for replacement or rehabilitation. Within the next year, eight structures have been identified as requiring rehabilitation and six structures have been identified for replacement. Within the next one to five years, ten structures haven been identified as requiring rehabilitation and three structures have been identified for replacement.

Burnside has noted that it may not be feasible to complete all of the capital work requirements within the recommended timeframe. The Municipality will have to investigate deferring some of the rehabilitation work and plan on replacement based on certain factors such as structure type, location and clearance accessibility.

The Municipality could explore alternative replacement options, based on further inspection of the individual bridge components. This could include single-lane prefabricated structure options, removing the structure and closing the road, or replacing the structure under their own forces. Burnside has identified some sites where the Municipality can investigate options to replace the existing structures under their own forces with single or multi-cell culverts.

In addition to the the routine maintenance, additional investigations, and capital works identified, there are current roadside safety needs that include costs for new / replacement guide rail and / or end treatments at structure locations as required. The total estimated cost for current roadside safety needs is $2,549,000.

It should be noted that all estimated costs as expressed through the report do not include property acquisition costs, utility relocation costs, or engineering fees associated with road work beyond the wingwalls, unless specifically identified within the individual OSIM forms. All costs are also exclusive of HST.

GREY HIGHLANDS STRATEGIC PLAN:
Responsible Governance - Maintain the comprehensive Asset Management Plan that enables effective tracking, planning, and allocation of resources to meet future infrastructure needs.

FINANCIAL IMPACT:
The Municipality's Asset Management Plan (which was based on 2018/2019 inspection data) identified a total replacement cost of $68.1 million, with an annual funding deficit

of $1.0 million. The updated total replacement cost based on 2022/2023 inspections is $82.4 million.

The current operating budget for bridges totals $42,200, which includes $15,000 for the annual bridge inspections and report, $20,000 for materials/parts, with the remaining budget allocated to staffing costs for completing the maintenance work.

Addressing the funding deficient for bridge replacement and rehabilitation now is essential for a number of reasons:

1. Safety: bridges in poor condition pose a safety risk to motorists and pedestrians.
2. Cost effectiveness: delaying necessary repairs can lead to further deterioration, resulting in more extensive and expensive repairs in the future.
3. Infrastructure resilience: investing in bridge infrastructure now improves its resilience to future challenges such as increased traffic volumes, extreme weather events, and aging infrastructure. By addressing the funding deficit, we can help ensure that our bridges are better equipped to withstand these challenges.
4. Economic impact: bridges are vital for commerce and transportation, and their condition directly impacts economic productivity. Addressing funding deficits now helps prevent disruptions to the road network, minimizing economic losses due to bridge closures or weight restrictions.

ENVIRONMENTAL IMPACTS:
0 - no impact

CONSULTATION:
R.J. Burnside and Associates Limited
Chris Cornfield, Director of Transportation and Public Spaces
Anna McCarthy, Director of Finance, Treasurer

Approved By:	**Status:**
Chris Cornfield, Director of Transportation	Approved - 12 Feb 2024
Anna McCarthy, Treasurer	Approved - 12 Feb 2024
Karen Govan, Chief Administrative Officer	Approved - 12 Feb 2024

2023 OSIM Bridge Inspections Report

Municipality of Grey Highlands
206 Toronto Street South, Unit 1
Markdale ON N0C 1H0

2023 OSIM Bridge Inspections Report

Municipality of Grey Highlands
206 Toronto Street South, Unit 1
Markdale ON N0C 1H0

R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood ON L9Y 4J6 CANADA

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-	September 29, 2023	Draft Report for Client Review
1	January 26, 2024	Final Submission

R.J. Burnside & Associates Limited

Report Prepared By:



Calum MacKenzie, P.Eng.
Project Engineer
CM:tc

Report Reviewed By:



Matthew Brooks, P.Eng.
Senior Vice President, Municipal Services and Structures

Executive Summary

R.J. Burnside & Associates Limited (Burnside) was engaged by the Municipality of Grey Highlands (Municipality) to undertake the inspection of 73 bridge and culvert structures. 36 of the 73 structure inspections are conducted during odd-numbered calendar years and have been completed this year. The remaining 37 structures are inspected in even-numbered calendar years and were recently completed in 2022. The visual inspections were carried out on an element-by-element basis in accordance with the Ministry of Transportation - Ontario Structure Inspection Manual (OSIM). The inspections were completed under the direction of a Professional Engineer to assess their condition and identify any material defects, performance deficiencies, maintenance needs, additional studies and / or repairs / rehabilitation work required on a structure-by-structure basis.

Following the field inspections, recommendations were made based on the data collected and the review of the previous inspection reports. Depending on the condition of each structure, the remedial needs have been provided in three classifications; routine maintenance, additional investigations, and repairs / rehabilitations / replacements (Capital Works).

The routine maintenance work often requires a minimal scope of work, and in most cases can be carried out by Municipality staff. The items included in the maintenance needs include recurring items that should be completed each year, i.e., cleaning winter sand / salt off bridge decks, and one-time costs such as placing rip-rap in washouts on slopes adjacent to bridge wingwalls. The total estimated value of the work to be completed by the Municipality is **$83,250.00** with the recurring portion being $28,750.00 and the one time items being $54,500.00. We recommend that the Municipality review the identified maintenance needs and consider including a general allowance in their annual maintenance budget for the recurring costs and complete the one-time maintenance needs as budget allows.

Additional studies, investigations, and monitoring programs, as summarized in the table below, are recommended for structures currently demonstrating severe material defects or performance deficiencies which may necessitate an inspector to require more detailed information. 14 structures have been identified for additional investigations and studies, for an estimated cost of **$55,000.00.** These investigations have been identified based on a “normal” or “urgent” priority.

The Capital Works needs include any repair, rehabilitation or replacement work which would typically be completed by a Municipality hired Contractor, to assist in extending the service life of a structure and increasing the Bridge Condition Index (BCI). In accordance with the OSIM, the capital works required are based on a priority of six to ten years, one to five years, within one year, and urgent and have been estimated as follows:

Capital Works Costs and Timeframes

Time Frame	Capital Cost
< 1 year	$8,164,000.00
1 – 5 years	$6,622,500.00
6 – 10 years	$4,409,500.00
Total	**$19,196,000.00**

It should be noted that these costs include recommended replacement costs for structures in need.

Taking into consideration the structures calculated BCI's, several structures have been identified for replacement or rehabilitation. Within the next year, eight structures have been identified as requiring rehabilitation and six structures have been identified for replacement. Within the next one to five years, ten structures have been identified as requiring rehabilitation and three structures have been identified for replacement.

Current roadside safety needs include costs for new / replacement guide rail and / or end treatments at structure locations as required or an investigation where the need for a guide rail system was not evident based on high level review. The total estimated cost for current roadside safety needs is **$2,549,000.00**.

It should be noted that all of the aforementioned estimated costs throughout this summary and the report do not include property acquisition costs, utility relocation costs, or engineering fees associated with road work beyond the wingwalls, unless specifically identified within the individual OSIM forms. All costs are also exclusive of HST.

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been engaged by the Municipality of Grey Highlands (Municipality) to undertake the inspection of 73 road bridge and culvert structures over the span of 3.0 m. 36 of the 73 structure inspections are conducted during odd-numbered calendar years and have been completed this year. The remaining 37 structures are inspected in even-numbered calendar years and were recently completed in 2022.

It is noted that all costs referenced within this report are based on the year of the most recent inspection. Therefore, all costs referenced for the 37 structures inspected in 2022 are based on 2022 estimated costs and do not account for changes in unit costs (due to inflation, material availability, labour rates, etc.) between 2022 and 2023.

The inspections have been completed in accordance with the Ministry of Transportation - Ontario Structure Inspection Manual (OSIM). Inspection of the Municipality's bridges and culverts are required every two years as per Ontario Regulation 104/97 which states *"The structural integrity, safety and condition of every bridge shall be determined through the performance of at least one inspection in every second calendar year under the direction of a professional engineer and in accordance with the Ontario Structure Inspection Manual."* These inspections assess the condition of the structure and identify any additional studies or repairs required. A map showing the location of all structures has been provided in Appendix C.

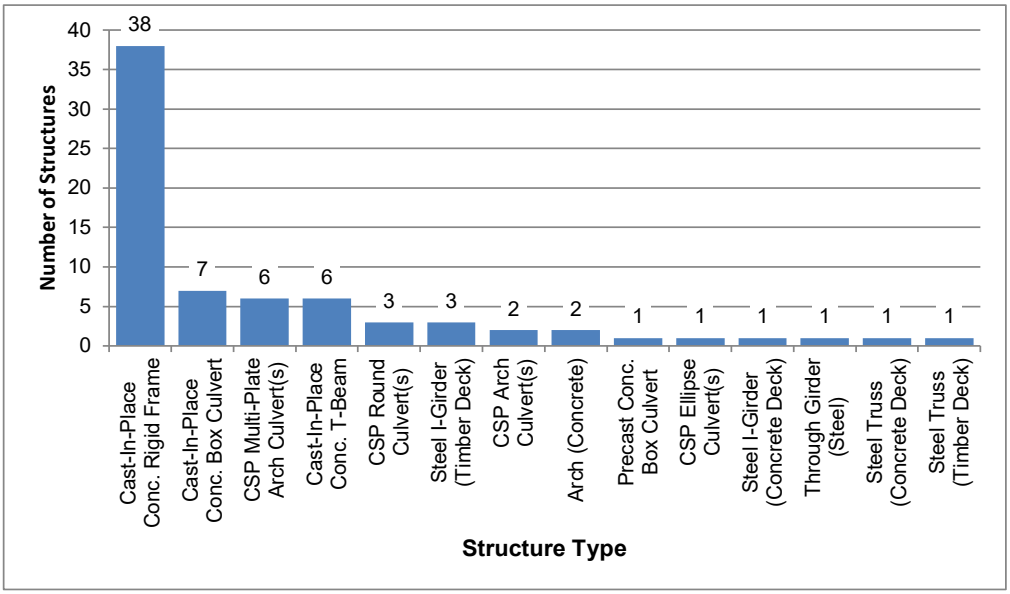
Burnside staff conducted a detailed element-by-element visual assessment of each structure in order to identify any material defects, performance deficiencies, and maintenance needs on a structure-by-structure basis. All data collected has been documented on the OSIM forms and provided in digital format in Appendix D. In addition, a brief written overview has been provided to clarify the OSIM data.

2.0 Inspection Observations and Recommendations

The following observations and recommendations were made during our recent inspection of the Municipality's structures. These inspections, along with a review of the previous reports have contributed to the recommendations provided.

The Municipality of Grey Highlands has an inventory of 73 structures, which is comprised of a variety of structure types. Figure 1 below summarizes the number and types of structures within the inventory.

Figure 1: Types of Structures



Depending on the condition of each structure, some level of remedial action is usually required. The recommendations for remedial work are provided in three classifications, routine maintenance, additional investigations, and repair / rehabilitation / replacement.

2.1 Routine Maintenance

Routine maintenance needs often require minimal effort to extend the service life of the structure. In most cases, routine maintenance can be undertaken by Municipality staff or locally contracted out. It is desirable to ensure that all maintenance needs identified at each structure are completed within the calendar year of receiving this Report.

Common structure defects were noted, to varying degrees, at most of the structures inspected. These common defects include:

- Minor erosion of slopes on culvert embankments and adjacent to bridge wingwalls.
- Excessive sand / granular material on deck surface due to winter maintenance or vehicle tracking.
- Clogged deck drains or lack of drainage.
- Erosion of stream banks at the water level.
- Debris collection and heavy vegetation at culvert and bridge openings.
- Lack of, damaged or non-code conforming guide rail.
- Minor asphalt defects (potholes, cracking).
- Lack of or missing hazard warning signs.

These general defects can be addressed within the Municipality's routine maintenance program and these issues can be added to the Municipality's in-house road and structure inspection routine.

Routine bridge sweeping, washing of decks, flushing of deck drains, joints, bearing seat areas, and girders will improve a structures service life. Removal or trimming of vegetation and addressing minor erosion concerns regularly will prevent more serious issues.

The total estimated value of the work to be completed by the Municipality is **$83,250.00** with the recurring portion being $28,750.00 and the one-time items accounting for $54,500.00. We recommend that the Municipality review the identified maintenance needs and consider including a general allowance in their annual maintenance budget for the recurring costs and complete the one-time maintenance needs as budget allows.

Through discussion with the Municipality in previous years, it has been determined that a **$20,000.00** annual maintenance budget will be allocated to complete the works noted above. A majority of the work can be completed by the Municipality staff, while some of the maintenance needs may need to be contracted out.

Below in Table 1 and Table 2 is a 2-year maintenance plan, which details the work required and estimated costs.

Table 1: Maintenance Plan 2023

Structure No. / Name	Road Name	Maintenance Need	Estimated Cost
A03	Road 180	Replace missing posts, flush deck drains.	$2,000.00
BC02	Sideroad 4A	Install rock protection. Install hazard warning signs.	$2,500.00
BC18	Quiet Valley Road	Install scour protection.	$2,500.00
A21	Lower Valley Road	Repairs required to embankments, install hazard warning signs.	$3,000.00
O18	Centre Line B	Install rock protection.	$2,500.00
BC06	Artemesia Townline	Install hazard warning signs.	$1,000.00
E03	Sideroad 7A	Clean deck wearing surface.	$500.00
O11	Concession 8B	Remove granular fill on deck and regrade roadway, flush deck drains.	$4,000.00
A08	35 Sideroad	Flush deck drains.	$500.00
O04	Centre Line A	Remove vegetation in close proximity to structure	$1,500.00
		Total	**$20,000.00**

Table 2: Maintenance Plan 2024

Structure No. / Name	Road Name	Maintenance Need	Estimated Cost
O18	Centre Line B	Install rock protection.	$2,500.00
E10	Sideroad 25	Remove vegetation at inlet and outlet.	$2,500.00
A21	Lower Valley Road	Repairs required to embankments, install hazard signs at structure	$3,000.00
A17	East Back Line	Repairs required to Embankments.	$4,000.00
A15	South Line A	Flush deck drains; grade approaches.	$2,500.00
BC03	Lower Valley Road	Install rock protection on embankments.	$2,500.00
A13	Lower Valley Road	Clean deck top; flush expansion joints and clean debris off bearing seat.	$2,000.00
E01	Sideroad 4 A	Repairs required to embankments.	$1,000.00
		Total	**$20,000.00**

A summary of maintenance needs is provided in Appendix B, along with estimated costs to complete the work.

2.2 Additional Studies / Investigations

As per the OSIM, additional investigations or surveys may be required to further assess the condition of certain elements that may not be fully determined by a visual inspection. In many cases, where a major rehabilitation of a structure is required or planned, the completion of additional studies or investigations will assist in developing appropriate rehabilitation programs. Studies or investigations may also be required where performance deficiencies are suspected. Typical investigations that may be required include:

- Deck condition surveys.
- Structure evaluations (Load Capacity).
- Monitoring of deformations, settlements, and movement.
- Monitoring crack widths.

A summary of the additional investigations recommended for the Municipality are summarized in Table 3 below:

Table 3: Additional Investigations

Structure No. / Name	Road Name	Additional Investigation	Estimated Cost
E03	Sideroad 7A	Detailed Deck Condition Survey.	$15,000.00
A15	South Line A	Feasibility Study.	$7,500.00
E16	7th Line	Feasibility Study.	$7,500.00
O07	South Line B	Feasibility Study.	$7,500.00
O10	Mill Bridge Road	Detailed Deck Condition Survey. Feasibility Study	$17,500.00
		Total	**$55,000.00**

A summary of the monitoring that should be undertaken during future biennial inspections is provided in Table 4 below. This monitoring would require no additional costs, as they are intended to be completed during the OSIM inspections.

Table 4: Monitoring to be Completed During Biennial Inspections

Structure No. / Name	Road Name	Additional Investigation
A13	Lower Valley Road	Monitoring of deformations, settlements, and movements.
E03	Sideroad 7A	Monitoring of deformations, settlements, and movements.
A01	20 Sideroad	Monitoring of deformations, settlements, and movements.
A20	Harold Best Parkway	Monitoring corrosion and section loss.
BC03	Lower Valley Road	Monitoring of erosion / scour.
BC09	3rd Concession	Monitoring of deformations, settlements, and movements.
BC13	Road 45	Monitoring of deformations, settlements, and movements.
E18	Sideroad 22C	Monitoring of deformations, settlements, and undermining.
O01	Osprey - Artemesia	Monitoring of rotation and movements.
A11	Grahams Hill	Monitoring of deformations, settlements, and movements.

A summary of recommended studies and costs is also included in Appendix B.

2.3 Flood Forecasting

In 2019, The Grey Sauble Conservation Authority (GSCA) attached flood forecasting technology infrastructure to measure water level and water temperature on two Municipality owned structures located on Sideroad 7A and 35 Sideroad. The monitored watercourses and associated structures are listed in Table 5.

Table 5: List of Flood Forecasting Equipped Infrastructure

Structure No. / Name	Road Name	Watercourse Name
E03	Sideroad 7A	Kimberly Creek
A6	35 Sideroad	Upper Beaver River

2.4 Roadside Safety

During our inspections, Burnside makes note of the condition and effectiveness of roadside safety measures on the approaches to the structures. Where no roadside safety systems are present, Burnside has a responsibility to identify that there should be consideration given to installing roadside safety systems, i.e., guide rail and end treatments.

Roadside safety system requirements are set out in the MTO - Roadside Safety Manual which is a guideline provided to be used as a risk assessment tool in establishing the need, type, and extent of roadside safety measures.

As is discussed in more detail in the Manual, risk management is critical in assessing the need for roadside safety installations. At some structures, and on some roadways, the installation of guide rail systems may be seen as more of a hazard than not having a system. This may be a result of a reduction in road platform width, the ability to remove snow effectively, and the space available to place and anchor end treatments. Section 4.2.2.1 from the MTO - Roadside Design Manual states *that guide rail systems must be offset a minimum of 4.25 m from the roadway centerline, to provide clearance to snowplowing operations*. In addition, local use of a roadway by farm equipment and the location of driveway and field entrances around structures should also be considered in determining the need and effectiveness of guide rail systems.

In consideration of the above, costs to install guide rail on narrow Municipality roads with a platform width of 8.0 m or narrower have not been included in this report under the rehabilitation plan, unless bridge / road widening to 8.5 m or wider has been recommended as part of the rehabilitation plan. Installation of steel beam guide rail for replacement options is included within the replacement cost estimate.

For the purpose of this Report, where a high level review indicated that guide rail or guiderail components would be required (apparent substandard length of need, substandard end treatments, rigid barriers on the structure, narrow clear zone between the edge of road and edge of structure, etc.) a general allowance for a typical guide rail system installation has been provided, however, site specific and detailed assessments of need at each structure is not included in this Report. Where the need for a guiderail system was not evident based on high level review, an allowance for an investigation into the need for guiderail was provided. The total estimated cost relating to guide rail installation or investigation is **$2,549,000.00**.

Where recommendations have been made for installation or corrective measures, Burnside has identified that the work is to be completed within one to five years. However, as each site has unique characteristics relating to the requirements of guiderail, Burnside also recommends that a further investigation and risk analysis of each of the identified sites be completed by the Municipality within one year to classify

the structures as high, medium, or low priority for guide rail installation or improvements. The study may also outline a timeline for guide rail upgrades based on annual guide rail budget.

2.4.1 Pedestrian and Inspector Safety

During inspections, Burnside makes note of the condition and effectiveness of the pedestrian barricades installed at bridges and culverts. MTO Bulletin, BO2020-03 Guards on Structures, was issued on April 7, 2020, and provides recommendations for the installation of guards on culvert ends and retaining walls for the safety of the public and inspectors.

The bulletin recommends that where an area is accessible to the public and an exposed height of greater than 0.6 m is present, a guard meeting the Ontario Building Code requirements shall be installed to protect the public from fall hazards. Additionally, in areas not accessible to the public and where exposed heights greater than 2.4 m are present, a guard shall be installed on culvert ends, or on top of retaining walls to protect inspectors from fall hazards.

It is further noted in the bulletin that a fall hazard risk assessment is to be completed and the need for guards determined by the MTO, or the Owner as appropriate. Installation of guards is recommended to be included as part of any major capital program, and in unique situations may be completed as a standalone installation if warranted.

Burnside has identified locations that could be considered high risk for pedestrians where the lack of guards, or poor condition of existing guards exist. Costs for replacement / installation of guards have been included in the recommended work programs.

2.5 Repair, Rehabilitation, or Replacement

Recommended repair, rehabilitation, or replacement work is provided on the OSIM form for each bridge and culvert. The recommended work is indicated for each element and outlines the priority and estimated construction cost. The priorities for the specified rehabilitation or replacement plans are typically identified on the OSIM forms as six to ten years, one to five years, within one year, and urgent.

The costs associated with the recommended work are based on the measured quantities of fair and poor element conditions and unit costs for similar and recent works. In many instances, where only minor works are required, the costs for mobilization, site access and or waterway control items (as required) are difficult to assess and may skew the costs of small-scale works. This work is often best completed by grouping similar efforts together.

For repair programs that require a number of prolonged on-site activities, we have assigned a variable general cost that may range from $40,000.00 to $150,000.00, to address some of the mobilization, insurance, bonding, and related costs of being on-site.

Where the recommended work is the replacement of the structure, these general costs are assumed to be included in the overall replacement cost.

Construction cost estimates do not include property acquisition, utilities relocation or support, or engineering fees associated for the works beyond the structure limits, unless specifically identified within the individual OSIM forms.

The total estimated cost for the capital works for all 73 structures within the Municipality, (including rehabilitation / repair and replacement costs) has been estimated as follows:

Table 6: Capital Works Costs and Timeframes

Time Frame	Capital Cost
< 1 year	$8,164,000.00
1 – 5 years	$6,622,500.00
6 – 10 years	$4,409,500.00
Total	**$19,196,000.00**

The total, 10-year estimated capital costs, which includes the above as well as all other associated costs including maintenance, additional investigations, and roadside protection costs, is $21,883,250.00. It should be noted that all costs are based on 2022 / 2023 prices and do not account for inflation. A summary of the capital works needs can be found in Appendix B.

2.6 Load Postings and Recommendations

Load postings may be recommended for structures based on age, condition, noted performance deficiencies, or based on the findings of a structural evaluation. A summary of the current and proposed load postings for the Municipality's inventory, as well as the reasoning for the posting, is provided in Table 7 below.

Table 7: Load Postings and Recommendations

Bridge Name	Load Posting (tonnes)	Additional Comments
	Current	
A03	12	No Change Recommended
E04	12	No Change Recommended
E05	12	No Change Recommended
E06	12	No Change Recommended
E11	12	No Change Recommended

Bridge Name	Load Posting (tonnes) Current	Additional Comments
O14	14	No Change Recommended
A15	10	No Change Recommended
E9	14/22/32	No Change Recommended

In accordance with Section 123(2) of the Highway Traffic Act and Regulation 103/97 made under the Act, we recommend that the Municipality enact an appropriate By-law for the maximum allowable gross weight crossing over the structures identified in the table above.

Furthermore, we recommend that any such By-law established shall be considered valid for a period of two years, or until the completion the next bridge inspection report.

3.0 Bridges on Closed Roads

The Municipality of Grey Highlands identified three structures that are located on currently closed roads. These structures were visually inspected in 2022 to determine their estimated remaining service life based on current conditions, with the understanding that the structures no longer carry vehicular traffic. A summary of the 2022 findings for each of the structure can be found below:

3.1 Sideroad 4A – Bridge UNK-1

- Severe deterioration / disintegration of culvert throughout, most notably on the fascia.
- Large area of bottom reinforcing steel is fully exposed with little to no concrete engaging the steel. This is mainly within the mid-span region.
- There did not appear to be signs of flexure cracks on the soffit.
- There appeared to be moderate section loss to the exposed reinforcing steel.
- The level of concrete disintegration is concerning and would reduce the overall load carrying capacity of bridge.
- It is recommended that the structure be considered for removal / replacement within the next one to three years based on visual inspection.
- It should be assured that no vehicles have the ability to cross the structure.

3.2 Sideroad 4A – Bridge UNK-2

- Steel Truss is generally in fair condition – There is surface corrosion throughout, but no signs of significant section loss on the main load carrying members.
- Diagonal bracing in the horizontal plane (i.e., lateral bracing) is noted to be deformed / buckled in some locations. These braces should not be experiencing significant compression loads, so these members may have been deformed for other reasons such as collision of ice / debris flowing in the river.

- Significant concrete disintegration / deterioration along the joint between abutment and footings which reduces the area of contact / load transfer. If 'failure' were to occur at this location, it is anticipated that it would not be sudden or 'catastrophic'.
- Substructure repairs and deck repairs could be considered to increase the lifespan of the structure, but it may be considered more economical to replace in the future.
- Should consider replacing this structure in five to ten years if substructure is not rehabbed. Substructure likely to govern replacement timeline.

3.3 Artemesia-Euphrasia Townline – Bridge UNK-3

- Steel Truss is generally in fair condition – There is surface corrosion throughout, but no signs of significant section loss on the main load carrying members. Some localized section loss, but not to the extent of significant capacity reduction.
- Stringers / floor beams have some coating still and there is not significant section loss noted.
- Deck top appeared to be in generally fair condition, with some moderate transverse cracks and spalls / disintegration, but not of significant concern at this time.
- Visible portions of substructure appear to be generally in good to fair condition.
- Up to ten years of service life left based on current use. Deck disintegration will likely govern timelines.

It is understood that the structures are used solely as trail bridges, experiencing pedestrian loading and maintenance vehicles such as lawnmowers only. Based on the current use and at the time of the inspections, the structures have not been recommended for closure or removal / replacement. The Municipality should ensure that vehicular traffic is prevented from crossing the bridges at any time. It is recommended that the structures be inspected as part of the biennial bridge inspection program going forward to ensure constant monitoring of the condition of the structures.

4.0 Bridge Condition Index

The Bridge Condition Index (BCI) for each structure has been determined based on the MTO methodology followed in the MTO Document, MTO Bridge Condition index and Overall Measure of Bridge Condition, July 2009.

A new structure would have a BCI value of 100 and the value would decline over time. Monitoring the rate of decline in the BCI and comparing this with an anticipated rate of decline will provide the Municipality with valuable, long-term planning and asset management information. The reduction in BCI, in theory, is a function of many factors, including traffic volume, truck use, use of de-icing chemicals, exposure to the elements, and the type of structure. Each bridge will decline at its own rate, but it is reasonable to expect that the decline will begin slowly and accelerate as the structure gets older.

In addition, determining an individual BCI value at any point in time will allow the Municipality to make estimates of expected remaining service life and or establish target BCI criteria for major rehabilitations or replacements.

The Canadian Highway Bridge Design Code has a target service life of approximately 75 years, but it is recognized that maintenance, repair, and rehabilitations will be required along the way to reach or exceed this target.

As indicated, the BCI for a structure can range from 0 to 100 and a municipal bridge and culvert infrastructure can be organized into several ranges.

Good – BCI Range 70 to 100

A bridge with a BCI greater than 70 is generally considered to be in good to excellent condition, and repair or rehabilitation work is not usually required within the next five years. Routine maintenance, such as sweeping, cleaning, and washing are still recommended.

Fair – BCI Range 50 to 70

A bridge with a BCI between 50 and 70 is generally considered to be in good to fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next five years. This is the ideal time to schedule major bridge repairs for larger and / or critical structures from an economic perspective. The most effective improvement in a structure's service life can be achieved by completing repairs while in this range.

Poor – BCI Less than 50

A bridge with a BCI rating of less than 50 is generally considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best scheduled to be completed within approximately one year. However, if it is determined that the replacement of the structure would be a more viable, practical, or economical solution than repairing the structure, the structure can be identified for continued monitoring and scheduled for replacement within a one-to-ten-year range. The lower the BCI the more of a priority, within the one-to-ten-year range, the replacement becomes.

5.0 Structure Inventory Trends

Based on the biennial inspection of each structure, the Bridge Condition Index (BCI) is calculated for each structure. The Bridge Condition Index Distribution graph, shown in Figure 2 below, provides a summary of the current state of the Municipality's structures, and Figure 3 shows the historical trend of the state of the structures over past inspections where BCI information was available.

Figure 2: Bridge Condition Index Distribution (2023)

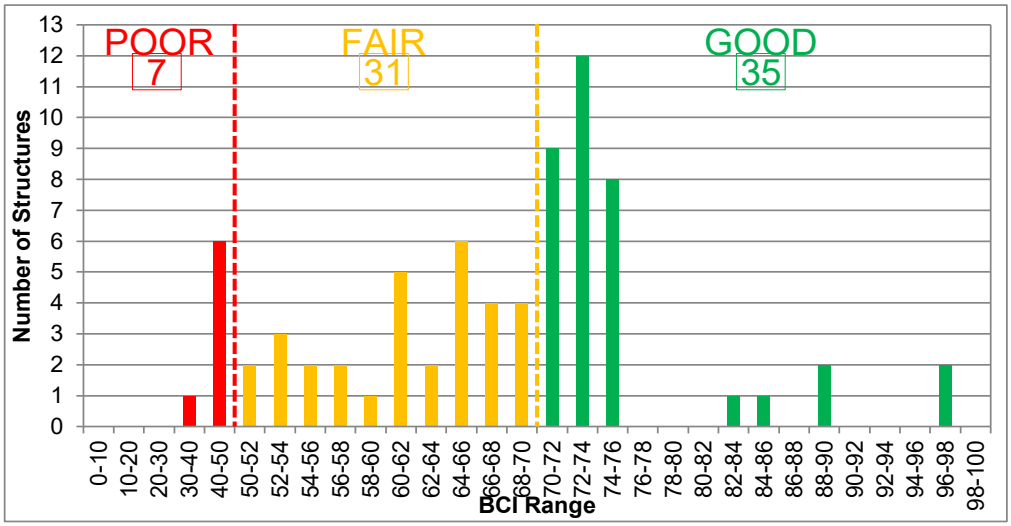
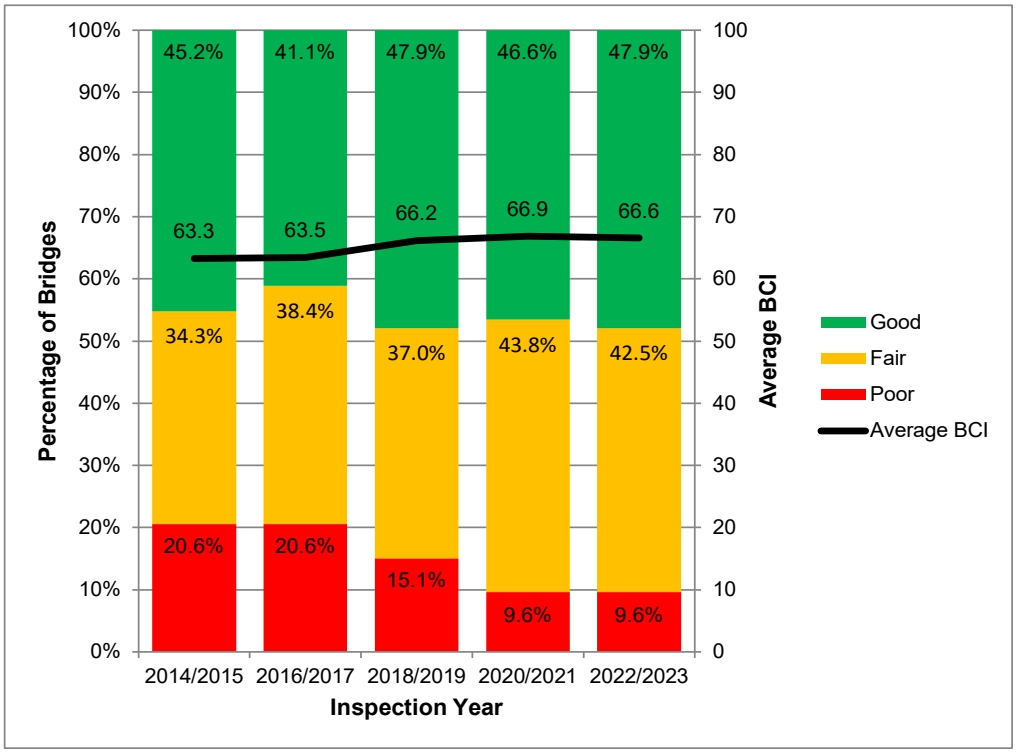


Figure 3: Bridge Condition Index Historical Trend



Currently, only approximately 47.9% of the Municipality's structures are within the "good" range, with 42.5% of the structures classified as "fair" and 9.6% classified as "poor", as illustrated in Figure 3 above. Of interest, the MTO has established a goal of maintaining 85% of their structures in "good" condition (BCI ≥ 70) by addressing rehabilitations and replacements as necessary. Burnside recognizes that the above goal was not established by the Municipality, but it is noted that, based on the current state of the inspected structures, the Municipality is underperforming on the management of their bridge assets when compared to the MTO's established goal.

The trend in Figure 3 identifies that the overall average BCI of the Municipality's inventory has increased slightly as a result of a continued effort by the Municipality to ensure maintenance and rehabilitation / replacement efforts are being made. Recently completed capital works projects completed since 2018 inspections, include the following:

- Box Culvert 10 – Road 63 Structure Rehabilitation (2018).
- Culvert 08 – Road 49 Structure Replacement (2019).
- Culvert 09 – Centre Line A Structure Replacement (2019).
- Artemesia Bridge A04 – West Back Line Structure Waterproof and Paving (2019).
- Bridge E13 – Euphrasia – St. Vincent Townline Bridge Rehabilitation (2020).
- Bridge A10 – 12th Concession A (on going).

Projects currently in the design stages include:

- Bridge E5 – Sideroad 7A Replacement.
- Bridge E6 – Sideroad 7A Replacement.
- Bridge E12 – Sideroad 7A Replacement.
- Bridge E4 – Sideroad 7A Replacement.

Continued maintenance and completion of rehabilitative or replacement works as recommended in this report will help to continue this trend of overall improvement of the Municipality's bridge assets.

The MTO has also developed theoretical deterioration curves which can be used as a backdrop to estimate the remaining service life of a structure before replacement, or to establish a time frame for future rehabilitations. Burnside has adjusted the MTO theoretical deterioration curve to more accurately reflect the deterioration curve of the structures that are being inspected. It has been observed after inspecting structures for over 10 years, that the structures are deteriorating slower than anticipated based on the MTO theoretical deterioration curve, and therefore the timeline for the rehabilitation / replacement of the structure has been adjusted to reflect this slower deterioration rate.

For the purposes of this report, culverts and bridges less than 4.5 m in span are assumed not to have a rehabilitation cycle. These structures will be monitored and planned for replacement when their BCI drops below a lower limit of 40. However, even

though our recommendation is to replace a structure, the costs to repair identified defects are included on the OSIM forms should the Municipality wish to repair these structures.

For structures with spans greater than 4.5 m, it has been assumed that a structure will be rehabilitated once during its lifetime. The rehabilitations are scheduled when the structures reach a target BCI of 60. However, for certain larger, more significant bridges, rehabilitation options may still be viable for BCI's lower than 60, but these will be considered on a site-by-site basis.

The estimated time until replacement or rehabilitation is required has been provided and the costs for all works required in the next ten years are identified.

6.0 Prioritization and Recommended Work

As an initial measure for prioritizing any required work, the structures have been ranked using their BCI values. A summary of the structures, in ascending order of BCI, along with their associated preliminary construction costs has been included in Appendix B. Two separate summary tables have been created to identify replacement and rehabilitation priority structures.

It should be noted that although the BCI is a good measure of the overall condition of the bridge, and therefore relative construction need, other factors are often considered when programming and prioritizing bridge work. Other factors that may be considered include:

- Traffic volume and number of trucks that regularly use the road.
- Load capacity restrictions at the site.
- Geometric restrictions (alignment or width).
- Pedestrian or cycling requirements.
- History of accidents or traffic conflicts.
- History of flooding or ice problems.
- Area growth and development.
- In conjunction with already planned road improvements.

The prioritized capital works plan and associated construction costs can be used for estimating future capital budgets. The budgets and rehabilitation work plans have been provided for the Municipality's highest priority structures. The structures provided below have been identified as requiring rehabilitation work or replacement in the next five years. The structures have been identified for rehabilitation or replacement based on their condition during the latest completed inspection.

Table 8: Top Priority Replacement Structures Based on Condition Rating (BCI) (Replacement Recommended Within One Year)

Structure No. / Name	Road Name	Recommended Work	Estimated Capital Works Cost
E12	Sideroad 7A	Replacement	$1,145,000.00
BC06	Artemesia Townline	Replacement [1]	$575,000.00
O12	Concession 10	Replacement [1]	$908,000.00
O21	10th Concession	Replacement	$645,000.00
O17	Centre Line B	Replacement [1]	$833,000.00
		Total	**$4,106,000.00**

Note [1] – These structures may be viable candidates to be replaced using multi-cell culverts by the Municipal staff. It is estimated that by utilizing Municipal Staff and resources, the estimated capital works costs may be reduced by up to 50%.

Table 9: Top Priority Rehabilitation Structures Based on Condition Rating (BCI) (Rehabilitation Recommended Within One Year)

Structure No. / Name	Road Name	Recommended Work	Estimated Capital Works Cost
O11	Concession 8B	Rehabilitation	$452,500.00
A15	South Line A	Rehabilitation	$564,500.00
E16	7th Line	Rehabilitation	$327,500.00
O07	South Line B	Rehabilitation	$405,500.00
O10	Mill Bridge Road	Rehabilitation	$622,500.00
A13	Lower Valley Road	Rehabilitation	$365,500.00
E11	Sideroad 22C	Rehabilitation	$1,127,500.00
A22	Old Hwy 4	Rehabilitation	$192,500.00
		Total	**$4,058,000.00**

Burnside recognizes that it may not be feasible to complete all of the Capital Works requirements within the recommended timeframe based on Table 8 and Table 9. The Municipality of Grey Highlands may investigate deferring some of the rehabilitation work and plan on replacement based on structure type, location, and clearance accessibility. On low volume roads with less than 200 vehicles per day, the Municipality could explore alternative replacement options, such as single-lane prefabricated structure options, removing the structure and closing the road, or replacing the structure under their own forces.

Burnside has also identified several sites in Table 10 where the Municipality can investigate options to replace the existing structures under their own forces with single or multi-cell culverts based on the following criteria:

- Span less than 5 m +/-.
- Slow moving watercourse or equalization structure.
- Existing culvert may be located on a municipal drain.
- Greater than 0.6 m of fill above the existing structure.
- Warm water fishery / low quality watercourse.

Table 10: Additional Sites Identified for Potential Multi-Cell System Replacement

Structure No. / Name	Road Name	Timeline for Rehabilitation / Replacement Works
BC01	Euphrasia – St. Vincent Townline	Replacement in 18 years.
BC06	Artemesia Townline	Replacement in 1 year
O12	Concession 10	Replacement in 1 year
O13	Concession 10	Rehabilitation in 8 years. Replacement in 18 years.
O17	Centre Line B	Replacement in 1 year
BC09	3rd Concession	Replacement in 11 years.
BC07	Road 41A	Replacement in 11 years.

7.0 5-Year Capital Plan

The structures in the 5-year Capital Plan shown in Table 11, have been ordered for rehabilitation or replacement based on their condition during the latest completed inspection, but also take into account additional factors through recent discussions with the Municipality. Some of the factors include low traffic volume roads, schedule reconstruction projects, close proximity of priority structures, etc.

Table 11: 5-Year Capital Plan

Year	Design, Planning, Geotechnical Investigation, Environmental Assessment		Capital Works		Total Annual Budget
	Structure No. / Name	Cost	Structure No. / Name	Cost	
2024	O12[1]	$40,000.00	West Back Line Culverts	$560,000.00	$1,487,000.00
	O17[1]	$40,000.00	O12[1]	$400,000.00	
	E06	$22,000.00	O17[1]	$400,000.00	
	E12	$25,000.00			
2025	BC06[1]	$40,000.00	E06	$907,000.00	$1,980,000.00*
			E12	$1,033,000.00	
2026	O21	$72,000.00	BC06[1]	$400,000.00	$472,000.00
2027	O11	$39,500.00	O21	$573,000.00	$612,500.00
2028	A15	$47,000.00	O11	$413,000.00	$460,000.00

Note [1] – These structures may be viable candidates to be replaced using multi-cell culverts by the Municipal staff. It is estimated that by utilizing Municipal Staff and resources, the estimated capital works costs may be reduced by up to 50%.

*Note – Structures E4, E5, E6 and E12 are all located on Sideroad 7A and would be completed at the same time and constructed as part of a funding program

8.0 Summary

The 2023 OSIM inspections were carried out by Burnside on behalf of the Municipality of Grey Highlands to identify the current condition of all the structures within the Municipality's inventory. The Summary Reports provided in Appendix A summarize the maintenance needs, additional investigations, and capital works requirements for each structure. The capital works for each structure has been given a priority of six to ten years, one to five years, within one year and urgent, based on the current BCI.

We trust the summary report provides all the information that you require at this time. If you have any questions or comments, please do not hesitate to contact us.

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Appendix A

Summary Reports

1.1 Structure No. A03

Structure Name:	Bridge A3 - Webers Bridge		**2023 BCI =53.78**
Road Name:	Road 180		
Location:	0.4 km east of West Back Line		
Structure Type:	Cast-In-Place Concrete T-Beam		
Number of Spans:	1	Span Lengths:	9.3 m
Overall Structure Width:	6.5 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	12 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	2.0	10.0

Recommendation:	**Minor Rehabilitation is recommended within 2 years.**

Justification:

Structure A3 is generally in fair condition, however, the low cover to the steel reinforcement and stirrups in the concrete soffit and concrete t-beam girders has resulted in multiple spalls and delaminations throughout the superstructure. This type of defect is not assumed to significantly impact the load carrying capacity of the structure.

It should be noted that rehabilitating this structure will not likely result in an increase or removal of the load posting. If the Municipality wishes to remove the load limit on the bridge, the structure should be replaced.

Structure No. A03 (Continued)	2023 BCI = 53.78

Maintenance Need	Element and Comments	Estimated Cost
Deck Drainage	Flush deck drains	$1,000.00
Other	Replace missing posts	$1,500.00
	Maintenance Needs Total	**$2,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install End Treatments	$35,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	1 to 5 years	$25,000.00
Type B concrete repairs to Girders, soffit	1 to 5 years	$150,000.00
Type C concrete repairs to abutment walls, wingwalls	1 to 5 years	$25,000.00
Replace barrier system with side mounted thrie beam barrier	1 to 5 years	$40,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$125,000.00
	Rehabilitation Cost Subtotal	**$365,000.00**

Estimate Value of Replacement Structure	$850,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$390,000.00	$875,000.00
Roadside Protection:	$35,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$39,000.00	$88,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$39,000.00	$88,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$44,000.00
Total Capital Work Cost	**$520,500.00**	**$1,220,000.00**

1.2 Structure No. A04

Structure Name:	Bridge A4 - Saugeen Junction Bridge	**2023 BCI =62.4**	
Road Name:	West Back Line		
Location:	0.7 km north of Road 180		
Structure Type:	Through Girder (Steel)		
Number of Spans:	1	Span Lengths:	13 m
Overall Structure Width:	5.3 m	Roadway Width:	5.1 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	2.0	18.0

Recommendation:	**Minor Rehabilitation is recommended within 2 years.**

Justification:
Structure A4 was waterproofed and paved in 2019 and is generally in fair condition. The structure is demonstrating signs of deterioration of the concrete abutments, wingwalls, and minor corrosion and section loss at the girder ends.

Structure No. A04 (Continued)	2023 BCI = 62.4

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Repair Guide Rail and Install End Treatments	$40,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type B concrete repairs to soffit	1 to 5 years	$15,000.00
Type C concrete repairs to abutment walls, wingwalls	1 to 5 years	$60,000.00
Painting required to Structural Steel (Full length)	1 to 5 years	$100,000.00
Replace barrier system with side mounted thrie beam barrier system	1 to 5 years	$25,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$125,000.00
	Rehabilitation Cost Subtotal	**$325,000.00**

Estimate Value of Replacement Structure	$1,200,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$350,000.00	$1,225,000.00
Roadside Protection:	$40,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$35,000.00	$112,000.00
Environmental Assessment:	$2,500.00	$60,000.00
Engineering Design:	$35,000.00	$112,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$62,000.00
Total Capital Work Cost	**$477,500.00**	**$1,686,000.00**

1.3 Structure No. A06

Structure Name:	Bridge A6 - Cameron Bridge		**2023 BCI =67.25**
Road Name:	35 Sideroad		
Location:	1.5 km north of Grey Road 4		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	16.7 m
Overall Structure Width:	8.2 m	Roadway Width:	6.4 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	4.0	15.0

Recommendation:	**Major Rehabilitation is recommended within 4 years.**

Justification:
Structure A6 is generally in good to fair condition but is demonstrating signs of moderate to severe concrete deterioration throughout, and moisture penetration through the deck top. Given the narrow platform width and structure type, options could be considered during the design to widen the structure to a full two lane bridge.

Structure No. A06 (Continued)	2023 BCI = 67.25

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install End Treatments	$35,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	1 to 5 years	$35,000.00
Type B concrete repairs to soffit	1 to 5 years	$50,000.00
Type C concrete repairs to abutment walls, wingwalls	1 to 5 years	$20,000.00
Replace Barrier System	1 to 5 years	$60,000.00
Waterproof and Pave	1 to 5 years	$25,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$125,000.00
	Rehabilitation Cost Subtotal	**$315,000.00**

Estimate Value of Replacement Structure	$1,200,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$330,000.00	$1,215,000.00
Roadside Protection:	$35,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$33,000.00	$111,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$33,000.00	$111,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$61,000.00
Total Capital Work Cost	**$448,500.00**	**$1,623,000.00**

1.4 Structure No. A07

Structure Name:	Bridge A7 - Mt. Zion Bridge		**2023 BCI =64.77**
Road Name:	East Back Line		
Location:	0.8 km west of 35 Sideroad		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	12.4 m
Overall Structure Width:	6.2 m	Roadway Width:	5.4 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	4.8	14.8

Recommendation:	**Major Rehabilitation is recommended within 5 years.**

Justification:
Structure A7 is generally in fair condition and is demonstrating signs of concrete deterioration, and moisture penetration through the deck top. Given the narrow platform width and structure type, options could be considered during the design to widen the structure to a full two lane bridge.

Structure No. A07 (Continued)	2023 BCI = 64.77

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Estimated Cost
	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider replacing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to end post, posts, deck top, curbs	1 to 5 years	$10,000.00
Type B concrete repairs to soffit	1 to 5 years	$40,000.00
Type C concrete repairs to wingwalls	1 to 5 years	$30,000.00
Replace deck drains	1 to 5 years	$15,000.00
Waterproof and pave	1 to 5 years	$30,000.00
Replace barrier system	1 to 5 years	$60,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$125,000.00
Replace Guide Rail	1 to 5 years	$95,000.00
	Rehabilitation Cost Subtotal	**$405,000.00**

Estimate Value of Replacement Structure	$950,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$430,000.00	$975,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$43,000.00	$98,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$43,000.00	$98,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$49,000.00
Total Capital Work Cost	**$533,500.00**	**$1,345,000.00**

1.5 Structure No. A13

Structure Name:	Bridge A13 - Low Bridge		**2023 BCI =65.67**
Road Name:	Lower Valley Road		
Location:	3 km north of East Back Line		
Structure Type:	Steel I-Girder (Concrete Deck)		
Number of Spans:	1	Span Lengths:	12.5 m
Overall Structure Width:	6 m	Roadway Width:	5.1 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	1.0	15.7

Recommendation:	**Minor Rehabilitation is recommended as soon as possible.**

Justification:
Structure A13 is generally in good condition but is demonstrating signs of severe corrosion with section loss of the structural steel girder ends as a result of the missing expansion joint seals. To prevent further damage of the bridge elements, it is recommended that the expansion joints be cleaned out and new seals be installed within one year.

Structure No. A13 (Continued)	2023 BCI = 65.67

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top	$500.00
Bridge Cleaning	Flush Expansion joints and clean debris off bearing seat	$1,500.00
	Maintenance Needs Total	**$2,000.00**

Additional Investigations	Estimated Cost
Monitoring of Deformations, Settlements and Movements	$0.00

Current Roadside Protection Needs	Estimated Cost
Narrow Structure	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Replace seals and sealants	Within 1 year	$10,000.00
Waterproof and Pave	Within 1 year	$25,000.00
Painting required to Structural Steel (Full length)	Within 1 year	$80,000.00
Steel repairs to railing system, girders - ends	Within 1 year	$50,000.00
General Items - Insurance, Mobilization, Access etc.	Within 1 year	$100,000.00
	Rehabilitation Cost Subtotal	**$265,000.00**

Estimate Value of Replacement Structure	$1,200,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$290,000.00	$1,225,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$29,000.00	$112,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$29,000.00	$112,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$62,000.00
Total Capital Work Cost	**$365,500.00**	**$1,636,000.00**

1.6 Structure No. BC01

Structure Name:	Bridge BC1 - Box Culvert 1		**2023 BCI =73.11**
Road Name:	Euphrasia - St. Vincent Townline		
Location:	0.1 km west of Deviation Road		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	1.52 m
Overall Structure Width:	6.2 m	Roadway Width:	4.6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	18.1

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC1 is generally in good condition with minor concrete defects noted through the culvert barrel. The Municipality may wish to remove this structure from the Municipal Bridge & Culvert Inspection Inventory since the span is less than 3.0 m.

Structure No. BC01 (Continued)	2023 BCI = 73.11

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install one hazard warning sign at structure	$250.00
	Maintenance Needs Total	**$250.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$365,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$37,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$37,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$19,000.00
Total Capital Work Cost	**N/A**	**$583,000.00**

1.7 Structure No. BC02

Structure Name:	Bridge BC2 - Box Culvert 2		**2023 BCI =74.98**
Road Name:	Sideroad 4A		
Location:	2 km east of 11th Line		
Structure Type:	CSP Ellipse Culvert(s)		
Number of Spans:	1	Span Lengths:	4.8 m
Overall Structure Width:	19.5 m	Roadway Width:	5 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	17.8

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC2 is generally in good condition, however the erosion and washouts on the embankments should be repaired as soon as possible to prevent further erosion.

Structure No. BC02 (Continued)	2023 BCI = 74.98

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install rip rap slope protection	$1,500.00
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider Replacing Steel Beam Guide Rail During Future Capital Works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$565,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$57,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$57,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$29,000.00
Total Capital Work Cost	**N/A**	**$833,000.00**

1.8 Structure No. BC07

Structure Name:	Bridge BC7 - Box Culvert 7	**2023 BCI =63.8**	
Road Name:	Road 41A		
Location:	1 km north of the Melancthon-Osprey Townline		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	2.7 m
Overall Structure Width:	5.8 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	11.9

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC7 is generally in good to fair condition and is demonstrating signs of concrete deterioration of the inlet, outlet and barrel. Given the low flow and cover above the concrete culvert, this structure may be an optimal candidate to replace with a multiple culverts system.

Structure No. BC07 (Continued)	2023 BCI = 63.8

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider installing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Install barrier system	N/A	$20,000.00
Type C concrete repairs to barrels, inlet, outlet	N/A	$25,000.00
Waterproof and Pave	N/A	$30,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$200,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$225,000.00	$425,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$23,000.00	$43,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$23,000.00	$43,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$22,000.00
Total Capital Work Cost	**$288,500.00**	**$658,000.00**

1.9 Structure No. BC08

Structure Name:	Bridge BC8 - Box Culvert 8		**2023 BCI =61.72**
Road Name:	South Line B		
Location:	1 km west of Road 41A		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	3.2 m
Overall Structure Width:	7.2 m	Roadway Width:	6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	10.9

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC8 is generally in fair to poor condition and is demonstrating signs of severe deterioration on the soffit.

Alternative designs such as a structural slab over the deck may be considered to reduce the rehabilitation costs, given that the abutments are generally in good condition.

Structure No. BC08 (Continued)	2023 BCI = 61.72

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider installing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Install Barrier System	N/A	$15,000.00
Type C concrete repairs to barrels, inlet, outlet	N/A	$40,000.00
Waterproof and Pave	N/A	$20,000.00
Add slope stabilization	N/A	$4,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$204,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$229,000.00	$425,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$23,000.00	$43,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$23,000.00	$43,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$22,000.00
Total Capital Work Cost	**$292,500.00**	**$658,000.00**

1.10 Structure No. BC10

Structure Name:	Bridge BC10 - Box Culvert 10		**2023 BCI =65.79**
Road Name:	Road 63		
Location:	0.75 km south of Centre Line B		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	6.1 m
Overall Structure Width:	6.85 m	Roadway Width:	6.25 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	12.9

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC10 underwent a rehabilitation in 2018 and is generally in good to fair condition. The rehabilitation included concrete repairs, installation of a concrete barrier / curb, approach guide rail installation, and waterproofing and paving. However, the concrete patches are failing at the southwest wingwall, resulting in repairs required to the guide rail posts and anchors at the structure connection.

Structure No. BC10 (Continued)	2023 BCI = 65.79

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Repairs required to Approach Wearing Surface	$1,000.00
Other	Concrete repairs required for anchors in structure connection guide rail	$2,000.00
	Maintenance Needs Total	**$3,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$500,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$515,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$52,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$52,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$26,000.00
Total Capital Work Cost	**N/A**	**$770,000.00**

1.11 Structure No. BC11

Structure Name:	Bridge BC11 - Box Culvert 11		**2023 BCI =71.37**
Road Name:	Road 55		
Location:	0.2 km north of Grey Road 31		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	4.9 m
Overall Structure Width:	9.7 m	Roadway Width:	5.7 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	16.4

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC11 is generally in good condition but is beginning to demonstrate signs of minor concrete deterioration throughout the culvert barrel.

Structure No. BC11 (Continued)	2023 BCI = 71.37

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to curbs	N/A	$2,000.00
Type C concrete repairs to barrels, inlet, outlet	N/A	$12,000.00
Install Barrier System	N/A	$40,000.00
Remove fill, waterproof and pave	N/A	$50,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$229,000.00**

Estimate Value of Replacement Structure	$700,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$244,000.00	$715,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$25,000.00	$72,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$25,000.00	$72,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$36,000.00
Total Capital Work Cost	**$406,500.00**	**$1,020,000.00**

1.12 Structure No. BC14

Structure Name:	Bridge BC14 - Box Culvert 14		**2023 BCI =57.99**
Road Name:	4th Concession B		
Location:	0.1 km west of Road 41A		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	2.6 m
Overall Structure Width:	7.2 m	Roadway Width:	6.2 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	9.0

Recommendation:	**Structure replacement is recommended within 9 years.**

Justification:
Structure BC14 is generally in fair to poor condition and is demonstrating signs of concrete deterioration, and moisture penetration throughout the culvert barrel.

Structure No. BC14 (Continued)	2023 BCI = 57.99

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider installing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to curbs	N/A	$1,500.00
Type C concrete repairs to barrels, inlet, outlet	N/A	$26,000.00
Install Barrier System	N/A	$30,000.00
Remove fill, waterproof and pave	N/A	$40,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$222,500.00**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$237,500.00	$465,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$24,000.00	$47,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$24,000.00	$47,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$24,000.00
Total Capital Work Cost	**$303,000.00**	**$708,000.00**

1.13 Structure No. BC15

Structure Name:	Bridge BC15 - Box Culvert 15		**2023 BCI =68.26**
Road Name:	4th Concession B		
Location:	0.2 km west of Road 41A		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	3.7 m
Overall Structure Width:	9.7 m	Roadway Width:	6.2 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	14.1

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC15 is generally in good to fair condition but is demonstrating signs of concrete deterioration throughout the barrel and deterioration / scour on the retaining wall and along the waterline.

Structure No. BC15 (Continued)	2023 BCI = 68.26

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider replacing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type C concrete repairs to wall, barrels, inlet, outlet	N/A	$16,567.50
Add slope stabilization	N/A	$4,000.00
Install Barrier System	N/A	$25,000.00
Remove fill, waterproof and pave	N/A	$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$195,567.50**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$210,567.50	$465,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$22,000.00	$47,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$22,000.00	$47,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$24,000.00
Total Capital Work Cost	**$272,067.50**	**$708,000.00**

1.14 Structure No. BC17

Structure Name:	Bridge BC17 - Box Culvert 17		**2023 BCI =89.58**
Road Name:	Centre Line A		
Location:	1.5 km west of Road 41A		
Structure Type:	Precast Concrete Box Culvert		
Number of Spans:	1	Span Lengths:	3.6 m
Overall Structure Width:	14.6 m	Roadway Width:	7.2 m
Year of Construction:	2013	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	34.6

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC 17 was replaced in 2013 and is generally in excellent condition with only minor maintenance recommended at this time.

Structure No. BC17 (Continued)	2023 BCI = 89.58

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Wearing Surface	$1,000.00
Other	Remove overgrown vegetation along shoulders	$500.00
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$465,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$47,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$47,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$24,000.00
Total Capital Work Cost	**N/A**	**$708,000.00**

1.15 Structure No. BC18

Structure Name:	Bridge BC18 - Box Culvert 18		**2023 BCI =89.25**
Road Name:	Quiet Valley Road		
Location:	1 km east of Grey Road 7		
Structure Type:	CSP Round Culvert(s)		
Number of Spans:	2	Span Lengths:	2, 2 m
Overall Structure Width:	16.1 m	Roadway Width:	5 m
Year of Construction:	2016	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	25.7

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure BC18 is generally in excellent condition, however, consideration should be given to repairing the scour pools at the outlets and the undermined retaining wall at the southwest quadrant of the structure.

Structure No. BC18 (Continued)	2023 BCI = 89.25

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install scour protection	$2,500.00
	Maintenance Needs Total	**$2,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider installing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$415,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$42,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$42,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$21,000.00
Total Capital Work Cost	**N/A**	**$645,000.00**

1.16 Structure No. E01

Structure Name:	Bridge E1 - Russel Hills Bridge		**2023 BCI =67.33**
Road Name:	Sideroad 4 A		
Location:	2.2 km west of 11th Line		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	12.3 m
Overall Structure Width:	8.2 m	Roadway Width:	5.3 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	2.0	17.3

Recommendation:	**Major Rehabilitation is recommended within 2 years.**

Justification:
Structure E1 is generally in good to fair condition but is demonstrating signs of concrete deterioration, so rehabilitation should be considered within two years.

Structure No. E01 (Continued)	2023 BCI = 67.33

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Repairs required to Embankments	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to posts, deck top, curbs	1 to 5 years	$25,000.00
Type B concrete repairs to soffit	1 to 5 years	$32,000.00
Type C concrete repairs to abutment walls, wingwalls	1 to 5 years	$40,000.00
Replace barrier system	1 to 5 years	$50,000.00
Add slope stabilization	1 to 5 years	$4,000.00
Waterproof and pave	1 to 5 years	$30,000.00
Concrete Overlay	1 to 5 years	$40,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$150,000.00
	Rehabilitation Cost Subtotal	**$371,000.00**

Estimate Value of Replacement Structure	$1,200,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$386,000.00	$1,215,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$39,000.00	$111,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$39,000.00	$111,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$61,000.00
Total Capital Work Cost	**$576,500.00**	**$1,623,000.00**

1.17 Structure No. E03

Structure Name:	Bridge E3 - Russel Hills Bridge		**2023 BCI =66.32**
Road Name:	Sideroad 7A		
Location:	0.8 km east of 7th Line		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	8 m
Overall Structure Width:	8.4 m	Roadway Width:	4.8 m
Year of Construction:	1954	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	2.0	16.3

Recommendation:	**Major Rehabilitation is recommended within 2 years.**

Justification:
Structure E3 is generally in good condition but is demonstrating signs of concrete deterioration, and moisture penetration through the deck top. It is recommended that a detailed deck condition survey be completed prior to the rehabilitation to determine the condition of the concrete deck and extent of chloride penetration and reinforcement corrosion.

Structure No. E03 (Continued)	2023 BCI = 66.32

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Wearing Surface	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Estimated Cost
Detailed Deck Condition Survey, Monitoring of Deformations, Settlements and Movements	$15,000.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to posts, deck top, curbs	N/A	$20,000.00
Type B concrete repairs to soffit	N/A	$30,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$20,000.00
Add slope stabilization	N/A	$4,000.00
Replace barrier system	N/A	$60,000.00
Concrete overlay	N/A	$30,000.00
Waterproof and pave	N/A	$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$314,000.00**

Estimate Value of Replacement Structure	$900,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$329,000.00	$915,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$33,000.00	$92,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$33,000.00	$92,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$46,000.00
Total Capital Work Cost	**$507,500.00**	**$1,270,000.00**

1.18 Structure No. E04

Structure Name:	Bridge E4 - Talisman Bridge		**2023 BCI =61.81**
Road Name:	Sideroad 7A		
Location:	1 km west of Grey Road 7		
Structure Type:	Cast-In-Place Concrete T-Beam		
Number of Spans:	1	Span Lengths:	9.1 m
Overall Structure Width:	5.8 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	12 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	1.8	11.8

Recommendation:	**Major Rehabilitation is recommended within 2 years.**

Justification:
Structure E4 is generally in good to fair condition, however, it is demonstrating signs of concrete deterioration throughout the concrete superstructure and substructure.

Structure No. E04 (Continued)	2023 BCI = 61.81

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	$15,000.00
Type B concrete repairs to Girders, soffit	N/A	$50,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$10,000.00
Replace barrier system	N/A	$50,000.00
Waterproof and Pave	N/A	$40,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$150,000.00
Rehabilitation Cost Subtotal		**$315,000.00**

Estimate Value of Replacement Structure	$1,400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Utilities - Relocate watermain	$0.00	$40,000.00
Total Associated Work Cost	**$15,000.00**	**$55,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$330,000.00	$1,455,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$33,000.00	$123,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$33,000.00	$123,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$73,000.00
Total Capital Work Cost	**$508,500.00**	**$1,899,000.00**

1.19 Structure No. E05

Structure Name:	Bridge E5 - Talisman Bridge		**2023 BCI =54.19**
Road Name:	Sideroad 7A		
Location:	0.5 km west of Grey Road 7		
Structure Type:	Cast-In-Place Concrete T-Beam		
Number of Spans:	1	Span Lengths:	9.4 m
Overall Structure Width:	5.8 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	12 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	7.1

Recommendation:	**Forgo rehabilitation and replace structure within 7 years.**

Justification:

Structure E5 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration and moisture penetration through the deck top.

Based on the lack of flow through the structure, the municipality could review the option of replacing the structure with a multi-cell culvert system or smaller precast box culvert option. Preliminary hydraulics have identified that if the span of this structure is reduced, structures E4 and E12 will need to be increased to offset the reduced conveyance capacity of the system.

Structure No. E05 (Continued)	2023 BCI = 54.19

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	$15,000.00
Type B concrete repairs to Girders, soffit	N/A	$50,000.00
Type C concrete repairs to abutment walls, ballast walls, wingwalls	N/A	$30,000.00
Replace barrier system	N/A	$50,000.00
Waterproof and Pave	N/A	$30,000.00
Add slope stabilization	N/A	$4,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$304,000.00**

Estimate Value of Replacement Structure	$800,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Utilities - Relocate watermain	$0.00	$40,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$65,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$329,000.00	$865,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$33,000.00	$87,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$33,000.00	$87,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$44,000.00
Total Capital Work Cost	**$507,500.00**	**$1,208,000.00**

1.20 Structure No. E06

Structure Name:	Bridge E6 - Talisman Bridge		**2023 BCI =51.42**
Road Name:	Sideroad 7A		
Location:	0.2 km west of Grey Road 7		
Structure Type:	Cast-In-Place Concrete T-Beam		
Number of Spans:	1	Span Lengths:	8.6 m
Overall Structure Width:	5.8 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	12 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	5.4

Recommendation:	**Forgo rehabilitation and replace structure within 5 years.**

Justification:
Structure E6 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration and moisture penetration through the deck top.
Preliminary hydraulic investigations have identified that the replacement structure for Bridge E6 would be approximately 5 m to provide adequate conveyance for the system of structures along Sideroad 7A, provided that both structures E4 and E12 are made larger.

Structure No. E06 (Continued)	2023 BCI = 51.42

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	$25,000.00
Type B concrete repairs to Girders, soffit	N/A	$60,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$15,000.00
Replace barrier system	N/A	$50,000.00
Waterproof and Pave	N/A	$25,000.00
Add slope stabilization	N/A	$5,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$305,000.00**

Estimate Value of Replacement Structure	$650,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Utilities - Relocate watermain	$0.00	$40,000.00
Total Associated Work Cost	**$15,000.00**	**$55,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$320,000.00	$705,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$32,000.00	$71,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$32,000.00	$71,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$36,000.00
Total Capital Work Cost	**$496,500.00**	**$1,008,000.00**

1.21 Structure No. E11

Structure Name:	Bridge E11 - Breadners Bridge		**2023 BCI =65.32**
Road Name:	Sideroad 22C		
Location:	1 km west of Grey Road 13		
Structure Type:	Steel Truss (Timber Deck)		
Number of Spans:	1	Span Lengths:	34.8 m
Overall Structure Width:	4.4 m	Roadway Width:	4 m
Year of Construction:		Current Load Limit:	12 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	1.0	12.7

Recommendation:	**Major Rehabilitation is recommended as soon as possible.**

Justification:
Structure E11, which was rehabilitated in 1990, is generally in fair condition and is demonstrating signs of concrete deterioration to the substructure as well as peeling and flaking of the structural steel coating. The structure is considered a heritage bridge and the rehabilitation work required to the structure should provide and aesthetically sympathetic design.

Structure No. E11 (Continued)	2023 BCI = 65.32

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Abutment Bearings	$1,500.00
Other	Remove tree growing through bottom chord	$1,000.00
	Maintenance Needs Total	**$2,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Replace Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type C concrete repairs to abutment walls, ballast walls, wingwalls	Within 1 year	$50,000.00
Sandblasting and painting required to Structural Steel (Full length)	Within 1 year	$400,000.00
Waterproof and Pave	Within 1 year	$50,000.00
Replace bearings	Within 1 year	$60,000.00
Add slope stabilization	Within 1 year	$20,000.00
General Items - Insurance, Mobilization, Access etc.	Within 1 year	$200,000.00
Structural Steel Repairs	Within 1 year	$40,000.00
	Rehabilitation Cost Subtotal	**$820,000.00**

Estimate Value of Replacement Structure	$2,200,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$845,000.00	$2,225,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$85,000.00	$162,000.00
Environmental Assessment:	$2,500.00	$90,000.00
Engineering Design:	$85,000.00	$162,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$112,000.00
Total Capital Work Cost	**$1,127,500.00**	**$2,866,000.00**

1.22 Structure No. E12

Structure Name:	Bridge E12 - Talisman Bridge		**2023 BCI =34.93**
Road Name:	Sideroad 7A		
Location:	0.05 km west of Grey Road 7		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5.8 m
Overall Structure Width:	5.8 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	0.0

Recommendation:	**Structure replacement is recommended as soon as possible.**

Justification:
Structure E12 is generally in poor condition and is demonstrating signs of severe concrete deterioration. Preliminary investigations and sizing of the structure are underway and it has been determined that a 14 m span (+/-) structure is proposed based on the hydraulics of the system of structures along Sideroad 7A.

Structure No. E12 (Continued)	2023 BCI = 34.93

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider replacing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	$30,000.00
Type B concrete repairs to soffit	N/A	$50,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$50,000.00
Replace barrier system	N/A	$50,000.00
Waterproof and Pave	N/A	$25,000.00
Add slope stabilization	N/A	$5,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$150,000.00
Rehabilitation Cost Subtotal		**$360,000.00**

Estimate Value of Replacement Structure	$800,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$375,000.00	$815,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$38,000.00	$82,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$38,000.00	$82,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$41,000.00
Total Capital Work Cost	**$468,500.00**	**$1,145,000.00**

1.23 Structure No. E13

Structure Name:	Bridge E13 - Euphrasia - St. Vincent Townline Bridge		**2023 BCI =71.28**
Road Name:	Euphrasia - St. Vincent Townline		
Location:	0.1 km west of Deviation Road		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5.5 m
Overall Structure Width:	6 m	Roadway Width:	5.55 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	5.0

Recommendation:	**Structure replacement is recommended within 5 years.**

Justification:
Structure E13 had emergency rehabilitation work completed in 2020. The repair was completed to prevent closure of the bridge and allow for the planning and design of a replacement structure. The structural rehabilitation was completed to temporarily prolong the service life of the structure, however, the existing substructure has been used to calculate the current BCI and as a result of the poor condition of the abutment walls and wingwalls, replacement should still be scheduled within the next five years.

Structure No. E13 (Continued)	2023 BCI = 71.28

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type C concrete repairs to abutment walls, wingwalls	N/A	$60,000.00
Add slope stabilization	N/A	$5,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$190,000.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$205,000.00	$565,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$21,000.00	$57,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$21,000.00	$57,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$29,000.00
Total Capital Work Cost	**$359,500.00**	**$833,000.00**

1.24 Structure No. E14

Structure Name:	Bridge E14 - Mill Creek South Bridge	**2023 BCI =47.56**	
Road Name:	Euphrasia - St. Vincent Townline		
Location:	2 km north of Grey Road 19		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5.5 m
Overall Structure Width:	7 m	Roadway Width:	6.3 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	3.8

Recommendation:	**Forgo rehabilitation and replace structure within 4 years.**

Justification:
Structure E14 is generally in poor condition and is demonstrating signs of severe concrete deterioration. Due to high levels of debris under the structure, the entire soffit was not able to be inspected.

Structure No. E14 (Continued)	2023 BCI = 47.56

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	N/A	$15,000.00
Type B concrete repairs to soffit	N/A	$40,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$35,000.00
Add slope stabilization	N/A	$8,000.00
Replace barrier system	N/A	$50,000.00
Waterproof and pave	N/A	$30,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$303,000.00**

Estimate Value of Replacement Structure	$650,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$318,000.00	$665,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$32,000.00	$67,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$32,000.00	$67,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$34,000.00
Total Capital Work Cost	**$494,500.00**	**$958,000.00**

1.25 Structure No. E15

Structure Name:	Bridge E15	**2023 BCI =70.32**	
Road Name:	Shilvock Sideroad		
Location:	0.8 km south of Sideroad 7A		
Structure Type:	Steel I-Girder (Timber Deck)		
Number of Spans:	1	Span Lengths:	3.95 m
Overall Structure Width:	4.25 m	Roadway Width:	3.95 m
Year of Construction:	2013	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	22.7

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure E15 was reconstructed in 2013 and is generally in good condition. Light corrosion on the steel girders and impact damage on the timber curbs was noted during the inspection.

Structure No. E15 (Continued)	2023 BCI = 70.32

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type C concrete repairs to wall	N/A	$15,000.00
Steel repairs to utilities	N/A	$3,000.00
Add slope stabilization	N/A	$4,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$147,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$162,000.00	$415,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$17,000.00	$42,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$20,000.00	$42,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$21,000.00
Total Capital Work Cost	**$216,500.00**	**$645,000.00**

1.26 Structure No. O08

Structure Name:	Culvert O8		**2023 BCI =97.39**
Road Name:	Centre Line A		
Location:	1.8 km east of Grey Road 2		
Structure Type:	CSP Round Culvert(s)		
Number of Spans:	3	Span Lengths:	1.6, 1.6, 1.6 m
Overall Structure Width:	10.5 m	Roadway Width:	5 m
Year of Construction:	2019	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	50.0

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure O8 was replaced in 2019 and is in excellent condition.

Structure No. O08 (Continued)	2023 BCI = 97.39

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$415,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$42,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$42,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$21,000.00
Total Capital Work Cost	**N/A**	**$645,000.00**

1.27 Structure No. O09

Structure Name:	Culvert O9		**2023 BCI =97.25**
Road Name:	Road 49		
Location:	2 km south of 3rd Concession		
Structure Type:	CSP Round Culvert(s)		
Number of Spans:	3	Span Lengths:	1.6, 1.6, 1.6 m
Overall Structure Width:	10.5 m	Roadway Width:	5.8 m
Year of Construction:	2019	Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	50.0

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure O9 was replaced in 2019 and is in excellent condition.

Structure No. O09 (Continued)	2023 BCI = 97.25

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
N/A	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
	Rehabilitation Cost Subtotal	**$0.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$415,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$42,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$42,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$21,000.00
Total Capital Work Cost	**N/A**	**$645,000.00**

1.28 Structure No. O11

Structure Name:	Bridge O11		**2023 BCI =45.32**
Road Name:	Concession 8B		
Location:	0.4 km west of Road 55		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5.6 m
Overall Structure Width:	6 m	Roadway Width:	5.6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	5.0

Recommendation:	**Major Rehabilitation is recommended as soon as possible.**

Justification:
Structure O11 is generally in good to fair condition, however, the condition of the barrier system and the severe erosion and disintegration of the abutment walls and wingwalls is significantly lowering the BCI of the structure. It is anticipated that the service life could be extended by approximately 20 years by replacing the current barrier system and refacing the concrete substructure.

Structure No. O11 (Continued)	2023 BCI = 45.32

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove granular fill on deck and regrade roadway	$3,500.00
Deck Drainage	Flush deck drains	$500.00
	Maintenance Needs Total	**$4,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Consider installing steel beam guide rail during future capital works	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	Within 1 year	$20,000.00
Type B concrete repairs to soffit	Within 1 year	$50,000.00
Type C concrete repairs to abutment walls, wingwalls	Within 1 year	$75,000.00
Replace deck drains	Within 1 year	$6,000.00
Waterproof and Pave	Within 1 year	$30,000.00
Replace barrier system	Within 1 year	$40,000.00
General Items - Insurance, Mobilization, Access etc.	Within 1 year	$125,000.00
	Rehabilitation Cost Subtotal	**$346,000.00**

Estimate Value of Replacement Structure	$800,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$361,000.00	$815,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$37,000.00	$82,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$37,000.00	$82,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$41,000.00
Total Capital Work Cost	**$452,500.00**	**$1,145,000.00**

1.29 Structure No. O12

Structure Name:	Bridge O12		**2023 BCI =40.12**
Road Name:	Concession 10		
Location:	2.3 km west of Grey Road 31		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	4.9 m
Overall Structure Width:	9.9 m	Roadway Width:	8.1 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	0.1

Recommendation:	**Structure replacement is recommended as soon as possible.**

Justification:
Structure O12 is in poor condition and is demonstrating signs of severe concrete deterioration, and moisture penetration through the deck top.

Structure No. O12 (Continued)	2023 BCI = 40.12

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	N/A	$20,000.00
Type B concrete repairs to soffit	N/A	$75,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$35,000.00
Waterproof and Pave	N/A	$30,000.00
Install Barrier System	N/A	$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$310,000.00**

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$335,000.00	$625,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$34,000.00	$63,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$34,000.00	$63,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$32,000.00
Total Capital Work Cost	**$515,500.00**	**$908,000.00**

1.30 Structure No. O13

Structure Name:	Bridge O13	**2023 BCI =68.07**	
Road Name:	Concession 10		
Location:	1.8 km west of Grey Road 31		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5 m
Overall Structure Width:	9.6 m	Roadway Width:	7.2 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	8.1	18.1

Recommendation:	**Forgo rehabilitation and replace structure in future (replacement timeline estimated to exceed 10 years).**

Justification:
Structure O13 is generally in good to fair condition but is demonstrating signs of concrete deterioration, and moisture penetration through the deck top was noted in previous inspections.

Structure No. O13 (Continued)	2023 BCI = 68.07

Maintenance Need	Element and Comments	Estimated Cost
Other	Remove beaver dam	$2,000.00
	Maintenance Needs Total	**$2,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	N/A	$5,000.00
Type B concrete repairs to soffit	N/A	$20,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$10,000.00
Waterproof and pave	N/A	$25,000.00
Install Barrier System	N/A	$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$210,000.00**

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$225,000.00	$615,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$23,000.00	$62,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$23,000.00	$62,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$31,000.00
Total Capital Work Cost	**$383,500.00**	**$895,000.00**

1.31 Structure No. O14

Structure Name:	Bridge O14		**2023 BCI =53.71**
Road Name:	4th Concession B		
Location:	1 km east of Road 63		
Structure Type:	Cast-In-Place Concrete T-Beam		
Number of Spans:	1	Span Lengths:	11.7 m
Overall Structure Width:	6.5 m	Roadway Width:	5.5 m
Year of Construction:		Current Load Limit:	14 tonnes



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	0.0	6.9

Recommendation:	**Forgo rehabilitation and replace structure within 7 years.**

Justification:
Structure O14 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration.

Structure No. O14 (Continued)	2023 BCI = 53.71

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate Need for Replacing with Longer Guide Rail	$0.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs	N/A	$25,000.00
Type B concrete repairs to Girders, soffit	N/A	$150,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$100,000.00
Replace deck drainage	N/A	$10,000.00
Replace barrier system	N/A	$40,000.00
Waterproof and pave	N/A	$30,000.00
Concrete Overlay	N/A	$40,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$520,000.00**

Estimate Value of Replacement Structure	$1,100,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Environmental - Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Total Associated Work Cost	**$25,000.00**	**$25,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$545,000.00	$1,125,000.00
Roadside Protection:	$0.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$55,000.00	$107,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$55,000.00	$107,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$57,000.00
Total Capital Work Cost	**$672,500.00**	**$1,521,000.00**

1.32 Structure No. O16

Structure Name:	Bridge O16		**2023 BCI =70.77**
Road Name:	Centre Line B		
Location:	1.8 km east of Road 63		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	7.9 m
Overall Structure Width:	7.9 m	Roadway Width:	7.4 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	10.8	20.8

Recommendation:	**No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered.**

Justification:
Structure O16 is generally in good condition, however, it is demonstrating signs of minor concrete deterioration throughout.

Structure No. O16 (Continued)	2023 BCI = 70.77

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments and structure connections	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to end post, posts, deck top, curbs	N/A	$10,000.00
Type B concrete repairs to soffit	N/A	$10,000.00
Type C concrete repairs to wingwalls	N/A	$15,000.00
Waterproof and pave	N/A	$30,000.00
Replace barrier system	N/A	$30,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$220,000.00**

Estimate Value of Replacement Structure	$900,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$235,000.00	$915,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$24,000.00	$92,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$24,000.00	$92,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$46,000.00
Total Capital Work Cost	**$395,500.00**	**$1,270,000.00**

1.33 Structure No. O17

Structure Name:	Bridge O17	**2023 BCI =46.27**	
Road Name:	Centre Line B		
Location:	1.5 km east of Road 63		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	4.4 m
Overall Structure Width:	6.4 m	Roadway Width:	6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	1.0

Recommendation:	**Structure replacement is recommended as soon as possible.**

Justification:
Structure O17 is generally in poor condition and is demonstrating signs of severe concrete deterioration.

Structure No. O17 (Continued)	2023 BCI = 46.27

Maintenance Need	Element and Comments	Estimated Cost
N/A	N/A	$0.00
	Maintenance Needs Total	**$0.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Proper End Treatments	$40,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	$10,000.00
Type B concrete repairs to soffit	N/A	$60,000.00
Type C concrete repairs to abutment walls, wingwalls	N/A	$10,000.00
Waterproof and Pave	N/A	$16,000.00
Replace Barrier System	N/A	$30,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
	Rehabilitation Cost Subtotal	**$251,000.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$266,000.00	$565,000.00
Roadside Protection:	$40,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$27,000.00	$57,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$27,000.00	$57,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$29,000.00
Total Capital Work Cost	**$377,500.00**	**$833,000.00**

1.34 Structure No. O19

Structure Name:	Bridge O19		**2023 BCI =74.45**
Road Name:	8th concession		
Location:	1.1 km east of Grey Road 2		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:		Span Lengths:	5.6 m
Overall Structure Width:	12.2 m	Roadway Width:	6.7 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	14.4	24.4

Recommendation:	**No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered.**

Justification:
Structure O19 is generally in good condition.

Structure No. O19 (Continued)	2023 BCI = 74.45

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation growing over inlet and outlet	$3,500.00
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Maintenance Needs Total	**$4,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Install Guide Rail, end treatments	$95,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Waterproof and pave	N/A	$40,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$40,000.00
Rehabilitation Cost Subtotal		**$80,000.00**

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$15,000.00	$15,000.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$95,000.00	$615,000.00
Roadside Protection:	$95,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$10,000.00	$62,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$20,000.00	$62,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$31,000.00
Total Capital Work Cost	**$237,500.00**	**$895,000.00**

1.35 Structure No. O20

Structure Name:	Bridge O20		**2023 BCI =71.31**
Road Name:	Wellington Street		
Location:	0.5 km east of Grey Road 2		
Structure Type:	CSP Multi-Plate Arch Culvert(s)		
Number of Spans:	1	Span Lengths:	4.6 m
Overall Structure Width:	13.5 m	Roadway Width:	7.2 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.7

Recommendation:	**No Capital Works is estimated to be required within the next 10 years.**

Justification:
Structure O20 is generally in good condition.

Structure No. O20 (Continued)	2023 BCI = 71.31

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation growing on NW quadrant	$2,500.00
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Maintenance Needs Total	**$3,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate need for Guide Rail	$1,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
N/A	N/A	$0.00
Rehabilitation Cost Subtotal		**$0.00**

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Rehabilitation	Replacement
Traffic Control	$0.00	$15,000.00
Total Associated Work Cost	**$0.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	N/A	$615,000.00
Roadside Protection:	N/A	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	$62,000.00
Environmental Assessment:	N/A	$10,000.00
Engineering Design:	N/A	$62,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	N/A	$31,000.00
Total Capital Work Cost	**N/A**	**$895,000.00**

1.36 Structure No. O21

Structure Name:	Bridge O21		**2023 BCI =46.28**
Road Name:	10th Concession		
Location:	1 km east of Grey Road 2		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	5.65 m
Overall Structure Width:	16.7 m	Roadway Width:	6.6 m
Year of Construction:		Current Load Limit:	



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	0.9

Recommendation:	**Structure replacement is recommended as soon as possible.**

Justification:

Structure O21 consists of an original structure and newer extensions. The newer extensions are considered to be in good condition however, the original section below the road is in poor condition and should be replaced within one year to help prolong the life span of the structure. The replacement cost provided is for the centre portion of the structure only, not the entire culvert.

Structure No. O21 (Continued)	2023 BCI = 46.28

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Rip-rap required at washouts on embankments	$1,500.00
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Estimated Cost
N/A	$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate need for Guide Rail	$1,000.00

Rehabilitation / Repair Required	Priority	Estimated Cost
Type C concrete repairs to barrels	N/A	$100,000.00
Patch asphalt	N/A	$15,000.00
Add slope stabilization	N/A	$16,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$125,000.00
Rehabilitation Cost Subtotal		**$256,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Rehabilitation	Replacement
Approaches	$0.00	$0.00
Detours	$0.00	$0.00
Traffic Control	$15,000.00	$15,000.00
Utilities	$0.00	$0.00
Right of Way	$0.00	$0.00
Environmental	$0.00	$0.00
Other	$0.00	$0.00
Total Associated Work Cost	**$15,000.00**	**$15,000.00**

Total Capital Works Costs		
Cost	**Rehabilitation**	**Replacement**
Rehab / Replacement Works:	$271,000.00	$415,000.00
Roadside Protection:	$1,000.00	$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	$28,000.00	$42,000.00
Environmental Assessment:	$2,500.00	$10,000.00
Engineering Design:	$28,000.00	$42,000.00
Geotechnical Investigation:	N/A	$20,000.00
Contract Administration:	$15,000.00	$21,000.00
Total Capital Work Cost	**$345,500.00**	**$645,000.00**

BURNSIDE

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Appendix B

Structure Inventory and Cost Summaries

Municipality of Grey Highlands - STRUCTURE INVENTORY

Structure No.	Inspect. Year	Structure Name	Road Name	Location	Structure Type	Span(s) (m)	Width (m)	Deck Area (m2)	Deterioration Curve	BCI
A01	2022	Artemesia Culvert 1	20 Sideroad	0.8km east of Highway 10	Cast-In-Place Conc. Box Culvert	6	17	115.6	BR-1	74.29
A02	2022	Artemesia Bridge 2	West Back Line	0.5km north west of the Proton-Artemesia Townline	Cast-In-Place Conc. Rigid Frame	4.3 , 4.3	9.8	94.08	BR-1	71.53
A03	2023	Bridge A3 - Webers Bridge	Road 180	0.4km East of West Back Line	Cast-In-Place Concrete T-Beam	9.3	6.5	61.75	BR-1	53.78
A04	2023	Bridge A4 - Saugeen Junction Bridge	West Back Line	0.7 km North of Road 180	Through Girder (Steel)	13	5.3	74.2	BR-1	62.40
A05	2022	Artemesia Bridge 5	8th Concession	1km west of 35 Sideroad	Cast-In-Place Conc. Rigid Frame	9.5	9.75	101.4	BR-1	72.89
A06	2023	Bridge A6 - Cameron Bridge	35 Sideroad	1.5km North of Grey Road 4	Cast-In-Place Conc. Rigid Frame	16.7	8.2	141.04	BR-1	67.25
A07	2023	Bridge A7 - Mt. Zion Bridge	East Back Line	0.8km West of 35 Sideroad	Cast-In-Place Conc. Rigid Frame	12.4	6.2	80.6	BR-1	64.77
A08	2022	Artemesia Bridge 8	35 Sideroad	0.5km North of East Back Line	Cast-In-Place Conc. Rigid Frame	13.75	10.1	151.5	BR-1	74.72
A09	2022	Artemesia Culvert 9	Centre Line A	1.5km east of Back Line	Cast-In-Place Conc. Box Culvert	4.2	18	86.4	BR-1	73.58
A10	2022	Artemesia Bridge 10 (Wyvill Bridge)	12th Concession A	1.5km east of 15 sideroad	Cast-In-Place Conc. Rigid Frame	6.1	7	49	BR-1	51.27
A11	2022	Bridge A11 - Minnie Graham Bridge	Grahams Hill	0.2km West of Lower Valley Road	Steel I-Girder (Timber Deck)	11.73	4.9	54.76	BR-1	82.02
A12	2022	Artemesia Bridge 12 (Hydro Bridge)	Lower Valley road	1.5km south of Grey Road 30	Cast-In-Place Conc. Rigid Frame	8	8.2	72.16	BR-1	66.20
A13	2023	Bridge A13 - Low Bridge	Lower Valley Road	3km North of East Back Line	Steel I-Girder (Concrete Deck)	12.5	6	80.4	BR-1	65.67
A14	2022	Artemesia Bridge 14 (High Bridge)	Lower Valley Road	2km north of East Back Line	CSP Multi-Plate Arch Culvert(s)	8.4	23.7	200	BR	74.39
A15	2022	Artemesia Bridge 15 (Old South Line Bridge)	South Line A	1.5km West of Boar Farm Road	Cast-In-Place Concrete T-Beam	13.8	6	87.6	BR-1	57.30
A16	2022	Artemesia Bridge 16 (Burnett Bridge)	South Line A	0.4km West of Collie D's Sideroad	Cast-In-Place Conc. Rigid Frame	18.9	9.8	203.84	BR-1	72.90
A17	2022	Artemesia Bridge 17 (Little Mill Bridge)	East Back Line	1.8km north of Grey Road 4	Cast-In-Place Conc. Rigid Frame	5	9.5	54.15	BR-1	70.21
A18	2022	Artemesia Bridge 18 (Johnstons Sideroad Bridge)	Johnstons Sideroad	1.6km west of Grey Road 32	CSP Arch Culvert(s)	1.8	13.3	97.09	BR	68.91
A20	2022	Artemesia Bridge 20	Harold Best Parkway	0.2 Km North of Grey Road 4	Steel I-Girder (Timber Deck)	3.3	4.9	19.4	BR	60.54
A21	2022	Artemesia Bridge 21	Lower Valley Road	1.5km north of East Back Line	Cast-In-Place Conc. Rigid Frame	5.7	12.6	79.38	BR-1	73.94
A22	2022	Artemesia Bridge 22	Old Hwy 4	Just east of West Back Line	Cast-In-Place Conc. Box Culvert	3.1	11	38.5	CC	64.69
BC06	2022	Box Culvert 6	Artemesia Townline	2km East of Hwy 10	CSP Arch Culvert(s)	2	14.5	29	BR	40.35
BC09	2022	Box Culvert 9	3rd Concession	0.5km East of Road 57B	Cast-In-Place Conc. Box Culvert	1	7	10.5	BR	61.18
BC13	2022	Box Culvert 13	Road 45	1 Km South of 8th Concession	Arch (Concrete)	9.7	34	363.8	BR-1	68.70
BC01	2023	Bridge BC1 - Box Culvert 1	Euphrasia - St. Vincent Townline	0.1km West of Deviation Road	Cast-In-Place Conc. Rigid Frame	1.52	6.2	13.02	CC	73.11
BC02	2023	Bridge BC2 - Box Culvert 2	Sideroad 4A	2km East of 11th Line	CSP Ellipse Culvert(s)	4.8	19.5	93.6	CS	74.98
BC03	2022	Box Culvert 3	Lower Valley Road	1km North of East Back Line	Cast-In-Place Conc. Box Culvert	6	10.6	69.96	BR-1	73.40
BC07	2023	Bridge BC7 - Box Culvert 7	Road 41A	1km North of the Melancthon-Osprey Townline	Cast-In-Place Conc. Rigid Frame	2.7	5.8	18.9	CC	63.80
BC08	2023	Bridge BC8 - Box Culvert 8	South Line B	1km West of Road 41A	Cast-In-Place Conc. Rigid Frame	3.2	7.2	27.36	CC	61.72
BC10	2023	Bridge BC10 - Box Culvert 10	Road 63	0.75km South of Centre Line B	Cast-In-Place Conc. Rigid Frame	6.1	6.85	45.895	CC	65.79
BC11	2023	Bridge BC11 - Box Culvert 11	Road 55	0.2km North of Grey Road 31	Cast-In-Place Conc. Rigid Frame	4.9	9.7	54.32	CC	71.37
BC12	2022	Box Culvert 12	Road 41B	1.6km South 12th Concession B	Cast-In-Place Conc. Box Culvert	4	15.1	69.46	CC	74.90
BC14	2023	Bridge BC14 - Box Culvert 14	4th Concession B	0.1km West of Road 41A	Cast-In-Place Conc. Rigid Frame	2.6	7.2	23.04	CC	57.99
BC15	2023	Bridge BC15 - Box Culvert 15	4th Concession B	0.2km West of Road 41A	Cast-In-Place Conc. Rigid Frame	3.7	9.7	41.71	CC	68.26
BC16	2022	Box Culvert 16	4th Concession B	0.8km West of Road 41A	Cast-In-Place Conc. Rigid Frame	3.9	9.2	41.4	CC	73.55
BC17	2023	Bridge BC17 - Box Culvert 17	Centre Line A	1.5km West of Road 41A	Precast Concrete Box Culvert	3.6	14.6	59.8	CC	89.58
BC18	2023	Bridge BC18 - Box Culvert 18	Quiet Valley Road	1km East of Grey Road 7	CSP Round Culvert(s)	2, 2	16.1	104.65	CS	89.25
E02	2022	Euphrasia Bridge 2 - 9th Line Bridge	9th Line	1.0km north of Grey Road 30	Cast-In-Place Conc. Rigid Frame	4.25	7	70	BR	70.18
E01	2023	Bridge E1 - Russel Hills Bridge	Sideroad 4 A	2.2km West of 11th Line	Cast-In-Place Conc. Rigid Frame	12.3	8.2	107.42	BR-1	67.33
E03	2023	Bridge E3 - Russel Hills Bridge	Sideroad 7A	0.8km East of 7th Line	Cast-In-Place Conc. Rigid Frame	8	8.4	73.92	BR-1	66.32
E04	2023	Bridge E4 - Talisman Bridge	Sideroad 7A	1km West of Grey Road 7	Cast-In-Place Concrete T-Beam	9.1	5.8	57.42	BR-1	61.81
E05	2023	Bridge E5 - Talisman Bridge	Sideroad 7A	0.5km West of Grey Road 7	Cast-In-Place Concrete T-Beam	9.4	5.8	59.16	BR-1	54.19
E06	2023	Bridge E6 - Talisman Bridge	Sideroad 7A	0.2km West of Grey Road 7	Cast-In-Place Concrete T-Beam	8.6	5.8	52.2	BR-1	51.42
E09	2022	Bridge E9 - Epping Bridge	Sideroad 19	0.03km East of 3rd Line C	Steel Truss (Concrete Deck)	29	5.97	159.98	BR-2	85.12
E10	2022	Euphrasia Bridge 10 - Little Mill Bridge	Sideroad 25	1.5km east of Grey Road 7	CSP Multi-Plate Arch Culvert(s)	4	29	145	CS	73.83

Municipality of Grey Highlands - STRUCTURE INVENTORY

Structure No.	Inspect. Year	Structure Name	Road Name	Location	Structure Type	Span(s) (m)	Width (m)	Deck Area (m2)	Deterioration Curve	BCI
E11	2023	Bridge E11 - Breadners Bridge	Sideroad 22C	1km West of Grey Road 13	Steel Truss (Timber Deck)	34.8	4.4	153.12	BR-2	65.32
E12	2023	Bridge E12 - Talisman Bridge	Sideroad 7A	0.05km West of Grey Road 7	Cast-In-Place Conc. Rigid Frame	5.8	5.8	38.28	BR-1	34.93
E13	2023	Bridge E13 - Euphrasia - St. Vincent Townline Bridge	Euphrasia - St. Vincent Townline	0.1km West of Deviation Road	Cast-In-Place Conc. Rigid Frame	5.5	6	36.6	BR-1	71.28
E14	2023	Bridge E14 - Mill Creek South Bridge	Euphrasia - St. Vincent Townline	2km North of Grey Road 19	Cast-In-Place Conc. Rigid Frame	5.5	7	44.1	BR-1	47.56
E15	2023	Bridge E15	Shilvock Sideroad	0.8km South of Sideroad 7A	Steel I-Girder (Timber Deck)	3.95	4.25	0	BR	70.32
E16	2022	Euphrasia Bridge 16	7th Line	North of Sideroad 7A	Cast-In-Place Conc. Rigid Frame	4.9	13	72.8	BR-1	55.21
E18	2022	Euphrasia Bridge 18	Sideroad 22C	2.4km west of Grey Road 13	CSP Multi-Plate Arch Culvert(s)	5.9	24.6	145.14	CS	61.40
O01	2022	Osprey Bridge 1 - Fenwick Bridge	Osprey - Artemesia	1.0km North of the 10th Concession	CSP Multi-Plate Arch Culvert(s)	4.8	14.8	90.28	CS	74.58
O02	2022	Osprey Bridge 2	Road 41a	0.3km North of Centre Line A	Cast-In-Place Conc. Rigid Frame	7.7	9.4	78.96	BR-1	73.05
O03	2022	Osprey Bridge 3	Road 41a	1.2km South of Centre Line A	Cast-In-Place Conc. Rigid Frame	6.1	9.1	64.61	BR-1	74.23
O04	2022	Osprey Bridge 4	Centre Line A	0.04km east of Road 41A	Cast-In-Place Conc. Rigid Frame	7.7	9.4	78.96	BR-1	73.41
O05	2022	Osprey Bridge 5	South Line B	Intersection of South Line B & Road 41a	Cast-In-Place Conc. Box Culvert	6	34	229.5	BR-1	72.07
O06	2022	Osprey Bridge 6	South Line B	1.2km east of Road 41a	Cast-In-Place Conc. Rigid Frame	7.8	8.4	73.92	BR-1	64.01
O07	2022	Osprey Bridge 7	South Line B	2km East of Road 41a	Cast-In-Place Conc. Rigid Frame	5.5	6.95	45.175	BR-1	57.67
O08	2023	Culvert O8	Centre Line A	1.8km East of Grey Road 2	CSP Round Culvert(s)	1.6, 1.6, 1.6	10.5	73.5	CS	97.39
O09	2023	Culvert O9	Road 49	2km South of 3rd Concession	CSP Round Culvert(s)	1.6, 1.6, 1.6	10.5	84	CS	97.25
O10	2022	Osprey Bridge 10 - Mill St. Bridge	Mill Bridge Road	0.1km North of Wellington St. in Feversham	Arch (Concrete)	19	7.7	154	BR-1	52.82
O11	2023	Bridge O11	Concession 8B	0.4km West of Road 55	Cast-In-Place Conc. Rigid Frame	5.6	6	37.2	BR-1	45.32
O12	2023	Bridge O12	Concession 10	2.3km West of Grey Road 31	Cast-In-Place Conc. Rigid Frame	4.9	9.9	54.45	BR-1	40.12
O13	2023	Bridge O13	Concession 10	1.8km West of Grey Road 31	Cast-In-Place Conc. Rigid Frame	5	9.6	53.76	BR-1	68.07
O14	2023	Bridge O14	4th Concession B	1km East of Road 63	Cast-In-Place Concrete T-Beam	11.7	6.5	91	BR-1	53.71
O15	2022	Osprey Bridge 15	3rd Concession	2.0km West of County Road 124	Cast-In-Place Conc. Rigid Frame	6.05	9.1	62.79	BR-1	72.31
O16	2023	Bridge O16	Centre Line B	1.8km East of Road 63	Cast-In-Place Conc. Rigid Frame	7.9	7.9	67.15	BR-1	70.77
O17	2023	Bridge O17	Centre Line B	1.5km East of Road 63	Cast-In-Place Conc. Rigid Frame	4.4	6.4	32	BR	46.27
O18	2022	Osprey Bridge 18	Centre Line B	1.3km east of Road 63	CSP Multi-Plate Arch Culvert(s)	3.7	21	77.7	CS	70.04
O19	2023	Bridge O19	8th concession	1.1km East of Grey Road 2	Cast-In-Place Conc. Rigid Frame	5.6	12.2	68.32	BR-1	74.45
O20	2023	Bridge O20	Wellington Street	0.5km East of Grey Road 2	CSP Multi-Plate Arch Culvert(s)	4.6	13.5	62.1	CS	71.31
O21	2023	Bridge O21	10th Concession	1km East of Grey Road 2	Cast-In-Place Conc. Rigid Frame	5.65	16.7	100.2	CC	46.28

Municipality of Grey Highlands - CAPITAL WORKS BY BCI

Structure No.	Inspect. Year	Road Name	Deterioration Curve	BCI	Years to Rehab	Years to Replace	Total Cost of Rehabilitation	Total Cost of Replacement	Recommended Work	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
E12	2023	Sideroad 7A	BR-1	34.93	0.00	0.00	$ 468,500.00	$ 1,145,000.00	Replace	$ 1,145,000.00	$ -	$ -	$ 1,145,000.00
O12	2023	Concession 10	BR-1	40.12	0.00	0.06	$ 515,500.00	$ 908,000.00	Replace	$ 908,000.00	$ -	$ -	$ 908,000.00
BC06	2022	Artemesia Townline	BR	40.35	N/A	0.00	N/A	$ 536,500.00	Replace	$ 575,000.00	$ -	$ -	$ 575,000.00
O11	2023	Concession 8B	BR-1	45.32	0.00	5.00	$ 452,500.00	$ 1,145,000.00	Rehabilitate	$ 452,500.00	$ -	$ -	$ 452,500.00
O17	2023	Centre Line B	BR	46.27	N/A	1.00	$ 377,500.00	$ 833,000.00	Replace	$ 833,000.00	$ -	$ -	$ 833,000.00
O21	2023	10th Concession	CC	46.28	N/A	0.90	$ 345,500.00	$ 645,000.00	Replace	$ 645,000.00	$ -	$ -	$ 645,000.00
E14	2023	Euphrasia - St. Vincent Townline	BR-1	47.56	0.00	3.78	$ 494,500.00	$ 958,000.00	Replace	$ -	$ 958,000.00	$ -	$ 958,000.00
A10	2022	12th Concession A	BR-1	51.27	0.00	1.00	N/A	$ 1,093,500.00	Replace	$ 1,155,000.00	$ -	$ -	$ 1,155,000.00
E06	2023	Sideroad 7A	BR-1	51.42	0.00	5.40	$ 496,500.00	$ 1,008,000.00	Replace	$ -	$ 1,008,000.00	$ -	$ 1,008,000.00
O10	2022	Mill Bridge Road	BR-1	52.82	0.00	6.41	$ 617,500.00	$ 3,088,000.00	Rehabilitate	$ 622,500.00	$ -	$ -	$ 622,500.00
O14	2023	4th Concession B	BR-1	53.71	0.00	6.86	$ 672,500.00	$ 1,521,000.00	Replace	$ -	$ -	$ 1,521,000.00	$ 1,521,000.00
A03	2023	Road 180	BR-1	53.78	2.00	10.00	$ 520,500.00	$ 1,220,000.00	Rehabilitate	$ -	$ 520,500.00	$ -	$ 520,500.00
E05	2023	Sideroad 7A	BR-1	54.19	0.00	7.10	$ 507,500.00	$ 1,208,000.00	Replace	$ -	$ -	$ 1,208,000.00	$ 1,208,000.00
E16	2022	7th Line	BR-1	55.21	0.00	7.00	$ 327,500.00	$ 956,500.00	Rehabilitate	$ 327,500.00	$ -	$ -	$ 327,500.00
A15	2022	South Line A	BR-1	57.30	0.00	8.65	$ 561,500.00	$ 1,545,500.00	Rehabilitate	$ 564,500.00	$ -	$ -	$ 564,500.00
O07	2022	South Line B	BR-1	57.67	0.00	4.50	$ 405,500.00	$ 896,500.00	Rehabilitate	$ 405,500.00	$ -	$ -	$ 405,500.00
BC14	2023	4th Concession B	CC	57.99	N/A	9.00	$ 303,000.00	$ 708,000.00	Replace	$ -	$ -	$ 708,000.00	$ 708,000.00
A20	2022	Harold Best Parkway	BR	60.54	N/A	4.90	N/A	$ 536,500.00	Replace	$ -	$ 575,000.00	$ -	$ 575,000.00
BC09	2022	3rd Concession	BR	61.18	N/A	11.18	N/A	$ 536,500.00	Replace	$ -	$ -	$ -	$ -
E18	2022	Sideroad 22C	CS	61.40	N/A	10.70	N/A	$ 1,196,500.00	Replace	$ -	$ -	$ -	$ -
BC08	2023	South Line B	CC	61.72	N/A	10.86	$ 292,500.00	$ 658,000.00	Replace	$ -	$ -	$ -	$ -
E04	2023	Sideroad 7A	BR-1	61.81	1.81	11.81	$ 508,500.00	$ 1,899,000.00	Rehabilitate	$ -	$ -	$ -	$ -
A04	2023	West Back Line	BR-1	62.40	2.00	18.00	$ 477,500.00	$ 1,686,000.00	Rehabilitate	$ -	$ 477,500.00	$ -	$ 477,500.00
BC07	2023	Road 41A	CC	63.80	N/A	11.90	$ 288,500.00	$ 658,000.00	Replace	$ -	$ -	$ -	$ -
O06	2022	South Line B	BR-1	64.01	4.01	14.01	$ 440,500.00	$ 1,076,500.00	Rehabilitate	$ -	$ 440,500.00	$ -	$ 440,500.00
A22	2022	Old Hwy 4	CC	64.69	1.00	12.34	$ 237,500.00	$ 656,500.00	Rehabilitate	$ 192,500.00	$ -	$ -	$ 192,500.00
A07	2023	East Back Line	BR-1	64.77	4.77	14.77	$ 533,500.00	$ 1,345,000.00	Rehabilitate	$ -	$ 533,500.00	$ -	$ 533,500.00
E11	2023	Sideroad 22C	BR-2	65.32	1.00	12.66	$ 1,127,500.00	$ 2,866,000.00	Rehabilitate	$ 1,127,500.00	$ -	$ -	$ 1,127,500.00
A13	2023	Lower Valley Road	BR-1	65.67	1.00	15.67	$ 365,500.00	$ 1,636,000.00	Rehabilitate	$ 365,500.00	$ -	$ -	$ 365,500.00
BC10	2023	Road 63	CC	65.79	N/A	12.90	N/A	$ 770,000.00	Replace	$ -	$ -	$ -	$ -
A12	2022	Lower Valley road	BR-1	66.20	6.20	16.20	$ 100,500.00	$ 1,545,500.00	Rehabilitate	$ -	$ -	$ 100,500.00	$ 100,500.00
E03	2023	Sideroad 7A	BR-1	66.32	2.00	16.32	$ 507,500.00	$ 1,270,000.00	Rehabilitate	$ -	$ -	$ -	$ -
A06	2023	35 Sideroad	BR-1	67.25	4.00	15.00	$ 448,500.00	$ 1,623,000.00	Rehabilitate	$ -	$ 448,500.00	$ -	$ 448,500.00
E01	2023	Sideroad 4 A	BR-1	67.33	2.00	17.33	$ 576,500.00	$ 1,623,000.00	Rehabilitate	$ -	$ 576,500.00	$ -	$ 576,500.00
O13	2023	Concession 10	BR-1	68.07	8.07	18.07	$ 383,500.00	$ 895,000.00	Replace	$ -	$ -	$ -	$ -
BC15	2023	4th Concession B	CC	68.26	N/A	14.13	$ 272,067.50	$ 708,000.00	Replace	$ -	$ -	$ -	$ -
BC13	2022	Road 45	BR-1	68.70	8.70	18.70	$ 466,500.00	$ 2,628,000.00	Rehabilitate	$ -	$ -	$ 466,500.00	$ 466,500.00
A18	2022	Johnstons Sideroad	BR	68.91	N/A	18.91	N/A	$ 817,500.00	Replace	$ -	$ -	$ -	$ -
O18	2022	Centre Line B	CS	70.04	N/A	15.02	N/A	$ 836,500.00	Replace	$ -	$ -	$ -	$ -
E02	2022	9th Line	BR	70.18	5.00	21.29	$ 161,500.00	$ 1,256,500.00	Rehabilitate	$ -	$ 140,500.00	$ -	$ 140,500.00
A17	2022	East Back Line	BR-1	70.21	10.21	20.21	$ 288,000.00	$ 656,500.00	Rehabilitate	$ -	$ -	$ 288,000.00	$ 288,000.00
E15	2023	Shilvock Sideroad	BR	70.32	N/A	22.66	$ 216,500.00	$ 645,000.00	Replace	$ -	$ -	$ -	$ -
O16	2023	Centre Line B	BR-1	70.77	10.77	20.77	$ 395,500.00	$ 1,270,000.00	Rehabilitate	$ -	$ -	$ -	$ -
E13	2023	Euphrasia - St. Vincent Townline	BR-1	71.28	N/A	5.00	$ 359,500.00	$ 833,000.00	Replace	$ -	$ 833,000.00	$ -	$ 833,000.00
O20	2023	Wellington Street	CS	71.31	N/A	15.73	N/A	$ 895,000.00	Replace	$ -	$ -	$ -	$ -
BC11	2023	Road 55	CC	71.37	N/A	16.37	$ 406,500.00	$ 1,020,000.00	Replace	$ -	$ -	$ -	$ -

Municipality of Grey Highlands - CAPITAL WORKS BY BCI

Structure No.	Inspect. Year	Road Name	Deterioration Curve	BCI	Years to Rehab	Years to Replace	Total Cost of Rehabilitation	Total Cost of Replacement	Recommended Work	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
A02	2022	West Back Line	BR-1	71.53	11.53	21.53	N/A	$ 1,196,500.00	Rehabilitate	$ -	$ -	$ -	$ -
O05	2022	South Line B	BR-1	72.07	12.07	22.07	N/A	$ 1,430,500.00	Rehabilitate	$ -	$ -	$ -	$ -
O15	2022	3rd Concession	BR-1	72.31	12.31	22.31	N/A	$ 937,500.00	Rehabilitate	$ -	$ -	$ -	$ -
A05	2022	8th Concession	BR-1	72.89	12.89	22.89	$ 456,500.00	$ 1,680,500.00	Rehabilitate	$ -	$ -	$ -	$ -
A16	2022	South Line A	BR-1	72.90	12.90	22.90	N/A	$ 1,872,500.00	Rehabilitate	$ -	$ -	$ -	$ -
O02	2022	Road 41a	BR-1	73.05	13.05	23.05	N/A	$ 1,196,500.00	Rehabilitate	$ -	$ -	$ -	$ -
BC01	2023	Euphrasia - St. Vincent Townline	CC	73.11	N/A	18.11	N/A	$ 583,000.00	Replace	$ -	$ -	$ -	$ -
BC03	2022	Lower Valley Road	BR-1	73.40	13.40	23.40	N/A	$ 1,136,500.00	Rehabilitate	$ -	$ -	$ -	$ -
O04	2022	Centre Line A	BR-1	73.41	13.41	23.41	N/A	$ 1,016,500.00	Rehabilitate	$ -	$ -	$ -	$ -
BC16	2022	4th Concession B	CC	73.55	N/A	18.55	$ 150,500.00	$ 716,500.00	Replace	$ -	$ -	$ -	$ -
A09	2022	Centre Line A	BR-1	73.58	13.58	23.58	N/A	$ 973,500.00	Rehabilitate	$ -	$ -	$ -	$ -
E10	2022	Sideroad 25	CS	73.83	N/A	17.13	N/A	$ 1,136,500.00	Replace	$ -	$ -	$ -	$ -
A21	2022	Lower Valley Road	BR-1	73.94	13.94	23.94	N/A	$ 817,500.00	Rehabilitate	$ -	$ -	$ -	$ -
O03	2022	Road 41a	BR-1	74.23	14.23	24.23	N/A	$ 896,500.00	Rehabilitate	$ -	$ -	$ -	$ -
A01	2022	20 Sideroad	BR-1	74.29	14.29	24.29	N/A	$ 896,500.00	Rehabilitate	$ -	$ -	$ -	$ -
A14	2022	Lower Valley Road	BR	74.39	3.00	24.39	$ 96,000.00	$ 1,527,500.00	Rehabilitate	$ -	$ 111,000.00	$ -	$ 111,000.00
O19	2023	8th concession	BR-1	74.45	14.45	24.45	$ 237,500.00	$ 895,000.00	Rehabilitate	$ -	$ -	$ -	$ -
O01	2022	Osprey - Artemesia	CS	74.58	N/A	17.54	N/A	$ 817,500.00	Replace	$ -	$ -	$ -	$ -
A08	2022	35 Sideroad	BR-1	74.72	14.00	24.00	N/A	$ 1,772,500.00	Rehabilitate	$ -	$ -	$ -	$ -
BC12	2022	Road 41B	CC	74.90	N/A	19.90	$ 146,500.00	$ 596,500.00	Replace	$ -	$ -	$ -	$ -
BC02	2023	Sideroad 4A	CS	74.98	N/A	17.77	N/A	$ 833,000.00	Replace	$ -	$ -	$ -	$ -
A11	2022	Grahams Hill	BR-1	82.02	10.00	31.56	$ 127,500.00	$ 1,268,500.00	Rehabilitate	$ -	$ -	$ 117,500.00	$ 117,500.00
E09	2022	Sideroad 19	BR-2	85.12	23.95	33.96	N/A	$ 2,120,500.00	Rehabilitate	$ -	$ -	$ -	$ -
BC18	2023	Quiet Valley Road	CS	89.25	N/A	25.69	N/A	$ 645,000.00	Replace	$ -	$ -	$ -	$ -
BC17	2023	Centre Line A	CC	89.58	N/A	34.58	N/A	$ 708,000.00	Replace	$ -	$ -	$ -	$ -
O09	2023	Road 49	CS	97.25	N/A	50.00	N/A	$ 645,000.00	Replace	$ -	$ -	$ -	$ -
O08	2023	Centre Line A	CS	97.39	N/A	50.00	N/A	$ 645,000.00	Replace	$ -	$ -	$ -	$ -
Sub Totals										**$ 9,319,000.00**	**$ 6,622,500.00**	**$ 4,409,500.00**	**$ 20,351,000.00**

Municipality of Grey Highlands - REHABILITATION CAPITAL WORKS

Structure No.	Inspect. Year	Road Name	BCI	Years to Rehab	Years to Replace	Recommended Work	Maintenance Needs	Additional Investigations	Construction Cost - Rehabilitation [1]	Contingency - Rehabilitation	E.A. - Rehabilitation	Engineering - Rehabilitation	Geotechnical - Rehabilitation	Contract Admin. - Rehabilitation	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
O11	2023	Concession 8B	45.32	0.00	5.00	Rehabilitate	$ 4,000.00	$ -	$ 361,000.00	$ 37,000.00	$ 2,500.00	$ 37,000.00	$ -	$ 15,000.00	$ 452,500.00	$ -	$ -	$ 452,500.00
A15	2022	South Line A	57.30	0.00	8.65	Rehabilitate	$ 2,500.00	$ 7,500.00	$ 450,000.00	$ 47,000.00	$ 2,500.00	$ 47,000.00	$ -	$ 18,000.00	$ 564,500.00	$ -	$ -	$ 564,500.00
E16	2022	7th Line	55.21	0.00	7.00	Rehabilitate	$ -	$ 7,500.00	$ 256,000.00	$ 27,000.00	$ 2,500.00	$ 27,000.00	$ -	$ 15,000.00	$ 327,500.00	$ -	$ -	$ 327,500.00
O07	2022	South Line B	57.67	0.00	4.50	Rehabilitate	$ -	$ 7,500.00	$ 320,000.00	$ 34,000.00	$ 2,500.00	$ 34,000.00	$ -	$ 15,000.00	$ 405,500.00	$ -	$ -	$ 405,500.00
O10	2022	Mill Bridge Road	52.82	0.00	6.41	Rehabilitate	$ 250.00	$ 17,500.00	$ 496,000.00	$ 52,000.00	$ 2,500.00	$ 52,000.00	$ -	$ 20,000.00	$ 622,500.00	$ -	$ -	$ 622,500.00
A13	2023	Lower Valley Road	65.67	1.00	15.67	Rehabilitate	$ 2,000.00	$ -	$ 290,000.00	$ 29,000.00	$ 2,500.00	$ 29,000.00	$ -	$ 15,000.00	$ 365,500.00	$ -	$ -	$ 365,500.00
E11	2023	Sideroad 22C	65.32	1.00	12.66	Rehabilitate	$ 2,500.00	$ -	$ 940,000.00	$ 85,000.00	$ 2,500.00	$ 85,000.00	$ -	$ 15,000.00	$ 1,127,500.00	$ -	$ -	$ 1,127,500.00
A22	2022	Old Hwy 4	64.69	1.00	12.34	Rehabilitate	$ 1,000.00	$ -	$ 180,000.00	$ 20,000.00	$ 2,500.00	$ 20,000.00	$ -	$ 15,000.00	$ 192,500.00	$ -	$ -	$ 192,500.00
E04	2023	Sideroad 7A	61.81	1.81	11.81	Rehabilitate	$ -	$ -	$ 425,000.00	$ 33,000.00	$ 2,500.00	$ 33,000.00	$ -	$ 15,000.00	$ -	$ -	$ -	$ -
A03	2023	Road 180	53.78	2.00	10.00	Rehabilitate	$ 2,500.00	$ -	$ 425,000.00	$ 39,000.00	$ 2,500.00	$ 39,000.00	$ -	$ 15,000.00	$ -	$ 520,500.00	$ -	$ 520,500.00
A04	2023	West Back Line	62.40	2.00	18.00	Rehabilitate	$ -	$ -	$ 390,000.00	$ 35,000.00	$ 2,500.00	$ 35,000.00	$ -	$ 15,000.00	$ -	$ 477,500.00	$ -	$ 477,500.00
E01	2023	Sideroad 4 A	67.33	2.00	17.33	Rehabilitate	$ 1,000.00	$ -	$ 481,000.00	$ 39,000.00	$ 2,500.00	$ 39,000.00	$ -	$ 15,000.00	$ -	$ 576,500.00	$ -	$ 576,500.00
E03	2023	Sideroad 7A	66.32	2.00	16.32	Rehabilitate	$ 1,000.00	$ 15,000.00	$ 424,000.00	$ 33,000.00	$ 2,500.00	$ 33,000.00	$ -	$ 15,000.00	$ -	$ -	$ -	$ -
A14	2022	Lower Valley Road	74.39	3.00	24.39	Rehabilitate	$ -	$ -	$ 71,500.00	$ 7,000.00	$ 2,500.00	$ 15,000.00	$ -	$ 15,000.00	$ -	$ 111,000.00	$ -	$ 111,000.00
A06	2023	35 Sideroad	67.25	4.00	15.00	Rehabilitate	$ 1,000.00	$ -	$ 365,000.00	$ 33,000.00	$ 2,500.00	$ 33,000.00	$ -	$ 15,000.00	$ -	$ 448,500.00	$ -	$ 448,500.00
O06	2022	South Line B	64.01	4.01	14.01	Rehabilitate	$ -	$ -	$ 365,000.00	$ 29,000.00	$ 2,500.00	$ 29,000.00	$ -	$ 15,000.00	$ -	$ 440,500.00	$ -	$ 440,500.00
A07	2023	East Back Line	64.77	4.77	14.77	Rehabilitate	$ 1,000.00	$ -	$ 430,000.00	$ 43,000.00	$ 2,500.00	$ 43,000.00	$ -	$ 15,000.00	$ -	$ 533,500.00	$ -	$ 533,500.00
E02	2022	9th Line	70.18	5.00	21.29	Rehabilitate	$ -	$ -	$ 116,000.00	$ 13,000.00	$ 2,500.00	$ 15,000.00	$ -	$ 15,000.00	$ -	$ 140,500.00	$ -	$ 140,500.00
A12	2022	Lower Valley road	66.20	6.20	16.20	Rehabilitate	$ -	$ -	$ 60,000.00	$ 8,000.00	$ 2,500.00	$ 15,000.00	$ -	$ 15,000.00	$ -	$ -	$ 100,500.00	$ 100,500.00
BC13	2022	Road 45	68.70	8.70	18.70	Rehabilitate	$ -	$ -	$ 375,000.00	$ 37,000.00	$ 2,500.00	$ 37,000.00	$ -	$ 15,000.00	$ -	$ -	$ 466,500.00	$ 466,500.00
A11	2022	Grahams Hill	82.02	10.00	31.56	Rehabilitate	$ -	$ -	$ 75,000.00	$ 10,000.00	$ 2,500.00	$ 15,000.00	$ -	$ 15,000.00	$ -	$ -	$ 117,500.00	$ 117,500.00
A17	2022	East Back Line	70.21	10.21	20.21	Rehabilitate	$ 4,000.00	$ -	$ 228,500.00	$ 21,000.00	$ 2,500.00	$ 21,000.00	$ -	$ 15,000.00	$ -	$ -	$ 288,000.00	$ 288,000.00
O16	2023	Centre Line B	70.77	10.77	20.77	Rehabilitate	$ -	$ -	$ 330,000.00	$ 24,000.00	$ 2,500.00	$ 24,000.00	$ -	$ 15,000.00	$ -	$ -	$ -	$ -
A02	2022	West Back Line	71.53	11.53	21.53	Rehabilitate	$ 1,500.00	$ -	$ 195,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O05	2022	South Line B	72.07	12.07	22.07	Rehabilitate	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O15	2022	3rd Concession	72.31	12.31	22.31	Rehabilitate	$ 1,000.00	$ -	$ 95,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
A05	2022	8th Concession	72.89	12.89	22.89	Rehabilitate	$ 2,000.00	$ -	$ 297,500.00	$ 22,000.00	$ -	$ 22,000.00	$ -	$ 15,000.00	$ -	$ -	$ -	$ -
A16	2022	South Line A	72.90	12.90	22.90	Rehabilitate	$ -	$ -	$ 40,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O02	2022	Road 41a	73.05	13.05	23.05	Rehabilitate	$ 2,000.00	$ -	$ 95,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
BC03	2022	Lower Valley Road	73.40	13.40	23.40	Rehabilitate	$ 2,500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O04	2022	Centre Line A	73.41	13.41	23.41	Rehabilitate	$ 1,500.00	$ -	$ 95,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
A09	2022	Centre Line A	73.58	13.58	23.58	Rehabilitate	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
A21	2022	Lower Valley Road	73.94	13.94	23.94	Rehabilitate	$ 3,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
A08	2022	35 Sideroad	74.72	14.00	24.00	Rehabilitate	$ 500.00	$ -	$ 95,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O03	2022	Road 41a	74.23	14.23	24.23	Rehabilitate	$ 1,000.00	$ -	$ 95,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
A01	2022	20 Sideroad	74.29	14.29	24.29	Rehabilitate	$ -	$ -	$ 1,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O19	2023	8th concession	74.45	14.45	24.45	Rehabilitate	$ 4,500.00	$ -	$ 190,000.00	$ 10,000.00	$ 2,500.00	$ 20,000.00	$ -	$ 15,000.00	$ -	$ -	$ -	$ -
E09	2022	Sideroad 19	85.12	23.95	33.96	Rehabilitate	$ 3,500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sub Totals							**$ 45,750.00**	**$ 55,000.00**	**$ 9,052,500.00**	**$ 767,000.00**	**$ 60,000.00**	**$ 799,000.00**	**$ -**	**$ 383,000.00**	**$ 4,058,000.00**	**$ 3,248,500.00**	**$ 972,500.00**	**$ 8,279,000.00**

Municipality of Grey Highlands - REPLACEMENT CAPITAL WORKS

Structure No.	Inspect. Year	Road Name	BCI	Years to Rehab	Years to Replace	Recommended Work	Maintenance Needs	Additional Investigations	Construction Cost - Replacement [1]	Contingency - Replacement	E.A. - Replacement	Engineering - Replacement	Geotechnical - Replacement	Contract Admin. - Replacement	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
E12	2023	Sideroad 7A	34.93	0.00	0.00	Replace	$ -	$ -	$ 910,000.00	$ 82,000.00	$ 10,000.00	$ 82,000.00	$ 20,000.00	$ 41,000.00	$ 1,145,000.00	$ -	$ -	$ 1,145,000.00
BC06	2022	Artemesia Townline	40.35	N/A	0.00	Replace	$ 1,000.00	$ -	$ 460,000.00	$ 37,000.00	$ 2,500.00	$ 37,000.00	$ 20,000.00	$ 18,500.00	$ 575,000.00	$ -	$ -	$ 575,000.00
O12	2023	Concession 10	40.12	0.00	0.06	Replace	$ -	$ -	$ 720,000.00	$ 63,000.00	$ 10,000.00	$ 63,000.00	$ 20,000.00	$ 32,000.00	$ 908,000.00	$ -	$ -	$ 908,000.00
O21	2023	10th Concession	46.28	N/A	0.90	Replace	$ 1,500.00	$ -	$ 510,000.00	$ 42,000.00	$ 10,000.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ 645,000.00	$ -	$ -	$ 645,000.00
O17	2023	Centre Line B	46.27	N/A	1.00	Replace	$ -	$ -	$ 660,000.00	$ 57,000.00	$ 10,000.00	$ 57,000.00	$ 20,000.00	$ 29,000.00	$ 833,000.00	$ -	$ -	$ 833,000.00
A10	2022	12th Concession A	51.27	0.00	1.00	Replace	$ 2,500.00	$ -	$ 925,000.00	$ 83,000.00	$ 2,500.00	$ 83,000.00	$ 20,000.00	$ 41,500.00	$ 1,155,000.00	$ -	$ -	$ 1,155,000.00
E14	2023	Euphrasia - St. Vincent Townline	47.56	0.00	3.78	Replace	$ -	$ -	$ 760,000.00	$ 67,000.00	$ 10,000.00	$ 67,000.00	$ 20,000.00	$ 34,000.00	$ -	$ 958,000.00	$ -	$ 958,000.00
A20	2022	Harold Best Parkway	60.54	N/A	4.90	Replace	$ 1,250.00	$ -	$ 460,000.00	$ 37,000.00	$ 2,500.00	$ 37,000.00	$ 20,000.00	$ 18,500.00	$ -	$ 575,000.00	$ -	$ 575,000.00
E13	2023	Euphrasia - St. Vincent Townline	71.28	N/A	5.00	Replace	$ -	$ -	$ 660,000.00	$ 57,000.00	$ 10,000.00	$ 57,000.00	$ 20,000.00	$ 29,000.00	$ -	$ 833,000.00	$ -	$ 833,000.00
E06	2023	Sideroad 7A	51.42	0.00	5.40	Replace	$ -	$ -	$ 800,000.00	$ 71,000.00	$ 10,000.00	$ 71,000.00	$ 20,000.00	$ 36,000.00	$ -	$ 1,008,000.00	$ -	$ 1,008,000.00
O14	2023	4th Concession B	53.71	0.00	6.86	Replace	$ 1,000.00	$ -	$ 1,220,000.00	$ 107,000.00	$ 10,000.00	$ 107,000.00	$ 20,000.00	$ 57,000.00	$ -	$ -	$ 1,521,000.00	$ 1,521,000.00
E05	2023	Sideroad 7A	54.19	0.00	7.10	Replace	$ -	$ -	$ 960,000.00	$ 87,000.00	$ 10,000.00	$ 87,000.00	$ 20,000.00	$ 44,000.00	$ -	$ -	$ 1,208,000.00	$ 1,208,000.00
BC14	2023	4th Concession B	57.99	N/A	9.00	Replace	$ -	$ -	$ 560,000.00	$ 47,000.00	$ 10,000.00	$ 47,000.00	$ 20,000.00	$ 24,000.00	$ -	$ -	$ 708,000.00	$ 708,000.00
E18	2022	Sideroad 22C	61.40	N/A	10.70	Replace	$ 6,500.00	$ -	$ 1,010,000.00	$ 92,000.00	$ 2,500.00	$ 92,000.00	$ 20,000.00	$ 46,000.00	$ -	$ -	$ -	$ -
BC08	2023	South Line B	61.72	N/A	10.86	Replace	$ -	$ -	$ 520,000.00	$ 43,000.00	$ 10,000.00	$ 43,000.00	$ 20,000.00	$ 22,000.00	$ -	$ -	$ -	$ -
BC09	2022	3rd Concession	61.18	N/A	11.18	Replace	$ 1,000.00	$ -	$ 460,000.00	$ 37,000.00	$ 2,500.00	$ 37,000.00	$ 20,000.00	$ 18,500.00	$ -	$ -	$ -	$ -
BC07	2023	Road 41A	63.80	N/A	11.90	Replace	$ -	$ -	$ 520,000.00	$ 43,000.00	$ 10,000.00	$ 43,000.00	$ 20,000.00	$ 22,000.00	$ -	$ -	$ -	$ -
BC10	2023	Road 63	65.79	N/A	12.90	Replace	$ 3,000.00	$ -	$ 610,000.00	$ 52,000.00	$ 10,000.00	$ 52,000.00	$ 20,000.00	$ 26,000.00	$ -	$ -	$ -	$ -
BC15	2023	4th Concession B	68.26	N/A	14.13	Replace	$ -	$ -	$ 560,000.00	$ 47,000.00	$ 10,000.00	$ 47,000.00	$ 20,000.00	$ 24,000.00	$ -	$ -	$ -	$ -
O18	2022	Centre Line B	70.04	N/A	15.02	Replace	$ 2,500.00	$ -	$ 710,000.00	$ 62,000.00	$ 2,500.00	$ 62,000.00	$ 20,000.00	$ 31,000.00	$ -	$ -	$ -	$ -
O20	2023	Wellington Street	71.31	N/A	15.73	Replace	$ 3,500.00	$ -	$ 710,000.00	$ 62,000.00	$ 10,000.00	$ 62,000.00	$ 20,000.00	$ 31,000.00	$ -	$ -	$ -	$ -
BC11	2023	Road 55	71.37	N/A	16.37	Replace	$ -	$ -	$ 810,000.00	$ 72,000.00	$ 10,000.00	$ 72,000.00	$ 20,000.00	$ 36,000.00	$ -	$ -	$ -	$ -
E10	2022	Sideroad 25	73.83	N/A	17.13	Replace	$ 2,500.00	$ -	$ 960,000.00	$ 87,000.00	$ 2,500.00	$ 87,000.00	$ 20,000.00	$ 43,500.00	$ -	$ -	$ -	$ -
O01	2022	Osprey - Artemesia	74.58	N/A	17.54	Replace	$ -	$ -	$ 695,000.00	$ 60,000.00	$ 2,500.00	$ 60,000.00	$ 20,000.00	$ 30,000.00	$ -	$ -	$ -	$ -
BC02	2023	Sideroad 4A	74.98	N/A	17.77	Replace	$ 1,500.00	$ -	$ 660,000.00	$ 57,000.00	$ 10,000.00	$ 57,000.00	$ 20,000.00	$ 29,000.00	$ -	$ -	$ -	$ -
O13	2023	Concession 10	68.07	8.07	18.07	Replace	$ 2,000.00	$ -	$ 710,000.00	$ 62,000.00	$ 10,000.00	$ 62,000.00	$ 20,000.00	$ 31,000.00	$ -	$ -	$ -	$ -
BC01	2023	Euphrasia - St. Vincent Townline	73.11	N/A	18.11	Replace	$ 250.00	$ -	$ 460,000.00	$ 37,000.00	$ 10,000.00	$ 37,000.00	$ 20,000.00	$ 19,000.00	$ -	$ -	$ -	$ -
BC16	2022	4th Concession B	73.55	N/A	18.55	Replace	$ 2,500.00	$ -	$ 610,000.00	$ 52,000.00	$ 2,500.00	$ 52,000.00	$ 20,000.00	$ 26,000.00	$ -	$ -	$ -	$ -
A18	2022	Johnstons Sideroad	68.91	N/A	18.91	Replace	$ 1,000.00	$ -	$ 695,000.00	$ 60,000.00	$ 2,500.00	$ 60,000.00	$ 20,000.00	$ 30,000.00	$ -	$ -	$ -	$ -
BC12	2022	Road 41B	74.90	N/A	19.90	Replace	$ -	$ -	$ 510,000.00	$ 42,000.00	$ 2,500.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ -	$ -	$ -	$ -
E15	2023	Shilvock Sideroad	70.32	N/A	22.66	Replace	$ -	$ -	$ 510,000.00	$ 42,000.00	$ 10,000.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ -	$ -	$ -	$ -
BC18	2023	Quiet Valley Road	89.25	N/A	25.69	Replace	$ 2,500.00	$ -	$ 510,000.00	$ 42,000.00	$ 10,000.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ -	$ -	$ -	$ -
BC17	2023	Centre Line A	89.58	N/A	34.58	Replace	$ 1,500.00	$ -	$ 560,000.00	$ 47,000.00	$ 10,000.00	$ 47,000.00	$ 20,000.00	$ 24,000.00	$ -	$ -	$ -	$ -
O08	2023	Centre Line A	97.39	N/A	50.00	Replace	$ -	$ -	$ 510,000.00	$ 42,000.00	$ 10,000.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ -	$ -	$ -	$ -
O09	2023	Road 49	97.25	N/A	50.00	Replace	$ -	$ -	$ 510,000.00	$ 42,000.00	$ 10,000.00	$ 42,000.00	$ 20,000.00	$ 21,000.00	$ -	$ -	$ -	$ -
Sub Totals							**$ 37,500.00**	**$ -**	**$ 23,415,000.00**	**$ 2,019,000.00**	**$ 267,500.00**	**$ 2,019,000.00**	**$ 700,000.00**	**$ 1,019,500.00**	**$ 5,261,000.00**	**$ 3,374,000.00**	**$ 3,437,000.00**	**$ 12,072,000.00**

(1) - Construction Cost includes cost of rehabilitation / replacement works, associated works, roadside protection, and construction staging (where applicable). See individual OSIM forms for breakdown of construction cost

Municipality of Grey Highlands - MAINTENANCE NEEDS

Structure Name	Road Name	Maintenance Need	Estimated Maintenance Costs
A03	Road 180	Flush deck drains; Replace missing posts	$2,500.00
A06	35 Sideroad	Install hazard warning signs at structure	$1,000.00
A07	East Back Line	Clean Deck Top	$1,000.00
A13	Lower Valley Road	Clean Deck Top; Flush Expansion joints and clean debris off bearing seat	$2,000.00
BC01	Euphrasia - St. Vincent Townline	Install one hazard warning sign at structure	$250.00
BC02	Sideroad 4A	Install rip rap slope protection	$1,500.00
BC10	Road 63	Repairs required to Approach Wearing Surface; Concrete repairs required for anchors in structure connection guide rail	$3,000.00
BC17	Centre Line A	Clean Deck Wearing Surface; Remove overgrown vegetation along shoulders	$1,500.00
BC18	Quiet Valley Road	Install scour protection	$2,500.00
E01	Sideroad 4 A	Repairs required to Embankments	$1,000.00
E03	Sideroad 7A	Clean Deck Wearing Surface	$1,000.00
E11	Sideroad 22C	Clean Abutment Bearings; Remove tree growing through bottom chord	$2,500.00
O11	Concession 8B	Remove granular fill on deck and regrade roadway; Flush deck drains	$4,000.00
O13	Concession 10	Remove beaver dam	$2,000.00
O14	4th Concession B	Clean Deck Top	$1,000.00
O19	8th concession	Remove vegetation growing over inlet and outlet; Install hazard warning signs at structure	$4,500.00
O20	Wellington Street	Remove vegetation growing on NW quadrant; Install hazard warning signs at structure	$3,500.00
O21	10th Concession	Rip-rap required at washouts on embankments	$1,500.00
A02	West Back Line	Remove sediment buildup in north cell obstructing flow	$1,500.00
A05	8th Concession	Repair washouts on Embankments; Rout and seal cracks in Approach Wearing Surface	$2,000.00
A08	35 Sideroad	Flush deck drains	$500.00
A10	12th Concession A	Remove debris/dam in watercourse	$2,500.00
A15	South Line A	Flush deck drains; Regrade approaches	$2,500.00
A17	East Back Line	Repair washouts on embankments and install rock protection	$4,000.00
A18	Johnstons Sideroad	Remove debris from channel	$1,000.00
A20	Harold Best Parkway	Clean Seals / Sealants; Install hazard warning sign in NW	$1,250.00
A21	Lower Valley Road	Install rock protection on Embankments; Install hazard warning signs at structure	$3,000.00
A22	Old Hwy 4	Remove debris from watercourse	$1,000.00
BC06	Artemesia Townline	Install hazard warning signs at structure	$1,000.00
BC09	3rd Concession	Remove overgrown vegetation from watercourse	$1,000.00
BC03	Lower Valley Road	Install rock protection on embankments	$2,500.00
BC16	4th Concession B	Remove gravel buildup from channel	$2,500.00
E09	Sideroad 19	Clean expansion joints and steel connections	$3,500.00
E10	Sideroad 25	Remove overgrown vegetation around inlet and outlet	$2,500.00
E18	Sideroad 22C	Remove overgrown vegetation around inlet and outlet; Install rock protection on embankments and at outlet	$6,500.00
O02	Road 41a	Clean Deck Top; Flush deck drains	$2,000.00
O03	Road 41a	Clean Deck Top	$1,000.00
O04	Centre Line A	Remove vegetation in close proximity to structure	$1,500.00
O10	Mill Bridge Road	Tighten loose post SE	$250.00
O15	3rd Concession	Clean Deck Top	$1,000.00
O18	Centre Line B	Install rock protection	$2,500.00

Total	**$83,250.00**

Municipality of Grey Highlands - ADDITIONAL INVESTIGATIONS REQUIRED

Priority	Structure Name	Road Name	Additional Investigations Required	Estimated Cost
Normal	A13	Lower Valley Road	Monitoring of Deformations, Settlements and Movements,	$0
Normal	E03	Sideroad 7A	Detailed Deck Condition Survey, Monitoring of Deformations, Settlements and Movements,	$15,000
Normal	A01	20 Sideroad	Monitoring of Deformations, Settlements and Movements,	$0
Normal	A11	Grahams Hill	Monitoring of Deformations, Settlements and Movements,	$0
Urgent	A15	South Line A	Other	$7,500
Normal	A20	Harold Best Parkway	Other,	$0
Normal	BC09	3rd Concession	Monitoring of Deformations, Settlements and Movements,	$0
Normal	BC13	Road 45	Monitoring of Deformations, Settlements and Movements,	$0
Normal	BC03	Lower Valley Road	Other,	$0
Normal	E16	7th Line	Other,	$7,500
Normal	E18	Sideroad 22C	Monitoring of Deformations, Settlements and Movements,	$0
Normal	O01	Osprey - Artemesia	Monitoring of Deformations, Settlements and Movements,	$0
Urgent	O07	South Line B	Other	$7,500
Normal	O10	Mill Bridge Road	Detailed Deck Condition Survey, , Other	$17,500

Total	**$55,000.00**

Municipality of Grey Highlands - CURRENT ROADSIDE SAFETY NEEDS

Structure Name	Road Name	CURRENT Roadside Safety Need	Estimated Cost
A03	Road 180	Install End Treatments	$35,000.00
A04	West Back Line	Repair Guide Rail and Install End Treatments	$40,000.00
A06	35 Sideroad	Install End Treatments	$35,000.00
A07	East Back Line	Consider replacing steel beam guide rail during future capital works	$0.00
A13	Lower Valley Road	Narrow Structure	$0.00
BC02	Sideroad 4A	Consider Replacing Steel Beam Guide Rail During Future Capital Works	$0.00
BC07	Road 41A	Consider installing steel beam guide rail during future capital works	$0.00
BC08	South Line B	Consider installing steel beam guide rail during future capital works	$0.00
BC11	Road 55	Install Guide Rail, end treatments	$95,000.00
BC14	4th Concession B	Consider installing steel beam guide rail during future capital works	$0.00
BC15	4th Concession B	Consider replacing steel beam guide rail during future capital works	$0.00
BC18	Quiet Valley Road	Consider installing steel beam guide rail during future capital works	$0.00
E01	Sideroad 4 A	Install Guide Rail, end treatments and structure connections	$95,000.00
E03	Sideroad 7A	Install Guide Rail, end treatments and structure connections	$95,000.00
E04	Sideroad 7A	Install Guide Rail, end treatments and structure connections	$95,000.00
E05	Sideroad 7A	Install Guide Rail, end treatments and structure connections	$95,000.00
E06	Sideroad 7A	Install Guide Rail, end treatments and structure connections	$95,000.00
E11	Sideroad 22C	Replace Guide Rail, end treatments and structure connections	$95,000.00
E12	Sideroad 7A	Consider replacing steel beam guide rail during future capital works	$0.00
E13	Euphrasia - St. Vincent Townline	Install Guide Rail, end treatments and structure connections	$95,000.00
E14	Euphrasia - St. Vincent Townline	Install Guide Rail, end treatments and structure connections	$95,000.00
O11	Concession 8B	Consider installing steel beam guide rail during future capital works	$0.00
O12	Concession 10	Install Guide Rail, end treatments	$95,000.00
O13	Concession 10	Install Guide Rail, end treatments	$95,000.00
O14	4th Concession B	Investigate Need for Replacing with Longer Guide Rail	$0.00
O16	Centre Line B	Install Guide Rail, end treatments and structure connections	$95,000.00
O17	Centre Line B	Install Proper End Treatments	$40,000.00
O19	8th concession	Install Guide Rail, end treatments	$95,000.00
O20	Wellington Street	Investigate need for Guide Rail	$1,000.00
O21	10th Concession	Investigate need for Guide Rail	$1,000.00
A01	20 Sideroad	Tighten loose cables	$1,000.00
A02	West Back Line	Install Guide Rail, end treatments and structure connections	$95,000.00
A05	8th Concession	Replace Guide Rail, end treatments and structure connections	$95,000.00

Municipality of Grey Highlands - CURRENT ROADSIDE SAFETY NEEDS

Structure Name	Road Name	CURRENT Roadside Safety Need	Estimated Cost
A08	35 Sideroad	Install Guide Rail, end treatments and structure connections	$95,000.00
A09	Centre Line A	Narrow Structure, install guide rail during rehab/replacement	$0.00
A10	12th Concession A	Narrow Structure, install guide rail during rehab/replacement	$0.00
A14	Lower Valley Road	Replace clamps and tighten cables	$1,500.00
A15	South Line A	Narrow Structure, install guide rail during rehab/replacement	$0.00
A16	South Line A	Install end treatments	$40,000.00
A17	East Back Line	Install end treatments	$40,000.00
A18	Johnstons Sideroad	Replace Guide Rail, end treatments	$95,000.00
A20	Harold Best Parkway	Replace Guide Rail, end treatments	$95,000.00
A21	Lower Valley Road	Narrow Structure - Install guide rail if road over structure is widened during rehab. / replacement	$0.00
A22	Old Hwy 4	Narrow Structure - Install guide rail if structure widened during rehabilitation / replacement	$0.00
BC06	Artemesia Townline	Investigate need for Guide Rail	$1,000.00
BC09	3rd Concession	Narrow Structure - Install guide rail if structure widened during rehabilitation / replacement	$0.00
BC13	Road 45	Repair and raise Guide Rail	$25,000.00
BC03	Lower Valley Road	Narrow Structure, install guide rail during rehab/replacement	$0.00
BC12	Road 41B	Investigate need for Guide Rail	$1,000.00
BC16	4th Concession B	Narrow Structure, install guide rail during rehab/replacement	$0.00
E02	9th Line	Replace damaged end treatment	$5,000.00
E09	Sideroad 19	Narrow Structure, install guide rail during rehab/replacement	$0.00
E10	Sideroad 25	Install guide rail	$95,000.00
E16	7th Line	Investigate need for Guide Rail	$1,000.00
E18	Sideroad 22C	Narrow Structure, install guide rail during rehab/replacement	$0.00
O01	Osprey - Artemesia	Replace clamps and tighten cables	$1,500.00
O02	Road 41a	Replace guide rail, structure connections, end treatments	$95,000.00
O03	Road 41a	Replace Guide Rail, end treatments and structure connections	$95,000.00
O04	Centre Line A	Replace guide rail, structure connections, end treatments	$95,000.00
O05	South Line B	Narrow Structure, install guide rail during rehab/replacement	$0.00
O06	South Line B	Install Guide Rail, end treatments and structure connections	$95,000.00
O07	South Line B	Narrow Structure, install guide rail during rehab/replacement	$0.00
O10	Mill Bridge Road	Narrow Structure, install guide rail during rehab/replacement	$0.00
O15	3rd Concession	Replace Guide Rail, end treatments and structure connections	$95,000.00
O18	Centre Line B	Narrow Structure, install guide rail during rehab/replacement	$0.00

Total	$2,549,000.00

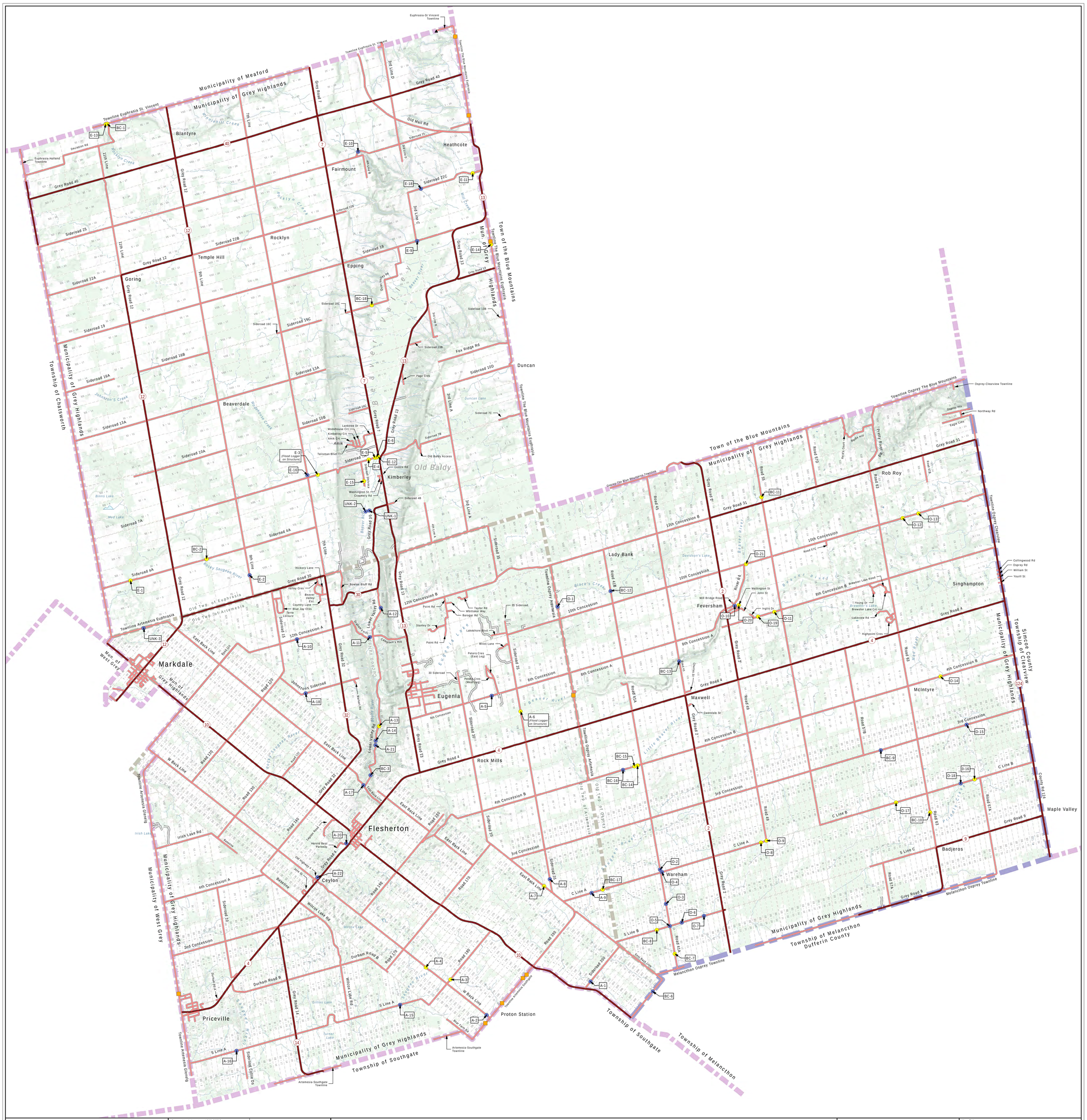
Municipality of Grey Highlands - STRUCTURE LOAD LIMITS			
Structure Name	**Year Inspected**	**Road Name**	**Existing Load Limit**
A03	9/13/2023	Road 180	12
E04	6/15/2023	Sideroad 7A	12
E05	7/11/2023	Sideroad 7A	12
E06	7/11/2023	Sideroad 7A	12
E11	7/11/2023	Sideroad 22C	12
O14	6/13/2023	4th Concession B	14
A15	7/14/2022	South Line A	10
E09	7/27/2022	Sideroad 19	14/22/32

BURNSIDE

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Appendix C

Structure Location Map


Municipality of Meaford
Municipality of Grey Highlands
Township of Chatsworth
Municipality of Grey Highlands
Municipality of West Grey
Town of the Blue Mountains
Municipality of Grey Highlands
Township of Melancthon
Dufferin County
Township of Southgate
Municipality of Grey Highlands
Township of Southgate
Township of Melancthon
Simcoe County
Township of Clearview
Municipality of Grey Highlands
Townline Euphrasia St. Vincent
Euphrasia-St Vincent Townline
Townline The Blue Mountains Euphrasia
Euphrasia-Holland Townline
Townline Osprey The Blue Mountains
Osprey-Clearview Townline
Townline Osprey Clearview
Townline Osprey Artemesia
Townline Artemesia Euphrasia
Townline Artemesia Glenelg
Artemesia-Southgate Townline
Townline Artemesia Southgate
Melancthon Osprey Townline
Blantyre
Heathcote
Fairmount
Rocklyn
Temple Hill
Goring
Epping
Beaverdale
Duncan
Kimberley
Old Baldy
Amik
Markdale
Flesherton
Ceylon
Priceville
Proton Station
Eugenia
Rock Mills
Lady Bank
Feversham
Maxwell
McIntyre
Singhampton
Rob Roy
Wareham
Badjeros
Maple Valley
Grey Road 40
Grey Road 7
Grey Road 12
Grey Road 13
Grey Road 30
Grey Road 32
Grey Road 4
Grey Road 2
Grey Road 31
Grey Road 9
Sideroad 25
Sideroad 22B
Sideroad 22C
Sideroad 19
Sideroad 16C
Sideroad 13B
Sideroad 10D
Sideroad 7C
Sideroad 22A
Sideroad 16B
Sideroad 13A
Sideroad 10B
Sideroad 7B
Sideroad 19
Sideroad 16A
Sideroad 10A
Sideroad 7A
Sideroad 4A
Sideroad 4B
Sideroad 35
Sideroad 30
Sideroad 25
Sideroad 20
Old Mail Rd
Deviation Rd
11th Line
9th Line
7th Line
3rd Line D
3rd Line C
3rd Line B
3rd Line A
Fox Ridge Rd
Page Cres
Old Bailey Access
Cedrine Rd
Washington St
Creamery Rd
Talisman Blvd
Lanktree Dr
Wodehouse Crt
Kimberley Crt
Amik Crt
Hickory Lane
Valley Cres
Beaver Valley Est
Country Lane
Blue Jay Cres
Sierra Leisure
Bowles Bluff Rd
Point Rd
Taylor Rd
Whittaker Way
Baragar Rd
Stanley Dr
Lakeshore Blvd
Wiles Lane
Peters Cres (East Leg)
Peters Cres (West Leg)
30 Sideroad
35 Sideroad
Johnstons Sideroad
Lower Valley Rd
Cameron's Mill
Stewart Rd
Irish Lake Rd
Harold Best Parkway
Jane St
Baseline
Wilcox Lake Rd
Durham Road B
Durham Rd 4
2nd Concession
4th Concession A
4th Concession B
8th Concession
8th Concession A
8th Concession B
10th Concession
12th Concession A
12th Concession B
C Line A
C Line B
S Line A
S Line B
S Line C
Road 120
Road 130
Road 140
Road 150
Road 160
Road 170
Road 180
Road 190
Road 200
Road 41A
Road 45
Road 49
Road 55
Road 57C
Road 57D
Road 57E
Road 57A
Road 63
Old Township of Artemesia
Old Township of Osprey
Old Township of Glenelg
Old Township of Sydenham
Beaver River
Little Beaver River
Boyne River
Rocklyn Creek
Mill Creek
Black's Creek
Davidson's Lake
Johnston's Creek
Bunnentill Creek
Mucky Saugeen River
Lower Valley Rd Branch
Irish Lake
Bims Lake
Mud Lake
Wilcox Lake
Gillies Lake
Turner Lake
Duncan Lake
Eugenia Lake
Pretty River
Pretty River Provincial Park
Collingwood Rd
Osprey Rd
William St
Youill St
Brewster's Lake Rd
Brewster Lake Crt
Lakeview Rd
Highpoint Cres
Young Dr
Wellington St
John St
Mill Bridge Road
Inglis Dr
River Rd
Gwendale St
Chutes Rd
Northway Rd
Osprey Hts
Eagle Cres
Rock Court
Rock's Mill
Ridge Rd
Ridge Rd E
Ridge Rd W
Fox Run Rd
Sideroad Collie Dr
Gilmour Rd
Lower Valley Rd
Old Highway 1
Lagoon Road
Page Rd
Durham Rd 4
Grey Rd 14
Grey Rd 32
Grey Rd 12
Grey Rd 13
Grey Rd 7
Grey Rd 40
Grey Rd 30
Grey Rd 4
Grey Rd 2
Grey Rd 31
Grey Rd 9
Grey Road 19
Grey Road 12
Grey Road 13
Grey Road 7
Grey Road 40

BURNSIDE

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Appendix D

OSIM Forms and Photos

Ontario Structure Inspection Manual - Inspection Form

Site Number: A03
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge A3 - Webers Bridge									
Main Hwy/Road #	Road 180	On	X	Crossing Type:	Navig. Water		Non-Navig.		X Ped.	
		Under	X		Rail		Road		X Other	
Structure Location	0.4km East of West Back Line									
Latitude	44.213421			Longitude	-80.50617					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed	80		No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Concrete T-Beam			Interchange Number						
Total Deck Length	9.5 m			Interchange Structure Number						
Overall Str. Width	6.5 m			Min. Vertical Clearance		m				
Total Deck Area	61.75 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	6 m (btwn tops of slopes)									
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	0 Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0.1 m					
Span Lengths	9.3 m			Height (streambed to structure top)	2.5 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	12 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Overcast		
Temperature:	12° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☑ Minor Rehab.	☐ Major Rehab.	☐ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Minor Rehabilitation is recommended within 2 years. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	12 tonnes			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

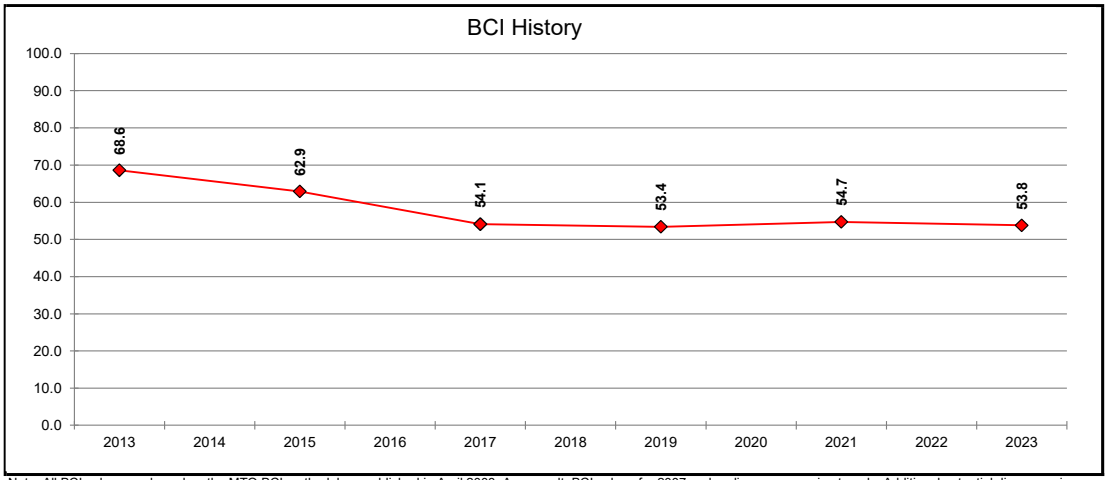
Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	53.8	A. Grzywnowicz	
2021	54.7	C. MacKenzie	
2019	53.4	M. August	
2017	54.1	C. MacKenzie	
2015	62.9	T. Littlejohns	
2013	68.6	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	3 hazard warning signs installed, 1 load limit sign						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	12			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	45.72	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	38.1	0	7.62	Element BCI	62.5
Comments:	Buried end treatments. Impact damage at SW.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Install code conforming end treatments.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.7	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	68.4	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	68.4	0	0	Element BCI	75.0
Comments:	Gravel wearing surface in good condition.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	9.5 m			
Element Name:	Deck Wearing Surface		Width:	5.7 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	54.15 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	54.15	0	0	Element BCI	75.0
Comments:	Light rippling of gravel wearing surface. Loose gravel along shoulders.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	9.5 m			
Element Name:	Deck Top		Width:	5.7 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	54.1 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	24.1	15	15	Element BCI	44.5
Comments:	Limited Inspection, condition assumed based on condition of soffit. Soffit defects are likely caused by low cover and therefore condition of deck top may be in better condition than assumption above.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Barriers		Length:	3.81 m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:	8			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	30.48 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	22.86	3.81	3.81	Element BCI	61.3
Comments:	Impact damage on a few of the wooden posts. Wood posts are on steel base plates. Panels flattened on North side.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Repair damaged SBGR.			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	9.5	m			
Element Name:	Posts		Width:		m			
Location:	North & South		Height:		m			
Material:	Steel		Count:	2				
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	24	Each			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	17	0	7		Element BCI	53.1

Comments: Quantity includes steel plates. Light checking and splitting on posts. Impact damage to several posts on SW. Two posts on SE missing from damage.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	18
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
Replace missing posts.		Maintenance Needs: Other Performance Deficiencies: None	

Element Group:	Curb and S/W		Length:	9.5	m			
Element Name:	Curbs		Width:	0.4	m			
Location:	North & South		Height:		m			
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Barrier Curb		Total Quantity:	7.6	Sq.m			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	7.5	0.1	0		Element BCI	74.5

Comments: Vegetation along curb. Small spall at SE and NE. Medium crack on North.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Decks		Length:		m			
Element Name:	Deck Drainage		Width:		m			
Location:	North & South		Height:		m			
Material:			Count:	8				
Element Type:	N/A		Total Quantity:	8	Each			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	11
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	0	0	8		Element BCI	0.0

Comments: Eight deck drains all covered with gravel and plugged.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	16
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Flush deck drains		Maintenance Needs: Deck Drainage Performance Deficiencies: Deck Drainage	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	3.7 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2.7 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	39.96 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	32.36	3.8	3.8	Element BCI	64.5

Comments: Cracking at corner where wingwall meets abutment. Medium cracking at cold joints, staining, delaminations throughout. Light scaling on west wingwalls.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	9.3 m			
Element Name:	Soffit - Thin Slab - Ext		Width:	0.25 m			
Location:	North & South		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	15.81 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	14.31	1.5	0	Element BCI	71.7

Comments: Light staining, small hairline crack, medium vertical crack on north and south. 5 medium vertical cracks on north side.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	9.3 m			
Element Name:	Soffit - Thin Slab - Int		Width:	1 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	37.2 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	7.2	15	15	Element BCI	30.6

Comments: Spalling and delaminations throughout. Exposed corroded reinforcement with section loss along full length of structure. Spalling appears to be due to low cover of bottom longitudinal reinforcement. Limited inspection, soffit could no be sounded due to height. Structural condition of soffit is not anticipated to be impacted greatly by defects and therefore the condition may be better than noted above. Multiple bird nests observed.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	6.5 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	1.6 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	20.8 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.15	2.95	2.7	Element BCI	60.3
Comments:	Wide cracking at corners where abutment meets wingwalls. Concrete repairs to north west corner. West abutment slightly rotated out at base (possibly due to the way it was formed). Delaminations, medium cracks, small spalls. Cracking and delamination at NE, SE, SW.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Girders		Length:	9.3 m			
Element Name:	Girders - Middle		Width:	0.4 m			
Location:	Interior (Middle)		Height:	0.45 m			
Material:	Cast-In-Place Concrete		Count:	5			
Element Type:	T-Beam		Total Quantity:	60.45 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	30.45	10	20	Element BCI	44.4
Comments:	Stirrups have minimal cover creating delaminations and spalls with exposed corroded reinforcement. All bottoms of girders are poor.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	North		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Conduit along north side. Wire running across from fence to fence on north side.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: A03
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Abut		Width:	m			
Location:			Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0.5	0	0.5	Element BCI	37.5

Comments: Limited inspection. Footing has been undermined on the west end.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Vegetated with rock protection.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Flows S-N. Shallow at north end. Aggradation at north. Rock check dam on north which is increasing water level.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A03
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Deck Drainage	Flush deck drains	$1,000.00
Other	Replace missing posts	$1,500.00
	Total Maintenance Needs Costs	**$2,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install End Treatments	**$35,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,		X			$25,000.00
Type B concrete repairs to Girders, soffit,		X			$150,000.00
Type C concrete repairs to abutment walls, wingwalls,		X			$25,000.00
Replace barrier system with side mounted thrie beam barrier		X			$40,000.00
General Items - Insurance, Mobilization, Access etc.		X			$125,000.00
			Rehabilitation Cost Subtotal		**$365,000.00**

Estimated Value of Replacement Structure	**$850,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$390,000.00	$875,000.00
Roadside Protection:		$35,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$39,000.00	$88,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$39,000.00	$88,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$44,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$520,500.00**	**$1,220,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	2.0	10.0

Recommendation:	Minor Rehabilitation is recommended within 2 years.

Justification:	**Current BCI**	**53.8**

Structure A3 is generally in fair condition, however, the low cover to the steel reinforcement and stirrups in the concrete soffit and concrete t-beam girders has resulted in multiple spalls and delaminations throughout the superstructure. This type of defect is not assumed to significantly impact the load carrying capacity of the structure.

It should be noted that rehabilitating this structure will not likely result in an increase or removal of the load posting. If the Municipality wishes to remove the load limit on the bridge, the structure should be replaced.

053395: Structure A-3: Road 180



UTM Coordinates (WGS84)	17-539453m.E 4895698m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. A-3: Deck Wearing Surface (East)

Photo



2. A-3: Approach Guide Rail (North East)

Photo



3. A-3: Railing System (South East)

Photo



4. A-3: Wingwalls (South West)

Photo



5. A-3: Abutment Walls (West)

Photo



6. A-3: Soffit - Thin Slab - Int (South West)

Photo



7. A-3: Girders - Middle (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: A04
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge A4 - Saugeen Junction Bridge										
Main Hwy/Road #	West Back Line	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	0.7 km North of Road 180										
Latitude	44.217566			Longitude	-80.517481						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed	80		No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Through Girder (Steel)			Interchange Number							
Total Deck Length	14 m			Interchange Structure Number							
Overall Str. Width	5.3 m			Min. Vertical Clearance		m					
Total Deck Area	74.2 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	5.5 m (btwn tops of slopes)										
Roadway Width	5.1 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	13 m			Height (streambed to structure top)	3.5 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year	2019

Structure was waterproofed and paved in 2019.

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Overcast		
Temperature:	12° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☑ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ Within 1 year ☑ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Minor Rehabilitation is recommended within 2 years. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

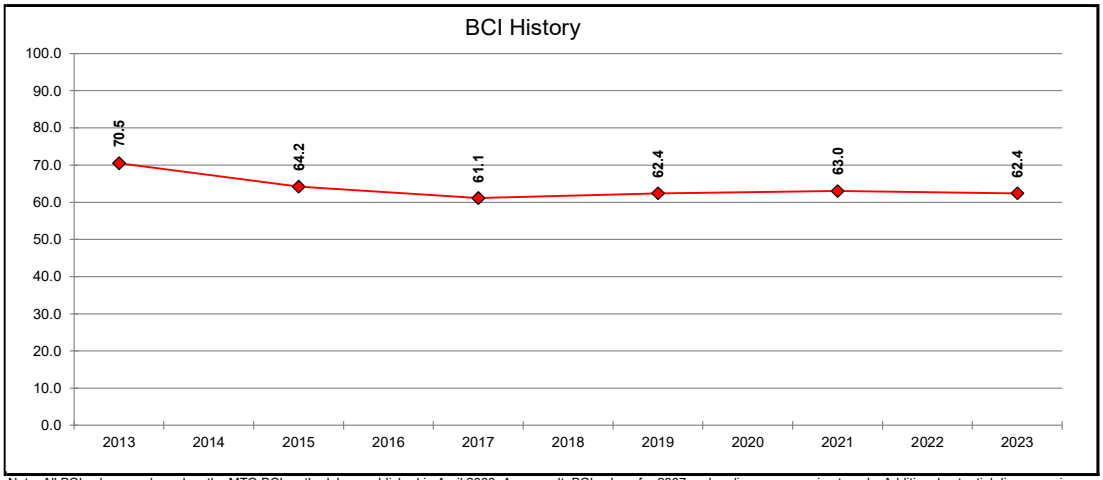
Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	62.4	A. Grzywnowicz	
2021	63.0	C. MacKenzie	
2019	62.4	C. MacKenzie	Waterproof and paving occurred in 2019
2017	61.1	C. MacKenzie	
2015	64.2	T. Littlejohns	
2013	70.5	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Four hazard warning signs installed. One sign with impact damage.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	North & South		Height:		m		
Material:	Steel		Count:	24			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	91.44	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	72.39	19.05	0	Element BCI	67.7
Comments:	Buried end treatments. Guide rail continues over structure. Impact damage on 4 sections of south, 1 section of north. Mounted too low.Covered on vegetation.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing Thrie Beam guide rail and end treatments.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.1	m		
Location:	North & South		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	61.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	12.2	49	0	0	Element BCI	80.0
Comments:	Approach wearing surface in excellent condition. Paved in 2019.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	14 m			
Element Name:	Deck Wearing Surface		Width:	5.3 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	N/A		Total Quantity:	74.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	14.8	59.4	0	0	Element BCI	80.0
Comments:	Deck wearing surface in excellent condition. Paved in 2019.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	14 m			
Element Name:	Deck Top		Width:	5.3 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	Solid Slab		Total Quantity:	74.2 Sq.m			
Environment:	Severe		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	72.95	1.25	0	Element BCI	74.4
Comments:	Limited inspection, condition based on condition of wearing surface, soffit and previous condition prior to placement of deck wearing surface in 2019. Deck top waterproofed during 2019 paving operation.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	3.81 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	9			
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	34.29 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	22.86	3.81	7.62	Element BCI	54.4
Comments:	Multiple locations of impact damage and perforations. Paint is peeling off posts. Guiderail continues over structure.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
Replace with Thrie Beam.			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	3.81 m			
Element Name:	Hand Railings		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	9			
Element Type:	Single Railing		Total Quantity:	34.29 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	33.29	1	0	Element BCI	74.0
Comments:	Small bend 1 in section. Paint peeling due to surface corrosion.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	13 m			
Element Name:	Soffit - Thin Slab - Ext		Width:	0.2 m			
Location:	East & West		Height:	0.2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	10.4 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.9	4	2.5	Element BCI	43.5
Comments:	Cracking and spalling near where barrier ties into deck. Crack on east, delamination and spalls on west.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	13 m			
Element Name:	Soffit - Thin Slab - Int		Width:	0.5 m			
Location:	Interior (Between Girders)		Height:	m			
Material:	Cast-In-Place Concrete		Count:	6			
Element Type:	Solid Slab		Total Quantity:	39 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	38.6	0.2	0.2	Element BCI	74.4
Comments:	Minor spalls at falsework hanger locations.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	4 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	32 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	19	5	8	Element BCI	50.8

Comments: Spalling/disintegration, pattern cracking. 3 wingwalls on 30 degree skew, 1 straight. North east wingwall is in good condition with one minor patch repair. Crack at cold joint, separated from curb on southeast. Efflorescence on all wingwalls. Northwest has severe disintegration and delaminations

Recommended Work: Rehab ☐ Replace ☑	**Maintenance Needs:**
1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Repair areas of poor concrete. Reface abutment.	Maintenance Needs: None Performance Deficiencies: None

Element Group:	Abutments		Length:	m			
Element Name:	Abutment Walls		Width:	5.3 m			
Location:	North & South		Height:	3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	31.8 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.91	8.05	7.84	Element BCI	47.6

Comments: Delaminations on north face. Light honeycombing on south face. Medium construction joint on south face. Medium horizontal crack, delaminations and staining on south. Spalling at exterior girders. Concrete patches at top of both abutments. Both have a wide crack along construction joint.

Recommended Work: Rehab ☐ Replace ☑	**Maintenance Needs:**
1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Repair areas of poor concrete. Reface abutment.	Maintenance Needs: None Performance Deficiencies: None

Element Group:	Girders		Length:	1 m			
Element Name:	Girders - Ends		Width:	0.23 m			
Location:	North & South		Height:	0.72 m			
Material:	Steel		Count:	4			
Element Type:	I-Beam or Girders		Total Quantity:	8.52 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	8.09	0.23	0.2	Element BCI	72.3

Comments: Areas of section loss on south end at both exterior girders. Area of section loss < 10% on the south east side. Area of section loss > 10% on the south west side. Loss of coating noted throughout. Birds nests noted.

Recommended Work: Rehab ☑ Replace ☐	**Maintenance Needs:**
1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
	Maintenance Needs: None Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	12 m			
Element Name:	Girders - Middle		Width:	0.23 m			
Location:	Exterior Beams		Height:	0.72 m			
Material:	Steel		Count:	2			
Element Type:	I-Beam or Girders		Total Quantity:	51.12 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	47.62	3.5	0	Element BCI	72.6
Comments:	3/4" drilled holes every foot in web of exterior girders with staining. Coating/paint peeling off. Two exterior girders have minor corrosion. Birds nest noted.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	5 m			
Element Name:	Floor Beams		Width:	0.2 m			
Location:	Interior		Height:	0.6 m			
Material:	Steel		Count:	2			
Element Type:	I-Beam or Girders		Total Quantity:	18 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	17.8	0.2	0	Element BCI	74.6
Comments:	Floor beams in good condition. Minor section loss on top flange. Limited inspection due to height.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	5 m			
Element Name:	Stringers		Width:	0.2 m			
Location:	Interior		Height:	0.3 m			
Material:	Steel		Count:	15			
Element Type:	I-Beam or Girders		Total Quantity:	15 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	15	0	0	Element BCI	75.0
Comments:	Birds nests noted. Paint coating peeling off. No connection issues noted.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Trusses		Length:		m		
Element Name:	Connections		Width:		m		
Location:	East & West		Height:		m		
Material:	Steel		Count:	24			
Element Type:	Bolted		Total Quantity:	24	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	24	0	0	Element BCI	75.0
Comments:	Includes connections between the floor beams and girders (4) and the connections between the stringers and the floor beams (20).						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Coating		Length:		m		
Element Name:	Coat - Structural Steel - Total		Width:		m		
Location:	Girders & Floor Beams		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	77.64	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	69.876	7.764	Element BCI	36.0
Comments:	Paint flaking and peeling.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - A		Width:		m		
Location:	North & South		Height:		m		
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	2	All		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	2	0	0	Element BCI	75.0
Comments:	Foundation exposed on N.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	East & West		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Unobstructed with no evidence of scour.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep and well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A04
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Repair Guide Rail and Install End Treatments	**$40,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type B concrete repairs to soffit,		X			$15,000.00
Type C concrete repairs to abutment walls, wingwalls,		X			$60,000.00
Painting required to Structural Steel (Full length),		X			$100,000.00
Replace barrier system with side mounted thrie beam barrier system		X			$25,000.00
General Items - Insurance, Mobilization, Access etc.		X			$125,000.00
			Rehabilitation Cost Subtotal		**$325,000.00**

Estimated Value of Replacement Structure	**$1,200,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$350,000.00	$1,225,000.00
Roadside Protection:		$40,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$35,000.00	$112,000.00
Environmental Assessment*:	Replacement assumes Schedule B Class Environmental Assessment	$2,500.00	$60,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$35,000.00	$112,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$62,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$477,500.00**	**$1,686,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	2.0	18.0

Recommendation:	Minor Rehabilitation is recommended within 2 years.

Justification:	**Current BCI**	**62.4**
Structure A4 was waterproofed and paved in 2019 and is generally in fair condition. The structure is demonstrating signs of deterioration of the concrete abutments, wingwalls and minor corrosion and section loss at the girder ends.		

053395: Structure A-4: W Back Line



UTM Coordinates (WGS84)	17-538544m.E 4896151m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. A-4: Deck Wearing Surface (North)

Photo



2. A-4: Railing System (West)

Photo



3. A-4: Approach Guide Rail (North West)

Photo



4. A-4: Wingwalls (North East)

Photo



5. A-4: Wingwalls (South West)

Photo



6. A-4: Abutment Walls (North)

Photo



7. A-4: Girders - Middle (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: A06
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge A6 - Cameron Bridge										
Main Hwy/Road #	35 Sideroad	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.		
		Under	X		Rail		Road	X	Other		
Structure Location	1.5km North of Grey Road 4										
Latitude	44.304187			Longitude	-80.472691						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	17.2 m			Interchange Structure Number							
Overall Str. Width	8.2 m			Min. Vertical Clearance		m					
Total Deck Area	141.04 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	7.6 m (btwn tops of slopes)										
Roadway Width	6.4 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	16.7 m			Height (streambed to structure top)	3 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☑ Major Rehab.	☐ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Major Rehabilitation is recommended within 4 years. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

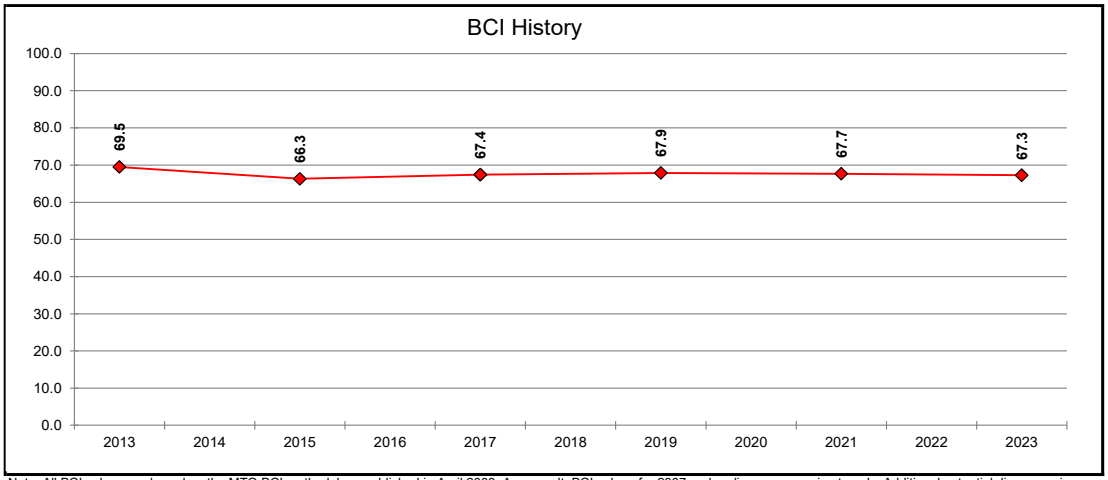
Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	67.3	A. Grzywnowicz	
2021	67.7	C. MacKenzie	
2019	67.9	C. MacKenzie	
2017	67.4	C. MacKenzie	
2015	66.3	T. Littlejohns	
2013	69.5	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Relocate hazard warning signs to end of guide rail.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**			17	
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☑ 1 Year ☐ 2 Year				
Relocate hazard warning signs to end of guide rail.			Maintenance Needs: Hazard Signs Performance Deficiencies: None				

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	North & South		Height:		m		
Material:	Steel		Count:	4			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	15.24	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	15.24	0	0	Element BCI	75.0
Comments:	Buried end treatments. Rot on top of posts. Impact damage on N/W corner at structure connection. Improper structure connections. Improper guide rail height.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Install approach end treatments.			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	6.5	m		
Location:	North & South		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	78	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	77	0.5	0.5	Element BCI	74.3
Comments:	Vegetation at approach on curb side. Flushing and patch repair evident. Pothole on north approach. Evidence of previous pothole patching.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: A06
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	17.2 m			
Element Name:	Deck Wearing Surface		Width:	6.5 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	Solid Slab		Total Quantity:	111.8 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	111.8	0	0	Element BCI	75.0
Comments:	Loss of material at NE corner.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	17.2 m			
Element Name:	Deck Top		Width:	8.2 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Solid Slab		Total Quantity:	141.04 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	129.04	6	6	Element BCI	70.3
Comments:	Limited Inspection, condition based on condition of wearing surface, and soffit.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	m			
Element Name:	Deck Drainage		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	6			
Element Type:	Metal Drain Pipes		Total Quantity:	6 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	6	0	0	Element BCI	75.0
Comments:	8" deck drains extend below deck. Light surface corrosion with minor section loss <10%.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Element Data

Element Group:	Curb and S/W		Length:	25.1 m			
Element Name:	Curbs		Width:	0.5 m			
Location:	East & West		Height:	0.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	40.16 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	32.96	4	3.2	Element BCI	65.5
Comments:	Delaminations and scaling. Spalling at joints. Spalling and delamination primarily at deck drains.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Barriers		Length:	25.1 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Bars		Total Quantity:	50.2 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	44.2	2	4	Element BCI	67.6
Comments:	Spalls, disintegration, delaminations and scaling. Concrete sealer on railing system is flaking off and staining. Hairline map cracking throughout. Wide horizontal crack at the top of railing at North end of railing						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	16.7 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	East & West		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Other		Total Quantity:	63.46 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	42.75	11.71	9	Element BCI	57.9
Comments:	Cold joint crack, wide longitudinal cracking with efflorescence staining, dampness evident. Delaminations and disintegration noted. Parging is disintegrating. Hairline stained map cracking throughout. Delamination and deterioration on NE. Cracking with effluorescence. Delamination midspan on east fascia due to growing vegetation. Dampness noted on first half meter on underside of exterior soffit (west side). Previous surface patched on NW corner is failing. Spalling, deterioration and delamination noted.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	16.7 m			
Element Name:	Soffit - Thick Slab - Int		Width:	6.2 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Solid Slab		Total Quantity:	103.54 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	95.14	4.2	4.2	Element BCI	70.5

Comments: Medium to wide centerline full length crack, cracks with efflorescence staining at north west corner.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	5 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2.3 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	46 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	38.7	2	5.3	Element BCI	64.8

Comments: Spalls, staining and delaminations. Wide diagonal crack on NE wingwall.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
Repair the concrete		Performance Deficiencies: None	

Element Group:	Abutments		Length:	m			
Element Name:	Abutment Walls		Width:	8.2 m			
Location:	North & South		Height:	1.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	21.32 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	19.32	1	1	Element BCI	69.8

Comments: Medium stained crack in N/W corner. One wall drain at each abutment. Delamination/spall at southwest and northeast corner. Delamination and disintegration at northeast corner. Staining and scaling noted.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	East		Height:	m			
Material:	Steel		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Utility conduit along east side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Some aggradation on northwest side. Northeast bank receding, flow against wingwall. Flow logger noted.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A06
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Total Maintenance Needs Costs	**$1,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install End Treatments	**$35,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top		X			$35,000.00
Type B concrete repairs to soffit,		X			$50,000.00
Type C concrete repairs to abutment walls, wingwalls,		X			$20,000.00
Replace Barrier System		X			$60,000.00
Waterproof and Pave		X			$25,000.00
General Items - Insurance, Mobilization, Access etc.		X			$125,000.00
Rehabilitation Cost Subtotal					**$315,000.00**

Estimated Value of Replacement Structure	**$1,200,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$330,000.00	$1,215,000.00
Roadside Protection:		$35,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$33,000.00	$111,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$33,000.00	$111,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$61,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$448,500.00**	**$1,623,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	4.0	15.0

Recommendation:	Major Rehabilitation is recommended within 4 years.

Justification:	**Current BCI**	**67.3**
Structure A6 is generally in good to fair condition but is demonstrating signs of moderate to severe concrete deterioration throughout, and moisture penetration through the deck top. Given the narrow platform width and structure type, options could be considered during the design to widen the structure to a full 2 lane bridge.		

053395: Structure A-6: Sideroad 35



UTM Coordinates (WGS84)	17-542034m.E 4905813m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. A-6: Deck Wearing Surface (South)

Photo



2. A-6: Approach Guide Rail (North East)

Photo



3. A-6: Railing System (East)

Photo



4. A-6: Curbs (South)

Photo



5. A-6: Wingwalls (North East)

Photo



6. A-6: Soffit - Thick Slab - Ext (East)

Photo



7. A-6: Abutment Walls (North)

Photo



8. A-6: Soffit - Thick Slab - Int (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: A07
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge A7 - Mt. Zion Bridge										
Main Hwy/Road #	East Back Line	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	0.8km West of 35 Sideroad										
Latitude	44.244881			Longitude	-80.462674						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed	80		No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	13 m			Interchange Structure Number							
Overall Str. Width	6.2 m			Min. Vertical Clearance		m					
Total Deck Area	80.6 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.2 m (btwn tops of slopes)										
Roadway Width	5.4 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	12.4 m			Height (streambed to structure top)	2.5 m						

Historical Data:

Year Built	○ Known ○ Estimated ◉ Unknown		Last Evaluation	
Last Biennial Inspection	2021		Current Load Limit	tonnes
Last Bridge Master Inspection			Load Limit By-Law #	
Last Condition Survey			By-Law Expiry Date	
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	28° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☑ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ Within 1 year ☑ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Major Rehabilitation is recommended within 5 years. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

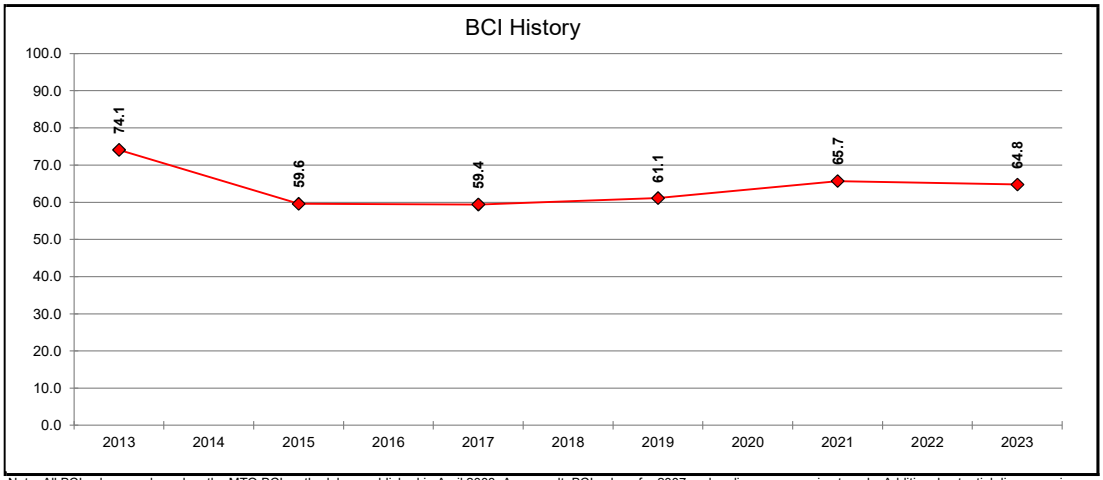
Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	64.8	A. Grzywnowicz	
2021	65.7	C. MacKenzie	Visible substructure quantity modified
2019	61.1	M. August	
2017	59.4	C. MacKenzie	
2015	59.6	T. Littlejohns	
2013	74.1	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed. Signs appear to have low reflectivity. Impact damage NW.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	East & West		Height:		m		
Material:	Steel		Count:	8			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	30.48	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	17.45	0	13.03	Element BCI	42.9

Comments: Buried end treatments, entrance at one corner. Impact damage in 4 locations. Incorrect lapping connection, rotten posts.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.4	m		
Location:	North & South		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	64.8	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	62.8	1	1	Element BCI	73.3

Comments: Medium rippling, and large pothole on north.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	13 m			
Element Name:	Deck Top		Width:	5.4 m			
Location:	Exposed		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	70.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	67.7	2	0.5	Element BCI	73.5

Comments: Exposed deck top. Gravel tracked on to deck top. Light abrasions all throughout visible section. Spall mid-span,

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	02
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Clean deck top		Maintenance Needs: Bridge Cleaning Performance Deficiencies: None	

Element Group:	Barriers		Length:	17.6 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Bars		Total Quantity:	35.2 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	28.05	0	7.15	Element BCI	59.8

Comments: One section is broken with section loss and exposed rebar. Railings are disintegrated and delaminated.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
Replace barrier system.		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Barriers		Length:	0.45 m			
Element Name:	Posts		Width:	0.2 m			
Location:	East & West		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	14			
Element Type:	N/A		Total Quantity:	14 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	10	2	2	Element BCI	59.3

Comments: Small spalls with exposed corroded rebar throughout. Large spalls with exposed corroded rebar SW and SE. Medium cracks.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	0.6 m			
Element Name:	End Post		Width:	0.25 m			
Location:	All Quadrants		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	1.85 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	1.45	0.2	0.2	Element BCI	63.1

Comments: Small spalls and abrasions.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Curb and S/W		Length:	21.7 m			
Element Name:	Curbs		Width:	0.4 m			
Location:	East & West		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	23.87 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.37	5	3.5	Element BCI	56.7

Comments: Minor cracking, abrasion along side, small spalls and wide cracks on top of curbs.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	m			
Element Name:	Deck Drainage		Width:	m			
Location:	Through Deck		Height:	m			
Material:	Steel		Count:	6			
Element Type:	Holes in Deck		Total Quantity:	6 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	2	0	4	Element BCI	25.0

Comments: Two deck drains extend 300mm below soffit, four deck drains do not extend below the soffit and are plugged. Surface corrosion evident with light section loss.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Extend or replace deck drains		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	5.1 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2.9 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	29.58 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.58	9	5	Element BCI	51.7
Comments:	Spalling/disintegration with efflorescence at corners where wingwalls meet abutments. Delaminations and map cracking. Wingwall extends beyond abutment.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	12.4 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	Exterior		Height:	0.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	44.64 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	24.64	10	10	Element BCI	50.4
Comments:	Delaminated fascia and spalling. Exposed rebar ties. Efflorescence staining and dampness on soffit. Wide horizontal cracking, stalactites, honeycombing. Disintegration. Limited inspection due to height.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	12.4 m			
Element Name:	Soffit - Thick Slab - Int		Width:	4.2 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	52.08 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	48.08	4	0	Element BCI	72.3
Comments:	Light to moderate honeycombing throughout. Exposed rebar and ties. Exposed formwork. Birds nests. Hairline stained cracks. Medium crack along centerline extending from abutments. Unable to sound soffit due to height.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	6.2 m			
Element Name:	Abutment Walls		Width:	m			
Location:	North & South		Height:	1.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	22.32 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	22.32	0	0	Element BCI	75.0

Comments: Two wall drains on each abutment show signs of surface corrosion. Hairline to narrow stained cracks with efflorescence.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	West		Height:	m			
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Utility conduit along west side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Unobstructed with no scour.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Steep and well vegetated.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A07
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top,	$1,000.00
	Total Maintenance Needs Costs	**$1,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider replacing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to end post, posts, deck top, curbs,		X			$10,000.00
Type B concrete repairs to soffit,		X			$40,000.00
Type C concrete repairs to wingwalls,		X			$30,000.00
Replace deck drains		X			$15,000.00
Waterproof and pave		X			$30,000.00
Replace barrier system		X			$60,000.00
General Items - Insurance, Mobilization, Access etc.		X			$125,000.00
Replace Guide Rail		X			$95,000.00
				Rehabilitation Cost Subtotal	**$405,000.00**

Estimated Value of Replacement Structure	**$950,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$430,000.00	$975,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$43,000.00	$98,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$43,000.00	$98,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$49,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$533,500.00**	**$1,345,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	4.8	14.8

Recommendation:	Major Rehabilitation is recommended within 5 years.

Justification:	**Current BCI**	**64.8**
Structure A7 is generally in fair condition and is demonstrating signs of concrete deterioration, and moisture penetration through the deck top. Based on the current BCI and structure size, a major rehabilitation should be considered as the BCI approaches 60. Based on typical deterioration rates, this is anticipated to occur in approximately 5 years. Concrete repairs, waterproofing and paving, barrier replacement, and deck drain replacement should be included in the rehabilitation project. Given the narrow platform width and structure type, options could be considered during the design to widen the structure to a full 2 lane bridge. Consideration should also be given to replacing the steel beam guide rail system, end treatments and structure connections to help protect oncoming traffic.		

053395: Structure A-7: E Back Line



UTM Coordinates (WGS84)	17-542903m.E 4899219m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. A-7: Abutment Walls (West)

Photo



2. A-7: Soffit - Thick Slab - Int (West)

Photo



3. A-7: Soffit - Thick Slab - Ext (South West)

Photo



4. A-7: Wingwalls (South West)

Photo



5. A-7: Soffit - Thin Slab - Ext (South)

Photo



6. A-7: Utilities (South)

Photo



7. A-7: Deck Wearing Surface (West)

Photo



8. A-7: Railing System (North)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: A13
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge A13 - Low Bridge									
Main Hwy/Road #	Lower Valley Road	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	3km North of East Back Line									
Latitude	44.299727			Longitude	-80.538205					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed	80		No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Steel I-Girder (Concrete Deck)			Interchange Number						
Total Deck Length	13.4 m			Interchange Structure Number						
Overall Str. Width	6 m			Min. Vertical Clearance		m				
Total Deck Area	80.4 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	7.6 m (btwn tops of slopes)									
Roadway Width	5.1 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	20 Degrees			Direction of Structure	North - South					
No. of Spans	1			Fill on Structure	0 m					
Span Lengths	12.5 m			Height (streambed to structure top)	2.6 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	22° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:		X		$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes: Continue to monitor corrosion and section loss on girder shoe plates during future biennial inspections.				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☑ Minor Rehab.	☐ Major Rehab.	☐ Replace
Timing of Recommended Work:	☑ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Minor Rehabilitation is recommended as soon as possible. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

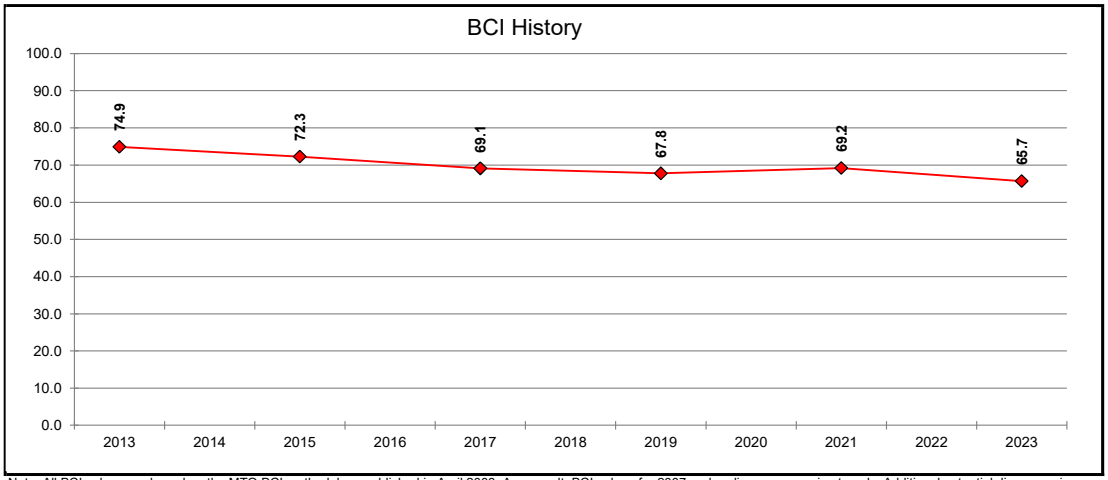
Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	65.7	C. MacKenzie	
2021	69.2	C. MacKenzie	
2019	67.8	C. MacKenzie	
2017	69.1	C. MacKenzie	
2015	72.3	T. Littlejohns	
2013	74.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.1	m		
Location:	North & South		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	61.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	61.2	0	0	Element BCI	75.0

Comments: Light potholes.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	North & South		Height:		m		
Material:	Steel		Count:	8			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	30.48	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	22.86	0	7.62	Element BCI	56.3

Comments: Impact damage at all ends with rotated offset blocks. Rot on top of wood posts.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
Consider replacing SBGR.		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	21 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	2			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	42 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	34.38	7.62	0	Element BCI	68.7

Comments: Some checks and rot at top of posts. Impact damage and rotated offset blocks. Wood posts sit on steel base plates.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	13.4 m			
Element Name:	Deck Top		Width:	6 m			
Location:	Exposed		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Solid Slab		Total Quantity:	80.4 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	67	13.4	0	Element BCI	69.2

Comments: Exposed concrete deck top in good condition, some scrape marks from plow. Fair quantity from heavy abrasion along centerline.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:** 02
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year
Clean granular material from deck top.		Maintenance Needs: Bridge Cleaning
		Performance Deficiencies: None

Element Group:	Joints		Length:	7.5 m			
Element Name:	Seals / Sealants		Width:	m			
Location:	North & South		Height:	m			
Material:	Other		Count:	2			
Element Type:	Other		Total Quantity:	2 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	0	0	2	Element BCI	0.0

Comments: Both joint seals are missing. Expansion joints filled with gravel.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Flush joints and replace expansion joint seals.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Joints		Length:	7.5 m			
Element Name:	Armouring/Retaining Device		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:	2			
Element Type:	Other		Total Quantity:	15 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	14	1	0	Element BCI	72.7

Comments: Light rust. Surface abrasion from plow.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	5.1 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2.1 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	42.84 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	42.84	0	0	Element BCI	75.0

Comments: Light scaling. Limited inspection due to heavy vegetation.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	7.5 m			
Element Name:	Abutment Walls		Width:	m			
Location:	North & South		Height:	1.05 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	15.75 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.75	0	0	Element BCI	75.0

Comments: Two wall drains on each abutment. Minor staining. Isolated hairline cracking.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	North & South		Height:		m		
Material:	Steel		Count:	2			
Element Type:	Other		Total Quantity:	2	All		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	2	0	0	Element BCI	75.0

Comments: Sheet piling. Surface corrosion and light staining.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	7.5	m		
Element Name:	Ballast Walls		Width:		m		
Location:	North & South		Height:	0.6	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	9	Sq.m		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9	0	0	Element BCI	75.0

Comments: Limited inspection, staining and light scaling.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:		m		
Element Name:	A. Bearings		Width:		m		
Location:	North & South		Height:		m		
Material:	Neoprene		Count:	6			
Element Type:	Elastomeric Pad		Total Quantity:	6	Each		
Environment:	Severe		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	0	1	5	Element BCI	6.7

Comments: Limited inspection due to gravel debris. Section loss on steel shoe plate at west side exterior girder and middle girder at the north and south end. 5 shoe plates poor, 1 shoe plate fair. Minor signs of bulging at SW and lifting at N center.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	02
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Clean bearing seat.		Maintenance Needs: Bridge Cleaning	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Coating		Length:	12.5 m			
Element Name:	Coat - Structural Steel - Total		Width:	0.25 m			
Location:	Girders Only		Height:	0.6 m			
Material:	Other		Count:	3			
Element Type:	Other		Total Quantity:	73.13 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	28.13	45	Element BCI	15.4
Comments:	Qty includes the coating on the girders only.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	1 m			
Element Name:	Girders - Ends		Width:	0.25 m			
Location:	Interior (Ends)		Height:	0.6 m			
Material:	Steel		Count:	6			
Element Type:	I-Beam or Girders		Total Quantity:	11.7 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.7	4	2	Element BCI	50.2
Comments:	Paint flaking off, minor-severe section loss (>10%) at end diaphragm connection, minor corrosion over abutment. Severe section loss at end 200mm of each girder.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	10.5 m			
Element Name:	Girders - Middle		Width:	0.25 m			
Location:	Interior (Middle)		Height:	0.6 m			
Material:	Steel		Count:	3			
Element Type:	I-Beam or Girders		Total Quantity:	61.43 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	61.43	0	0	Element BCI	75.0
Comments:	Light rust, paint is flaking off. Coating is category 4 rust on exterior girders and all bottom flanges.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	1.8	m			
Element Name:	Diaphragms - Middle		Width:	0.18	m			
Location:	Interior		Height:	0.3	m			
Material:	Steel		Count:	6				
Element Type:	I-Beam or Girders		Total Quantity:	6	Each			
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	6	0	0		Element BCI	75.0
Comments:	Light surface corrosion. Paint flaking. Severe corrosion and section loss on end units under joint.							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	12.5	m			
Element Name:	Soffit - Thin Slab - Ext		Width:	1	m			
Location:	East & West		Height:	0.225	m			
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Solid Slab		Total Quantity:	8.125	Sq.m			
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	7.525	0.3	0.3		Element BCI	70.9
Comments:	Small spall, slight dampness, spalls at guiderail post connection. No drip channel.							
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	12.5	m			
Element Name:	Soffit - Thin Slab - Int		Width:	1.8	m			
Location:	Interior (Between Girders)		Height:		m			
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Solid Slab		Total Quantity:	45	Sq.m			
Environment:	Benign		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	45	0	0		Element BCI	75.0
Comments:	Hairline transverse cracking. Birds nests present.							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Flows east to west.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	A13
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top	$500.00
Bridge Cleaning	Flush Expansion joints and clean debris off bearing seat	$1,500.00
	Total Maintenance Needs Costs	**$2,000.00**

Additional Investigations:	Monitoring of Deformations, Settlements and Movements,	**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Narrow Structure	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Replace seals and sealants			X		$10,000.00
Waterproof and Pave			X		$25,000.00
Painting required to Structural Steel (Full length),			X		$80,000.00
Steel repairs to railing system, girders - ends,			X		$50,000.00
General Items - Insurance, Mobilization, Access etc.			X		$100,000.00
			Rehabilitation Cost Subtotal		**$265,000.00**

Estimated Value of Replacement Structure	**$1,200,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$290,000.00	$1,225,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$29,000.00	$112,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$29,000.00	$112,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$62,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$365,500.00**	**$1,636,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	1.0	15.7

Recommendation:	Minor Rehabilitation is recommended as soon as possible.

Justification:	**Current BCI**	**65.7**
Structure A13 is generally in good condition but is demonstrating signs of severe corrosion with section loss of the structural steel girder ends as a result of the missing expansion joint seals. To prevent further damage of the bridge elements, it is recommended that the expansion joints be cleaned out and new seals be installed within 1 year.		

053395: Structure A-13: Lower Valley Rd



UTM Coordinates (WGS84)	17-536816m.E 4905257m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Jori Enstrom, Neil McCaffrey

1. A-13: Abutment Walls (North)

Photo



2. A-13: Wingwalls (North West)

Photo



3. A-13: A. Bearings (South)

Photo



4. A-13: Railing System (West)

Photo



5. A-13: Girders - Ends (South East)

Photo



6. A-13: Girders - Middle (West)

Photo



7. A-13: Diaphragms - Middle (West)

Photo



8. A-13: Diaphragms - End (North East)

Photo



9. A-13: Deck Top (South)

Photo



10. A-13: Soffit - Thin Slab - Ext (South East)

Photo



11. A-13: Soffit - Thin Slab - Int (North)

Photo



12. A-13: Armouring/Retaining Device (North)

Photo



13. A-13: Seals / Sealants (South)

Photo



14. A-13: Foundation (below ground level) - Abut (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC01
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC1 - Box Culvert 1									
Main Hwy/Road #	Euphrasia - St. Vincent Townline	On	X	Crossing Type:	Navig. Water		Non-Navig.	X	Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.1km West of Deviation Road									
Latitude	44.504589			Longitude	-80.663377					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number						
Total Deck Length	2.1 m			Interchange Structure Number						
Overall Str. Width	6.2 m			Min. Vertical Clearance		m				
Total Deck Area	13.02 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	5.8 m (btwn tops of slopes)									
Roadway Width	4.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0.3 m					
Span Lengths	1.52 m			Height (streambed to structure top)	1 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

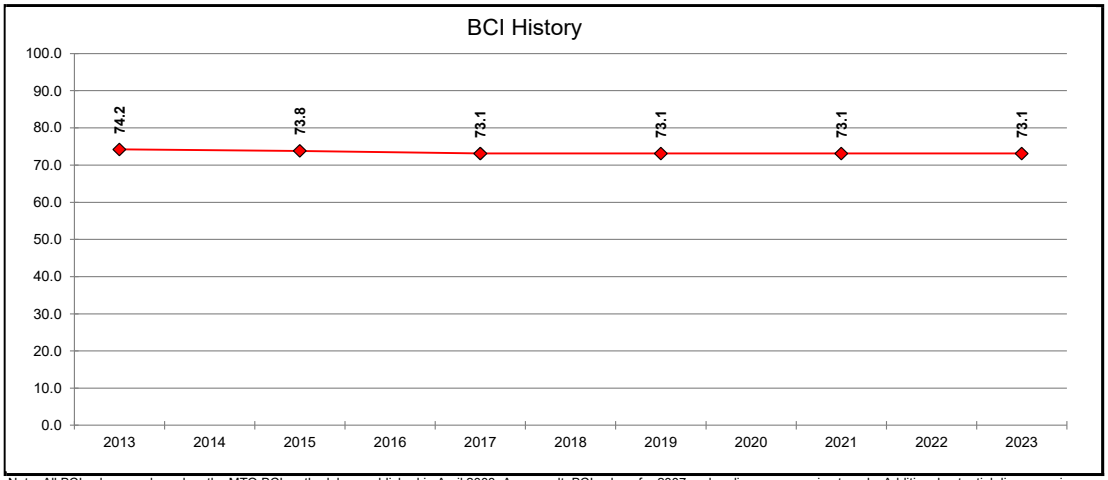
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	73.1	C. MacKenzie	
2021	73.1	C. MacKenzie	
2019	73.1	C. MacKenzie	
2017	73.1	C. MacKenzie	
2015	73.8	T. Littlejohns	
2013	74.2	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	3	0	1	Element BCI	56.3

Comments: Three hazard warning signs present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	17
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
		Maintenance Needs: Hazard Signs	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	4 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	48 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	48	0	0	Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	2.1 m			
Element Name:	Deck Wearing Surface		Width:	4.6 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	9.66 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.66	0	0	Element BCI	75.0
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	1 m			
Element Name:	Inlet		Width:	m			
Location:	South		Height:	1.05 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Open Footing		Total Quantity:	2.85 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.45	0.2	0.2	Element BCI	67.3
Comments:	0.5m x 1.5m headwall/fascia included. Small spall at SE and SW corners, light scaling. Sound concrete. Remove vegetation and debris.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	6.2 m			
Element Name:	Barrels		Width:	1.5 m			
Location:	Interior		Height:	0.55 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Open Footing		Total Quantity:	16.12 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.72	0.2	0.2	Element BCI	73.6

Comments: Limited inspection. Small spall with exposed corroded rebar.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Culvert		Length:	1 m			
Element Name:	Outlet		Width:	m			
Location:	North		Height:	1.05 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Open Footing		Total Quantity:	2.85 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.85	0	0	Element BCI	75.0

Comments: Light scaling, spall on NE.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: No signs of erosion.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number: BC01
MTO Site Number: N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	0	1	Element BCI	0.0
Comments:	No water in the waterway at the time of inspection.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC01
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install one hazard warning sign at structure	$250.00
	Total Maintenance Needs Costs	**$250.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Rehabilitation Cost Subtotal					**$0.00**

Estimated Value of Replacement Structure	**$350,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$365,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$37,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$37,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$19,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$583,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	Description	Rehabilitation	Replacement
CC	Concrete culvert - No rehabilitation planned.	N/A	18.1

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**73.1**
Structure BC1 is generally in good condition with minor concrete defects noted through the culvert barrel. The Municipality may wish to remove this structure from the Municipal Bridge & Culvert Inspection Inventory since the span is less than 3.0m.		

053395: Structure BC-1: Euphrasia-St Vincent Tline



UTM Coordinates (WGS84)	17-526797m.E 4927985m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. BC-1: Inlet (South)

Photo



2. BC-1: Outlet (North)

Photo



3. BC-1: Barrels (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC02
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC2 - Box Culvert 2										
Main Hwy/Road #	Sideroad 4A	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	2km East of 11th Line										
Latitude	44.356681			Longitude	-80.6178						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	CSP Ellipse Culvert(s)			Interchange Number							
Total Deck Length	4.8 m			Interchange Structure Number							
Overall Str. Width	19.5 m			Min. Vertical Clearance		m					
Total Deck Area	93.6 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	7.6 m (btwn tops of slopes)										
Roadway Width	5 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	1.5 m						
Span Lengths	4.8 m			Height (streambed to structure top)	3 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	22° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

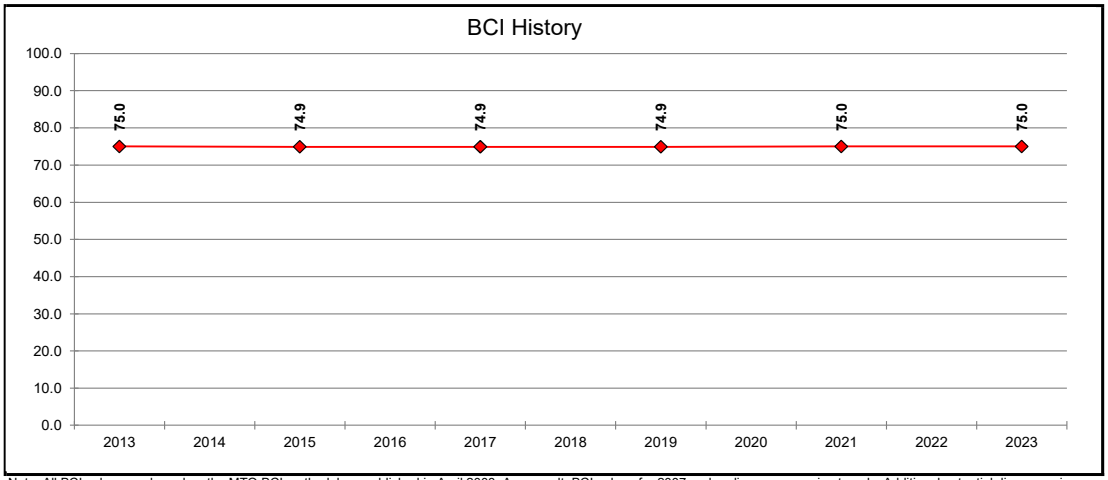
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	75.0	C. MacKenzie	
2021	75.0	C. MacKenzie	
2019	74.9	C. MacKenzie	
2017	74.9	C. MacKenzie	
2015	74.9	T. Littlejohns	
2013	75.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each		4			Element BCI	75.0

Comments: Four hazard warning signs

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	5 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	60 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	60	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	4.8 m			
Element Name:	Deck Wearing Surface		Width:	5 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:				
Element Type:	N/A		Total Quantity:	24 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	24	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	1.5 m			
Element Name:	Inlet		Width:	m			
Location:	South		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Ellipse Culvert		Total Quantity:	3 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3	0	0	Element BCI	75.0

Comments: Headwalls partially buried.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	19.5 m			
Element Name:	Barrels		Width:	4.8 m			
Location:	Interior		Height:	2.8 m			
Material:	Steel		Count:	1			
Element Type:	Ellipse Culvert		Total Quantity:	232.674 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	232.524	0.15	0	Element BCI	75.0

Comments: Light rust at waterline, small bulge at east, improper lapping, incorrect bolting pattern. Deformation at N/E and S/W end of barrel. No section loss.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep, with minor washout on south and north sides above culvert.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	13
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Install rip rap slope protection.		Maintenance Needs: Erosion Control Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: No observed defects. Flows south to north.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC02
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install rip rap slope protection	$1,500.00
	Total Maintenance Needs Costs	**$1,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider Replacing Steel Beam Guide Rail During Future Capital Works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
			Rehabilitation Cost Subtotal		**$0.00**

Estimated Value of Replacement Structure	**$550,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$565,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$57,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$57,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$29,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$833,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CS	Metal culvert - No rehabilitation planned.	N/A	17.8

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**75.0**
Structure BC2 is generally in good condition however the erosion and washouts on the embankments should be repaired as soon as possible to prevent further erosion.		

053395: Structure BC-2: Sideroad 4A



UTM Coordinates (WGS84)	17-530463m.E 4911561m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. BC-2: Inlet (South)

Photo



2. BC-2: Outlet (North)

Photo



3. BC-2: Barrels (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC07
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC7 - Box Culvert 7										
Main Hwy/Road #	Road 41A	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	1km North of the Melancthon-Osprey Townline										
Latitude	44.221675			Longitude	-80.402587						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed	80		No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	3.5 m			Interchange Structure Number							
Overall Str. Width	5.8 m			Min. Vertical Clearance		m					
Total Deck Area	18.9 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.2 m (btwn tops of slopes)										
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	20 Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0.4 m						
Span Lengths	2.7 m			Height (streambed to structure top)	2 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Overcast		
Temperature:	12° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

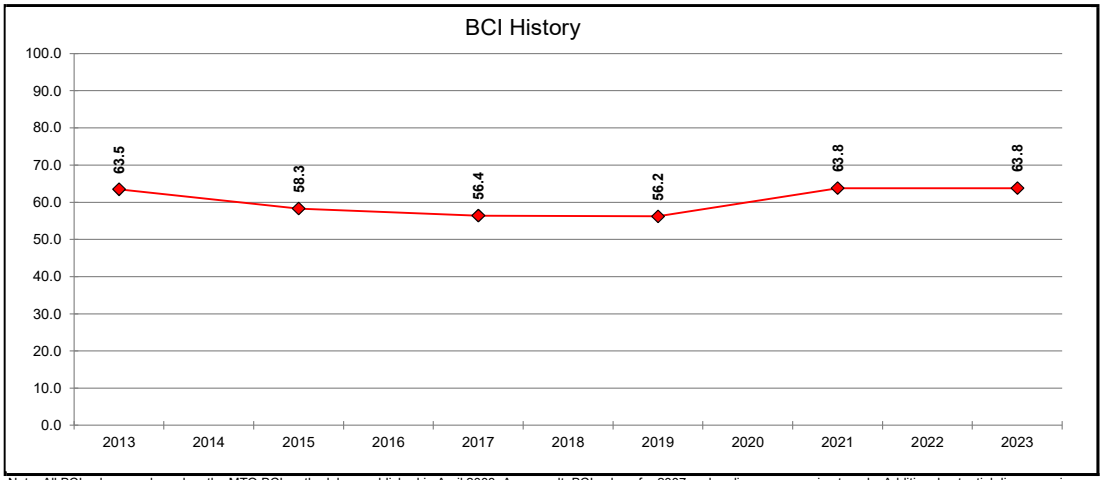
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	63.8	A. Grzywnowicz	
2021	63.8	C. MacKenzie	Visible quantity of inlet and outlet revised
2019	56.2	M. August	
2017	56.4	C. MacKenzie	
2015	58.3	T. Littlejohns	
2013	63.5	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed. Signs appear to have low reflectivity. All signs leaning.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR & end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	5.6 m			
Location:	North & South		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	67.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	67.2	0	0	Element BCI	75.0

Comments: Light wheel rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	3.5 m			
Element Name:	Deck Wearing Surface		Width:	5.6 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	19.6 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	19.6	0	0	Element BCI	75.0
Comments:	Light wheel rutting.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing barrier system.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Curb and S/W		Length:	8.5 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	East & West		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Mountable Curb		Total Quantity:	10.2 Sq.m			
Environment:	Severe		Limited Inspection:	☑			
Protection System:	N/A					Performance	04
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.2	2.5	2.5	Element BCI	48.0
Comments:	Limited inspection due to vegetation. Buried under 300 to 400mm of gravel. Spalling and wide cracking. Vegetation clean-out required. West side poor. NW curb displaced and rotating outward.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: Continuing Movements				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	2.5 m			
Element Name:	Inlet		Width:	2.7 m			
Location:	East		Height:	1.6 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	4.9 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.4	0.5	1	Element BCI	56.1
Comments:	Limited inspection due to vegetation. Spalling and delaminations and deterioration at one wingwall near curb. Medium crack at cold joint.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	7.4 m			
Element Name:	Barrels		Width:	2.7 m			
Location:	Interior		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Rectangular Culvert		Total Quantity:	40.7 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	34.7	3	3	Element BCI	66.9
Comments:	A few small spalls along soffit. Spalling and delamination with exposed corroded rebar due to low cover. Light scaling. West end poor. Medium vertical cracks in abutment. Delamination NE corner.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	2.5 m			
Element Name:	Outlet		Width:	2.7 m			
Location:	West		Height:	1.6 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	4.9 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.8	0.1	2	Element BCI	43.7
Comments:	Limited inspection due to vegetation. Wide pattern cracking, spalling, severe disintegration. One (1) wingwall in poor condition, fascia and opposite wingwall appear to be in good condition. Bell box on outlet side.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Abut		Width:	m			
Location:	North & South		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Limited inspection. Minor erosion and scour at footing.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep and well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Heavily vegetated. No flow at time of inspection.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC07
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider installing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Install barrier system					$20,000.00
Type C concrete repairs to barrels, inlet, outlet,					$25,000.00
Waterproof and Pave					$30,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$200,000.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$225,000.00	$425,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$23,000.00	$43,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$23,000.00	$43,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$22,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$288,500.00**	**$658,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	11.9

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**63.8**
Structure BC7 is generally in good to fair condition and is demonstrating signs of concrete deterioration of the inlet, outlet and barrel. Given the low flow and cover above the concrete culvert, this structure may be an optimal candidate to replace with a multiple culverts system.		

053395: Structure BC-7: Road 41A



UTM Coordinates (WGS84)	17-547720m.E 4896668m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. BC-7: Deck Wearing Surface (South)

Photo



2. BC-7: Inlet (East)

Photo



3. BC-7: Barrels (West)

Photo



4. BC-7: Outlet (West)

Photo



5. BC-7: Outlet (South West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC08
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC8 - Box Culvert 8										
Main Hwy/Road #	South Line B	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	1km West of Road 41A										
Latitude	44.229837	Longitude	-80.410745								
Owners	Municipality of Grey Highlands	Heritage Designation		Not Consid:	X	Cons/not App.		List/n.d.			
				Desig./not list		Desig & List					
MTO region		Road Class:		Freeway		Arterial					
				Collector		Local	X				
MTO District		Posted Speed	80	No. of Lanes	2						
Old County		AADT		% Trucks							
Geographic Twp.		Inspection Route Sequence									
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number									
Total Deck Length	3.8 m	Interchange Structure Number									
Overall Str. Width	7.2 m	Min. Vertical Clearance		m							
Total Deck Area	27.36 sq. m	Special Routes:	Transit		Truck						
			School		Bicycle						
Road Platform Width	6.6 m (btwn tops of slopes)										
Roadway Width	6 m (btwn edges of shoulders)	Detour Length Around Bridge		km							
Skew Angle	0 Degrees	Direction of Structure	North - South								
No. of Spans	1	Fill on Structure	0.3 m								
Span Lengths	3.2 m	Height (streambed to structure top)	1.8 m								

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Overcast		
Temperature:	12° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

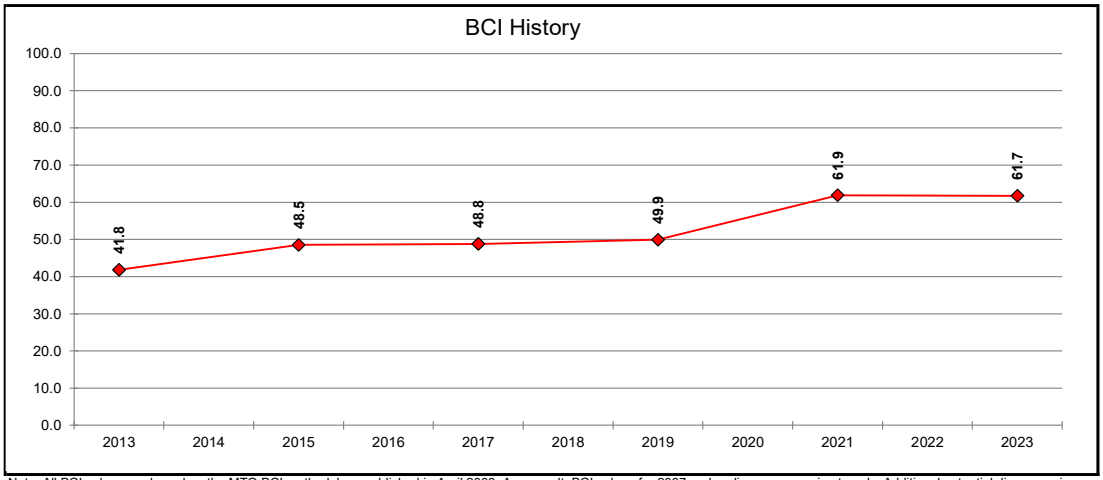
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	61.7	A. Grzywnowicz	
2021	61.9	C. MacKenzie	Abutment walls condition revised
2019	49.9	M. August	
2017	48.8	C. MacKenzie	
2015	48.5	T. Littlejohns	
2013	41.8	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
Consider installing approach guide rail and end treatments.		Performance Deficiencies: None

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	6 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	72 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	71.5	0.5	0	Element BCI	74.8

Comments: Small pot holes along centerline

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	8.2 m			
Element Name:	Deck Wearing Surface		Width:	6 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	49.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	47.2	2	0	Element BCI	73.6
Comments:	Small potholes						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider adding barrier railing system.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Curb and S/W		Length:	8.2 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	North & South		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	7.38 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.88	1.5	0	Element BCI	67.9
Comments:	Narrow to medium cracks, abrasion and spalls throughout.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	2.6 m			
Element Name:	Inlet		Width:	m			
Location:	South		Height:	2.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	13.88 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	11.68	2	0.2	Element BCI	68.9
Comments:	Delamination on south and spall with exposed corroded rebar on fascia.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	7.2 m			
Element Name:	Barrels		Width:	3.8 m			
Location:	Interior		Height:	1.7 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Rectangular Culvert		Total Quantity:	51.84 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	33.84	10	8	Element BCI	56.7
Comments:	Soffit is spalled/delaminated with exposed corroded rebar throughout due to low cover. Staining and light scaling on abutment walls. Active birds nest. Entire abutment walls condition revised to good.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	2.6 m			
Element Name:	Outlet		Width:	m			
Location:	North		Height:	2.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	13.88 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	11.68	2	0.2	Element BCI	68.9
Comments:	Narrow cracks with efflorescence. One small spall with exposed corroded rebar. Delaminations. Medium cracks at cold joints.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	East & West		Height:		m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	2	All		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	1	Element BCI	20.0

Comments: Scouring/erosion and deterioration of footing on east & west beginning to undermine footing.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated. N/E corner embankment very steep.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Stream well vegetated. Aggradation at inlet and outlet. Flows S-N. Water not flowing at time of inspection.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC08
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider installing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Install Barrier System					$15,000.00
Type C concrete repairs to barrels, inlet, outlet,					$40,000.00
Waterproof and Pave					$20,000.00
Add slope stabilization					$4,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
			Rehabilitation Cost Subtotal		**$204,000.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$229,000.00	$425,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$23,000.00	$43,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$23,000.00	$43,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$22,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$292,500.00**	**$658,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	10.9

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**61.7**

Structure BC8 is generally in fair to poor condition and is demonstrating signs of severe deterioration on the soffit.

Alternative designs such as a structural slab over the deck may be considered to reduce the rehabilitation costs, given that the abutments are generally in good condition.

053395: Structure BC-8: Southline B



UTM Coordinates (WGS84)	17-547057m.E 4897568m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. BC-8: Deck Wearing Surface (West)

Photo



2. BC-8: Curbs (North East)

Photo



3. BC-8: Inlet (South)

Photo



4. BC-8: Barrels (South)

Photo



5. BC-8: Outlet (North)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC10
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC10 - Box Culvert 10										
Main Hwy/Road #	Road 63	On	X	Crossing Type:	Navig. Water		Non-Navig.		X Ped.		
		Under			Rail		Road		Other		
Structure Location	0.75km South of Centre Line B										
Latitude	44.268964	Longitude	-80.284214								
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.				
			Desig./not list		Desig & List						
MTO region		Road Class:	Freeway		Arterial						
			Collector		Local	X					
MTO District		Posted Speed		No. of Lanes	2						
Old County		AADT		% Trucks							
Geographic Twp.		Inspection Route Sequence									
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number									
Total Deck Length	6.7 m	Interchange Structure Number									
Overall Str. Width	6.85 m	Min. Vertical Clearance		m							
Total Deck Area	45.895 sq. m	Special Routes:	Transit		Truck						
			School		Bicycle						
Road Platform Width	9.2 m (btwn tops of slopes)										
Roadway Width	6.25 m (btwn edges of shoulders)	Detour Length Around Bridge		km							
Skew Angle	Degrees	Direction of Structure									
No. of Spans	1	Fill on Structure	0.4 m								
Span Lengths	6.1 m	Height (streambed to structure top)	2.7 m								

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year	2018

Structural rehabilitation completed in 2018. Concrete repairs, concrete barrier installed, approach guide rail installed and approach & deck wearing surface repaved.

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

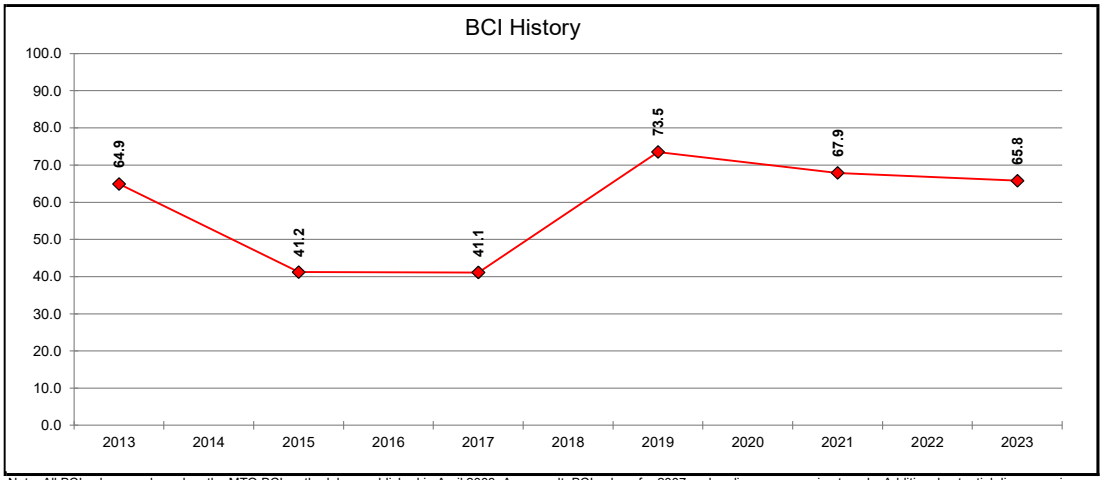
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	65.8	A. Grzywnowicz	
2021	67.9	C. MacKenzie	
2019	73.5	M. August	Recently Rehabilitated.
2017	41.1	C. MacKenzie	
2015	41.2	T. Littlejohns	
2013	64.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each		4	0	0	Element BCI	75.0

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	129.54 m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	129.54 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m		129.54	0	0	Element BCI	75.0

Comments: Posts are anchored to a severely deteriorated wingwall SW.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	18
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Repair guiderail anchors at structure connection.		Maintenance Needs: Other	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	4 m			
Element Name:	Approach Wearing Surface		Width:	6.25 m			
Location:	North & South		Height:	m			
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	50 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	43.75	3.125	3.125	Element BCI	68.1

Comments: Wide transverse cracks at approach ends. Alligator cracking at south wheel tracks. Previous pothole was patched.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	15
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Rout & seal cracks at approach ends.		Maintenance Needs: Rout and Seal	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.7 m			
Element Name:	Deck Wearing Surface		Width:	6.25 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	N/A		Total Quantity:	41.88 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m		41.88	0	0	Element BCI	75.0

Comments: Granular build up on shoulders.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers		Length:	7.15 m			
Element Name:	Railing System		Width:	0.4 m			
Location:	East & West		Height:	0.5 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Parapet Wall without Railing		Total Quantity:	14.3 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	5.72	8.58	0	0	Element BCI	85.0

Comments: Quantity includes interior & top. Bug holes throughout.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	m			
Element Name:	Inlet		Width:	2.8 m			
Location:	West		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Open Footing		Total Quantity:	19.985 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	6.6	11.385	1	1	Element BCI	77.8

Comments: Quantity includes exterior fascia, barrier and wingwalls. Conduit along face. Severe disintegration under posts. Narrow stained cracks with efflorescence throughout. Small spall. Exposed corroded rebar. Previous patches failing.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	6.85 m			
Element Name:	Barrels		Width:	6.1 m			
Location:	Interior		Height:	1.8 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Open Footing		Total Quantity:	66.44 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	43.24	11.6	11.6	Element BCI	55.8

Comments: Honeycombing on abutments, with medium to wide vertical cracks in both abutments, exposed corroded rebar, and narrow stained cracks throughout soffit. Delamination along the waterline. Patch repairs noted throughout soffit beginning to deteriorate. Deck top appears to have been waterproofed during rehab. Birds nest noted. Conduit travelling along north side of barrel.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	m			
Element Name:	Outlet		Width:	2.8 m			
Location:	East		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Open Footing		Total Quantity:	19.985 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	6.6	11.385	1	1	Element BCI	77.8

Comments: Quantity includes exterior fascia, barrier and wingwalls. Disintegration and delamination on SE. Moderated honeycombing on base of SE. Parging has cracked and failed on exterior fascia below posts. Patch is no longer bonded to existing concrete. Concerns about anchorage of guide rail post into wingwall cap.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:			Height:	m			
Material:			Count:	2			
Element Type:			Total Quantity:	2 All			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	0	2	Element BCI	0.0

Comments: Conduit along west side. Detached from fascia, the cables are exposed and the conduit is missing.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:			Height:		m		
Material:	Cast-In-Place Concrete		Count:				
Element Type:			Total Quantity:	1	All		
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection, no visible signs of settlement.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep and well vegetated. Erosion in front of wingwalls.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	0	1	Element BCI	0.0

Comments: Heavy vegetation in stream. No flow at time of inspection. Heavy aggradation at inlet and outlet. Ponding observed.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC10
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Repairs required to Approach Wearing Surface,	$1,000.00
Other	Concrete repairs required for anchors in structure connection guide rail,	$2,000.00
	Total Maintenance Needs Costs	**$3,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Rehabilitation Cost Subtotal					**$0.00**

Estimated Value of Replacement Structure	**$500,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$515,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$52,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$52,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$26,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$770,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	12.9

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**65.8**
Structure BC10 underwent a rehabilitation in 2018 and is generally in good to fair condition. The rehabilitation included concrete repairs, installation of a concrete barrier/curb, approach guide rail installation and waterproofing and paving. However, the concrete patches are failing at the southwest wingwall, resulting in repairs required to the guide rail posts and anchors at the structure connection.		

053395: Structure BC-10: Road 63



UTM Coordinates (WGS84)	17-557130m.E 4902002m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. BC-10: Deck Wearing Surface (North)

Photo



2. BC-10: Approach Guide Rail (South West)

Photo



3. BC-10: Wingwalls (South West)

Photo



4. BC-10: Barrels (West)

Photo



5. BC-10: Outlet (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC11
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC11 - Box Culvert 11										
Main Hwy/Road #	Road 55	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	0.2km North of Grey Road 31										
Latitude	44.376602			Longitude	-80.360944						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	5.6 m			Interchange Structure Number							
Overall Str. Width	9.7 m			Min. Vertical Clearance		m					
Total Deck Area	54.32 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	9 m (btwn tops of slopes)										
Roadway Width	5.7 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0.1 m						
Span Lengths	4.9 m			Height (streambed to structure top)	1.3 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	13° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

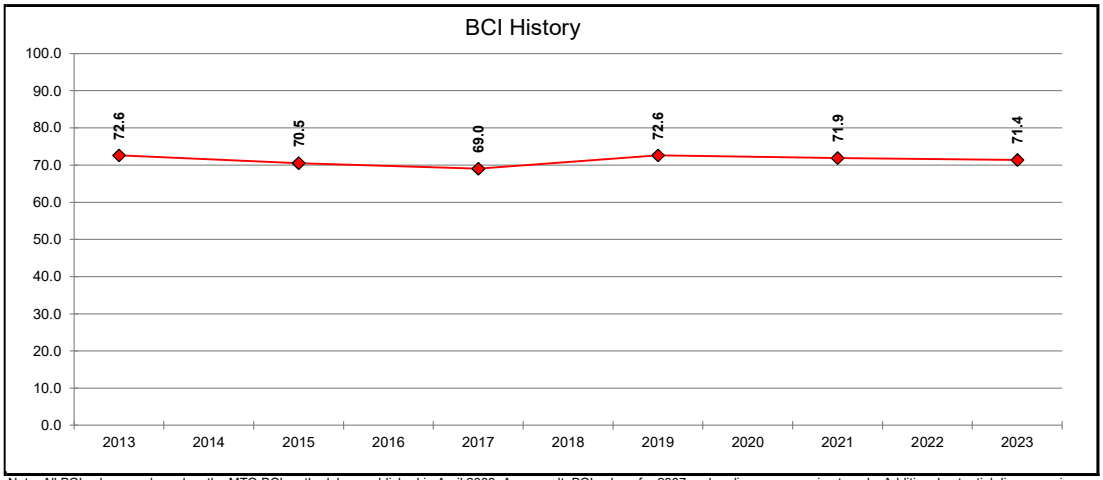
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	71.4	A Grzywnowicz	
2021	71.9	C. MacKenzie	
2019	72.6	M. August	
2017	69.0	C. MacKenzie	
2015	70.5	T. Littlejohns	
2013	72.6	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed. NW hazard warning sign hidden by vegetation.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	5.7 m			
Location:	North & South		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	68.4 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	68.4	0	0	Element BCI	75.0

Comments: Loose gravel outside of wheel tracks.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.6 m			
Element Name:	Deck Wearing Surface		Width:	5.7 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	31.92 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	31.92	0	0	Element BCI	75.0
Comments:	Loose gravel, light rutting in wheel tracks. 1.5m± shoulder east, 2.5m± shoulder west.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing barrier system over structure.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Curb and S/W		Length:	10.5 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	East & West		Height:	0.2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	10.5 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.8	0.35	0.35	Element BCI	71.3
Comments:	Spall at SE corner with exposed corroded rebar. Two (2) narrow to medium cracks. 300mm wide crack.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	m			
Element Name:	Inlet		Width:	2.8 m			
Location:	East		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	11.27 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.27	1	1	Element BCI	65.2

Comments: Quantity includes 0.7m x 4.9m headwall. Disintegration/erosion and delamination at abutment/wingwall corner. NE corner severe erosion. Pattern cracking and delamination. NE corner cracking with efflorecence.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	9.7 m			
Element Name:	Barrels		Width:	4.9 m			
Location:	Interior		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Rectangular Culvert		Total Quantity:	64.99 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	61.99	1.5	1.5	Element BCI	72.5

Comments: Low clearance for inspection. Disintegration and delamination at bottom of abutment at centerline. Spalls on middle of south wall. Stained narrow to medium cracks throughout. Erosion along waterline. Form paper still in place, assumed to be causing delaminations. Slight sag noted in soffit likely due to construction. Birds nest noted.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	m			
Element Name:	Outlet		Width:	2.8 m			
Location:	West		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	11.27 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10.27	0.5	0.5	Element BCI	70.1

Comments: Severe spalls, delamination and disintegration at south west abutment/wingwall corner. Light scaling on fascia.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Abut		Width:	m			
Location:			Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection, condition based on condition of exposed portions and overall structure condition. Footing visible on N/E and S/W end; not undermined.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated and appears stable.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Flows E-W. Watercourse wider than span. Sign post at outlet.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC11
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to curbs,					$2,000.00
Type C concrete repairs to barrels, inlet, outlet,					$12,000.00
Install Barrier System					$40,000.00
Remove fill, waterproof and pave					$50,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$229,000.00**

Estimated Value of Replacement Structure	**$700,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$244,000.00	$715,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$25,000.00	$72,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$25,000.00	$72,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$36,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$406,500.00**	**$1,020,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	16.4

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**71.4**
Structure BC11 is generally in good condition but is beginning to demonstrate signs of minor concrete deterioration throughout the culvert barrel.		

053395: Structure BC-11: (Road 55)



UTM Coordinates (WGS84)	17-550915m.E 4913902m.N
Road or Location Description	Road 55

1. BC-11: Deck Wearing Surface (North)

Photo



2. BC-11: Curbs (North East)

Photo



3. BC-11: Barrels (West)

Photo



4. BC-11: Inlet (West)

Photo



5. BC-11: Outlet (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC14
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC14 - Box Culvert 14									
Main Hwy/Road #	4th Concession B	On	X	Crossing Type:	Navig. Water		Non-Navig.	X	Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.1km West of Road 41A									
Latitude	44.285698			Longitude	-80.419092					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number						
Total Deck Length	3.2 m			Interchange Structure Number						
Overall Str. Width	7.2 m			Min. Vertical Clearance		m				
Total Deck Area	23.04 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	6.6 m (btwn tops of slopes)									
Roadway Width	6.2 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0.3 m					
Span Lengths	2.6 m			Height (streambed to structure top)	1.7 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☑ 6 to 10 years	☐ >10 years
Overall Comments:	Structure replacement is recommended within 9 years. Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

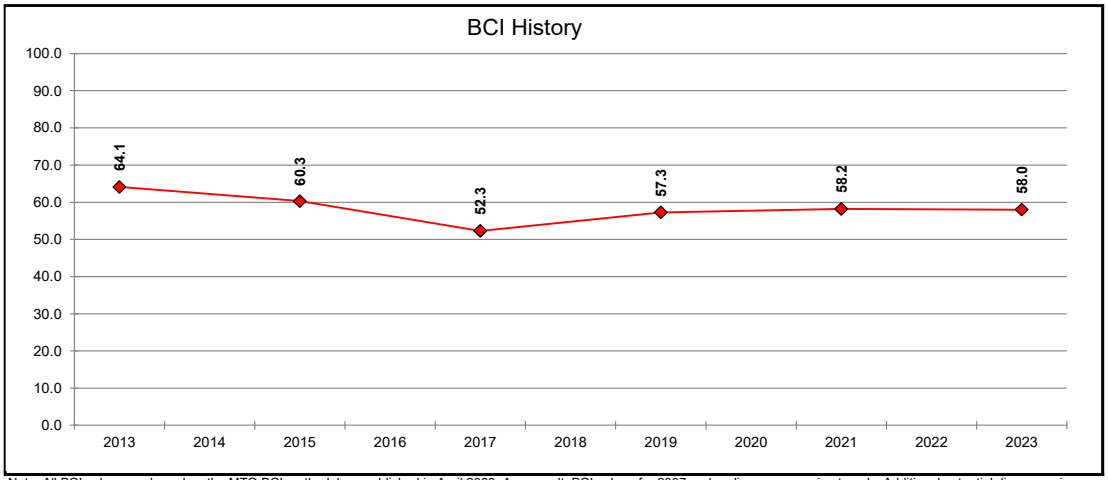
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	58.0	A. Grzywnowicz	
2021	58.2	C. MacKenzie	
2019	57.3	C. MacKenzie	
2017	52.3	C. MacKenzie	
2015	60.3	T. Littlejohns	
2013	64.1	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	6.6	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	79.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	79.2	0	0	Element BCI	75.0

Comments: Rutting in wheel paths. Some small potholes, loose gravel.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	3.2 m			
Element Name:	Deck Wearing Surface		Width:	6.6 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:				
Element Type:	N/A		Total Quantity:	21.12 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	21.12	0	0	Element BCI	75.0

Comments: Loose gravel and vegetation growing on shoulders

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Curb and S/W		Length:	5.5 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	North & South		Height:	0.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	CIP Concrete		Total Quantity:	6.6 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.1	1	0.5	Element BCI	64.0

Comments: Small spalls at ends, 1 vertical crack. Vegetation along curb line. Abrasions and scaling along curb face. Small spall at south curb.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing barrier system over structure.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	m				
Element Name:	Outlet		Width:	1.5 m				
Location:	North		Height:	1.5 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Rectangular Culvert		Total Quantity:	6.32 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	5.92	0.2	0.2		Element BCI	71.5

Comments: Quantity includes 0.7m x 2.6m fascia. Large spalls at east and west corner at waterline.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	7.2 m				
Element Name:	Barrels		Width:	2.6 m				
Location:	Interior		Height:	0.9 m				
Material:	Cast-In-Place Concrete		Count:	1				
Element Type:	Rectangular Culvert		Total Quantity:	31.68 Sq.m				
Environment:	Benign		Limited Inspection:	☐				
Protection System:	N/A						Performance	03
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	17.68	8	6		Element BCI	52.0

Comments: Erosion and disintegration at water level contibuting to majority of poor and fair condition state. Medium to wide crack at centerline of soffit. Delamination at south soffit, scaling/honeycombing present. Possible settlement noted. Wide crack in abutment wall. Full span narrow crack at north side of road with exposed corroded reinforcement. Cold joint full length of abutment walls.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: Continuing Settlement

Element Group:	Culvert		Length:	m				
Element Name:	Inlet		Width:	1.5 m				
Location:	South		Height:	1.5 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Rectangular Culvert		Total Quantity:	6.32 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	5.32	0.5	0.5		Element BCI	66.3

Comments: Quantity includes 0.9 x 2.6m headwall. Small spalls, and staining. Erosion at water level. Build-up of stone at inlet.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: BC14
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	East & West		Height:		m		
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Other		Total Quantity:	1	All		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Limited inspection. Small scour at north west corner. Possible signs of settlement. Wide crack at midspan.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated and appears stable.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Flows south to north. Trees growing in watercourse downstream from structure.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC14
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider installing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to curbs,					$1,500.00
Type C concrete repairs to barrels, inlet, outlet,					$26,000.00
Install Barrier System					$30,000.00
Remove fill, waterproof and pave					$40,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$222,500.00**

Estimated Value of Replacement Structure	**$450,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$237,500.00	$465,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$24,000.00	$47,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$24,000.00	$47,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$24,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$303,000.00**	**$708,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	9.0

Recommendation:	Structure replacement is recommended within 9 years.

Justification:	**Current BCI**	**58.0**
Structure BC14 is generally in fair to poor condition and is demonstrating signs of concrete deterioration, and moisture penetration throughout the culvert barrel.		

053395: Structure BC-14: 4th Concession B



UTM Coordinates (WGS84)	17-546347m.E 4903772m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. BC-14: Deck Wearing Surface (West)

Photo



2. BC-14: Curbs (South)

Photo



3. BC-14: Outlet (North)

Photo



4. BC-14: Barrels (South)

Photo



5. BC-14: Inlet (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC15
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC15 - Box Culvert 15									
Main Hwy/Road #	4th Concession B	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.2km West of Road 41A									
Latitude	44.285395			Longitude	-80.420464					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number						
Total Deck Length	4.3 m			Interchange Structure Number						
Overall Str. Width	9.7 m			Min. Vertical Clearance		m				
Total Deck Area	41.71 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	7.2 m (btwn tops of slopes)									
Roadway Width	6.2 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	30 Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0.1 m					
Span Lengths	3.7 m			Height (streambed to structure top)	1.6 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

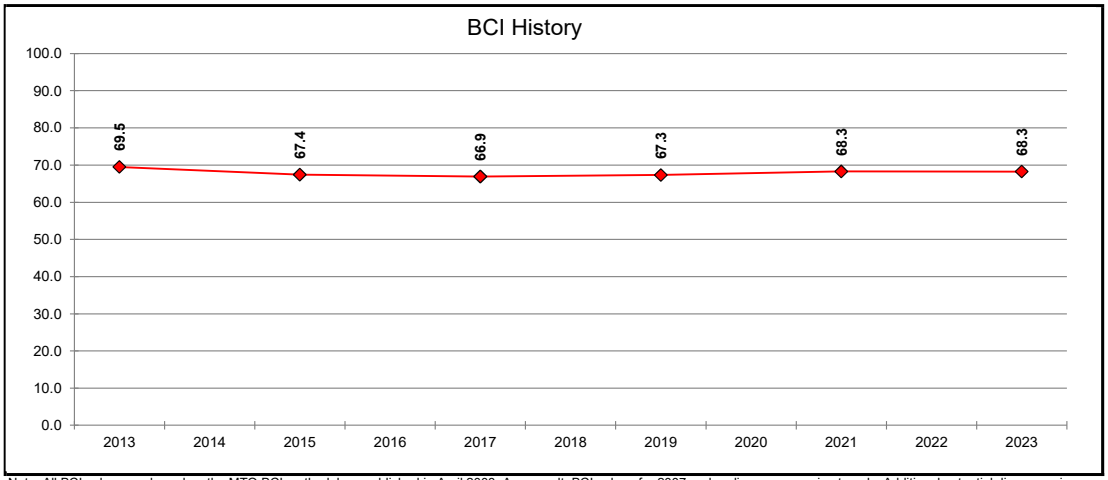
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	68.3	A. Grzywnowicz	
2021	68.3	C. MacKenzie	
2019	67.3	C. MacKenzie	
2017	66.9	C. MacKenzie	
2015	67.4	T. Littlejohns	
2013	69.5	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	6.2 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	74.4 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	74.4	0	0	Element BCI	75.0

Comments: Loose gravel along shoulders.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	4.3 m			
Element Name:	Deck Wearing Surface		Width:	6.2 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:				
Element Type:	N/A		Total Quantity:	26.66 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	26.66	0	0	Element BCI	75.0
Comments:	Loose gravel along shoulders.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing barrier system over structure.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	m			
Element Name:	Inlet		Width:	0.3 m			
Location:	North		Height:	1.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	2.19 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	1.99	0.2	0	Element BCI	71.8
Comments:	Quantity includes headwall 0.3m x 3.7m. Small spall, honeycombing, vertical crack.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	9.7 m			
Element Name:	Barrels		Width:	3.7 m			
Location:	Interior		Height:	1.5 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Rectangular Culvert		Total Quantity:	64.99 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	59.69	2	3.3	Element BCI	70.1

Comments: Erosion and deterioration primarily on the south end at waterline, some honeycombing. Dampness on soffit. Delaminations on the barrel wall. Staining at soffit/abutment connection.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Culvert		Length:	m			
Element Name:	Outlet		Width:	0.3 m			
Location:	South		Height:	1.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	2.19 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0.99	0.6	0.6	Element BCI	44.9

Comments: Quantity includes headwall 0.3m x 3.7m. Spall and small delamination. Erosion/disintegration at southwest corner.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Consider repairing concrete components.

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Retaining Walls		Length:	3.1 m			
Element Name:	Wall		Width:	0.3 m			
Location:	South		Height:	1.2 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Reinforced Concrete		Total Quantity:	4.65 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.65	0.5	1.5	Element BCI	47.0

Comments: Large spall/erosion/disintegration with exposed corroded rebar at end of retaining wall, some pattern cracking, delaminations and honeycombing.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated, southwest has minor washout.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Stream flows against eastern retaining wall at outlet. Aggradation in stream inlet and outlet.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC15
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider replacing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type C concrete repairs to wall, barrels, inlet, outlet,					$16,567.50
Add slope stabilization					$4,000.00
Install Barrier System					$25,000.00
Remove fill, waterproof and pave					$25,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$195,567.50**

Estimated Value of Replacement Structure	**$450,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$210,567.50	$465,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$22,000.00	$47,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$22,000.00	$47,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$24,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$272,067.50**	**$708,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	14.1

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**68.3**
Structure BC15 is generally in good to fair condition but is demonstrating signs of concrete deterioration throughout the barrel and deterioration/scour on the retaining wall and along the waterline.		

053395: Structure BC-15: 4th Concession B



UTM Coordinates (WGS84)	17-546236m.E 4903739m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. BC-15: Deck Wearing Surface (West)

Photo



2. BC-15: Wall (North)

Photo



3. BC-15: Inlet (North)

Photo



4. BC-15: Barrels (South)

Photo



5. BC-15: Outlet (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC17
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC17 - Box Culvert 17										
Main Hwy/Road #	Centre Line A	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	1.5km West of Road 41A										
Latitude	44.243657			Longitude	-80.435705						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Precast Concrete Box Culvert			Interchange Number							
Total Deck Length	4.1 m			Interchange Structure Number							
Overall Str. Width	14.6 m			Min. Vertical Clearance		m					
Total Deck Area	59.8 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	8.5 m (btwn tops of slopes)										
Roadway Width	7.2 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	12.4 Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0.15 m						
Span Lengths	3.6 m			Height (streambed to structure top)	1.5 m						

Historical Data:

Year Built	(●) Known ( ) Estimated ( ) Unknown	2013	Last Evaluation	
Last Biennial Inspection		2021	Current Load Limit	tonnes
Last Bridge Master Inspection			Load Limit By-Law #	
Last Condition Survey			By-Law Expiry Date	
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		
Structure replaced in 2013.			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Overcast		
Temperature:	12° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

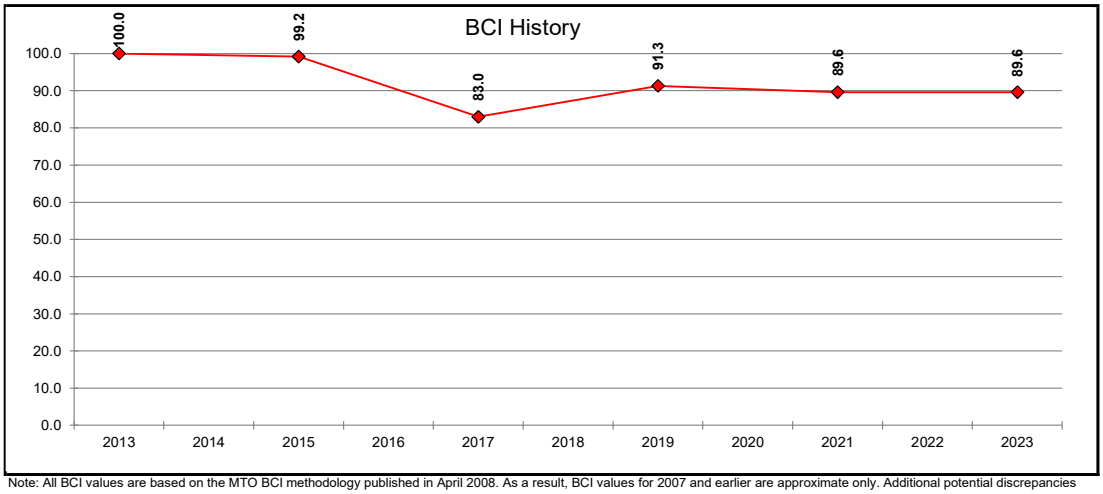
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	89.6	A. Grzywnowicz	
2021	89.6	C. MacKenzie	
2019	91.3	M. August	Due to revision of element conditions.
2017	83.0	C. MacKenzie	
2015	99.2	T. Littlejohns	
2013	100.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: BC17
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Four hazard warning signs installed.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	16			
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	60.96	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	60.96	0	0	Element BCI	75.0
Comments:	Three extruders and one leaving end treatment. Section over structure with channel. Loose end treatment cables. Channel not buried NW.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	8.5	m		
Location:	East & West		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	102	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	93.75	5.25	3	Element BCI	71.0
Comments:	Moderate to severe settlement at both approaches (approximately 35mm). Wide transverse crack full width sealed. Light surface abrasion. Light rutting beginning to form on west. Abrasions at north. Medium longitudinal cracks West. Flushing on approaches. Patching on west approach to transition onto bridge deck.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**			18	
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☑ 1 Year ☐ 2 Year				
			Maintenance Needs: Other				
Remove over grown vegetation along shoulders.			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	4.1 m				
Element Name:	Deck Wearing Surface		Width:	8.5 m				
Location:	Over Deck Top		Height:	m				
Material:	Asphalt		Count:	1				
Element Type:	N/A		Total Quantity:	34.85 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	34.65	0.1	0.1		Element BCI	74.7

Comments: Light surface abrasion. Medium-wide longitudinal cracking along centerline.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	02
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
Sweep deck wearing surface.		Maintenance Needs: Bridge Cleaning Performance Deficiencies: None	

Element Group:	Decks		Length:	10.5 m				
Element Name:	Deck Top		Width:	4.1 m				
Location:	Under Wearing Surface		Height:	0.15 m				
Material:	Cast-In-Place Concrete		Count:	1				
Element Type:	Solid Slab		Total Quantity:	43.05 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	25.83	17.22	0	0		Element BCI	90.0

Comments: Quantity included for the distribution slab (length x width) . Exposed portions includes end unit. Small cracks around exposed drains that do not extend below soffit.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Barriers		Length:	3.81 m				
Element Name:	Railing System		Width:	m				
Location:	North & South		Height:	m				
Material:	Steel		Count:	4				
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	15.24 m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m	0	15.24	0	0		Element BCI	75.0

Comments: Steel posts are anchored to distribution slab.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Element Data

Element Group:	Curb and S/W		Length:	4.2 m			
Element Name:	Curbs		Width:	0.2 m			
Location:	North & South		Height:	0.2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	3.36 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.36	0	0	Element BCI	75.0
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Retaining Walls		Length:	2 m			
Element Name:	Wall		Width:	m			
Location:	NW & NE		Height:	1.4 m			
Material:	Other		Count:	2			
Element Type:	Retaining Wall		Total Quantity:	5.6 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	2.61	2.99	0	0	Element BCI	86.7
Comments:	Sub drains plugged on north.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	m			
Element Name:	Inlet		Width:	0.25 m			
Location:			Height:	1.4 m			
Material:	Precast Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	1.93 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0.9	1.03	0	0	Element BCI	86.7
Comments:	Small spall. Narrow stained cracks.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	14.4 m			
Element Name:	Barrels		Width:	3.6 m			
Location:	Interior		Height:	1.4 m			
Material:	Precast Concrete		Count:	1			
Element Type:	Rectangular Culvert		Total Quantity:	92.16 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	62.67	29.49	0	0	Element BCI	92.0
Comments:	Parging along joints beginning to crack.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	m			
Element Name:	Outlet		Width:	0.25 m			
Location:			Height:	1.4 m			
Material:	Precast Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	1.93 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0.9	1.03	0	0	Element BCI	86.7
Comments:	Rough surface, light scaling.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	4	0	0	0	Element BCI	100.0
Comments:	Temporary rock-check dams are still present.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Aggradation at south end. Silt build up at north end.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC17
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Wearing Surface,	$1,000.00
Other	Remove overgrown vegetation along shoulders	$500.00
	Total Maintenance Needs Costs	**$1,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
				Rehabilitation Cost Subtotal	**$0.00**

Estimated Value of Replacement Structure	**$450,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$465,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$47,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$47,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$24,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$708,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	34.6

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**89.6**
Structure BC 17 was replaced in 2013 and is generally in excellent condition with only minor maintenance recommended at this time.		

053395: Structure BC-17: Centre Line A



UTM Coordinates (WGS84)	17-545061m.E 4899090m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. BC-17: Deck Wearing Surface (West)

Photo



2. BC-17: Approach Wearing Surface (South)

Photo



3. BC-17: Curbs (East)

Photo



4. BC-17: Railing System (West)

Photo



5. BC-17: Inlet (East)

Photo



6. BC-17: Barrels (West)

Photo



7. BC-17: Outlet (West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: BC18
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge BC18 - Box Culvert 18										
Main Hwy/Road #	Quiet Valley Road	On	X	Crossing	Navig. Water		Non-Navig.		X	Ped.	
		Under	X	Type:	Rail		Road		X	Other	
Structure Location	1km East of Grey Road 7										
Latitude	44.443151			Longitude	-80.538266						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	CSP Round Culvert(s)			Interchange Number							
Total Deck Length	6.5 m			Interchange Structure Number							
Overall Str. Width	16.1 m			Min. Vertical Clearance		m					
Total Deck Area	104.65 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	5.1 m (btwn tops of slopes)										
Roadway Width	5 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	45 Degrees			Direction of Structure	E/W						
No. of Spans	2			Fill on Structure	1 m						
Span Lengths	2, 2 m			Height (streambed to structure top)	2.5 m						

Historical Data:

Year Built (◉ Known ○ Estimated ○ Unknown)	2016	Last Evaluation		
Last Biennial Inspection	2021	Current Load Limit		tonnes
Last Bridge Master Inspection		Load Limit By-Law #		
Last Condition Survey		By-Law Expiry Date		
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		
Structure replaced in 2016.			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

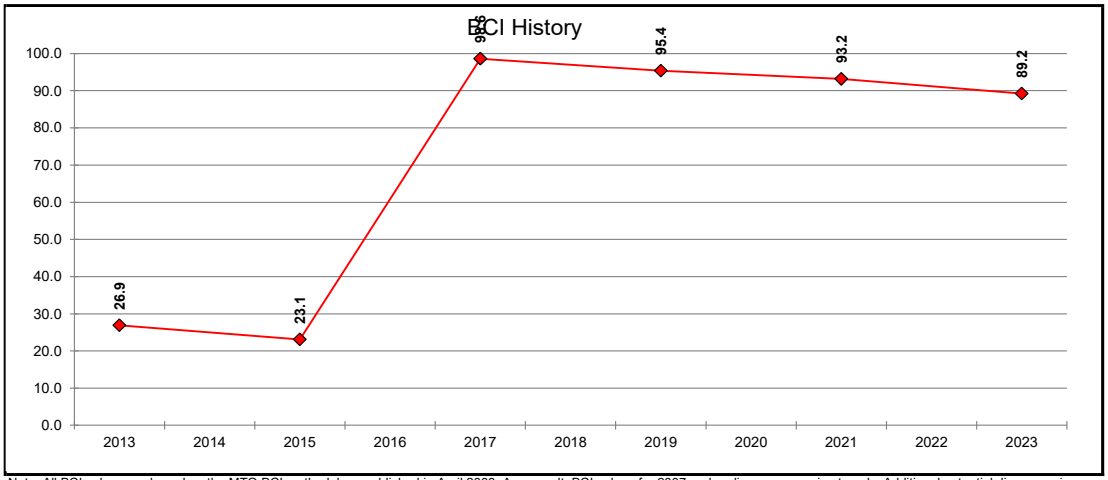
Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	89.2	C. MacKenzie	
2021	93.2	C. MacKenzie	
2019	95.4	C. MacKenzie	
2017	98.6	C. MacKenzie	
2015	23.1	T. Littlejohns	
2013	26.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	5 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	60 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	60	0	0	Element BCI	75.0

Comments: Summer road only, loose gravel, slight rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.5 m				
Element Name:	Deck Wearing Surface		Width:	5 m				
Location:	Over Structure		Height:	m				
Material:	Gravel		Count:	1				
Element Type:	N/A		Total Quantity:	32.5 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	32.5	0	0		Element BCI	75.0
Comments:	Summer road only, loose gravel, slight rutting.							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Barriers		Length:	m				
Element Name:	Railing System		Width:	m				
Location:	North & South		Height:	m				
Material:	Steel		Count:					
Element Type:	N/A		Total Quantity:	m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m						Element BCI	
Comments:	None present.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Retaining Walls		Length:	1.8 m				
Element Name:	Wall		Width:	1 m				
Location:	NW & SW		Height:	0.6 m				
Material:	Mass Concrete		Count:	7				
Element Type:	Retaining Wall		Total Quantity:	7.56 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m				7.56		Element BCI	0.0
Comments:	Newly constructed retaining wall on NW. SW retaining wall has failed and is being undermined by scour pool. SE retaining wall is undermining and failure anticipated. Settlement at NW							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	16.1 m			
Element Name:	Barrels		Width:	2 m			
Location:	East		Height:	2 m			
Material:	Corrugated Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	101 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	72	29	0	0	Element BCI	92.8
Comments:	Low flow. Surface corrosion with no section loss.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	16.1 m			
Element Name:	Barrels		Width:	2 m			
Location:	West		Height:	2 m			
Material:	Corrugated Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	101 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	72	29	0	0	Element BCI	92.8
Comments:	Low flow. Surface corrosion with no section loss.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All		1	0	0	Element BCI	75.0
Comments:	Scour pool forming at outlet of each culvert. Low flow enters into both culverts. Debris at inlet.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**			13	
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☑ 1 Year ☐ 2 Year				
Install rock protection.			Maintenance Needs: Erosion Control				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	6			
Element Type:	Rock Protection		Total Quantity:	6 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	2	Element BCI	50.0

Comments: Rip-rap rock protection providing slope protection Minor erosion between culverts on north embankment. Severe erosion on south embankments under retaining walls.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	BC18
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install scour protection	$2,500.00
	Total Maintenance Needs Costs	**$2,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider installing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
				Rehabilitation Cost Subtotal	**$0.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$415,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$42,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$42,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$21,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$645,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CS	Metal culvert - No rehabilitation planned.	N/A	25.7

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**89.2**
Structure BC18 is generally in excellent condition, however, consideration should be given to repairing the scour pools at the outlets and the undermined retaining wall at the southwest quadrant of the structure.		

053395: Structure BC-18: Quiet Valley Rd



UTM Coordinates (WGS84)	17-536554m.E 4921143m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. BC-18: Inlet (North)

Photo



2. BC-18: Outlet (South)

Photo



3. BC-18: Barrels (East)

Photo



4. BC-18: Barrels (West)

Photo



5. BC-18: Wall (South West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E01
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E1 - Russel Hills Bridge									
Main Hwy/Road #	Sideroad 4 A	On	X	Crossing Type:	Navig. Water		Non-Navig.	X	Ped.	
		Under			Rail		Road		Other	
Structure Location	2.2km West of 11th Line									
Latitude	44.349485	Longitude	-80.653							
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.			
			Desig./not list		Desig & List					
MTO region		Road Class:	Freeway		Arterial					
			Collector		Local	X				
MTO District		Posted Speed		No. of Lanes	2					
Old County		AADT		% Trucks						
Geographic Twp.		Inspection Route Sequence								
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number								
Total Deck Length	13.1 m	Interchange Structure Number								
Overall Str. Width	8.2 m	Min. Vertical Clearance		m						
Total Deck Area	107.42 sq. m	Special Routes:	Transit		Truck					
			School		Bicycle					
Road Platform Width	7.6 m (btwn tops of slopes)									
Roadway Width	5.3 m (btwn edges of shoulders)	Detour Length Around Bridge		km						
Skew Angle	Degrees	Direction of Structure	East - West							
No. of Spans	1	Fill on Structure	0.3 - 0.5 m							
Span Lengths	12.3 m	Height (streambed to structure top)	2.8 m							

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	xxxx			$0.00
Non-destructive Delamination Survey of Covered Deck:	xxxx			$0.00
Concrete Substructure Condition Survey:	xxxx			$0.00
Detailed Coating Condition Survey:	xxxx			$0.00
Detailed Timber Investigation:	xxxx			$0.00
Post-Tensioned Strand Investigation:	xxxx			$0.00
Underwater Investigation:	xxxx			$0.00
Fatigue Inspection:	xxxx			$0.00
Enhanced OSIM Inspection:	xxxx			$0.00
Structure Evaluation:	xxxx			$0.00
Other:				$0.00
Monitoring of Deformations, Settlements and Movements:	xxxx			$0.00
Monitoring Crack Widths:	xxxx			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☑ Major Rehab.	☐ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Major Rehabilitation is recommended within 2 years. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

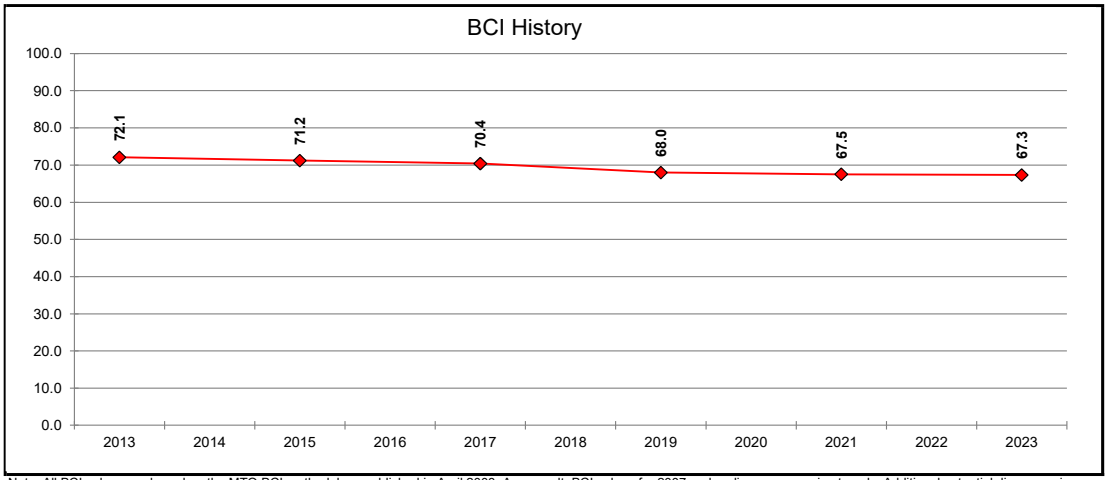
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	67.3	C. MacKenzie	
2021	67.5	C. MacKenzie	
2019	68.0	C. MacKenzie	
2017	70.4	C. MacKenzie	
2015	71.2	T. Littlejohns	
2013	72.1	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	E & W		Height:		m		
Material:	Aluminum		Count:	4			
Element Type:	Other		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	3	1	0	Element BCI	66.3

Comments: Four hazard warning signs installed. One bent.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.5	m		
Location:	E & W		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	Other		Total Quantity:	66	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	66	0	0	Element BCI	75.0

Comments: Light potholes.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:			Height:		m		
Material:			Count:				
Element Type:			Total Quantity:		m		
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None Present - Should be added

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
Consider installing SBGR with end treatments.		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number: E01
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	13.1 m			
Element Name:	Deck Wearing Surface		Width:	5.5 m			
Location:	On top of structure		Height:	m			
Material:	Gravel		Count:				
Element Type:	Other		Total Quantity:	72.05 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	72.05	0	0	Element BCI	75.0
Comments:	Gravel carried over the deck. Vegetation over structure along curb and shoulders. Excessive fill on structure.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Remove full.			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	12.3 m			
Element Name:	Deck Top		Width:	8.2 m			
Location:	Under wearing surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	100.9 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	77	23.9	0	Element BCI	66.7
Comments:	Limited inspection - Condition based on soffit.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider waterproofing and paving			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Barriers		Length:	6x0.4, 4x1.2 m			
Element Name:	Posts		Width:	0.25 m			
Location:	Vertical Components Only		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	14			
Element Type:	Concrete Post and Bars		Total Quantity:	14 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each		13	0	1	Element BCI	60.6
Comments:	Vertical concrete posts only. Northeast has spall, impact damage and disintegration. Barrier too low, remove fill and replace with code conforming system.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider replacing barrier system.			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	3.5 m			
Element Name:	Posts		Width:	0.2 m			
Location:	Horizontal Components Only		Height:	0.4 m			
Material:	Cast-In-Place Concrete		Count:	12			
Element Type:	Concrete Post and Bars		Total Quantity:	12 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	08
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	8	0	4	Element BCI	60.6

Comments: Horizontal concrete posts only. Wide vertical cracks at four locations at vertical post connections. Exposed corroded rebar. Barrier too low, remove fill and replace with code conforming barrier.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider replacing barrier system.		Maintenance Needs: None Performance Deficiencies: Pedestrian/Vehicular Hazard

Element Group:	Curb and S/W		Length:	20.9 m			
Element Name:	Curbs		Width:	0.5 m			
Location:	N & S		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	27.17 Sq.m			
Environment:	Severe		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	16.87	5.15	5.15	Element BCI	54.1

Comments: Limited inspection - buried in gravel. Delaminations, spalling, and disintegration. Exposed corroded rebar.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
Remove gravel and replace with barrier system.		Maintenance Needs: None Performance Deficiencies: None

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	South		Height:	m			
Material:	Steel		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Empty conduit along half the span on the south side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	4.3 m			
Element Name:	Wingwalls		Width:	m			
Location:	All four quadrants		Height:	2.1 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	36.12 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	27.32	4.5	4.3	Element BCI	61.7
Comments:	Narrow cracking, disintegration, delaminations, spalling and efflorescence staining. Wide crack at construction joint at NW and SE wingwall with vegetation growing through.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	8.2 m			
Element Name:	Abutment Walls		Width:	m			
Location:	E & W		Height:	1.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	21.32 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	20.52	0.8	0	Element BCI	73.7
Comments:	Light honeycombing. Staining present.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	12.3 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	Exterior		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	46.74 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	36.74	4	6	Element BCI	62.4
Comments:	Spalls with exposed corroded rebar with section loss on underside portion. Delaminations, spalls and honeycombing.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E01
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	12.3 m			
Element Name:	Soffit - Thick Slab - Int		Width:	6.2 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Solid Slab		Total Quantity:	76.26 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	69.26	3.5	3.5	Element BCI	70.0

Comments: Light scaling, small honeycombing. Spalls around deck drain on east side. Wide full span crack present. Several hairline-narrow full width transverse cracks noted.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Timber lagging on west side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All four quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	3	1	0	Element BCI	66.3

Comments: Washout at N/W corner.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	13
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
		Maintenance Needs: Erosion Control	
Repair washout.		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E01
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Repairs required to Embankments,	$1,000.00
	Total Maintenance Needs Costs	**$1,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to posts, deck top, curbs,		X			$25,000.00
Type B concrete repairs to soffit,		X			$32,000.00
Type C concrete repairs to abutment walls, wingwalls,		X			$40,000.00
Replace barrier system		X			$50,000.00
Add slope stabilization		X			$4,000.00
Waterproof and pave		X			$30,000.00
Concrete Overlay		X			$40,000.00
General Items - Insurance, Mobilization, Access etc.		X			$150,000.00
				Rehabilitation Cost Subtotal	**$371,000.00**

Estimated Value of Replacement Structure	**$1,200,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$386,000.00	$1,215,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$39,000.00	$111,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$39,000.00	$111,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$61,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$576,500.00**	**$1,623,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	2.0	17.3

Recommendation:	Major Rehabilitation is recommended within 2 years.

Justification:	**Current BCI**	**67.3**
Structure E1 is generally in good to fair condition but is demonstrating signs of concrete deterioration, so a rehabilitation should be considered within 2 years.		

053395: Structure E-1: Sideroad 4A



UTM Coordinates (WGS84)	17-527660m.E 4910748m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-1: Abutment Walls (East)

Photo



2. E-1: Wingwalls (North East)

Photo



3. E-1: Deck Wearing Surface (West)

Photo



4. E-1: Railing System (North)

Photo



5. E-1: Soffit - Thick Slab - Int (North)

Photo



6. E-1: Soffit - Thick Slab - Ext (North West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E03
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E3 - Russel Hills Bridge									
Main Hwy/Road #	Sideroad 7A	On	X	Crossing Type:	Navig. Water		Non-Navig.	X	Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.8km East of 7th Line									
Latitude	44.384535			Longitude	-80.569291					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number						
Total Deck Length	8.8 m			Interchange Structure Number						
Overall Str. Width	8.4 m			Min. Vertical Clearance		m				
Total Deck Area	73.92 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	8.25 m (btwn tops of slopes)									
Roadway Width	4.8 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	Degrees			Direction of Structure	E/W					
No. of Spans	1			Fill on Structure	0.1 m					
Span Lengths	8 m			Height (streambed to structure top)	3 m					

Historical Data:

Year Built (◉ Known ○ Estimated ○ Unknown)	1954		Last Evaluation	
Last Biennial Inspection	2021		Current Load Limit	tonnes
Last Bridge Master Inspection			Load Limit By-Law #	
Last Condition Survey			By-Law Expiry Date	
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	25° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:		X		$15,000.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:		X		$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes: A Detailed Deck Condition Survey is recommended prior to rehabilitation to determine the extent of concrete repairs due to wet areas observed on soffit. Monitor wingwall rotation during future biennial inspections.				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☑ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ Within 1 year ☑ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Major Rehabilitation is recommended within 2 years. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

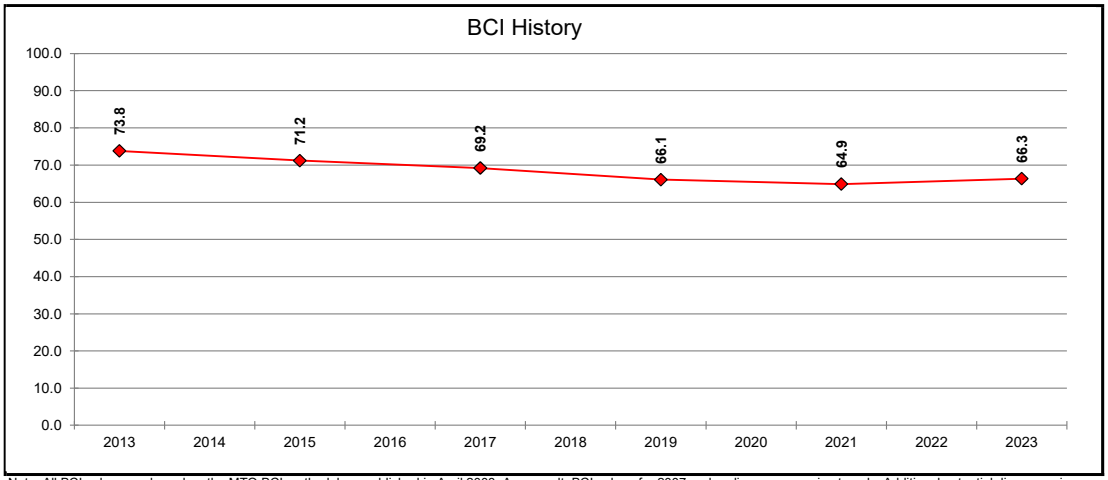
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	66.3	C. MacKenzie	
2021	64.9	C. MacKenzie	
2019	66.1	C. MacKenzie	
2017	69.2	C. MacKenzie	
2015	71.2	T. Littlejohns	
2013	73.8	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E03
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	4.8 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	57.6 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	57.6	0	0	Element BCI	75.0

Comments: Light wheel rutting

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number: E03
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	8.8 m			
Element Name:	Deck Wearing Surface		Width:	4.8 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:				
Element Type:	Other		Total Quantity:	42.24 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	42.24	0	0	Element BCI	75.0
Comments:	Light wheel track rutting. Vegetation growing along deck. Consider removing fill.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**			02	
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☑ 1 Year ☐ 2 Year				
Remove fill.			Maintenance Needs: Bridge Cleaning Performance Deficiencies: None				

Element Group:	Decks		Length:	8.8 m			
Element Name:	Deck Top		Width:	8.4 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	74 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	50	12	12	Element BCI	57.2
Comments:	Limited inspection, condition based on condition of soffit.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Barriers		Length:	3.5 m			
Element Name:	Railing System		Width:	0.2 m			
Location:	Horizontal Components Only		Height:	0.4 m			
Material:	Cast-In-Place Concrete		Count:	8			
Element Type:	Concrete Post and Bars		Total Quantity:	16.8 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	5.8	8	3	Element BCI	44.9
Comments:	Horizontal concrete rails only. Vertical hairline to medium cracks in railing. Scaling and delaminations. Horizontal medium cracks with staining. Disintegration noted (NE).						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	5.4 m			
Element Name:	Posts		Width:	0.25 m			
Location:	Vertical Components Only		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Concrete Post and Bars		Total Quantity:	10 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	9.8	0	0.2	Element BCI	73.5

Comments: Vertical concrete posts only. Staining and narrow to wide cracking.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Curb and S/W		Length:	16 m			
Element Name:	Curbs		Width:	0.5 m			
Location:	North & South		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	20.8 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m		17.2	2.1	1.5	Element BCI	66.1

Comments: Gravel build-up on curb. Narrow to medium cracking. Large spall on southeast.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	South		Height:	m			
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Conduit along south side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	4 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2.1 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	33.6 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	04
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	27.6	3	3	Element BCI	65.2

Comments: Delamination and wide crack at SE corner - full height. Small spalls. Hairline to narrow crack on northeast. Separation of wingwall and abutment on northeast. Consider setting up monitoring program for movement between wingwall and abutment. NE & SE wingwalls rotating outward. limired inspection on south due to vegetation.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: Continuing Movements

Element Group:	Abutments		Length:	8 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	1.9 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	30.4 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	29.8	0.5	0.1	Element BCI	74.2

Comments: Light scaling and honeycombing.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Al		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection, condition based on overall structure condition.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E03
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	8 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	North & South		Height:	0.65 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	26.4 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	25.7	0.4	0.3	Element BCI	73.6
Comments:	Small spalls at center of span. Light scaling.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	8 m			
Element Name:	Soffit - Thick Slab - Int		Width:	6.4 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	51.2 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	29.2	20	2	Element BCI	58.4
Comments:	Small spall, areas of dampness and staining noted throughout. Several longitudinal construction joints with form paper. Hairline cracks. Damp soffit noted at time of inspection in 2021. Soffit dry during 2023 inspection but areas of staining identified.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
Consider waterproofing and paving.			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Aggregation on west side - forcing flow of water to east side. Aggregation also on S/E side. Scour pool on east abutment.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Install rock protection along abutments.		Maintenance Needs: None Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E03
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Wearing Surface,	$1,000.00
	Total Maintenance Needs Costs	**$1,000.00**

Additional Investigations:	Detailed Deck Condition Survey, Monitoring of Deformations, Settlements and Movements,	**$15,000.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to posts, deck top, curbs,					$20,000.00
Type B concrete repairs to soffit,					$30,000.00
Type C concrete repairs to abutment walls, wingwalls,					$20,000.00
Add slope stabilization					$4,000.00
Replace barrier system					$60,000.00
Concrete overlay					$30,000.00
Waterproof and pave					$25,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$314,000.00**

Estimated Value of Replacement Structure	**$900,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$329,000.00	$915,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$33,000.00	$92,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$33,000.00	$92,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$46,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$507,500.00**	**$1,270,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	2.0	16.3

Recommendation:	Major Rehabilitation is recommended within 2 years.

Justification:	**Current BCI**	**66.3**
Structure E3 is generally in good condition but is demonstrating signs of concrete deterioration, and moisture penetration through the deck top. It is recommended that a detailed deck condition survey be completed prior to the rehabilitation to determine the condition of the concrete deck and extent of chloride penetration and reinforcement corrosion.		

053395: Structure E-3: Sideroad 7A



UTM Coordinates (WGS84)	17-534559m.E 4914743m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-3: Soffit - Thick Slab - Ext (North)

Photo



2. E-3: Abutment Walls (East)

Photo



3. E-3: Wingwalls (North West)

Photo



4. E-3: Railing System (South)

Photo



5. E-3: Curbs (North West)

Photo



6. E-3: Soffit - Thick Slab - Int (North)

Photo



7. E-3: Deck Wearing Surface (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E04
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E4 - Talisman Bridge									
Main Hwy/Road #	Sideroad 7A	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	1km West of Grey Road 7									
Latitude	44.390207			Longitude	-80.542825					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes			
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Concrete T-Beam			Interchange Number						
Total Deck Length	9.9 m			Interchange Structure Number						
Overall Str. Width	5.8 m			Min. Vertical Clearance		m				
Total Deck Area	57.42 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	8 m (btwn tops of slopes)									
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0 m					
Span Lengths	9.1 m			Height (streambed to structure top)	3.5 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	12 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E04
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 15, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	25° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☑ Major Rehab.	☐ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Major Rehabilitation is recommended within 2 years. Roadside Safety work recommended.			
Current Load Limit Posting:	12 tonnes			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

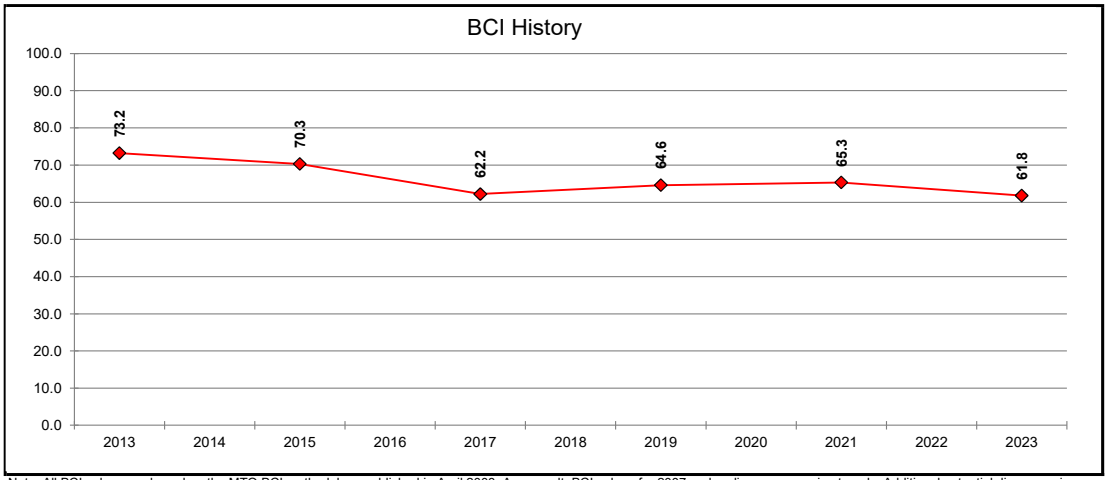
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E04
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	61.8	C. MacKenzie	
2021	65.3	C. MacKenzie	
2019	64.6	C. MacKenzie	
2017	62.2	C. MacKenzie	
2015	70.3	T. Littlejohns	
2013	73.2	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E04
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.6	m		
Location:	East & West		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	67.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	37.2	15	15	Element BCI	50.4
Comments:	Patching evident. Flushing and settlement at abutment. Alligator cracking on southwest approach. Wheel rutting.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing SBGR with proper extruder end treatments.			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E04
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	9.9 m			
Element Name:	Deck Wearing Surface		Width:	5.8 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:				
Element Type:	N/A		Total Quantity:	57.42 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	37.42	10	10	Element BCI	55.8
Comments:	Medium to wide edge cracking . Vegetation and debris along edges. Medium to wide cracking. Alligator cracking. Severe rippling and settlement.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	9.9 m			
Element Name:	Deck Top		Width:	5.8 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	57.42 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	45	6	6.42	Element BCI	63.0
Comments:	Limited inspection, condition based on condition of wearing surface and soffit.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	15.24 m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:	2			
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	30.48 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	0	0	30.48	Element BCI	0.0
Comments:	Posts are rusted. System does not meet current requirements for barrier protection. Steel beam guide rail on 1 in. by 4 in. metal posts.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E04
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Utilities		Width:		m		
Location:	North		Height:		m		
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Large conduit along north side, watermain.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Abutments		Length:	3.6	m		
Element Name:	Wingwalls		Width:		m		
Location:	All Quadrants		Height:	2.4	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	19	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	18.5	0.5	0	Element BCI	74.1

Comments: Hairline to narrow pattern cracking. Horizontal cracking. Cold joint.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Abutments		Length:	5.8	m		
Element Name:	Abutment Walls		Width:		m		
Location:	East & West		Height:	2.1	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	24.36	Sq.m		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	21.86	1.5	1	Element BCI	69.8

Comments: Staining, spalling at bearing seats. Narrow to medium cracking. Cold joint on west.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☐ 6-10 Years ☑

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E04
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	East & West		Height:		m		
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Other		Total Quantity:	1	All		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Limited inspection, condition based on overall structure condition.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:		m		
Element Name:	A. Bearings		Width:		m		
Location:	East & West		Height:		m		
Material:	Other		Count:	4			
Element Type:	Elastomeric Pad		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Steel plates on east expansion end. West end fixed. Section loss on exterior bearings.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	1	m		
Element Name:	Girders - Ends		Width:	0.35	m		
Location:	East & West (Ends)		Height:	0.6	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	6.2	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.8	0.2	0.2	Element BCI	71.5
Comments:	Wide horizontal crack close to west abutment. Medium to large crack with delamination on bottom of south girder.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E04
MTO Site Number: N/A

Element Data

Element Group:	Girders		Length:	7.1 m			
Element Name:	Girders - Middle		Width:	0.35 m			
Location:	Interior (Middle)		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	44.04 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m		36.04	4	4	Element BCI	65.0

Comments: Spalls with exposed corroded rebar. Large spall on northern girder by midspan. Delaminations. Narrow to medium vertical cracking noted. Large crack with delamination on south girder. Bird nest on north girder.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	9.1 m			
Element Name:	Soffit - Thin Slab - Ext		Width:	0.35 m			
Location:	North & South		Height:	0.35 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	12.74 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	8.74	2	2	Element BCI	57.7

Comments: Exposed corroded rebar on north underside. Delamination and spalling at post connections..

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	9.1 m			
Element Name:	Soffit - Thin Slab - Int		Width:	1.2 m			
Location:	Interior (Between Girders)		Height:	m			
Material:	Cast-In-Place Concrete		Count:	3			
Element Type:	Solid Slab		Total Quantity:	32.76 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	28.56	2.1	2.1	Element BCI	67.9

Comments: Small spalls with exposed corroded rebar, delaminations.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E04
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Light washout and erosion at SE and NW end of wingwall.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Flow against SE abutment, causing a scour pool at the corner. Rock protection in place.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E04
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top,					$15,000.00
Type B concrete repairs to Girders, soffit,					$50,000.00
Type C concrete repairs to abutment walls, wingwalls,					$10,000.00
Replace barrier system					$50,000.00
Waterproof and Pave					$40,000.00
General Items - Insurance, Mobilization, Access etc.					$150,000.00
Rehabilitation Cost Subtotal					**$315,000.00**

Estimated Value of Replacement Structure	**$1,400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities	Relocate watermain		$40,000.00
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$55,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$330,000.00	$1,455,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$33,000.00	$123,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$33,000.00	$123,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$73,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$508,500.00**	**$1,899,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	1.8	11.8

Recommendation:	Major Rehabilitation is recommended within 2 years.

Justification:	**Current BCI**	**61.8**
Structure E4 is generally in good to fair condition, however, it is demonstrating signs of concrete deterioration throughout the concrete superstructure and substructure.		

053395: Structure E-4: Sideroad 7A



UTM Coordinates (WGS84)	17-536438m.E 4915315m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-4: Abutment Walls (East)

Photo



2. E-4: Wingwalls (South East)

Photo



3. E-4: Railing System (North)

Photo



4. E-4: Girders - Ends (East)

Photo



5. E-4: Girders - Middle (South)

Photo



6. E-4: Soffit - Thin Slab - Ext (South West)

Photo



7. E-4: Soffit - Thin Slab - Int (East)

Photo



8. E-4: Deck Wearing Surface (West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E05
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E5 - Talisman Bridge									
Main Hwy/Road #	Sideroad 7A	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.5km West of Grey Road 7									
Latitude	44.390837			Longitude	-80.53965					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes			
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Concrete T-Beam			Interchange Number						
Total Deck Length	10.2 m			Interchange Structure Number						
Overall Str. Width	5.8 m			Min. Vertical Clearance		m				
Total Deck Area	59.16 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	8.25 m (btwn tops of slopes)									
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	32 Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0 m					
Span Lengths	9.4 m			Height (streambed to structure top)	1.9 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	12 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Hammer, Camera, Tape Measure		
Weather:	Sunny		
Temperature:	26° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☑ 6 to 10 years	☐ >10 years
Overall Comments:	Forgo rehabilitation and replace structure within 7 years. Roadside Safety work recommended.			
Current Load Limit Posting:	12 tonnes			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

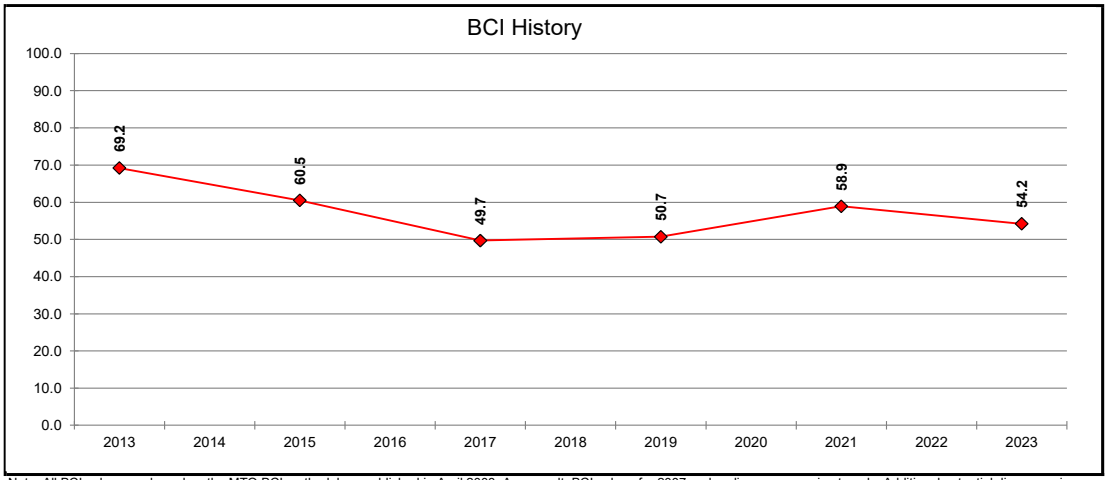
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	54.2	C. MacKenzie	
2021	58.9	C. MacKenzie	Abutment wall condition revised. Girder Qty revised
2019	50.7	C. MacKenzie	
2017	49.7	C. MacKenzie	
2015	60.5	T. Littlejohns	
2013	69.2	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E05
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Four hazard warning signs installed.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.6	m		
Location:	East & West		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	67.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	47.2	20	Element BCI	28.1
Comments:	Settlement at abutments. Alligator cracking. Light wheel rutting, flushing on west side and east side. Vegetation and debris along edges.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing SBGR with proper extruder end treatments.			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Element Data

Element Group:	Decks			Length:	10.2	m		
Element Name:	Deck Wearing Surface			Width:	5.8	m		
Location:	Over Deck Top			Height:		m		
Material:	Asphalt			Count:	1			
Element Type:	N/A			Total Quantity:	59.16	Sq.m		
Environment:	Severe			Limited Inspection:	☐			
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	0	29.16	30		Element BCI	19.7

Comments: Alligator cracking progressing into potholes with cold patch repairs. Medium wheel rutting.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks			Length:	10.2	m		
Element Name:	Deck Top			Width:	5.8	m		
Location:	Under Wearing Surface			Height:		m		
Material:	Cast-In-Place Concrete			Count:	1			
Element Type:	Solid Slab			Total Quantity:	59	Sq.m		
Environment:	Moderate			Limited Inspection:	☑			
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	39	10	10		Element BCI	56.4

Comments: Limited inspection, condition based on condition of wearing surface and soffit. Some soffit leakage noted.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers			Length:	16	m		
Element Name:	Railing System			Width:		m		
Location:	North & South			Height:		m		
Material:	Steel			Count:	2			
Element Type:	Steel Flex Beam on Steel Post			Total Quantity:	32	m		
Environment:	Severe			Limited Inspection:	☐			
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m	0	0	0	32		Element BCI	0.0

Comments: Posts rusty and stained. Barriers do not meet the requirements of the current code. Steel beam guide rail on 1 in. by 5 in. metal posts.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Replace barrier system.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E05
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Utilities		Width:		m		
Location:	North		Height:		m		
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Large conduit along north side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	3.6	m		
Element Name:	Wingwalls		Width:		m		
Location:	All Quadrants		Height:	1.6	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	23.04	Sq.m		
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	14.04	3	6	Element BCI	50.9

Comments: Limited inspection due to dense vegetation. Delaminations, efflorescent staining, spalls and disintegration.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	7.2	m		
Element Name:	Abutment Walls		Width:		m		
Location:	East & West		Height:	0.9	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	12.96	Sq.m		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10.96	1	1	Element BCI	66.5

Comments: Staining at bearing seat, large spalls, disintegration and erosion, light scaling.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	m			
Element Name:	Ballast Walls		Width:	1.2 m			
Location:	East & West		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	6			
Element Type:	Reinforced Concrete		Total Quantity:	5.04 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.64	0.2	0.2	Element BCI	70.6

Comments: Cracking, honeycombing and spalling at exterior corner. Formwork and debris sticking out. Cold joint.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	m			
Element Name:	A. Bearings		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	4			
Element Type:	Plate		Total Quantity:	4 Each			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each		4	0		Element BCI	75.0

Comments: Corrosion and staining, minor section loss.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Girders		Length:	1 m			
Element Name:	Girders - Ends		Width:	0.35 m			
Location:	East & West		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	6.2 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.6	0.3	0.3	Element BCI	69.7

Comments: Girder ends have exposed corroded rebar due to low cover.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	9.4 m			
Element Name:	Soffit - Thin Slab - Ext		Width:	0.35 m			
Location:	North & South		Height:	0.35 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	13.16 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.26	1.4	2.5	Element BCI	57.0
Comments:	Small spalls and hairline crack with staining on fascia. Exposed corroded rebar. Delamination and large spall on south. Vegetation growing.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	9.4 m			
Element Name:	Soffit - Thin Slab - Int		Width:	1.2 m			
Location:	Interior (Between Girders)		Height:	m			
Material:	Cast-In-Place Concrete		Count:	3			
Element Type:	Solid Slab		Total Quantity:	33.84 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	22.84	5.5	5.5	Element BCI	57.1
Comments:	Spalls with exposed corroded rebar and delaminations due to low cover.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	8.4 m			
Element Name:	Girders - Middle		Width:	0.35 m			
Location:	Interior (Middle)		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	52.08 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	42.08	4	6	Element BCI	63.7
Comments:	Cold Joint (hairline to narrow) at N/W ext. beam. Exposed rebar ties. Vertical hairline cracks at mid spans of beams. S int. beam - diagonal cold joint, light honeycombing. Honeycombing, delaminations, large spall at midspan and vertical cracks on S ext. beam. Low cover under all girders leading to spalls. Multiple vertical narrow cracks. Qty revised to account for fixed girder ends and free girder ends. Bird nest on south interior girder.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Heavily vegetated.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0
Comments:	No flow at time of inspection. Vegetation and debris present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E05
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top,					$15,000.00
Type B concrete repairs to Girders, soffit,					$50,000.00
Type C concrete repairs to abutment walls, ballast walls, wingwalls,					$30,000.00
Replace barrier system					$50,000.00
Waterproof and Pave					$30,000.00
Add slope stabilization					$4,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$304,000.00**

Estimated Value of Replacement Structure	**$800,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities	Relocate watermain		$40,000.00
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$65,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$329,000.00	$865,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$33,000.00	$87,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$33,000.00	$87,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$44,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$507,500.00**	**$1,208,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	7.1

Recommendation:	Forgo rehabilitation and replace structure within 7 years.

Justification:	**Current BCI**	**54.2**

Structure E5 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration and moisture penetration through the deck top.

Based on the lack of flow through the structure, the municipality could review the option of replacing the structure with a multi-cell culvert system or smaller precast box culvert option. Preliminary hydraulics have identified that if the span of this structure is reduced, structures E4 and E12 will need to be increased to offset the reduced conveyance capacity of the system.

053395: Structure E-5: Sideroad 7A



UTM Coordinates (WGS84)	17-536668m.E 4915385m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-5: Abutment Walls (East)

Photo



2. E-5: Wingwalls (North East)

Photo



3. E-5: Girders - Ends (East)

Photo



4. E-5: Girders - Middle (South)

Photo



5. E-5: Railing System (South)

Photo



6. E-5: Soffit - Thin Slab - Ext (South)

Photo



7. E-5: Soffit - Thin Slab - Int (East)

Photo



8. E-5: Deck Wearing Surface (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E06
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E6 - Talisman Bridge									
Main Hwy/Road #	Sideroad 7A	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.2km West of Grey Road 7									
Latitude	44.391012			Longitude	-80.538821					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed	80		No. of Lanes	2		
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Cast-In-Place Concrete T-Beam			Interchange Number						
Total Deck Length	9 m			Interchange Structure Number						
Overall Str. Width	5.8 m			Min. Vertical Clearance		m				
Total Deck Area	52.2 sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	7.5 m (btwn tops of slopes)									
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	36 Degrees			Direction of Structure	East - West					
No. of Spans	1			Fill on Structure	0 m					
Span Lengths	8.6 m			Height (streambed to structure top)	1.9 m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	12 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	25° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Forgo rehabilitation and replace structure within 5 years. Roadside Safety work recommended.			
Current Load Limit Posting:	12 tonnes			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

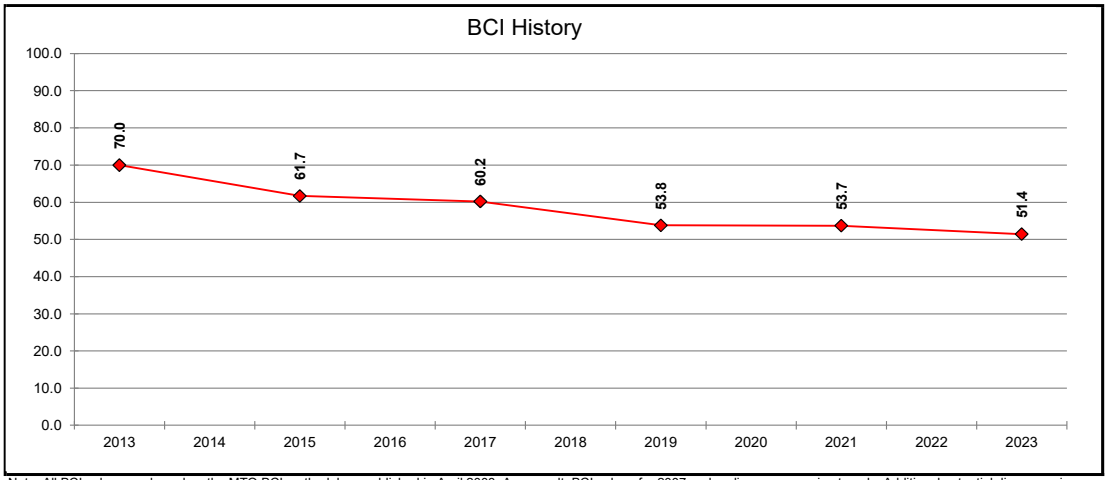
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	51.4	C. MacKenzie	
2021	53.7	C. MacKenzie	
2019	53.8	C. MacKenzie	
2017	60.2	C. MacKenzie	
2015	61.7	T. Littlejohns	
2013	70.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E06
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Four hazard warning signs installed.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing SBGR with proper extruder end treatments.			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.6	m		
Location:	East & West		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	67.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	37.2	30	Element BCI	22.1
Comments:	Map cracking, settlement at abutments, alligator cracking.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	8.6 m				
Element Name:	Deck Wearing Surface		Width:	5.8 m				
Location:	Over Deck Top		Height:	m				
Material:	Asphalt		Count:	1				
Element Type:	N/A		Total Quantity:	49.88 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	15.48	9.4	25		Element BCI	30.8

Comments: Alligator cracking, cold patch repairs, signs of settlement, rutting in wheel tracks.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	9 m				
Element Name:	Deck Top		Width:	5.8 m				
Location:	Under Wearing Surface		Height:	m				
Material:	Cast-In-Place Concrete		Count:	1				
Element Type:	Solid Slab		Total Quantity:	52.2 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	17.8	17.2	17.2		Element BCI	38.8

Comments: Limited inspection, condition based on condition of wearing surface and soffit. Deterioration of south fascia causing deterioration at deck top.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Barriers		Length:	15.24 m				
Element Name:	Railing System		Width:	m				
Location:	North & South		Height:	m				
Material:	Steel		Count:	2				
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	30.48 m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m	0	0	0	30.48		Element BCI	0.0

Comments: Rail consists of light steel post and steel beam guide rail. System does not meet current code, staining evident, end treatment damaged. South bottom connection severely corroded at all posts. Incorrect lapping on South end.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Replace barrier system.		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Utilities		Width:		m		
Location:	North		Height:		m		
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Large watermain along north side of structure.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	3.6	m		
Element Name:	Wingwalls		Width:		m		
Location:	All Quadrants		Height:	1	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	14.4	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10.3	3.6	0.5	Element BCI	63.6

Comments: Hairline map cracking and staining on N/E wingwall, staining SE, stained wide crack delaminated and separated in sections at SW, spall at curb connection, exposed rebar SW, stained hairline crack with efflorescence N. Cold joint at bearing seat on NW. Limited inspection due to vegetation.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	7.2	m		
Element Name:	Abutment Walls		Width:		m		
Location:	East & West		Height:	1.2	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	17.28	Sq.m		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	16.28	0.5	0.5	Element BCI	71.8

Comments: Some narrow vertical cracks with staining. Wide crack on east abutment. Form ties protruding on both abutments, formwork still in place on ballast wall, efflorescence, staining under bearing pads. Honeycombing at bottom.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	m			
Element Name:	A. Bearings		Width:	m			
Location:	West		Height:	m			
Material:	Steel		Count:				
Element Type:	Plate		Total Quantity:	4 Each			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steel pads showing signs of corrosion.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Girders		Length:	1 m			
Element Name:	Girders - Ends		Width:	0.35 m			
Location:	Interior (Ends)		Height:	0.55 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	5.8 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.6	0.6	0.6	Element BCI	63.6

Comments: Spalls on two interior girders on west side. Exposed corroded rebar.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	8.6 m			
Element Name:	Soffit - Thin Slab - Ext		Width:	0.4 m			
Location:	North & South		Height:	0.35 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	12.9 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.45	1	6.45	Element BCI	34.8

Comments: Entire southern side is in poor condition with severe disintegration with exposed corroded rebar, narrow to medium crack at wingwall on north, large spalls at post.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	7.6 m			
Element Name:	Girders - Middle		Width:	0.35 m			
Location:	Interior (Middle)		Height:	0.55 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	T-Beam		Total Quantity:	44.08 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	35.48	4.3	4.3	Element BCI	64.3

Comments: Small spalls and delaminations with exposed corroded rebar, some efflorescent stalactites, narrow vertical cracks at midspan of girders, staining on exterior beam, low cover, staining of bottom corners. Underside of north exterior girder has spalls with exposed corroded rebar.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	8.6 m			
Element Name:	Soffit - Thin Slab - Int		Width:	1.2 m			
Location:	Interior (Between Girders)		Height:	m			
Material:	Cast-In-Place Concrete		Count:	3			
Element Type:	Solid Slab		Total Quantity:	30.96 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	19.96	4	7	Element BCI	53.5

Comments: Spalling with exposed corroded rebar and delaminations due to low cover, efflorescent staining and stalactite, formwork still in place in various locations, limited inspection due to low elevation.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0.75	0.25	0	Element BCI	66.3

Comments: Vegetation at outlet, aggregation at N/W corner.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Heavily vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E06
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top,					$25,000.00
Type B concrete repairs to Girders, soffit,					$60,000.00
Type C concrete repairs to abutment walls, wingwalls,					$15,000.00
Replace barrier system					$50,000.00
Waterproof and Pave					$25,000.00
Add slope stabilization					$5,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
			Rehabilitation Cost Subtotal		**$305,000.00**

Estimated Value of Replacement Structure	**$650,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities	Relocate watermain		$40,000.00
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$55,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$320,000.00	$705,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$32,000.00	$71,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$32,000.00	$71,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$36,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$496,500.00**	**$1,008,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	5.4

Recommendation:	Forgo rehabilitation and replace structure within 5 years.

Justification:	**Current BCI**	**51.4**

Structure E6 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration and moisture penetration through the deck top.

Preliminary hydraulic investigations have identified that the replacement structure for Bridge E6 would be approximately 5m to provide adequate conveyance for the system of structures along Sideroad 7A, provided that both structures E4 and E12 are made larger.

053395: Structure E-6: Sideroad 7A



UTM Coordinates (WGS84)	17-536732m.E 4915404m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-6: Abutment Walls (East)

Photo



2. E-6: Wingwalls (North West)

Photo



3. E-6: Railing System (North)

Photo



4. E-6: Girders - Ends (East)

Photo



5. E-6: Girders - Middle (North)

Photo



6. E-6: Soffit - Thin Slab - Int (West)

Photo



7. E-6: Soffit - Thin Slab - Ext (North)

Photo



8. E-6: Deck Wearing Surface (East)

Photo



9. E-6: A. Bearings (West)

Photo



10. E-6: Utilities (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E11
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E11 - Breadners Bridge										
Main Hwy/Road #	Sideroad 22C	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.		
		Under	X		Rail		Road	X	Other		
Structure Location	1km West of Grey Road 13										
Latitude	44.487309			Longitude	-80.493707						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed	60		No. of Lanes	1			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Steel Truss (Timber Deck)			Interchange Number							
Total Deck Length	34.8 m			Interchange Structure Number							
Overall Str. Width	4.4 m			Min. Vertical Clearance		m					
Total Deck Area	153.12 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	5.2 m (btwn tops of slopes)										
Roadway Width	4 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	34.8 m			Height (streambed to structure top)	3.4 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	12 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year	1990
Concrete deck removed and replaced with post tension timber deck in mid 1990's.		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☑ Major Rehab.	☐ Replace
Timing of Recommended Work:	☑ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Major Rehabilitation is recommended as soon as possible. Maintenance and Roadside Safety work recommended.			
Current Load Limit Posting:	12 tonnes			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

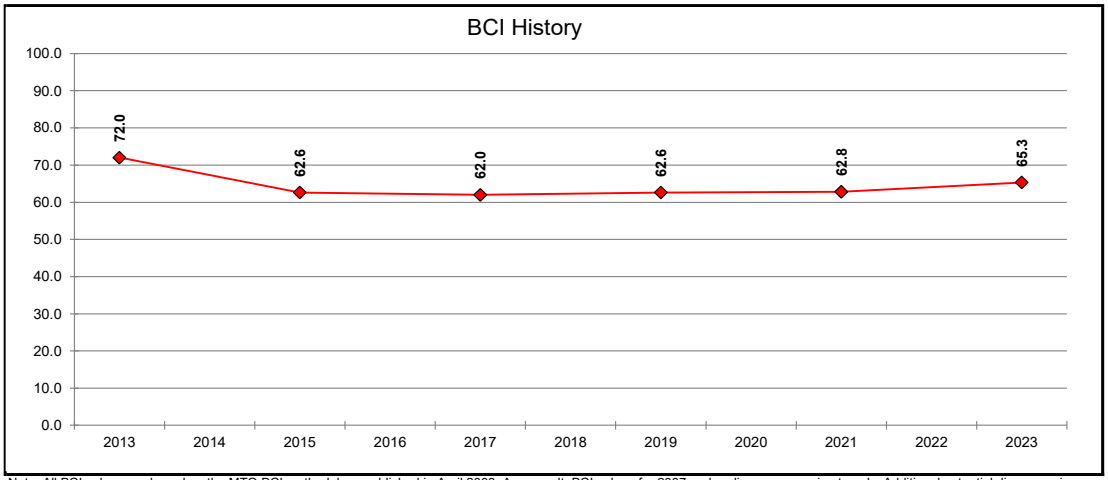
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	65.3	C. MacKenzie	
2021	62.8	C. MacKenzie	
2019	62.6	C. MacKenzie	
2017	62.0	C. MacKenzie	
2015	62.6	T. Littlejohns	
2013	72.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	6			
Element Type:	N/A		Total Quantity:	6	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	6	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed, two load limit signs (12 tonne).

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	4	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	48	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	42	0	6	Element BCI	65.6

Comments: Multiple potholes on approaches.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Regrade gravel wearing surface		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	91.44	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	57.15	19.05	15.24	Element BCI	55.2

Comments: Buried End Treatments. 6, 9, 4, 9, and 7 sections of 3.81m guiderail, offset blocks rotated in multiple locations, consider replacing end treatments with extruders, rotting in multiple posts. impact damage on NE and SW sides. Guide rail mounted low.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E11
MTO Site Number: N/A

Element Data

Element Group:	Joints		Length:	4.2 m			
Element Name:	Armouring/Retaining Device		Width:	0.3 m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	2			
Element Type:	Other		Total Quantity:	2.52 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	0.52	2	0	Element BCI	47.2

Comments: Surface abrasion from plow impact. Surface corrosion and no section loss. Covered with gravel.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	34.8 m			
Element Name:	Deck Wearing Surface		Width:	4 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:				
Element Type:	Other		Total Quantity:	140 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	96.5	40	3.5	Element BCI	63.1

Comments: Long transverse medium cracks, long - light to medium longitudinal cracks, surface abrasion, light wheel track rutting, edge cracking. Deteriorated asphalt 250mm wide stretching entire length.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	34.8 m			
Element Name:	Deck Top		Width:	4 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Wood		Count:				
Element Type:	Laminated Wood Decking - Longitud		Total Quantity:	139.2 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	130	9.2	0	Element BCI	72.7

Comments: Timber deck not visible - Inspection based on soffit and wearing surface.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	9 x 3.81	m		
Element Name:	Railing System		Width:		m		
Location:	North & South		Height:		m		
Material:	Steel		Count:	4			
Element Type:	Steel Flex Beam on Steel Post		Total Quantity:	137.16	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	123.16	10	4	Element BCI	70.3

Comments: Double SBGR system. Minor damage from plow, staining from truss. Wood damaged at connection to barrier.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Trusses		Length:	23.6	m		
Element Name:	Top Chords		Width:	0.26	m		
Location:	North & South		Height:	0.17	m		
Material:	Steel		Count:	2			
Element Type:	Half-Through Truss		Total Quantity:	56.64	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	51.04	5.3	0.3	Element BCI	71.3

Comments: Back to back channel with plate, rust with no visible section loss, minor flaking, S/E corner - bottom of top chord has crack in bottom plate. Bird nests present. Rivet missing on top chord at southwest corner.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Coating		Length:		m		
Element Name:	Coat - Structural Steel - Total		Width:		m		
Location:	Truss Members		Height:		m		
Material:	Steel		Count:				
Element Type:	Other		Total Quantity:	250	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	250		Element BCI	40.0

Comments: AWS. Heavy corrosion and patina over entire structural steel. No visible signs of section loss

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Element Data

Element Group:	Trusses		Length:	4.8 m			
Element Name:	Verticals / Diagonals		Width:	0.21 m			
Location:	Verticals		Height:	0.13 m			
Material:	Steel		Count:	8			
Element Type:	Half-Through Truss		Total Quantity:	26.112 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	22.512	3.5	0.1	Element BCI	70.0
Comments:	Back to back channels, rust with no section loss, flaking, southeast vertical section shows signs of impact damage. Two verticals with signs of impact damage.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Trusses		Length:	6 m			
Element Name:	Verticals / Diagonals		Width:	0.05 m			
Location:	Diagonals		Height:	0.015 m			
Material:	Steel		Count:	15			
Element Type:	Half-Through Truss		Total Quantity:	11.7 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10	1.7	0	Element BCI	70.0
Comments:	Visible signs of corroded steel with no section loss, signs of flaking. NE and SW diagonals show signs of impact damage in 3 locations.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Trusses		Length:	m			
Element Name:	Connections		Width:	m			
Location:			Height:	m			
Material:	Steel		Count:	28			
Element Type:	Half-Through Truss		Total Quantity:	28 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	28	0	0	Element BCI	75.0
Comments:	No excessive corrosion or section loss at any of the connections. No signs of displacement, distortionor elongation.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E11
MTO Site Number: N/A

Element Data

Element Group:	Abutments		Length:	3.6 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	28.8 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	16.8	6	6	Element BCI	52.1
Comments:	Disintegration and delamination on face of wingwalls.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	m			
Element Name:	Abutment Walls		Width:	6 m			
Location:	East & West		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	24 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	14	4	6	Element BCI	50.4
Comments:	Large spalls, disintegration, exposed corroded rebar, cracking and delamination on east and west abutment walls.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	m			
Element Name:	Ballast Walls		Width:	6 m			
Location:	East & West		Height:	0.4 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	4.8 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	4.8	0	Element BCI	40.0
Comments:	Limited inspection based on visibility.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E11
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Abut		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0.75	0	0.25	Element BCI	56.3

Comments: Undermining at SE corner, limited inspection of SW corner and buried areas. Consider adding large stones for scour protection.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	18
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
		Maintenance Needs: Other	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	m			
Element Name:	A. Bearings		Width:	m			
Location:	East & West		Height:	m			
Material:	Other		Count:				
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	0	2	2	Element BCI	20.0

Comments: Fixed end cast in concrete, expansion end buried with debris and seized.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	02
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
		Maintenance Needs: Bridge Cleaning	
Clean bearing seat.		Performance Deficiencies: None	

Element Group:	Trusses		Length:	5 m			
Element Name:	Bottom Chords		Width:	0.02 m			
Location:	North & South		Height:	0.15 m			
Material:	Steel		Count:	28			
Element Type:	Half-Through Truss		Total Quantity:	95.2 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	90.2	5	0	Element BCI	73.2

Comments: Surface corrosion; no section loss. Flaking. 8 elements replaced, new elements are channel sections. One section of bottom chord is bowed.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	4.9	m		
Element Name:	Floor Beams		Width:	0.2	m		
Location:	Interior		Height:	0.45	m		
Material:	Steel		Count:	8			
Element Type:	I-Beam or Girders		Total Quantity:	58.8	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	49.5	8.3	1	Element BCI	68.8

Comments: Some paint peeling, minor rust with section loss. Floor beam on West abutment with section loss and flaking on bottom of web and bottom flange. Birds nest noted. Corroded with section loss at bracing connection.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Bracing		Length:		m		
Element Name:	Bracings		Width:		m		
Location:	Between Floor Beams		Height:		m		
Material:	Steel		Count:	14			
Element Type:	Cross Type		Total Quantity:	14	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	14	0	0	Element BCI	75.0

Comments: Turn buckle cross bracing under each bay. Bracing in good condition.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	34.8	m		
Element Name:	Soffit - Thin Slab - Int		Width:	4.1	m		
Location:	Interior		Height:		m		
Material:	Wood		Count:				
Element Type:	Laminated Wood Decking - Longitud		Total Quantity:	142.68	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	Creosote					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	142.68	0	0	Element BCI	75.0

Comments: Soffit is wet with no visible signs of rot or defects. Creosote treatment observed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	18
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Remove tree.		Maintenance Needs: Other	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	2	1	1	Element BCI	47.5

Comments: Erosion of channel evident on east side that is deteriorating north and south embankments beyond structure location.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Large scour pool at southeast abutment foundation causing severe undermining.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E11
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Abutment Bearings,	$1,500.00
Other	Remove tree growing through bottom chord	$1,000.00
	Total Maintenance Needs Costs	**$2,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Replace Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type C concrete repairs to abutment walls, ballast walls, wingwalls,			X		$50,000.00
Sandblasting and painting required to Structural Steel (Full length),			X		$400,000.00
Waterproof and Pave			X		$50,000.00
Replace bearings			X		$60,000.00
Add slope stabilization			X		$20,000.00
General Items - Insurance, Mobilization, Access etc.			X		$200,000.00
Structural Steel Repairs			X		$40,000.00
Rehabilitation Cost Subtotal					**$820,000.00**

Estimated Value of Replacement Structure	**$2,200,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$845,000.00	$2,225,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$85,000.00	$162,000.00
Environmental Assessment*:	Replacement assumes Schedule B Class Environmental Assessment	$2,500.00	$90,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$85,000.00	$162,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$112,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$1,127,500.00**	**$2,866,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-2	Bridge with span over 20m. Two rehabilitation cycles planned	1.0	12.7

Recommendation:	Major Rehabilitation is recommended as soon as possible.

Justification:	**Current BCI**	**65.3**
Structure E11, which was rehabilitated in 1990, is generally in fair condition and is demonstrating signs of concrete deterioration to the substructure as well as peeling and flaking of the structural steel coating. The structure is considered a heritage bridge and the rehabilitation work required to the structure should provide and aesthetically sympathetic design.		

053395: Structure E-11: Sideroad 22C



UTM Coordinates (WGS84)	17-540273m.E 4926123m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-11: Top Chords (North West)

Photo



2. E-11: Verticals / Diagonals (North)

Photo



3. E-11: Connections (North West)

Photo



4. E-11: Armouring/Retaining Device (West)

Photo



5. E-11: Deck Wearing Surface (West)

Photo



6. E-11: Railing System (North West)

Photo



7. E-11: Bracings (West)

Photo



8. E-11: Abutment Walls (East)

Photo



9. E-11: Wingwalls (South East)

Photo



10. E-11: Soffit - Thick Slab - Int (West)

Photo



11. E-11: Bottom Chords (North)

Photo



12. E-11: Floor Beams (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E12
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E12 - Talisman Bridge										
Main Hwy/Road #	Sideroad 7A	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	0.05km West of Grey Road 7										
Latitude	44.391079			Longitude	-80.5383						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes				
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	6.6 m			Interchange Structure Number							
Overall Str. Width	5.8 m			Min. Vertical Clearance		m					
Total Deck Area	38.28 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	7.7 m (btwn tops of slopes)										
Roadway Width	5.6 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	5.8 m			Height (streambed to structure top)	1.7 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E12
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☑ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Structure replacement is recommended as soon as possible. Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

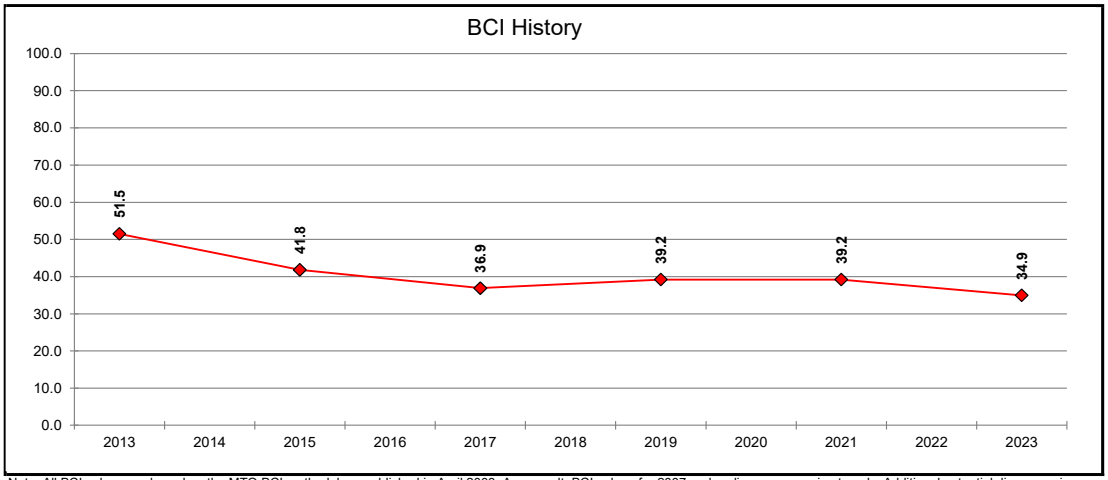
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E12
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	34.9	C. MacKenzie	
2021	39.2	C. MacKenzie	
2019	39.2	C. MacKenzie	
2017	36.9	C. MacKenzie	
2015	41.8	T. Littlejohns	
2013	51.5	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E12
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	6			
Element Type:	N/A		Total Quantity:	6	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	6	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed, one load restriction sign and one speed sign.

Recommended Work: Rehab ☐ Replace ☐	**Maintenance Needs:**
1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
	Maintenance Needs: None
	Performance Deficiencies: None

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	NE & SE		Height:		m		
Material:	Steel		Count:	2			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	7.62	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	7.62	0	0	Element BCI	75.0

Comments: Northeast and southeast (approach) sides only, lapping incorrect at S/E side.

Recommended Work: Rehab ☐ Replace ☐	**Maintenance Needs:**
1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing SBGR at all corners with proper extruder end treatments.	Maintenance Needs: None
	Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.6	m		
Location:	North & South		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	67.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	18	49.2	Element BCI	10.7

Comments: Alligator and map cracking, settlement evident at both ends, longitudinal wide crack at west center line.

Recommended Work: Rehab ☐ Replace ☑	**Maintenance Needs:**
1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
	Maintenance Needs: None
	Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E12
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	6.6 m			
Element Name:	Deck Wearing Surface		Width:	5.6 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	N/A		Total Quantity:	36.96 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10.56	13.2	13.2	Element BCI	35.7

Comments: Map cracking, patched potholes, alligator cracking, light wheel rutting, vegetation growing on shoulders.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers		Length:	7.62 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:	2			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	15.24 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	0	0	15.24	Element BCI	0.0

Comments: Does not meet current standards, surface corrosion, incorrect lapping at SE corner, impact damage north. Railing posts are not connected to structure.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	6.6 m			
Element Name:	Deck Top		Width:	5.8 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	38.28 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	20	6.28	12	Element BCI	45.7

Comments: Limited inspection, condition based on condition of wearing surface and soffit.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E12
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:	9 m			
Element Name:	Utilities		Width:	m			
Location:	North		Height:	m			
Material:	Steel		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Insulated watermain on north side. Vegetation growing over structure.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Abutments		Length:	2.55 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	9.18 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	1	8.18	Element BCI	4.4

Comments: Large spalls, map cracking, staining, two walls at 45 degree angles, two at 90 degrees, limited inspection on N/W wingwall (buried), delaminations, medium to wide cracking at cold joints, efflorescence staining, crack at SE curb joint, erosion at SW corner.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Abutments		Length:	m			
Element Name:	Abutment Walls		Width:	5.8 m			
Location:	North & South		Height:	0.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	9.28 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.48	3	1.8	Element BCI	49.1

Comments: Spalls on corners, severe honeycombing, disintegration, light to medium scaling, horizontal crack at cold joint east.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E12
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	North & South		Height:		m		
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	5.8	m		
Element Name:	Soffit - Thick Slab - Ext		Width:	1	m		
Location:	East & West		Height:	0.65	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	19.14	Sq.m		
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.14	2	12	Element BCI	24.3

Comments: Disintegration of fascia with exposed corroded rebar, limited inspection on west side due to watermain, vegetation growing over fascia, entire east side poor. Limited inspection due to utility.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	5.8	m		
Element Name:	Soffit - Thick Slab - Int		Width:	3.8	m		
Location:	Interior		Height:		m		
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	22.04	Sq.m		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	12.04	5	5	Element BCI	50.0

Comments: Spall with exposed corroded rebar, delaminations, dampness evident. Limited inspection due to high water level and low clearance.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number: E12
MTO Site Number: N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	East & West		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0.5	0.5	0	Element BCI	57.5

Comments: Aggregation on N/W and S/E corner, pushing flow to east side. Severe scour at southeast.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E12
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider replacing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top,					$30,000.00
Type B concrete repairs to soffit,					$50,000.00
Type C concrete repairs to abutment walls, wingwalls,					$50,000.00
Replace barrier system					$50,000.00
Waterproof and Pave					$25,000.00
Add slope stabilization					$5,000.00
General Items - Insurance, Mobilization, Access etc.					$150,000.00
			Rehabilitation Cost Subtotal		**$360,000.00**

Estimated Value of Replacement Structure	**$800,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$375,000.00	$815,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$38,000.00	$82,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$38,000.00	$82,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$41,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$468,500.00**	**$1,145,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	0.0

Recommendation:	Structure replacement is recommended as soon as possible.

Justification:	**Current BCI**	**34.9**

Structure E12 is generally in poor condition and is demonstrating signs of severe concrete deterioration. Based on the current BCI, this structure has surpassed the typical feasible rehabilitation threshold and replacement of the structure should be scheduled within the next year.

Preliminary investigations and sizing of the structure are underway and it has been determined that a 14m span (+/-) structure is proposed based on the hydraulics of the system of structures along Sideroad 7A.

053395: Structure E-12: Sideroad 7A



UTM Coordinates (WGS84)	17-536784m.E 4915420m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-12: Wingwalls (South West)

Photo



2. E-12: Abutment Walls (West)

Photo



3. E-12: Soffit - Thick Slab - Int (North)

Photo



4. E-12: Soffit - Thick Slab - Ext (South West)

Photo



5. E-12: Railing System (South)

Photo



6. E-12: Utilities (North)

Photo



7. E-12: Deck Wearing Surface (East)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E13
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E13 - Euphrasia - St. Vincent Townline Bridge										
Main Hwy/Road #	Euphrasia - St. Vincent Townline	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	0.1km West of Deviation Road										
Latitude				Longitude							
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.	Euphrasia			Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	6.1 m			Interchange Structure Number							
Overall Str. Width	6 m			Min. Vertical Clearance		m					
Total Deck Area	36.6 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.1 m (btwn tops of slopes)										
Roadway Width	5.55 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	E/W						
No. of Spans	1			Fill on Structure	0.3 m						
Span Lengths	5.5 m			Height (streambed to structure top)	1.55 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year	2020
Structural rehabilitation completed in 2020. Concrete overlay, curb removal and replacement and TCB barrier installation completed.		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Structure replacement is recommended within 5 years. Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

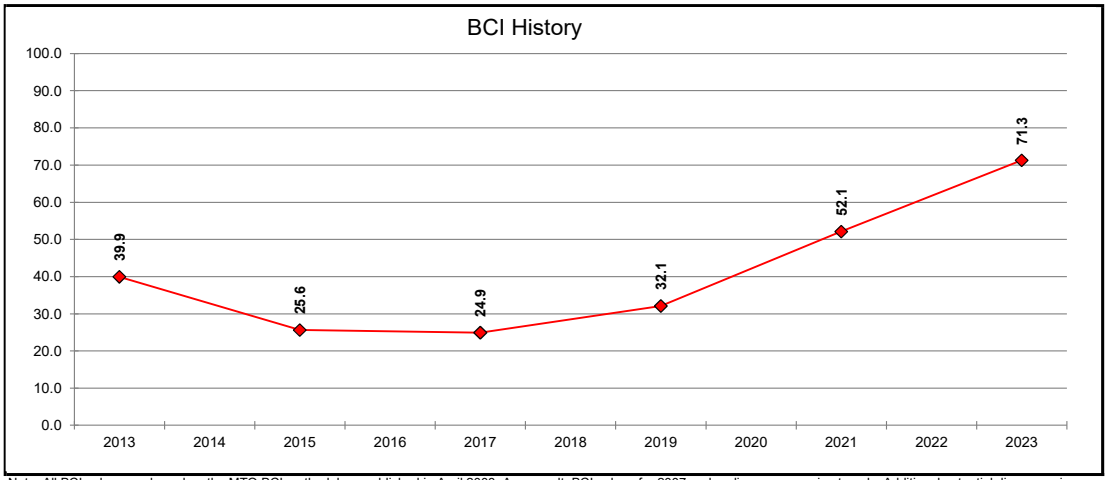
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	71.3	C. MacKenzie	
2021	52.1	C. MacKenzie	Structural Rehabilitation completed
2019	32.1	C. MacKenzie	Concrete deficiencies on soffit re-evaluated (due to low cover)
2017	24.9	C. MacKenzie	
2015	25.6	T. Littlejohns	
2013	39.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E13
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	3	0	1	Element BCI	56.3
Comments:	Three hazard warning signs installed. Southeast sign laying on shoulder						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.55	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	66.6	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	60.6	6	0	Element BCI	71.8
Comments:	Multiple minor potholes throughout approach.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
Regrade wearing surface			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.1 m				
Element Name:	Deck Top		Width:	5.55 m				
Location:			Height:	m				
Material:	Cast-In-Place Concrete		Count:					
Element Type:	N/A		Total Quantity:	33.9 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	13.56	20.34	0	0		Element BCI	85.0

Comments: Exposed concrete deck top with gravel tracked onto wearing surface. New concrete overlay (2020). Abrasion in wheel path.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers		Length:	16 m				
Element Name:	Railing System		Width:	m				
Location:	North & South		Height:	1.3 m				
Material:	Precast Concrete		Count:	2				
Element Type:	Other		Total Quantity:	32 m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m	0	32	0	0		Element BCI	75.0

Comments: Concrete TCB's on both sides (20m x 2). Concrete barrier has some minor spalls at corners and connection areas.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Curb and S/W		Length:	20 m				
Element Name:	Curbs		Width:	m				
Location:	North & South		Height:	0.3 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Barrier Curb		Total Quantity:	12 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	4.8	7.2	0	0		Element BCI	85.0

Comments: New curbs installed in 2020 rehabilitation. Curbs are in excellent condition.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	1.5 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	19.2 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4	7.2	8	Element BCI	30.6
Comments:	N = 1.6m long, S = 4.8m long. Spalling, disintegration and delaminations on N/W and N/E wingwall, hairline to wide cracking with efflorescence. Limited inspection due to rip rap. Cracks and delaminations at SW, spalling and disintegration at SE.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Abutments		Length:	m			
Element Name:	Abutment Walls		Width:	6 m			
Location:	East & West		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	10.8 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	6.8	2	2	Element BCI	54.6
Comments:	Severe erosion at bottom, spalls with exposed rebar, staining, efflorescence cracking.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - At		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0.8	0.2	0	Element BCI	68.0
Comments:	Scaling and light disintegration. No undermining or erosion evident.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.5 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	North & South		Height:	0.65 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	18.15 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	14.52	3.63			Element BCI	95.0
Comments:	Structural slab installed in 2020, condition of original soffit not considered.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	4 m			
Element Name:	Soffit - Thick Slab - Int		Width:	5.5 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Solid Slab		Total Quantity:	22 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	19.36	2.64			Element BCI	97.0
Comments:	Structural slab installed in 2020, condition of original soffit not considered.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Heavily vegetated at time of inspection. North side has rip rap.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Remove trees from waterway, SE blockage in waterway causing flow to direct water into east abutment. Curb from North side in watercourse. Aggradation SW inlet blocking channel. Consider removing tree.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E13
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type C concrete repairs to abutment walls, wingwalls,					$60,000.00
Add slope stabilization					$5,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
				Rehabilitation Cost Subtotal	**$190,000.00**

Estimated Value of Replacement Structure	**$550,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$205,000.00	$565,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$21,000.00	$57,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$21,000.00	$57,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$29,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$359,500.00**	**$833,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	N/A	5.0

Recommendation:	Structure replacement is recommended within 5 years.

Justification:	**Current BCI**	**71.3**
Structure E13 had emergency rehabilitation work completed in 2020 consisting of barrier installation, curb removal and the installation of a concrete structural slab. The repair was completed to prevent closure of the bridge and allow for the planning and design of a replacement structure. The structural rehabilitation was completed to temporarily prolong the service life of the structure, however, the existing substructure has been used to calculate the current BCI and as a result of the poor condition of the abutment walls and wingwalls, replacement should still be scheduled within the next 5 years.		

053395: Structure E-13: Euphrasia-St Vincent Tline



UTM Coordinates (WGS84)	17-526748m.E 4927971m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-13: Abutment Walls (East)

Photo



2. E-13: Wingwalls (South East)

Photo



3. E-13: Deck Top (East)

Photo



4. E-13: Soffit - Thick Slab - Ext (North East)

Photo



5. E-13: Soffit - Thick Slab - Int (South)

Photo



6. E-13: undefined (North West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E14
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E14 - Mill Creek South Bridge										
Main Hwy/Road #	Euphrasia - St. Vincent Townline	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	2km North of Grey Road 19										
Latitude	44.464142			Longitude	-80.48575						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	6.3 m			Interchange Structure Number							
Overall Str. Width	7 m			Min. Vertical Clearance		m					
Total Deck Area	44.1 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	7.5 m (btwn tops of slopes)										
Roadway Width	6.3 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	5.5 m			Height (streambed to structure top)	2 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A. Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	20° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☑ 1 to 5 years	☐ 6 to 10 years	☐ >10 years
Overall Comments:	Forgo rehabilitation and replace structure within 4 years. Roadside Safety work recommended.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

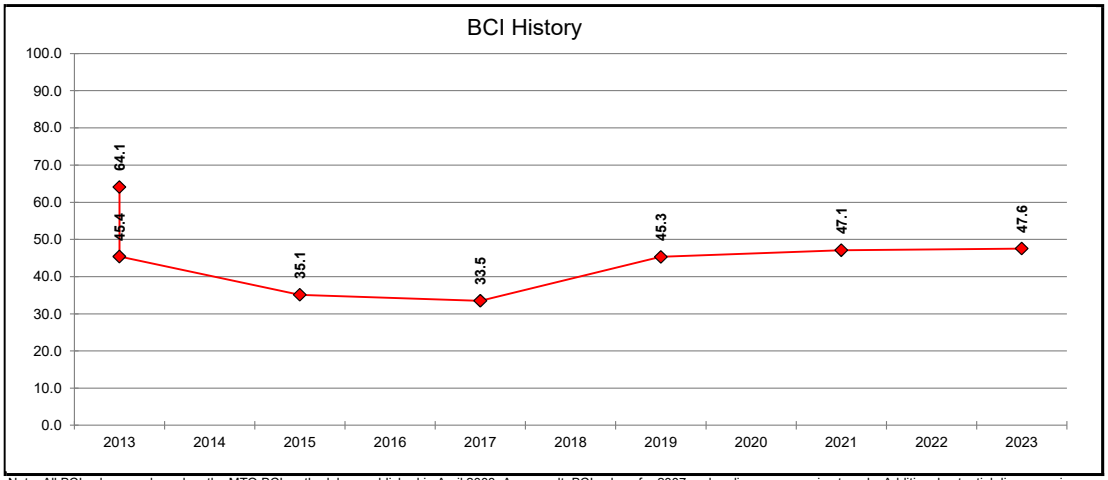
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	47.6	C. MacKenzie	
2021	47.1	C. MacKenzie	
2019	45.3	C. MacKenzie	Concrete deficiences on soffit re-evaluated (due to low cover)
2017	33.5	C. MacKenzie	
2015	35.1	T. Littlejohns	
2013	45.4	J. Cober	
2013	64.1	J. Cober	#N/A

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed. Impact damage on one hazard warning sign.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatment.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	6.3	m		
Location:	North & South		Height:		m		
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	75.6	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	75.6	0	0	Element BCI	75.0

Comments: No visible defects. Gravel tracked on to northeasf approach.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.3 m			
Element Name:	Deck Wearing Surface		Width:	6.3 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:				
Element Type:	N/A		Total Quantity:	39.69 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	39.69	0	0	Element BCI	75.0
Comments:	No visible defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Curb and S/W		Length:	10.8 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	6.48 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	5.38	0.6	0.5	Element BCI	66.0
Comments:	Scaling, spalling, disintegration and hairline to narrow cracking.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	10.8 m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Bars		Total Quantity:	21.6 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	0	0	21.6	Element BCI	0.0
Comments:	Spalls with exposed corroded rebar, section missing, disintegration. Impact damage at corners with rotation and severed concrete end posts.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.3 m			
Element Name:	Deck Top		Width:	6.3 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	39.7 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	23.7	9	7	Element BCI	53.8
Comments:	Limited inspection, condition based on wearing surface and soffit.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	5.5 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	Exterior		Height:	0.75 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Solid Slab		Total Quantity:	19.25 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	8	6.25	5	Element BCI	44.2
Comments:	Stalactites, spalls with exposed corroded rebar and some delaminations, wide horizontal cracks, spalls, staining. Limited visibility due to debris and vegetation.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Decks		Length:	5.5 m			
Element Name:	Soffit - Thick Slab - Int		Width:	5 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Solid Slab		Total Quantity:	27.5 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	17.5	5	5	Element BCI	55.0
Comments:	Medium honeycombing. Medium to wide crack at centerline, stalactites, exposed corroded rebar in various locations, medium to wide cracks full width at construction joint, dampness evident, very large sized aggregate in concrete. Narrow to medium cracking throughout. Cracking with efflorescence staining (west).						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E14
MTO Site Number: N/A

Element Data

Element Group:	Abutments		Length:	2.8 m			
Element Name:	Wingwalls		Width:	m			
Location:	All Quadrants		Height:	2 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	22.4 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.2	9.2	4	Element BCI	47.2
Comments:	Scaling, delaminations, cracks with efflorescence and disintegration at bottom. Hairline map cracking throughout, severe scaling on NW, wide crack and delamination on SE. Limited inspection due to debris and vegetation.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	7 m			
Element Name:	Abutment Walls		Width:	m			
Location:	North & South		Height:	1.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	18.2 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	11.2	3	4	Element BCI	52.7
Comments:	Scaling, erosion and spalling. Medium to wide cracking, hairline map cracking. Severe honeycombing and delaminations. Accessible section sounded.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - Al		Width:	m			
Location:	North & South		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Other		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Limited inspection.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E14
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	East		Height:	m			
Material:	Steel		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Conduit located on east side.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	13
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	0	1	Element BCI	0.0

Comments: No water at time of inspection. Significant amount of debris under structure.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: Flooding/Channel Blockage

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated, material dumped on SE embankment, washout at SE and SW corner.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E14
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,					$15,000.00
Type B concrete repairs to soffit,					$40,000.00
Type C concrete repairs to abutment walls, wingwalls,					$35,000.00
Add slope stabilization					$8,000.00
Replace barrier system					$50,000.00
Waterproof and pave					$30,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$303,000.00**

Estimated Value of Replacement Structure	**$650,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$318,000.00	$665,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$32,000.00	$67,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$32,000.00	$67,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$34,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$494,500.00**	**$958,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	3.8

Recommendation:	Forgo rehabilitation and replace structure within 4 years.

Justification:	**Current BCI**	**47.6**
Structure E14 is generally in poor condition and is demonstrating signs of severe concrete deterioration. Due to high levels of debris under the structure, the entire soffit was not able to be inspected.		

053395: Structure E-14: The Blue Mountains Euphrasia Townline



UTM Coordinates (WGS84)	17-540947m.E 4923435m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure

Inspectors | Alex Eremeev, Calum Mackenzie

1. E-14: Soffit - Thick Slab - Ext (South East)

Photo



2. E-14: Soffit - Thick Slab - Int (West)

Photo



3. E-14: Deck Wearing Surface (North)

Photo



4. E-14: Abutment Walls (South)

Photo



5. E-14: Wingwalls (South East)

Photo



6. E-14: Railing System (West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: E15
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge E15									
Main Hwy/Road #	Shilvock Sideroad	On	X	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under	X		Rail		Road	X	Other	
Structure Location	0.8km South of Sideroad 7A									
Latitude	44.382155			Longitude	-80.544807					
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.	
					Desig./not list		Desig & List			
MTO region				Road Class:	Freeway		Arterial			
					Collector		Local	X		
MTO District				Posted Speed			No. of Lanes			
Old County				AADT			% Trucks			
Geographic Twp.				Inspection Route Sequence						
Structure Type	Steel I-Girder (Timber Deck)			Interchange Number						
Total Deck Length	4.25 m			Interchange Structure Number						
Overall Str. Width	4.25 m			Min. Vertical Clearance		m				
Total Deck Area	sq. m			Special Routes:	Transit		Truck			
					School		Bicycle			
Road Platform Width	6 m (btwn tops of slopes)									
Roadway Width	3.95 m (btwn edges of shoulders)			Detour Length Around Bridge		km				
Skew Angle	30 Degrees			Direction of Structure	N/S					
No. of Spans	1			Fill on Structure	0 m					
Span Lengths	3.95 m			Height (streambed to structure top)	1.6 m					

Historical Data:

Year Built (◉ Known ○ Estimated ○ Unknown)	2013	Last Evaluation		
Last Biennial Inspection	2021	Current Load Limit		tonnes
Last Bridge Master Inspection		Load Limit By-Law #		
Last Condition Survey		By-Law Expiry Date		
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		
Superstructure replaced in 2013.			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	July 11, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	C. MacKenzie		
Others in Party:	A.Eremeev		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	25° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:				
Recommended Work on Structure:	☐ None	☐ Minor Rehab.	☐ Major Rehab.	☑ Replace
Timing of Recommended Work:	☐ Within 1 year	☐ 1 to 5 years	☐ 6 to 10 years	☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years.			
Current Load Limit Posting:	N/A			
Recommended Load Limit Posting:	N/A			
Date of Next Inspection:	2025			

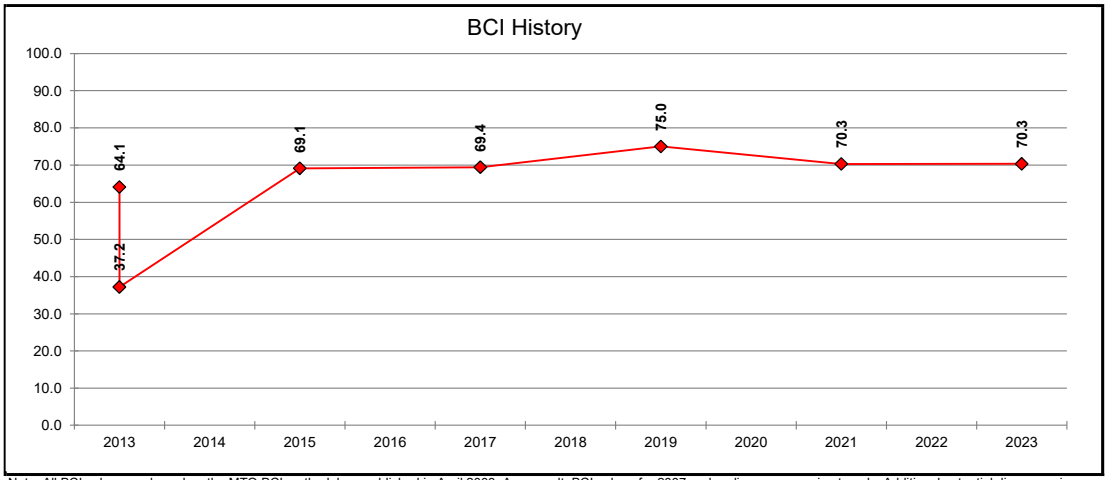
Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	70.3	C. MacKenzie	
2021	70.3	C. MacKenzie	
2019	75.0	C. MacKenzie	Old abutments removed from BCI calculator
2017	69.4	C. MacKenzie	
2015	69.1	T. Littlejohns	New superstructure constructed in 2013
2013	37.2	J. Cober	
2013	64.1	J. Cober	#N/A

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number: E15
MTO Site Number: N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Consider installing full size signs.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	4	m		
Location:	North & South		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	48	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	48	0	0	Element BCI	75.0
Comments:	Loose gravel on approaches. Small pothole at north.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: E15
MTO Site Number: N/A

Element Data

Element Group:	Decks		Length:	5 m			
Element Name:	Deck Top		Width:	4.5 m			
Location:	Exposed		Height:	m			
Material:	Wood		Count:				
Element Type:	Laminated Wood Decking - Transverse		Total Quantity:	22.5 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	14.5	8	0	Element BCI	62.6

Comments: Timber curbs and timber decking. Surface abrasion from equipment.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	East & West		Height:	m			
Material:	Steel		Count:				
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: No barrier system present.

Recommended Work: Rehab ☐ Replace ☑
1-5 Years ☑ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Curb and S/W		Length:	4 m			
Element Name:	Curbs		Width:	0.2 m			
Location:	East & West		Height:	0.2 m			
Material:	Wood		Count:	2			
Element Type:	Timber Curb		Total Quantity:	3.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.1	0.1	0	Element BCI	73.9

Comments: Impact damage at northwest and southeast. Less than 5% checking.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Utilities		Width:		m		
Location:	West		Height:		m		
Material:	Steel		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Small bell conduit on west side, no longer attached to bridge in some locations.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Retaining Walls		Length:	5.5	m		
Element Name:	Wall		Width:		m		
Location:	North & South (Old Abutments)		Height:	1.4	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Reinforced Concrete		Total Quantity:	15.4	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	7.1	4.8	3.5	Element BCI	47.0

Comments: Cold joint observed. Old abutments are not serving as a structural element. Large crack in spall at north CL.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	5.9	m		
Element Name:	Wingwalls		Width:	0.175	m		
Location:	All Quadrants		Height:	0.36	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Reinforced Concrete		Total Quantity:	29.38	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	29.38	0	0	Element BCI	75.0

Comments: 45 degree wing walls, light to medium scaling. Wingwalls are a part of the old structure, new structure has no wingwalls. Acting as retaining wall/channeling flow. Delaminations.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	5.5 m				
Element Name:	Abutment Walls		Width:	m				
Location:	North & South		Height:	0.5 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Reinforced Concrete		Total Quantity:	5.5 Sq.m				
Environment:	Moderate		Limited Inspection:	☑				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	5.5	0	0		Element BCI	75.0

Comments: Limited inspection - New abutments were constructed behind the old abutments.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	m				
Element Name:	Ballast Walls		Width:	4.25 m				
Location:	North & South		Height:	0.9 m				
Material:	Wood		Count:	2				
Element Type:	N/A		Total Quantity:	7.65 Sq.m				
Environment:	Benign		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	7.65	0	0		Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Abutments		Length:	m				
Element Name:	A. Bearings		Width:	m				
Location:	North & South		Height:	m				
Material:	Other		Count:	8				
Element Type:	Elastomeric Pad		Total Quantity:	8 Each				
Environment:	Benign		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	8	0	0		Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.9	m		
Element Name:	Soffit - Thin Slab - Ext		Width:	0.43	m		
Location:	East & West (Exterior)		Height:	0.14	m		
Material:	Wood		Count:	2			
Element Type:	Laminated Wood Decking - Transverse		Total Quantity:	6.73	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	6.73	0	0	Element BCI	75.0
Comments:	Minor checks, splits and shakes noted.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	1	m		
Element Name:	Girders - Ends		Width:	0.175	m		
Location:	North & South		Height:	0.36	m		
Material:	Steel		Count:	8			
Element Type:	I-Beam or Girders		Total Quantity:	9.96	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.96	0	0	Element BCI	75.0
Comments:	Light corrosion on bottom flange. Flaking of coating.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:		m		
Element Name:	Diaphragms - End		Width:		m		
Location:	Between Girders		Height:		m		
Material:	Steel		Count:	6			
Element Type:	Channel		Total Quantity:	6	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	6	0	0	Element BCI	75.0
Comments:	Welded connections and bolted to abutment. Light corrosion with light section loss.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	3.9 m			
Element Name:	Girders - Middle		Width:	0.175 m			
Location:	Interior		Height:	0.36 m			
Material:	Steel		Count:	4			
Element Type:	I-Beam or Girders		Total Quantity:	19.42 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	19.42	0	0	Element BCI	75.0

Comments: Light corrosion on bottom flange with light section loss.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Girders		Length:	m			
Element Name:	Diaphragms - Middle		Width:	0.08 m			
Location:	Between Girders		Height:	0.3 m			
Material:	Steel		Count:	3			
Element Type:	Channel		Total Quantity:	3 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	3	0	0	Element BCI	75.0

Comments: Welded connections. Surface corrosion, coating flaking. Bird nest on interior diaphragm.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	4 m			
Element Name:	Soffit - Thin Slab - Int		Width:	0.1 m			
Location:	Interior		Height:	m			
Material:	Wood		Count:	8			
Element Type:	Laminated Wood Decking - Transve		Total Quantity:	3.2 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.2	0	0	Element BCI	75.0

Comments: Light splits.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number: E15
MTO Site Number: N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0

Comments: Flows west to east.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	E15
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type C concrete repairs to wall,					$15,000.00
Steel repairs to utilities,					$3,000.00
Add slope stabilization					$4,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
				Rehabilitation Cost Subtotal	**$147,000.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$162,000.00	$415,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$17,000.00	$42,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$20,000.00	$42,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$21,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$216,500.00**	**$645,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR	Bridge with span less than 4.5m and replacement planned	N/A	22.7

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**70.3**
Structure E15 was reconstructed in 2013 and is generally in good condition. Light corrosion on the steel girders and impact damage on the timber curbs was noted during the inspection.		

053395: Structure E-15: Shilvock Sideroad



UTM Coordinates (WGS84)	17-536265m.E 4914503m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Alex Eremeev, Calum Mackenzie

1. E-15: Curbs (South West)

Photo



2. E-15: Deck Top (North)

Photo



3. E-15: Wall (South West)

Photo



4. E-15: Girders - Ends (North)

Photo



5. E-15: Girders - Middle (East)

Photo



6. E-15: Diaphragms - Middle (North)

Photo



7. E-15: Soffit - Thin Slab - Int (North)

Photo



8. E-15: Soffit - Thin Slab - Ext (North West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O08
MTO Site Number: N/A

Inventory Data:

Structure Name	Culvert O8										
Main Hwy/Road #	Centre Line A	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	1.8km East of Grey Road 2										
Latitude	44.259256			Longitude	-80.362504						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	1			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	CSP Round Culvert(s)			Interchange Number							
Total Deck Length	7 m			Interchange Structure Number							
Overall Str. Width	10.5 m			Min. Vertical Clearance		m					
Total Deck Area	73.5 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	5.5 m (btwn tops of slopes)										
Roadway Width	5 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	N-S						
No. of Spans	3			Fill on Structure	0.45 m						
Span Lengths	1.6, 1.6, 1.6 m			Height (streambed to structure top)	1.4 m						

Historical Data:

Year Built	(●) Known ( ) Estimated ( ) Unknown	2019	Last Evaluation	
Last Biennial Inspection		2021	Current Load Limit	tonnes
Last Bridge Master Inspection			Load Limit By-Law #	
Last Condition Survey			By-Law Expiry Date	
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		
Structure replaced in Aug-2019			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Tape Measure, Flashlight		
Weather:	Overcast		
Temperature:	12°C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

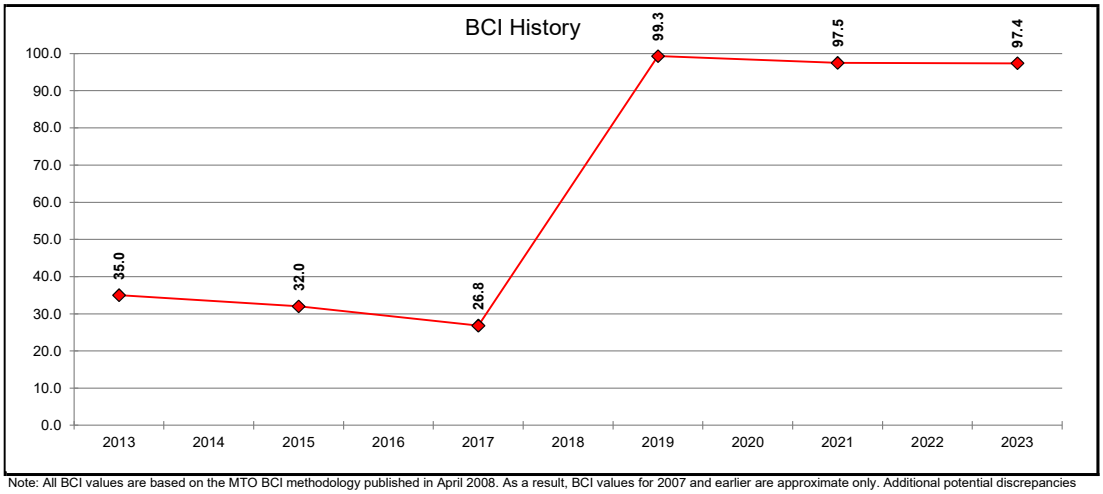
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	97.4	A. Grzywnowicz	
2021	97.5	C. MacKenzie	
2019	99.3	C. MacKenzie	Structure Replaced in 2019
2017	26.8	C. MacKenzie	
2015	32.0	T. Littlejohns	
2013	35.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs, SE has minor impact damage.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	60	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	60	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	7	m		
Element Name:	Deck Wearing Surface		Width:	5	m		
Location:	Over Structure		Height:		m		
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	35	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	35	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	West		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition. Limited inspection due to clearance. Small scratches through polymer coating likely during installation.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	Middle		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition. Limited inspection due to clearance. Small scratches through polymer coating likely during installation.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	East		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition. Limited inspection due to clearance. Small scratches through polymer coating likely during installation.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	North & South		Height:	m			
Material:	Other		Count:				
Element Type:	Rock Protection		Total Quantity:	2 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	2	0	0	Element BCI	75.0

Comments: Rip-rap rock protection on both embankments. No signs of erosion.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1			Element BCI	75.0

Comments: Stagnant water in all three culverts. Water depth in culverts approximately 1.4 m.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O08
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
			Rehabilitation Cost Subtotal		**$0.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$415,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$42,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$42,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$21,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$645,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CS	Metal culvert - No rehabilitation planned.	N/A	50.0

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**97.4**
Structure O8 was replaced in 2019 and is in excellent condition.		

053395: Structure O-8: Centre Line A



UTM Coordinates (WGS84)	17-550898m.E 4900865m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. O-8: Deck Wearing Surface (West)

Photo



2. O-8: Inlet (North)

Photo



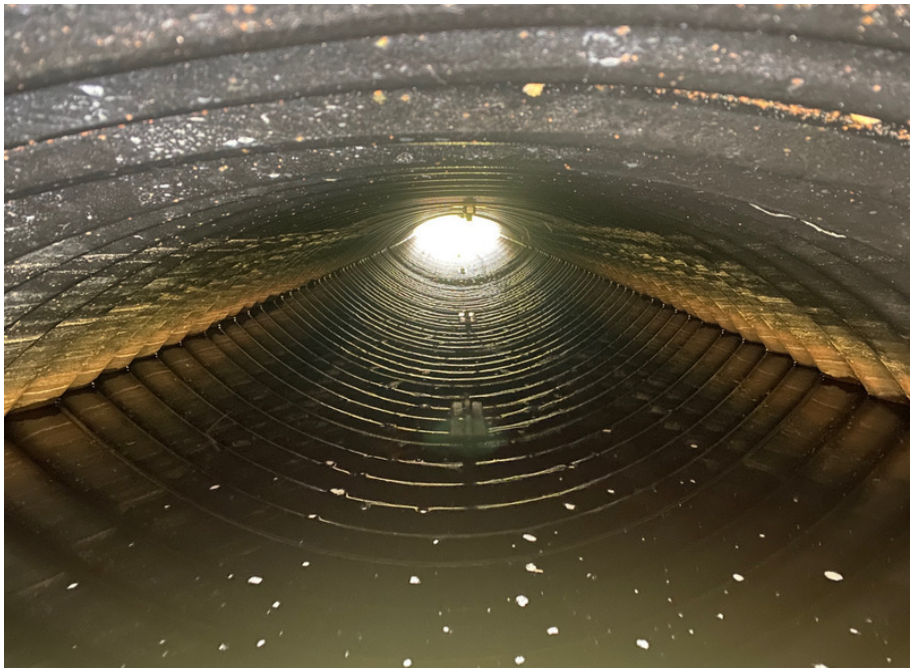
3. O-8: Outlet (South)

Photo



4. O-8: Barrels (East)

Photo



5. O-8: Slope Protection (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O09
MTO Site Number: N/A

Inventory Data:

Structure Name	Culvert O9										
Main Hwy/Road #	Road 49	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	2km South of 3rd Concession										
Latitude	44.259919			Longitude	-80.359876						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	1			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	CSP Round Culvert(s)			Interchange Number							
Total Deck Length	8 m			Interchange Structure Number							
Overall Str. Width	10.5 m			Min. Vertical Clearance		m					
Total Deck Area	84 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.2 m (btwn tops of slopes)										
Roadway Width	5.8 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	E-W						
No. of Spans	3			Fill on Structure	0.45 m						
Span Lengths	1.6, 1.6, 1.6 m			Height (streambed to structure top)	1.2 m						

Historical Data:

Year Built	(●) Known ( ) Estimated ( ) Unknown	2019	Last Evaluation	
Last Biennial Inspection		2021	Current Load Limit	tonnes
Last Bridge Master Inspection			Load Limit By-Law #	
Last Condition Survey			By-Law Expiry Date	
Last Underwater Inspection				

Rehab History: (Date / Description)	Rehab Year		
Structure replaced in Aug-2019			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	September 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:			
Equipment Used:	Camera, Tape Measure, Flashlight		
Weather:	Overcast		
Temperature:	12°C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

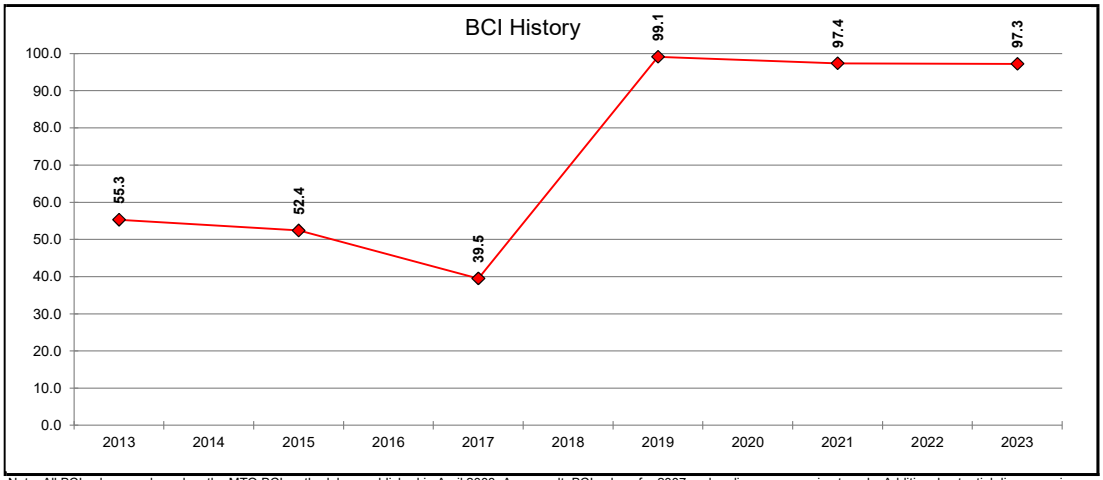
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	97.3	A. Grzywnowicz	
2021	97.4	C. MacKenzie	
2019	99.1	C. MacKenzie	Structure replaced in 2019
2017	39.5	C. MacKenzie	
2015	52.4	T. Littlejohns	
2013	55.3	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	5			
Element Type:	N/A		Total Quantity:	5	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	1	0	Element BCI	68.0

Comments: All four hazard warning signs and one stop sign in excellent condition. NE sign leaning, minor impact damage on SE.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.8	m		
Location:	North & South		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	69.6	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	69.6	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	8	m		
Element Name:	Deck Wearing Surface		Width:	5.8	m		
Location:	Over Structure		Height:		m		
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	46.4	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	46.4	0	0	Element BCI	75.0

Comments: Light wheel track rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	North		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition. Limited inspection due to clearance. Small scratches to polymer coating on exterior exposed barrel, likely occurred during construction.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	Middle		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition. Small scratches to polymer coating on exterior exposed barrel, likely occurred during construction. Limited inspection due to clearance.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	10.5 m			
Element Name:	Barrels		Width:	1.6 m			
Location:	South		Height:	1.6 m			
Material:	Steel		Count:	1			
Element Type:	Round Culvert		Total Quantity:	52.78 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	48.46	4.22	0.1	0	Element BCI	97.9
Comments:	Polymer coated round CSP culvert installed in 2019 and in excellent condition.Limited inspection due to clearance. Small scratches to polymer coating on exterior exposed barrel, likely occurred during construction.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	East & West		Height:	m			
Material:	Other		Count:	2			
Element Type:	Rock Protection		Total Quantity:	2 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	2	0	0	Element BCI	75.0

Comments: Rip-rap rock protection on both embankments. No signs of erosion.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Stagnant water in all three culverts. Water depth in culverts approximately 1m.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O09
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:		

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
			Rehabilitation Cost Subtotal		**$0.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$415,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$42,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$42,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$21,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$645,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CS	Metal culvert - No rehabilitation planned.	N/A	50.0

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**97.3**
Structure O9 was replaced in 2019 and is in excellent condition.		

053395: Structure O-9:



UTM Coordinates (WGS84)	17-551099m.E 4900935m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz

1. O-9: Deck Wearing Surface (North)

Photo



2. O-9: Barrels (West)

Photo



3. O-9: Slope Protection (West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O11
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O11										
Main Hwy/Road #	Concession 8B	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	0.4km West of Road 55										
Latitude	44.337593	Longitude	-80.355429								
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.				
			Desig./not list		Desig & List						
MTO region		Road Class:	Freeway		Arterial						
			Collector		Local	X					
MTO District		Posted Speed		No. of Lanes	2						
Old County		AADT		% Trucks							
Geographic Twp.		Inspection Route Sequence									
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number									
Total Deck Length	6.2 m	Interchange Structure Number									
Overall Str. Width	6 m	Min. Vertical Clearance	m								
Total Deck Area	37.2 sq. m	Special Routes:	Transit		Truck						
			School		Bicycle						
Road Platform Width	6.4 m (btwn tops of slopes)										
Roadway Width	5.6 m (btwn edges of shoulders)	Detour Length Around Bridge	km								
Skew Angle	0 Degrees	Direction of Structure	East - West								
No. of Spans	1	Fill on Structure	0.7 m								
Span Lengths	5.6 m	Height (streambed to structure top)	2.5 m								

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☑ Major Rehab. ☐ Replace
Timing of Recommended Work:	☑ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Major Rehabilitation is recommended as soon as possible. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

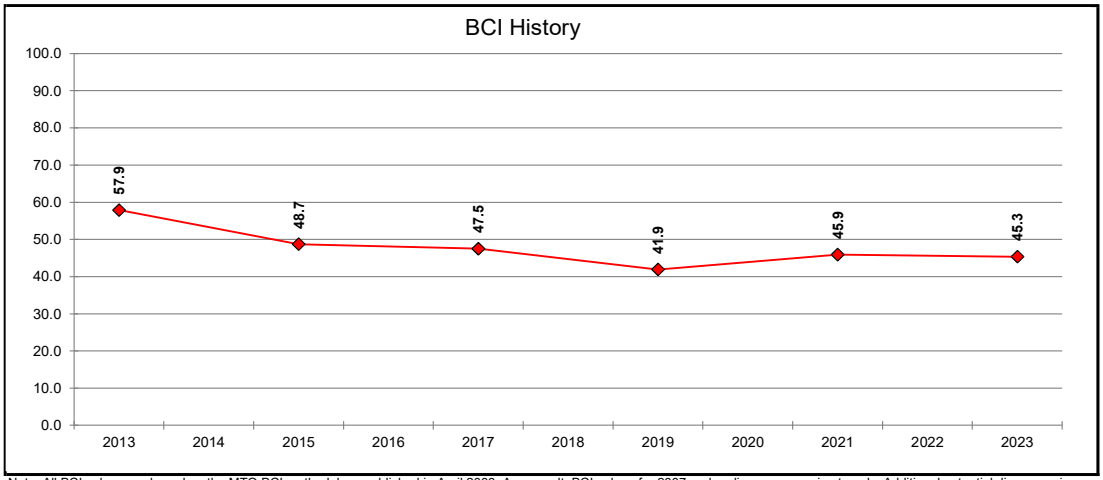
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	45.3	A. Grzywnowicz	
2021	45.9	C. MacKenzie	
2019	41.9	M. August	
2017	47.5	C. MacKenzie	
2015	48.7	T. Littlejohns	
2013	57.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	0	2	2	Element BCI	20.0

Comments: Four (4) hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:		m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.6	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	67.2	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	67.2	0	0	Element BCI	75.0

Comments: Light wheel rutting. Loose gravel on shoulders.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	6.2 m			
Element Name:	Deck Wearing Surface		Width:	5.6 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:				
Element Type:	N/A		Total Quantity:	34.72 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	34.22	0	0.5	Element BCI	73.9
Comments:	Washout on NE quadrant of deck. Gravel build up to first railing height. Loose gravel on approaches.						

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	6.2 m			
Element Name:	Deck Top		Width:	5.6 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	35 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	01
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	32	1.5	1.5	Element BCI	70.3
Comments:	Limited inspection, condition based soffit. Fill has been tracked and graded onto deck over time. Consider removing granular fill and regrading roadway over structure to expose concrete deck top.						

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	02
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Remove gravel from deck.		Maintenance Needs: Bridge Cleaning	
		Performance Deficiencies: Load Carrying Capacity	

Element Group:	Barriers		Length:	10 m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Bars		Total Quantity:	20 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	10	2	8	Element BCI	41.5
Comments:	South barrier - Posts spalled and have large cracks, rails have large cracks, corroded exposed rebar, sections of rail missing. Impact damage throughout. North barrier is in good functioning condition despite not conforming to code. Quantity moved back to good. Barrier system height is not adequate as a result of granular fill on deck top.						

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Replace barrier system.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Element Data

Element Group:	Decks			Length:		m		
Element Name:	Deck Drainage			Width:		m		
Location:	Through Deck			Height:		m		
Material:	Steel			Count:	8			
Element Type:	N/A			Total Quantity:	8	Each		
Environment:	Severe			Limited Inspection:	☐			
Protection System:	N/A						Performance	11
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	0	0	8		Element BCI	0.0

Comments: Deck drains are plugged and buried under gravel. All drains extend below soffit and show signs of surface corrosion.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	16
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Remove fill and flush deck drains.		Maintenance Needs: Deck Drainage Performance Deficiencies: Deck Drainage	

Element Group:	Curb and S/W			Length:	10	m		
Element Name:	Curbs			Width:	0.3	m		
Location:	North & South			Height:	0.28	m		
Material:	Cast-In-Place Concrete			Count:	2			
Element Type:	Barrier Curb			Total Quantity:	11.6	Sq.m		
Environment:	Severe			Limited Inspection:	☐			
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	7.6	2	2		Element BCI	56.0

Comments: Gravel covering sections of curb, large cracks in northwest and southwest curbs, severe spalls at south west and center section of curbs, 45° crack at northwest section at back of abutment, possible settlement.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Abutments			Length:	2.2	m		
Element Name:	Wingwalls			Width:		m		
Location:	All Quadrants			Height:	1.8	m		
Material:	Cast-In-Place Concrete			Count:	4			
Element Type:	N/A			Total Quantity:	15.84	Sq.m		
Environment:	Moderate			Limited Inspection:	☐			
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	3.17	3.8	8.87		Element BCI	24.6

Comments: Spalls, delaminations and disintegration throughout. Isolated large horizontal cracks, large crack along cold joint at curb. Vegetation covering sections of wingwalls.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.6 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	North & South		Height:	0.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	20.16 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	16.66	2.5	1	Element BCI	66.9
Comments:	Small spalls. Horizontal crack in fascia, delaminations, staining and dampness evident (noted in previous inspections) at inlet and outlet. No drip channel likely causing staining on soffit. Corroded exposed rebar.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	5.6 m			
Element Name:	Soffit - Thick Slab - Int		Width:	4 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	22.4 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	18.4	2	2	Element BCI	65.2
Comments:	Isolated delaminations, longitudinal crack full length along the centerline, small spall on west side. Hairline stained cracks.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	6 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	12 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	1.8	1.2	9	Element BCI	15.3
Comments:	Disintegration and erosion of concrete along waterline. Delaminations extend full height of abutment. Medium to wide efflorescent stained cracking throughout.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider refacing abutment.			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number: O11
MTO Site Number: N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	East & West		Height:		m		
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection. Visible on west side.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Unobstructed waterway, no evidence of scour. Flows N-S.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: No observed defects.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O11
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove granular fill on deck and regrade roadway	$3,500.00
Deck Drainage	Flush deck drains	$500.00
	Total Maintenance Needs Costs	**$4,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Consider installing steel beam guide rail during future capital works	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,			X		$20,000.00
Type B concrete repairs to soffit,			X		$50,000.00
Type C concrete repairs to abutment walls, wingwalls,			X		$75,000.00
Replace deck drains			X		$6,000.00
Waterproof and Pave			X		$30,000.00
Replace barrier system			X		$40,000.00
General Items - Insurance, Mobilization, Access etc.			X		$125,000.00
			Rehabilitation Cost Subtotal		**$346,000.00**

Estimated Value of Replacement Structure	**$800,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$361,000.00	$815,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$37,000.00	$82,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$37,000.00	$82,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$41,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$452,500.00**	**$1,145,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	5.0

Recommendation:	Major Rehabilitation is recommended as soon as possible.

Justification:	**Current BCI**	**45.3**
Structure O11 is generally in good to fair condition, however, the condition of the barrier system and the severe erosion and disintegration of the abutment walls and wingwalls is significantly lowering the BCI of the structure. It is anticipated that the service life could be extended by approximately 20 years by replacing the current barrier system and refacing the concrete substructure.		

053395: Structure O-11: 8th Concession B



UTM Coordinates (WGS84)	17-551388m.E 4909569m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-11: Deck Wearing Surface (East)

Photo



2. O-11: Railing System (South)

Photo



3. O-11: Soffit - Thick Slab - Ext (South)

Photo



4. O-11: Abutment Walls (East)

Photo



5. O-11: Soffit - Thick Slab - Int (North)

Photo



6. O-11: Wingwalls (South West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O12
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O12										
Main Hwy/Road #	Concession 10	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	2.3km West of Grey Road 31										
Latitude	44.369108			Longitude	-80.295745						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes				
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	5.5 m			Interchange Structure Number							
Overall Str. Width	9.9 m			Min. Vertical Clearance		m					
Total Deck Area	54.45 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	9 m (btwn tops of slopes)										
Roadway Width	8.1 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	0 Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	4.9 m			Height (streambed to structure top)	1.7 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	13° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☑ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Structure replacement is recommended as soon as possible. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

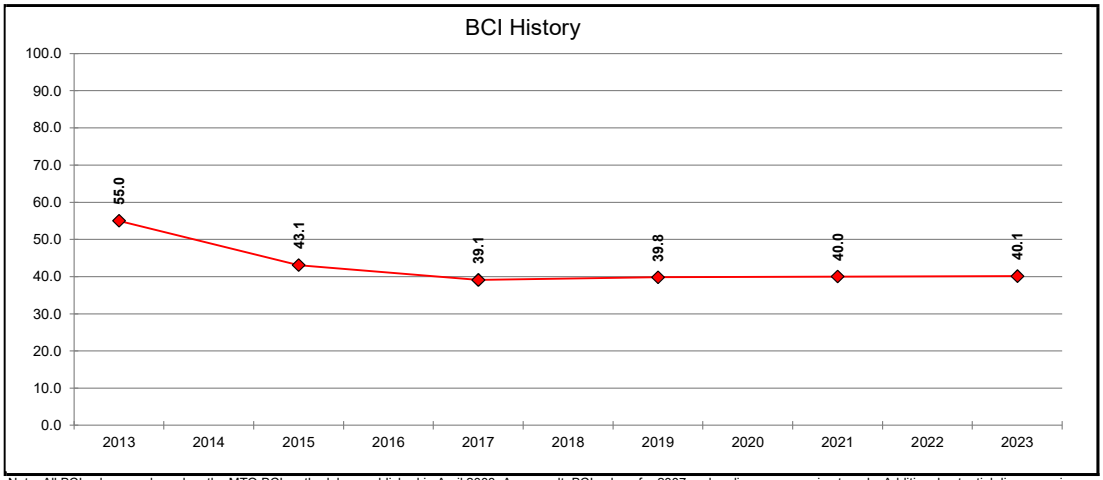
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	40.1	A. Grzywnowicz	
2021	40.0	C. MacKenzie	
2019	39.8	M. August	
2017	39.1	C. MacKenzie	
2015	43.1	T. Littlejohns	
2013	55.0	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed. Impact damage SE.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	6.6 m			
Location:	East & West		Height:	m			
Material:	Asphalt		Count:	2			
Element Type:	N/A		Total Quantity:	79.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	67.2	6	6	Element BCI	66.7

Comments: Recently paved. No deficiencies noted.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.5 m			
Element Name:	Deck Wearing Surface		Width:	8.1 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:				
Element Type:	N/A		Total Quantity:	44.55 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	37.55	6	1	Element BCI	68.6

Comments: Recently paved. No deficiencies noted.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	5.2 m			
Element Name:	Deck Top		Width:	9.9 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	52 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	32	10	10	Element BCI	53.8

Comments: Limited inspection, condition based on condition of wearing surface and soffit.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing barrier system over structure.		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Element Data

Element Group:	Curb and S/W		Length:	10.2 m				
Element Name:	Curbs		Width:	0.3 m				
Location:	North & South		Height:	0.1 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Barrier Curb		Total Quantity:	8.16 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A					Performance		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m	0	0	6.26	1.9	Element BCI	30.7	
Comments:	Medium to severe spalls, disintegration and scaling, wide cracks, delaminations, remove vegetation along curb line.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Abutments		Length:	2.8 m				
Element Name:	Wingwalls		Width:	m				
Location:	All Quadrants		Height:	1.1 m				
Material:	Cast-In-Place Concrete		Count:	4				
Element Type:	N/A		Total Quantity:	12.32 Sq.m				
Environment:	Moderate		Limited Inspection:	☑				
Protection System:	N/A					Performance		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m	0	7.12	2.6	2.6	Element BCI	51.8	
Comments:	Hairline to medium stained cracking, spalls, delaminations, erosion at waterline southwest. Disintegration throughout. Limited inspection on south due to vegetation.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	4.9 m				
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m				
Location:	Exterior		Height:	0.6 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	N/A		Total Quantity:	15.68 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A					Performance		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m	0	0	0	15.68	Element BCI	0.0	
Comments:	Severe spalls and disintegration with exposed corroded rebar, fascia's are delaminated, efflorescent staining, delaminations extend through entire exterior soffit. Severe flaking and corrosion of exposed rebar resulting in severe section loss.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.5 m			
Element Name:	Soffit - Thick Slab - Int		Width:	7.9 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	43 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	23	10	10	Element BCI	49.4
Comments:	Form paper present. Deformations of soffit - possibly from poor forming. Delaminations and exposed corroded rebar, efflorescence stalactites. Birds nest present. Appears to be sagging in middle of structure.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	9.9 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	0.8 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	15.84 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.84	6	6	Element BCI	33.3
Comments:	Narrow to medium pattern cracking, some vertical cracks and disintegration, delaminations along west abutment at waterline, erosion both sides - severe deterioration of concrete on west.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - A		Width:	m			
Location:			Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Limited inspection.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Flows N-S.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Well vegetated embankments.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:			Length:		m		
Element Name:			Width:		m		
Location:			Height:		m		
Material:			Count:				
Element Type:			Total Quantity:		#N/A		
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A
Comments:							
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O12
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,					$20,000.00
Type B concrete repairs to soffit,					$75,000.00
Type C concrete repairs to abutment walls, wingwalls,					$35,000.00
Waterproof and Pave					$30,000.00
Install Barrier System					$25,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$310,000.00**

Estimated Value of Replacement Structure	**$600,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$335,000.00	$625,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$34,000.00	$63,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$34,000.00	$63,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$32,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$515,500.00**	**$908,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	0.1

Recommendation:	Structure replacement is recommended as soon as possible.

Justification:	**Current BCI**	**40.1**
Structure O12 is in poor condition and is demonstrating signs of severe concrete deterioration, and moisture penetration through the deck top.		

053395: Structure O-12: 10th Concession



UTM Coordinates (WGS84)	17-556117m.E 4913111m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-12: Deck Wearing Surface (West)

Photo

2. O-12: Wingwalls (North East)

Photo



3. O-12: Soffit - Thick Slab - Ext (North)

Photo



4. O-12: Abutment Walls (East)

Photo



5. O-12: Soffit - Thick Slab - Ext (South)

Photo



6. O-12: Soffit - Thin Slab - Int (Looking north)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O13
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O13										
Main Hwy/Road #	Concession 10	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	1.8km West of Grey Road 31										
Latitude	44.370648	Longitude	-80.288413								
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.				
			Desig./not list		Desig & List						
MTO region		Road Class:	Freeway		Arterial						
			Collector		Local	X					
MTO District		Posted Speed		No. of Lanes							
Old County		AADT		% Trucks							
Geographic Twp.		Inspection Route Sequence									
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number									
Total Deck Length	5.6 m	Interchange Structure Number									
Overall Str. Width	9.6 m	Min. Vertical Clearance		m							
Total Deck Area	53.76 sq. m	Special Routes:	Transit		Truck						
			School		Bicycle						
Road Platform Width	8.8 m (btwn tops of slopes)										
Roadway Width	7.2 m (btwn edges of shoulders)	Detour Length Around Bridge		km							
Skew Angle	Degrees	Direction of Structure	East - West								
No. of Spans	1	Fill on Structure	0.3 m								
Span Lengths	5 m	Height (streambed to structure top)	2.2 m								

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	Forgo rehabilitation and replace structure in future (replacement timeline estimated to exceed 10 yrs). Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

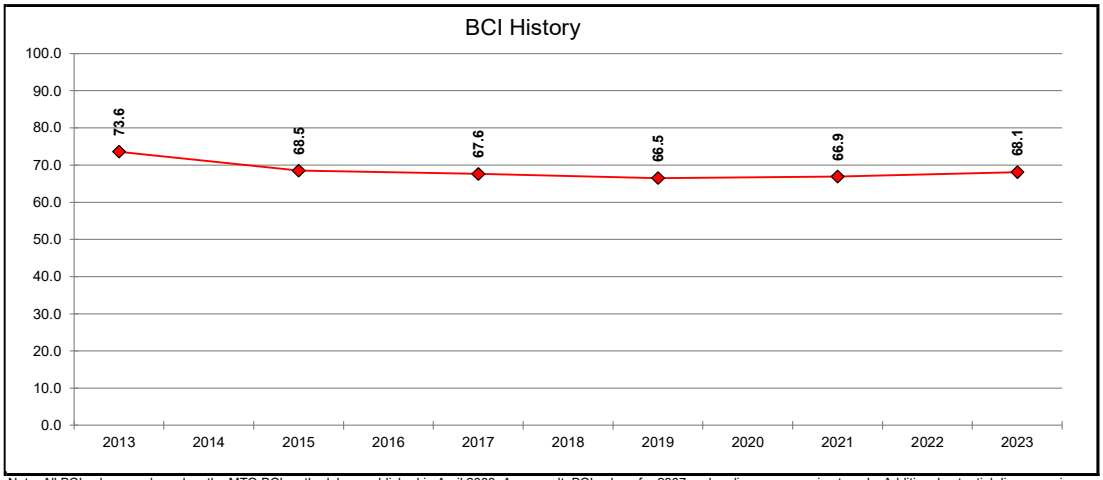
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	68.1	A. Grzywnowicz	New asphalt wearing surface
2021	66.9	C. MacKenzie	
2019	66.5	M. August	
2017	67.6	C. MacKenzie	
2015	68.5	T. Littlejohns	
2013	73.6	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m			
Element Name:	Signs		Width:		m			
Location:	All Quadrants		Height:		m			
Material:	Steel		Count:	4				
Element Type:	N/A		Total Quantity:	4	Each			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	4	0	0		Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:		m			
Element Name:	Approach Guide Rail		Width:		m			
Location:	All Quadrants		Height:		m			
Material:	Steel		Count:					
Element Type:	N/A		Total Quantity:		m			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m						Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m			
Element Name:	Approach Wearing Surface		Width:	7.2	m			
Location:	East & West		Height:		m			
Material:	Asphalt		Count:	2				
Element Type:	N/A		Total Quantity:	86.4	Sq.m			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	86.4				Element BCI	75.0

Comments: Recently paved. No deficiencies noted. Cold joint at centerline.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.6 m			
Element Name:	Deck Wearing Surface		Width:	7.2 m			
Location:	Over Deck Top		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	N/A		Total Quantity:	40.32 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	40.32			Element BCI	75.0
Comments:	Recently paved No deficiencies noted.Cold joint at centerline.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	5.6 m			
Element Name:	Deck Top		Width:	9.6 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	54 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	49	5	0	Element BCI	71.8
Comments:	Limited inspection, condition based on condition of wearing surface and soffit.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Element Data

Element Group:	Curb and S/W		Length:	10.5 m				
Element Name:	Curbs		Width:	0.3 m				
Location:	North & South		Height:	m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	Mountable Curb		Total Quantity:	6.3 Sq.m				
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	3.7	1.55	1.05		Element BCI	53.9
Comments:	Partially covered by fill, some medium spalls in visible portions, vegetation growing along curb line, wide cracks and spalling curb is fractured from top of wingwall, delaminations, disintegration, severe scaling.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Abutments		Length:	2.7 m				
Element Name:	Wingwalls		Width:	m				
Location:	All Quadrants		Height:	1.2 m				
Material:	Cast-In-Place Concrete		Count:	4				
Element Type:	N/A		Total Quantity:	12.96 Sq.m				
Environment:	Moderate		Limited Inspection:	☑				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	10.56	1.2	1.2		Element BCI	64.8
Comments:	Some honeycombing, cold joint, fractured curb at north west wingwall, erosion at waterline, light scaling. Small spalls. Limited inspection due to vegetation. NE spall and delaminations.							
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	5 m				
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m				
Location:	North & South (Exterior)		Height:	0.6 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	N/A		Total Quantity:	16 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	11.07	2.5	2.43		Element BCI	58.1
Comments:	Small spalls on upstream side, light scaling and delaminations, cracking on the north, staining on the north.Water level 4 inches below soffit.							
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5 m			
Element Name:	Soffit - Thick Slab - Int		Width:	7.6 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	38 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	33	5	0	Element BCI	70.4

Comments: Limited inspection due to beaver dam and clearance to water level. Areas of staining noted during previous inspection.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Abutments		Length:	9.6 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	0.9 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	17.28 Sq.m			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	15.28	1	1	Element BCI	68.6

Comments: Limited inspection due to high water level. Some light staining, medium to wide vertical cracks, light honeycombing noted during previous inspection.

Recommended Work: Rehab ☑ Replace ☐
1-5 Years ☐ 6-10 Years ☑

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - A		Width:	m			
Location:			Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Limited inspection, rated on performance only.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	13
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: No flow at time of inspection, vegetated waterway. Flows S-N. Beaver dam in NW corner preventing flow through the ditching.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	18
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Remove beaver dam.		Maintenance Needs: Other Performance Deficiencies: Flooding/Channel Blockage	

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Stable, well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**		
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year		
		Maintenance Needs: None Performance Deficiencies: None		

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**		
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year		
		Maintenance Needs: None Performance Deficiencies: None		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O13
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Other	Remove beaver dam	$2,000.00
	Total Maintenance Needs Costs	**$2,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,					$5,000.00
Type B concrete repairs to soffit,					$20,000.00
Type C concrete repairs to abutment walls, wingwalls,					$10,000.00
Waterproof and pave					$25,000.00
Install Barrier System					$25,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$210,000.00**

Estimated Value of Replacement Structure	**$600,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$225,000.00	$615,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$23,000.00	$62,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$23,000.00	$62,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$31,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$383,500.00**	**$895,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	8.1	18.1

Recommendation:	Forgo rehabilitation and replace structure in future (replacement timeline estimated to exceed 10 yrs).

Justification:	**Current BCI**	**68.1**
Structure O13 is generally in good to fair condition but is demonstrating signs of concrete deterioration, and moisture penetration through the deck top was noted in previous inspections.		

053395: Structure O-13: 10th Concession



UTM Coordinates (WGS84)	17-556700m.E 4913286m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault
Road or Location Description	10th Concession

1. O-13: Deck Wearing Surface (West)

Photo



2. O-13: Wingwalls (South West)

Photo



3. O-13: Soffit - Thick Slab - Ext (South)

Photo



4. O-13: Soffit - Thick Slab - Ext (North)

Photo



5. O-13: Streams and Waterways (North West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O14
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O14										
Main Hwy/Road #	4th Concession B	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	1km East of Road 63										
Latitude	44.315154			Longitude	-80.278821						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes				
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Concrete T-Beam			Interchange Number							
Total Deck Length	14 m			Interchange Structure Number							
Overall Str. Width	6.5 m			Min. Vertical Clearance		m					
Total Deck Area	91 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.6 m (btwn tops of slopes)										
Roadway Width	5.5 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	45 Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0 m						
Span Lengths	11.7 m			Height (streambed to structure top)	2.5 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	14 tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, hammer, measuring tape		
Weather:	Sunny		
Temperature:	15° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☑ 6 to 10 years ☐ >10 years
Overall Comments:	Forgo rehabilitation and replace structure within 7 years. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	14 tonnes
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

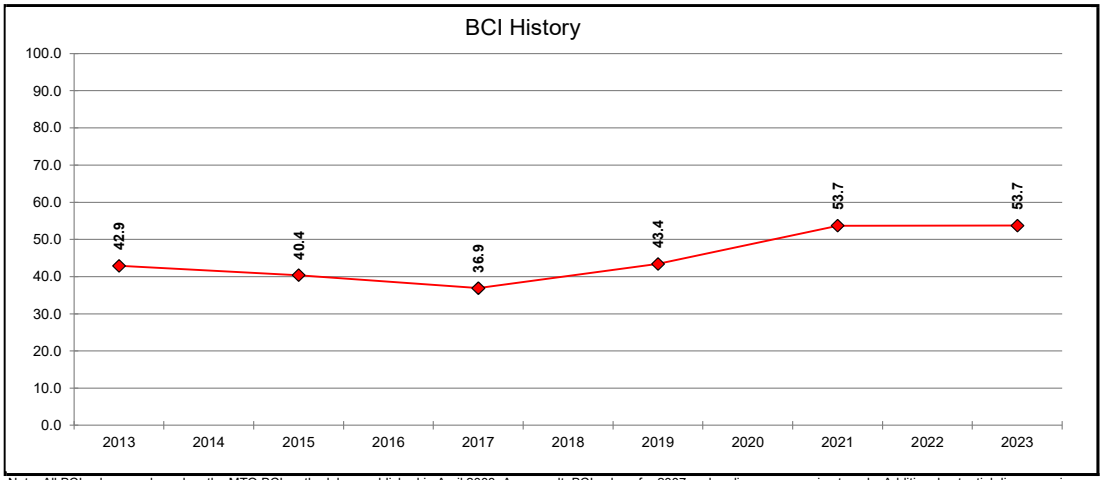
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	53.7	A. Grzywnowicz	
2021	53.7	C. MacKenzie	Condition of exposed deck top revised. Condition of Abutment walls re
2019	43.4	M. August	Due to revision of BCI calculation methods.
2017	36.9	C. MacKenzie	
2015	40.4	T. Littlejohns	
2013	42.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	5			
Element Type:	N/A		Total Quantity:	5	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	5	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed, and one load limit sign. Signs appear to have low reflectivity.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Steel		Count:	14			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	53.34	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	19.05	7.62	26.67	Element BCI	32.5

Comments: Buried end treatments, nine damaged sections, bolts missing. Guide rail too high, does not conform to current code. Offset blocks missing and rotated. Posts deteriorated in several locations.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Install extruder end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	5.5	m		
Location:	East & West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	66	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	66	0	0	Element BCI	75.0

Comments: Some light potholes, gravel built up on shoulders. Loose gravel.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	14 m			
Element Name:	Deck Top		Width:	5.5 m			
Location:	Exposed		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	77 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	45.5	27	4.5	Element BCI	58.3

Comments: Exposed deck top, spalls and abrasions from plow, gravel tracked on deck and along shoulders on both sides. Quantity of abrasion that was previously in fair condition moved to good as deck top was sounded and no issues were observed. Heavy abrasion isolated at centerline, lighter abrasion throughout deck top.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	02
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☑ 1 Year ☐ 2 Year	
Remove gravel from deck wearing surface.		Maintenance Needs: Bridge Cleaning Performance Deficiencies: None	

Element Group:	Barriers		Length:	25.2 m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Continuous Raili		Total Quantity:	50.4 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	40.2	6	4.2	Element BCI	64.6

Comments: Some small spalls and cracks where rails meet posts, horizontal cracks, delaminations, railing section broken at connection. Exposed corroded rebar on N. Does not conform to current code.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Curb and S/W		Length:	25.2 m			
Element Name:	Curbs		Width:	0.4 m			
Location:	North & South		Height:	0.3 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	35.28 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	23.28	6	6	Element BCI	56.3

Comments: Large spalls, some smaller spalls and cracks, delamination, light scaling, disintegration along bottom, large crack NW.Vegetation growing in cracks.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:		m		
Element Name:	Deck Drainage		Width:		m		
Location:	Through Deck		Height:		m		
Material:	Steel		Count:	6			
Element Type:	N/A		Total Quantity:	6	Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	11
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	0	0	6	Element BCI	0.0

Comments: Five deck drains visible from deck top, all drains do not extend below soffit.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Replace deck drains.		Maintenance Needs: None Performance Deficiencies: Deck Drainage

Element Group:	Abutments		Length:	6.3	m		
Element Name:	Wingwalls		Width:		m		
Location:	All Quadrants		Height:	2.7	m		
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	68.04	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	66.04	1	1	Element BCI	73.4

Comments: Patch job becoming delaminated, some small spalls, wide 45° crack NW, heavily vegetated. Wide crack and delamination SW.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None Performance Deficiencies: None

Element Group:	Decks		Length:	14	m		
Element Name:	Soffit - Thin Slab - Ext		Width:	0.3	m		
Location:	North & South (Exterior)		Height:	0.6	m		
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	25.2	Sq.m		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	18.2	3.5	3.5	Element BCI	59.7

Comments: Patch work in poor condition and beginning to delaminate. Spalls, delamination's, light to medium scaling.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	14 m			
Element Name:	Soffit - Thin Slab - Int		Width:	1 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	56 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	46	6	4	Element BCI	65.9
Comments:	Some exposed rebar, small spalls with exposed rebar, delaminations, nests, formwork still in place, low cover to reinforcing. Bird nest noted.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Abutments		Length:	13 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	2.2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	57.2 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	26	13	18.2	Element BCI	43.2
Comments:	Severe erosion of concrete at waterline, vertical wide crack at centerline of west abutment. Moderate to severe scaling throughout. Stratification, disintegration, scouring, and staining evident. Wide crack at cold joint at east. Light to severe honeycombing. 2019 Photos reviewed and poor condition was taken to be bottom 0.7m along entire face of abutment walls. Cold joint at underside of girders.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Girders		Length:	10.7 m			
Element Name:	Girders - Middle		Width:	0.4 m			
Location:	Middle		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	5			
Element Type:	T-Beam		Total Quantity:	85.6 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	28.6	28.5	28.5	Element BCI	38.4
Comments:	Spalls and delaminations with exposed rebar, low cover on all stirrups, light to medium scaling, cracks, poor vibration, south girder disintegration at deck drains. Previous patches noted on exterior.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Element Data

Element Group:	Girders		Length:	1 m			
Element Name:	Girders - Ends		Width:	0.4 m			
Location:	Ends		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	5			
Element Type:	T-Beam		Total Quantity:	8 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4	2	2	Element BCI	47.5
Comments:	Spalls and delaminations with exposed rebar, low cover on some stirrups, honeycombing, disintegration.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	Rock placed at all four quadrants. Flows S-N. Large debris under structure.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Well vegetated.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O14
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clean Deck Top,	$1,000.00
	Total Maintenance Needs Costs	**$1,000.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Investigate Need for Replacing with Longer Guide Rail	**$0.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top, curbs,					$25,000.00
Type B concrete repairs to Girders, soffit,					$150,000.00
Type C concrete repairs to abutment walls, wingwalls,					$100,000.00
Replace deck drainage					$10,000.00
Replace barrier system					$40,000.00
Waterproof and pave					$30,000.00
Concrete Overlay					$40,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$520,000.00**

Estimated Value of Replacement Structure	**$1,100,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental	Bird Nesting Preventative Measures	$10,000.00	$10,000.00
Other			
	Total Associated Work Costs	**$25,000.00**	**$25,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$545,000.00	$1,125,000.00
Roadside Protection:		$0.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$55,000.00	$107,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$55,000.00	$107,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$57,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$672,500.00**	**$1,521,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	0.0	6.9

Recommendation:	Forgo rehabilitation and replace structure within 7 years.

Justification:	**Current BCI**	**53.7**
Structure O14 is generally in fair to poor condition and is demonstrating signs of severe concrete deterioration.		

053395: Structure O-14: 4th Concession B



UTM Coordinates (WGS84)	17-557510m.E 4907132m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-14: Approach Wearing Surface (West)

Photo



2. O-14: Railing System (South)

Photo



3. O-14: Deck Wearing Surface (East)

Photo



4. O-14: Wingwalls (South West)

Photo



5. O-14: Abutment Walls (West)

Photo



6. O-14: Girders - Middle (South)

Photo



7. O-14: Soffit - Thick Slab - Int (South)

Photo



8. O-14: Girders - Ends (West)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O16
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O16										
Main Hwy/Road #	Centre Line B	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under	X		Rail		Road		X	Other	
Structure Location	1.8km East of Road 63										
Latitude	44.280149			Longitude	-80.263578						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	8.5 m			Interchange Structure Number							
Overall Str. Width	7.9 m			Min. Vertical Clearance		m					
Total Deck Area	67.15 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.6 m (btwn tops of slopes)										
Roadway Width	7.4 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0.1 m						
Span Lengths	7.9 m			Height (streambed to structure top)	2 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 9, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hamer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☑ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

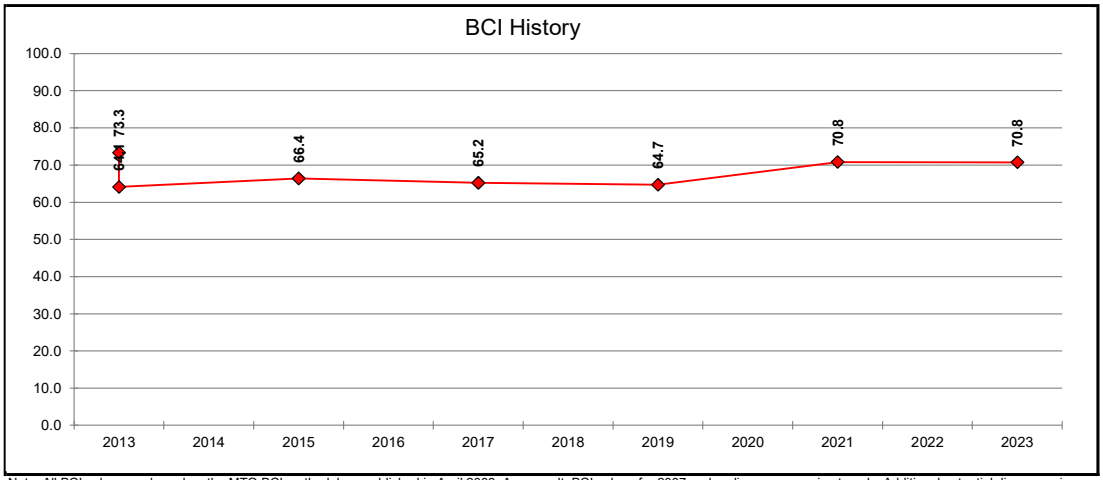
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	70.8	A. Grzywnowicz	
2021	70.8	C. MacKenzie	Exterior soffit condition revised
2019	64.7	M. August	
2017	65.2	C. MacKenzie	
2015	66.4	T. Littlejohns	
2013	73.3	J. Cober	
2013	64.1	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning signs installed, slightly leaning. Signs appear to have low reflectivity.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	7.1 m			
Location:	East & West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	85.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	84.2	0.5	0.5	Element BCI	74.4

Comments: Small potholes throughout.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	8.5 m			
Element Name:	Deck Wearing Surface		Width:	7.1 m			
Location:	Over Deck Top		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	60.35 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	59.35	0.5	0.5	Element BCI	74.1
Comments:	Small potholes throughout.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	8.5 m			
Element Name:	Deck Top		Width:	7.9 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	67.15 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	65.15	2	0	Element BCI	74.0
Comments:	Limited inspection, condition based on condition of soffit.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	12.5 m			
Element Name:	Railing System		Width:	m			
Location:	North & South		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Concrete Post and Bars		Total Quantity:	25 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	18.75	3.125	3.125	Element BCI	61.3
Comments:	Severe spalling and disintegration on top rails, cracking at post/railing joint, impact damage, disintegration.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	0.75 m			
Element Name:	End Post		Width:	0.255 m			
Location:	All Quadrants		Height:	0.925 m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	Concrete Post and Bars		Total Quantity:	8.2 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	7.6	0.3	0.3	Element BCI	71.0
Comments:	Quantity includes railing over post. Disintegration throughout. Delamination NE.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	0.395 m			
Element Name:	Posts		Width:	0.255 m			
Location:	North & South		Height:	0.925 m			
Material:	Cast-In-Place Concrete		Count:	6			
Element Type:	Concrete Post and Bars		Total Quantity:	6 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	2	0	Element BCI	63.3
Comments:	Quantity includes railing over post. Medium to wide cracks at railing. Spall with exposed corroded rebar at base of North post.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Curb and S/W		Length:	15.2 m			
Element Name:	Curbs		Width:	0.5 m			
Location:	North & South		Height:	0.15 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Barrier Curb		Total Quantity:	19.76 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	12.26	6	1.5	Element BCI	58.7
Comments:	Medium to wide cracking throughout, spalling throughout, delamination on south curb face, vegetation growing along curb line, light to medium scaling, staining, wide crack SW. Cracking with efflorecenceon vertical face.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	3.3 m				
Element Name:	Wingwalls		Width:	m				
Location:	All Quadrants		Height:	1.8 m				
Material:	Cast-In-Place Concrete		Count:	4				
Element Type:	N/A		Total Quantity:	23.76 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	17.56	3.1	3.1		Element BCI	60.6
Comments:	Spalls at joint of abutment and wingwall, delaminations, efflorescence staining and map cracking, crack at joint of curb, exposed corroded rebar, large spall SE, wide crack SE, erosion at waterline NW. Disintegration. Spalls at SE and SW.							
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	7.9 m				
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m				
Location:	North & South (Exterior)		Height:	0.65 m				
Material:	Cast-In-Place Concrete		Count:	2				
Element Type:	N/A		Total Quantity:	26.07 Sq.m				
Environment:	Moderate		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	23.57	2	0.5		Element BCI	70.9
Comments:	Narrow crack at curb/fascia joint with salt staining, delaminations, disintegration, map cracking, efflorescence staining. Exterior soffit sounded and condition revised to good from fair. Utility connected to south fascia. Dampness noted on soffit due to lack of proper drip detail.							
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Element Group:	Decks		Length:	7.9 m				
Element Name:	Soffit - Thick Slab - Int		Width:	5.9 m				
Location:	Interior		Height:	m				
Material:	Cast-In-Place Concrete		Count:	1				
Element Type:	N/A		Total Quantity:	46.61 Sq.m				
Environment:	Benign		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	44.61	2	0		Element BCI	73.5
Comments:	Some rebar ties are exposed. Narrow to medium cracks throughout.							
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**					
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year					
			Maintenance Needs: None					
			Performance Deficiencies: None					

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Abutments		Length:	7.9 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East & West		Height:	1.2 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	18.96 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	18.96	0	0	Element BCI	75.0

Comments: Small spall at corner where abutment meets wingwall, erosion at waterline, some damp areas, 1 abutment drain on west abutment, light to moderate scaling, segregation at top of wall. High water level, visible portion sounded and in good condition.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Accessories		Length:	m			
Element Name:	Utilities		Width:	m			
Location:	South		Height:	m			
Material:			Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Conduit along south side.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	N/A		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated embankments.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Watercourse is unobstructed. Flows N-S. Stagnant at time of inspection and silty bottom.

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work: Rehab ☐ Replace ☐
1-5 Years ☐ 6-10 Years ☐

Maintenance Needs:
☐ Urgent ☐ 1 Year ☐ 2 Year

Maintenance Needs: None
Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O16
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments and structure connections	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to end post, posts, deck top, curbs,					$10,000.00
Type B concrete repairs to soffit,					$10,000.00
Type C concrete repairs to wingwalls,					$15,000.00
Waterproof and pave					$30,000.00
Replace barrier system					$30,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$220,000.00**

Estimated Value of Replacement Structure	**$900,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$235,000.00	$915,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$24,000.00	$92,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$24,000.00	$92,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$46,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$395,500.00**	**$1,270,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	10.8	20.8

Recommendation:	No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered.

Justification:	**Current BCI**	**70.8**
Structure O16 is generally in good condition, however, it is demonstrating signs of minor concrete deterioration throughout.		

053395: Structure O-16: Centre Line B



UTM Coordinates (WGS84)	17-558766m.E 4903251m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. 0-16: Deck Wearing Surface (West)

Photo



2. 0-16: Railing System (North East)

Photo



3. 0-16: Wingwalls (South West)

Photo



4. 0-16: Soffit - Thick Slab - Ext (North)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O17
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O17										
Main Hwy/Road #	Centre Line B	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	1.5km East of Road 63										
Latitude	44.272486			Longitude	-80.299945						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	Cast-In-Place Conc. Rigid Frame			Interchange Number							
Total Deck Length	5 m			Interchange Structure Number							
Overall Str. Width	6.4 m			Min. Vertical Clearance		m					
Total Deck Area	32 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	6.7 m (btwn tops of slopes)										
Roadway Width	6 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	East - West						
No. of Spans	1			Fill on Structure	0.4 m						
Span Lengths	4.4 m			Height (streambed to structure top)		m					

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☑ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Structure replacement is recommended as soon as possible. Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

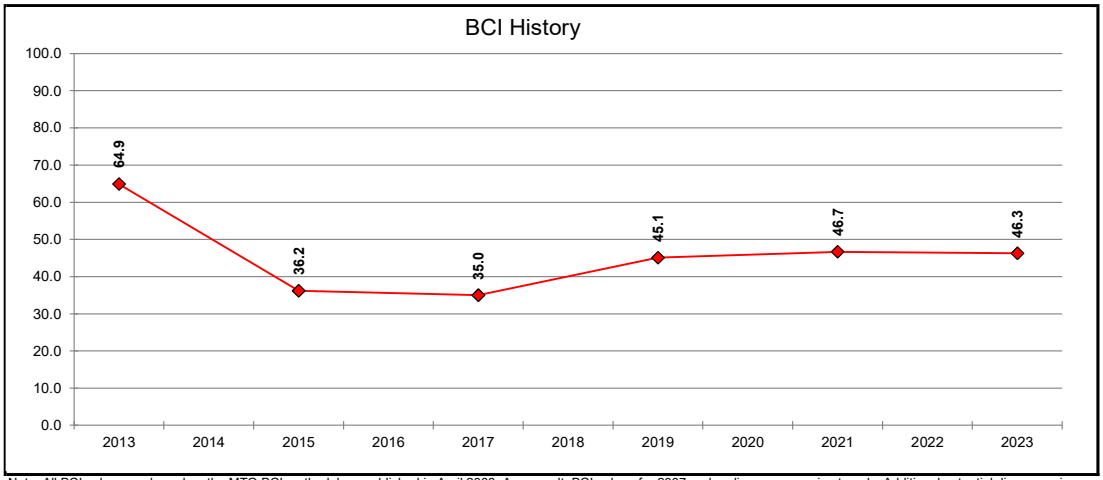
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	46.3	A. Grzywnowicz	
2021	46.7	C. MacKenzie	
2019	45.1	M. August	Wearing surface regraded, barrier system rated on visual appearance
2017	35.0	C. MacKenzie	
2015	36.2	T. Littlejohns	
2013	64.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Four Quadrants		Height:		m		
Material:	Steel		Count:	4			
Element Type:	N/A		Total Quantity:	4	Each		
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Four hazard warning installed. Signs are not located offset from the guide rail leaving end treatments.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	3.81	m		
Element Name:	Approach Guide Rail		Width:		m		
Location:	All Four Quadrants		Height:		m		
Material:	Steel		Count:	19			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	72.39	m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	64.77	3.81	3.81	Element BCI	69.2

Comments: Impact damage on 6 sections, end treatments do not conform to code. Guide rail too low. Appears half of the posts have been replaced.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Approach		Length:	6	m		
Element Name:	Approach Wearing Surface		Width:	6	m		
Location:	East and West		Height:		m		
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	72	Sq.m		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	72	0	0	Element BCI	75.0

Comments: Light wheel rutting.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5 m			
Element Name:	Deck Wearing Surface		Width:	6 m			
Location:	Over Deck		Height:	m			
Material:	Gravel		Count:	1			
Element Type:	N/A		Total Quantity:	30 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	28	1	1	Element BCI	71.3
Comments:	Light to moderate potholes and wheel rutting. Gravel built up on shoulders as well as vegetation.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Decks		Length:	5 m			
Element Name:	Deck Top		Width:	6.4 m			
Location:	Under Wearing Surface		Height:	m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	N/A		Total Quantity:	32 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	16	16	0	Element BCI	57.5
Comments:	Limited inspection - Condition based on soffit.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	3.81 m			
Element Name:	Railing System		Width:	m			
Location:	North and South		Height:	m			
Material:	Steel		Count:	4			
Element Type:	Steel Flex Beam on Wood Post		Total Quantity:	15.24 m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m	0	15.24	0	0	Element BCI	75.0
Comments:	Non code conforming. Some plow impact damage.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Element Data

Element Group:	Curb and S/W		Length:	8 m			
Element Name:	Curbs		Width:	0.3 m			
Location:	North and South		Height:	m			
Material:	Cast-In-Place Concrete		Count:	4.8			
Element Type:	Barrier Curb		Total Quantity:	4.8 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.8	0	0	Element BCI	75.0

Comments: Buried, new curbs added when SBGR added to structure.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Abutments		Length:	1.8 m			
Element Name:	Wingwalls		Width:	1.4 m			
Location:	All Four Quadrants		Height:	m			
Material:	Cast-In-Place Concrete		Count:	4			
Element Type:	N/A		Total Quantity:	10.08 Sq.m			
Environment:	Moderate		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.08	1	0	Element BCI	71.5

Comments: Limited inspection due to vegetation, staining and scaling noted during previous inspection.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Decks		Length:	4.4 m			
Element Name:	Soffit - Thick Slab - Ext		Width:	1 m			
Location:	Exterior		Height:	1 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	17.6 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2	5.92	9.68	Element BCI	22.0

Comments: Delaminations, large spalls, exposed corroded rebar. Disintegration, light scaling.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	4.4 m			
Element Name:	Soffit - Thick Slab - Int		Width:	4.4 m			
Location:	Interior		Height:	m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	N/A		Total Quantity:	19 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	01
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.12	4	10.88	Element BCI	24.7

Comments: Medium to wide crack full span, spalls and delaminations throughout. Erosion at water line, scaling throughout. Spalling with exposed corroded rebar.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: Load Carrying Capacity

Element Group:	Abutments		Length:	6.4 m			
Element Name:	Abutment Walls		Width:	m			
Location:	East and West		Height:	0.6 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	7.68 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	3.68	3	1	Element BCI	51.6

Comments: Scaling, disintegration, erosion on abutment.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Well vegetated.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Waterway vegetated, slow flow, high water level. Flows N-S. Heavy aggradation throughout.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:			Length:	m			
Element Name:			Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	#N/A			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	#N/A					Element BCI	#N/A

Comments:

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O17
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
	Total Maintenance Needs Costs	**$0.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Proper End Treatments	**$40,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type A concrete repairs to deck top,					$10,000.00
Type B concrete repairs to soffit,					$60,000.00
Type C concrete repairs to abutment walls, wingwalls,					$10,000.00
Waterproof and Pave					$16,000.00
Replace Barrier System					$30,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
Rehabilitation Cost Subtotal					**$251,000.00**

Estimated Value of Replacement Structure	**$550,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$266,000.00	$565,000.00
Roadside Protection:		$40,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$27,000.00	$57,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$27,000.00	$57,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$29,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$377,500.00**	**$833,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR	Bridge with span less than 4.5m and replacement planned	N/A	1.0

Recommendation:	Structure replacement is recommended as soon as possible.

Justification:	**Current BCI**	**46.3**
Structure O17 is generally in poor condition and is demonstrating signs of severe concrete deterioration.		

053395: Structure O-17: Centre Line B



UTM Coordinates (WGS84)	17-555876m.E 4902375m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-17: Deck Wearing Surface (West)

Photo



2. O-17: Railing System (North)

Photo



3. O-17: Soffit - Thick Slab - Ext (North)

Photo



4. O-17: Abutment Walls (West)

Photo



5. O-17: Soffit - Thick Slab - Ext (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O19
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O19									
Main Hwy/Road #	8th concession	On	x	Crossing Type:	Navig. Water		Non-Navig.		Ped.	
		Under			Rail		Road		Other	
Structure Location	1.1km East of Grey Road 2									
Latitude	44.335968	Longitude	-80.362917							
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	x	Cons/not App.		List/n.d.			
			Desig./not list		Desig & List					
MTO region		Road Class:	Freeway		Arterial					
			Collector		Local					
MTO District		Posted Speed		No. of Lanes						
Old County		AADT		% Trucks						
Geographic Twp.		Inspection Route Sequence								
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number								
Total Deck Length	5.6 m	Interchange Structure Number								
Overall Str. Width	12.2 m	Min. Vertical Clearance		m						
Total Deck Area	68.32 sq. m	Special Routes:	Transit		Truck					
			School		Bicycle					
Road Platform Width	8 m (btwn tops of slopes)									
Roadway Width	6.7 m (btwn edges of shoulders)	Detour Length Around Bridge		km						
Skew Angle	Degrees	Direction of Structure	East - West							
No. of Spans		Fill on Structure	1.4 m							
Span Lengths	5.6 m	Height (streambed to structure top)	3.6 m							

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	16°C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:	X			$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☑ Minor Rehab. ☐ Major Rehab. ☐ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

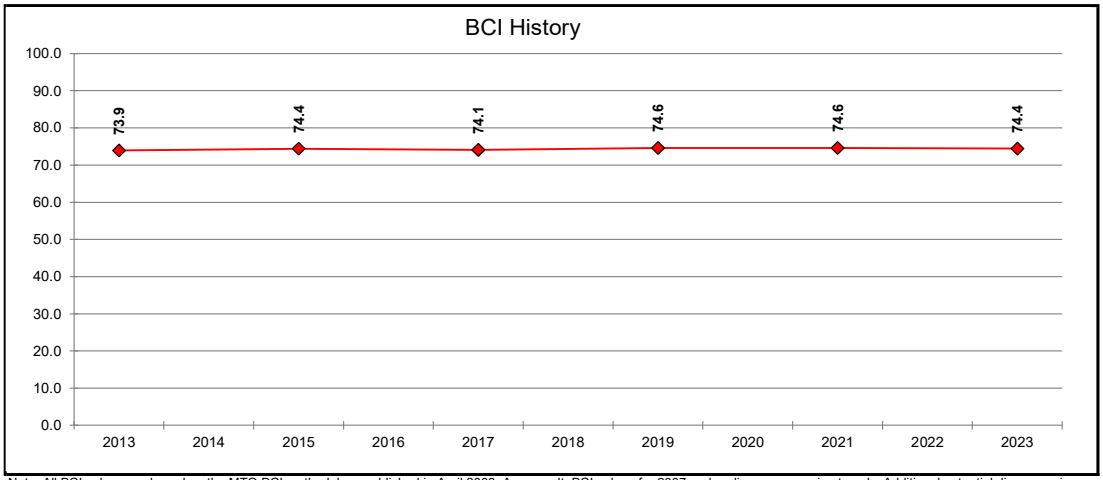
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	74.4	A. Grzywnowicz	
2021	74.6	C. MacKenzie	
2019	74.6	M. August	
2017	74.1	C. MacKenzie	
2015	74.4	T. Littlejohns	
2013	73.9	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:	m			
Element Name:	Signs		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:	Each			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each					Element BCI	

Comments: No hazard warning signs present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	17
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Consider installing hazard warning signs.		Maintenance Needs: Hazard Signs Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present, should be added.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	6.7 m			
Location:	East and West		Height:	m			
Material:	Gravel		Count:	2			
Element Type:	N/A		Total Quantity:	80.4 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	80.4	0	0	Element BCI	75.0

Comments: Signs of light wheel track rutting, loose gravel on shoulders, hard packed road surface.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.6 m			
Element Name:	Deck Wearing Surface		Width:	6.7 m			
Location:	Over Structure		Height:	m			
Material:	Gravel		Count:				
Element Type:	N/A		Total Quantity:	37.52 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	37.52	0	0	Element BCI	75.0
Comments:	Signs of light wheel rutting, loose gravel on shoulders, hard packed road surface.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present, should be added.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
Consider installing barrier system over structure			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	5.6 m			
Element Name:	Inlet		Width:	0.75 m			
Location:	South		Height:	1.5 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Rectangular Culvert		Total Quantity:	10 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	10	0	0	Element BCI	75.0
Comments:	Cedar trees growing over culvert. Light scaling, horizontal hairline cracks at cold joint.Dampness likely due to vegetation.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**			02	
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☑ 1 Year ☐ 2 Year				
Consider removing trees over structure			Maintenance Needs: Bridge Cleaning				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	12.2 m			
Element Name:	Barrels		Width:	5.6 m			
Location:	Interior		Height:	1.5 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Rectangular Culvert		Total Quantity:	104.92 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	104.42	0.25	0.25	Element BCI	74.7

Comments: Hairline to narrow cracks throughout. Delamination near inlet on soffit. Wet areas and staining caused due to lack of drip edge.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Culvert		Length:	5.6 m			
Element Name:	Outlet		Width:	0.75 m			
Location:	North		Height:	1.5 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Rectangular Culvert		Total Quantity:	10 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	9.2	0.4	0.4	Element BCI	70.6

Comments: Hairline stained cracks, vegetation growing over structure, erosion and spalls from cedar trees growing on outlet.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:** 02
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year
		Maintenance Needs: Bridge Cleaning
Remove trees from above soffit		Performance Deficiencies: None

Element Group:	Foundations		Length:	m			
Element Name:	Foundation (below ground level) - A		Width:	m			
Location:	Transverse Struts		Height:	m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	N/A		Total Quantity:	2 All			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	2	0	0	Element BCI	75.0

Comments: Limited inspection - condition based on overall structure condition.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep, well vegetated. Light washout SW. vegetation growing on concrete at wingwalls.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Up stream enters structure at 90 degrees, rocks across the stream at inlet and outlet, aggradation on east footing. Flows S-N.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year
		Maintenance Needs: None
		Performance Deficiencies: None

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O19
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation growing over inlet and outlet	$3,500.00
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Total Maintenance Needs Costs	**$4,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Install Guide Rail, end treatments	**$95,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Waterproof and pave					$40,000.00
General Items - Insurance, Mobilization, Access etc.					$40,000.00
				Rehabilitation Cost Subtotal	**$80,000.00**

Estimated Value of Replacement Structure	**$600,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$95,000.00	$615,000.00
Roadside Protection:		$95,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$10,000.00	$62,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$20,000.00	$62,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$31,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$237,500.00**	**$895,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
BR-1	Bridge with span less than 20m. One rehabilitation cycle planned	14.4	24.4

Recommendation:	No Capital Works estimated to be required within 10 years. Future structure rehabilitation should be considered.

Justification:	**Current BCI**	**74.4**
Structure O19 is generally in good condition.		

053395: Structure O-19: 8th Concession B



UTM Coordinates (WGS84)	17-550786m.E 4909387m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault
Road or Location Description	8th Concession B

1. O-19: Deck Wearing Surface (East)

Photo



2. O-19: Inlet (South)

Photo



3. O-19: Barrels (North)

Photo



4. O-19: Outlet (North)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O20
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O20										
Main Hwy/Road #	Wellington Street	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	0.5km East of Grey Road 2										
Latitude	44.339969			Longitude	-80.37177						
Owners	Municipality of Grey Highlands			Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.		
					Desig./not list		Desig & List				
MTO region				Road Class:	Freeway		Arterial				
					Collector		Local	X			
MTO District				Posted Speed			No. of Lanes	2			
Old County				AADT			% Trucks				
Geographic Twp.				Inspection Route Sequence							
Structure Type	CSP Multi-Plate Arch Culvert(s)			Interchange Number							
Total Deck Length	4.6 m			Interchange Structure Number							
Overall Str. Width	13.5 m			Min. Vertical Clearance		m					
Total Deck Area	62.1 sq. m			Special Routes:	Transit		Truck				
					School		Bicycle				
Road Platform Width	8.3 m (btwn tops of slopes)										
Roadway Width	7.2 m (btwn edges of shoulders)			Detour Length Around Bridge		km					
Skew Angle	Degrees			Direction of Structure	North - South						
No. of Spans	1			Fill on Structure	0.8 m						
Span Lengths	4.6 m			Height (streambed to structure top)	4.1 m						

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 13, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	13° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	xxxx			$0.00
Non-destructive Delamination Survey of Covered Deck:	xxxx			$0.00
Concrete Substructure Condition Survey:	xxxx			$0.00
Detailed Coating Condition Survey:	xxxx			$0.00
Detailed Timber Investigation:	xxxx			$0.00
Post-Tensioned Strand Investigation:	xxxx			$0.00
Underwater Investigation:	xxxx			$0.00
Fatigue Inspection:	xxxx			$0.00
Enhanced OSIM Inspection:	xxxx			$0.00
Structure Evaluation:	xxxx			$0.00
Other:	xxxx			$0.00
Monitoring of Deformations, Settlements and Movements:	xxxx			$0.00
Monitoring Crack Widths:	xxxx			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☐ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☑ >10 years
Overall Comments:	No Capital Works is estimated to be required within the next 10 years. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

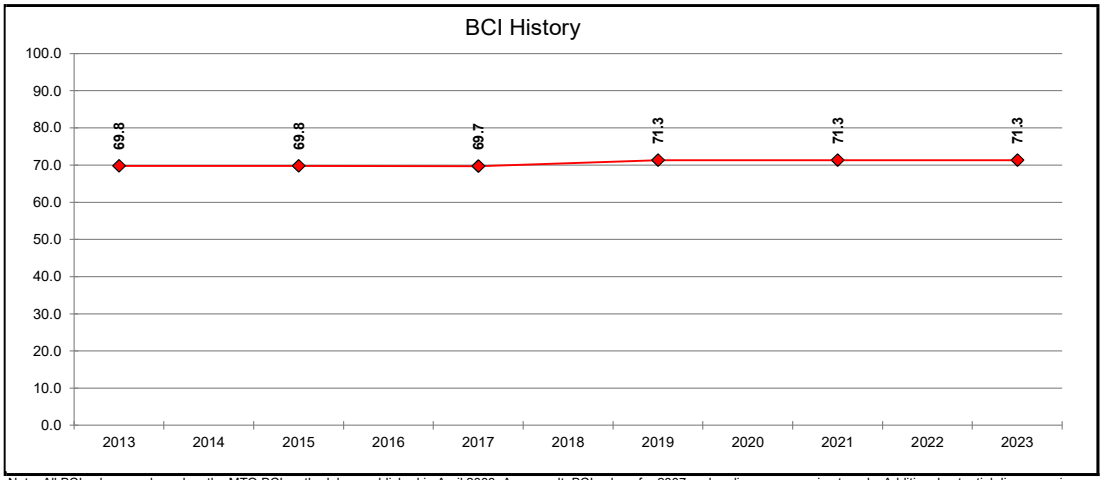
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	71.3	A. Grzywnowicz	
2021	71.3	C. MacKenzie	
2019	71.3	M. August	Wearing surface repaved
2017	69.7	C. MacKenzie	
2015	69.8	T. Littlejohns	
2013	69.8	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Element Data

Element Group:	Approach		Length:	6 m			
Element Name:	Approach Wearing Surface		Width:	7.2 m			
Location:			Height:	m			
Material:			Count:	2			
Element Type:			Total Quantity:	86.4 Sq.m			
Environment:			Limited Inspection:	☐			
Protection System:						Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m		86.4			Element BCI	75.0

Comments: No observed defects.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	m			
Element Name:	Approach Guide Rail		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present - should be added.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatments.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Decks		Length:	4.6 m			
Element Name:	Deck Wearing Surface		Width:	7.2 m			
Location:	Over Structure		Height:	m			
Material:	Asphalt		Count:				
Element Type:	N/A		Total Quantity:	33 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	33	0	0	Element BCI	75.0

Comments: No observed defects. Sediment build up on south shoulder.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Element Data

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	

Comments: None present - should be added.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing barrier system over structure.		Maintenance Needs: None Performance Deficiencies: None	

Element Group:	Retaining Walls		Length:	m			
Element Name:	Wall		Width:	m			
Location:			Height:	m			
Material:	Gabion		Count:				
Element Type:	Gabions		Total Quantity:	6.3 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	04
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	4.2	2.1	0	Element BCI	63.3

Comments: Some baskets are sagging and rotated out. Separated from roadside embankment, settlement evident behind wall. Vegetation growing behind the N/E corner. Continue to monitor retaining wall rotation/movement during future biennial inspections. Remove cedar tree on NE corner that may be causing retaining wall movement.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	02
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Monitor the gabions on future inspections. Remove vegetation		Maintenance Needs: Bridge Cleaning Performance Deficiencies: Continuing Movements	

Element Group:	Culvert		Length:	13.5 m			
Element Name:	Barrels		Width:	4.6 m			
Location:	Interior		Height:	2.8 m			
Material:	Steel		Count:				
Element Type:	Arch Culvert		Total Quantity:	137.7 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	124.2	13.5	0	Element BCI	71.6

Comments: Rust at waterline, efflorescence staining at bolt holes located around haunch height, incorrect bolt pattern, loose bolts, no deformations visible.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☑	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0

Comments: Unobstructed waterway, no evidence of scour.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Accessories		Length:		m		
Element Name:	Signs		Width:		m		
Location:	All Four Quadrants		Height:		m		
Material:	Steel		Count:				
Element Type:	N/A		Total Quantity:		Each		
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each					Element BCI	

Comments: No hazard warning signs present.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	17
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☑ 1 Year ☐ 2 Year	
Consider installing hazard warning signs.		Maintenance Needs: Hazard Signs	
		Performance Deficiencies: None	

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Four Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0

Comments: Steep, well vegetated, gabion wall providing stabilization on the northwest bank. Small erosion beginning on the northeast bank.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Element Data

Element Group:	Foundations		Length:		m		
Element Name:	Foundation (below ground level) - Abut		Width:		m		
Location:	East & West		Height:		m		
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Other		Total Quantity:	1	All		
Environment:	Benign		Limited Inspection:	☑			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	40.0
Comments:	Limited Inspection. Small scour at north west corner. Possible signs of settlement. Wide crack at midspan.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Embankments		Width:		m		
Location:	All Quadrants		Height:		m		
Material:	Other		Count:	4			
Element Type:	Other		Total Quantity:	4	Each		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	4	0	0	Element BCI	75.0
Comments:	Well vegetated and appears stable.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:		m		
Element Name:	Streams and Waterways		Width:		m		
Location:	Through Structure		Height:		m		
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1	All		
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	75.0
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O20
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation growing on NW quadrant	$2,500.00
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Total Maintenance Needs Costs	**$3,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Investigate need for Guide Rail	**$1,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
				Rehabilitation Cost Subtotal	**$0.00**

Estimated Value of Replacement Structure	**$600,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control			$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$0.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		N/A	$615,000.00
Roadside Protection:		N/A	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	N/A	$62,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	N/A	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	N/A	$62,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	N/A	$31,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**N/A**	**$895,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CS	Metal culvert - No rehabilitation planned.	N/A	15.7

Recommendation:	No Capital Works is estimated to be required within the next 10 years.

Justification:	**Current BCI**	**71.3**
Structure O20 is generally in good condition.		

053395: Structure O-20: Wellington Street



UTM Coordinates (WGS84)	17-550077m.E 4909826m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-20: Deck Wearing Surface (West)

Photo



2. O-20: Wall (North)

Photo



3. O-20: Barrels (South)

Photo



4. O-20: Inlet (South)

Photo



Ontario Structure Inspection Manual - Inspection Form

Site Number: O21
MTO Site Number: N/A

Inventory Data:

Structure Name	Bridge O21										
Main Hwy/Road #	10th Concession	On	X	Crossing Type:	Navig. Water		Non-Navig.		X	Ped.	
		Under			Rail		Road			Other	
Structure Location	1km East of Grey Road 2										
Latitude	44.353919	Longitude	-80.36839								
Owners	Municipality of Grey Highlands	Heritage Designation	Not Consid:	X	Cons/not App.		List/n.d.				
			Desig./not list		Desig & List						
MTO region		Road Class:	Freeway		Arterial						
			Collector		Local	X					
MTO District		Posted Speed		No. of Lanes	2						
Old County		AADT		% Trucks							
Geographic Twp.		Inspection Route Sequence									
Structure Type	Cast-In-Place Conc. Rigid Frame	Interchange Number									
Total Deck Length	6 m	Interchange Structure Number									
Overall Str. Width	16.7 m	Min. Vertical Clearance		m							
Total Deck Area	100.2 sq. m	Special Routes:	Transit		Truck						
			School		Bicycle						
Road Platform Width	9.5 m (btwn tops of slopes)										
Roadway Width	6.6 m (btwn edges of shoulders)	Detour Length Around Bridge		km							
Skew Angle	Degrees	Direction of Structure	East - West								
No. of Spans	1	Fill on Structure	1.5 m								
Span Lengths	5.65 m	Height (streambed to structure top)	3 m								

Historical Data:

Year Built (○ Known ○ Estimated ◉ Unknown)		Last Evaluation	
Last Biennial Inspection	2021	Current Load Limit	tonnes
Last Bridge Master Inspection		Load Limit By-Law #	
Last Condition Survey		By-Law Expiry Date	
Last Underwater Inspection			

Rehab History: (Date / Description)	Rehab Year		
Date of culvert extension unknown			

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Field Inspection Information:			
Date of Inspection:	June 9, 2023	Type of Inspection:	☑ OSIM ☐ Enhanced OSIM
Inspector:	A. Grzywnowicz		
Others in Party:	S. Breault		
Equipment Used:	Camera, Hammer, Tape Measure		
Weather:	Sunny		
Temperature:	13° C		

Additional Investigations Required:	Priority			Estimated Cost
	None	Normal	Urgent	
Material Condition Survey				
Detailed Deck Condition Survey:	X			$0.00
Non-destructive Delamination Survey of Covered Deck:	X			$0.00
Concrete Substructure Condition Survey:	X			$0.00
Detailed Coating Condition Survey:	X			$0.00
Detailed Timber Investigation:	X			$0.00
Post-Tensioned Strand Investigation:	X			$0.00
Underwater Investigation:	X			$0.00
Fatigue Inspection:	X			$0.00
Enhanced OSIM Inspection:	X			$0.00
Structure Evaluation:	X			$0.00
Other:				$0.00
Monitoring of Deformations, Settlements and Movements:	X			$0.00
Monitoring Crack Widths:	X			$0.00
Investigation Notes:				

Overall Structure Notes:	
Recommended Work on Structure:	☐ None ☐ Minor Rehab. ☐ Major Rehab. ☑ Replace
Timing of Recommended Work:	☑ Within 1 year ☐ 1 to 5 years ☐ 6 to 10 years ☐ >10 years
Overall Comments:	Structure replacement is recommended as soon as possible. Maintenance and Roadside Safety work recommended.
Current Load Limit Posting:	N/A
Recommended Load Limit Posting:	N/A
Date of Next Inspection:	2025

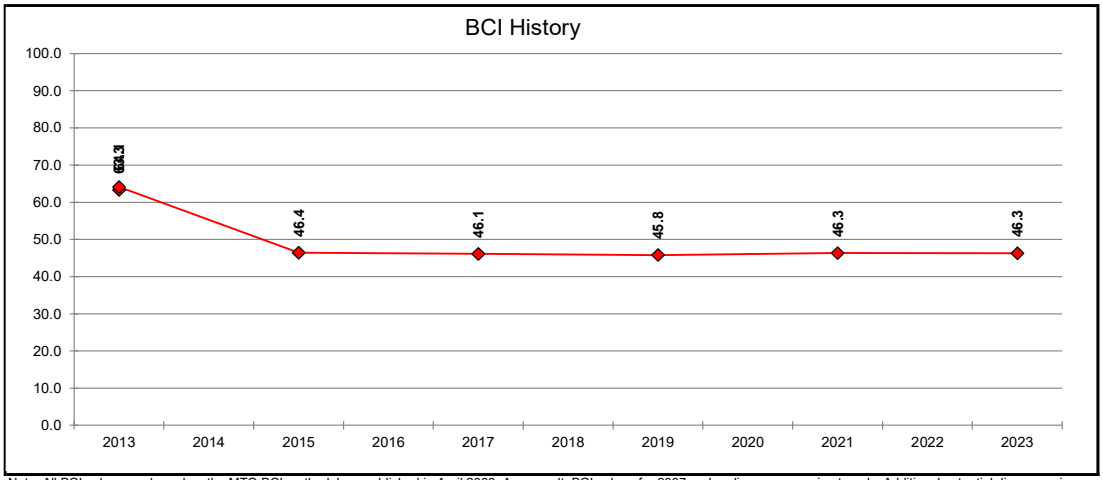
Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

BCI History

Date	BCI	Inspector	BCI Change Justification
2023	46.3	A. Grzywnowicz	
2021	46.3	C. MacKenzie	
2019	45.8	M. August	
2017	46.1	C. MacKenzie	
2015	46.4	T. Littlejohns	
2013	63.3	J. Cober	
2013	64.1	J. Cober	

Note: When no justification is given for BCI change above, the change is a result of typical ongoing deterioration with time, load cycles and exposure to the elements



Note: All BCI values are based on the MTO BCI methodology published in April 2008. As a result, BCI values for 2007 and earlier are approximate only. Additional potential discrepancies may also exist as a result from changes over time in the way the quantities for certain elements are calculated.

Standard Codes

Suspected Performance Deficiencies

01 Load Carrying Capacity
02 Excessive Deformations (deflections/rotations)
03 Continuing Settlement
04 Continuing Movements
05 Seized Bearings
06 Bearing not Uniformly Loaded/Unstable
07 Jammed Expansion Joint
08 Pedestrian/Vehicular Hazard
09 Rough Riding Surface
10 Surface Ponding
11 Deck Drainage
12 Slippery Surfaces
13 Flooding/Channel Blockage
14 Undermining of Foundation
15 Unstable Embankments
16 Other

Maintenance Needs

01 Lift and Swing Bridge Maintenance
02 Bridge Cleaning
03 Bridge Handrail Maintenance
04 Painting Steel Bridge Structures
05 Bridge Deck Joint Repair
06 Bridge Bearing Maintenance
07 Repair to Structural Steel
08 Repair to Bridge Concrete
09 Repair of Bridge Timber
10 Bailey Bridges - Maintenance
11 Animal/Pest Control
12 Bridge Structure Repair
13 Erosion Control at Bridges
14 Concrete Sealing
15 Rout and Seal
16 Bridge Deck Drainage
17 Hazard Warning Signs
18 Other

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Element Data

Element Group:	Accessories		Length:		m			
Element Name:	Signs		Width:		m			
Location:	All Four Quadrants		Height:		m			
Material:	Steel		Count:	4				
Element Type:	N/A		Total Quantity:	4	Each			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Each	0	4	0	0		Element BCI	75.0

Comments: Four hazard warning signs installed.

Recommended Work:	Rehab ☐ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☐ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:		m			
Element Name:	Approach Guide Rail		Width:		m			
Location:	All Four Quadrants		Height:		m			
Material:			Count:					
Element Type:			Total Quantity:		m			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	m						Element BCI	

Comments: None present - should be added.

Recommended Work:	Rehab ☐ Replace ☑	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
Consider installing SBGR with proper extruder end treatment.		Maintenance Needs: None	
		Performance Deficiencies: None	

Element Group:	Approach		Length:	6	m			
Element Name:	Approach Wearing Surface		Width:	6.6	m			
Location:	East and West		Height:		m			
Material:	Asphalt		Count:	2				
Element Type:	N/A		Total Quantity:	79.2	Sq.m			
Environment:	Severe		Limited Inspection:	☐				
Protection System:	N/A						Performance	
Condition	Units	Exc.	Good	Fair	Poor		Deficiencies	
Data:	Sq.m	0	66.2	9	4		Element BCI	67.2

Comments: Wide transverse cracks behind abutment on east side, settlement east, saw cut not sealed, edge cracking/alligator cracking on approaches.

Recommended Work:	Rehab ☑ Replace ☐	**Maintenance Needs:**	
	1-5 Years ☑ 6-10 Years ☐	☐ Urgent ☐ 1 Year ☐ 2 Year	
		Maintenance Needs: None	
		Performance Deficiencies: None	

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Element Data

Element Group:	Decks		Length:	5.65 m			
Element Name:	Deck Wearing Surface		Width:	6.6 m			
Location:	Over Structure		Height:	m			
Material:	Asphalt		Count:	1			
Element Type:	N/A		Total Quantity:	37.29 Sq.m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	34.29	0	3	Element BCI	69.0
Comments:	Medium to wide center line longitudinal crack, alligator cracking at deck ends, washout north and south.Alligator and edge cracking on south side.						
Recommended Work:	Rehab ☑ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Barriers		Length:	m			
Element Name:	Railing System		Width:	m			
Location:			Height:	m			
Material:			Count:				
Element Type:			Total Quantity:	m			
Environment:	Severe		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	m					Element BCI	
Comments:	None present - should be added.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
Consider installing barrier system over structure			Performance Deficiencies: None				

Element Group:	Culvert		Length:	5.65 m			
Element Name:	Inlet		Width:	0.4 m			
Location:	North		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Open Footing		Total Quantity:	2.82 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.82	0	0	Element BCI	75.0
Comments:	Light scaling, dampness and active wet areas observed during inspection. Trees growing on embankement above inlet.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Element Data

Element Group:	Culvert		Length:	5.5 m			
Element Name:	Barrels		Width:	5.65 m			
Location:	New exteriors		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:	2			
Element Type:	Rectangular Culvert		Total Quantity:	46.5 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	46.5	0	0	Element BCI	43.7
Comments:	Narrow stained crack near joint South. Water seepage. Honeycombing at top of haunches.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Element Group:	Culvert		Length:	6 m			
Element Name:	Barrels		Width:	5.65 m			
Location:	Old portions		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:	1			
Element Type:	Rectangular Culvert		Total Quantity:	50.7 Sq.m			
Environment:	Benign		Limited Inspection:	☐			
Protection System:						Performance	03
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	0	19.01	31.69	Element BCI	43.7
Comments:	Very wide vertical cracks (30mm) at center line with exposed corroded rebar. Appears abutments have settled on both sides of crack. Spalls on soffit, some patch work coming off. Spalls at joint with new extensions. Existing soffit sits lower than the new sections. Light honeycombing, large delaminations and exposed corroded rebar. Efflorescence staining with stalactites. Large voids.Dampness noted on soffit between new and original portion.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: Continuing Settlement				

Element Group:	Culvert		Length:	5.65 m			
Element Name:	Outlet		Width:	0.4 m			
Location:	South		Height:	1.4 m			
Material:	Cast-In-Place Concrete		Count:				
Element Type:	Open Footing		Total Quantity:	2.82 Sq.m			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m	0	2.82	0	0	Element BCI	75.0
Comments:	Wet areas due to fill above culvert.						
Recommended Work:	Rehab ☐ Replace ☐		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☐		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None				
			Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Element Data

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Embankments		Width:	m			
Location:	All Four Quadrants		Height:	m			
Material:	Other		Count:	4			
Element Type:	Vegetation		Total Quantity:	4 Each			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Each	0	2	1	1	Element BCI	47.5
Comments:	Some rip rap, washouts above structure						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**			13	
	1-5 Years ☑ 6-10 Years ☐		☐ Urgent ☑ 1 Year ☐ 2 Year				
Place stone protection			Maintenance Needs: Erosion Control Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	N/A		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	0	1	0	Element BCI	57.5
Comments:	Rock dam at down stream end causing scour pool down stream of structure. Flows N-S.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Element Group:	Embankment and Stream		Length:	m			
Element Name:	Streams and Waterways		Width:	m			
Location:	Through Structure		Height:	m			
Material:	Other		Count:	1			
Element Type:	Other		Total Quantity:	1 All			
Environment:	Moderate		Limited Inspection:	☐			
Protection System:	N/A					Performance	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	All	0	1	0	0	Element BCI	57.5
Comments:	No observed defects.						
Recommended Work:	Rehab ☐ Replace ☑		**Maintenance Needs:**				
	1-5 Years ☐ 6-10 Years ☑		☐ Urgent ☐ 1 Year ☐ 2 Year				
			Maintenance Needs: None Performance Deficiencies: None				

Ontario Structure Inspection Manual - Inspection Form

Site Number:	O21
MTO Site Number:	N/A

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Rip-rap required at washouts on embankments	$1,500.00
	Total Maintenance Needs Costs	**$1,500.00**

Additional Investigations:		**$0.00**

See Page 2 for detailed breakdown of additional investigations

Roadside Protection:	Investigate need for Guide Rail	**$1,000.00**

The above are the current roadside protection needs at the time of inspection; however, the recommended work at the time of future capital works (Rehab / Replacement) may differ than the current needs

Repair and Rehabilitation Required: Element-Repair and Rehabilitation Required	6 to 10 years	1 to 5 years	Within 1 year	Urgent	Estimated Construction Cost
Type C concrete repairs to barrels,					$100,000.00
Patch asphalt					$15,000.00
Add slope stabilization					$16,000.00
General Items - Insurance, Mobilization, Access etc.					$125,000.00
				Rehabilitation Cost Subtotal	**$256,000.00**

Estimated Value of Replacement Structure	**$400,000.00**

Associated Work:	Comments	Rehabilitation:	Replacement:
Approaches			
Detours			
Traffic Control		$15,000.00	$15,000.00
Utilities			
Right of Way			
Environmental			
Other			
	Total Associated Work Costs	**$15,000.00**	**$15,000.00**

Capital Works Costs:	Notes:	Rehabilitation:	Replacement:
Rehab / Replacement Works:		$271,000.00	$415,000.00
Roadside Protection:		$1,000.00	$95,000.00
Staging Costs:		N/A	N/A
Contingencies:	10% of first $1M + 5% of cost above $1M	$28,000.00	$42,000.00
Environmental Assessment*:	Replacement assumes Schedule A/A+ Class Environmental Assessment	$2,500.00	$10,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M (Min $20,000 for rehab, $40,000 for replace)	$28,000.00	$42,000.00
Geotechnical Investigation		N/A	$20,000.00
Contract Administration	5% of Rehab / Replacement Works (Minimum $15,000)	$15,000.00	$21,000.00
*EA Schedule shall be confirmed during design	**Total Capital Works Costs:**	**$345,500.00**	**$645,000.00**

Note: Costs shown do not include property acquisition or roadwork beyond the end of the bridge.

BCI Deterioration Curve		Years to	
Curve	**Description**	**Rehabilitation**	**Replacement**
CC	Concrete culvert - No rehabilitation planned.	N/A	0.9

Recommendation:	Structure replacement is recommended as soon as possible.

Justification:	**Current BCI**	**46.3**

Structure O21 consists of an original structure and newer extensions. The newer extensions are considered to be in good condition, however the original section below the road is in poor condition and should be replaced within one year to help prolong the life span of the structure.

The replacement cost provided is for the centre portion of the structure only, not the entire culvert.

053395: Structure O-21: 10th Concession



UTM Coordinates (WGS84)	17-550343m.E 4911376m.N
Ownership	Municipality of Grey Highlands
Structure Type	Municipal Structure
Inspectors	Amy Grzywnowicz, Sonya Breault

1. O-21: Deck Wearing Surface (East)

Photo



2. O-21: Approach Wearing Surface (North East)

Photo



3. O-21: Inlet (North)

Photo



4. O-21: Barrels (North)

Photo



5. O-21: Barrels (Center)

Photo



6. O-21: Barrels (South)

Photo



7. O-21: Outlet (South)

Photo



R.J. Burnside & Associates Limited