



CORPORATION OF THE TOWN OF TECUMSEH

2024 Bridge and Culvert Needs Study Structures with Spans > 3.0 m





February 11, 2024

Corporation of the Town of Tecumseh
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Attention: Mr. John Henderson, P.Eng.
Manager Engineering Services

*Town of Tecumseh – 2024 Bridge and Culvert Needs Study
Structures with Spans > 3.0 m*

Dillon is pleased to submit a PDF copy of the Final 2024 Bridge and Culvert Needs Study Report for Structures with Spans > 3.0 metres (m) to the Town of Tecumseh.

Should you have any questions or concerns, please contact us for discussion.

Sincerely,

DILLON CONSULTING LIMITED

A handwritten signature in black ink, appearing to read "MSokolski".

Monica Sokolski
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MAS:rrk
Enclosure

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Executive Summary

A Bridge and Culvert Needs Study was carried out in 2024 by Dillon Consulting Limited (Dillon) for 16 bridge and culvert structures with spans greater than 3.0 metres (m), including two pedestrian bridges, located in the Town of Tecumseh (the Town). This report summarizes the findings of the study and identifies the required improvements to structures which are currently deficient or are likely to become deficient within a ten year period from the time of this report.

Three of the 16 structures investigated were identified to have deficiencies where rehabilitation of the structures is recommended. The structures are listed below and this information is also summarized in Appendices B and C.

- Rehabilitation within one to five years
 - Structure 2001 – Colchester Townline Drain at Eighth Concession Road
- Replacement within six to ten years
 - Pedestrian Bridge No.1 – Lakewood Park Pedestrian Bridge
- Rehabilitation within six to ten years
 - Structure 1016 – Collins Drain at Outer Drive.

Structure 2001 was generally in fair condition with very severe spalling of grout, loss of stone and voids observed above the CSP inlet and outlet. The deterioration at the headwalls has progressed since the last inspection and a minor rehabilitation to address these concerns is recommended within one to two years.

The coating system on Pedestrian Bridge No. 1's floor system was observed to have failed and has advanced significantly since the last inspection. The progression of the coating failure confirmed that the previously noted severe corrosion and section loss of the floor system was coating failure. Light corrosion was observed throughout with areas of medium corrosion observed on the stringers. While the corrosion of the floor beams, stringers, and wind bracing has progressed since the last inspection it is not a significant issue at the moment. A steel condition survey in order to quantify the extent of the deterioration and confirm presence of section loss is not considered required at this time but could be considered in the future dependant on the findings from future inspections. Annual inspections are recommended until the structure is replaced. During the 2022 needs study, consultation with the bridge fabricator determined the cost to replace the structure is similar to that of a rehabilitation and therefore a replacement is recommended within six to ten years.

Rehabilitation of structure 1016 may be required in six to ten years in order to address the potential lack of waterproofing on the top of deck and the leaking wide crack observed on the culvert soffit.

No additional investigations are warranted for the 16 structures investigated. However, a steel condition survey and/or detailed coating condition survey may be considered in the future for Pedestrian Bridge No. 1 and should be confirmed during the next inspection.

As part of a previous assignment, Dillon completed a detailed roadside safety review for the bridges and culverts located in the Town of Tecumseh. The outstanding previously recommended roadside safety improvements are summarized below and this information is also summarized in Appendix B.

- Structure 1005 – Pike Creek at Baseline Road
 - Extend the steel beam guide rail at the eastbound approach to relocate the steel beam energy attenuating terminal away from utility poles.

The total estimated capital needs allocation over the ten year study period (to 2034) is \$595,000. This cost estimate excludes H.S.T. and routine maintenance items and includes allowances for construction contingencies and engineering. The Town should consider the needs of the road network when determining priorities for the structures.

By combining road and structure works, there may be opportunities for additional cost savings and a reduction in public traffic disruptions. These estimated costs are in 2024 Canadian dollars without allowance for inflation and are based on visual observations during the study. The recommendations may not necessarily include every improvement possible for each structure. The final estimated costs for structure rehabilitation or replacement will vary on the results of detailed investigations, and/or changes to the proposed scope of work during detailed design.

In this study, the Bridge Condition Index (BCI) was calculated for each structure and compared to the BCI of the previous studies (2003 to 2022). This comparison is provided in Appendix D. The average BCI value calculated for 2024 is 76.6 which is slightly lower than the BCI value of 77.7 that was calculated for the 2022 study. The decrease in BCI can be attributed to the standard decline in structure condition over time.

1.0 Background, Purpose, and Methodology

1.1 Background and Purpose

Dillon Consulting Limited (Dillon) was retained by the Corporation of the Town of Tecumseh (the Town) in March 2024, to conduct a needs study for the Town's current inventory of 16 bridge and culvert structures greater than 3 metres (m) in span. The general scope of work for this study is as follows:

- Review of previous 'Town of Tecumseh – 2022 Bridge and Culvert Needs Study' report, recent updates to structures, existing reports, and drawings readily available, including past capital spending information provided by the Town since the 2022 report.
- Perform a visual site inspection of the accessible portions of the Town's 16 bridge and culvert structures with spans greater than 3.0 m.
- Where accessible, take approximate site measurements and update previous records of structural defects, deficiencies, and maintenance needs.
- Update the overall and detailed maps of the Town showing the location and ID of each structure.
- Update the Ontario Structure Inspection Manual (OSIM) inspection reports of the previous 2022 Bridge and Culvert Needs Study, prepared by Dillon.
- Complete the Bridge Condition Index (BCI) for each structure with a graphical comparison with the previous studies (2003 to 2022).
- Prioritization of structures requiring capital works based on current BCI values and site observation and any future planning of the Town.
- Prepare a preliminary opinion of probable cost of construction for improving and maintaining the structure inventory over a ten-year period (2024 to 20324) from the time of this report.

1.2 Methodology

1.2.1 Structure Inspection

The general methodology used for conducting the visual review of the structures is as follows:

- Visually inspect or hammer sound accessible concrete elements from ground level and/or from the water level, where use of hip waders is deemed safe and practical.
- Visually inspect the condition of the structural steel elements, where applicable.
- Compile a digital photo inventory of the observed condition for each structure.
- Record general defects for each element inspected, under the following general classifications:
 - Material defects, such as concrete delamination, spalling, cracking, scaling, etc., as applicable.
 - Performance deficiencies, such as observed settlements or load carrying capabilities.
 - Maintenance needs, such as minor concrete repairs, cleaning deck drains, removing debris, asphalt repairs, embankment repairs, installing signage, etc.

Note: Repair Costs for these items have not been included. It is assumed that these items are included in the Town's routine maintenance budget.

1.2.2 Definition of Bridge and Culvert

The definition of bridges and culverts, for the purpose of this study, has been taken from the CSA S6-19 Canadian Highway Bridge Design Code (CHBDC), and is summarized below:

- Bridge – A structure which provides a roadway or a walkway for the passage of vehicles, pedestrians, or cyclists across an obstruction, gap or facility, and is greater than 3 m in span.
- Culvert – A structure that forms an opening through soil. Only structures with spans in excess of 3 m were considered part of this study.

1.2.3 Structure Inventory and Classification

The 16 structures located in the Town, and included in this study, were classified as a Bridge or Culvert according to CSA S6-19, as stated above. The structures were inventoried and appraised according to the Ontario Structure Inspection Manual (OSIM), recent field investigations and discussions with the Town. Each structure was allocated an identification number by the Town for inventory purposes.

General information relating to each of the structures included in this study is summarized in Table 1. An aerial map, showing the approximate structure locations is included in Appendix A.

Table 1: Inventory of Bridges and Culverts

Structure ID	Structure Location	Structure Type	Year of Construction	Year of Last Major Rehab
1002	Pike Creek at Twelfth Concession Road	Concrete Rigid Frame (Bridge)	1961	2016
1003	Pike Creek at Twelfth Concession Road	Concrete Slab on Steel Girder (Bridge)	1965	2013
1004	Sullivan Drain at Twelfth Concession Road	Concrete Non-Rigid Frame (Bridge)	1965	2019
1005	Pike Creek at Baseline Road	Concrete Slab on Steel Girder (Bridge)	1955	2014
1006	Sullivan Creek at Baseline Road	Concrete Rigid Frame (Culvert)	2015	--
1009	Pike Creek at Malden Road	Concrete Rigid Frame (Culvert)	2007	--
1010	West Townline Drain at Malden Road	Corrugated Steel Pipe Arch (Culvert)	1995	--
1011	Malden Road Drain at South Talbot Road	Concrete Rigid Frame (Culvert)	2007	--

Structure ID	Structure Location	Structure Type	Year of Construction	Year of Last Major Rehab
1013	Merrick Drain at Eighth Concession Road	Concrete Non-Rigid Frame (Bridge)	1965	2020
1014	Colchester Townline Drain at Sixth Concession Road	Concrete Non-Rigid Frame (Culvert)	1955	2019
1015	Merrick Creek Drain at Sixth Concession Road	Concrete Rigid Frame (Culvert)	2007	--
1016	Collins Drain at Outer Drive	Concrete Rigid/Non-Rigid Frame (Culvert)	1975	2005
1021	Pike Creek at Twelfth Concession Road	Corrugated Steel Pipe Arch (Culvert)	1965	--
2001	Colchester Townline Drain at Eighth Concession Road	Corrugated Steel Pipe Arch (Culvert)	2012	--
1	Lakewood Park over Lakewood Park Channel	Bowstring Pratt Truss (Bridge)	2016	--
2	Malden Road Over Pike Creek	Pratt Truss (Bridge)	2015	--

1.2.4 Visual Site Inspection

Visual inspection of the 16 bridge and culvert structures was performed in accordance with the OSIM to update the inspection forms for the Town, as part of their strategy to maintain a safe bridge inventory. Measurements collected during the 2022 study were verified and updated, where applicable. The field inspections included a review for material defects and performance deficiencies, as per the OSIM. Structure maintenance needs were identified in the inspection forms and included in the comments associated with recommended works in the summary of construction needs and probable cost tables in Appendix B.

Comments on the condition of each element, recommended rehabilitation work, timing for recommended work and photo logs were recorded and included on the inspection forms (see Appendix C). A list of elements, common to most structure types included in this study is summarized in Table 2.

Table 2: OSIM Element List

Element Group	Element Name	Units
Decks	Wearing Surface	Sq.m.
	Deck Top	Sq.m.
	Soffit – Thin Slab	Sq.m.
	Soffit – Thick Slab	Sq.m.
	Soffit – Inside Boxes	Sq.m.
	Drainage System	Each
Joints	Seals/Sealants	Each
	Concrete End Dams	Sq.m.
	Armouring/Retaining Devices	m.
Sidewalks/Curbs	Sidewalks and Medians	Sq.m.
	Curbs	Sq.m.
Barriers	Barrier/Parapet Walls	Sq.m.
	Railing Systems	m.
	Posts	Each
	Hand Railings	m.
Beams/MLE's	Girders	Sq.m.
	Floor Beams	Sq.m.
	Stringers	Each
	Inside Boxes (sides and bottom)	Sq.m.
	Diaphragms	Each (Sq. m. if concrete)
Coatings	Structural Steel	Sq.m.
	Railing Systems/Hand Railings	Sq.m.
Abutments	Abutment Walls	Sq.m.
	Ballast Walls	Sq.m.
	Wingwalls	Sq.m.
	Bearings	Each
Piers	Shafts/Columns/Pile Bents	Sq.m.
	Caps	Sq.m.
	Bearings	Each
Retaining Walls	Walls	Sq.m.
	Barrier Systems on Walls	Sq.m.
Culverts	Inlet Components	Sq.m.
	Outlet Components	Sq.m.
	Barrels	Sq.m.
Foundations	Foundation (below ground level)	N/A

Element Group	Element Name	Units
Embankments and Streams	Streams and Waterways	All
	Embankments	Each
	Slope Protection	Each
Signs	Signs	Each
Approaches	Wearing Surface	Sq.m.
	Approach Slabs	Sq.m.
	Drainage System	All
	Curb/Gutters	m.
	Sidewalk and Curb	Sq.m.

A limited visual inspection was performed for elements (or parts of elements) which could not be readily accessed during the inspection. This typically includes soffits, deck tops (below a wearing surface) and interior portions of main longitudinal elements (i.e., inside structure with high water level). The elements which received a limited inspection are noted on the OSIM inspection forms. Where inspection of a particular element was limited, the quantity and condition of that element, as observed during the 2022 inspection, was visually verified and carried forward.

1.2.4.1 Deck Top

The deck top surface of most bridges was rated based on the condition of the asphalt wearing surface directly above, in accordance with OSIM. The presence of bottom-up defects (defects which start on the underside of the asphalt and propagate upwards) suggests the possibility of a defect in the deck top. Many of the Town's roads are low class bituminous (tar and chip) surfaces, which may not accurately reflect the condition of the deck top as the new road surface might obscure any defects. The condition of structures on these roads was therefore rated based on both the age of the structure and the presence of any bottom-up asphalt defects observed in the road surface and visual observation (or previous visual observations if the asphalt surface was recently replaced).

1.2.4.2 Approach Slabs

Approach slabs were assumed to be present on some structures which typically require them according to the CHBDC. An approach slab length of 6.0 m at each abutment was assumed, as the actual length could not be visually confirmed in the field.

1.2.5 Condition of Elements and Defects

The bridge and culvert structures were appraised on an element-by-element basis. The condition of each element is rated as Excellent, Good, Fair or Poor. The condition of the elements and defects was recorded according to OSIM. Any structure is rated deficient if the condition of any of the elements that make up the structure has recommended work.



1.2.6 Timing of Needs

Recommended work and timing for the recommended work, are noted for each element in the inspection forms (see Appendix C). Timing for the recommended work was recorded as < 1 Year, 1 to 5 Years, 6 to 10 Years or None, with the following outlining the scope of each timing window.

< 1 Year	A structure need that is required with some degree of urgency but can still be addressed within one year, unless specifically addressed as an immediate concern. In some cases, it may be possible for the Town to complete these items as part of their regular maintenance. Where the apparent safety of the public is at risk due to an impending failure of the structure, such as notification shall be given for recommended closure of the roadway until repair or replacement can be undertaken.
1 to 5 Years	A structure need that should be addressed within a period of one to five years from the time of this report. In some cases, it may be possible for the Town to complete these items as part of their regular maintenance.
6 to 10 Years	A structure need that is not of any immediate concern but will likely develop further deficiencies that should be addressed within a period of up to ten (10) years from the time of this report. In some cases, it may be possible for the Town to complete these items as part of their regular maintenance.
None	The structure displays no major deficiencies, and no work is required other than routine maintenance.

1.2.7 Additional Investigations

Additional investigations are warranted based on the need for more detailed information and recommendations were based on engineering judgement for each site. These specialized investigations or surveys should normally be completed within a two year timeframe.

For structures that have suggested additional investigations, the recommended rehabilitation measures and costs should be re-assessed upon the result of the investigations.

1.2.8 Material Condition Survey

A number of material condition survey types may be warranted based on the results of the visual inspection. One or more of the following surveys are typically recommended in OSIM, when deemed necessary:

- **A detailed deck condition survey** is recommended for bridges showing significant asphalt defects (such as severe alligator or map cracking), or significant soffit deterioration. These defects suggest that the deck top may also have deficiencies that are not visible, due to the asphalt wearing surface.
- A half-cell survey is normally warranted in the OSIM due to the presence of bottom-up asphalt defects. However, the survey could still be warranted if the asphalt wearing surface was recently replaced (eliminating the bottom-up asphalt defects) and concrete deterioration of the soffit is still observed due to past leakage through the deck. The asphalt may have been replaced a reasonably

short time ago in some cases, and it is suspected that not enough time has passed to allow for the formation of new bottom-up asphalt defects.

- A **substructure condition survey** is recommended for bridges that have a significant amount of concrete in poor condition and require delineation of delaminated areas, areas of high corrosion potential and the testing of concrete core samples. It is likely that these structures may require rehabilitation or replacement as a result of further investigation.
- A **steel condition survey** is recommended for bridges that have a significant amount of coating and steel in poor condition. The investigations could include steel thickness investigations, deterioration mapping or other non-destructive testing.

It may also be recommended in some cases that the asphalt wearing surface and bridge deck waterproofing be replaced in order to access the bridge deck, where deterioration is suspected but could not be verified visually.

1.2.9 Benchmark Probable Construction Costs

Benchmark probable costs for bridge and culvert improvements from the Ministry of Transportation Ontario (MTO) Highway Costing System (HiCo) were used to establish probable costs of construction for each structure. A summary of these unit costs is provided in Table 3. In addition to the MTO HiCo unit costs, the following information was also used as reference:

- Ministry of Transportation Ontario 2021 Parametric Estimating Guide.
- 2022 Bridge and Culvert Needs Study for the Town.
- Recent tendered bridge and culvert rehabilitation and replacement projects with similar construction scope.

An allowance for engineering and contingency has also been included. The contingency value was assumed to be approximately 30% of the estimated probable cost of construction for major rehabilitation and replacement projects.

Table 3: Bridge and Culvert Benchmark Probable Costs of Construction

Category	Description	Units	Unit Cost
Asphalt Paving and Waterproofing	Removal of asphalt pavement from concrete surfaces	m ²	\$45.00
	Concrete deck waterproofing	m ²	\$150.00
	Asphalt pavement	tonne	\$465.00
	Routing and sealing cracks in asphalt pavement	m	\$50.00
Concrete Repairs	Crack Injection	m	\$450.00

Category	Description	Units	Unit Cost
(See Notes)	Concrete patch repairs – Type A	m ²	\$1,900.00
	Concrete patch repairs – Type B	m ²	\$5,200.00
	Concrete patch repairs – Type C	m ²	\$4,000.00
Full Replacement (See Notes)	CSP Pipe Culvert – Low fill	m ²	\$8,500.00
	CSP Pipe Culvert – High fill	m ²	\$13,500.00
	Precast Concrete Box Culvert	m ²	\$14,500.00
Deck Drains	Removal and replacement of deck drains	each	\$4,500.00
Expansion Joint	Full depth concrete removal	m	\$9,000.00
	Reinforcing steel bar		
	Deck joint assemblies, installation		
+/-3m High Gabion Basket Retaining Wall	Earth excavation – grading	m ²	\$6,100.00
	Gabions		
	Granular Fill		
New Barrier on Bridge Deck	Concrete removal – full depth	m	\$9,500.00
	Reinforcing steel (black) bar		
	Concrete in structure		
	Concrete in parapet wall		
	Parapet wall railing		
Erosion Protection	Earth excavation – grading	m ²	\$370.00
	Geotextile		
	Rip rap, hand laid		
Clean and Coat Structural Steel	Coating existing structural steel	m ²	\$800.00
	Environmental protection during coating operations		
Jacking and Bearing Replacement	Jacking of superstructure	LS	\$75,000.00
	Bearings		

Category	Description	Units	Unit Cost
Investigations	Roadside Review (Not Including Design)	L.S	\$6,500.00
	Hydrology Study and Hydraulic Analysis	L.S.	\$13,000.00
	Structural Condition Assessment & Renewal Options Report	L.S.	\$35,000.00
	Monitoring of Deformations, and Settlements	L.S.	\$9,000.00
	Half-Cell Survey	L.S.	\$15,000.00

Notes:

- Unit rates have been taken from the averages of recently closed tenders Contract Administered by Dillon, and 2024 HiCo costs in the region including for inflation where appropriate.
- When completing the cost estimates, a number of assumptions were made (e.g., asphalt thickness, concrete repair depths, etc.) in order to simplify quantity calculations. Detailed measurements, including destructive testing where necessary, should be completed during detailed design to estimate probable construction costs.
- Unit prices vary according to the amount and extent of work performed on a structure at one time. It is anticipated that unit prices will be higher for small quantity work items.
- Unit Prices for full replacement of culverts include costs associated with mobilization, demobilization, bonds, insurance, and roadside safety.
- Unit Prices for specific items do not allow for costs associated with mobilization, demobilization, bonds, insurance, roadside safety, or other costs related to performing and executing capital work.
- Patch repair unit costs include removals, abrasive blast cleaning, and concrete repair. Definitions of concrete patch repairs are as follows:
 - Type A: Concrete removals that typically apply to the top surface of decks, including removals over round voids in post tensioned structures, sidewalks, curbs, culvert tunnel floor slabs, and the top and inside faces of concrete barrier walls and parapet walls.
 - Type B: Concrete removals that typically apply to deck soffit and fascia of bridge decks, soffit of the top slab of culverts and tunnels, girders, diaphragms, outside face of concrete barrier walls and parapet walls.
 - Type C: Concrete removals other than the ones specified for Concrete Removals – Partial Depth, Type A and Type B, and typically apply to abutments, wingwalls, pier columns and caps, bearing seats, retaining walls, vertical walls of culverts and tunnels.
- Asphalt replacement or repair costs have only been included where structural rehabilitation is recommended. For all other cases, it has been assumed that deteriorated asphalt will be repaired or replaced under the Town's road maintenance program.
- Hydrology and Hydraulic analysis costs are associated with culvert / rigid frame structures Costs associated with larger bridge structures may be higher.
- Unit prices do not include HST.

1.2.10 Bridge Condition Index (BCI) Comparison and Bridge Spending

The BCI was developed by the MTO as a means of consolidating inspection information, and overall structure condition, into a single value. The BCI is calculated using asset management principals and is based upon the remaining economic worth of the structure. The value takes into consideration that the structure composed of a number of distinct elements that begin at a certain condition from the point of construction or rehabilitation, and that deteriorate over time.



The index is a planning tool that can be used to assist the Town in scheduling improvements. The BCI is the ratio of the current approximate value of a structure, to its estimated replacement cost, and should not be used to rate or indicate the safety of a structure, or individual element.

The BCI is organized into ranges of **0** to **100**, where **100** would represent a newly constructed structure, free of any repair needs. A BCI rating of **70** to **100** would be considered in ‘**good**’ condition, a rating of **60** to **70** would be considered in ‘**fair**’ condition, and a structure with a BCI rating less than **60** is considered in ‘**poor**’ condition. It is recommended that the Town strive to maintain an aggregate BCI rating of a minimum of **70** for their infrastructure portfolio.

The current (2024) BCI was calculated for each of the 16 structures included in this study. An average BCI of 76.6 was calculated – a decrease in overall condition from the BCI value of 77.7 that was calculated for the 2022 study. The current BCI indicates the Town is maintaining their infrastructure portfolio in good condition and spending on bridge repairs has increased the BCI average from 66.0 in 2003, to 76.6 in 2024. The decrease in BCI can be attributed to the standard decline in structure condition over time. Current BCI values for each structure were compared to the BCI values from the previous seven Needs Study Reports. A summary of the BCI comparisons and the towns spending on bridge infrastructure can be found in **Appendix D** and **Appendix E**.

2.0 Discussion of Findings and Capital Needs

The following sections provide a discussion of unique, significant findings with respect to the overall bridges and culverts within the Town road network, and for specific structures. They are ordered based on the priority of the work required to be undertaken. Further details, recommendations and probable costs of construction can be found in Appendix B.

2.1 Specific Structures: Less than One Year (Immediate) Capital Needs

No structures were identified in this study with deficiencies and capital needs that should be addressed immediately (within less than one year) other than routine maintenance and roadside safety items (see Appendix B – Comments).

2.2 Specific Structures: One to Five Year Capital Needs

One structure was identified in this study with deficiencies and capital needs that should be addressed in the one to five year time frame other than routine maintenance (see Appendix B – Comments).

2.2.1 Structure No. 2001 over Colchester Townline Drain at Eighth Concession Road

This structure was constructed in 2012 and is a 3.1 m span corrugated steel pipe arch culvert with precast concrete block headwalls and retaining walls.

The current BCI for this structure is 67.0 and has decreased from the 2022 OSIM inspection BCI of 68.5 due to the deterioration progression of the head walls. Very severe spalling and cracking of grout, and mortar with loss of stone was observed above the CSP inlet and outlet.

A minor rehabilitation shall be completed within one (1) to two (2) years to repair the headwalls and grout the void space between headwalls and CSPS. This will prevent further deterioration of the culvert causing the need for an earlier major rehabilitation or replacement. The proposed scope of rehabilitation includes: removal and replacement of asphalt, excavation to the top of CSP to properly grout the voided areas, and concrete headwall repairs. Additional site works to be completed at this time: clearing of vegetation as required, and installation of object marker signs.

2.3 Specific Structures: Six to Ten Year Capital Needs

Two structures were identified in this study with deficiencies and capital needs that should be addressed in the six to ten year time frame other than routine maintenance (see Appendix B – Comments). The structures are presented below.

2.3.1

Pedestrian Bridge No.1

This structure was constructed in 2016 and is a 23.5 m span bowstring pony truss founded on concrete caissons. The shop drawings indicate that the steel used for construction was Grade A500 and coated with a two-coat powder coating system.

The current BCI for this structure is 68.8 and has decreased from the 2022 OSIM Inspection BCI of 72.7. Deterioration consisting of loss of coating and corrosion of the floor system has progressed since the last inspection. Deterioration is worst at the end panels, underside of stringers and at points of contact between steel members (i.e., weld locations).

It is anticipated that the deterioration of the floor beam and stringer members will continue to accelerate due to the failure of the coating system. The truss members (chords, diagonals, and verticals) were observed to be in good condition.



(a) Typical condition of the floor system with light corrosion and coating failure across all members.

(b) Typical Coating Failure on Stringer Members

Figure 1: Typical condition of floor system at Pedestrian Bridge No.1

Based on discussions with the manufacturer, rehabilitation consisting of abrasive blast cleaning, replacement of the floor system, and recoating the structure with a three-coat MTO approved paint system may be completed; however, the steel thickness of existing members may be reduced during abrasive blast cleaning. Alternatively, the structure may be replaced. A summary of the proposed structure rehabilitation and replacement costs based on the 2022 quotes from Iron Bridge Fabrication Inc. are summarized in Appendix B. The structure replacement costs account for removal of the existing structure and the delivery, fabrication and erection of a new structure. Based on the reduced service life and cost similarities rehabilitation is not recommended. For the purposes of this report, replacement with a weathering steel truss has been assumed. The costs provided for budgeting purposes were increased from the provided quotes to account for inflation between 2022 and 2024.

Annual inspections are recommended until the structure is replaced. The requirement for a steel condition survey, to confirm section loss and quantify the corrosion deterioration, should be confirmed during future inspections.

2.3.2 Structure No. 1016 over Collins Drain at Outer Drive

This structure was constructed in 1975 and is a 3.1 m span cast-in-place concrete non-rigid frame culvert with open footings. In 2005, the original structure was repaired, the existing footings were jacketed, and cast-in-place concrete rigid frame culvert extensions were constructed on each side of the existing culvert as part of Highway 3 and Highway 401 road improvements. To our knowledge, no waterproofing membrane was placed on the original culvert deck top during the 2005 rehabilitation.

The current BCI for this structure is 72.3. However, this BCI rating could be misleading because it does not evaluate the condition of the new and original sections independently, thus not accurately depicting the condition of the original culvert section in its current state of deterioration.

In the original culvert section, medium to wide cracks with active efflorescence and a severe delamination was observed across the barrel soffit. The barrel walls were noted to have light scaling and footing scour throughout. The scour has not led to undermining of the footings and is not considered to need any repairs. The scour should be monitored as part of the biennial inspection. Two (2) wide cracks were observed in the north wall footing jacket. No deterioration was observed in the new culvert extensions. Excessive vegetation growth was noted in the waterway to the north of the structure and object markers were noted to be missing at two corners of the approaches.



(a) Culvert barrel

(b) Typical soffit deterioration

Figure 2: Typical Condition of Structure 1016

Rehabilitation should be completed with the next repaving cycle or if deterioration accelerates. The proposed scope of rehabilitation includes: installation of new or replacement of waterproofing along the top slab, concrete patch repairs and crack repair to the original culvert structure. Additional site works include: asphalt removal and replacement, excavations, backfilling, steel beam guiderail post repair; routine maintenance on the north embankments and waterway; and add missing signs.

2.4 Roadside Safety

A detailed roadside safety review was conducted in 2015 by Dillon for the bridges and culverts in the Town of Tecumseh entitled “2015 Bridge Roadside Safety Review Report”. Potential roadside safety deficiencies were identified and preferred solutions were provided based on the 1993 MTO Roadside Safety Manual.

This report was updated by Dillon in 2019, entitled “Roadside Safety Improvement Cost-Benefit Analysis”. The memo includes updated recommendations based on the 2017 MTO Roadside Design Manual, which replaced the 1993 MTO Roadside Safety Manual. A summary of roadside safety improvements for each structure in this study is located in Appendix B. The 2019 report was not updated by Dillon in 2024, but all recommendations made for remaining structures still apply.

3.0 Program of Work

3.1 Program of Work

A two year program to accommodate investigations, planning, environmental assessments, engineering, property acquisition and utility relocation (if, and when, required) – is recommended as follows, for any major bridge or culvert construction project.

- First Year: Preliminary Design, Legal Surveys, Land Acquisition and Utility Relocation
- Second Year: Detailed Design and Construction.

3.2 Recommended Structure Improvement

Based on the results of the study, it is recommended that the Town allocate an estimated budget of \$595,000 to address the improvement needs of the bridges and culverts during the ten-year study period. Of this total, the Town is expected to incur some spending over the next five years to address the current improvement needs of their structure assets. The recommended structure work for the six to ten year time frame may be advanced for earlier completion if the proposed works are deemed to be beneficial for the life-cycle costs of the structure.

The final estimated costs for a structure will vary based on a detailed assessment, results of various investigations, or changes to the proposed scope of work during detailed design. The needs of the road network should also be taken into consideration by the Town when determining priorities for the structures. Combining road and structure works provides opportunities for additional cost savings, and can reduce disruptions to the public caused by construction. It should be noted that costs for routine maintenance needs have not been included in these cost estimates. Table 4 presents a summary of the Town's bridge and culvert needs, in 2024 Canadian dollars.

Table 4: Bridge and Culvert Construction Needs Summary

Timing for Recommended Work	Amount (CAD)
1 to 5 Years	\$100,000
6 to 10 Years	\$495,000
Total	\$595,000

Appendix B provides a detailed summary of the bridge and culvert appraisals, recommended items, timing, and estimated costs. For complete comments, estimated repair quantities, recommended work items and timing, refer to the inspection forms and photos in Appendix C.

3.3

Study Updating

The basic information assembled in this study, particularly with respect to inventory and construction needs, is subject to continual change. To ensure the reliability of the base data, a system of biennial updating should include the following:

- An updating of the OSIM inspection forms for structures which were improved; and
- Identification of new deficiencies which have not been apparent and the provisions of estimated costs for improvements required to address those deficiencies.

The study content can remain in effective for up to ten years provided implementation of the biennial update procedures is followed.

Closure

We trust that this report is sufficient for your requirements at this time; however, please do not hesitate to contact us for any questions or clarifications regarding this report.

DILLON CONSULTING LIMITED

Report Prepared By:

Report Reviewed By:



Monica Sokolski
Project Manager



Brad Schmidt, P.Eng.
Structural Engineer

References

Ormwhaw, W. (Feb. 2021). 2020 Bridge and Culvert Needs Study, (20-2645). Dillon Consulting Limited.

Van Haren, M. P. (Jan. 2018) 2018 Bridge Roadside Safety Review, (17-6817). Dillon Consulting Limited.

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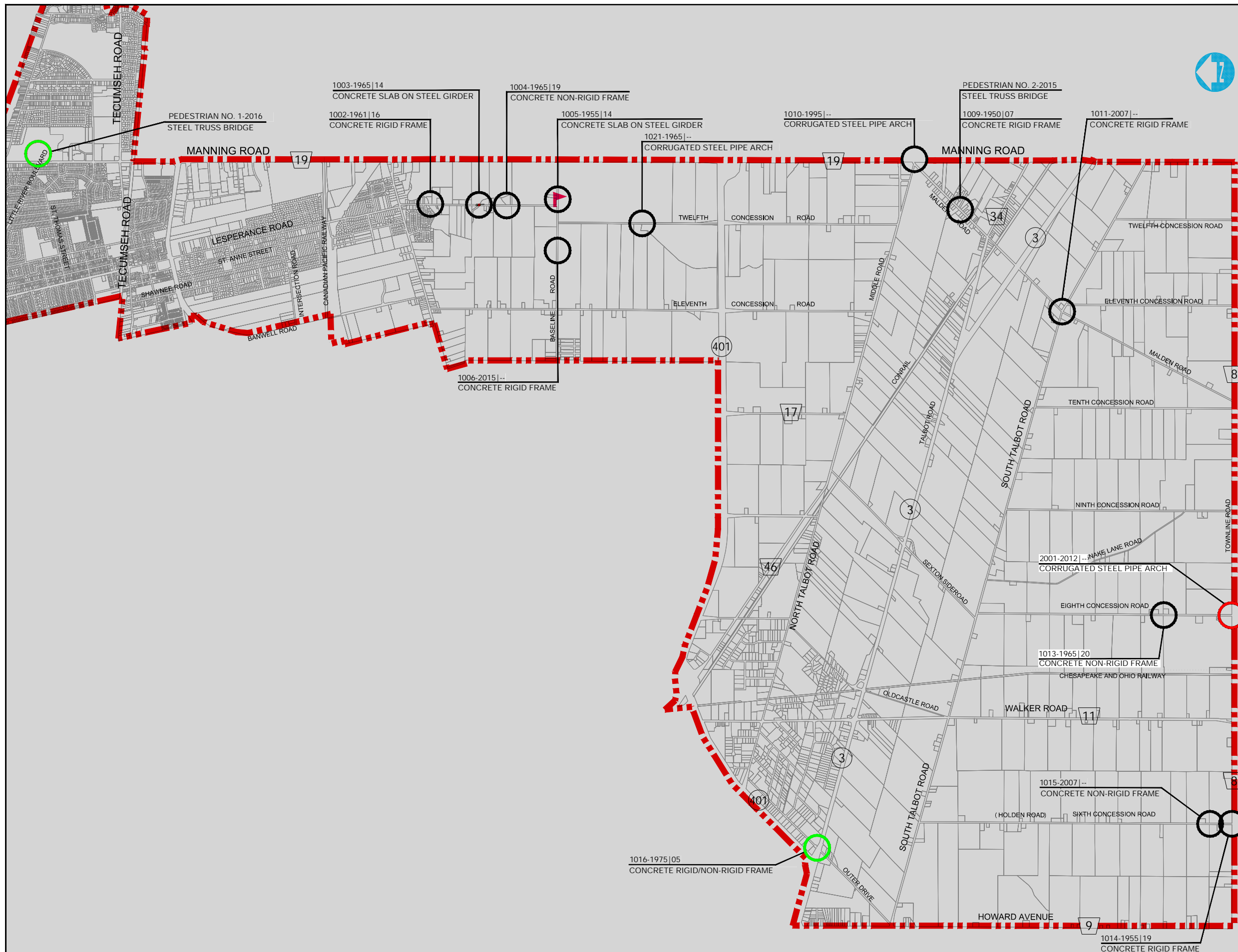
Policy, Planning & Standard Division. (Oct. 2000), (Revised: Nov. 2003, Apr. 2008, May. 2018). Ontario Structure Inspection Manual (OSIM). Ontario Ministry of Transportation.

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Appendix A

Location Plan

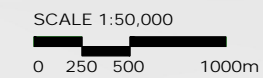
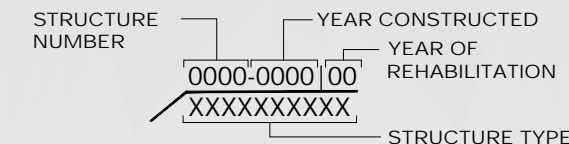


TOWN OF TECUMSEH
2024 Bridge and Culvert Needs Study
Structures with Spans > 3.0 m

LOCATION PLAN

TIME FRAMES / RECOMMENDED WORK

- NO RECOMMENDED WORK
- 1 TO 5 YEARS REHAB OR REPLACE
- 6 TO 10 YEARS REHAB OR REPLACE
- ROADSIDE SAFETY CONCERN



MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSE ONLY.
IT INDICATES APPROXIMATE LOCATIONS FOR THE INSPECTED BRIDGES AND SHOULD BE SURVEYED FOR EXACT LOCATIONS.
CREATED BY: JBP
CHECKED BY: MAS
DESIGNED BY: KM
File Location:
c:\pw working directory\projects 2024\dillon_33\bp\dms81847\22-4428-fig-02.dwg
October, 22, 2024 10:44 AM



PROJECT: 24-8266
STATUS: FINAL
DATE: FEBRUARY 2025

Appendix B

Summary of Construction Needs and Probable Costs

Summary of Construction Needs and Probable Costs

Structure ID	Structure Location	Structure Type	2024 BCI	Total Deck Length (m)	Span Length (m)	Overall Structure Width (m)	Road Width (m)	Year of Construction	Year of Last Rehabilitation	Comments (Including Routine Maintenance and Roadside Safety Needs)	Capital Needs/Construction Costs			Date of Last Inspection
											Items	Timing of Recommended Work Item	Estimated Construction Costs	
1002	Pike Creek at Twelfth Concession Road	Concrete Rigid Frame (Bridge)	78.2	17.3	15.8	9.8	8.5	1961	2016	Wet staining and efflorescence was observed on the soffit. Medium spalling was observed on the SW parapet wall due to a vehicle impact. Medium honeycombing was observed adjacent to the wall drains on the north abutment wall in addition to light honeycombing throughout both walls. The northeast wingwall was observed with a discrete location of medium spalling. The southwest wingwall was observed to have a medium vertical crack extending from wingwall into rear of parapet into a medium spall. The southeast wingwall was observed to have a narrow to medium crack at the parapet wall into joint. The granular base supporting the curb NW curb slab has eroded away, exposing the underside of the concrete curb. Hairline to narrow cracks were observed on curbs and parapet walls. <u>Maintenance</u> Recommended work includes routine maintenance including erosion control of the northwest curb slab. <u>Roadside Safety</u> No improvements necessary. Improvements were included in the most recent rehabilitation.	No work is necessary.			27-Jun-24
1003	Pike Creek at Twelfth Concession Road	Concrete Slab on Steel Girder (Bridge)	77.4	16.3	15.7	8.6	8.0	1965	2013	The deck wearing surface was observed with narrow longitudinal cracking along the centreline of the road and two locations of narrow transverse cracks. The approach wearing surface has settlement with a sealed crack on the west side of the South approach and both sides of the North approach. The west fascia has a narrow longitudinal crack extending the full bridge length with discrete locations of active wet staining and efflorescence near the edge. Debris build up was noted in the spillways and expansion joint strip seals. Hairline map cracking was observed throughout the parapet walls in addition to light spalling on the northeast corner. Medium corrosion was observed at the bearing shoe plates. Both abutment walls had medium cracking with active wet staining and efflorescence. <u>Maintenance</u> Recommended maintenance includes bearing shoe plates should be wire-brushed, primed and coated; and routine bridge cleaning including cleaning of the deck joints and drains. <u>Roadside Safety</u> No improvements necessary. Improvements were included in the most recent rehabilitation.	No work is necessary.			27-Jun-24
1004	Sullivan Drain at Twelfth Concession Road	Concrete Non-Rigid Frame (Bridge)	77.8	7.5	6.8	9.3	7.0	1965	2019	Hairline longitudinal crack noted along the full span of the soffit extending from concrete patch repair. Light scour noted at abutment footings, however footings are not being undermined. <u>Roadside Safety</u> No improvements necessary. (Wa-33 were installed during recent rehabilitation per Dillon 2019 Roadside Safety Improvements Memo recommendation).	No work is necessary.			27-Jun-24
1005	Pike Creek at Baseline Road	Concrete Slab on Steel Girder (Bridge)	79.3	15.3	15.0	8.6	8.0	1955	2014	The wearing surfaces were observed with medium to wide cracks in addition to settlement on the southeast approach. Both fascias were observed with hairline to narrow cracks extending the full bridge span with discrete wet areas and efflorescence staining. Hairline cracking was seen throughout the soffit. The joints were noted to have light corrosion staining and wear from winter maintenance, and additionally were filled with debris. The northwest parapet end wall was observed with light spalling in addition to the light honeycombing and hairline cracking throughout both walls. Collision damage was seen on the southwest guide railing system in addition to a missing offset block. The south corner of the west abutment had rust staining and light honeycombing at the joint between the new and old concrete. Both ballast walls had narrow to hairline vertical cracks in discrete locations. The southwest wingwall was observed with light spalling, narrow map cracking, and light honeycombing at the joint between the new and old concrete. The northwest wingwall has light honeycombing. Multiple anchor rods were observed to be misaligned in the longitudinal direction. Insufficient erosion protection was observed at the southeast, southwest, and northwest embankments, causing rotation of guide rail posts as well as undermining of asphalt at the southwest corner and the northeast corner. <u>Maintenance</u> Recommended maintenance includes routine bridge cleaning of the joints and drains; repair or replace damaged guiderail; remove debris from stream and install erosion protection improvements; and crack sealing of the wearing surface. <u>Roadside Safety</u> Extend the SBGR at the eastbound approach to relocate the steel beam energy attenuating terminal (SBEAT) away from utility poles. (Refer to Dillon 2015 Bridge Roadside Safety Review Report). The limits of the SBGR should be reassessed based on updated standards.	No work is necessary.			27-Jun-24
1006	Sullivan Creek at Baseline Road	Concrete Rigid Frame (Culvert)	86.9	5.9	5.2	19.8	9.3	2015	N/A	Six (6) locations of light spalling or delamination was observed on the culvert barrel soffit at the joints of the precast units. Fourteen (14) light spalls were observed at the south headwall. The precast concrete block wingwalls were observed with light to very severe scaling on the top faces. A full lane width, medium transverse crack was observed in the E.B.L. of the east approach. Hairline cracks were seen in discrete locations along the curb and gutter. Light debris buildup was observed in the curb/gutter. <u>Roadside Safety</u> No improvements necessary. Improvements were included in the structure replacement.	No work is necessary.			27-Jun-24
1009	Pike Creek at Malden Road	Concrete Rigid Frame (Culvert)	77.6	5.5	4.8	13.0	7.3	2007	N/A	The deck wearing surface was observed with repaired/sealed cracks. One (1) severe transverse crack extending the entire width of the road was observed at approximately midspan, severe transverse cracking was observed at south end, and medium longitudinal cracks were observed along the centreline. One localized area of impact damage was noted on the guide rail at the west shoulder. The east barrier system was observed with several posts exhibiting settlement and rotation on the east side and two (2) bent posts on the west side. Both fascia were observed with a number of hairline to narrow cracks with staining extending to the top of the headwall. The northwest and southwest wingwalls were each observed with one (1) hairline crack. Two (2) ruptures were seen in the gabion basket retaining walls at the southeast embankment. The northeast embankment rip-rap was in poor condition. Similarly to the deck wearing surface, the approach wearing surfaces have a number of repaired/sealed cracks and isolated, narrow to medium transverse cracking in both lanes. <u>Maintenance</u> Recommended maintenance includes repair settled and tilted barrier posts and upgrade the erosion protection at the embankment(s); repair gabion basket; install bridge object marker signs; and rout and seal the wearing surfaces. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary.			26-Jun-24
1010	West Townline Drain at Malden Road	Corrugated Steel Pipe Arch (Culvert)	74.4	4.8	4.8	25.2	9.6	1995	N/A	Severe transverse cracks and medium to severe map cracks were observed in the asphalt wearing surface at the joint between the asphalt over the culvert and at both approaches. Settlement was noted at the south side of the east approach. The retaining walls had severe scaling, very severe honeycombing, and light isolated spalls. Medium corrosion was observed on the culvert barrel at the spring line as well as light to medium corrosion of the bolts at the plate joints. Severe corrosion was noted below the inlet pipes. One (1) rupture of the north outlet gabion baskets was observed. Past inspection noted concerns with rotation of retaining wall, no significant changes were observed during this inspection. (Note: The retaining wall is part of the drain which is attributed to the County Road. However, it was addressed since it is located in the vicinity of the bridge.) <u>Maintenance</u> Recommended maintenance includes crack sealing of the wearing surfaces; repair gabion basket; monitor NE embankment. <u>Roadside Safety</u> No improvements necessary. North and south curved portions of SBGR were maintained, and all approach and leaving end portions were replaced, extended and terminated with SBEATs and object marker signs per Dillon 2019 Roadside Safety Improvements Memo.	No work is necessary.			26-Jun-24

Summary of Construction Needs and Probable Costs

Structure ID	Structure Location	Structure Type	2024 BCI	Total Deck Length (m)	Span Length (m)	Overall Structure Width (m)	Road Width (m)	Year of Construction	Year of Last Rehabilitation	Comments (Including Routine Maintenance and Roadside Safety Needs)	Capital Needs/Construction Costs			Date of Last Inspection
											Items	Timing of Recommended Work Item	Estimated Construction Costs	
1011	South Talbot Drain at Malden Road	Concrete Rigid Frame (Culvert)	72.9	4.3	3.7	39.5	16.0	2007	N/A	All cracks were repaired/sealed at the approach wearing surface and medium map cracking observed at the east approach. The west approach wearing surface had very severe transverse cracking and severe map cracking. The culvert barrel soffit had one (1) full width hairline crack with efflorescence and light honeycombing was observed throughout. The vertical walls of the barrel had two (2) hairline cracks with efflorescence. <u>Maintenance</u> Recommended maintenance includes repairs to gabion baskets and replacing exposed waterproofing on culvert top. Note this is a confined space and requires trained personnel or a camera inspection to gather future information. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary.			26-Jun-24
1013	Merrick Drain at Eighth Concession Road	Concrete Non-Rigid Frame (Bridge)	78.9	4.2	3.6	9.2	6.3	1965	2020	Light delamination was observed at the west end of the deck soffit. Light scaling and four (4) light spalls were noted on the west curb and both abutment walls had isolated light scaling. There is one (1) medium crack at the junction of the SE wingwall and abutment wall. Debris was observed in waterway. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2019 Roadside Safety Improvements Memo)	No work is necessary.			26-Jun-24
1014	Colchester Townline Drain at Sixth Concession Road	Concrete Non-Rigid Frame (Culvert)	80.4	4.2	3.7	15.3	8.5	1955	2019	Narrow transverse crack in new portion of west end of the deck soffit. Light map cracking was noted in the culvert headwalls. Light honeycombing was observed throughout the vertical walls of the barrel. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2019 Roadside Safety Improvements Memo)	No work is necessary.			26-Jun-24
1015	Merrick Creek Drain at Sixth Concession Road	Concrete Rigid Frame (Culvert)	78.4	6.3	5.5	15.0	6.5	2007	N/A	Severe alligator cracking and light to medium progressive edge cracking was observed throughout the entire wearing surface. The culvert walls had light honeycombing and isolated hairline to narrow cracking with efflorescence extending from the inlet pipes. One (1) hairline crack with efflorescence was observed on the northwest, southwest, and southeast wingwall and one (1) hairline crack was observed on the northeast wingwall. Light spill was also observed on the northwest wingwall. Debris build up was seen in the stream near the culvert inlet. Severe erosion of the shoulder was observed at the edge of the southeast wingwall. The southwest embankment had a severe slope and its filter cloth was exposed. The northeast and southeast rip-rap embankments were noted to be unstable. <u>Maintenance</u> Rout and Seal asphalt cracks. Prior to replacing or performing maintenance on the existing wearing surface, consideration should be made to investigate the underlying pavement issues by removal of wearing surface and base materials at the structure. Recommended maintenance includes: clearing of the stream and embankments; and repair erosion on the southeast shoulder. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary.			26-Jun-24
1016	Collins Drain at Outer Drive	Concrete Rigid/Non-Rigid Frame (Culvert)	72.3	3.6	3.1	40.4	23.6	1975	2005	One (1) wood post was damaged and disconnected from the east guardrail. Seven (7) wide to medium cracks were observed on the original section of barrel soffit showing active signs of efflorescence as well as severe delamination. Four (4) of these cracks were noted to be sealed from previous works. The barrel walls were noted to have light scaling and light scour at the footings, however footings are not being undermined. The north barrel wall had two (2) injected, wide cracks, one light delamination, and one (1) wide vertical crack was observed in the new footing jacket. Minor debris buildup and excessive vegetation growth was seen in the waterway to the north of the structure. Hazard marker signs seem to be missing on the northeast and southeast corners. Recommended work includes major rehabilitation in the next six (6) to ten (10) years. The scope of rehabilitation includes: installation or replacement of waterproofing, concrete patch repairs and crack injection to the original culvert structure. Additional maintenance includes barrier post repair; routine maintenance on the north embankments and waterway; and add missing signs. Crack widths should also be monitored. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	Rehabilitation Needs Removal of Asphalt and Waterproofing \$ 10,000.00 Excavation and Backfill of Structure \$ 20,000.00 Concrete repairs (patches and crack sealing) \$ 93,180.00 Asphalt replacement \$ 30,000.00 Deck waterproofing \$ 13,000.00 Environmental Control \$ 10,000.00 Subtotal \$ 176,180.00 Engineering (Design, Tender, Environmental Applications, CA, and CO) 20% \$ 35,236.00 Mobilization, Traffic Signage, and Traffic Control 15% \$ 26,427.00 Construction Contingency 20% \$ 35,236.00 Total \$ 273,079.00	6-10 Years		26-Jun-24
1021	Pike Creek at Twelfth Concession Road	Corrugated Steel Pipe Arch (Culvert)	70.6	6.5	6.5	11.8	3.7	1965	N/A	Minor buckling along fasteners at top of CSPA, minor dents, and deformations were observed in the culvert barrel as well as light corrosion above the springline. Approximately ten (10) bolts in the culvert section were missing at random locations. Minor erosion of the embankments and debris build up was seen in the waterway downstream. No object marker signs were present. <u>Maintenance</u> Recommended maintenance includes improve erosion control; and install object marker signs as the structure is still likely utilized by maintenance vehicles and agricultural equipment. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary.			27-Jun-24
2001	Colchester Townline Drain at Eighth Concession Road	Corrugated Steel Pipe Arch (Culvert)	67.0	3.1	3.1	25.5	11.0	2012	N/A	Asphalt wearing surface was observed with severe alligator and edge cracking over the bridge and at both approaches. Top of culvert has minor sagging under the roadway as well as localized deformations and leakage at culvert joints. Medium corrosion at springline and severe corrosion below inlet pipes. Precast headwall blocks at inlet and outlet were noted to have cracked grout and separation at the joints. <u>Maintenance</u> Recommended maintenance includes crack sealing or asphalt repaving; install object marker signs. <u>Roadside Safety</u> No improvements necessary. (Refer to Dillon 2019 Roadside Safety Improvements Memo)	Minor Rehabilitation Needs Removal and replacement of Asphalt \$ 4,000.00 Excavation and Backfill of Structure \$ 10,000.00 Concrete and grouting repairs \$ 40,000.00 Environmental Control \$ 10,000.00 Subtotal \$ 64,000.00 Engineering (Design, Tender, Environmental Applications, CA, and CO) 20% \$ 12,800.00 Mobilization, Traffic Signage, and Traffic Control 15% \$ 9,600.00 Construction Contingency 20% \$ 12,800.00 Total \$ 99,200.00 Rounded Total \$ 100,000.00	1-5 Years		26-Jun-24
1	Lakewood Park Pedestrian Bridge	Steel Pedestrian Crossing	68.8	23.8	23.8	3.7	N/A	2016	N/A	Light surface rust was observed on all screws at the top of deck and threshold plates at either deck end were not flush with the concrete and could be a potential tripping hazard. Medium splits and checks on 21 wood planks throughout. Deterioration consisting of failure of floor coating system and has advanced significantly since the last inspection. The progression of the coating failure confirmed that the previously noted severe corrosion and section loss of the floor system was coating failure. Light corrosion was observed throughout with areas of medium corrosion observed on the stringers. A steel condition survey in order to quantify the extent of the deterioration and confirm presence of section loss is not considered required at this time but could be considered in the future dependant on the findings from future inspections. Annual inspections are recommended until the structure is replaced.	Replacement Cost Delivery, Fabrication, and Erection New Tied Arch Structure (Including Removal of Existing) \$ 132,300.00 Environmental Control \$ 5,200.00 Subtotal \$ 137,500.00 Engineering (Design, Tender, Environmental Applications, CA, and CO) 20% \$ 27,500.00 Mobilization and Access 10% \$ 13,750.00 Construction Contingency 30% \$ 41,250.00 Total \$ 220,000.00 Rounded Total \$ 220,000.00	6-10 Years		27-Jun-24
2	Malden Road Pedestrian Bridge	Steel Pedestrian Crossing	84.5	12.2	12.2	2.68	N/A	2015	N/A	Minor settlement of precast retaining wall blocks at north embankment, as well as corrosion staining on top of blocks. Embankments were noted to have erosion and are potentially unstable, however is not a concern for the structure foundations.	No work is necessary.			27-Jun-24



89 Hamilton Road, New Hamburg, ON, N3A 2H1

QUOTATION

Date: November 9, 2022

Validity: 15 Days

To:	Owner:	Tender No:
Mazen Charraoui	Town of Tecumseh	N/A

Project: Lakewood Bowstring Pedestrian Bridge

We are pleased to submit our price for the project noted above. We have based our quotation on the reference documents listed below and have include addendums N/A. This quotation is subject to the Terms and Conditions specified below. In the event of any inconsistencies between the terms of the body of this quotation and the terms of the reference documents or addendums, the terms of the body of this quotation shall prevail.

Reference Documents

- Email dated October 6, 2022 from Dillon Consulting

Scope of Work

Iron Bridge Fabrication is certified by the Canadian Welding Bureau, CWB to W47.1 division 2 and is Canadian Institute of Steel Construction CISC Certified for Complex Steel Bridges with Fracture Critical Endorsement. As such, we offer the following scope of work:

- All work to be completed in accordance with CSA S6-19 and OPSS 906 Standards
- All welding to conform to CWB Standards W47.1 and W59
- All work to conform to C.I.S.C. Code of Standard Practice
- Rehabilitation of Lakewood Structure**
- Includes pdf copy of shop drawings sealed by a design P.Eng
- Includes removal of existing bridge
- Includes installation of rehabilitated existing bridge
 - Replacing the floor system in the shop with a 3-coat painted system
 - Material to be A500C HSS and 50W bar stock and plate (mild steel)
 - Includes removal of existing bridge and bringing it back to IBF's shop, salvaging the trusses and replacing the floor system (Stringers, Floor Beams, Wind Bracing and baseplates.
 - Includes replacement of wood decking - to be nominal 2x10 SPF PT
 - Pricing option to blast off powder coating system on trusses and re-coating with a 3-coat paint system
 - Replacing the floor system in the shop with a 3-coat painted system



- Material to be A847 HSS and A588 bar stock and plate (Corten steel)
- Includes removal of existing bridge and bringing it back to IBF’s shop, salvaging the trusses and replacing the floor system (Stringers, Floor Beams, Wind Bracing and baseplates.
- Includes replacement of wood decking to be nominal 2x10 SPF PT
- Pricing option to blast off powder coating system on trusses and re-coating with a 3-coat paint system
- **Replacement of Lakewood Pedestrian Bridge with a similar Bowstring Arch Pedestrian Bridge**
- Includes fabrication, delivery and erection of new structure
- Includes removal of existing bridge
- Includes pdf copy of shop drawings sealed by a design P.Eng
- Includes vertical picket railing system
- Includes Bicycle rail
- Includes Stainless Steel threshold plates
- Decking to be nominal 2x10 (1.5”x9.25”) pressure treated SPF
- Includes Hilti Hit anchoring system
 - a) Weathering Steel Option
 - Material to be A847 HSS and A588 bar stock and plate (self-weathering steel)
 - b) Galvanized Steel
 - Material to be A500C HSS and 50 bar stock and plate (Mild steel)
 - Bridge to be spliced in 2 or 3 locations to facilitate the Galvanizers’ tank
 - c) Mild Steel option with 3-coat paint system
 - Material to be A500C HSS and 50 bar stock and plate (Mild steel)
 - Includes 3-coat paint system as per OPSS 906 – RAL to be determined
 - d) Weathering Steel option with 3-coat paint system
 - Material to be A847 HSS and A588 bar stock and plate (self-weathering steel)
 - Includes 3-coat paint system as per OPSS 906 – RAL to be determined

Schedule of Prices

This engagement will be conducted on a Contract basis. The total value for the items listed in the Schedule of Pricing pursuant to this Quotation shall remain unchanged unless otherwise agreed to by both parties via the Change Order procedure, as outlined within. A CO will be issued specifying the change in value.

Rehabilitation of Lakewood Structure					
Item	Description	Quantity	Unit	Unit Price	Total Price
1.1	Replacing floor system in IBF’s shop with a 3-coat paint system (Mild Steel)	1	LS	\$83,500.00	\$83,500.00
1.1.1	With re-coating the truss with a 3-coat paint system	1	LS	\$110,000.00	\$110,000.00
1.2	Replacing floor system in IBF’s shop with a 3-coat paint system (Weathering Steel)	1	LS	\$86,500.00	\$86,500.00
1.2.1	With re-coating the truss with a 3-coat paint system	1	LS	\$113,000.00	\$113,000.00



Replacement of Lakewood Structure					
Item	Description	Quantity	Unit	Unit Price	Total Price
2.1	Weathering Steel Bowstring Bridge	1	LS	\$97,000.00	\$97,000.00
2.2	Galvanized Steel Bowstring Bridge	1	LS	\$134,500.00	\$134,500.00
2.3	Mild Steel 3-coat painted Bowstring bridge	1	LS	\$118,000.00	\$118,000.00
2.4	Weathering Steel 3-coat painted Bowstring bridge	1	LS	\$126,000.00	\$126,000.00

Clarifications

- Pricing is based on non-union labour working a 40 hour regular work week and does not include overtime or evening/night shifts
- Any damage, disruption or displacement of, or to, existing structures, facilities, roadways, parking lots, sidewalks, landscaping, curbs or services however caused to be rectified by the client.
- Field work is based on one mobilization to be completed in a continuous, uninterrupted manner.
- The construction access will be suitable for the easy passage by cranes. Existing trail/road grades, slopes and widths must be reviewed and modified by others to the satisfaction of IBF.
- All access roads, staging areas, work areas will be graveled at a minimum, free of water, mud and any other contaminant that could jeopardize safety or efficiency of our work
- In advance of our field operations, all underground, surface, above-ground and overhead interferences, services or utilities will be identified, located, protected, de-energized, removed or diverted by others to prevent any delay or safety hazard.

Exclusions

- Third party inspection (painting, welding, fabrication, erection)
- Design calculations & Certificate of Conformance, if required will be an additional \$2,500 fee/each
- Pedestrian handrail not included

Client Responsibilities

- If required, design and construction of suitable access roads, crane pads, assembly areas and rail crossings subject to the satisfaction of IBF
- Assembly areas and crane pads to be provide if required, Crane pads to be at a maximum 3m from the face of the abutment
- Flat suitable crane pads (+50mm elevation tolerance) including a level area at the same elevation for the nose of the crane.
- Continuous maintenance of jobsite for safety of all equipment and employees
- All items listed in the General Terms and Conditions below. **The client is responsible for any costs incurred by IBF's determination of inadequate completion of the above responsibilities.**



General Terms and Conditions

1) Confidentiality

This proposal is being provided to you in confidence. The information contained in this proposal, including but not limited to, commercial information, financial values, operational information, methodologies, and schedule is sensitive and shall be protected. Disclosure of any of the information contained in this proposal will cause harm to Iron Bridge Fabrication and is strictly prohibited.

2) General

- a) This offer is conditional upon acceptance of our tender in 30 days, availability of crews, equipment and prior sale of materials.
- b) IBF shall not be bound by any representation, promise or incentive, made by any agent or employee of IBF not specifically stated withing this document.
- c) This proposal is based on the conditions of the C.I.S.C. Code of Standard Practice and the terms and conditions of a standard CCDC form of contract that includes our quotation letter as an appendix.
- d) Values listed in the schedule of prices are for accounting purposes only and are not stand-alone prices.
- e) This proposal does not include bonding costs, tariffs, H.S.T. or any other applicable provincial and federal taxes.
- f) Material pricing is subject to availability and mill increases. Due to the volatility in the steel industry and until further notice, all prices for quotations are subject to mill increases at the time order is placed.

3) Delays

- a) We will not be held responsible for delays due to force majeure, pandemics, new legislation, regulation, government order, labour shortages, supply chain issues, material availability, transportation, break-downs, lock-outs, strikes, civil unrest, acts of war, fire, flood, weather, accident or any causes beyond our control.
- b) Liquidated damages, consequential damages and penalties will not be accepted by IBF.
- c) Delays caused by the Client, the project owner or their consultants/representatives will result in schedule and price increases as decided by IBF.

4) Change Order Procedure

- a) A Change Order (CO) will be the vehicle for communicating change. The CO must describe the change, the rationale for the change, and the effect the change will have on the project cost, schedule and other terms and conditions of the Agreement.
- b) A designated Project Manager from Iron Bridge Fabrication and from the Client will review the impact of the proposed change and, if mutually agreed, a Change Order will be executed.
- c) A written Change Order must be signed by both parties to authorize implementation of the reviewed changes.

5) Jobsite

- a) We reserve the right to refuse work in an unsafe or an unhealthy environment.
- b) The Client will prepare and continuously maintain the site to the satisfaction of IBF in a manner suitable for the delivery, assembly, installation, operation and removal of our products, equipment, cranes and delivery trucks. Dry, stable, compacted and level working surfaces including ramps, assembly areas and crane pads will be provided when required. Any necessary demolition of existing structures shall be provided.
- c) Secure on-site storage areas suitably located for our materials, tools and equipment are to be provided by the Client.
- d) The Client shall be responsible for identifying any unusual site conditions such as hidden services, underground structures, etc., which could be damaged by any crane(s) or other equipment
- e) The Client warrants that the soil, pavement and any structure of the job site or the neighbourhood can withstand the weight of crane(s) or other equipment, loaded or not and moving or not, as well as any vibration or shaking that may come therefrom.
- f) If the work site is inadequate to provide clear passage or to support the operation of crane(s) or other heavy equipment, or if the subsurface conditions necessitate reinforcement and/or relocation of facilities and/or services, all such work and the co-ordination of same required to permit the work to proceed in a timely manner shall be the sole responsibility of and at the expense of the customer.



- g) If additional towing or pushing of our equipment is required because of site conditions, any costs incurred will be invoiced as an extra to the contract. Any damages incurred to property or equipment (including Iron Bridge Fabrication's equipment) as a result of towing or pushing will be charged as an extra.
 - h) IBF will not be held responsible for damage, disruption or displacement of, or to, existing structures, facilities, roadways, parking lots, sidewalks, landscaping, curbs or services however caused. (The Client will indemnify and protect IBF from any claim).
 - i) The Client is responsible for all on-site supervision, parking spaces for IBF vehicles, removals, access to work areas, work platforms, scaffolding, site protection, including pedestrian and traffic control (including crash trucks for access/egress for deliveries as required), lane & shoulder closures and all permits, signage, barricades, fences, hoarding, site security, hydro line insulation/relocation/de-energizing if required, tree trimming/removal, street cleaning, snow removal, dust control, flagmen, pay duty police, lighting sufficient to permit night time (or low light) erection (if required) etc.
 - j) Review/approval of site access/prep will be required prior to installation.
- 6) Verification**
- a) Unless specifically stated in the Scope of Work all field verification is the responsibility of the Client.
 - b) It is the Client's responsibility to identify conflicts between issued for construction drawings, tender drawings, Client construction drawings, other sub-trade drawings and our shop drawings. All revisions to our drawings, fabrication and or erection procedures as a result of these conflicts will be charged as an extra to the contract.
 - c) Abutment dimensions and elevations to be verified by Client prior to installation
 - d) The Client shall provide IBF complete and accurate survey information in AutoCAD format as follows:
 - i) Abutment, pier, bearing seat, anchor bolt locations, dimensions and elevations three weeks prior to delivery of steel.
 - ii) Existing site conditions including location and dimensions of access roads, assembly areas, crane locations, abutments, piers, and all interferences, obstructions, sensitive areas, and working limits two weeks prior to IBF developing our erection plan.
 - iii) Modified site conditions directed by IBF to facilitate our erection plan one week prior to delivery of steel to site.
 - e) IBF will not accept any liability for additional work due to an incomplete or inaccurate survey or as a result of the Client failing to prepare the worksite as either indicated on the erection plan or agreed to.
- 7) Weather**
- a) Adverse weather conditions can affect deliveries. IBF reserves the right to delay or cancel and re-schedule deliveries for weather related concerns as we see fit with no responsibility for delay of schedule or additional costs incurred by the Client as a result.
 - b) Adverse weather conditions can affect hoisting operations. IBF reserves the right to delay or cancel and re-schedule hoisting for weather related concerns as we see fit with no responsibility for delay of schedule or additional costs incurred by the Client as a result.
 - c) Rain Days and Wind Days – When in the opinion of IBF rain or wind either poses a risk to safety or reduces efficiency our operations will cease with no responsibility for delay of schedule or additional costs incurred by the Client as a result.
 - d) Extreme Temperatures - When ambient temperatures below -18° C or wind chill temperatures below -23° C, or ambient temperatures above 30° C or a humidex index above 40° C are expected or occur, IBF reserves the right to refuse work with no responsibility for delay of schedule or additional costs incurred by the Client as a result.
 - e) Winter Weather - December 1st to March 1st an inefficiency factor of 25% will be applied
- 8) Schedule**
- a) A project schedule shall be mutually agreed upon prior to the commencement of any work.
 - b) IBF must receive Issued For Construction (IFC) Drawings from the Client prior to starting shop drawings, ordering material and or scheduling production time.
 - c) IBF may issue Requests For Information (RFI's) prior to and or during the shop drawing phase, responses to RFI's must be received within 48 hours of issuance. If responses are not received within 48 hours the project schedule will be extended one business day for every business day the response is past due up to a maximum of three business days at which time the project will be put on hold.



- d) IBF will issue shop drawings for Client review and must receive written approval to fabricate within five business days of issuance to ensure schedule can be maintained. If written approval to fabricate is not within five business days the project schedule will be extended one business day for every business day the response is past due up to a maximum of ten business days at which time the project will be put on hold.
 - e) Once a project is put on hold; design time, drafting time, shop space, labour forces, and equipment resources will be reallocated to other projects. All costs incurred will be immediately invoiced and due upon receipt. Once the required answers or approvals are received the project schedule will be re-evaluated and a new project schedule will be developed based on the current and anticipated production commitments. Additional fees, not limited to; disruption, accelerated schedule requests, and storage will apply.
- 9) Payment**
- a) Payment by Client is NOT contingent on Client's receipt of money from Owner or Paid when Paid Clauses
 - b) IBF will issue monthly invoices on the 25th of the month for material received, work completed and anticipated to be completed by the end of the month. Invoices will be due in 30 days regardless of owner's acceptance of payment schedule or any Client or owner requirements for material to be on site for payment.
 - c) Terms of Payment: 90% of monthly progress invoices shall be paid within 30 days of invoice date.
 - d) Full payment including 10% holdback shall be made within 45 days of substantial completion of our work.
 - e) This agreement is contingent upon credit approval. Credit investigations will generally be completed within five business days of receiving completed credit application and responses from credit references and bank references.
 - f) IBF may delay or stop shipment of goods at any time if the Client's account is not in good standing or if any time reasonable doubt exists as to the Client's financial position.
 - g) Interest will be charged at a rate of 2% per month, 24% annually on all overdue invoices and accounts.

We thank you for the opportunity of assisting you on this project, and look forward to working with you in the future. If you have any questions or concerns about this proposal, please feel free to contact me at any time.

I have reviewed, understand and accept this quotation and all of its Terms and Conditions. I hereby order the products and services covered in this quotation.

Quoted By: Mercedes Mattes

Name: Mercedes Mattes

Title: Lead Estimator

Accepted By: _____

Name: _____

Company: _____

Title: _____

Date: _____



Appendix C

OSIM Inspection Forms and Photos

Inventory Data:

Structure Name	Pike Creek at Twelfth Concession Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Twelfth Concession Road		
Structure Location	0.40 km South from County Road 42		
Latitude	42° 16' 32"	Longitude	-82° 52' 42"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Cons/not App. <input type="checkbox"/> Desig & List <input type="checkbox"/> List/n.d. <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	50 No. of Lanes 2
Old County	<input type="text"/>	AADT	650 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	17.3 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	9.8 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	169.5 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	8.5 m	Detour Length Around Bridge	5.5 km
Skew Angle	16 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	<input type="text"/> m
Span Lengths	Total = 15.8 (1) = 15.8; <input type="text"/> m		

Historical Data:

Year Built	1961	Year of Last Major Rehab.	2016
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Major rehabilitation completed in July 2016.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 100%;" type="text"/>
Programmed Work Year	<input style="width: 100%;" type="text"/>
Nature of Program Work:	

Appraisal Indices:		Comments
Fatigue	0.00	
Seismic	0.00	
Scour	0.00	
Flood	0.00	
Geometrics	0.00	
Barrier	0.00	
Curb	0.00	
Load Capacity	0.00	

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	27.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Maintenance: Place additional granular to support the northwest curb.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	17.3 m		
Element Name:	Wearing Surface		Width:	8.0 m		
Location:			Height:	0.1 m		
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	138.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	64.6	63.5	8.7	1.7	
Comments: Signs of ponding observed along parapet walls. NBL: Narrow transverse crack observed (0.25 x 0.8 m) and light rippling 1m from south abutment (3 x 0.5 m).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Decks		Length:	17.3 m		
Element Name:	Deck Top		Width:	9.2 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	159.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	74.3	84.9	3.0	0.0	
Comments: The condition of the deck in the NBL near the south abutment was assumed to be fair due to observed asphalt defects.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Decks		Length:	15.8 m		
Element Name:	Soffit - Thick Slab		Width:	9.2 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	145.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 9.0	Good 133.4	Fair 2.0	Poor 1.0	
Comments: Four pieces of formwork were left in place. Two light to medium HC, a light delamination and a medium spall was observed (Est. 0.5 sq.m). W Side: Wet staining, narrow map cracking and efflorescence was observed in locations near the edge of the soffit and fascia (Est. 0.5 sq.m).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	1.0 m		
Element Name:	Barrier/Parapet Walls - Exterior		Width:	0.3 m		
Location:	NE / SW corners		Height:	1.1 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	5.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 1.0	Good 3.7	Fair 0.2	Poor 0.1	
Comments: SW Corner: Medium spalling due to vehicular damage was observed (0.25x0.25m)						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Barriers		Length:	2.2 m		
Element Name:	Barrier/Parapet Walls - Exterior		Width:	0.3 m		
Location:	NW / SE corners		Height:	1.1 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	11.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 5.1	Good 5.9	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:			Rehab		Replace	
			1-5 years		6-10 years	
					Maintenance Needs:	
					Urgent	
					1 year	
					2 year	

Element Group:	Barriers		Length:	21.7 m		
Element Name:	Barrier/Parapet Walls - Interior		Width:	0.3 m		
Location:	East/West - Edges		Height:	0.475 m		
Material:	Concrete Parapet		Count:	2		
Element Type:	Parapet wall with Two Tube Railing		Total Quantity:	54.3 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 54.2	Fair 0.0	Poor 0.1	
Comments:						
Narrow cracks throughout parapet (16 on west parapet and 10 on east parapet). No joint filler was observed at the deck end joints. One piece of formwork (wood) was left in the south parapet wall at the east side.						
Recommended Work:			Rehab		Replace	
			1-5 years		6-10 years	
					Maintenance Needs:	
					Urgent	
					1 year	
					2 year	

Element Data

Element Group:	Barriers		Length:	21.7 m		
Element Name:	Barrier/Parapet Walls - Interior		Width:	0.3 m		
Location:	Interior (East/West)		Height:	0.9 m		
Material:	Steel Railing		Count:	2		
Element Type:	Parapet wall with Two Tube Railing		Total Quantity:	43.4 m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	43.4	0.0	0.0	
Comments: Light surface rust on top end cap bolt at the southeast corner.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	75.0 m		
Element Name:	Railing System		Width:			
Location:	NE/SW corners		Height:			
Material:	Steel		Count:			
Element Type:	Guide rail		Total Quantity:	75.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	15.0	60.0	0.0	0.0	
Comments:						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Abutments		Length:	9.2 m		
Element Name:	Abutment Walls		Width:			
Location:	North/South		Height:	3.4 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	62.6 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	56.5	6.0	0.1	
Comments:						
<p>N Wall: Efflorescence observed near the wall drains (2.0x1.0m). Medium and severe spalls (Est. 0.1 sq. m) and light honeycombing was observed throughout). S Wall: Light honeycombing observed throughout.</p>						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Abutments		Length:	4.4 m		
Element Name:	Wingwalls		Width:	0.3 m		
Location:	All Four Quadrants		Height:	Var. m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	35.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	33.2	1.0	1.2	
Comments:						
<p>NE: One medium spall was observed (0.5 sq.m) SW: Medium vertical crack extending into rear of parapet into a medium spall (0.25 x 0.5 m). SE: Narrow to medium crack at parapet wall into joint (0.2x0.25 m).</p>						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankment & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	1	0	0	
Comments:						
Recommended Work:			Rehab	Replace	Maintenance Needs:	
			1-5 years	6-10 years	Urgent	1 year 2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments:						
Embankment slopes were modified and new gabion walls were added to provide more stability.						
NW Corner: Granular supporting curb slab has eroded away, exposing the underside of the concrete curb.						
Recommended Work:			Rehab	Replace	Maintenance Needs:	
			1-5 years	6-10 years	Urgent	x 1 year 2 year
					Place additional granular to support the NW curb.	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hand Laid Rip-Rap, Gabion Baskets		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments: No rip-rap was placed in front of the abutment walls only beside the wingwalls.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	4		
Element Type:	Hazard Marker Sign		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	3	0	1	
Comments: One of the hazard marker signs was missing at the southeast corner. A natural gas warning sign was observed in the northwest corner of the structure.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Approaches		Length:	29.0 m		
Element Name:	Wearing Surface		Width:	Var. m		
Location:	North/South		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	406.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 189.5	Good 216.5	Fair 0.0	Poor 0.0	
Comments: Lane width ranges from 4.0 m over the bridge to 3.0 m at the road.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:			
Element Name:	Drainage		Width:			
Location:	All Four Quadrants		Height:			
Material:	Cast-in-Place concrete		Count:	4		
Element Type:	Spillways		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 4	Fair 0	Poor 0	
Comments: A build up of debris was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:	Var. m		
Element Name:	Curb/gutters		Width:	0.3 m		
Location:	NE/SW corners		Height:	0.2 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	25.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	11.7	13.3	0.0	0.0	
Comments:						
NE Corner: 13.0 m long. SW Corner: 12.0 m long. Both appear to have settled approximately 15 mm.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	4.9 m		
Element Name:	Curb/gutters		Width:	1.2 m		
Location:	NW/SE corners		Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Concrete Pad for TL-2 and TL-3		Total Quantity:	9.8 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	4.0	5.8	0.0	0.0	
Comments:						
Seventeen (17) hairline to narrow transverse cracks were observed on both curbs. Pad is undermined at NW Corner.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	



Photograph 1: Overview of the structure (Looking South)



Photograph 2: South approach (Looking North)



Photograph 3: North approach (Looking North)



Photograph 4: Expansion joint between the deck and the north approach (Looking East)



Photograph 5: End treatment at the northwest quadrant of the structure



Photograph 6: Concrete barrier wall at the northwest quadrant of the structure



Photograph 7: Guide rail at the south approach



Photograph 8: Guide rail at the north approach



Photograph 9: Parapet wall on the west side of the structure



Photograph 10: Parapet wall on the east side of the structure



Photograph 11: East elevation



Photograph 12: West elevation



Photograph 13: Erosion below approach slab at the northwest wingwall



Photograph 14: North abutment wall



Photograph 15: Efflorescence and honeycombing on north abutment wall



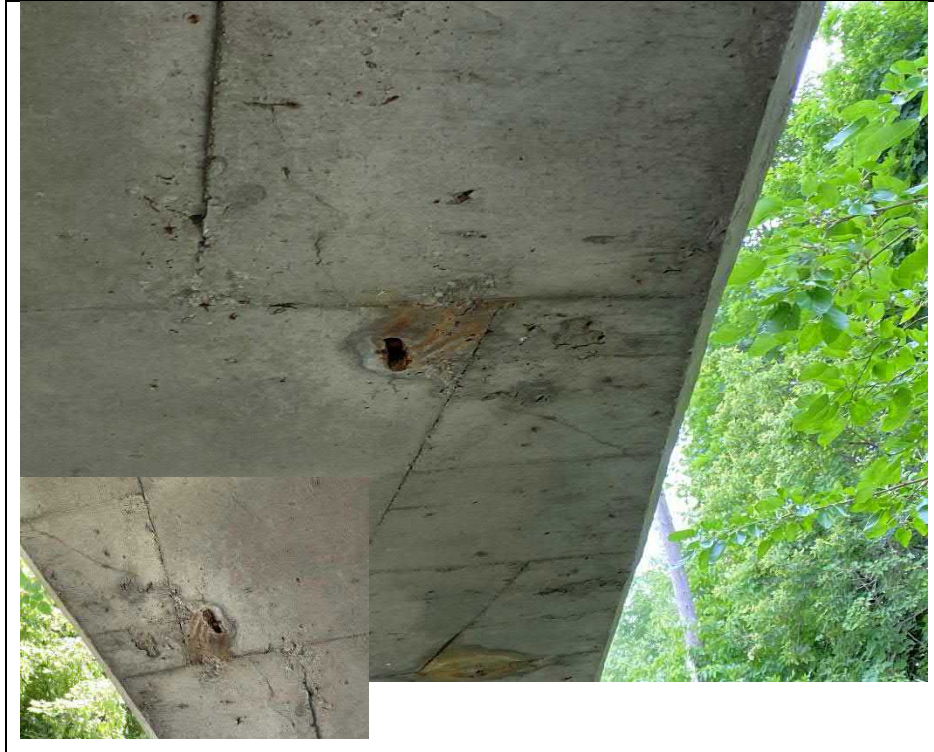
Photograph 16: South abutment wall



Photograph 17: Typical condition of wall drains on the south abutment wall and typical honeycombing



Photograph 18: Former wet staining and efflorescence on west edge of soffit (Rehab in 2016)



Photograph 19: Localized spall, wet staining, and light honeycombing on the edge of soffit



Photograph 20: Typical condition of wingwalls (Southeast quadrant shown)



Photograph 21: Embankment at northwest quadrant of the structure



Photograph 22: Embankment at southwest quadrant of the structure



Photograph 23: Waterway, looking east from under the structure



Photograph 24: Waterway, looking west from under the structure

Inventory Data:

Structure Name	Pike Creek at Twelfth Concession Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Twelfth Concession Road		
Structure Location	1.00 km South from County Road 42		
Latitude	42° 16' 11"	Longitude	-82° 52' 43.8"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	50 No. of Lanes 2
Old County	<input type="text"/>	AADT	650 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Slab on Steel Girders	Interchange Number	<input type="text"/>
Total Deck Length	16.3 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	8.6 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	140.2 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	8.0 m	Detour Length Around Bridge	5.5 km
Skew Angle	20 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	<input type="text"/> m
Span Lengths	Total = 15.7 (1) = 15.7; <input type="text"/> m		

Historical Data:

Year Built	1965	Year of Last Major Rehab.	2013
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Major rehabilitation completed in 2013, incl. new concrete deck, steel beams, parapet walls, bearings and guiderails.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	27.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Bearing shoe plates should be wire-brushed, primed and coated. Place scour protection along stream banks. Regular maintenance is recommended for cleaning of the joints and deck drains, and repairing the NW drainage pipe.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks	Length:	15.2 m			
Element Name:	Wearing Surface	Width:	8.0 m			
Location:		Height:				
Material:	Asphalt	Count:				
Element Type:		Total Quantity:	121.6 Sq.m			
Environment:	Moderate	Limited Inspection				
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	24.9	89.2	7.5	0.0	
Comments:						
Narrow longitudinal crack was observed along the CL of the road (15.2m). Narrow cracks noted throughout. S.B.L.: Two (2) narrow transverse cracks observed (approx. 4m and 1m). All cracks sealed.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Decks	Length:	15.2 m			
Element Name:	Deck Top	Width:	8.6 m			
Location:		Height:				
Material:	Cast-in-place concrete	Count:				
Element Type:		Total Quantity:	130.6 Sq.m			
Environment:	Moderate	Limited Inspection				
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	34.8	95.8	0.0	0.0	
Comments:						
Top of deck condition based on the condition of the wearing surface of the deck.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Decks		Length:	13.8 m		
Element Name:	Soffit - Thin Slab - Exterior		Width:	0.9 m		
Location:	East/West Edge of Deck		Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	24.8 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 6.6	Good 15.2	Fair 2.0	Poor 1.0	
Comments: W Fascia: Full length narrow longitudinal crack with discrete active wet areas and efflorescence (13.8x0.25m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	13.8 m		
Element Name:	Soffit - Thin Slab - Interior		Width:	6.8 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	93.8 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 52.5	Good 41.3	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Decks		Length:	1.0 m		
Element Name:	Soffit - Thin Slab - End		Width:	8.6 m		
Location:	North/South Abutment		Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	17.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 4.6	Good 12.6	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:			
Element Name:	Drainage		Width:			
Location:			Height:			
Material:	Steel		Count:	6		
Element Type:	Metal drain pipes		Total Quantity:	6 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 6	Fair 0	Poor 0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Repair NW drainage pipe.			

Element Data

Element Group:	Decks		Length:			
Element Name:	Drainage		Width:			
Location:			Height:			
Material:	PVC		Count:	4		
Element Type:	PVC drain pipes		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 3	Fair 1	Poor 0	
Comments: Four (4) PVC of 2 inch diameter are located at the soffit corners. NW drain was disconnected.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	x 2 year
				Repair / reconnect NW drain.		

Element Group:	Joints		Length:	8.5 m		
Element Name:	Seals/Sealants		Width:			
Location:	North/South end of Deck		Height:			
Material:			Count:	2		
Element Type:	Strip Seal		Total Quantity:	2 each		
Environment:	Severe		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 2	Fair 0	Poor 0	
Comments: Debris build up observed in both strip seals.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	x 1 year	2 year
				Bridge cleaning		

Element Data

Element Group:	Joints		Length:	8.5 m		
Element Name:	Concrete end dams		Width:	0.5 m		
Location:	North/South Abutments		Height:			
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	17.0 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 16.9	Fair 0.1	Poor 0.0	
Comments: Light spall likely due to plow damage observed at the south joint in the south bound lane. Narrow longitudinal crack was observed at the north joint, sealed.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Joints		Length:	8.5 m		
Element Name:	Armouring/Retaining devices		Width:			
Location:	North/South Abutments		Height:			
Material:	Steel		Count:	4		
Element Type:			Total Quantity:	34.0 m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 34.0	Fair 0.0	Poor 0.0	
Comments: Spots of light corrosion observed throughout.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Barriers		Length:	1.0 m		
Element Name:	Parapet Walls - Exterior		Width:	0.25 m		
Location:	East/West Edge of Deck		Height:	0.8 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Parapet Wall with Single railing		Total Quantity:	7.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 6.7	Fair 0.4	Poor 0.3	
Comments: Hairline map cracking throughout. NE: Light spalling (0.15x0.15m). NW: Medium scaling. (0.25x0.10m). SE: impact damage (0.25x0.25m) and delamination of grout under last railing post (0.25 x 0.25).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	23.0 m		
Element Name:	Parapet Walls - Interior		Width:	0.25 m		
Location:	East/West Edge of Deck		Height:	0.8 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Parapet Wall with Single railing		Total Quantity:	85.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 22.7	Good 62.3	Fair 0.1	Poor 0.0	
Comments: Hairline map cracking was observed throughout. Two light spalls were observed on the southeast barrier wall.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Barriers		Length:	23.0		
Element Name:	Hand Railings		Width:			
Location:	East/West Edge of Deck		Height:			
Material:	Steel		Count:	2		
Element Type:	Single Rail		Total Quantity:	46.0 m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 46.0	Fair 0.0	Poor 0.0	
Comments: Light corrosion on railing posts observed throughout.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	Varries		
Element Name:	Railing Systems		Width:			
Location:	NE / NW / SE		Height:			
Material:	Steel		Count:	3		
Element Type:	Single Rail (Steel Beam, and Post)		Total Quantity:	99.7 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 99.7	Fair 0.0	Poor 0.0	
Comments: Quantities: NE: 23.7m, NW: 23.7m, SE: 52.3m. SW: Energy attenuator with concrete pad was observed to be in good condition with light rust at structure connection and void under the concrete pad.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Beams/MLE's		Length:	4.0 m		
Element Name:	Girders (End)		Width:	0.27 m		
Location:			Height:	0.75 m		
Material:	Steel		Count:	5		
Element Type:	I-type		Total Quantity:	46.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 12.3	Good 33.8	Fair 0.0	Poor 0.1	
Comments: Medium corrosion on shoe plates (typ.) Light surface area loss was observed on the northwest exterior shoe plate.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Beams/MLE's		Length:	11.7 m		
Element Name:	Girders (Middle)		Width:	0.27 m		
Location:			Height:	0.75 m		
Material:	Steel		Count:	5		
Element Type:	I-type		Total Quantity:	135.1 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 75.7	Good 59.5	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Beams/MLE's		Length:	1.8 m		
Element Name:	Diaphragms		Width:	0.13 m		
Location:	North/South Abutment		Height:	0.35 m		
Material:	Galvanized Steel		Count:	8		
Element Type:	I-type		Total Quantity:	8 each		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 8	Fair 0	Poor 0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Beams/MLE's		Length:	1.7 m		
Element Name:	Diaphragms		Width:	0.08 m		
Location:	Intermediate		Height:	0.31 m		
Material:	Galvanized Steel		Count:	8		
Element Type:	C-Channel		Total Quantity:	8 each		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 8	Fair 0	Poor 0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Coatings	Length:	2.0 m			
Element Name:	Structural Steel	Width:	0.27 m			
Location:	Girder End	Height:	0.75 m			
Material:		Count:	10			
Element Type:		Total Quantity:	46.2 Sq.m			
Environment:	Moderate	Limited Inspection		x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 9.7	Good 33.9	Fair 2.3	Poor 0.3	
Comments: No coating on shoe plates. All girders ends were coated approximately 2 m length. Active corrosion and light section loss was observed at the northwest exterior shoeplate						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	x 1 year	2 year
				Wire brush, prime and coat shoe plates to reduce rate of corrosion		

Element Group:	Coatings	Length:	1.8 m			
Element Name:	Structural Steel	Width:	0.13 m			
Location:	End Diaphragm	Height:	0.35 m			
Material:	Galvanized Steel	Count:	8			
Element Type:		Total Quantity:	15.5 Sq.m			
Environment:	Moderate	Limited Inspection		x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 4.1	Good 11.4	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Abutments		Length:	8.5 m		
Element Name:	Abutment walls		Width:			
Location:	North/South Abutment		Height:	3.5 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Conventional closed		Total Quantity:	59.5 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 47.0	Fair 8.0	Poor 4.5	
Comments:						
<p>N Wall: A full height medium crack showing signs of previous leaking and efflorescence was observed (4.0x0.5m). Light spalling was observed at tie rod locations.</p> <p>S Wall: Medium crack with a medium delamination showing signs of active leaking and efflorescence (4.0x0.5m)</p>						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Abutments		Length:	8.5 m		
Element Name:	Ballast walls		Width:			
Location:	North/South Abutment		Height:	1.0 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	16.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 16.2	Fair 0.0	Poor 0.0	
Comments:						
Hairline to narrow cracks were observed throughout.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Abutments		Length:	4.4 m		
Element Name:	Wingwalls		Width:			
Location:	North/South Abutment		Height:	4.5 m		
Material:	Cast-In-place concrete		Count:	4		
Element Type:	Reinforced concrete		Total Quantity:	79.2 Sq.m		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 44.4	Good 34.8	Fair 0.0	Poor 0.0	
Comments: Top of wingwalls reconstructed during 2013 rehab.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Abutments		Length:			
Element Name:	Bearings		Width:			
Location:	North/South Abutment		Height:			
Material:	Laminated Elastomeric Bearing		Count:	10		
Element Type:			Total Quantity:	10 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 10	Fair 0	Poor 0	
Comments: Medium corrosion on shoe plates (typ.)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	x Urgent	1 year	2 year	
			Wire brush, prime and coat shoe plates to reduce rate of corrosion			

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 0	Fair 1	Poor 0	
Comments: Stream alignment is shifted against south abutment.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	x 2 year
				Place scour protection along stream banks		

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 3	Fair 1	Poor 0	
Comments:						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:			Height:			
Material:			Count:	3		
Element Type:	Hand laid riprap		Total Quantity:	3 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 2	Fair 1	Poor 0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	3		
Element Type:	Hazard Marker Signs		Total Quantity:	3 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 3	Fair 0	Poor 0	
Comments:						
Northwest and northeast signs were both observed with light impact damage.						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	7.0 m		
Location:	North/South Approach		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	0.0	83.0	1.0	0.0	
Comments:						
<p>S Approach: Settlement with a sealed crack of 3.5 m length was observed on the west side of the approach (3.5x0.25m). N Approach: Settlement with a sealed crack of 1.0 m length was observed on both sides of the approach 2x(1.0x0.25m)</p>						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

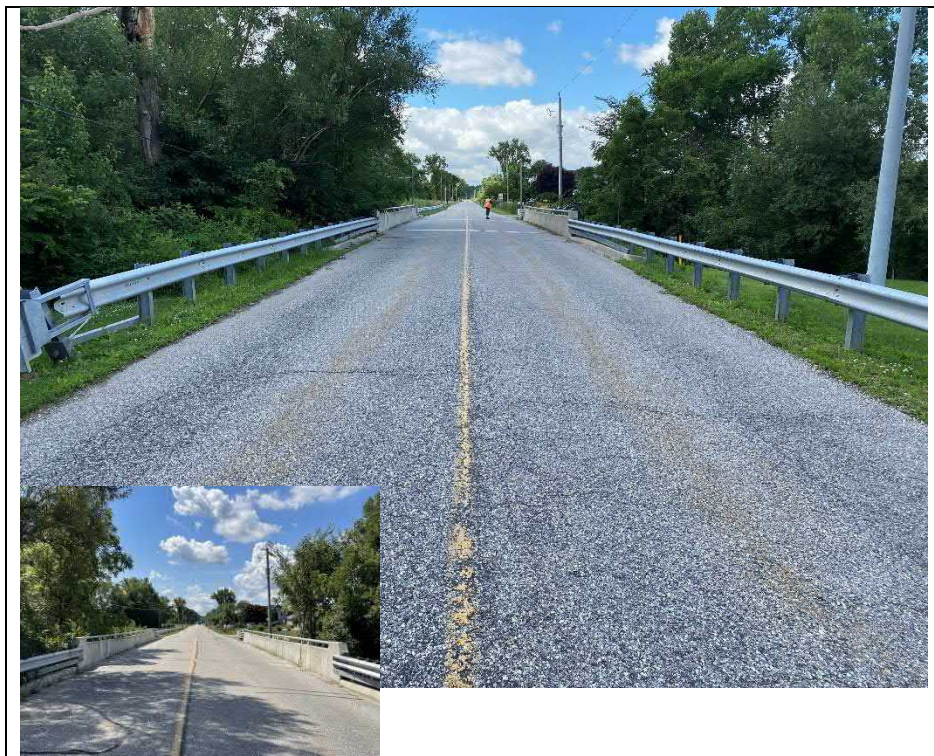
Element Group:	Approaches		Length:	6.0 m		
Element Name:	Approach Slabs		Width:	7.0 m		
Location:	North/South Approach		Height:	0.25 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	0.0	84.0	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:	10.0 m		
Element Name:	Curb/Gutters		Width:	0.3 m		
Location:	NE / NW / SE		Height:	0.15 m		
Material:	Cast-in-place concrete		Count:	3		
Element Type:			Total Quantity:	30.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	0.0	29.9	0.1	0.0	
Comments:						
Light debris build up was observed at all spillways. Northwest spillway was observed to have light map cracking (Est. 0.1 sq. m). Settlement of east curbs at bridge end of approx. 1".						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year



Photograph 1: Overview of structure (Looking North)



Photograph 2: Overview of structure (Looking South)



Photograph 3: Wearing surface at the south approach (Looking West)



Photograph 4: Wearing surface at the south approach (Looking East)



Photograph 5: Wearing surface at the north approach (Looking North)



Photograph 6: Typical condition of expansion joints (South joint shown)



Photograph 7: Typical debris build up in expansion joints



Photograph 8: Deck drainage and east parapet wall (Looking North)



Photograph 9: Typical condition of parapet walls



Photograph 10: Typical condition of parapet end walls



Photograph 11: Light spall on north east end wall



Photograph 12: Typical condition of energy attenuator at the southwest approach (Looking North)



Photograph 13: Missing bolt(s) at bottom of northwest guardrail



Photograph 14: West elevation



Photograph 15: East elevation



Photograph 16: Deck soffit, steel girders, and diaphragms (Looking South)



Photograph 17: End diaphragms at north abutment wall



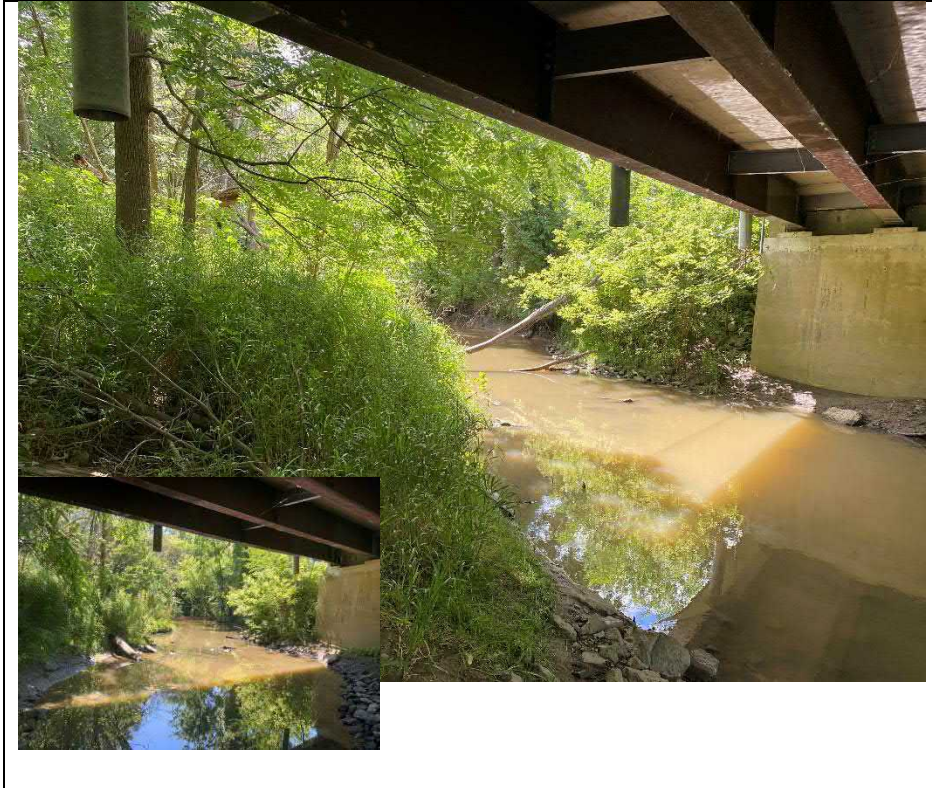
Photograph 18: Shoe plate corrosion at north abutment wall



Photograph 19: Medium crack with active wet areas and efflorescence at north abutment wall



Photograph 20: Medium crack with active wet areas and efflorescence at south abutment wall



Photograph 21: Embankments and waterway east of structure



Photograph 22: Embankments and waterway at northwest quadrant of structure



Photograph 23: Waterway west of structure

Inventory Data:

Structure Name	Sullivan Drain at Twelfth Concession Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Twelfth Concession Road		
Structure Location	1.40 km South from County Road 42		
Latitude	42° 15' 59.3"	Longitude	-82° 52' 44.6"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	50 No. of Lanes 2
Old County	<input type="text"/>	AADT	650 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Non-Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	7.5 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	9.3 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	69.8 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	7.0 m	Detour Length Around Bridge	5.5 km
Skew Angle	36.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0.3 m
Span Lengths	Total = 6.8 (1) = 6.8; <input type="text"/> m		

Historical Data:

Year Built	1965	Year of Last Major Rehab.	2019
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Structure was rehabilitated in Fall 2019. Work included: concrete patches, addition of precast block retaining walls to improve embankment slope, curb reconstruction, concrete deck overlay, new waterproofing and asphalt.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input checked="" type="checkbox"/> None <input type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Structure rehabilitated in 2019.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	7.5 m		
Element Name:	Wearing Surface		Width:	7.0 m		
Location:			Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	52.5 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	35.0	15.8	1.7	0.0	
Comments: Repared in 2019. Narrow cracking was observed at the southeast and southwest corners along the form and fill grooves. (Est. 1.7 sq. m).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Decks		Length:	7.5 m		
Element Name:	Deck Top		Width:	8.6 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Reinforced concrete		Total Quantity:	64.5 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	43.0	21.5	0.0	0.0	
Comments: Concrete deck overlay in 2019.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Decks		Length:	6.8 m		
Element Name:	Soffit - Thick slab		Width:	9.3 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Reinforced concrete		Total Quantity:	63.2 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0.0	63.2	0.0	0.0	
Comments: Soffit patches in 2019. Hairline crack noted full span (N/S) extending from concrete patch.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Abutments		Length:	9.3 m		
Element Name:	Abutment Walls		Width:			
Location:	North/South Abutment		Height:	3.5 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	64.2 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0.0	64.2	0.0	0.8	
Comments: Crack injection and parging in 2019. Light scour and concrete erosion at footings, however footings are not being undermined. N: two narrow vertical cracks with active leaking were observed (0.5 x 1.5 m).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Abutments		Length:	4.6 m		
Element Name:	Wingwalls		Width:			
Location:			Height:	2.6 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Reinforced concrete		Total Quantity:	47.8 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	15.1	29.4	0.3	3.0	
Comments:						
Precast block retaining walls installed in 2019.						
NE: Medium vertical crack of 2.0m. SW: Medium longitudinal crack full length of wingwall and fascia (0.25x11m)						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Sidewalks/Curbs		Length:	23.0 m		
Element Name:	Curbs		Width:	0.3 m		
Location:			Height:	0.4 m		
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	16.1 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	16.1	0.0	0.0	
Comments:						
Curbs raised in 2019 to accommodate raise in asphalt (due to deck overlay).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 1	Fair 0	Poor 0	
Comments: Consider drain & structure realignment during next structure replacement.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 4	Fair 0	Poor 0	
Comments: Precast block retaining walls installed in 2019 to extend embankment slope. Light to medium scaling observed along top face of southeast block. Steep slopes due to depth of drain.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year

Element Data

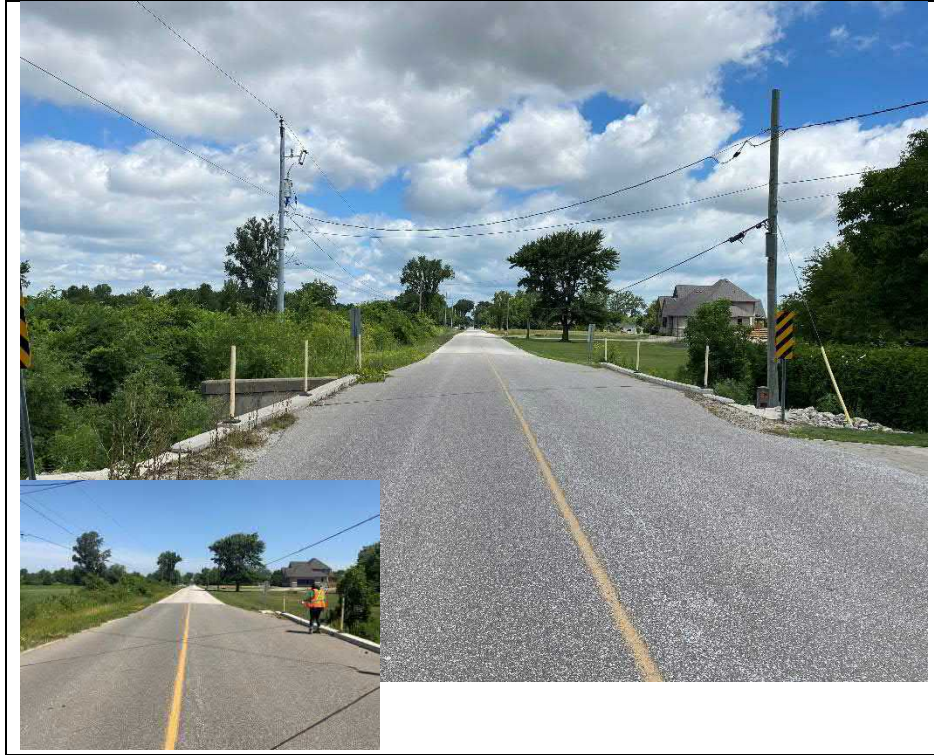
Element Group:	Embankments & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hand laid riprap		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4	0	0	0	
Comments: Light to medium vegetation growth observed throughout.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Approaches		Length:			
Element Name:	Curb and Gutters - Spillways		Width:			
Location:	NE, SE, SW Quadrants		Height:			
Material:	Cast-in-Place Concrete		Count:	3		
Element Type:	Spillway		Total Quantity:	3 each		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	3	0	0	
Comments: Spillways installed in 2019. Noted to be at an appropriate elevation unlike previously noted.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hazard Marker Signs		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 3	Good 1	Fair 0	Poor 0	
Comments: 3 new object markers installed in 2019. NW corner is original.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	7.0 m		
Location:			Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 56.0	Good 28.0	Fair 0.0	Poor 0.0	
Comments: Repaved in 2019. Light settlement observed at all four corners of the culvert.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year



Photograph 1: Overview of structure (Looking North)



Photograph 2: Wearing surface over the structure (Looking North)



Photograph 3: Object marker and raised curbs on west side (Looking South)



Photograph 4: Concrete spillway, precast block retaining wall and raised curb at southwest quadrant of structure (Looking North)



Photograph 5: East elevation of structure



Photograph 6: Concrete soffit patch at east end of soffit



Photograph 7: Concrete soffit patch at west end of soffit



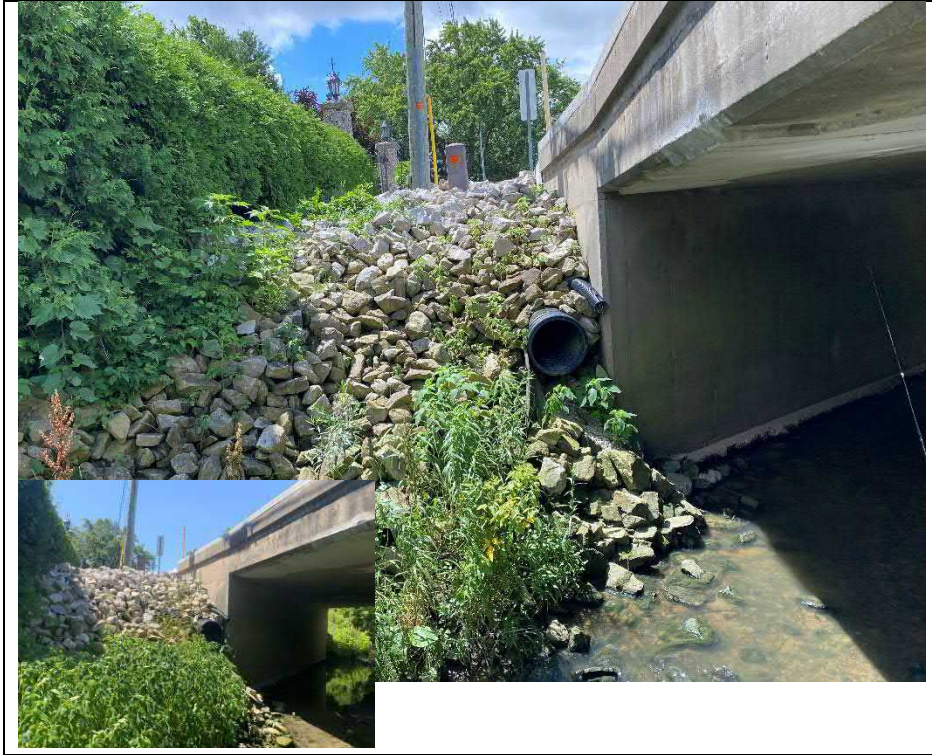
Photograph 8: Crack repairs at north abutment wall



Photograph 9: Scour and concrete erosion at south abutment footings (typ.)



Photograph 10: New precast block retaining wall and slope protection at northeast embankment (Looking West)



Photograph 11: New slope protection at southeast embankment (Looking South)



Photograph 12: New precast block retaining wall and slope protection at southwest embankment (Looking South)



Photograph 13: Waterway, looking west from inside the structure

Inventory Data:

Structure Name	Pike Creek at Baseline Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Baseline Road		
Structure Location	0.50 km West from Manning Road		
Latitude	42° 15' 37.1"	Longitude	-82° 52' 42.4"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Arterial <input type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	60 No. of Lanes 2
Old County	<input type="text"/>	AADT	1646 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Slab on Steel Girders	Interchange Number	<input type="text"/>
Total Deck Length	15.3 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	8.6 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	131.6 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	8.0 m	Detour Length Around Bridge	7.8 km
Skew Angle	15 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	<input type="text"/> m
Span Lengths	Total = 15.0 (1) = 15.0: <input type="text"/> m		

Historical Data:

Year Built	1955	Year of Last Major Rehab.	2014
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Major rehabilitation completed in 2014, including but not limited to new beams, deck and parapet walls.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes: South fascia should be monitored. A transverse narrow crack extends the entire fascia length with observed efflorescence and wet areas.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Maintenance: Remove debris in stream and place erosion protection at east abutment. Strip seal joints should be cleaned. Asphalt crack sealing. Guide rail repairs.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Deck		Length:	14.4 m		
Element Name:	Wearing Surface		Width:	8.0 m		
Location:			Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	115.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	38.4	59.5	17.3	0.0	
Comments:						
WBL: Light pitting of 15% of the asphalt surface and a medium longitudinal crack full length of structure.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	14.4 m		
Element Name:	Deck Top		Width:	8.6 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	123.7 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	41.2	82.4	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Decks		Length:	13.0 m		
Element Name:	Soffit - Thin Slab - Exterior		Width:	0.9 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	23.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	7.8	10.1	4.0	1.5	
Comments:						
N & S Fascia: Longitudinal hairline to narrow cracks extending approximately the full bridge span with discrete wet areas and efflorescence (N: 10m, S: 13m). Utility attached to north side of structure.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	13.0 m		
Element Name:	Soffit - Thin Slab - Interior		Width:	6.8 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	88.3 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	53.0	35.3	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Decks		Length:	1.0 m		
Element Name:	Soffit - Thin Slab - End		Width:	8.6 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	17.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	5.7	11.5	0.0	0.0	
Comments: Hairline cracking was observed in various locations along the soffit.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Decks		Length:			
Element Name:	Drainage		Width:			
Location:			Height:			
Material:	Steel		Count:	6		
Element Type:	Metal drain pipes		Total Quantity:	6 each		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	2	
Comments: Four (4) additional PVC of 2 inch diameter are located at the soffit corners. SE: Broken at structure.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Joints		Length:	8.3 m		
Element Name:	Seals/sealants		Width:			
Location:	East/West Abutment		Height:			
Material:			Count:	2		
Element Type:	Strip Seal		Total Quantity:	2 each		
Environment:	Severe		Limited Inspection	x		
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0	2	0	0	
Comments: Strip seal joints were filled with debris (Typ. E & W Joint)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x	1 year	2 year
			Bridge joint cleaning.			

Element Group:	Joints		Length:	8.3 m		
Element Name:	Concrete End Dams		Width:	0.5 m		
Location:	East/West Abutment		Height:			
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	16.5 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0.0	16.5	0.0	0.0	
Comments: Light rust staining was observed throughout. W: two light spalls in EBL (0.1 m2).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent		1 year	2 year

Element Data

Element Group:	Joints		Length:	8.3 m		
Element Name:	Armouring/Retaining devices		Width:			
Location:	East/West Abutment		Height:			
Material:	Steel		Count:	4		
Element Type:			Total Quantity:	33.0 m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0.0	31.5	1.5	0.0	
Comments:						
Light scraping and coating removed from snow plows use. Light to medium corrosion observed throughout.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Barriers		Length:	1.0 m		
Element Name:	Parapet Walls - Ends		Width:	0.3 m		
Location:	Solid parapet at 4 corners		Height:	0.8 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Parapet Wall		Total Quantity:	7.4 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0.0	7.1	0.2	0.1	
Comments:						
SE Corner: Light HC and map cracking was observed throughout. NW Corner: Light spalling and light rust staining observed on the top of the parapet end wall (0.15x0.15m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Barriers		Length:	23.0 m		
Element Name:	Parapet Walls - Interior		Width:	0.3 m		
Location:			Height:	0.8 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Parapet Wall with Single railing		Total Quantity:	85.1 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	85.1	0.0	0.0	
Comments:						
N and S Edges: Hairline map cracking and light honeycombing was observed throughout the parapet walls.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	23.0 m		
Element Name:	Hand Railing		Width:	m		
Location:			Height:	m		
Material:	Steel		Count:	2		
Element Type:	Parapet Wall with Single Railing		Total Quantity:	46.0 m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	46.0	0.0	0.0	
Comments:						
Light corrosion observed at centreline splice of north railing and throughout the posts. Grouting under posts missing / spalled in all but 1 location.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Barriers		Length:	120.6 m		
Element Name:	Railing Systems		Width:			
Location:	NW / SE / SW		Height:			
Material:	Steel		Count:			
Element Type:	Single Rail (Steel Beam, and Post)		Total Quantity:	120.6 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	40.2	76.4	0.0	4.0	
Comments:						
SW Barrier: Light impact damage was observed (4m). One (1) offset block missing. Slope erosion causing rotation of posts and potential performance concerns at all 3 corners.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x	1 year	2 year
			Repair or replace damaged guiderail			

Element Group:	Beams/MLE's		Length:	4.0 m		
Element Name:	Girders - End		Width:	0.3 m		
Location:			Height:	0.8 m		
Material:	Weathering Steel		Count:	5		
Element Type:	I type		Total Quantity:	46.2 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	15.4	30.8	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent		1 year	2 year

Element Data

Element Group:	Beams/MLE's		Length:	11.5 m		
Element Name:	Girders - Middle		Width:	0.3 m		
Location:			Height:	0.8 m		
Material:	Weathering Steel		Count:	5		
Element Type:	I type		Total Quantity:	132.8 Sq.m		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	79.7	53.1	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Beams/MLE's		Length:	1.8 m		
Element Name:	Diaphragms - End		Width:	0.1 m		
Location:			Height:	0.4 m		
Material:	Galvanized Steel		Count:	8		
Element Type:	I-type		Total Quantity:	8 each		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	3	5	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Beams/MLE's		Length:	1.7 m		
Element Name:	Diaphragms - Intermediate		Width:	0.1 m		
Location:			Height:	0.3 m		
Material:	Galvanized Steel		Count:	8		
Element Type:	I-type		Total Quantity:	8 each		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	6	2	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Coatings		Length:	2.0 m		
Element Name:	Structural		Width:	0.3 m		
Location:	Girder Ends		Height:	0.8 m		
Material:			Count:	10		
Element Type:			Total Quantity:	46.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	15.4	30.8	0.0	0.0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Abutments		Length:			
Element Name:	Abutment Walls		Width:	8.6 m		
Location:	East/West Abutment		Height:	2.4 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Conventional closed		Total Quantity:	41.3 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	37.3	4.0	0.0	
Comments:						
Four (4) drains at each wall. W: North drain is covered with the embankment. Medium vertical crack observed. Rust stains and light spall was observed at the joint between new and old concrete.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Abutments		Length:			
Element Name:	Ballast Walls		Width:	8.6 m		
Location:	East/West Abutment		Height:	0.8 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	13.8 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4.6	8.4	0.8	0.0	
Comments:						
E and W: Narrow to hairline vertical cracks observed throughout both ballast walls.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Abutments		Length:	Var. m		
Element Name:	Wingwalls		Width:			
Location:	East/West Abutment		Height:	3.2 m		
Material:	Cast-In-place concrete		Count:	4		
Element Type:	Reinforced concrete		Total Quantity:	60.2 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	54.7	5.0	0.5	
Comments:						
<p>Crack Quantity (Length): NE and NW ±4.40m, SE ±3.20m, and SW ±6.80m. SW: Light spalling (0.5 sq.m), hairline to narrow map cracking (1.0 sq.m), and light honeycombing was observed at the joint between the new/old concrete. NW: Light honeycombing was observed at the joint between the new/old concrete. NE: 15 mm of settlement at asphalt.</p>						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Abutments		Length:			
Element Name:	Bearings		Width:			
Location:	East/West Abutment		Height:			
Material:	Laminated Elastomeric Bearing		Count:	10		
Element Type:			Total Quantity:	10 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4	6	0	0	
Comments:						
Multiple anchor rods were observed to be misaligned (non-vertical) in the longitudinal direction.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	0	1	
Comments: Concrete debris (large concrete pieces) in stream. Stream is out of alignment at the structure. Erosion of the embankment in front of the east abutment was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x	1 year	2 year
			Remove debris in stream and place erosion protection at east abutment.			

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants, 1 additional drain		Height:			
Material:			Count:	5		
Element Type:			Total Quantity:	5 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	2	3	0	
Comments: SE, SW and NW Embankments: Insufficient erosion protection.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x	1 year	2 year
			Install erosion protection.			

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:	Hand laid riprap		Total Quantity:	1 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0	1	0	0	
Comments: NE Embankment: Slope protection provided at the CSP outlet.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	x 1 year	2 year
				Consider erosion protection at all embankments and at east abutment.		

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	5		
Element Type:			Total Quantity:	5 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0	5	0	0	
Comments: Three (3) HAZARD MARKER Signs at 3 corners, SPEED LIMIT Sign at South West railing system, and CHECK BOARD Sign at the pole.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Approaches		Length:	10.0 m		
Element Name:	Curb/gutters		Width:	0.3 m		
Location:	NW / SE / SW		Height:	0.2 m		
Material:	Cast-in-place concrete		Count:	3		
Element Type:			Total Quantity:	30.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	10.0	20.0	0.0	0.0	
Comments: NW, NE , SW and SE: 25 mm of settlement was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	7.0 m		
Location:	East/West Approaches		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	28.0	49.0	7.0	0.0	
Comments: East Approach: Medium transverse crack extends the full width and a medium to wide cracking with settlement was observed on south side of the approach. West Approach: Medium transverse crack extends the full width.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Crack sealing.			

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Approaches Slabs		Width:	7.0 m		
Location:	East/West Approaches		Height:			
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	28.0	56.0	0.0	0.0	
Comments:						
East Approach: Narrow transverse crack extending to the full width and medium to severe crack with settlement on south side observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x	1 year	2 year
			Crack sealing.			



Photograph 1: Overview of structure looking east



Photograph 2: Overview of structure looking west



Photograph 3: Typical condition of wearing surface



Photograph 4: Typical condition of parapet wall (Looking West)



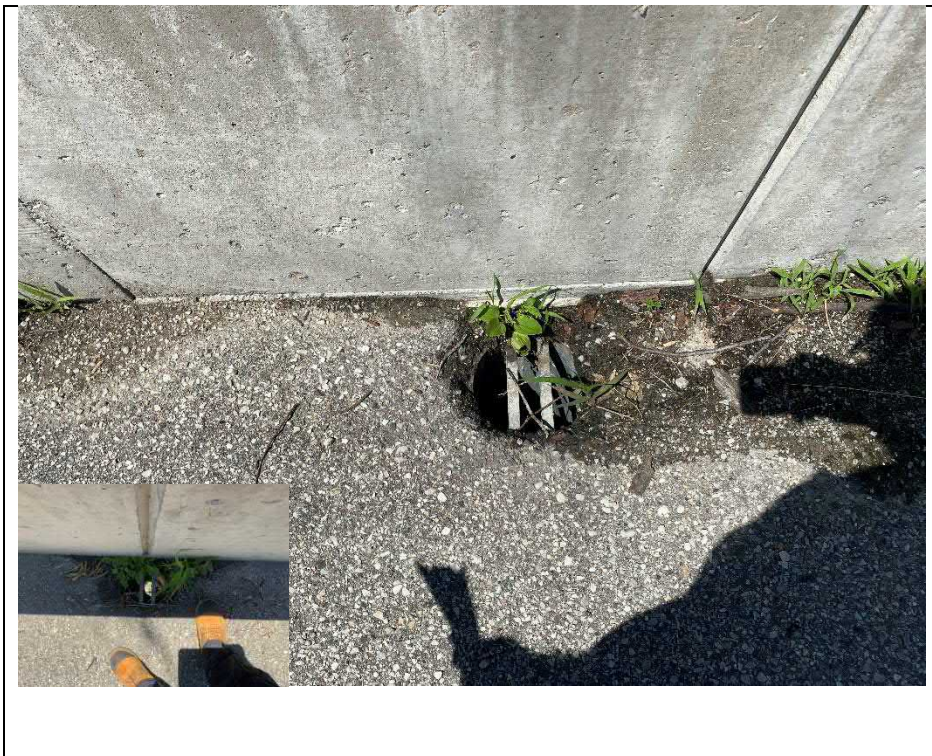
Photograph 5: Expansion joint and railing system at northeast quadrant of structure



Photograph 6: SBEAT at east approach (Looking West)



Photograph 7: Expansion joint at east side of the structure (Looking South)



Photograph 8: Typical deck drainage



Photograph 9: North elevation of structure



Photograph 10: South elevation of structure



Photograph 11: Deck soffit, main girders, diaphragms, and deck drainage (Looking West)



Photograph 12: Bearing seat at east abutment wall with typical bent anchor bolt (Looking South)



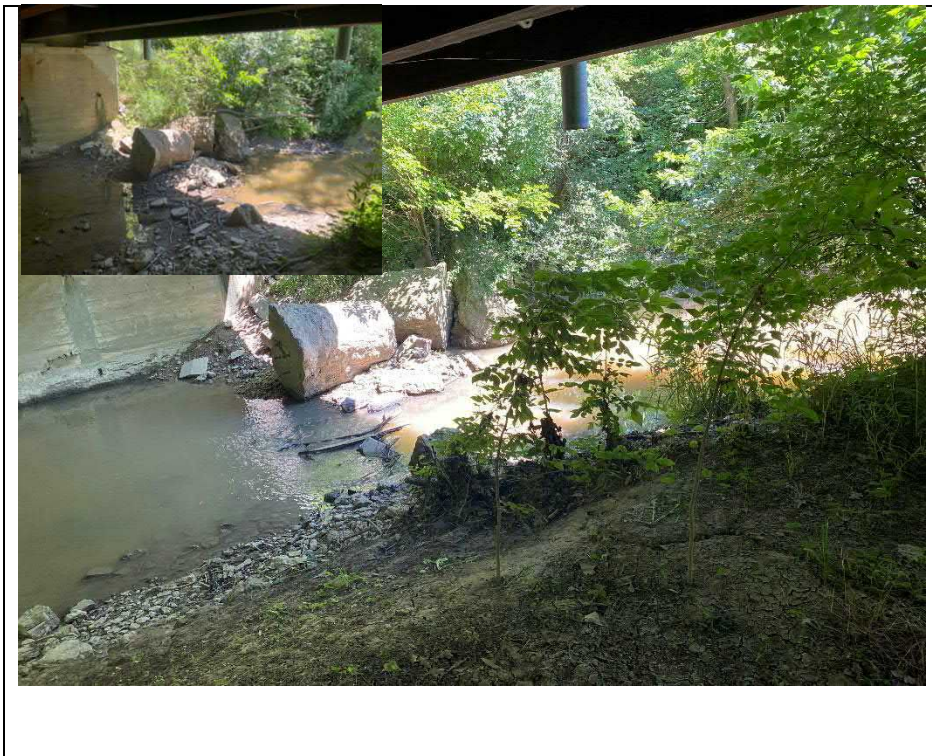
Photograph 13: Misaligned anchor rod at abutment bearings (typ.)



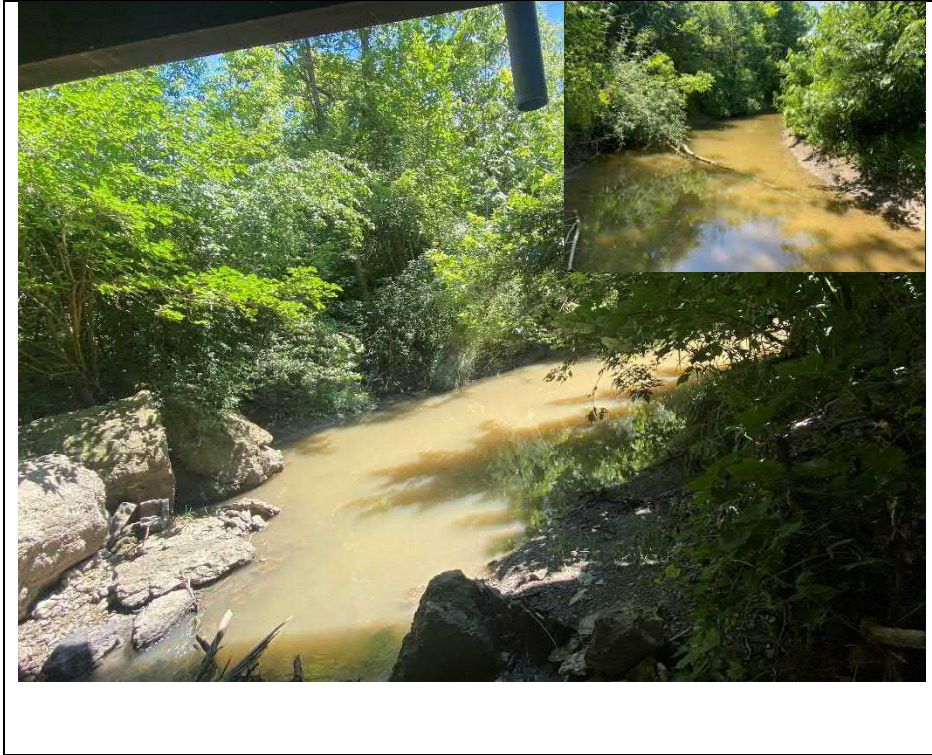
Photograph 14: Wall drains and erosion at footing at east abutment (Looking East)



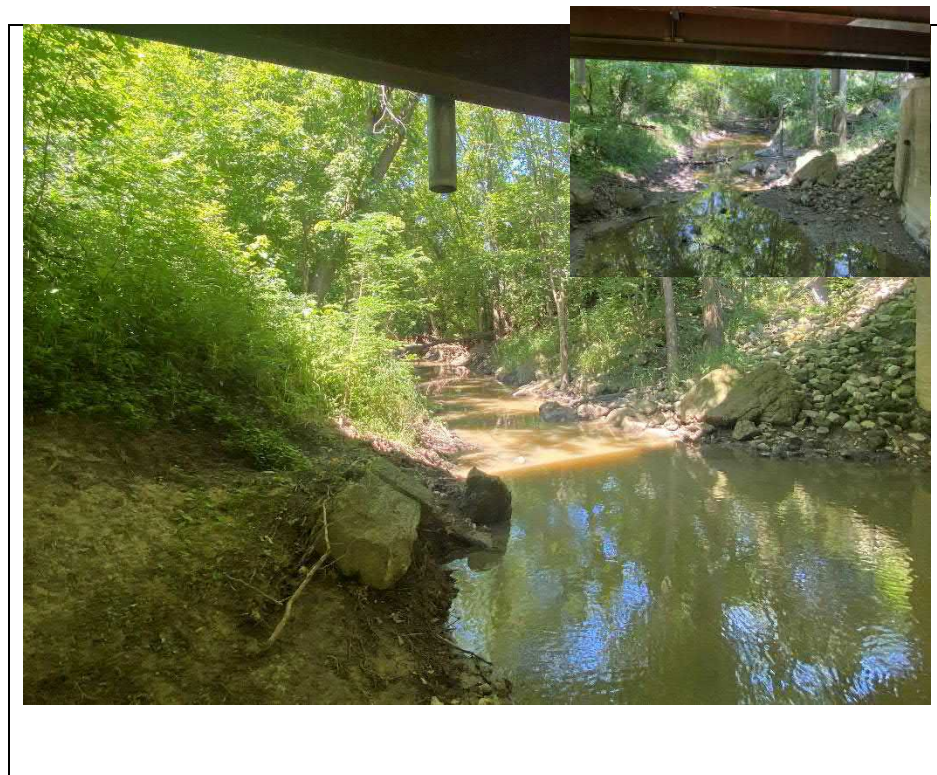
Photograph 15: Embankments at northeast quadrant of structure (Looking East)



Photograph 16: Embankments and waterway at south side of structure (Looking South)



Photograph 17: Waterway (Looking South)



Photograph 18: Embankments and waterway (Looking North)

Inventory Data:

Structure Name	Sullivan Creek at Baseline Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Baseline Road		
Structure Location	1.20 km West from Manning Road		
Latitude	42° 16' 38.2"	Longitude	-82° 53' 12.2"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Arterial <input type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	60 No. of Lanes 2
Old County	<input type="text"/>	AADT	1700 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	5.9 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	19.8 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	116.8 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	9.3 m	Detour Length Around Bridge	7.8 km
Skew Angle	57 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	<input type="text"/> m
Span Lengths	Total = 5.2 (1) = 5.2; <input type="text"/> m		

Historical Data:

Year Built	2015	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Bridge was fully replaced in 2015

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen S. (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
<input type="checkbox"/> Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Underwater Investigation:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Fatigue Investigation:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Seismic Investigation:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
<input type="checkbox"/> Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Maintenance: Retension guiderails. Light spall/delaminations noted at soffit of several precast unit joints.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	5.9 m		
Element Name:	Wearing surface		Width:	11.0 m		
Location:	Top of Deck		Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	64.9 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	26.0	38.4	0.0	0.5	
Comments: Medium to severe transverse crack at southwest corner.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Barriers		Length:	7.0 m		
Element Name:	Railing System		Width:			
Location:			Height:	0.65 m		
Material:	Steel		Count:	2		
Element Type:	Box Beam Railing on Curb		Total Quantity:	14.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	5.6	8.4	0.0	0.0	
Comments: SE Corner: Channel between the box beams was observed to have rotated. Light corrosion observed on bolts. Scrapes on tube railing with no rusting observed through out.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Barriers		Length:	Var. m		
Element Name:	Railing System		Width:			
Location:	All four quadrants		Height:			
Material:	Steel		Count:	4		
Element Type:	SBGR w/ Channel OPSD 912.130		Total Quantity:	34.2 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	13.7	20.5	0.0	0.0	
Comments: NE: 7.6m, NW: 11.4m, SE: 7.6m, and SW: 7.6m.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year
				Re-Tension guiderails		

Element Group:	Barriers		Length:	Var. m		
Element Name:	Railing System		Width:			
Location:	All four quadrants		Height:			
Material:	Steel		Count:	4		
Element Type:	SBGR w/eccentric loader end treat		Total Quantity:	95.1 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	38.0	57.1	0.0	0.0	
Comments: NE: 34.3m, NW: 15.2m, SE: 15.2m, and SW: 30.3m. Cable at guiderail ends was observed to be loose at all four corners.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	x Urgent	1 year	2 year
				Re-Tension guiderails		

Element Data

Element Group:	Culverts		Length:	5.2 m		
Element Name:	Barrels - Soffit		Width:	19.8 m		
Location:			Height:			
Material:	Precast concrete		Count:			
Element Type:			Total Quantity:	103.0 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	65.9	33.5	3.0	0.6	
Comments:						
Six (6) locations of light spalling or delamination observed at precast joints on soffit. Repair with proprietary product was observed at first joint from north. Narrow to medium cracking was observed throughout. Light corrosion was observed at bolts.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Culverts		Length:	19.8 m		
Element Name:	Barrels - Vertical Walls		Width:			
Location:	East/West		Height:	2.8 m		
Material:	Precast concrete		Count:	2		
Element Type:	Legs of rigid Box		Total Quantity:	110.9 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	71.0	38.4	1.0	0.5	
Comments:						
Fourteen (14) light spalls (0.1 x 0.1m) noted at the south fascia. Narrow to medium crack on north culvert top connecting to crack in curb. Medium transverse crack in south deck top that continues down outside face of SE wall and four narrow cracks in curb.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Culverts		Length:	Var. m		
Element Name:	Inlet/Outlet Components - Wingwall		Width:			
Location:			Height:	3.0 m		
Material:	Precast Blocks (1.5*0.75*0.75)		Count:	4		
Element Type:	Reinforced concrete		Total Quantity:	108.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	43.2	61.8	2.0	1.0	
Comments: NE and NW: 12.0m; and SE and SW: 6.0m. Light to very severe scaling observed at the top faces of the precast blocks.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Foundations		Length:	5.2 m		
Element Name:	Foundations (below grade level)		Width:	19.8 m		
Location:			Height:			
Material:	Precast concrete		Count:			
Element Type:	Bottom of rigid Box		Total Quantity:	103.0 Sq.m		
Environment:	Benign		Limited Inspection x			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	65.9	37.1	0.0	0.0	
Comments: No signs of distress were observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	3	1	0	0	
Comments: Vegetation overgrowth observed.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 All		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	1	0	0	0	
Comments:						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	All four embankments		Height:			
Material:			Count:	4		
Element Type:	Hand laid riprap		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	3	1	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:	At Four corners of Guide rails		Height:			
Material:			Count:	4		
Element Type:	Hazard Marker Signs		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	11.0 m		
Location:	East/West approaches		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	132.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	52.8	78.2	1.0	0.0	
Comments:						
W / E Approach: Medium transverse cracking observed in the E.B.L. at approach slab ends (4x0.25m) and W.B.L. at the east approach slab end only.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Approach slabs		Width:	11.0 m		
Location:	East/West approaches		Height:	0.25		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	132.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	52.8	78.2	1.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:			
Element Name:	Curb/Gutter		Width:			
Location:	All four Quadrants		Height:			
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Spillways (Curb Outlets) OPSD 605.04		Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 3	Good 1	Fair 0	Poor 0	
Comments: Hairline cracking was observed throughout. Light debris buildup was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	Var. m		
Element Name:	Curb/Gutter		Width:			
Location:	All four Quadrants		Height:			
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Barrier Curbs OPSD 605.040		Total Quantity:	36.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 14.4	Good 21.6	Fair 0.0	Poor 0.0	
Comments: Light debris buildup was observed. NW and NE: 15 to 25 mm of settlement was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	



Photograph 1: East approach



Photograph 2: West approach



Photograph 3: Typical condition of wearing surface at approaches (Looking East)



Photograph 4: Typical condition of barrier and wearing surface over the structure with medium transverse crack (Looking South)



Photograph 5: Spillway at southwest quadrant of structure



Photograph 6: Guiderrail cable anchorage observed to be loose at all 4 quadrants



Photograph 7: North elevation



Photograph 8: South elevation



Photograph 9: Discrete locations of light spalling at the south headwall



Photograph 10: Typical condition of culvert barrel (Looking North)



Photograph 11: Existing concrete parging at precast unit joint



Photograph 12: Typical delamination on soffit at joints between precast units



Photograph 13: North embankments and waterway (Looking North)



Photograph 14: Embankments and waterway (Looking South)



Photograph 15: Embankments and retaining walls at north side of culvert (Looking East)



Photograph 16: Embankments and retaining walls at north side of culvert (Looking West)



Photograph 17: Embankments and retaining walls at south side of culvert (Looking West)



Photograph 18: Severe scaling on top of one precast retaining wall block at southeast side of culvert

Inventory Data:

Structure Name	Pike Creek at Malden Road Culvert		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Malden Road		
Structure Location	0.90 km South West from Manning Road		
Latitude	42° 12' 44.7"	Longitude	-82° 52' 59.1"
Owners	Town of Tecumseh	Heritage Designation	Not Consid: <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	50 No. of Lanes 2
Old County	<input type="text"/>	AADT	1115 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	5.5 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	13.0 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	70.9 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	7.3 m	Detour Length Around Bridge	4.0 km
Skew Angle	0.0 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	1.0 m
Span Lengths	Total = 4.8 (1) = 4.8; <input type="text"/> m		

Historical Data:

Year Built	2007	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

The culvert was fully replaced in 2007

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Culvert replaced in 2007. Maintenance: rout and seal asphalt cracks, improve embankment stability (additional rip rap, gabion repair), and guide rail repairs. Consider adding object markers to remaining 2 corners.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	5.5 m		
Element Name:	Wearing Surface		Width:	7.0 m		
Location:			Height:	0.1 m		
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	38.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	22.7	6.5	9.0	
Comments:						
Surface has a number of sealed cracks. Medium longitudinal cracks along centreline (5x0.5m). Midspan: Severe transverse crack extending the entire width of the road (7x0.5m) and medium map cracking (3x1m). South: Severe transverse cracking (3x1m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Route and seal			

Element Group:	Barriers		Length:	23.0 m		
Element Name:	Railing Systems		Width:			
Location:	East/West Road Edge		Height:			
Material:	Steel		Count:	2		
Element Type:	Single Rail (Steel Beam, and Post)		Total Quantity:	46.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	44.0	1.0	1.0	
Comments:						
NW and SE Corners: Guiderails have protective end treatments. W Edge: Localized deformation of rail observed between two posts. E Edge: Rail is disconnected from offset block at SE corner.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year		2 year

Element Data

Element Group:	Barriers		Length:	0.1 m		
Element Name:	Posts		Width:	0.2 m		
Location:	East/West Road Edge		Height:	0.8 m		
Material:	Steel		Count:	25		
Element Type:			Total Quantity:	25 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	22.0	2.0	1.0	
Comments: Wood offset blocks are used and light splitting was observed. East Side: Post settlement and rotation observed. Rail is disconnected from post at S corner. West Side: Two posts (2) are slightly bent.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Repair settled posts.			

Element Group:	Culverts		Length:	4.8 m		
Element Name:	Barrels - Soffit		Width:	13.0 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Reinforced concrete		Total Quantity:	62.4 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	20.0	42.4	0.0	0.0	
Comments: An area of parged concrete was observed at the centreline of the barrel.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year		2 year

Element Data

Element Group:	Culverts		Length:	4.8 m		
Element Name:	Inlet / Outlet Components		Width:			
Location:	East/West Culvert Ends		Height:	1.0 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	9.6 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	9.6	0.0	0.0	
Comments:						
Both Fascia: Hairline to narrow cracks with staining extending to the top of the headwall observed throughout the fascia. Hairline cracks extending from haunches.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Culverts		Length:	13.0 m		
Element Name:	Barrels - Vertical Walls		Width:			
Location:	North/South		Height:	2.1 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced Concrete		Total Quantity:	54.6 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	17.5	36.6	0.5	0.0	
Comments:						
Narrow vertical cracks were observed throughout. Light spalling was observed under the wall drains.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Culverts		Length:	3.0 m		
Element Name:	Inlet/Outlet Components - Wingwalls		Width:			
Location:			Height:	3.1 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:	Reinforced Concrete		Total Quantity:	37.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	37.2	0.0	0.0	
Comments:						
NW: One (1) hairline crack was observed. SW: One (1) hairline crack was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Retaining Walls		Length:	10.0 m		
Element Name:	Walls		Width:			
Location:	South-East Embankment		Height:	2.0 m		
Material:	Gabions		Count:	1		
Element Type:			Total Quantity:	20.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	19.3	0.1	0.6	
Comments:						
Two (2) ruptures in the wire mesh were observed (0.25x0.25m + 1x0.5m.)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x 2 year	
			Repair gabion			

Element Data

Element Group:	Retaining Walls		Length:			
Element Name:	Walls		Width:			
Location:	North-West Embankment		Height:			
Material:	Concrete Blocks		Count:	6		
Element Type:			Total Quantity:	6 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	5	1	0	
Comments: Differential settlement of block adjacent to structure, as well as corrosion staining.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankment & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	2		
Element Type:			Total Quantity:	2 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	1	0	1	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankment & Streams		Length:			
Element Name:	Embankments		Width:			
Location:			Height:			
Material:			Count:	6		
Element Type:			Total Quantity:	6 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	2	0	
Comments: Existing gabion baskets are damaged at S corner of structure. All embankments at East (inlet) side noted to be unstable in the previous inspection, but this was not observed.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	x 2 year
				Routine maintenance.		

Element Group:	Embankment & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:	NE/SW Embankments		Height:			
Material:			Count:	2		
Element Type:	Hand Laid riprap		Total Quantity:	2 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	1	1	
Comments: NE: Poor rip-rap condition. Embankment slope at this property corner should be pulled back (It was observed to be very close to the pedestrian bridge in the previous inspection but was overgrown with vegetation and could not confirm).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	x 2 year
				Additional rip rap needed. Embankment works.		

Element Data

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:	NW/SE Barriers		Height:			
Material:			Count:	2		
Element Type:	Hazard Marker Sign		Total Quantity:	2 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	2	0	0	
Comments: Missing bridge OBJECT MARKER Signs on NW and SE						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Install bridge object marker signs.			

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	7.0 m		
Location:	North/South Approach		Height:	0.1 m		
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	84.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	75.5	5.0	3.5	
Comments: Approaches have several repaired/sealed cracks in both logitudinal and transversal directions. N Approach: Narrow to medium crack was observed in the N.B.L (3.0x2.5m). S Approach: Medium transverse was observed in the S.B.L. (3.0x0.25m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Rout and seal			



Photograph 1: North approach (Looking south)



Photograph 2: South approach (Looking north)



Photograph 3: Wearing surface over the structure with transverse crack (Looking West)



Photograph 4: Guide rail end treatment at the southeast quadrant of structure



Photograph 5: Guide rail on southeast quadrant of structure with detached post



Photograph 6: Guide rail end treatment at the southwest quadrant of structure



Photograph 7: East elevation with typical cracking with efflorescence at the headwalls



Photograph 8: West elevation with typical cracking at headwalls with efflorescence



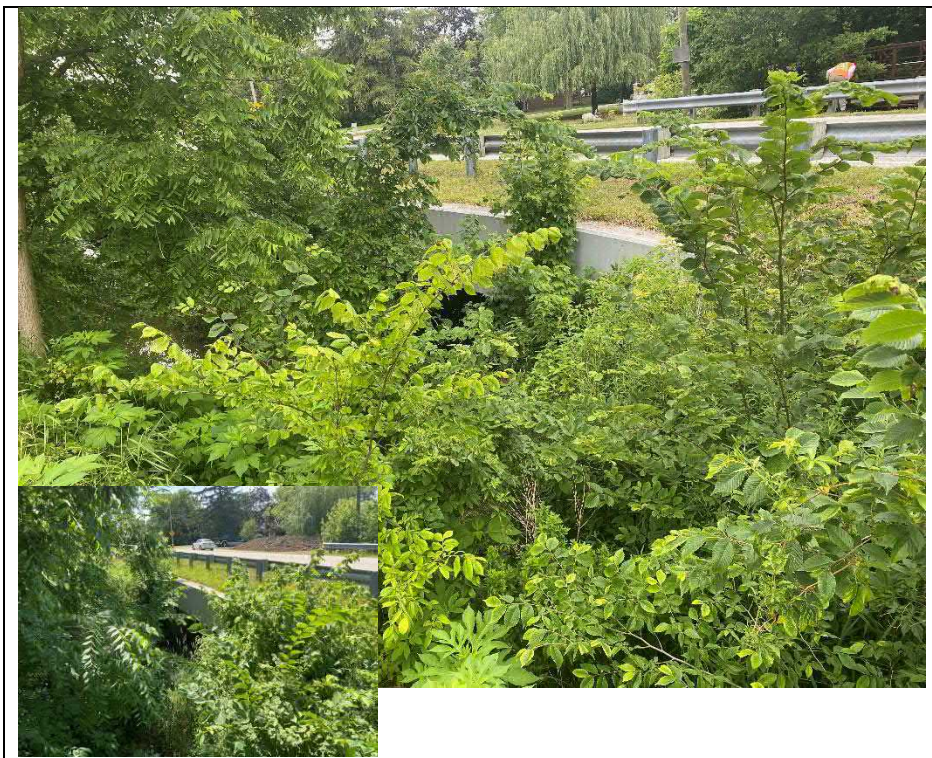
Photograph 9: Culvert barrel (Looking West)



Photograph 10: Pedestrian bridge on east side of structure (Looking South)



Photograph 11: Embankments, retaining elements on west side of structure (Looking North)



Photograph 12: Embankments, retaining elements at west side of structure (Looking South)



Photograph 13: Ruptured gabion basket at west embankment



Photograph 14: Waterway at the east inlet (Looking East)



Photograph 15: Waterway at the west outlet (Looking West)



Photograph 16: C.S.P outlet, retaining structure, pedestrian bridge and abutment at west side of structure (Looking North)

Inventory Data:

Structure Name	West Townline Drain at Malden Road Culvert		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Malden Road		
Structure Location	At intersection with Manning Road		
Latitude	42° 13' 3.7"	Longitude	-82° 52' 30.3"
Owners	Town of Tecumseh	Heritage Designation	Not Consid: <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input checked="" type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	80 No. of Lanes 2
Old County	<input type="text"/>	AADT	1115 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Corrugated Steel Pipe Arch	Interchange Number	<input type="text"/>
Total Deck Length	4.8 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	25.2 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	121.0 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	9.6 m	Detour Length Around Bridge	4.0 km
Skew Angle	0.0 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	2.0 m
Span Lengths	Total = 4.8 (1) = 4.8; <input type="text"/> m		

Historical Data:

Year Built	1995	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

2024 - Curved portions of SBGR were maintained. All approach/leaving end portions were replaced, extended and terminated with SBEATs and object marker signs.

Scheduled Improvements:	
Regional Priority Number	
Programmed Work Year	
Nature of Program Work:	

Appraisal Indices:		Comments
Fatigue	0.00	
Seismic	0.00	
Scour	0.00	
Flood	0.00	
Geometrics	0.00	
Barrier	0.00	
Curb	0.00	
Load Capacity	0.00	

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephan Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:		<input checked="" type="checkbox"/>	
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes: Monitor NE embankment for stability.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Maintenance: asphalt crack sealing or repaving, and repair of gabion basket. Spending on this structure to be coordinated with the County of Essex.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks			Length:	4.8 m		
Element Name:	Wearing surface			Width:	9.6 m		
Location:				Height:			
Material:	Asphalt			Count:			
Element Type:				Total Quantity:	46.0 Sq.m		
Environment:	Moderate			Limited Inspection			
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / each / % / all	0.0	43.0	0.0	3.0		
Comments: Severe transverse cracks at the joint between the asphalt over the culvert and asphalt at both approaches (3 sq.m).							
Recommended Work:	Rehab	Replace	Maintenance Needs:				
	1-5 years	6-10 years	Urgent	1 year	x	2 year	
			Crack sealing or repave.				

Element Group:	Barriers			Length:	41.5 m		
Element Name:	Railing Systems			Width:			
Location:	North/South Road Edge			Height:			
Material:	Steel			Count:	2		
Element Type:	Single Rail (Steel Beam, and Post)			Total Quantity:	83.0 m		
Environment:	Moderate			Limited Inspection			
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / each / % / all	60.0	23.0	0.0	0.0		
Comments: All approach/leaving SBGR end sections were replaced and terminated with SBEATs. N: 19.05 m replaced at NW + Maintained 9.12 m + 13.33 m replaced at NE. S: 17.12 m replaced at SW + Maintained 13.88 m + 10.5 m replaced at SE.							
Recommended Work:	Rehab	Replace	Maintenance Needs:				
	1-5 years	6-10 years	Urgent	1 year		2 year	

Element Data

Element Group:	Barriers		Length:			
Element Name:	Posts		Width:			
Location:	North/South Road Edge		Height:			
Material:	Steel		Count:	46		
Element Type:			Total Quantity:	46 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	28	18	0	0	
Comments: New posts installed at new sections of SBGR.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Retaining Walls		Length:	15.2 m		
Element Name:	Walls		Width:			
Location:	South-East Embankment		Height:	1.9 m		
Material:	Cast-in-place concrete		Count:	1		
Element Type:	Reinforced concrete		Total Quantity:	29.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0.0	12.0	12.0	5.0	
Comments: Severe scaling, light spalling and very severe honeycombing along bottom portion of wall.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Culverts		Length:	25.2 m		
Element Name:	Barrels		Width:	4.8 m		
Location:	North/South		Height:	3.1 m		
Material:	Corrugated steel		Count:	1		
Element Type:	Pipe arch		Total Quantity:	294.5 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0.0	278.8	14.5	1.2	
Comments: Medium corrosion along spring line. Light to medium corrosion of bolts at plate joints. Severe corrosion below pipe inlets.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Culverts		Length:	10.8 m		
Element Name:	Inlet Components		Width:			
Location:	South Inlet		Height:	3.0 m		
Material:	Gabions		Count:	1		
Element Type:			Total Quantity:	32.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0.0	32.4	0.0	0.0	
Comments: No signs of distress was observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Culverts		Length:	13.0 m		
Element Name:	Outlet Components		Width:			
Location:	North Outlet		Height:	4.0 m		
Material:	Gabions		Count:	1		
Element Type:			Total Quantity:	52.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0.0	50.0	1.0	1.0	
Comments: One (1) rupture was observed on top of a gabion basket (0.25x0.25). Several animal holes were observed in the fill on top of the culvert.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Repair gabion basket			

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0	1	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year		2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	NE / NW / SW Embankments		Height:			
Material:			Count:	3		
Element Type:	Hand laid riprap South west		Total Quantity:	3 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0	2	0	1	
Comments:						
NE: embankment observed to be close to edge of roadway.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	6		
Element Type:	Var.		Total Quantity:	6 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0	6	0	0	
Comments: Object marker signs were installed at all four SBGR ends. STOP Sign exists. LOAD LIMIT Sign was present just to west of structure.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	9.6 m		
Location:	East/West Approach		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	115.2 sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	Perform. Deficiencies
Data:	Sq.m / m / each / % / all	0.0	60.2	55.0	0.0	
Comments: Medium to severe map cracking at both approaches. Severe edge cracking was observed. Settlement noted at SE structure corner (approx. 15mm).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x 2 year	
			Crack sealing or repave.			



Photograph 1: West Approach (Looking East)



Photograph 2: Wide crack at joint between wearing surface over the culvert and the east approach



Photograph 3: Wide transverse cracking (Looking North)



Photograph 4: Wearing surface at west approach



Photograph 5: Load limit sign and new guide rail section at the northwest end



Photograph 6: New guide rail section at the northeast end



Photograph 7: New typical guiderail posts



Photograph 8: North elevation and gabion headwalls



Photograph 9: South elevation with rip-rap slope protection, and gabion basket retaining walls (Looking North)



Photograph 10: Typical condition of culvert barrel



Photograph 11: Typical condition of culvert barrel soffit



Photograph 12: Typical loss of coating and light to medium corrosion along the water line



Photograph 13: Typical light to medium corrosion on bolts heads



Photograph 14: Severe corrosion below inlet pipe at west wall



Photograph 15: North embankments with gabion basket retaining walls at north (Looking South)



Photograph 16: Retaining wall, gabion baskets, and culvert end at south elevation (Looking East).
Note: The retaining wall is part of the drain which is attributed to the county road.



Photograph 17: Deterioration along the retaining wall at the southeast embankment consisted of medium spalling, severe scaling, pop outs and severe honeycombing along the bottom of the wall



Photograph 18: Watercourse (Looking South)



Photograph 19: Watercourse (Looking North)

Inventory Data:

Structure Name	Malden Road Drain at South Talbot Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Malden Road		
Structure Location	Crossing South Talbot at Malden Intersection		
Latitude	42° 12' 3.0"	Longitude	-82° 54' 0.3"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Arterial <input type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	80 No. of Lanes 2
Old County	<input type="text"/>	AADT	319 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Rigid Frame Box	Interchange Number	<input type="text"/>
Total Deck Length	4.3 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	39.5 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	169.9 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	16.0 m	Detour Length Around Bridge	6.0 km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	< 0.3 m
Span Lengths	Total = 3.7 (1) = 3.7; <input type="text"/> m		

Historical Data:

Year Built	2007	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Culvert replaced in 2007.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input checked="" type="checkbox"/> 6 to 10 years
Overall Comments:	Structure interior only accessible from North end (confined space); camera inspection recommended. Maintenance: Add additional rocks to gabion baskets, replace waterproofing on exposed concrete surfaces. Interior culvert barrel should be inspected in the next inspection since it will have been 8 years since the last entry. Confined space entry requirements will need to be considered.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	4.3 m		
Element Name:	Wearing surface		Width:	16.0 m		
Location:	Top of Deck		Height:	0.1 m		
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	68.8 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	63.8	5.0	0.0	
Comments: All cracks have been repaired / sealed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	3.7 m		
Element Name:	Deck Top (with Thick Slab)		Width:	39.4 m		
Location:	Top of Deck		Height:	m		
Material:	Cast-in-place concrete		Count:			
Element Type:	Reinforced concrete		Total Quantity:	145.8 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	80.8	35.0	30.0	
Comments: Exposed waterproofing on top of the culvert was observed to be in fair to poor condition.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x 2 year	
			Replace Waterproofing on exposed surfaces.			

Element Data

Element Group:	Culverts		Length:	3.7 m		
Element Name:	Barrels - Soffit		Width:	39.4 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Reinforced concrete		Total Quantity:	145.8 Sq.m		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	46.6	95.4	3.7	0.0	
Comments: Medium spall observed on north inlet (0.05x1m). (From 2016): Hairline crack across the full width (3.7x0.25m) with efflorescence observed. Light honeycombing was observed throughout. The inside can be accessed only through the north opening as the south end is closed and intersects with HDPE culvert, this is considered a confined space and requires trained personnel for entry.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	X	1 year	2 year
			Replace waterproofing on exposed surfaces.			

Element Group:	Culverts		Length:	39.4 m		
Element Name:	Barrels - Vertical Walls		Width:			
Location:	East/West		Height:	2.6 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	204.9 Sq.m		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	65.6	134.1	5.2	0.0	
Comments: (From 2016): E Wall: Two (2) hairline cracks showing signs of efflorescence staining, spaced approx. 2.0m was observed (2.6x0.25 each). Inspection limited due to high water level and confined space entry limitations. The south end of the culvert is closed and intersect with other HDPE culvert.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent		1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:	NW / NE Embankments		Height:			
Material:	Gabions / Rip-Rap		Count:	2		
Element Type:			Total Quantity:	0.0 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	1.0	1.0	0.0	
Comments:						
NE: Hand laid rip-rap.						
NW: Gabion baskets observed to be missing rocks. Consider re-instating additional rocks.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Add additional rocks to gabion baskets.			

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	1	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year		2 year

Element Data

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	4		
Element Type:	Var.		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments: Four different signs were located in the area around the bridge including: Stop Sign at intersection, HAZARD MARKER Sign at the NW edge of the gabion baskets, and SPEED LIMIT Sign (80km/h).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	Var. m		
Location:	East/West Approaches		Height:	0.1 m		
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	75.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	37.0	30.0	8.0	
Comments: All cracks have been repaired / sealed. Medium map cracking observed at east approach (2 - 2 x 2 m)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	



Photograph 1: Wearing surface over structure (Looking West). Cracks have been sealed since the last inspection



Photograph 2: Wearing surface over structure (Looking East). Cracks have been sealed since the last inspection



Photograph 3: Sealed map cracking on the Wearing surface at the east approach (Looking South)



Photograph 4: Sealed wide cracks on the wearing surface at the west approach (Looking South)



Photograph 5: Southern closed end of structure with exposed waterproofing (Looking North)



Photograph 6: Exposed waterproofing on the top of deck showing signs of bubbling and deterioration in areas not covered by granular material (Looking North)



Photograph 7: Exposed waterproofing deterioration on north side of structure



Photograph 8: North inlet with exposed waterproofing along the top of deck (Looking South)



Photograph 9: Watercourse, embankments and slope protection at the north inlet of the structure (Looking North)



**Photograph 10: North end of barrel (Looking South).
Note: Picture from 2016. Barrel access is deemed Confined Space Entry**



Photograph 11: Two vertical cracks at the east barrel wall.
Note: Picture from 2016. Barrel access is deemed Confined Space Entry

Inventory Data:

Structure Name	Merrick Creek at Eighth Concession Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Eighth Concession Road		
Structure Location	1.60 km North from County Road 8		
Latitude	42° 11' 47.1"	Longitude	-82° 56' 56.8"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	Not posted No. of Lanes <input type="text" value="2"/>
Old County	<input type="text"/>	AADT	426 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Non-Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	4.2 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	9.2 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	38.6 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	6.3 m	Detour Length Around Bridge	10.0 km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0.2 m
Span Lengths	Total = 3.6 (1) = 3.6 m		

Historical Data:

Year Built	1965	Year of Last Major Rehab.	2020
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

2020 Rehab: Full depth concrete deck repairs, concrete overlay, waterproofing and asphalt, enclosed drain at SE wingwall.

Scheduled Improvements:	
Regional Priority Number	<input type="text"/>
Programmed Work Year	<input type="text"/>
Nature of Program Work:	

Appraisal Indices:		Comments
Fatigue	0.00	
Seismic	0.00	
Scour	0.00	
Flood	0.00	
Geometrics	0.00	
Barrier	0.00	
Curb	0.00	
Load Capacity	0.00	

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Major rehab completed in 2020
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	4.2 m		
Element Name:	Wearing Surface		Width:	6.3 m		
Location:			Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	26.5 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 19.4	Good 7.1	Fair 0.0	Poor 0.0	
Comments: Repaved in 2020.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	4.2 m		
Element Name:	Deck Top		Width:	9.2 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	38.6 Sq.m		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 28.3	Good 10.3	Fair 0.0	Poor 0.0	
Comments: Concrete overlay in 2020.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Decks		Length:	3.6 m		
Element Name:	Soffit - Thick Slab		Width:	9.2 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	33.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	3.2	29.7	0.0	0.3	
Comments: Concrete repair in 2020. Light delamination at west end (0.6 x 0.5 m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Sidewalks/Curbs		Length:	Var. m		
Element Name:	Curbs		Width:	0.3 m		
Location:	East/West Road Edges		Height:	0.3 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	9.3 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	3.4	5.7	0.1	0.1	
Comments: E Curb: reconstructed in 2020. W Curb: light scaling and four (4) light spalls were observed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Abutments		Length:	9.2 m		
Element Name:	Abutment Walls		Width:			
Location:	North/South		Height:	2.1 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	35.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	35.0	0.0	0.0	
Comments: Light scaling observed on both walls.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Abutments		Length:	4.2 m		
Element Name:	Wingwalls		Width:			
Location:			Height:	2.8 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	47.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	47.0	0.0	0.0	
Comments: SE Wingwall: One (1) CSP pipe coming through the wingwall. Medium crack was observed at the junction of abutment wall.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	1	0	0	0	
Comments: Debris observed in waterway. (Blockage at west end 8 m past structure)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	4	0	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	NE / NW / SW Embankments		Height:			
Material:	Hand Laid Riprap		Count:	3		
Element Type:			Total Quantity:	3 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	3	0	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:	NW and SE Wingwalls		Height:			
Material:			Count:	4		
Element Type:	Hazard Marker Signs		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	2	2	0	0	
Comments:						
Object markers added to 2 remaining corners in 2020. (light impact damage to SE sign)						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	6.3 m		
Location:			Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	75.6 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	55.4	19.2	1.0	0.0	
Comments:						
Asphalt extends 8 m past the form and fill grooves in either direction, transitioning back to a tar and chip wearing surface. Narrow crack at SE corner in line with end of curb. (0.5 x 2 m)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	



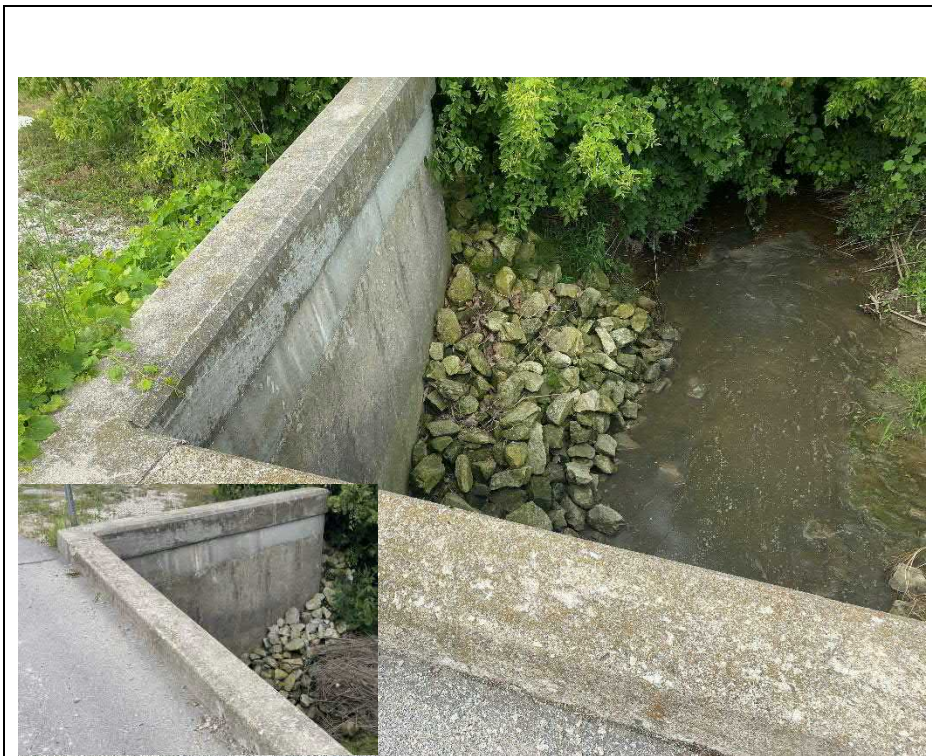
Photograph 1: South approach (Looking North)



Photograph 2: North approach (Looking South)



Photograph 3: Wearing surface over the structure (Looking West)



Photograph 4: Curb and wingwall at southwest quadrant of structure



Photograph 5: Reconstructed curb on east side of structure



Photograph 6: East elevation



Photograph 7: West elevation



Photograph 8: Typical condition of CSP outlet through the southeast wingwall



Photograph 9: South abutment wall and wall drains



Photograph 10: Typical condition of culvert barrel (Looking West)



Photograph 11: Soffit patch repair completed in 2019 (Looking Southwest)



Photograph 12: Typical condition of wall drains in culvert barrel with wet staining and efflorescence



Photograph 13: Watercourse on east side of structure, and slope protection rip-rap (Looking North)



Photograph 14: Watercourse on west side of structure (Looking West)

Inventory Data:

Structure Name	Townline Road Drain at Sixth Concession Road Culvert		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Sixth Concession Road (Holden Road)		
Structure Location	At intersection with County Road 8		
Latitude	42° 11' 0.3"	Longitude	-82° 59' 1.1"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	60 No. of Lanes 2
Old County	<input type="text"/>	AADT	500 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Non-Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	4.2 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	15.3 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	64.3 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	8.5 m	Detour Length Around Bridge	10.6 km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0.6 m
Span Lengths	Total = 3.7 (1) = 3.7; <input type="text"/> m		

Historical Data:

Year Built	1955	Year of Last Major Rehab.	2019
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	5.0
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

2019 Rehab: Remove and reconstruct 1.1m of deck at each extent (E/W), install new precast block retaining walls adjacent to new CIP corner strip, waterproof and pave.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Rehabilitated in 2019.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	4.2 m		
Element Name:	Wearing Surface		Width:	8.5 m		
Location:			Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	35.7 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	23.8	11.9	0.0	0.0	
Comments: Repaved in 2019.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Decks		Length:	3.7 m		
Element Name:	Deck Top		Width:	15.5 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	57.4 Sq.m		
Environment:	Benign		Limited Inspection	x		
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	45.9	11.5	0.0	0.0	
Comments: Reinforced concrete overlay completed in 2019. Deck ends reconstructed with new concrete headwalls.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Decks		Length:	3.7 m		
Element Name:	Soffit		Width:	15.5 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	57.4 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	6.5	50.9	0.0	0.0	
Comments:						
Soffit Patch repairs completed in 2019. Narrow transverse crack in new portion of west end (1.5 x 0.5 m).						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Culverts		Length:	3.7 m		
Element Name:	Inlet/Outlet Components - Headwalls		Width:	0.3 m		
Location:	Headwalls		Height:	0.2 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	3.7 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	2.5	1.2	0.0	0.0	
Comments:						
Constructed in 2019. One narrow crack at the centreline of the top face of both head walls and into fascia was observed. Light map cracking observed (0.5 x span)						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Abutments		Length:	15.5 m		
Element Name:	Abutment Walls		Width:			
Location:	North/South Abutments		Height:	2.1 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	65.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	64.6	0.5	0.0	
Comments:						
Light honeycomb throughout. Sediment and efflorescence buildup was observed under all wall drains. Medium vertical crack at interface of new abutment walls and retaining walls on the west side. Light map cracking in new portion of SW+SE wall)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	1	0	0	0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4	0	0	0	
Comments:						
2019: New HDPE pipes at NE and NW embankments, precast block retaining walls and rip rap laid at all 4 corners. South embankments are steep due to proximity of CR-8. Vegetation overgrowth around rip-rap.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hand-laid rip rap		Total Quantity:	4 Sq.m		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4	0	0	0	
Comments:						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Retaining Walls		Length:	1.5 m		
Element Name:	Walls		Width:			
Location:	4 Quadrants		Height:	2.3 m		
Material:	Precast block		Count:	4		
Element Type:			Total Quantity:	13.8 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	9.2	4.6	0.0	0.0	
Comments: Light scaling on top face of precast blocks was observed.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	8.5 m		
Location:	North/South Approaches		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	102.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	68.0	34.0	0.0	0.0	
Comments: Repaved in 2019. Erosion of shoulder in westbound lane (SE CORNER)						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year



Photograph 1: North approach (Looking South)



Photograph 2: Wearing surface at north approach (Looking South)



Photograph 3: Wearing surface over the structure (Looking East)



Photograph 4: West elevation (Looking Northeast)



Photograph 5: East elevation (Looking Northwest)



Photograph 6: Typical condition culvert barrel



Photograph 7: Typical condition of fascia (west end shown)



Photograph 8: Typical condition of deck soffit (East end shown)



Photograph 9: Abutment wall and deck soffit inside the structure



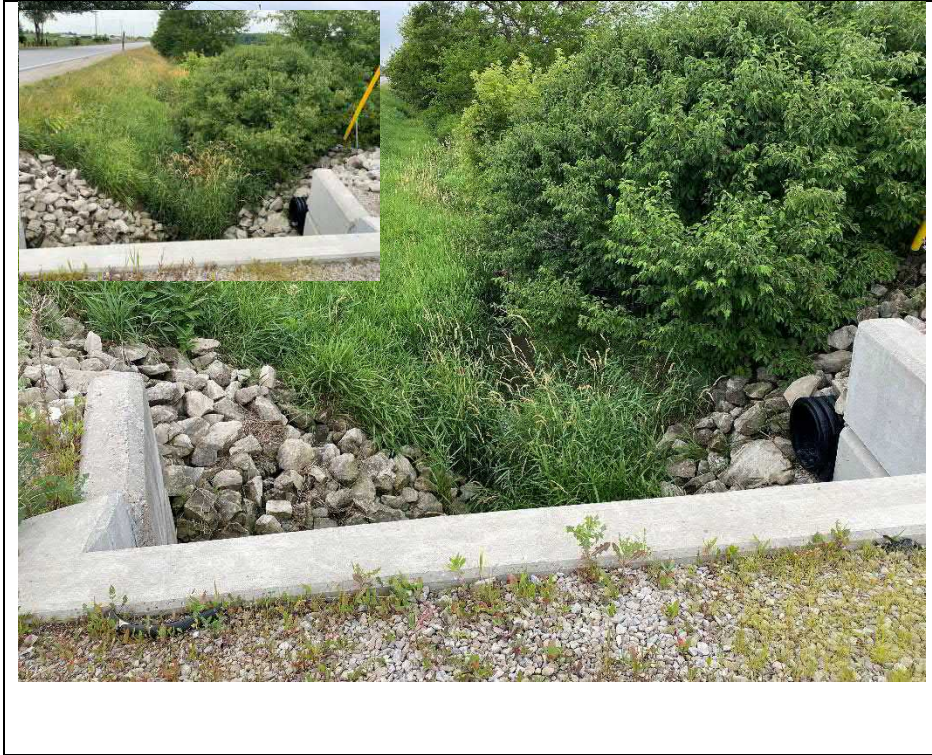
Photograph 10: Concrete patch in soffit near north abutment



Photograph 11: Typical Precast block retaining walls, rip rap and sub drains at embankments



Photograph 12: Watercourse east of structure



Photograph 13: Watercourse west of structure

Inventory Data:

Structure Name	Merrick Creek Drain at Sixth Concession Road Culvert		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Sixth Concession Road (Holden Road)		
Structure Location	0.25 km North from County Road 8		
Latitude	42° 11' 9.8"	Longitude	-82° 59' 0.4"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	60 No. of Lanes 2
Old County	<input type="text"/>	AADT	500 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Concrete Rigid Frame	Interchange Number	<input type="text"/>
Total Deck Length	6.3 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	15.0 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	94.5 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	6.5 m	Detour Length Around Bridge	10.6 km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	< 0.3 m
Span Lengths	Total = 5.5 (1) = 5.5; <input type="text"/> m		

Historical Data:

Year Built	2007	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	5.0
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Bridge replaced in 2007

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	<input checked="" type="checkbox"/>		
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input checked="" type="checkbox"/> 1 to 5 years <input type="checkbox"/> 6 to 10 years
Overall Comments:	Severe erosion was observed at SE shoulder. Maintenance: route and seal (or repavement program), remove debris from water course and stabilize / repair embankments.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	6.3 m		
Element Name:	Wearing surface		Width:	6.5 m		
Location:			Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	41.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0.0	0.0	25.0	16.0	
Comments: localized wearing surface deterioration at the structure limits. Very severe alligator cracking starting at N&S approaches and extending toward midspan. Medium to severe edge cracking along E&W edges of pavement.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	x 1 year	2 year
				Wearing surface cracks should be routed and sealed.		

Element Group:	Culverts		Length:	5.5 m		
Element Name:	Barrels - Soffit		Width:	15.0 m		
Location:			Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:			Total Quantity:	82.5 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	26.4	56.0	0.1	0.0	
Comments: Light honeycombing was observed at the west end (0.3x0.1m)						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Culverts		Length:	15.0 m		
Element Name:	Barrels - Vertical Walls		Width:			
Location:	North/South		Height:	3.2 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced Concrete		Total Quantity:	94.5 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	30.2	58.9	3.6	1.8	
Comments:						
<p>N Wall: HDPE outlet with hairline cracking and efflorescence and a narrow vertical crack extending the full height of wall.</p> <p>S Wall: 2 HDPE outlets with hairline cracking and light honeycombing was observed. Corrosion staining and water flow observed below west pipe .</p>						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Culverts		Length:	5.5 m		
Element Name:	Inlet/Outlet Components		Width:			
Location:	East/West Headwalls		Height:	0.6 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	6.6 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	0.0	6.6	0.0	0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Culverts		Length:	3.5 m		
Element Name:	Inlet/Outlet Components - Wingwalls		Width:	0.3 m		
Location:	North/South		Height:	3.8 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	53.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0.0	48.2	4.5	0.5	
Comments:						
NW: Hairline crack with efflorescence (1.0m). Light spall at top of wall. NE: Hairline crack (2.0m). SW: Hairline crack with efflorescence (0.5m). SE: Hairline crack with efflorescence (0.5m).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	2		
Element Type:			Total Quantity:	2 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition Data:	Units	Exc.	Good	Fair	Poor	Deficiencies
	Sq.m / m / each / % / all	0	0	1	1	
Comments:						
Debris build up in the waterway. Large trees and other vegetation at inlet end. Water was observed flowing through culvert.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Remove debris.			

Element Data

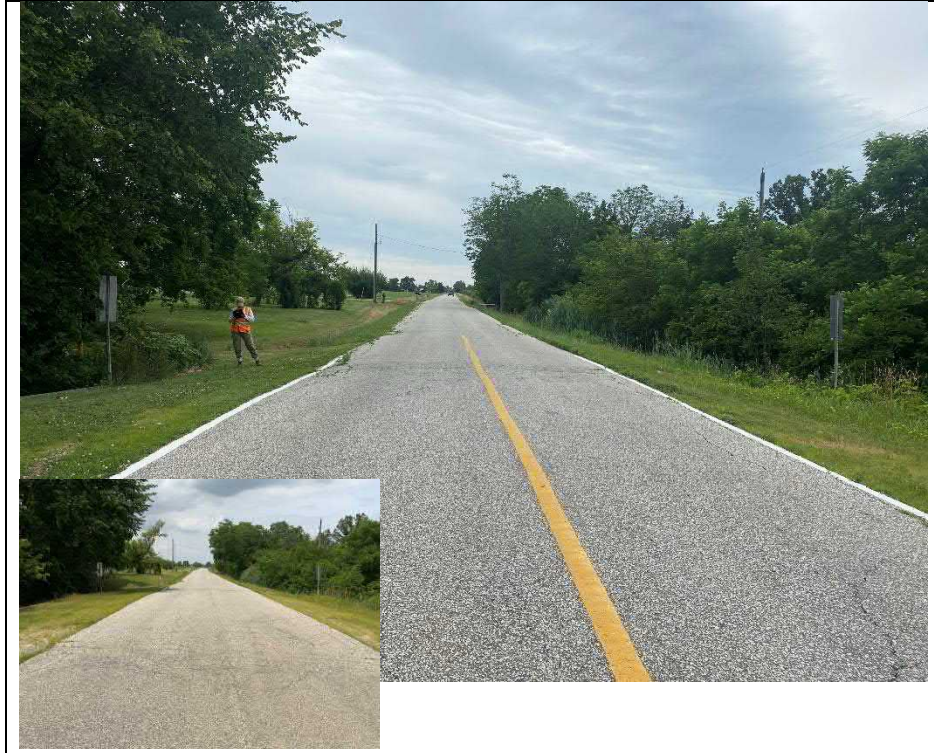
Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:			Height:			
Material:			Count:	6		
Element Type:			Total Quantity:	6 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	0.0	4.0	2.0	
Comments:						
Additional embankments located at NE and SW corners. SE: Severe erosion of the shoulder at structure corner.						
SW: Steep slope with filtercloth exposed.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Repair embankments.			

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hand laid riprap		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	2	2	0	
Comments:						
NW and SW: Unstable / steep rip-rap.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Routine maintenance.			

Element Data

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	4	0	
Comments: Object markers at 4 corners. Northwest sign had signs of impact damage and was hard to see from road.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	6.5 m		
Location:	North/South Approaches		Height:			
Material:	Asphalt (Tar and Chip)		Count:	2		
Element Type:			Total Quantity:	78.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	10.0	43.0	25.0	
Comments: N: Severe alligator and edge cracking along west edge of pavement (7.0x2.0m). Severe alligator cracking starting at the structure edge and extending into the approach wearing surface (6.2x1.5m) S: Severe alligator cracking starting at the structure edge extending into the wearing surface (7x2.0m)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Wearing surface cracks should be routed and sealed.			



Photograph 1: South approach (Looking North)



Photograph 2: North approach (Looking South)



Photograph 3: Cracking of asphalt pavement at interface of deck and south approach (Looking East)



Photograph 4: Edge cracking of wearing surface at north approach (Looking North)



Photograph 5: Severe erosion of the shoulder at the southeast embankment



Photograph 6: East elevation (Looking South)



Photograph 7: West elevation (Looking East)



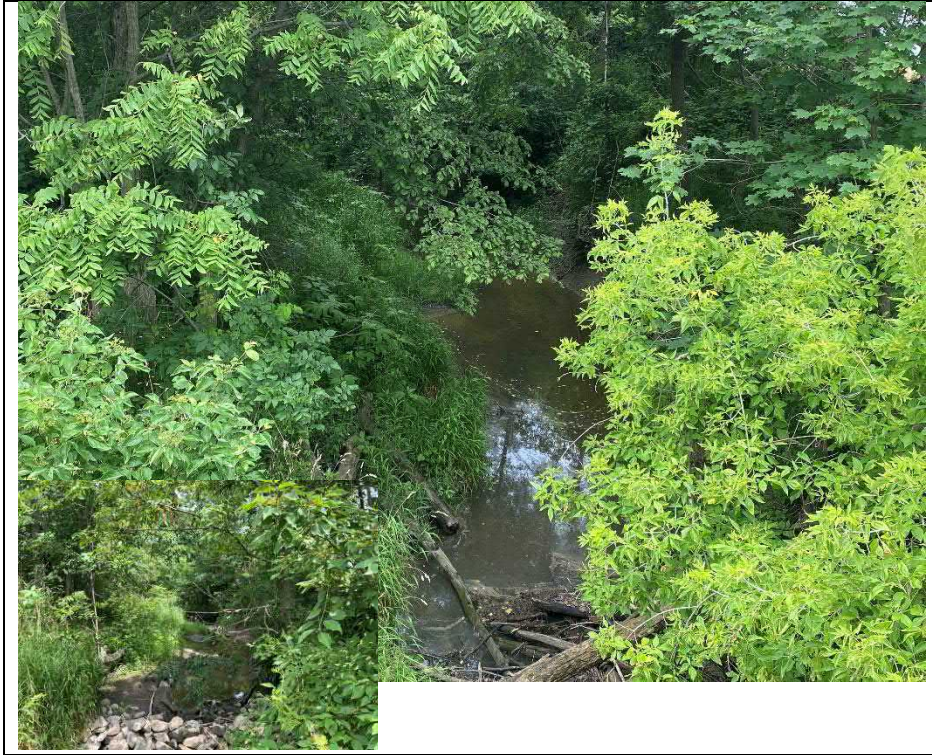
Photograph 8: Typical condition of culvert barrel



Photograph 9: South abutment wall near west extent of structure, HDPE outlet with corrosion staining beneath (Looking South)



Photograph 10: North-west wing wall with efflorescent-stained vertical crack



Photograph 11: Watercourse on west side of structure (Looking West)



Photograph 12: Watercourse on east side of structure (Looking East)



Photograph 13: North-east embankment (Looking North)



Photograph 14: Watercourse and south-west embankment with debris impeding flow

Inventory Data:

Structure Name	Collins Drain at Outer Drive Culvert		
Main Hwy/Road #	Outer Dr.	On Under <input checked="" type="checkbox"/>	Crossing Type: Navig. Water Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Outer Drive		
Structure Location	At transition from Outer Drive connector (North of Talbot Road) to Outer Drive		
Latitude	42° 13' 58.7"	Longitude	-82° 59' 3.8"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. Desig./not list <input checked="" type="checkbox"/> Cons/not App. Desig & List <input type="checkbox"/> List/n.d. <input type="checkbox"/>
MTO region		Road Class:	Freeway <input type="checkbox"/> Collector <input checked="" type="checkbox"/> Arterial <input type="checkbox"/> Local <input type="checkbox"/>
MTO District		Posted Speed	50 No. of Lanes 3
Old County		AADT	3152 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Concrete Frame (Rigid/Non-Rigid)	Interchange Number	
Total Deck Length	3.6 m	Interchange Structure Number	
Overall Str. Width	40.4 m	Min. Vertical Clearance	m
Total Deck Area	145.8 sq. m	Special Routes:	Transit School <input type="checkbox"/> Truck Bicycle <input checked="" type="checkbox"/>
Roadway Width	23.6 m	Detour Length Around Bridge	4.2 km
Skew Angle	20.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	1.1 m
Span Lengths	Total = 3.1 (1) = 3.1; m		

Historical Data:

Year Built	1975	Year of Last Major Rehab.	2005
Last OSIM Inspection	2022	Last Evaluation	
Last Enhanced OSIM Inspection		Current Load Limit	5.0
Enhanced Access Equipment (ladder, boat, lift, etc.)		Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			

Rehab History: (Date / Description)

Repaired and extended in 2005 for the Hwy #3 and Hwy 401 improvements including jacketing of footings.

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:			
Monitoring Crack Widths:		<input checked="" type="checkbox"/>	
Investigation Notes: Cracks at the deck soffit shall be monitored for degradation.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input checked="" type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input checked="" type="checkbox"/> 6 to 10 years
Overall Comments:	Recommended rehabilitation work includes: replacement of waterproofing, concrete patch repairs and crack injection to the original culvert structure, and repair of guidrail posts.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	3.6 m		
Element Name:	Wearing surface		Width:	23.6 m		
Location:	Top of Deck		Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	85.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	51.0	33.0	0.0	1.0	
Comments:						
Road repaved in recent years. Severe transverse crack between right turn merge lane and northbound through lane has been sealed (4x0.25m).						
Recommended Work:	x	Rehab		Replace	Maintenance Needs:	
		1-5 years	x	6-10 years	Urgent	1 year
Replace deck waterproofing in 6-10 years.						2 year

Element Group:	Barriers		Length:	55.0 m		
Element Name:	Railing System		Width:			
Location:	West Road Edge		Height:			
Material:	Steel		Count:			
Element Type:	Single Rail (Steel Beam, and Post)		Total Quantity:	55.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	55.0	7.0	0.0	
Comments:						
Light impact damage at south approach at the turn.						
Recommended Work:		Rehab		Replace	Maintenance Needs:	
		1-5 years		6-10 years	Urgent	1 year
						2 year

Element Data

Element Group:	Barriers		Length:			
Element Name:	Posts		Width:			
Location:	West Road Edge		Height:			
Material:	Steel		Count:	27		
Element Type:			Total Quantity:	27 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	27	0	0	
Comments:						
Eight (8) wood posts with wood offsets, fifteen (15) steel posts with wood offsets, and four (4) steel posts and plastic offsets are used.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Barriers		Length:	75.0 m		
Element Name:	Railing System		Width:			
Location:	East Road Edge		Height:			
Material:	Steel		Count:			
Element Type:	Single Rail (Steel Beam, and Post)		Total Quantity:	75.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	75.0	9.0	0.0	
Comments:						
Light impact damage at northwest turn.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Barriers		Length:			
Element Name:	Posts		Width:			
Location:	East Road Edge		Height:			
Material:	Var.		Count:	39		
Element Type:			Total Quantity:	39 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	34	4	1	
Comments:						
Eight (8) wood posts with wood offsets, twenty-four (24) steel posts with wood offsets, and seven (7) steel posts with plastic offsets are used. NE Corner: One (1) wood post was damaged and disconnected from the guardrail system. Splits and checks were observed in the wood posts throughout.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	<input checked="" type="checkbox"/> Urgent	<input type="checkbox"/> 1 year	<input type="checkbox"/> 2 year	
			Repair elements in poor condition.			

Element Group:	Culverts		Length:	3.1 m		
Element Name:	Barrels - Soffit - New Section		Width:	Var. m		
Location:	East/West Ends		Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Rigid R.C frame		Total Quantity:	68.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	68.2	0.0	0.0	
Comments:						
Structure was extended by 22.0 m E End: 14.3m and; W End: 7.7m.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	<input type="checkbox"/> Urgent	<input type="checkbox"/> 1 year	<input type="checkbox"/> 2 year	

Element Data

Element Group:	Culverts		Length:	3.1 m		
Element Name:	Barrels - Soffit - Original Section		Width:	18.5 m		
Location:	Intermediate section		Height:			
Material:	Cast-in-place concrete		Count:			
Element Type:	Non-Rigid R.C frame		Total Quantity:	57.4 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	24.7	21.8	10.9	
Comments:						
Two (2) wide and (5) Med. Cracks observed in the soffit with efflorescence and/or corrosion staining. 4 cracks were sealed in previous works. W End: Severe delamination was observed on the original section across the soffit.						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab	<input type="checkbox"/>	Replace	Maintenance Needs:	
	<input type="checkbox"/>	1-5 years	<input checked="" type="checkbox"/>	6-10 years	<input type="checkbox"/>	Urgent
					<input type="checkbox"/>	1 year
					<input type="checkbox"/>	2 year
Monitor cracks. Concrete repair in 6-10 years						

Element Group:	Culverts		Length:	40.5 m		
Element Name:	Barrels - Vertical Walls		Width:			
Location:	North/South		Height:	2.0 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced concrete		Total Quantity:	162.0 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	38.9	119.1	2.0	2.0	
Comments:						
Light scaling and light scour throughout, 2 wide cracks (injected) observed in wall. One (1) wide vertical crack was observed in the new footing jacket (0.8x0.25m). N Wall: Light delamination and 2 medium vertical cracks through jacketing observed.						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab	<input type="checkbox"/>	Replace	Maintenance Needs:	
	<input type="checkbox"/>	1-5 years	<input checked="" type="checkbox"/>	6-10 years	<input type="checkbox"/>	Urgent
					<input type="checkbox"/>	1 year
					<input type="checkbox"/>	2 year
Monitor cracks. Concrete maintenance in 6-10 years						

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	1	0	
Comments: Debris and overgrowth of vegetation was observed in the waterway.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Remove debris, and complete regular maintenance for the waterway.			

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments: Steep embankments. W End: 1.0m Dia. and 0.6m Dia. CSP drain into the embankment.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:	Hand laid Rip-Rap		Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments: Vegetation overgrowth.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:	All four corners		Height:			
Material:			Count:	3		
Element Type:	Var.		Total Quantity:	3 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	3	0	0	
Comments: Two (2) hazard marker signs and one (1) yield sign were observed to be in good condition. NE and SE Corners: no marker signs present.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	x 1 year	2 year
				Add object markers.		

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing surface		Width:	23.6 m		
Location:	North/South Approach		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	283.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	169.9	109.3	0.0	4.0	
Comments:						
Road repaved in recent years. Severe transverse crack between right turn merge lane and northbound through lane on both approaches has been sealed (6x0.25m). Medium pot hole at end of south approach (0.3 x 0.3 m)						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	



Photograph 1: South Approach (Looking Southwest)



Photograph 2: North approach (Looking Northeast)



Photograph 3: South approach (Looking East)



Photograph 4: Centreline of the road wearing surface approximately at mid span of the structure



Photograph 5: E.B.L wearing surface (Looking Northeast)



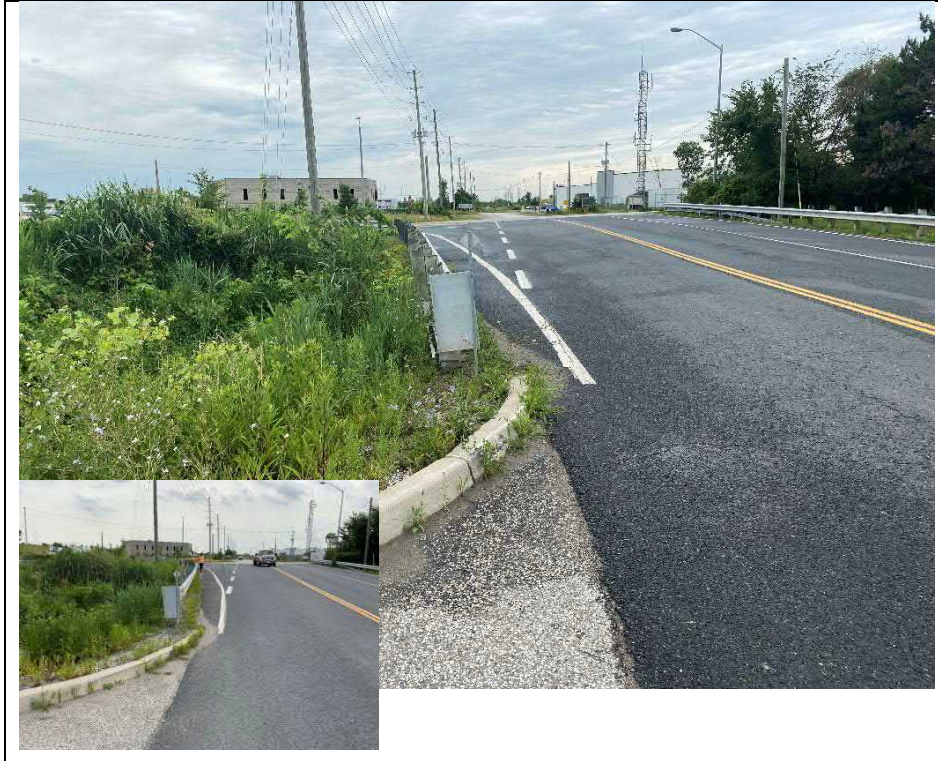
Photograph 6: Pavement joint between the deck and approach wearing surfaces (Looking Northeast)



Photograph 7: Wearing surface over the structure (Looking Northwest)



Photograph 8: Settled, rotated post of railing system at the northeast quadrant of structure (Looking Northeast)



Photograph 9: Missing hazard marker sign at northeast quadrant of structure (Looking Southwest)



Photograph 10: East elevation (Looking North)



Photograph 11: Culvert barrel, showing the non-rigid original section of the culvert with jacketed footings, as well as the new rigid frame section extension (Looking Northwest)



Photograph 12: Typical delamination, and epoxy injected cracks with staining along soffit within the original section of the culvert



Photograph 13: Typical stained medium to wide cracks throughout the soffit (Looking Northwest)



Photograph 14: Cracks extending from the culvert soffit to the abutments



Photograph 15: Watercourse at west extent of culvert (Looking West)



Photograph 16: Watercourse at east extent of structure (Looking Southeast)

Inventory Data:

Structure Name	Pike Creek at Twelfth Concession Road Culvert		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Twelfth Concession Road (closed to traffic - walking path)		
Structure Location	Pike Creek at Twelfth Concession Road (South of Baseline Road in Pike Creek Park)		
Latitude	42° 15' 1.4"	Longitude	-82° 52' 58.7"
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	N/A No. of Lanes <input type="text" value="1"/>
Old County	<input type="text"/>	AADT	0 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Corrugated Steel Pipe Arch	Interchange Number	<input type="text"/>
Total Deck Length	6.5 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	11.8 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	76.7 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	3.7 m	Detour Length Around Bridge	N/A km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0.6 m
Span Lengths	Total = 6.5 (1) = 6.5; <input type="text"/> m		

Historical Data:

Year Built	1965	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:		<input checked="" type="checkbox"/>	
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes: Monitor the deformation of the CSPA section.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input checked="" type="checkbox"/> 6 to 10 years
Overall Comments:	Deformation observed along fasteners at top of CSPA. Maintenance: improve the erosion protection at the south end of the culvert and embankments and install object markers.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	6.5 m		
Element Name:	Wearing surface		Width:	3.7 m		
Location:			Height:			
Material:	Compacted granular		Count:			
Element Type:			Total Quantity:	24.0 Sq.m		
Environment:	Severe		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	24.0	0.0	0.0	
Comments: It was observed that an extra 300mm of fill was added to the original 300mm (new cover = 600 mm).						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Culverts		Length:	6.5 m		
Element Name:	Barrels		Width:	11.8 m		
Location:			Height:	3.5 m		
Material:	Corrugated steel		Count:	1		
Element Type:	Pipe Arch		Total Quantity:	180.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	163.0	12.0	5.0	
Comments: Medium deformation was observed along fasteners at top of CSPA. Bolts are missing in a few locations. Light corrosion was observed above spring line.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

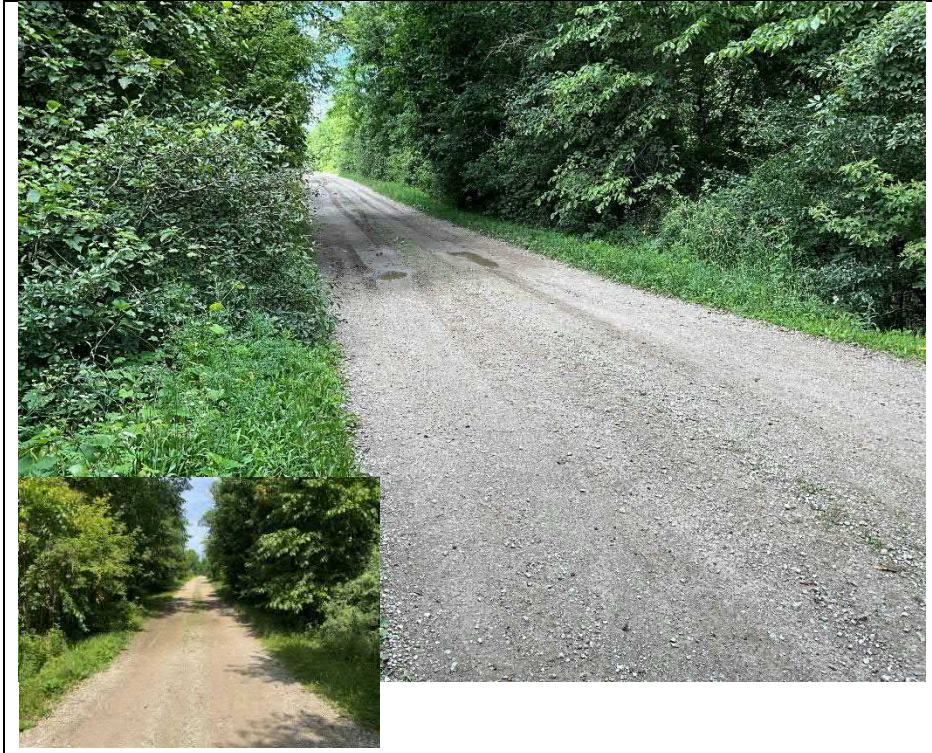
Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	2		
Element Type:			Total Quantity:	2 all		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	2	0	
Comments: Signs of erosion of downstream banks.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:			Height:			
Material:			Count:	5		
Element Type:			Total Quantity:	5 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	5	0	
Comments: Steep embankments with signs of erosion. Large concrete pieces at each corner						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	x	2 year
			Clear debris and Improve erosion control.			

Element Data

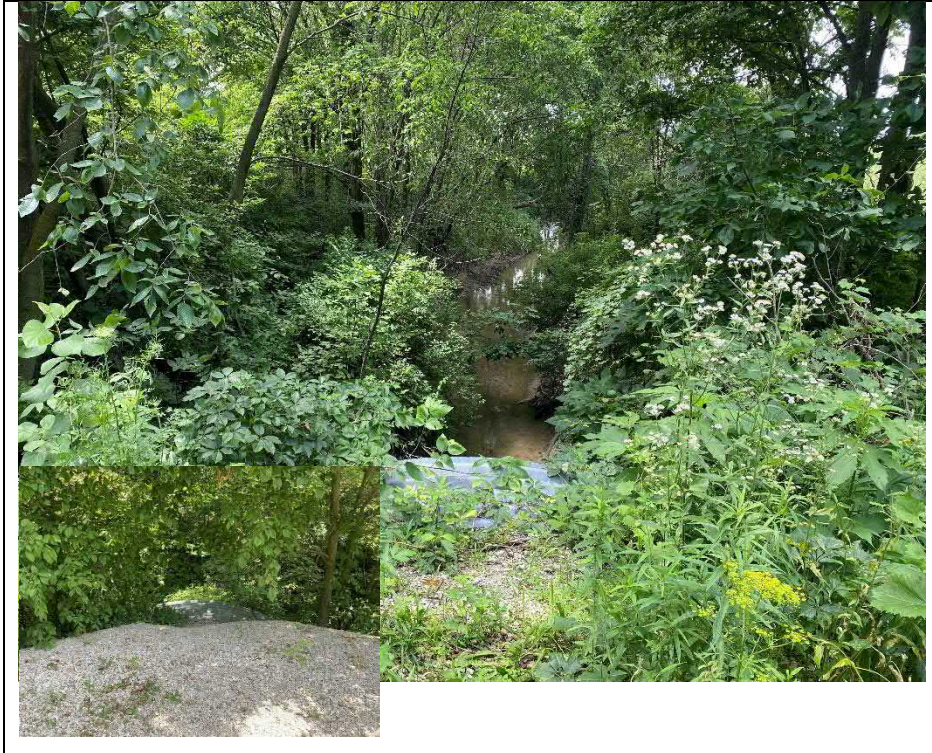
Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	0		
Element Type:			Total Quantity:	0 each		
Environment:			Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	0	0	
Comments:						
No sign present. Object marker signs should be installed as the path is still utilized by maintenance vehicles and farm equipment.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	x	Urgent	1 year
				2 year		
				Install signs		



Photograph 1: North approach (Looking North)



Photograph 2: South approach (Looking South)



Photograph 3: Looking west from top of culvert



Photograph 4: East elevation



Photograph 5: West elevation



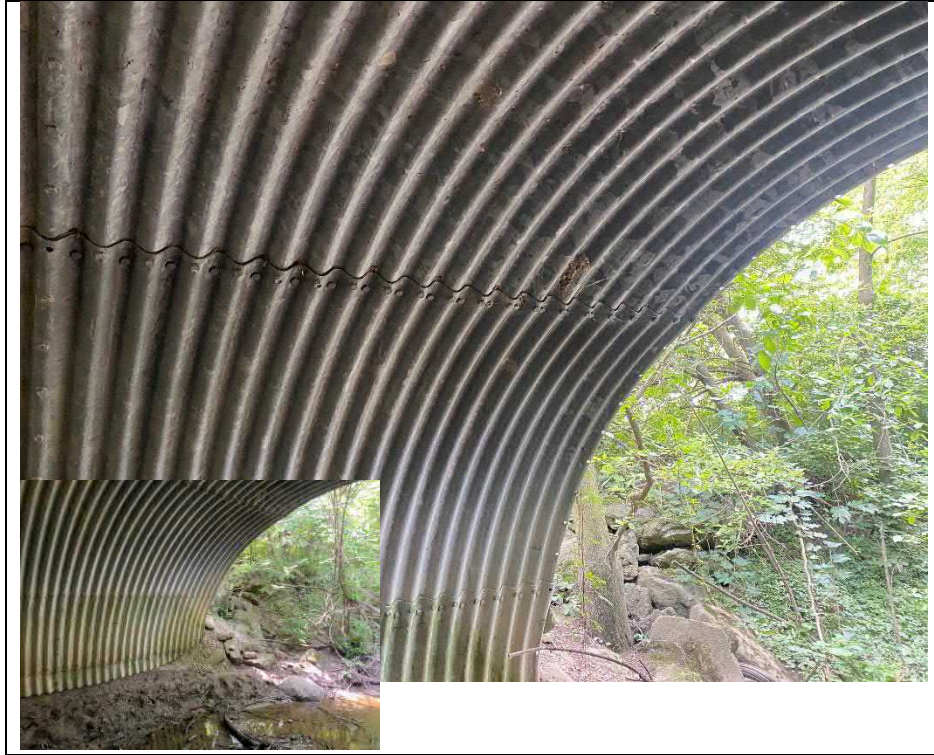
Photograph 6: Culvert barrel (Looking West)



Photograph 7: Typical condition along spring line



Photograph 8: North spring line (Looking West)



Photograph 9: Medium deformation in culvert barrel



Photograph 10: Typical condition of culvert barrel soffit



Photograph 11: Watercourse inlet at east end of structure (Looking South)



Photograph 12: Watercourse outlet at west end of structure (Looking Northwest)

Inventory Data:

Structure Name	Townline Road Drain at Eighth Concession Road Bridge		
Main Hwy/Road #	<input type="text"/>	On <input checked="" type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input checked="" type="checkbox"/> Ped. Other <input type="checkbox"/>
Hwy/Road Name	Eighth Concession Road		
Structure Location	At intersection with County Road 8		
Latitude	42° 10' 56.3"	Longitude	-82° 57' 0.4"
Owners	Town of Tecumseh	Heritage Designation	Not Consid: <input checked="" type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Collector <input type="checkbox"/> Arterial <input type="checkbox"/> Local <input checked="" type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	Not Posted No. of Lanes <input type="text" value="2"/>
Old County	<input type="text"/>	AADT	426 % Trucks <input type="text"/>
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Corrugated Steel Pipe Arch	Interchange Number	<input type="text"/>
Total Deck Length	3.1 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	25.5 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	79.1 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	11.0 m	Detour Length Around Bridge	9.3 km
Skew Angle	0.0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0.6 m
Span Lengths	Total = 3.1 (1) = 3.1; <input type="text"/> m		

Historical Data:

Year Built	2012	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	<input type="text"/>
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:	Comments
Fatigue	0.00
Seismic	0.00
Scour	0.00
Flood	0.00
Geometrics	0.00
Barrier	0.00
Curb	0.00
Load Capacity	0.00

Field Inspection Information:	
Date of Inspection:	June 26, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen S (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	<input checked="" type="checkbox"/>		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	<input checked="" type="checkbox"/>		
Concrete Substructure Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Coating Condition Survey:	<input checked="" type="checkbox"/>		
Detailed Timber Investigation:	<input checked="" type="checkbox"/>		
Post-Tensioned Strand Investigation:	<input checked="" type="checkbox"/>		
Underwater Investigation:	<input checked="" type="checkbox"/>		
Fatigue Investigation:	<input checked="" type="checkbox"/>		
Seismic Investigation:	<input checked="" type="checkbox"/>		
Structure Evaluation:	<input checked="" type="checkbox"/>		
Monitoring			
Monitoring of Deformations, Settlements and Movements:		<input checked="" type="checkbox"/>	
Monitoring Crack Widths:	<input checked="" type="checkbox"/>		
Investigation Notes:			
Deformations and settlement of the CSP section should be monitored.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Minor Rehab. <input checked="" type="checkbox"/> Replace <input type="checkbox"/> Major Rehab.
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input checked="" type="checkbox"/> 6 to 10 years
Overall Comments:	<p>Wearing surface condition over culvert is typical of surrounding asphalt on CR8 & 8th Concession. Asphalt resurfacing recommended with next road reconstruction project or with culvert replacement. Spalling of grout around CSP at both the inlet and outlet should be repaired. Install object markers at south corners. Clear vegetation during summer months as necessary.</p> <p>Deformations should be monitored, in order to determine if replacement is required in 6 to 10 years. Headwalls and retaining walls should be replaced in 6 to 10 years if deterioration progresses.</p>
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	3.1 m		
Element Name:	Wearing surface		Width:	11.0 m		
Location:	Top of Deck		Height:			
Material:	Asphalt		Count:			
Element Type:			Total Quantity:	34.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 28.6	Fair 5.0	Poor 0.5	
Comments: E Side: Severe edge cracking with pieces of asphalt broken off was observed (2.5x2m)						
Recommended Work:	Rehab	x	Replace	Maintenance Needs:		
	1-5 years	x	6-10 years	Urgent	1 year	2 year
Asphalt resurfacing recommended with next road reconstruction project.						

Element Group:	Culverts		Length:	25.5 m		
Element Name:	Barrels		Width:	3.1 m		
Location:			Height:	1.8 m		
Material:	Corrugated steel		Count:	1		
Element Type:	Pipe Arch		Total Quantity:	200.0 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 175.0	Fair 15.0	Poor 10.0	
Comments: Transverse culvert joints distorted and leaking, medium corrosion at springline, and severe corrosion below outlet pipes in barrel walls. Apparent sagging in top of culvert under roadway.						
Recommended Work:	Rehab	x	Replace	Maintenance Needs:		
	1-5 years	x	6-10 years	Urgent	1 year	x 2 year
Based on joint deformations, corrosion, and sagging culvert replacement should be accounted for in 6-10 years.				Monitor deformations.		

Element Data

Element Group:	Culverts		Length:	8.7 m		
Element Name:	Inlet Component		Width:	2.4 m		
Location:	West Inlet		Height:			
Material:			Count:	1		
Element Type:	Pre-cast concrete blocks		Total Quantity:	20.9 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 14.9	Fair 3.5	Poor 2.5	
Comments: Headwalls were backfileld incorrectly (filled with bricks). Very severe spalling was observed above the CSP inlet and has progressed. Separation of units and cracking of grout, appear to be rotating (in plan view). South block full depth crack. Erosion behind headwall.						
Recommended Work:	Rehab	x	Replace	Maintenance Needs:		
	1-5 years	x	6-10 years	x Urgent	1 year	2 year
Replace headwall and retaining walls				Grout void space between headwalls and CSP		

Element Group:	Culverts		Length:	8.7 m		
Element Name:	Outlet Component		Width:	2.4 m		
Location:	East Outlet		Height:			
Material:			Count:	1		
Element Type:	Pre-cast concrete blocks		Total Quantity:	20.9 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0.0	Good 14.9	Fair 3.5	Poor 2.5	
Comments: Headwalls were not backfileld correctly, void space is filled with bricks. Very Severe spalling of grout and mortar with loss of stone was observed from the CSP outlet and has progressed. Joint separation of units and cracking of grout.						
Recommended Work:	Rehab	x	Replace	Maintenance Needs:		
	1-5 years	x	6-10 years	x Urgent	1 year	2 year
Replace headwall and retaining walls				Grout void space between headwalls and CSP		

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 1	Fair 0	Poor 0	
Comments:						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 0	Fair 4	Poor 0	
Comments:						
Steep vegetated embankments with rip-rap erosion protection at each corner. SE embankment in close proximity to CR-8 roadway.						
Recommended Work:		Rehab 1-5 years	Replace 6-10 years	Maintenance Needs:		
				Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope Protection		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0	4	0	0	
Comments: Vegetation overgrowth.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Clear vegetation as required.			

Element Group:	Signs		Length:			
Element Name:	Signs		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:	Stop Sign		Total Quantity:	1 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0	1	0	0	
Comments: Sign located at the intersection at wood post.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	x 1 year	2 year	
			Install object markers to improve roadside safety at south corners.			

Element Data

Element Group:	Approaches		Length:	6.0 m		
Element Name:	Wearing Surface		Width:	11.0 m		
Location:	North/South Approaches		Height:			
Material:	Asphalt		Count:	2		
Element Type:			Total Quantity:	132.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0.0	49.0	78.0	5.0	
Comments:						
<p>N: Medium to severe edge cracking and medium transverse joint crack extending entire road width, sealed .</p> <p>S: Medium to wide edge and alligator cracking, sealed. Settlement and erosion at SE corner.</p>						
Recommended Work:	<input checked="" type="checkbox"/>	Rehab	<input type="checkbox"/>	Replace	Maintenance Needs:	
	<input type="checkbox"/>	1-5 years	<input checked="" type="checkbox"/>	6-10 years	<input type="checkbox"/>	Urgent
					<input type="checkbox"/>	1 year
					<input type="checkbox"/>	2 year
Wearing surface condition over culvert is typical of surrounding asphalt on CR8 & 8th Concession.reconstruction project.						



Photograph 1: North approach



Photograph 2: Wearing surface at south approach (Looking East)



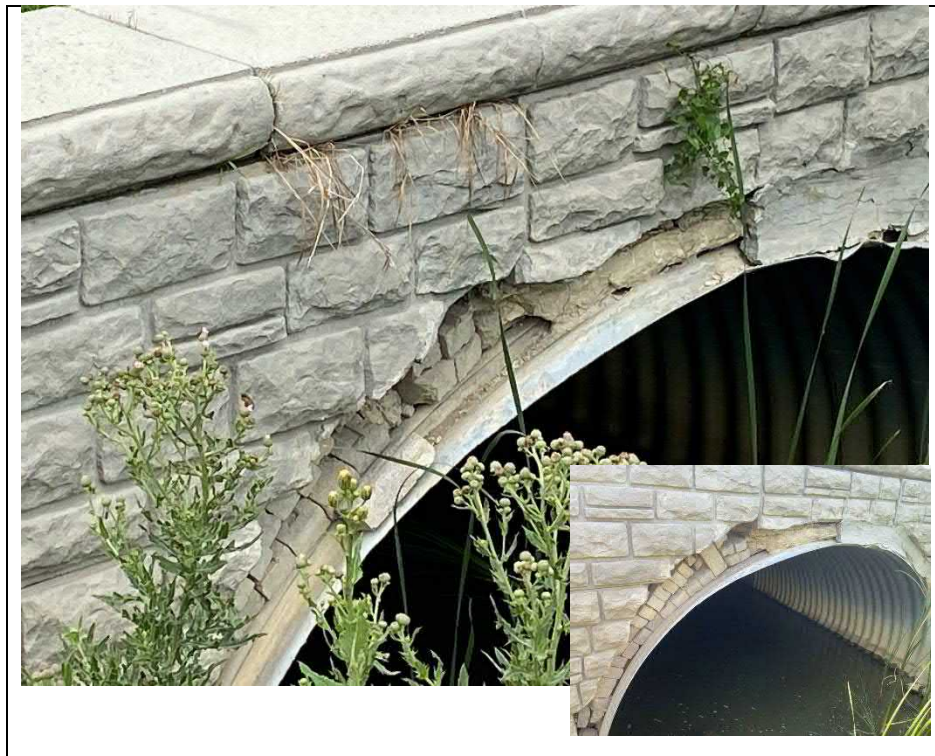
Photograph 3: Alligator cracking of wearing surface at southeast quadrant (Looking West)



Photograph 4: East elevation with excessive vegetation (Looking North)



Photograph 5: West elevation with excessive vegetation (Looking North)



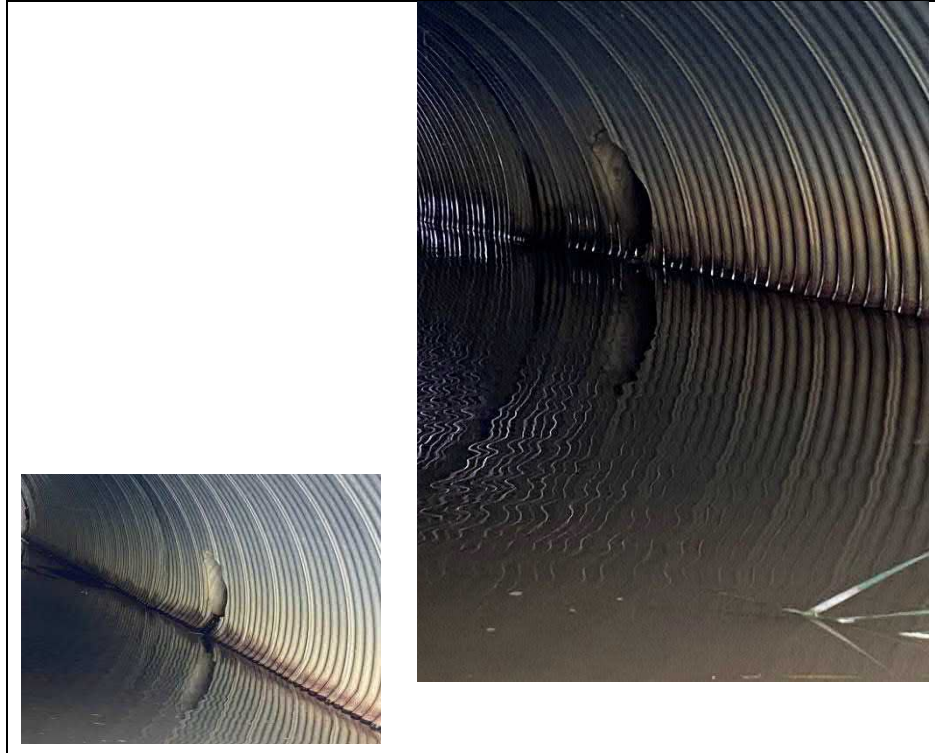
Photograph 6: Headwall joint with severe spalling of grout, signs of precast wall unit movement (typ.)



Photograph 7: Typical condition of the culvert barrel



Photograph 8: Typical transverse joint deformation and light to medium corrosion along the waterline



Photograph 9: Severe corrosion below outlet pipe in culvert wall



Photograph 10: Waterway, embankments and vegetation (Looking East)



Photograph 11: Waterway, embankments and vegetation (Looking West)

Inventory Data:

Structure Name	Lakewood Park Pedestrian Bridge		
Main Hwy/Road #	<input type="text"/>	On <input type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input type="checkbox"/> Ped. <input checked="" type="checkbox"/> Other <input type="checkbox"/>
Hwy/Road Name	Manning Road (County Road 19) / Little River Blvd.		
Structure Location	Lakewood Park over Lakewood Park Channel		
Latitude	42° 19' 18.948" N	Longitude	82° 52' 3.252" W
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	n/a No. of Lanes n/a
Old County	<input type="text"/>	AADT	n/a % Trucks n/a
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Bowstring Pratt Truss	Interchange Number	<input type="text"/>
Total Deck Length	23.8 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	3.7 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	88.1 sq. m	Special Routes:	Transit <input type="checkbox"/> School <input type="checkbox"/> Truck <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	N/A m	Detour Length Around Bridge	N/A km
Skew Angle	0 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	0 m
Span Lengths	Total = 23.8 (1) = 23.8 m		

Historical Data:

Year Built	2016	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	8100.0 kg
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:		Comments
Fatigue	0.00	
Seismic	0.00	
Scour	0.00	
Flood	0.00	
Geometrics	0.00	
Barrier	0.00	
Curb	0.00	
Load Capacity	0.00	

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen S. (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey:	x		
Non-Destructive Delamination Survey of Asphalt-Covered Deck:	x		
Concrete Substructure Condition Survey:	x		
Detailed Coating Condition Survey:		x	
Detailed Timber Investigation:	x		
Post-Tensioned Strand Investigation:	x		
Underwater Investigation:	x		
Fatigue Investigation:	x		
Seismic Investigation:	x		
Structure Evaluation:	x		
Monitoring			
Monitoring of Deformations, Settlements and Movements:	x		
Monitoring Crack Widths:	x		
Investigation Notes: The recommendation for a Detailed Coating Condition Survey to should be confirmed during the next inspection.			

Overall Structure Notes:	
Recommended Work on Structure:	<input type="checkbox"/> None <input type="checkbox"/> Minor Rehab. <input type="checkbox"/> Major Rehab. <input checked="" type="checkbox"/> Replace
Timing of Recommended Work:	<input type="checkbox"/> 1 to 5 years <input checked="" type="checkbox"/> 6 to 10 years
Overall Comments:	The coating system for the floor system (floor beams, stringers, wind bracing) was observed to have failed and the corrosion of those members has progressed. Annual inspections are recommended until the structure is replaced, which is recommended in six to ten years.
Date of Next Inspection:	June 2026

Element Data

Element Group:	Decks		Length:	23.5 m		
Element Name:	Deck top		Width:	3.0 m		
Location:	Top of Deck		Height:			
Material:	Wood Planks		Count:			
Element Type:			Total Quantity:	70.5 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	32.9	27.6	10.0	0.0	
Comments: Light surface rust on all screws. Threshold plates at either deck end were not flush with the concrete and could be a potential tripping hazard. Medium splits and checks on 21 wood planks throughout.						
Recommended Work:		Rehab	x	Replace	Maintenance Needs:	
	1-5 years	x	6-10 years	x	Urgent	1 year
						2 year
				Re-fasten threshold plates.		

Element Group:	Barriers		Length:			
Element Name:	Posts		Width:			
Location:	North/South edges		Height:			
Material:	Steel		Count:	22		
Element Type:			Total Quantity:	22 each		
Environment:	Benign		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	15	7	0	0	
Comments:						
Recommended Work:		Rehab	x	Replace	Maintenance Needs:	
	1-5 years	x	6-10 years		Urgent	1 year
						2 year

Element Data

Element Group:	Barriers	Length:	23.5		
Element Name:	Hand Railings	Width:			
Location:	North/South edges	Height:			
Material:	Steel	Count:	2.0		
Element Type:		Total Quantity:	47.0 m		
Environment:	Benign	Limited Inspection			
Protection System:					Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor
	Sq.m / m / each / % / all	32.0	15.0	0.0	0.0
Comments:					
Recommended Work:		Rehab	x	Replace	Maintenance Needs:
		1-5 years	x	6-10 years	Urgent
				1 year	
				2 year	

Element Group:	Beams/MLE's	Length:	3.5 m		
Element Name:	Floor Beams	Width:	51 mm		
Location:		Height:	152 mm		
Material:	Steel	Count:	12		
Element Type:	HSS 152 x 51 x 6.4	Total Quantity:	17.1 Sq.m		
Environment:	Moderate	Limited Inspection			
Protection System:					Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor
	Sq.m / m / each / % / all	0.0	12.1	5.0	0.0
Comments:					
Light corrosion observed throughout all faces of floor beams with a higher concentration on the bottom and at weld connections to stringers and wind bracing. Section loss should be confirmed in areas of coating failure.					
Recommended Work:		Rehab	x	Replace	Maintenance Needs:
		1-5 years	x	6-10 years	Urgent
				1 year	
				2 year	

Element Data

Element Group:	Beams/MLE's	Length:	2.44 m				
Element Name:	Stringer	Width:	51 mm				
Location:		Height:	152 mm				
Material:	Steel	Count:	10				
Element Type:	HSS 152 x 51 x 6.4	Total Quantity:	100 each				
Environment:	Moderate	Limited Inspection					
Protection System:					Perform. Deficiencies		
Condition Data:	Units	Exc.	Good	Fair	Poor		
	Sq.m / m / each / % / all	0	50	40	10		
Comments: Light to medium corrosion observed throughout. Section loss should be confirmed in areas of coating failure.							
Recommended Work:		Rehab	x	Replace	Maintenance Needs:		
		1-5 years	x	6-10 years	Urgent	1 year	2 year

Element Group:	Trusses/Arches	Length:	23.5 m				
Element Name:	Top Chords	Width:	152 mm				
Location:	North/South Edges	Height:	152 mm				
Material:	Steel	Count:	2				
Element Type:	HSS 152 x 152 x 6.4	Total Quantity:	28.6 Sq.m				
Environment:	Benign	Limited Inspection					
Protection System:					Perform. Deficiencies		
Condition Data:	Units	Exc.	Good	Fair	Poor		
	Sq.m / m / each / % / all	19.4	9.1	0.0	0.0		
Comments: Truss members are in good condition.							
Recommended Work:		Rehab	x	Replace	Maintenance Needs:		
		1-5 years	x	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Trusses/Arches		Length:	23.5 m		
Element Name:	Bottom Chords		Width:	152 mm		
Location:	North/South Edges		Height:	152 mm		
Material:	Steel		Count:	2		
Element Type:	HSS 152 x 152 x 6.4		Total Quantity:	28.6 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	13.3	15.3	0.0	0.0	
Comments: Light corrosion at centre of north chord on bottom face.						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Group:	Trusses/Arches		Length:	Varies m		
Element Name:	Verticals		Width:	51 mm		
Location:	North/South Edges		Height:	76 mm		
Material:	Steel		Count:	24		
Element Type:	HSS 76x51x4.8		Total Quantity:	10.5 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	4.9	5.6	0.0	0.0	
Comments:						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Data

Element Group:	Trusses/Arches		Length:	Varies m		
Element Name:	Diagonals		Width:	51 mm		
Location:	North/South Edges		Height:	51 mm		
Material:	Steel		Count:	16		
Element Type:	HSS 51x51x4.8		Total Quantity:	10.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	4.7	5.3	0.0	0.0	
Comments:						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Group:	Bracing		Length:	4.1 m		
Element Name:	Wind Bracing		Width:	51 m		
Location:	Underside of Deck		Height:	51 m		
Material:	Steel		Count:	10		
Element Type:	HSS 51 x 51 x 4.8		Total Quantity:	10 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	0	6	4	0	
Comments:						
Light to medium corrosion was observed at weld locations. Section loss should be confirmed in areas of coating failure.						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Data

Element Group:	Coating		Length:			
Element Name:	Railings		Width:	m		
Location:	North/South Edges		Height:	m		
Material:			Count:			
Element Type:			Total Quantity:	47.0 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 36	Fair 11.0	Poor 0	
Comments: Localized damage and corrosion observed on several railing pickets.						
Recommended Work:		Rehab	x	Replace	Maintenance Needs:	
		1-5 years	x	6-10 years	Urgent	1 year
						2 year

Element Group:	Coating		Length:			
Element Name:	Floor Beams and Stringers		Width:	m		
Location:	Underside of Deck		Height:	m		
Material:			Count:			
Element Type:			Total Quantity:	116 m2		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 0	Fair 30.0	Poor 86	
Comments: The coating system was observed to have failed. Floor beam coating generally fair to poor condition. Stringer coating observed to be in poor condition throughout						
Recommended Work:		Rehab	x	Replace	Maintenance Needs:	
		1-5 years	x	6-10 years	Urgent	1 year
						2 year

Element Data

Element Group:	Coating		Length:			
Element Name:	Truss Members		Width:	m		
Location:	North/South Edges		Height:	m		
Material:			Count:			
Element Type:			Total Quantity:	77.7 m2		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0	57.7	20	0	
Comments:						
Coating on Truss members is in good condition, with areas in fair condition along the bottom chord. The coating system used (Powder coating) is non standard and should be replaced during the next rehab.						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Group:	Coating		Length:			
Element Name:	Wind Bracing		Width:	m		
Location:	Underside of Deck		Height:	m		
Material:			Count:			
Element Type:			Total Quantity:	7.5 m2		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition	Units	Exc.	Good	Fair	Poor	
Data:	Sq.m / m / each / % / all	0	4.5	2	1	
Comments:						
The coating system was observed to have failed. Wind Bracing coating generally in fair condition, except at weld locations it was observed to be in poor condition.						
Recommended Work:		Rehab	x	Replace		Maintenance Needs:
		1-5 years	x	6-10 years		Urgent 1 year 2 year

Element Data

Element Group:	Foundations		Length:			
Element Name:	Reinforced concrete caison		Width:	1.2 m		
Location:	East/West Ends		Height:	2.5 m		
Material:	Cast-in-place concrete		Count:	4		
Element Type:			Total Quantity:	4 each		
Environment:	Moderate		Limited Inspection	x		
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 4	Fair 0	Poor 0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 1	Fair 0	Poor 0	
Comments:						
Stagnant water, no flow.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants		Height:			
Material:			Count:	2		
Element Type:			Total Quantity:	2 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	2	0	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

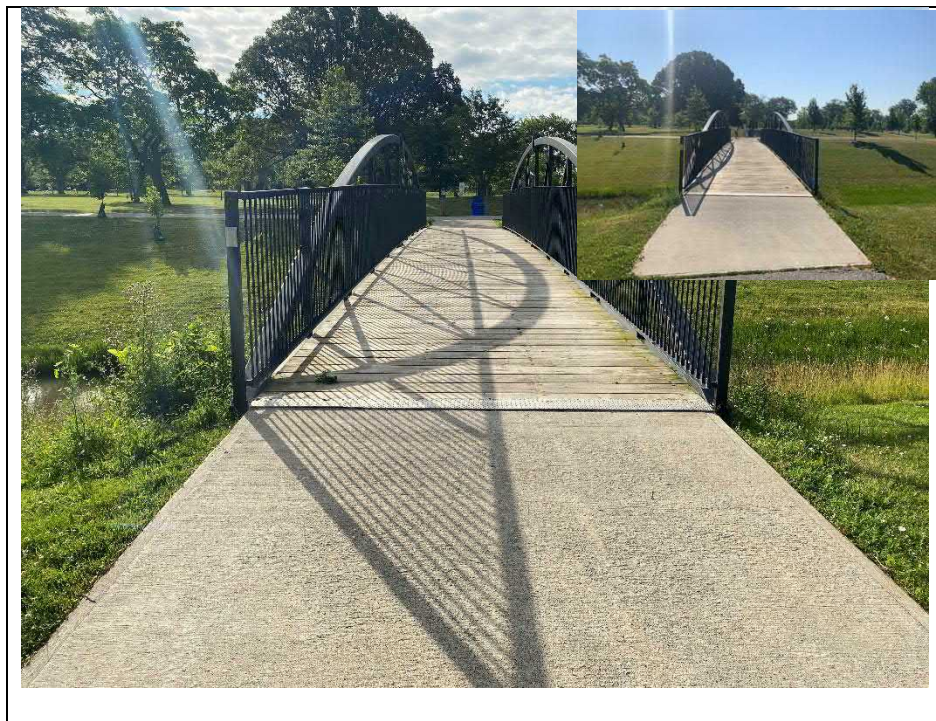
Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:			Height:			
Material:			Count:	2		
Element Type:	Hand laid riprap		Total Quantity:	2 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units	Exc.	Good	Fair	Poor	
	Sq.m / m / each / % / all	2	0	0	0	
Comments:						
Recommended Work:						
	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

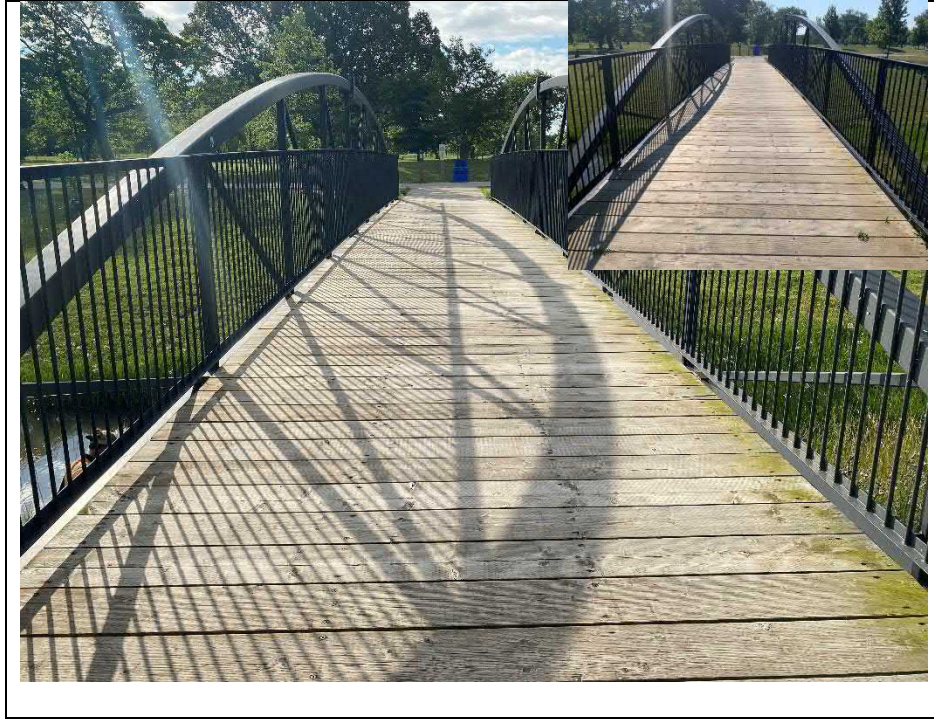
Element Group:	Approaches	Length:	3.7 m	8.1 m		
Element Name:	Approach Slabs	Width:	3.0 m			
Location:	East/West Approach	Height:	0.25 m			
Material:	Cast-in-place concrete	Count:	2			
Element Type:		Total Quantity:	35.4 Sq.m			
Environment:	Moderate	Limited Inspection				
Protection System:				Perform.		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	16.5	18.9	0.0	0.0	
Comments:						
Narrow crack at north west corner of the structure. Fibre board between east approach and deck end has fallen out of gap. E Approach: 3.0m x 8.1m; W Approach: 3.0m x 3.7m						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year



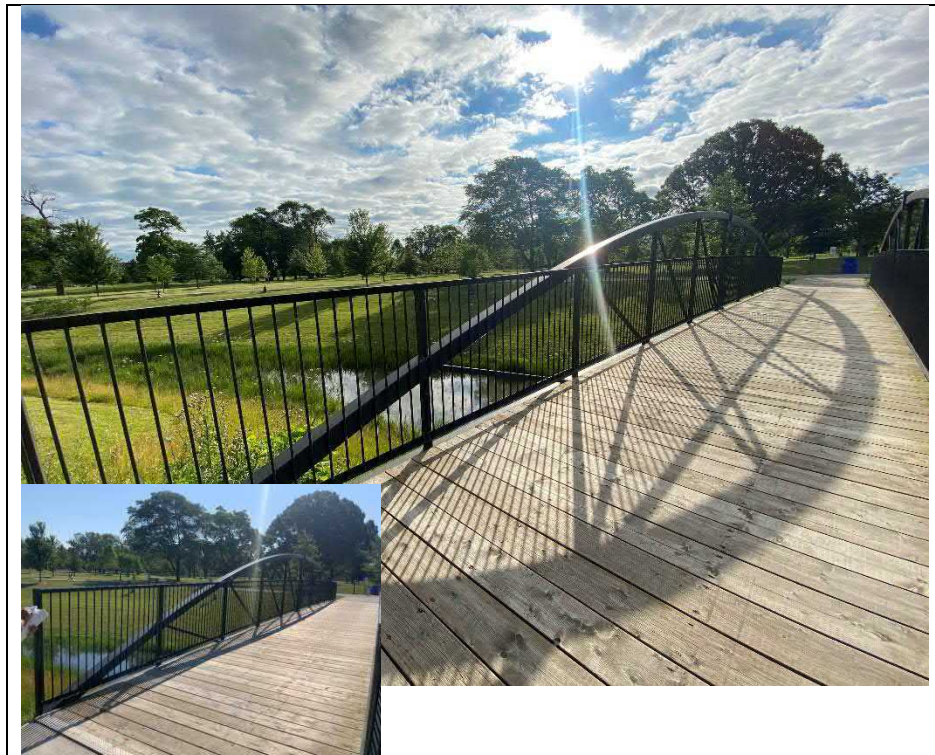
Photograph 1: North elevation



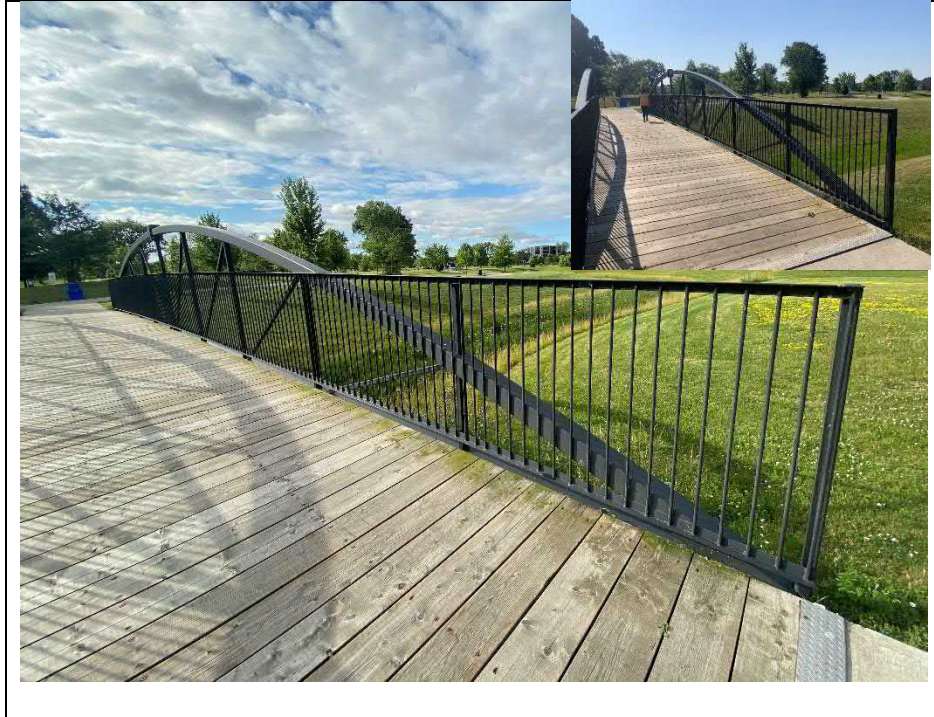
Photograph 2: West approach slab (Looking East)



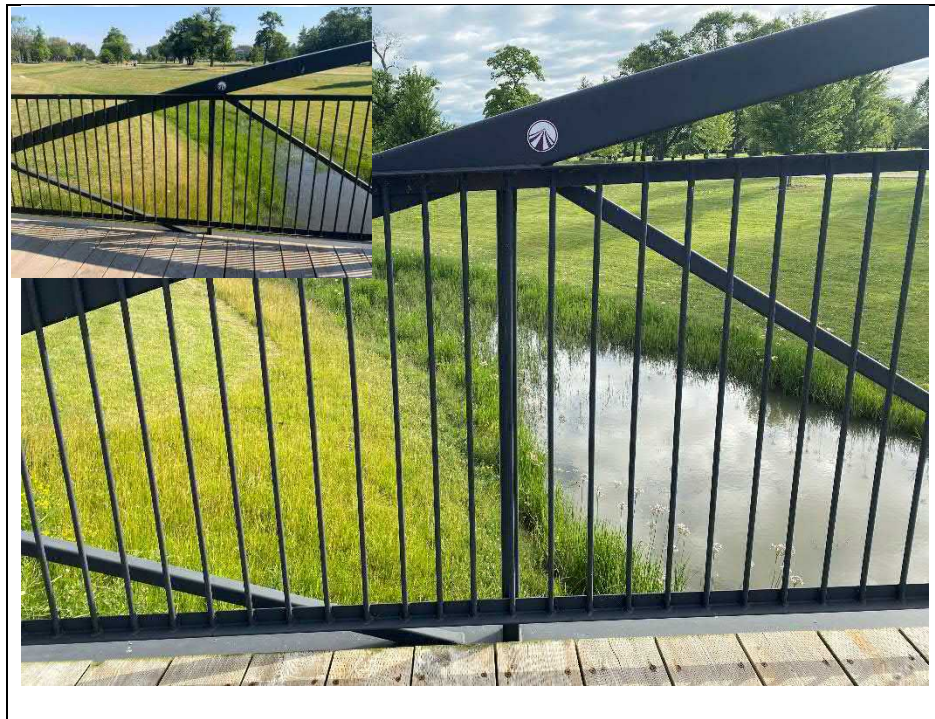
Photograph 3: Top of Deck (Looking East)



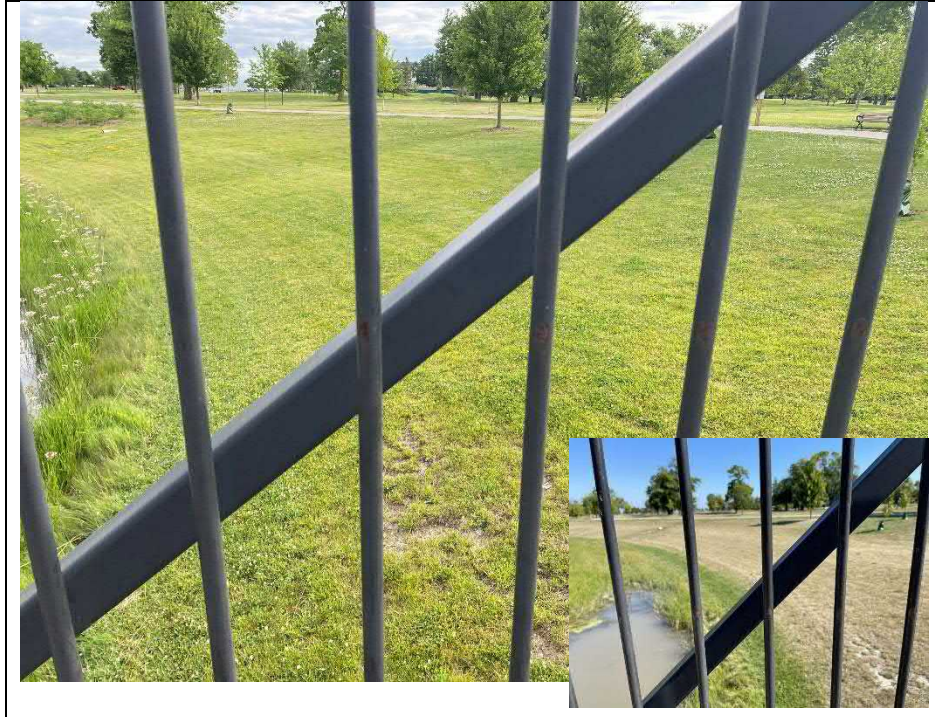
Photograph 4: Top chord, railing system, truss verticals and diagonals (Looking Northeast)



Photograph 5: Top chord, railing system, truss verticals and diagonals (Looking Southeast)



Photograph 6: Typical condition of railing (Looking North)



Photograph 7: Coating damage to north railing



Photograph 8: Underside of deck (Looking West)



Photograph 9: Typical severe corrosion at stringer to floor beam weld locations



Photograph 10: Typical coating failure and light to medium corrosion throughout all stringers



Photograph 11: Typical severe corrosion on several stringer members



Photograph 12: Perforation observed on one stringer member



Photograph 13: Typical corrosion and coating failure of all members in the floor system



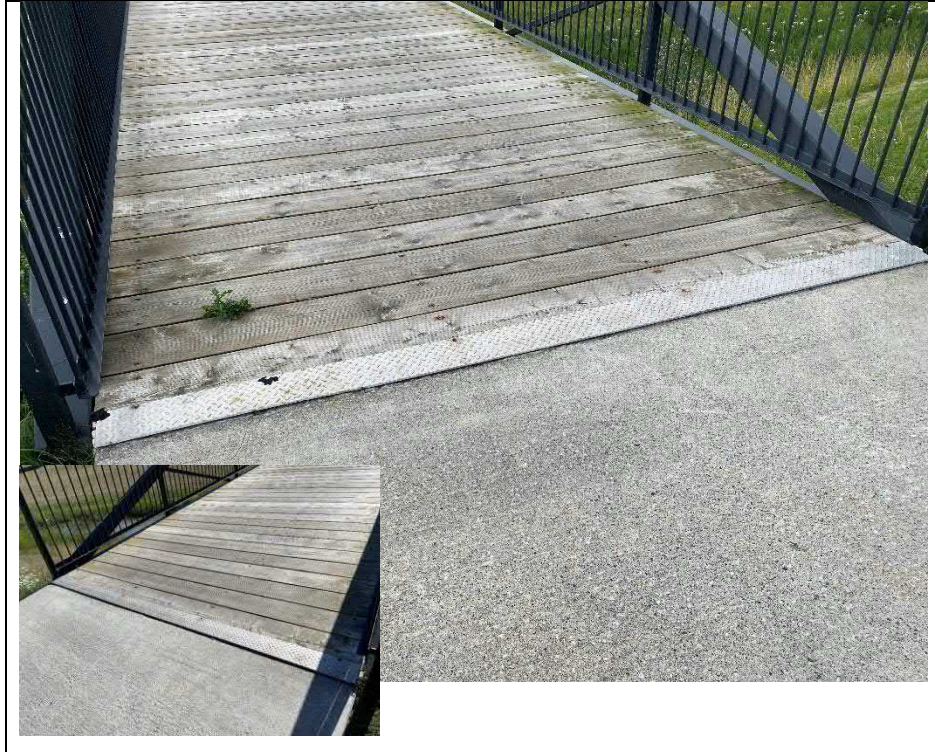
Photograph 14: Typical reinforced concrete caisson and embankment



Photograph 15: Bridge ID found at northeast quadrant of structure



Photograph 16: Threshold plate at east approach



Photograph 17: Loose Threshold plate at west approach

Inventory Data:

Structure Name	Malden Road Pedestrian Bridge		
Main Hwy/Road #	<input type="text"/>	On <input type="checkbox"/> Under <input type="checkbox"/>	Crossing Type: Navig. Water <input type="checkbox"/> Rail <input type="checkbox"/> Non-Navig. Road <input type="checkbox"/> Ped. Other <input checked="" type="checkbox"/>
Hwy/Road Name	Malden Road		
Structure Location	Over Pike Creek		
Latitude	42° 12' 46.368" N	Longitude	82° 53' 5.28" W
Owners	Town of Tecumseh	Heritage Designation	Not Consid. <input type="checkbox"/> Cons/not App. <input type="checkbox"/> List/n.d. <input type="checkbox"/> Desig./not list <input type="checkbox"/> Desig & List <input type="checkbox"/>
MTO region	<input type="text"/>	Road Class:	Freeway <input type="checkbox"/> Arterial <input type="checkbox"/> Collector <input type="checkbox"/> Local <input type="checkbox"/>
MTO District	<input type="text"/>	Posted Speed	n/a No. of Lanes n/a
Old County	<input type="text"/>	AADT	n/a % Trucks n/a
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	<input type="text"/>
Structure Type	Pratt Truss	Interchange Number	<input type="text"/>
Total Deck Length	12.2 m	Interchange Structure Number	<input type="text"/>
Overall Str. Width	2.68 m	Min. Vertical Clearance	<input type="text"/> m
Total Deck Area	32.7 sq. m	Special Routes:	Transit <input type="checkbox"/> Truck <input type="checkbox"/> School <input type="checkbox"/> Bicycle <input type="checkbox"/>
Roadway Width	N/A m	Detour Length Around Bridge	N/A km
Skew Angle	0 Degrees	Direction of Structure	N/S
No. of Spans	1.0	Fill on Structure	0 m
Span Lengths	Total = 12.2 (1) = 12.2 m		

Historical Data:

Year Built	2015	Year of Last Major Rehab.	<input type="text"/>
Last OSIM Inspection	2022	Last Evaluation	<input type="text"/>
Last Enhanced OSIM Inspection	<input type="text"/>	Current Load Limit	N/A
Enhanced Access Equipment (ladder, boat, lift, etc.)	<input type="text"/>	Load Limit By-Law #	<input type="text"/>
Last Underwater Inspection	<input type="text"/>	By-Law Expiry Date	<input type="text"/>
Last Condition Survey	<input type="text"/>		

Rehab History: (Date / Description)

Scheduled Improvements:	
Regional Priority Number	<input style="width: 150px; height: 20px;" type="text"/>
Programmed Work Year	<input style="width: 150px; height: 20px;" type="text"/>
Nature of Program Work:	

Appraisal Indices:		Comments
Fatigue	0.00	
Seismic	0.00	
Scour	0.00	
Flood	0.00	
Geometrics	0.00	
Barrier	0.00	
Curb	0.00	
Load Capacity	0.00	

Field Inspection Information:	
Date of Inspection:	June 27, 2024
Type of Inspection:	<input checked="" type="checkbox"/> OSIM <input type="checkbox"/> Enhanced OSIM
Inspector:	Monica Sokolski, E.I.T. (Dillon Consulting Limited)
Others in Party:	Stephen Strachan (Dillon Consulting Limited)
Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer
Weather:	Sunny
Temperature:	28.0 °C

Additional Investigations Required:	Priority		
	None	Normal	Urgent
Material Condition Survey			
Detailed Deck Condition Survey	x		
Non-Destructive Delamination Survey of Asphalt-Covered Deck	x		
Concrete Substructure Condition Survey	x		
Detailed Coating Condition Survey	x		
Detailed Timber Investigation	x		
Post-Tensioned Strand Investigation	x		
Underwater Investigation	x		
Fatigue Investigation	x		
Seismic Investigation	x		
Structure Evaluation	x		
Monitoring			
Monitoring of Deformations, Settlements and Movements	x		
Monitoring Crack Widths		x	
Investigation Notes: Monitoring cracking and splits in wooden deck planks.			

Overall Structure Notes:			
Recommended Work on Structure:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Minor Rehab.	<input type="checkbox"/> Major Rehab. <input type="checkbox"/> Replace
Timing of Recommended Work:		<input type="checkbox"/> 1 to 5 years	<input type="checkbox"/> 6 to 10 years
Overall Comments:			
Date of Next Inspection:	June 2026		

Element Data

Element Group:	Decks		Length:	12.2 m		
Element Name:	Deck top		Width:	2.7 m		
Location:	Top of Deck		Height:			
Material:	Wood Planks		Count:			
Element Type:			Total Quantity:	32.9 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 13.2	Good 10.2	Fair 6.0	Poor 3.5	
Comments: Medium to severe cracking and splitting of 22 wood planks.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers		Length:	12.2 m		
Element Name:	Hand Railings		Width:			
Location:	East/West edges		Height:			
Material:	Steel		Count:	2		
Element Type:			Total Quantity:	24.4 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 9.8	Good 14.6	Fair 0.0	Poor 0.0	
Comments: Small areas of light surface rust.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Barriers		Length:	12.2 m		
Element Name:	Safety Railing		Width:			
Location:	East/West edges		Height:			
Material:	Weathered Steel		Count:	12.0		
Element Type:			Total Quantity:	146.4 m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 58.6	Good 87.8	Fair 0.0	Poor 0.0	
Comments: Light corrosion at threshold plates at safety railing interface.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Beams/MLE's		Length:	2.7 m		
Element Name:	Floor Beams		Width:	51 mm		
Location:			Height:	152 mm		
Material:	Weathered Steel		Count:	11		
Element Type:	HSS 152 x 51 x 4.8		Total Quantity:	12.1 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 4.8	Good 7.3	Fair 0.0	Poor 0.0	
Comments: Weathering Steel is in good condition.						
Recommended Work:		Rehab	Replace	Maintenance Needs:		
		1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Beams/MLE's		Length:	1.20 m		
Element Name:	Stringer		Width:	51 mm		
Location:			Height:	102 mm		
Material:	Steel		Count:	7		
Element Type:	HSS 102 x 51 x 4.8		Total Quantity:	70 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	28	42	0	0	
Comments:						
Weathering Steel is in good condition.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Trusses/Arches		Length:	12.2 m		
Element Name:	Top Chords		Width:	51 mm		
Location:	East/West Edges		Height:	76 mm		
Material:	Steel		Count:	2		
Element Type:	HSS 76 x 51 x 4.8		Total Quantity:	6.2 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	4.0	2.2	0.0	0.0	
Comments:						
Weathering Steel is in good condition.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Trusses/Arches		Length:	12.2 m		
Element Name:	Bottom Chords		Width:	51 mm		
Location:	East/West Edges		Height:	76 mm		
Material:	Steel		Count:	2		
Element Type:	HSS 76 x 51 x 4.8		Total Quantity:	6.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 2.5	Good 3.7	Fair 0.0	Poor 0.0	
Comments: No coating on shoe plates.						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Trusses/Arches		Length:	1.6 m		
Element Name:	Verticals		Width:	51 mm		
Location:	North/South Edges		Height:	76 mm		
Material:	Steel		Count:	22		
Element Type:	HSS 76x51x4.8		Total Quantity:	8.9 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 3.6	Good 5.3	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Trusses/Arches		Length:	1.9 m		
Element Name:	Diagonals		Width:	51 mm		
Location:	North/South Edges		Height:	51 mm		
Material:	Steel		Count:	20		
Element Type:	HSS 51x51x4.8		Total Quantity:	7.8 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 3.1	Good 4.7	Fair 0.0	Poor 0.0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Group:	Bracing		Length:	3.0 m		
Element Name:	Bracing		Width:	51 m		
Location:	Underside of Deck		Height:	51 m		
Material:	Steel		Count:	10		
Element Type:	HSS 51 x 51 x 4.8		Total Quantity:	10 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 4	Good 6	Fair 0	Poor 0	
Comments:						
Recommended Work:	Rehab	Replace	Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year	

Element Data

Element Group:	Retaining Walls	Length:	1.5		
Element Name:	Concrete Retaining Blocks	Width:	0.8 m		
Location:	North Embankment	Height:	0.8 m		
Material:	Precast concrete	Count:	6		
Element Type:		Total Quantity:	6 each		
Environment:	Moderate	Limited Inspection	x		
Protection System:					Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 1	Good 5	Fair 0	Poor 0
Comments: Signs of settlement of block adjacent to bridge (south-most). Corrosion staining on top of blocks.					
Recommended Work:	Rehab	Replace	Maintenance Needs:		
	1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Foundations	Length:			
Element Name:	Reinforced concrete caison	Width:	0.9 m		
Location:	North/South Ends	Height:	2.5 m		
Material:	Cast-in-place concrete	Count:	4		
Element Type:		Total Quantity:	4 each		
Environment:	Moderate	Limited Inspection	x		
Protection System:					Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 2	Good 2	Fair 0	Poor 0
Comments:					
Recommended Work:	Rehab	Replace	Maintenance Needs:		
	1-5 years	6-10 years	Urgent	1 year	2 year

Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Streams and Waterways		Width:			
Location:			Height:			
Material:			Count:	1		
Element Type:			Total Quantity:	1 all		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 1	Fair 0	Poor 0	
Comments:						
Recommended Work:			Rehab	Replace	Maintenance Needs:	
			1-5 years	6-10 years	Urgent	1 year 2 year

Element Group:	Embankments & Streams		Length:			
Element Name:	Embankments		Width:			
Location:	North/South Embankment		Height:			
Material:			Count:	2		
Element Type:			Total Quantity:	2 each		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 1	Fair 1	Poor 0	
Comments:						
N side: 914 mm CSP outlet						
S Side: Erosion, steep embankment.						
Recommended Work:			Rehab	Replace	Maintenance Needs:	
			1-5 years	6-10 years	Urgent	1 year 2 year

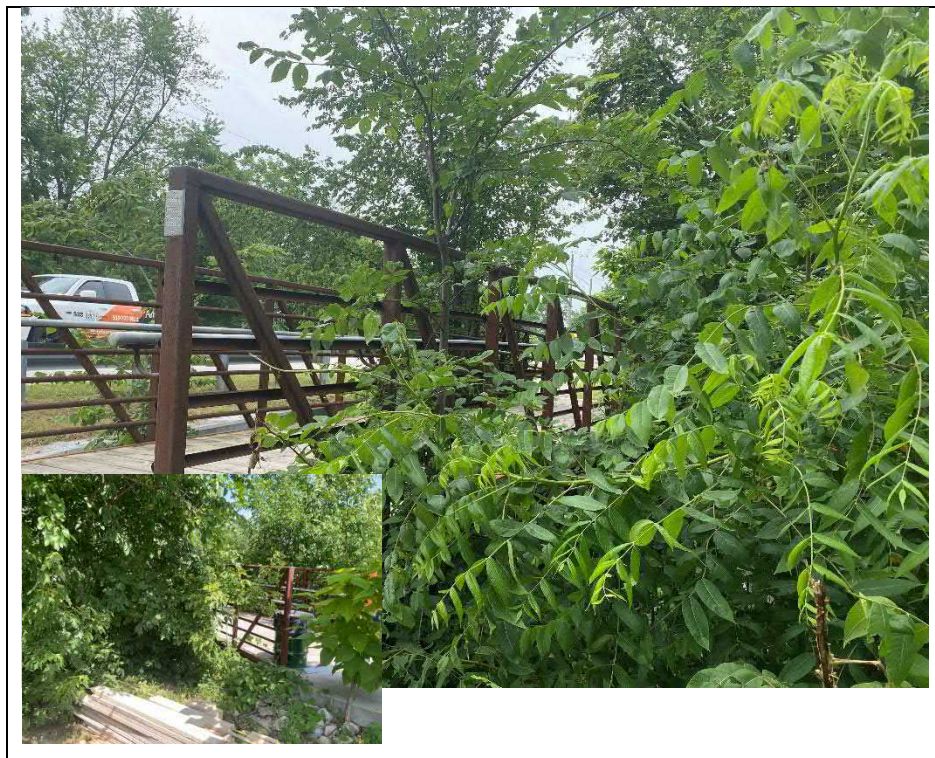
Element Data

Element Group:	Embankments & Streams		Length:			
Element Name:	Slope protection		Width:			
Location:	North/South Embankment		Height:			
Material:			Count:	2		
Element Type:	Hand laid riprap		Total Quantity:	2 each		
Environment:			Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 0	Good 0	Fair 2	Poor 0	
Comments:						
Recommended Work:		Rehab		Replace	Maintenance Needs:	
		1-5 years		6-10 years	Urgent	1 year
						2 year

Element Group:	Approaches		Length:	3.0 m		
Element Name:	Approach Slabs		Width:	3.0 m		
Location:	North/South Approach		Height:	0.25 m		
Material:	Cast-in-place concrete		Count:	2		
Element Type:			Total Quantity:	18.0 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:						Perform. Deficiencies
Condition Data:	Units Sq.m / m / each / % / all	Exc. 7.2	Good 10.8	Fair 0.0	Poor 0.0	
Comments:						
A void was observed beneath both approach slabs at the deck ends.						
Recommended Work:		Rehab		Replace	Maintenance Needs:	
		1-5 years		6-10 years	Urgent	1 year
						2 year



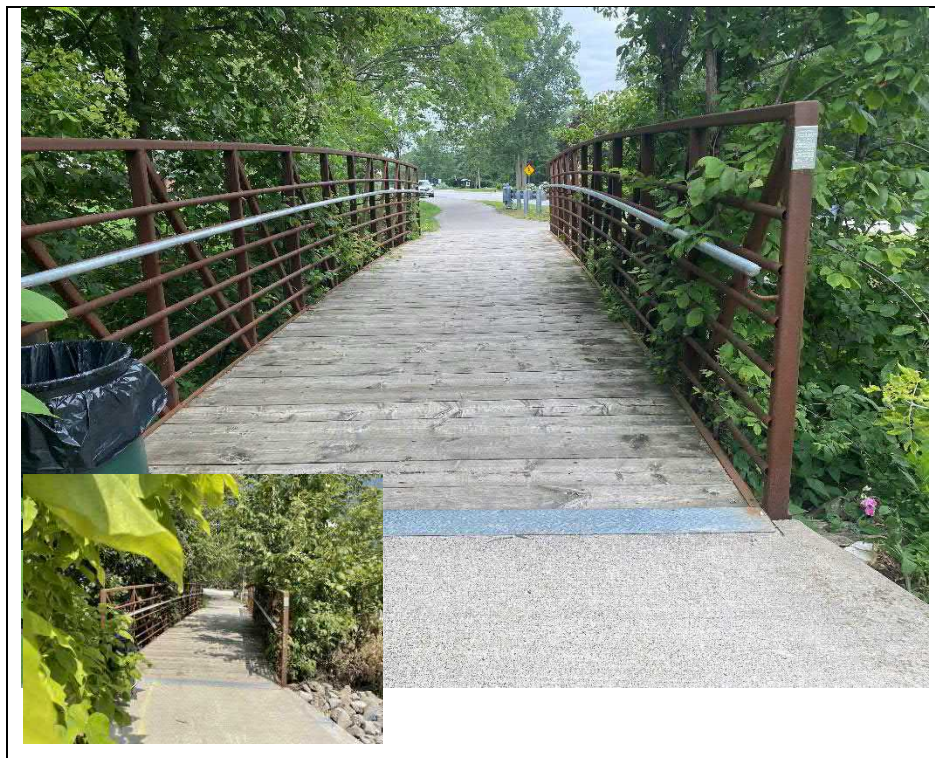
Photograph 1: East elevation of structure (Looking Southwest)



Photograph 2: West Elevation (Looking East)



Photograph 3: North approach (Looking South)



Photograph 4: South approach (Looking North)



Photograph 5: Top of Deck (Looking South)



Photograph 6: Top chord, railing system, truss verticals and diagonals (Looking Southeast)



Photograph 7: Top chord, railing system, truss verticals and diagonals (Looking Southwest)



Photograph 8: Typical top chord, railing system, truss verticals and diagonals



Photograph 9: Underside of the deck (Looking South)



Photograph 10: Concrete caissons at north end with void under approach slab



Photograph 11: CSP outlet (Looking North)



Photograph 12: Watercourse downstream (Looking West)

Appendix D

BCI Comparisons

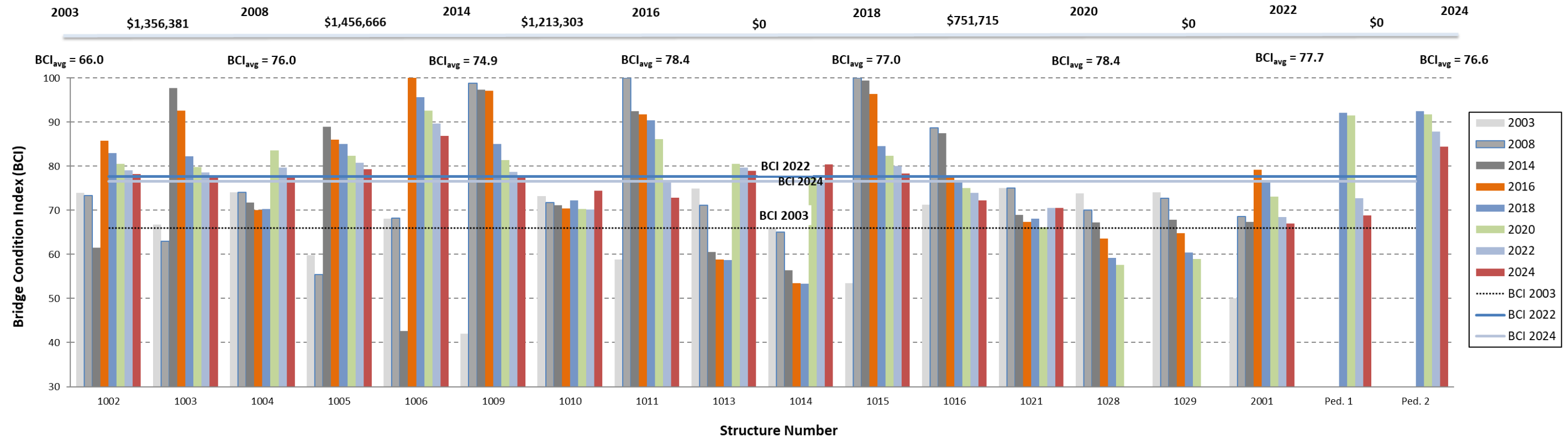
Table D.1: Summary of BCI between 2003 and 2024

Structure ID	BCI 2003	BCI 2008	BCI 2014	BCI 2016	BCI 2018	BCI 2020	BCI 2022	BCI 2024
1002	73.9	73.4	61.5	<u>85.8</u>	83.0	80.5	79.1	78.2
1003	66.8	63.0	<u>97.7</u>	92.6	82.3	79.8	78.6	77.4
1004	74.1	74.1	71.8	70.1	70.3	<u>83.6</u>	79.7	77.8
1005	59.8	55.4	<u>88.9</u>	86.0	85.1	82.4	80.8	79.3
1006	68.1	68.2	42.6	<u>100.0</u>	95.7	92.6	89.7	86.9
1009	42.0	<u>98.8</u>	97.4	97.1	85.0	81.4	78.7	77.6
1010	73.2	71.7	71.1	70.4	72.3	70.3	70.2	74.4
1011	58.8	<u>100.0</u>	92.5	91.7	90.4	86.1	76.5	72.9
1013	74.9	71.2	60.6	58.8	58.7	<u>80.5</u>	79.7	78.9
1014	65.9	65.1	56.4	53.5	53.3	<u>77.7</u>	76.9	80.4
1015	53.5	<u>100.0</u>	99.4	96.4	84.6	82.4	80.1	78.4
1016	71.3	88.7	87.5	77.5	76.7	75.0	73.9	72.3
1021	75.0	75.0	68.9	67.4	68.1	66.2	70.6	70.6
2001	50.1	68.6	67.4	79.2	76.3	73.1	68.5	67.0
1	--	--	--	--	<u>92.1</u>	91.5	72.7	68.8
2	--	--	--	--	<u>92.5</u>	91.7	87.9	84.5
BCI _{avg}	66.0	76.0	74.9	78.4	77.0	78.4	77.7	76.6

Notes:

- Structures 1009, 1011 and 1015 were fully replaced in 2007. Structure 1006 was fully replaced in 2015.
- A major rehabilitation of Structures 1003 and 1005 was completed in 2014. The scope of work included: superstructure replacement and concrete patch repairs to the substructure.
- A major rehabilitation of Structure 1002 was completed in 2016. The scope of working included: concrete repairs to deck soffit, abutments and wingwalls, concrete deck overlay.
- A major rehabilitation of Structure 1004 was completed in 2019. The scope of work included: concrete patch repairs, new deck overlay, precast retaining walls, new asphalt and waterproofing.
- A major rehabilitation of Structure 1014 was completed in 2019. The scope of work included: partial full-depth deck replacement, precast retaining walls, new asphalt and waterproofing.
- A major rehabilitation of Structure 1013 was completed in 2020. The scope of work included: concrete patch repairs, full-depth deck repairs, new asphalt and waterproofing.

Town of Tecumseh - BCI Trends



Appendix E

Historic Bridge Spending (2003 – 2024)

Town of Tecumseh - Historic Major Bridge (Rehab./Replacement) Spending (2003 - 2024)

