

# CORPORATION OF THE TOWN OF TECUMSEH 2020 Bridge and Culvert Needs Study

Structures with Spans > 3.0 m





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March 30, 2021

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Attention: Mr. Phil Bartnik, P.Eng.

Director Public Works and Environmental Services

Town of Tecumseh 2020 Bridge and Culvert Needs Study Structures with Spans > 3.0 m

Dear Mr. Bartnik:

Dillon is pleased to submit a pdf copy of the 2020 Bridge and Culvert Needs Study Report for Structures with Spans > 3.0 m to the Town of Tecumseh.

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

Sincerely,

DILLON CONSULTING LIMITED

Wayne Ormshaw, P.Eng. Project Manager

WAO:jw Enclosure

Our file: 20-2645

Dillon Consulting Limited

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# **Executive Summary**

A Bridge and Culvert Needs Study was carried out in 2020 by Dillon Consulting Limited (Dillon) for 18 bridge and culvert structures with spans greater than 3.0 metres, 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.

Two (2) of the 18 structures investigated were identified with significant deficiencies, and rehabilitation of the structures within five years is recommended. The structures are listed below and this information is also summarized in **Appendices B** and **C**.

- Structure No. 1028 East Townline Drain at St. Thomas Street Bridge
- Structure No. 1029 East Townline Drain at Little River Road Bridge.

Temporary repairs on Structure No. 1028 and 1029, consisting of large steel plates placed on the top slab above the soffit deterioration were carried out in July 2016. Improvements on Manning Road (Phase 2) scheduled for 2021 will remove Structures No. 1028 and 1029 with an enclosed storm water drain and therefore the cost estimates of replacement for these two structures are not included herein.

The total estimated capital needs allocation over the ten year study period (to 2030) is \$300,000. This cost estimate excludes H.S.T. and routine maintenance items, and includes an allowance for contingency and engineering. This figure also excludes the costs associated with the improvements on Manning Road (Phase 2), as mentioned above. 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 2021 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 previous studies (2003 to 2018). This comparison is provided in Appendix D. The average BCI value calculated for 2020 is 78.4, which is slightly higher than the BCI value of 77.0 that was calculated for the 2018 study. The increase in BCI can be attributed to the completed rehabilitation of three structures, namely No. 1004, 1013 and 1014, since the timing of the previous report.

It should additionally be noted that the planned structure removal of No.'s 1028 and 1029 from the Town's asset list will further theoretically increase the average BCI to 80.9. In recent years, these two structures have been maintained with an economical short-term holding strategy and therefore have negatively influenced the recent average BCI values. For the purposes of this report, the true BCI average (78.4) has been carried, however this is not entirely reflective of the Town's efforts in capital expenditures towards their structure assets.



# Background, Purpose, and Methodology

#### Background and Purpose 1.1

1.0

Dillon Consulting Limited (Dillon) was retained by the Corporation of the Town of Tecumseh (the Town) in March 2020, to conduct a needs study for the Town's current inventory of eighteen bridge and culvert structures greater than 3m in span. The general scope of work for this study is as follows:

- Review of previous 'Town of Tecumseh 2018 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 2018 report
- Perform a visual site inspection of the accessible portions of the Town's eighteen 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 2018 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 2018)
- · Prioritization of structures requiring capital works based on current BCI values and site observation as well as 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 (2021 to 2030) from the time of this report.

#### Methodology 1.2

#### 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/replacing 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 CAN/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 three metres in span.

**Culvert** – A structure that forms an opening through soil.

\* Only structures with spans in excess of 3m were considered part of this study.

#### **Structure Inventory and Classification** 1.2.3

The eighteen (18) 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	2013
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	
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	
1028	East Townline Drain at St. Thomas Street Bridge	Concrete Rigid Frame (Culvert)	1975	
1029	East Townline Drain at Little River Road Bridge	Concrete Rigid Frame (Culvert)	1975	
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	Pike Creek at Malden Road	Pratt Truss (Bridge)	2015	



#### 1.2.4 **Visual Site Inspection**

Visual inspection of the eighteen (18) 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 2018 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
	Wearing Surface	Sq.m.
	Deck Top	Sq.m.
Dooles	Soffit – Thin Slab	Sq.m.
Decks	Soffit – Thick Slab	Sq.m.
	Soffit – Inside Boxes	Sq.m.
	Drainage System	Each
	Seals/Sealants	Each
Joints	Concrete End Dams	Sq.m.
	Armouring/Retaining Devices	m.
Sidewalks/Curbs	Sidewalks and Medians	Sq.m.
Sidewalks/Curbs	Curbs	Sq.m.
	Barrier/Parapet Walls	Sq.m.
Barriers	Railing Systems	m.
barriers	Posts	Each
	Hand Railings	m.
	Girders	Sq.m.
	Floor Beams	Sq.m.
Beams/MLE's	Stringers	Each
	Inside Boxes (sides and bottom)	Sq.m.
	Diaphragms	Each (Sq. m. if concrete



Element Group	Element Name	Units
Continue	Structural Steel	Sq.m.
Coatings	Railing Systems/Hand Railings	Sq.m.
	Abutment Walls	Sq.m.
A bushing a rate	Ballast Walls	Sq.m.
Abutments	Wingwalls	Sq.m.
	Bearings	Each
	Shafts/Columns/Pile Bents	Sq.m.
Piers	Caps	Sq.m.
	Bearings	Each
Dataining Malla	Walls	Sq.m.
Retaining Walls	Barrier Systems on Walls	Sq.m.
	Inlet Components	Sq.m.
Culverts	Outlet Components	Sq.m.
	Barrels	Sq.m.
Foundations	Foundation (below ground level)	N/A
	Streams and Waterways	All
Embankments and Streams	Embankments	Each
Streams	Slope Protection	Each
Signs	Signs	Each
	Wearing Surface	Sq.m.
	Approach Slabs	Sq.m.
Approaches	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 2018 inspection, was visually verified and carried forward.



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).

#### Approach Slabs

Approach slabs were assumed to be present on some structures which typically require them according to the Canadian Highway Bridge Design Code (CAN/CSA S6-19). An approach slab length of 6.0 meters 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.

#### **Timing of Needs** 1.2.6

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 1 to 5 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 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 recommended were based on engineering judgement for each site. These specialized investigations or surveys should normally be completed within a 2 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.

It may also 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.

#### **Benchmark Probable Construction Costs** 1.2.9

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 are provided in Table 3. In addition to the MTO HiCo unit costs, the following information was also used as reference:

- Ministry of Transportation Ontario 2016 Parametric Estimating Guide
- 2018 Bridge and Culvert Needs Study for the Town
- Recent locally 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	Removal of asphalt pavement from concrete surfaces	m²	\$35.00	
Waterproofing	Concrete deck waterproofing	m <sup>2</sup>	\$50.00	
	Asphalt pavement	tonne	\$350.00	
	Crack Injection	m	\$350.00	
Concrete Repairs	Concrete patch repairs – Type A	m <sup>2</sup>	\$600.00	
(See Notes)	Concrete patch repairs – Type B	m²	\$2,000.00	
	Concrete patch repairs – Type C	m²	\$1,600.00	
E	CSP Pipe Culvert – Low fill	m	\$7,500.00	
Full Replacement	CSP Pipe Culvert – High fill	m	\$12,000.00	
Deck Drains	Removal and replacement of deck drains	each	\$2,500.00	
	Full depth concrete removal			
Expansion Joint	Reinforcing steel bar	m	\$5,000.00	
	Deck joint assemblies, installation			
	Earth excavation – grading			
+/-3m High Gabion Basket Retaining Wall	Gabions	m²	\$1,500	
businet neturning war	Granular Fill			
	Concrete removal – full depth			
	Reinforcing steel (black) bar			
New Barrier on Bridge Deck	Concrete in structure	m	\$2,500.00	
bridge beck	Concrete in parapet wall			
	Parapet wall railing			
	Earth excavation – grading			
Erosion Protection	Geotextile	m <sup>2</sup>	\$150.00	
	Rip rap, hand laid			
Clean and Coat	Coating existing structural steel	2	ΦΕΩΩ ΩΩ	
Structural Steel	Environmental protection during coating operations	m <sup>2</sup>	\$500.00	



Category	Description	Units	Unit Cost
Jacking and Bearing	Jacking of superstructure	ooch	\$8,500.00
Replacement	Bearings	each	\$0,300.00
	Roadside Review (Not Including Design)	L.S	\$5,000.00
	Hydrology Study and Hydraulic Analysis	L.S.	\$10,000.00
Investigations	Structural Condition Assessment & Renewal Options Report	L.S.	\$30,000.00
	Monitoring of Deformations, and Settlements	L.S.	\$7,500.00
	Half-Cell Survey	L.S.	\$12,000.00

#### Notes:

- Unit rates have been taken from the averages of recently closed tenders Contract Administered by Dillon within the Windsor/Essex and Chatham/Kent area, 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
- · Prices do not allow for costs associated with mobilization, demobilization, bonds, insurance, roadside safety, or other costs related to performing and executing capital work
- 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
- Unit prices do not include HST.



#### **Bridge Condition Index (BCI) Comparison and Bridge Spending** 1.2.10

The Bridge Condition Index (BCI) was developed by the MTO as a means of consolidating inspection information, and overall structure condition, into a single value. The BCl 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 (2020) BCI was calculated for each of the 18 structures included in this study. An average BCI of 78.4 was calculated – an increase in overall condition from the BCI value of 77.0 that was calculated for the 2018 study. The current BCI indicates the Town is maintaining their infrastructure portfolio in good condition and recent spending on bridge repairs has increased the BCI average from 66.0 in 2003, to 78.4 in 2020. Current BCI values for each structure were compared to the BCI values from the previous five (5) Needs Study Reports. These comparisons are summarized in Appendix D.

The increase in BCI can be attributed to the completed rehabilitation of three structures, namely No. 1004, 1013 and 1014, since the timing of the previous report. It should additionally be noted that the planned structure removal of No.'s 1028 and 1029 from the Town's asset list will further theoretically increase the average BCI to 80.9. In recent years, these two structures have been maintained with an economical short-term holding strategy and therefore have negatively influenced the recent average BCI values. For the purposes of this report, the true BCI average (78.4) has been carried, however this is not entirely reflective of the Town's efforts in capital expenditures towards their structure assets.



# 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

2.0

A total of two (2) structures were identified with deficiencies that should be addressed within the next one to five years from the time of this report, other than routine maintenance (see **Appendix B – Comments**). The structure(s) are presented below.

### 2.2.1 Structure No. 1028 over East Townline Drain at St. Thomas Street

This structure was built in 1975, and is a 4.8 m span cast-in-place concrete rigid frame culvert with open footings. To our knowledge, there have not been any major rehabilitations completed to this structure. The current BCI for this structure is 57.6.

Narrow to wide cracks with efflorescence staining were observed throughout the culvert barrel.

Approximately seven (7) locations of very severe delamination and very severe spalling with exposed and severely corroded reinforcing steel were observed in the culvert barrel soffit.





Figure 1: Asphalt over steel plate repair on deck top (left), typ. soffit deterioration (right)

In July 2016, temporary repairs were completed by removing the asphalt wearing surface and placing a steel plate on the top of deck over the deteriorated soffit sections and re-paving the repaired areas.



This repair was performed in anticipation that the structure will be fully replaced with a storm water sewer as part of the improvements on Manning Road (Phase 2) project in 2021.





Figure 2: Photos from temporary repairs (2016) construction

Until the structure is replaced, Dillon recommends a monitoring program that consists of biannual inspections (two-times per year). The program should monitor the extents of the soffit deterioration to ensure the temporary repairs remain satisfactory. Additional temporary works may be warranted based on the results of the inspections and will be recommended to the Town upon the completion of each biannual investigation.

#### Structure No. 1029 over East Townline Drain at Little River

2.2.2

This structure was built in 1975, and is a 4.8 m span cast-in-place concrete rigid frame culvert with open footings. To our knowledge, there have not been any major rehabilitations completed to this structure. The current BCI for this structure is 58.9.

Narrow to wide cracks with efflorescence staining were observed throughout the culvert barrel. Approximately four locations of severe to very severe delamination and very severe spalling with exposed and severely corroded reinforcing steel were observed in the culvert barrel soffit.





Figure 3: Asphalt over steel plate repair on deck top (left), typ. soffit deterioration (right)

In July 2016, temporary repairs were completed by removing the asphalt wearing surface and placing a steel plate on the top of deck over the deteriorated soffit sections and re-paving the repaired areas. This repair was performed in anticipation that the structure will be fully replaced with a storm water sewer as part of the improvements on Manning Road (Phase 2) project in 2021.







Figure 4: Temporary repair construction (2016)

Until the structure is replaced, Dillon recommends a monitoring program that consists of biannual inspections (two-times per year). The program should monitor the extents of the soffit deterioration to ensure the temporary repairs remain satisfactory. Additional temporary works may be warranted based on the results of the inspections and will be recommended to the Town upon the completion of each biannual investigation.

## 2.3 Specific Structures: Six to Ten Year Capital Needs

One (1) structure was 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 structure(s) are presented below.

### 2.3.1 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 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 75.0. However, this BCI rating is 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 single discrete severe delamination were observed on the barrel soffit. The barrel walls were noted to have light scaling and footing scour throughout, however, the scour has not lead to undermining of the footings and is not considered to be in need of any repairs. The scour should be monitored as part of the biennial inspection. Two (2) wide cracks were observed in the new footing jacket. In the new culvert extensions, no deterioration was observed. Excessive vegetation growth was noted in the waterway to the north of the structure and object markers were noted to be missing at two (2) corners of the approaches.







Figure 5: Culvert barrel (left), typ. soffit deterioration (right)

The proposed scope of rehabilitation includes: installation of new or replacement of waterproofing, concrete patch repairs and crack injection 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 Ministry of Transportation, Ontario (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 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**.



# Program of Work

## **3.1** Program of Work

3.0

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 \$300,000 to address the improvement needs of the bridges and culverts during the ten year study period. Of this total, the Town is **not expected** to incur any spending over the next five years to address the current improvement needs of their structure assets. However, the recommended structure work for the 6 to 10 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, as well as the costs associated with the removal of Structures 1028 and 1029. **Table 4** presents a summary of the Town's bridge and culvert needs, in 2021 Canadian dollars.

 Timing for Recommended Work
 Amount (CAD)

 1 - 5
 Years
 \$0

 6 - 10
 Years
 \$300,000

 Total
 \$300,000

Table 4: Bridge and Culvert Construction Needs Summary

**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** Further Recommendations

### 3.3.1 Structure No. 1021 over Pike Creek at Twelfth Concession Road

This structure is located on a previously closed section of road which is now maintained by Friends of Pike Creek in conjunction with the Town. The trail is assumed to be used primarily by pedestrians as well as agricultural equipment and maintenance vehicles.

It was noted that this structure presently has a limited amount of fill over the corrugated steel pipe arch which may be limiting the performance of the culvert. Maintenance should be performed to provide additional fill. The height of fill to be added shall be determined by a professional engineering review.

In addition to the maintenance described above, object markers or a suitable alternative should be provided at the structure approaches to warn users of the steep embankments at the structure.

The costs of the above works has not been included in the capital needs estimate provided herein, as maintenance expenses are assumed to be covered in the Town's maintenance budget.

## **3.4** 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
- 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 4.0

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** WINDSOR, ONTARIO

Report prepared by:



Wayne Ormshaw, P.Eng. Project Manager

Jeremy Wammes, E.I.T.



# 5.0 References

Robitaille, P. (Jan. 2019). 2018 Bridge and Culvert Needs Study, (17-6817). Dillon Consulting Limited.

Van Haren, M. P. (Nov. 2015) 2015 Bridge Roadside Safety Review, (15-2321). Dillon Consulting Limited.

Robitaille, P. (Oct. 2016). 2016 Bridge and Culvert Needs Study, (15-2978). Dillon Consulting Limited.

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

Ontario Ministry of Transportation (MTO)'s Parametric Estimating Guide (PEG), 2016.



# Appendix A Location Plan

Corporation of the Town of Tecumseh 2020 Bridge and Culvert Needs Study Structures with Spans > 3.0 m March 2021 – 20-2645



# Appendix B



# Appendix C OSIM Inspection Forms and Photos



# Appendix D BCI Comparisons



Table D.1: Summary of BCI between 2003 and 2018

Structure ID	BCI 2003	BCI 2008	BCI 2014	BCI 2016	BCI 2018	BCI 2020
1002	73.9	73.4	61.5	<u>85.8</u>	83.0	80.5
1003	66.8	63.0	<u>97.7</u>	92.6	82.3	79.8
1004	74.1	74.1	71.8	70.1	70.3	<u>83.6</u>
1005	59.8	55.4	<u>88.9</u>	86.0	85.1	82.4
1006	68.1	68.2	42.6	100.0	95.7	92.6
1009	42.0	<u>98.8</u>	97.4	97.1	85.0	81.4
1010	73.2	71.7	71.1	70.4	72.3	70.3
1011	58.8	<u>100.0</u>	92.5	91.7	90.4	86.1
1013	74.9	71.2	60.6	58.8	58.7	<u>80.5</u>
1014	65.9	65.1	56.4	53.5	53.3	<u>77.7</u>
1015	53.5	<u>100.0</u>	99.4	96.4	84.6	82.4
1016	71.3	88.7	87.5	77.5	76.7	75.0
1021	75.0	75.0	68.9	67.4	68.1	66.2
1028	73.8	70.1	67.3	63.6	59.2	57.6
1029	74.1	72.7	67.9	64.8	60.4	58.9
2001	50.1	68.6	67.4	79.2	76.3	73.1
1					<u>92.1</u>	91.5
2					<u>92.5</u>	91.7
BCI <sub>avg</sub>	66.0	76.0	74.9	78.4	77.0	78.4

#### Notes:

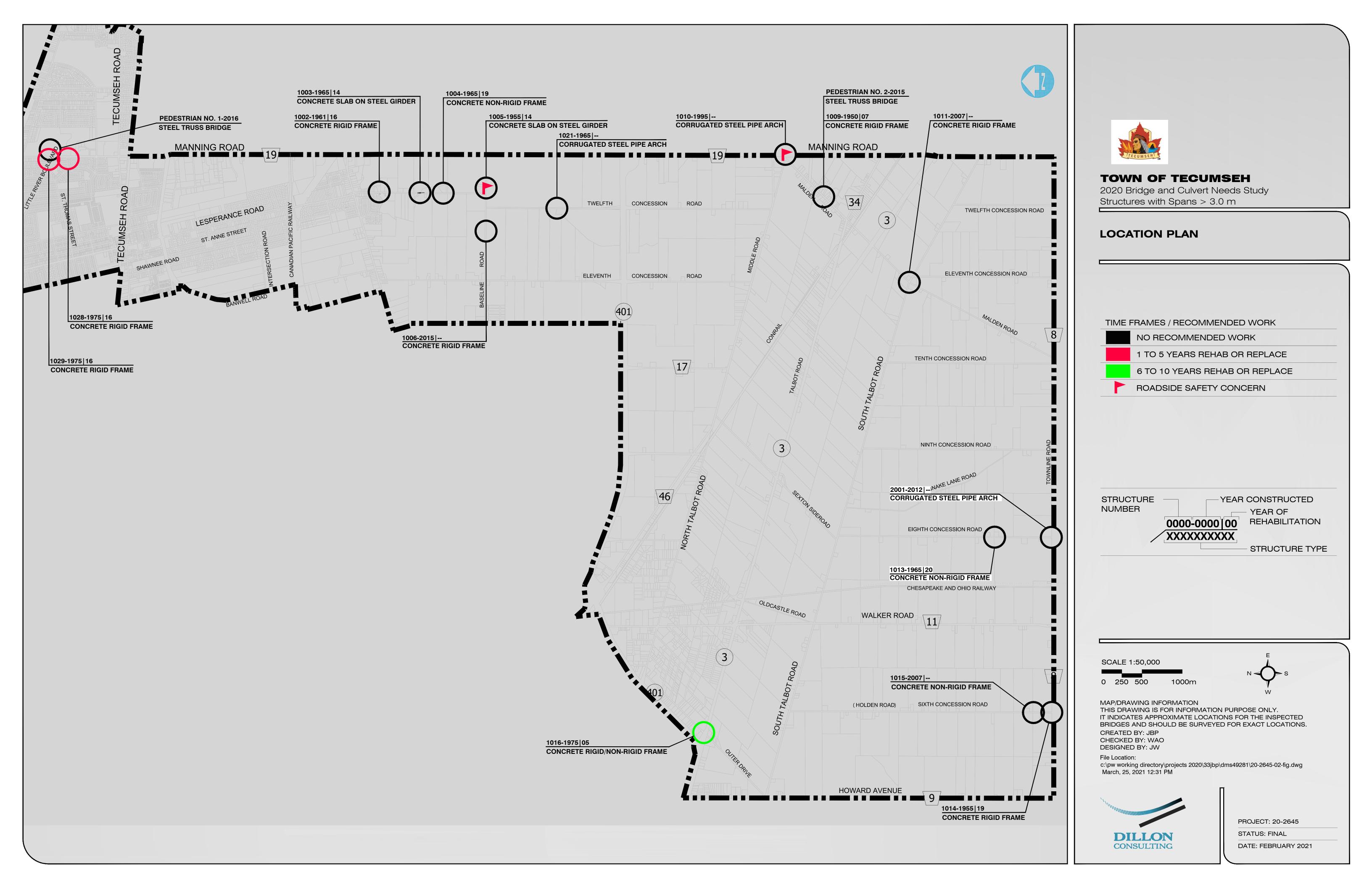
- Structure 1009, 1011 and 1015 were fully replaced in 2007. Structure 1006 was fully replaced in 2015
- A major rehabilitation of Structures 1003 and 1005 was completed in 2014. The scope of work included: superstructure replacement and concrete patch repairs to the substructure.
- A major rehabilitation 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.
- Removal of Structures 1028 and 1029 is scheduled for 2021 during the improvements on Manning
   Road (Phase 2).



# Appendix E

Historic Bridge Spending (2003 – 2020)





Summary of Construction Needs and Probable Costs												_
				Total	Span	Overall	Road				Capital Needs/Construction Costs	Date of
Structure ID	Structure Location	Structure Type	2020 BCI	Deck Length (m)	Length (m)	Structure Width (m)	Width (m)	Year of Construction	Year of Last Rehabilitation	Comments (Including Routine Maintenance and Roadside Safety Needs)	Items Timing of Recommended Construction Work Item Costs	Last
1002	Pike Creek at Twelfth Concession Road	Concrete Rigid Frame (Bridge)	80.5	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 medium map cracking and a discrete location of medium spalling. The southwest wingwall was observed to have a medium vertical crack extending into the backside of the parapet wall. 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.  Recommended work includes routine maintenance including erosion control of the northwest SBEAT slab.	No work is necessary	30-Jul-20
										Roadside Safety:  No improvements necessary. Improvements were included in the most recent rehabilitation.		
1003	Pike Creek at Twelfth Concession Road	Concrete Slab on Steel Girder (Bridge)	79.8	16.3	15.7	8.6	8.0	1965	2013	The deck and approach wearing surfaces were observed with narrow longitudinal cracking along the centreline of the road and two locations of narrow transverse cracks in the southbound traffic lane. The approach wearing surface has settled at both bridge ends and medium to light alligator cracks were observed. The west fascia has a narrow longitudinal crack extending the full bridge length with discrete locations of active wet staining and efflorescence. Debris build up was noted in the deck drains 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.  Recommended maintenance includes: bearing shoe plates should be wire-brushed, primed and coated; and routine bridge cleaning including cleaning of the	No work is necessary	30-Jul-20
										deck joints and drains.  Roadside Safety:  No improvements necessary. Improvements were included in the most recent rehabilitation.		
1004	Sullivan Drain at Twelfth Concession Road	Concrete Non-Rigid Frame (Bridge)	83.6	7.5	6.8	9.3	7.0	1965	2019	Hairline longitudinal crack noted on the soffit extending from concrete patch repair. Light scour noted at abutment footings, however footings are not being undermined.		30-Jul-20
										Roadside Safety:  No improvements necessary.  (Wa-33 were installed during recent rehabiliation per Dillon 2018 Roadside Safety Improvements Memo recommendation)	No work is necessary	
1005	Pike Creek at Baseline Road	Concrete Slab on Steel Girder (Bridge)	82.4	15.3	15.0	8.6	8.0	1955	2013	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 staine, ladriline 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 vertical hairline to narrow 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 SBEAT.	No work is necessary	30-Jul-20
										Recommended maintenance includes routine bridge cleaning of the joints and drains; repair or replace damaged guiderail; install erosion protection improvements; and crack sealing of the wearing surface.  Roadside Safety:  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)		
1006	Sullivan Creek at Baseline Road	Concrete Rigid Frame (Culvert)	92.6	5.9	5.2	19.8	9.3	2015	N/A	Six (6) locations of light spalling and delamination were observed on the culvert barrel soffit between the joints of the precast units. Thirteen (13) light spalls were observed at the south headwall. The precast concrete block wingwalls were observed with light to 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.  Roadside Safety:  No improvements necessary. Improvements were included in the structure replacement.	No work is necessary	30-Jul-20
1009	Pike Creek at Malden Road	Concrete Rigid Frame (Culvert)	81.4	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. 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. Additionally, the guiderail was missing end treatments. Both fascia were observed with a number of hairline cracks showing evidence of rust staining. 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, medium transverse cracking in both lanes.  Recommended maintenance includes; repair settled and tilted barrier posts and upgrade the erosion protection at the embankment(s); crack repair on the headwalls; install bridge object marker signs; and rout and seal the approach wearing surfaces.  Roadside Safety:	No work is necessary	31-Jul-20
										No improvements necessary. (Refer to Dillon 2015 Bridge Roadside Safety Review Report)		

Julilliai	of Construction Needs and	FIONANIE COSTS												
Structure				Total Deck	Span	Overall Structure	Road	Year of	Year of Last	Comments	Capital Needs/Construction Costs		-	Date of
ID	Structure Location	Structure Type	2020 BCI	Length (m)	Length (m)	Width (m)	Width (m)	Construction		(Including Routine Maintenance and Roadside Safety Needs)	Items	Timing of Recommended	Estimated Construction	Last Inspection
1010	West Townline Drain at Malden Road	Corrugated Steel Pipe Arch (Culvert)	70.3	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. A number of offset blocks were loose and the guide rail was not in contract with the clip angle at the end treatment. The retaining walls had severe scaling, very severe honeycombing, and light isolated spalls. Light 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. No object marker signs were present at the site. 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.)  Recommended maintenance includes; crack sealing of the wearing surfaces; replacement or repair sections of steel beam guiderail; install object markers at end treatments of guiderails.  Roadside Safety:  Maintain and extend steel beam guide rail (SBGR).  (Refer to Dillon 2018 Roadside Safety Improvements Memo)	No work is necessary	Work Item	Costs	31-Jul-20
1011	South Talbot Drain at Malden Road	Concrete Rigid Frame (Culvert)	86.1	4.3	3.7	39.5	16.0	2007	N/A	Light to medium progressive edge cracking was observed in the asphalt wearing surface. The culvert barrel soffit had one (1) full width hairline crack with efflorescence. The vertical walls of the barrel had two (2) hairline cracks with efflorescence. The east approach wearing surface had severe map and transverse cracking and the west approach wearing surface had very severe transverse cracking and severe map cracking.  Recommended maintenance includes; crack sealing of the wearing surfaces; and seal concrete cracks in the culvert barrel. Note this is a confined space and requires trained personnel or a camera inspection to gather future information.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary			31-Jul-20
1013	Merrick Drain at Eighth Concession Road	Concrete Non-Rigid Frame (Bridge)	80.5	4.2	3.6	9.2	6.3	1965	2020	Light scaling was 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.  Roadside Safety: No improvements necessary. (Refer to Dillon 2018 Roadside Safety Improvements Memo)	No work is necessary			09-Oct-20
1014	Colchester Townline Drain at Sixth Concession Road	Concrete Non-Rigid Frame (Culvert)	77.7	4.2	3.7	15.3	8.5	1955	2019	Light honeycombing was observed throughout the vertical walls of the barrel.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2018 Roadside Safety Improvements Memo)	No work is necessary			31-Jul-20
1015	Merrick Creek Drain at Sixth Concession Road	Concrete Rigid Frame (Culvert)	82.4	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 wingwall and one (1) hairline crack was observed on the northeast 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 northeast embankment had a severe slope and its filtercloth was exposed. The northeast and southeast rip-rap embankments were noted to be unstable.  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.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary			31-Jul-20
1016	Collins Drain at Outer Drive	Concrete Rigid/Non-Rigid Frame (Culvert)	75.0	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 barrel soffit showing active signs of efflorescence as well as severe delamination on the original section of the soffit. 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 and one light delamination. 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.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	Rehabilitation Needs Engineering (Design, Tender, Environmental Applications, CA, and CO) Mobilization, Traffic Signage, and Traffic Control Removal of Asphalt and Waterproofing Excavation and Backfill of Structure Concrete repairs (patches and crack sealing) Asphalt replacement Deck waterproofing Construction Contingency Environmental Control	6-10 Years Total	\$ 60,000.00 \$ 25,000.00 \$ 20,000.00 \$ 20,000.00 \$ 80,000.00 \$ 40,000.00 \$ 10,000.00 \$ 35,000.00 \$ 10,000.00	

			Total		Span	Overall	Road				Capital Needs/Construction Costs			Date of
Structure ID	Structure Location	Structure Type	2020 BCI	Deck Length (m)	Length (m)	Structure Width (m)	Width (m)	Year of Construction	Year of Last Rehabilitation	Comments (Including Routine Maintenance and Roadside Safety Needs)	Items	Timing of Recommended Work Item	Estimated Construction Costs	Last Inspection
1021	Pike Creek at Twelfth Concession Road	Corrugated Steel Pipe Arch (Culvert)	66.2	6.5	6.5	11.8	3.7	1965	N/A	Minor 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.  Recommended maintenance includes; add additional fill height over structure (appropriate fill height shall be determined by engineering review); improve erosion control; and install object marker signs as the structure is still likely utilized by maintenance vehicles and agricultural equipment.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2015 Bridge Roadside Safety Review Report)	No work is necessary			30-Jul-20
1028	East Townline Drain at St. Thomas Street	Concrete Rigid Frame (Culvert)	57.6	5.4	4.8	30.5	20.0	1975	N/A	Asphalt wearing surface was noted to have several wide cracks. Narrow to wide cracks with efflorescence staining were observed throughout the culvert barrel. Approximately seven (7) locations of very severe delamination and very severe spalling with exposed and severely corroded reinforcing steel were observed in the culvert barrel soffit. Partial failure of slope protection at all embankments; curbs at the northeast and southeast were noted to have settled.  Temporary repairs were completed in July 2016 as a holding strategy until the structure is replaced with a storm water sewer as part of the Manning Road Improvements project in 2021.	Until this structure is replaced, Dillon recommends a monitoring program consisting of biannual inspections. The program will ensure the temporary repairs remain satisfactory until the structures are replaced.			30-Jul-20
1029	East Townline Drain at Little River Road	Concrete Rigid Frame (Culvert)	58.9	5.4	4.8	30.5	20.6	1975	N/A	Asphalt wearing surface was noted to have several wide cracks. Narrow to wide cracks with efflorescence staining were observed throughout the culvert barrel. Approximately four (4) locations of very severe delamination and very severe spalling with exposed and severely corroded reinforcing steel were observed in the culvert barrel soffit. Partial failure of slope protection at all embankments; the northeast curb was noted to have settled and the southeast curb was noted to have failed.  Temporary repairs were completed in July 2016 as a holding strategy until the structure is replaced with a storm water sewer as part of the Manning Road Improvements project in 2021.	Until this structure is replaced, Dillon recommends a monitoring program consisting of biannual inspections. The program will ensure the temporary repairs remain satisfactory until the structures are replaced.			30-Jul-20
2001	Colchester Townline Drain at Eighth Concession Road	Corrugated Steel Pipe Arch (Culvert)	73.1	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 apparrently sagging under 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 seperation at the joints.  Recommended maintenance includes: crack sealing or asphalt repaving; parging of the precast block joints.  Roadside Safety:  No improvements necessary.  (Refer to Dillon 2018 Roadside Safety Improvements Memo)	No work is necessary			31-Jul-20
1	Lakewood Park Pedestrian Bridge	Steel Pedestrian Crossing	91.5	23.8	23.8	3.7	N/A	2016	N/A	Light corrosion was observed at the weld connections to stringers and wind bracing. Damage to the north railing system was noted.  Recommended maintenance includes: wire brush and coat corroded welded connections and damaged railing.	No work is necessary			09-Oct-20
2	Malden Road Pedestrian Bridge	Steel Pedestrian Crossing	91.7	12.2	12.2	2.68	N/A	2015	N/A	Heavy debris build up was seen downstream. 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.  Recommended work and maintenance includes: provide erosion control; remove debris from waterway.	No work is necessary			09-Oct-20

### Ontario Structure Inspection Manual - Inspection Form

Structure Number

- 1	UUZ	

Inventory Data:			
Structure Name	Pike Creek at Twelfth Concession Roa	d Bridge	
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other	
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 Not Consid: Cons/not App. List/n.d. Designation Desig./not list Desig & List	
MTO region		Road Class: Freeway Arterial Local X	
MTO District		Posted Speed 50 No. of Lanes 2	
Old County		AADT 650 % Trucks	
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Concrete Rigid Frame	Interchange Number	
Total Deck Length	17.3 m	Interchange Structure Number	
Overall Str. Width	9.8 m	Min. Vertical Clearance m	
Total Deck Area	169.5 sq. m	Special Transit Truck Routes: School Bicycle	
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 Structurem	
Span Lengths	Total = 15.8 (1) = 15.8;	m	
Historical Data:			
Year Built	1961	Year of Last Major Rehab. 2016	
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM I	nspection	Current Load Limit	
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #	
Last Underwater Inspection		By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date / Description)			
Major rehabilitation con	npleted in July 2016.		

Ontario Structure Insp	ntario Structure Inspection Manual - Inspection Form Structure Number		1002	
Scheduled Improveme	ents:			
Regional Priority Number		Programmed Work Year		
Nature of Program Worl	K:			
Appraisal Indices:		Comments		
Fatigue	0.00			
Seismic	0.00			
Scour	0.00			
Flood	0.00			
Geometrics	0.00			
Barrier	0.00			

0.00

0.00

Curb

Load Capacity

				_
Ontario Structure	Inspection	Manual -	Inspection	Form

**Structure Number** 

1	002	

Inspector: Jeremy Wammes, E.I.T. (Dillon Consulting Limited) Others in Party: Alessia Mussio, E.I.T. (Dillon Consulting Limited) Access Equipment Used: Camera, Measuring tape, Measuring wheel, and Hammer Weather: Sunny Temperature: 24.0 °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 Seismic Investigation: X Seismic Investigation: X Seismic Investigation: X Monitoring Monitoring Monitoring Grack Widths: X Investigation Notes:    Monitoring Crack Widths:   X   None   Maintenance   Minor Rehab.   Replace   Major Rehab.	Field Inspection Informa	tion:					
Others in Party: Alessia Mussio, E.I.T. (Dillon Consulting Limited)  Access Equipment Used: Camera, Measuring tape, Measuring wheel, and Hammer  Weather: Sunny  Temperature: 24.0 °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 Timber Investigation: X Detailed Timber Investigation: X Post-Tensioned Strand Investigation: X Underwater Investigation: X Seismic Investigation: X Seismic Investigation: X Seismic Investigation: X Monitoring Monitoring of Deformations, Settlements and Movements: X Investigation Notes:    Major Rehab.   Replace	Date of Inspection:	July 30, 2020	Type of Inspection:	: x OSIM	Enhanced OS	SIM	
Access Equipment Used: Camera, Measuring tape, Measuring wheel, and Hammer  Weather: Sunny  Temperature: 24.0 °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 Seismic Investigation: X Seismic Investigation: X Seismic Investigation: X Structure Evaluation: X Monitoring Monitoring of Deformations, Settlements and Movements: X Monitoring Crack Widths: X Investigation Notes:  Overall Structure Notes: 6 to 10 years  Overall Comments: 6 to 10 years  Overall Comments: 6 to 10 years	Inspector:	Jeremy Wammes, E	E.I.T. (Dillon Consulting Lin	mited)			
Weather: Sunny  Temperature: 24.0 °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 Structure Investigation: X Seismic Investigation: X Structure Evaluation: X Monitoring Monitoring of Deformations, Settlements and Movements: X Monitoring Crack Widths: X Investigation Notes:    Monitoring Crack Widths:   1 to 5 years   6 to 10 years	Others in Party:	Alessia Mussio, E.I.	T. (Dillon Consulting Limit	ed)			
Temperature: 24.0 °C    Additional Investigations Required:	Access Equipment Used:	Camera, Measuring	tape, Measuring wheel, a	nd Hammer			
Additional Investigations Required:    None   Normal   Urgent	Weather:	Sunny					
Material Condition Survey  Detailed Deck Condition Survey:  Non-Destructive Delamination Survey of Asphalt-Covered Deck:  Concrete Substructure Condition Survey:  Detailed Coating Condition Survey:  Detailed Coating Condition Survey:  Detailed Timber Investigation:  Post-Tensioned Strand Investigation:  Post-Tensioned Strand Investigation:  X  Underwater Investigation:  Seismic Investigation:  Seismic Investigation:  X  Structure Evaluation:  Monitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure:  X   None	Temperature:	24.0 °C					
Material Condition Survey  Detailed Deck Condition Survey:  Non-Destructive Delamination Survey of Asphalt-Covered Deck:  Concrete Substructure Condition Survey:  Detailed Coating Condition Survey:  Detailed Coating Condition Survey:  Detailed Timber Investigation:  Post-Tensioned Strand Investigation:  Post-Tensioned Strand Investigation:  X  Underwater Investigation:  Seismic Investigation:  Seismic Investigation:  X  Structure Evaluation:  Monitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure:  X   None		·					
Material Condition Survey    Detailed Deck Condition Survey:	Additional Investigations	Required:					
Detailed Deck Condition Survey:				None	Normal	Urgent	
Detailed Deck Condition Survey:	Material Condition Survey						
Non-Destructive Delamination Survey of Asphalt-Covered Deck:		ion Survey		x		1	
Concrete Substructure Condition Survey:  Detailed Coating Condition Survey:  Detailed Timber Investigation:  Post-Tensioned Strand Investigation:  Underwater Investigation:  Fatigue Investigation:  Seismic Investigation:  Whonitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure:  X None Maintenance Minor Rehab.  Major Rehab.  Timing of Recommended Work:  1 to 5 years 6 to 10 years  Overall Comments:			sphalt-Covered Deck			1	
Detailed Coating Condition Survey:  Detailed Timber Investigation:  Post-Tensioned Strand Investigation:  Underwater Investigation:  Seismic Investigation:  Seismic Investigation:  Structure Evaluation:  Monitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure: x None Maintenance Minor Rehab.  Major Rehab.  Timing of Recommended Work:  Overall Comments:  1 to 5 years 6 to 10 years  Overall Comments:			oprian covered been.				
Detailed Timber Investigation:							
Post-Tensioned Strand Investigation:	·						
Underwater Investigation:  Fatigue Investigation:  Seismic Investigation:  Structure Evaluation:  Monitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure: x None Maintenance Minor Rehab.  Major Rehab.  Timing of Recommended Work:  1 to 5 years 6 to 10 years  Overall Comments:							
Fatigue Investigation:  Seismic Investigation:  Structure Evaluation:  Monitoring  Monitoring of Deformations, Settlements and Movements:  Monitoring Crack Widths:  Investigation Notes:   Overall Structure Notes:  Recommended Work on Structure: x None Maintenance Minor Rehab. Replace Major Rehab.  Timing of Recommended Work:  1 to 5 years 6 to 10 years  Overall Comments:		u III oo iigaa o III					
Seismic Investigation:				-		1	
Structure Evaluation: x   Monitoring   Monitoring   Monitoring of Deformations, Settlements and Movements:   x   Monitoring Crack Widths:   x   Investigation Notes:    Overall Structure Notes:   X   None   Maintenance   Minor Rehab.   Replace   Major Rehab.   Replace   Major Rehab.   Timing of Recommended Work:   1 to 5 years   6 to 10 years   Overall Comments:						1	
Monitoring    Monitoring of Deformations, Settlements and Movements:				х			
Monitoring of Deformations, Settlements and Movements:							
Overall Structure Notes:  Recommended Work on Structure: x None Maintenance Minor Rehab. Replace Major Rehab.  Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:		ations, Settlements a	nd Movements:	Х			
Overall Structure Notes:  Recommended Work on Structure: x None Maintenance Minor Rehab. Replace Major Rehab.  Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:	Monitoring Crack Wid	ths:		Х			
Recommended Work on Structure: x None Maintenance Minor Rehab. Replace Major Rehab.  Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:	Investigation Notes:			•	·		
Recommended Work on Structure: x None Maintenance Minor Rehab. Replace Major Rehab.  Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:							
Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:							
Timing of Recommended Work: 1 to 5 years 6 to 10 years  Overall Comments:	Recommended Work on S	Structure: x None	Maintenance	Minor Rel	nab.	Replace	
Overall Comments:				Major Rel	nab.		
Overall Comments:	Timing of Recommended	Work:	1 to 5 years	6 to 10 ve	ars		
Date of Next Inspection: June 2022	Overall Comments:						
	Date of Next Inspection:	June. 202	22				

## **Structure Number**

1002

Element Data									
Element Group:	Decks			Length:	17.3	m			
Element Name:	Wearing Su	ırface		Width:	8.0	m			
Location:				Height:	0.1	m			
Material:	Asphalt			Count:					
Element Type:				Total Quantity:	: 138.4	Sq.m			
Environment:	Moderate			Limited Inspec					
Protection System:						<u>                                     </u>	Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:		each / % / all	101.5	36.9	0.0	0.0			
Comments:									
Recommended Work:		Rehab	Replace		Maintenance	e Needs:			
		1-5 years	6-10 year	'S	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-plac	e concrete		Count:					
Element Type:				Total Quantity:		Sq.m			
Environment:	Moderate			Limited Inspec	tion	х			
Protection System:							Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	116.7	42.4	0.0	0.0			
Comments: 2016 rehabilitation inclu variable thickness and a Recommended Work:			-		l a reinforced		erlay with		
Recommended work.		1-5 years	6-10 year		Urgent	1 year	2 year		
		T o yours		5	Orgoni	r you			
Element Group:	Decks			Length:	15.8	m			
Element Name:	Soffit - Thic	k Slab		Width:	9.2	m			
Location:				Height:					
Material:	Cast-in-plac	ce concrete		Count:					
Element Type:				Total Quantity:	: 145.4	Sq.m			
Environment:	Moderate			Limited Inspec	tion				
Protection System:							Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	9.5	134.4	1.0	0.5			
Comments: 2016 rehabilitation: pate drains at both E/W edge was observed in locatio	s as per as-l	ouilt drawings). <b>W</b>	V Side: Wet s	•					
Recommended Work: Rehab Replace					Maintenance	e Needs:			
	1-5 years 6-10 ye				Urgent	1 year	2 year		

Element Data										
Element Group:	Barriers			Length:	1.0	m				
Element Name:	Barrier/Para	apet Walls - Ex	cterior	Width:	0.3					
Location:	NE / SW co	•		Height:	1.1					
Material:	Cast-in-plac			Count:	2					
Element Type:	†			Total Quantity						
Environment:	Moderate			Limited Inspec			_			
Protection System:	10000.000			Limitou map :	<del></del>		Perform.			
Condition	+	Inits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	-	each / % / all	1.0	3.7	0.2	0.1	Donoidinoid			
Comments:	Sq.m / m / C	Jacii / /o / ali L		3.7	0.2	0.1				
Added in 2016 rehabilit				e to vehicular da	1		5x0.25m)			
Recommended Work	:	Rehab	Replace		Maintenanc					
	!	1-5 years	6-10 year	rs	Urgent	1 year	2 year			
Element Group:	Barriers			Length:	2.2	m				
Element Name:		apet Walls - Ex	terior	Width:	0.3	0.3 m				
Location:	NW / SE co	rners		Height:	1.1	m				
Material:	Cast-in-plac	ce concrete		Count:	4					
Element Type:	<u> </u>			Total Quantity		Sq.m				
Environment:	Moderate			Limited Inspec	ction					
Protection System:	†					1 1	Perform.			
Condition	U	Inits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sa.m / m / r	each / % / all	16.1	5.9	0.0	0.0				
Comments: Added in 2016 rehabilit		<del>  </del>	<del></del>		·		<u> </u>			
Recommended Work	<u>:                                    </u>	Rehab	Replace		Maintenanc	1 1	T_			
		1-5 years	6-10 year	ıs	Urgent	1 year	2 year			
Element Group:	Barriers			Length:	21.7	m				
Element Name:	Barrier/Para	apet Walls - Int	erior	Width:	0.3	m				
Location:	East/West -	- Edges		Height:	0.475	m				
Material:	Concrete Pa	arapet	-	Count:	2					
Element Type:		II with Two Tub	e Railing	Total Quantity	54.3	Sq.m				
Environment:	Severe			Limited Inspec						
Protection System:	1			-		<u>                                     </u>	Perform.			
Condition	U	Inits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	<b>Sq.m</b> / m / 6	10.9	43.4	0.0	0.0	<del> </del>				
Comments:	•	'				<del>*</del> :-				
Added in 2016 rehabili					1		1			
Recommended Work: Rehab Replace					Maintenanc	e Needs:				
l										
		1-5 years	6-10 year	rs	Urgent	1 year	2 year			

## **Structure Number**

1002

Element Data												
Element Group:	Barriers					Length:		21.7	m	1		
Element Name:	Barrier/Para	apet \	Walls - In	te	rior	Width:		0.3	m	1		
Location:	Interior (Ea	st/We	est)			Height:		0.9	m	1		
Material:	Steel Railin	ıg				Count:		2				
Element Type:	Parapet wa	ll with	n Two Tul	be	Railing	Total Quantity	<b>/</b> :	43.4	m	)		
Environment:	Severe					Limited Inspection						
Protection System:									_	-1		Perform.
Condition	U	Inits			Exc.	Good		Fair	Poor	Г	Deficiencies	
Data:	Sq.m / <b>m</b> /	each	/ % / all		8.6	34.8		0.0		0.0		
Comments: Added in 2016 rehabilit	ation.											
Recommended Work:		R	Rehab		Replace		M	aintenance	e l	Needs:		
		1	-5 years		6-10 year	S		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	<b>/</b> :	75.0	m	1		
Environment:	Moderate					Limited Inspe	cti	on				
Protection System:								•				Perform.
Condition	U	Inits			Exc.	Good		Fair		Poor	Г	Deficiencies
Data:	Sq.m / <b>m</b> /	each	/ % / all		15.0	60.0		0.0		0.0		
Comments: Added in 2016 rehabilit	ation.											
Recommended Work:		R	Rehab		Replace		M	aintenance	<b>!</b>	Needs:		
		1	-5 years		6-10 year	S		Urgent		1 year		2 year
Flomont Croun.	Abutmonto					Longth			_			
Element Group: Element Name:	Abutments Abutment V			_		Length: Width:		9.2	111	ı		
Location:	North/South					Height:		2.4	_			
Material:	Cast-in-plac		noroto			Count:		3.4	111	ı		
	Cast-III-plat	CE CO	increte			Total Quantity	<i>,</i> .		_	a m		
Element Type: Environment:	Moderate					·		62.6	<u>ہ</u>	ү.п Т		
Protection System:	Moderate					Limited Inspe	·CII	UII	<u></u>			Dorform
	11	Inita	1		Eve	Cood	1	Eoir 1	_	Post	١,	Perform.
Condition		Jnits	/ 0/ / -11		Exc.	Good	-	Fair	H	Poor		Deficiencies
Data:	<b>Sq.m</b> / m /	eacn	/ % / all		0.0	56.6	<u> </u>	6.0	<u></u>	0.0	<u></u>	
Comments:  N Wall: Medium honeyorthroughout. S Wall: Lig							1.0	m). Light ho	on	eycombing	ob	served
Recommended Work:		R	Rehab		Replace		M	aintenance	- I	Needs:		
		1	-5 years		6-10 year	S		Urgent	Π	1 year		2 year
							1		_			

Element Data									
Element Group:	Abutments				Length:	4.4	n	n	
Element Name:	Wingwalls				Width:	0.3	3 n	n	
Location:	All Four Qua	adrants			Height:	Var		n	
Material:	Cast-in-plac	e concrete			Count:	4	ļ		
Element Type:					Total Quantity	: 35.2	2 5	Sq.m	
Environment:	Moderate				Limited Inspec		T		
Protection System:							_		Perform.
Condition	Ur	nits		Exc.	Good	Fair	Т	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e			0.0	33.2	1.0	t	1.0	
Comments:	Oq.m/ m/ c	acii/ /u/ aii	<u> </u>	0.0	00.2	1.0		1.0	
NE Corner: Medium ma				spa	alling was o	bserved (0.5			
Recommended Work:		Rehab		Replace		Maintenand	:е	Needs:	
		1-5 years		6-10 year	S	Urgent		1 year	2 year
Element Group:	Embankmer	nt & Streams			Length:				
Element Name:		d Waterways			Width:		_		
Location:	2			Height:		_			
Material:				Count:					
Element Type:				Total Quantity	1 1	l a	ıll		
Environment:				Limited Inspec		Ť	<u> </u>		
Protection System:				Limited mapet	J. 1011			Perform.	
Condition	l lr	nite	Evo	Good	Fair	$\overline{}$	Poor	Deficiencies	
Data:		Units Exc.  Sq.m / m / each / % / all 0				0 0	+	0	Deliciencies
Comments: New errosion protection	1		ner	nts					
Recommended Work:		Rehab		Replace		Maintenand	<u>_</u>	Needs:	
		1-5 years		6-10 year	S	Urgent	Urgent 1 year		
Element Group:	Embankmer	nts & Streams	S		Length:				
Element Name:	Embankmer				Width:		_		
Location:	All Four Qua				Height:		_		
Material:	501 900				Count:		_		
Element Type:					Total Quantity			each	
Environment:	Moderate				Limited Inspec		Т		
Protection System:	Wioderate				Limited mopet	J.1011			Perform.
Condition	l Ir	nits	1	Exc.	Good	Fair	Τ	Poor	Deficiencies
Data:	Sq.m/m/e			0	4	0	+	0	Deficiencies
Comments: Embankment slopes we NW Corner: Granular s	ere modified a	and new gabi		walls were	added to provide	de more stab		y.	rb.
Recommended Work: Rehab Replace				Replace		Maintenand	<u></u>	Needs:	
		1-5 years		6-10 year	S	Urgent	_	x 1 year	2 year
			Erosion con	_					

Zioiiioiii Zata											
Element Group:	Embankme	nts &	Streams	3		Length:					
Element Name:	Slope prote	ction				Width:					
Location:	All Four Qu	adra	nts			Height:					
Material:						Count:		4			
Element Type:	Hand Laid F	Rip-R	ap, Gabi	ior	n Baskets	<b>Total Quantity</b>	:	4	each		
Environment:	Moderate					Limited Inspec					
Protection System:											Perform.
Condition	U	nits			Exc.	Good	Fa	air	Р	oor	Deficiencies
Data:	Sq.m/m/	each	/ % / all		0	4	(	)		0	
Comments:		Пь	lohoh		Panlaga		Mainte		a Noo	do:	T
Recommended Work:			ehab		Replace		Mainte				10
		1	-5 years		6-10 year	S	Urg	ent	1 )	/ear	2 year
Element Group:	Signs					Length:					
Element Name:	Signs					Width:					
Location:						Height:					
Material:						Count:		4			
Element Type:	Hazard Marker Sign					<b>Total Quantity</b>	:	4	each		
Environment:						Limited Inspec	ction				
Protection System:						-					Perform.
Condition	Units Exc.					Good	Fa	air	Р	oor	Deficiencies
Data:	Sa.m/m/e	q.m/m/ <b>each</b> /%/all 0 4 0 0									
Comments:  Recommended Work:		R	lehab		Replace		Mainte	enance	e Nee	ds:	
		1	-5 years		6-10 year	S	Urg	ent	1 y	/ear	2 year
		•			•		•		•		
Element Group:	Approaches	S				Length:		29.0	m		
Element Name:	Wearing Su		)			Width:		Var.			
Location:	North/South					Height:					
Material:	Asphalt					Count:		2			
Element Type:	'					Total Quantity	:	406.0	Sa.m		
Environment:	Moderate					Limited Inspec			1		
Protection System:									<u> </u>		Perform.
Condition	U	nits			Exc.	Good	Fa	air	Р	oor	Deficiencies
					297.7	108.3		.0		0.0	1
Comments: Lane width ranges from	•			3.0				-		-	
Recommended Work:		R	tehab		Replace		Mainte		e Nee	ds:	
		1	-5 years		6-10 year	s	Urg	ent	1 y	/ear	2 year

## **Structure Number**

1002

Element Data										
Element Group:	Approaches	3		Length:						
Element Name:	Drainage			Width:						
Location:	All Four Qu	adrants		Height:						
Material:	Cast-in-Plac			Count:	4					
Element Type:	Spillways			Total Quantity:						
Environment:	Moderate			Limited Inspec						
Protection System:							Perform.			
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sa.m./m./e	each / % / all	0	4	0	0				
Comments:							1			
Recommended Work:		Rehab	Replace		Maintenance					
		1-5 years	6-10 year	'S	Urgent	1 year	2 year			
Element Group:	Approaches			Length:	Var.	m				
Element Name:	Curb/gutters			Width:	0.3	m				
Location:	NE/SW corr	ners		Height:	0.2	0.2 m				
Material:	Cast-in-plac	e concrete		Count:	2					
Element Type:				Total Quantity:		m				
Environment:	Moderate			Limited Inspec	tion		_			
Protection System:							Perform.			
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sq.m / <b>m</b> / 6	each / % / all	18.3	6.7	0.0	0.0				
Comments: NE Corner: 13.0 m long Recommended Work:	g. SW Corne	r: 12.0 m long	Replace	1	Maintenance	e Needs:	T			
		1-5 years	6-10 year		Urgent	1 year	2 year			
Element Group:	Approaches	3		Length:	4.9	m				
Element Name:	Curb/gutters			Width:	1.2	m				
Location:	NW/SE cor			Height:						
Material:	Cast-in-plac			Count:	2					
Element Type:	Concrete Pa	ad for TL-2 an	d TL-3	Total Quantity:	9.8	m				
Environment:	Moderate			Limited Inspec						
Protection System:				<u> </u>			Perform.			
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sq.m / <b>m</b> / 6	each / % / all	4.2	5.6	0.0	0.0				
Comments: Seventeen (17) hairline is undermined at <b>NW</b> C		ansverse crac	ks were obs	erved on both cu	rbs extending	full depth of	f the curb. Pad			
Recommended Work:		Rehab	Replace		Maintenance	e Needs:				
		1-5 years	6-10 year	s	Urgent	1 year	2 year			



## Description

Overview of the bridge. (Looking South)



## Description

Road view over the brige span. (Looking North)



## Description

Road view at the north approach. (Looking North)



## Description

Joint between the bridge deck and the north approach. (Looking East)



## Description

End treatment at the northwest corner of the bridge.



## Description

Concrete barrier wall at the northwest corner of the bridge.



## Description

Guide rail at the south approach.



## Description

Guide rail at the north approach.



## Description

Parapet wall and barrier wall at the east edge of the bridge.



## Description

Parapet wall and barrier wall at the east edge of the bridge.



## Description

East elevation



## Description

West elevation



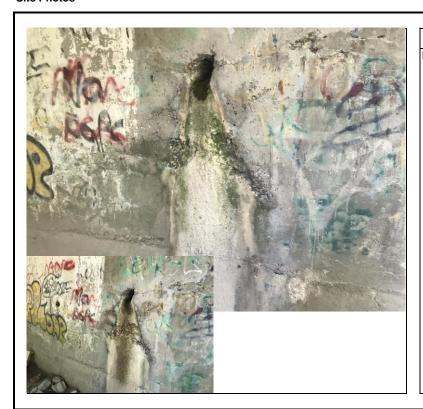
## Description

Erosion below curb slab at northwest wingwall



## Description

North abutment wall



Medium honeycombing on north abutment wall



## Description

South abutment wall



## Description

Wet staining and efflorescence on west edge of soffit.



Northwest wingwall



# **Description**Northwest embankment



# Description Southwest embankment



## Description

Waterway at the east side of the bridge



## Description

Waterway at the west side of the bridge

## **Ontario Structure Inspection Manual - Inspection Form**

Structure Number

1003

Inventory Data:		
Structure Name	Pike Creek at Twelfth Concession Brid	lge
Main Hwy/Road #	On x	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local X
MTO District		Posted Speed 50 No. of Lanes 2
Old County		AADT 650 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Slab on Steel Girders	Interchange Number
Total Deck Length	16.3 m	Interchange Structure Number
Overall Str. Width	8.6 m	Min. Vertical Clearance m
Total Deck Area	140.2 sq. m	Special Transit Truck Routes: School Bicycle
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 Structurem
Span Lengths	Total = 15.7 (1) = 15.7;	m
Historical Data:		
Year Built	1965	Year of Last Major Rehab. 2013
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM Ir	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date / I	Description)	
Major rehabilitation com	npleted in 2013, incl. new concrete deck	, steel beams, parapet walls, bearings and guiderails.

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nu	mber 1003
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comme	nts
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Date of Next Inspection:

**Structure Number** 

Field Inspection Informat	ion:							
Date of Inspection:	July 30, 2020	)	Type of Inspec	tion:	x OSIM	En	hanced OS	SIM
Inspector:	Jeremy Wan	nmes, E.I.T.	(Dillon Consultin	g Limi	ited)			
Others in Party:	Alessia Muss	sio, E.I.T. (D	illon Consulting L	imited	d)			
Access Equipment Used:	Camera, Mea	asuring tape	e, Measuring whe	el, and	d Hammer			
Weather:	Sunny							
Temperature:	20.0 °C							
Additional Investigations	Paguirad:				_		Driority	
Additional investigations	Requirea:				None		Priority	Llumont
					None	,	Normal	Urgent
Material Condition Survey								
Detailed Deck Condition	on Survov:				х			
Non-Destructive Delar		ov of Acaba	It Covered Deek:		X			-
			iii-Covered Deck.		X			+
Concrete Substructure								+
Detailed Coating Cond					X			-
Detailed Timber Inves					X			-
Post-Tensioned Stran	d investigatio	n:			Х			-
Underwater Investigation:					Х			-
Fatigue Investigation:					X			-
Seismic Investigation:					Х			-
Structure Evaluation:					Х			
Monitoring	0							
Monitoring of Deforma		nents and iv	lovements:		X			-
Monitoring Crack Wid	ths:				Х			
Investigation Notes:								
Overall Structure Notes:								
Recommended Work on S	tructure:	None	x Maintenance		Minor Re	ehab.		Replace
					Major Re		_	,
Timing of Recommended \	Nork:		x 1 to 5 years	1	6 to 10 y	eare		
Overall Comments:	plates should be	wiro-h	ruched pri	med and	d coated D	'Agular		
overali comments.			is recommended					

June 2022

Element Data								
Element Group:	Decks				Length:	15.2	m	
Element Name:	Wearing Sur	rface			Width:	8.0	m	
Location:					Height:			
Material:	Asphalt				Count:			
Element Type:					Total Quantity:	: 121.6	Sq.m	
Environment:	Moderate				Limited Inspec	tion		
Protection System:					<u> </u>			Perform.
Condition	Ur	nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ach / %	/ all	57.4	56.7	7.5	0.0	
Comments: Narrow full length longitic cracks noted. All cracks		L.: Two	(2) na	arrow transve	erse cracks obse	rved (approxi	mately 4m ar	
Recommended Work:		Reha		Replace		Maintenance		1_
		1-5 y	ears	6-10 year	S	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-plac	e concre	ete		Count:			
Element Type:					Total Quantity:		. i	
Environment:	Moderate				Limited Inspec	tion	Х	<del></del>
Protection System:					ļ <u></u>			Perform.
Condition		nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ach / %	/ all	69.7	61.0	0.0	0.0	
Comments: Top of deck assumed ba	ased on the o	ı						T
Recommended Work:		Reha		Replace		Maintenance		1
		1-5 y	ears	6-10 year	S	Urgent	1 year	2 year
Element Group:	Decks				Length:	13.8	m	
Element Name:	Soffit - Thin	Slab - E	xterio	r	Width:	0.9	m	
Location:	East/West E	dge of I	Deck		Height:			
Material:	Cast-in-plac	e concre	ete		Count:	2		
Element Type:					Total Quantity:	24.8	Sq.m	
Environment:	Moderate				Limited Inspec	tion		
Protection System:								Perform.
Condition		nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ach / %	/ all	13.2	8.6	2.0	1.0	
Comments: W Fascia: Full length narrow longitundinal crack with discrete					active wet areas	and effloresc	ence (13.8x0	.25m).
Recommended Work:		Reha	ab	Replace		Maintenance	e Needs:	
1-5 years 6-10					rs .	Urgent	1 year	2 year

Element Group:	Decks					Length:		13.8	m	
Element Name:	Soffit - Thin	Sla	ab - Interio	r		Width:		6.8	m	
Location:						Height:				
Material:	Cast-in-place	се с	oncrete			Count:				
Element Type:						<b>Total Quantity</b>	<b>'</b> :	93.8	Sq.m	
Environment:	Benign					Limited Inspection				
Protection System:	_					-				Perform.
Condition	U	Inits	i		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	eac	h/%/all		67.5	26.3		0.0	0.0	
Comments:										
Recommended Work:			Rehab		Replace		Needs:			
			1-5 years		6-10 years	S		Urgent	1 year	2 year
Element Group:	Decks					Length:		1.0	m	
Element Name:	Soffit - Thin	Sla	ab - End			Width:		8.6	m	
Location:	North/South	North/South Abutment								
Material:	Cast-in-place	се с	oncrete			Count:		2	-	
Element Type:						Total Quantity	<u>':</u>	17.2	Sq.m	
Environment:	Moderate					Limited Inspec	ctic			
Protection System:						•				Perform.
Condition	Units				Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e				9.2	8.0		0.0	0.0	Bonolonoloo
Comments:  Recommended Work:			Rehab		Replace		M	aintenance	Needs:	
			1-5 years		6-10 years	s		Urgent	1 year	2 year
		1 1	1 0 300.0		jo 10 your	<u> </u>		JOI GOIN	r you.	
Element Group:	Decks					Length:				
Element Name:	Drainage					Width:				
Location:						Height:				
Material:	Steel					Count:		6		
Element Type:	Metal drain	nin	PS			Total Quantity	,.		each	
Environment:	Moderate	PiP				Limited Inspec		L	Cacii	
Protection System:	Moderate					Limited inspec	CLIC	,,,,		Do ufo um
Condition	11	Inits	,			Cood	1	Fair	Deer	Perform.
	_	-			Exc.	Good		Fair 0	Poor 0	Deficiencies
Data: Sq.m / m / each / % / all 0  Comments: Deck drain at midspan on west side has debris build up and						6 ausing partial clo	ggi			
Recommended Work:			Rehab		Replace		D/I	aintenance	Noode:	
					†	<u> </u>	1419			2
	1-5 years		6-10 year	3	Br	Urgent idge cleani	x 1 year ng	2 year		
							<u> </u>			

Element Data									
Element Group:	Decks			Length:					
Element Name:	Drainage			Width:					
Location:				Height:					
Material:	PVC			Count:	Count: 4				
Element Type:	PVC drain p	pipes		Total Quantity	ntity: 4 each				
Environment:	Moderate			Limited Inspe	ction				
Protection System:							Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m / m / e	each / % / all	0	4	0	0			
Comments: Four (4) PVC of 2 inch o	diameter are	located at the			_		_		
Recommended Work:		Rehab	Replac		Maintenanc	e Needs:			
		1-5 years	6-10 ye	ears	Urgent	1 year	2 year		
Element Group:	Joints			Length:	8.5	m			
Element Name:	Seals/Seala	ints		Width:					
Location:	North/South	end of Deck		Height:	_				
Material:				Count:	2				
Element Type:	Strip Seal			Total Quantity		each			
Environment:	Severe			Limited Inspe	ction				
Protection System:					_		Perform.		
Condition		nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m/m/e	each / % / all	0	2	0	0			
Comments: Debris build up in the ea	ach strip seal	Rehab	Poplac		Maintenanc	o Noods:			
Recommended work:			Replac			1 1	10		
		1-5 years	6-10 ye	ears	Urgent Bridge clean	x 1 year	2 year		
					Bridge clear	liig			
Element Group:	Joints			Length:	8.5	m			
Element Name:	Concrete er	nd dams		Width:	0.5	m			
Location:	North/South	Abutments		Height:					
Material:	Cast-in-plac	e concrete		Count:	4				
Element Type:				Total Quantity	<i>y</i> : 17.0	Sq.m			
Environment:	Severe			Limited Inspe	ction				
Protection System:							Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / 6	each / % / all	0.0	17.0	0.0	0.0			
Comments:									
Recommended Work:		Rehab	Replac	e	Maintenanc	e Needs:			
		1-5 years	6-10 ye	ears	Urgent	1 year	2 year		

Liement Data									
Element Group:	Joints				Length:	3	3.5 m		
Element Name:	Armouring/I	Retaining d	evi	ces	Width:				
Location:	North/South	Abutment	S		Height:				
Material:	Steel				Count:		4		
Element Type:					<b>Total Quantity</b>	r: 34	4.0 m		
Environment:	Severe				Limited Inspec	ction			
Protection System:							Perform.		
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / <b>m</b> / 6	each / % / a	Ш	0.0	34.0	0.0	0.0		
Comments:		· /		T= .		T		1	
Recommended Work:		Rehab		Replace		<del> </del>	nce Needs:		
		1-5 yea	rs	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Barriers				Length:	•	1.0 m		
Element Name:	Parapet Wa	ılls - Exterio	r		Width:	0.	25 m		
Location:	East/West I	Edge of De	ck		Height:	(	0.8 m		
Material:	Cast-in-place	ce concrete			Count:		4		
Element Type:	Parapet Wa	all with Sing	le i	railing	<b>Total Quantity</b>	r: 7	7.4 Sq.m		
Environment:	Moderate				Limited Inspec	ction			
Protection System:								Perform.	
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / 6	each / % / a	ıll	0.0	7.1	0.2	0.1		
Comments: Hairline map cracking w Recommended Work:	as observed	throughou	t. <b>N</b>	Replace	ight spalling wa	1	I (0.15x0.15m).	<u> </u>	
Trocommonaca Tronki		1-5 yea	rc	6-10 year	<u> </u>	Urgent		2 year	
		i o yea	13	To 10 year	<u> </u>	Jorgeni	T year		
Element Group:	Barriers				Length:	23	3.0 m		
Element Name:	Parapet Wa	alls - Interio	r		Width:	0.	25 m		
Location:	East/West I				Height:	(	0.8 m		
Material:	Cast-in-place				Count:		2		
Element Type:	Parapet Wa	all with Sing	le i	railing	Total Quantity	r: 85	5.1 Sq.m		
Environment:	Moderate				Limited Inspec	ction			
Protection System:						1		Perform.	
Condition		nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / a	ıll	45.4	39.7	0.0	0.0		
Comments: Hairline map cracking w	as observed	l throughou	t.						
Recommended Work:		Rehab		Replace		Maintena	nce Needs:		
		1-5 yea	rs	6-10 year	S	Urgent	1 year	2 year	

Element Data										
Element Group:	Barriers					Length:		23.0		
Element Name:	Hand Railin	ngs				Width:				
Location:	East/West E	Edg	e of Deck			Height:				
Material:	Steel					Count:		2		
Element Type:	Single Rail					Total Quantity	:	46.0	m	
Environment:	Severe					Limited Inspec	tion			
Protection System:								<u> </u>	•	Perform.
Condition	U	nits			Exc. Good			air	Poor	Deficiencies
Data:	Sq.m / <b>m</b> / 6	each	n / % / all		0.0	46.0	0	.0	0.0	
Comments:		T 1.								ı
Recommended Work:		-	Rehab		Replace				Needs:	
			1-5 years		6-10 year	S	Urg	ent	1 year	2 year
Element Group:	Barriers					Length:	\	/arries		
Element Name:	Railing Syst	tem	S			Width:				
Location:	NE / NW / S	SE				Height:				
Material:	Steel					Count:		3		
Element Type:	Single Rail	(Ste	el Beam,	aı	nd Post)	Total Quantity	:	99.7	m	
Environment:	Moderate					Limited Inspec	tion			
Protection System:										Perform.
Condition	Units				Exc.	Good	Fa	air	Poor	Deficiencies
Data:	Sq.m / <b>m</b> / e	each	n / % / all		0.0	99.7	0	.0	0.0	
Comments: Quantities: NE: 23.7m, Light corrosion on railing		rve	d througho	ou			<b></b>		No. 1	Γ
Recommended Work:		$\vdash$	Rehab	H	Replace				Needs:	
		Ш.	1-5 years	<u> </u>	6-10 year	S	Urg	jent	1 year	2 year
Element Group:	Beams/MLE	E's				Length:		4.0	m	
Element Name:	Girders (En	d)				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 Inspec	tion			
Protection System:										Perform.
Condition	U	nits			Exc.	Good	Fa	air	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each	n/%/all		24.6	21.6	0	.0	0.0	
Comments: Medium corrosion on sh	noe plates (ty	/p.)								
Recommended Work:			Rehab		Replace		Maint	Maintenance Needs:		
			1-5 years		6-10 year	s	Urg	jent	1 year	2 year
							_			

Element Data								
Element Group:	Beams/MLE	's		Length:	11.7	m		
Element Name:	Girders (Mid	ddle)		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 Inspec	tion			
Protection System:						l l	Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / all	97.3	37.8	0.0	0.0		
Comments:								
Recommended Work:		Rehab	Replace		Maintenanc		T.	
		1-5 years	6-10 yea	ars	Urgent	1 year	2 year	
Element Group:	Beams/MLE	's		Length:	1.8	m		
Element Name:	Diaphragms	3		Width:	0.13	m		
Location:	North/South	Abutment		Height:	0.35	0.35 m		
Material:	Galvanaized	d Steel		Count:	8			
Element Type:	I-type			Total Quantity	: 8	each		
Environment:	Moderate			Limited Inspec	tion	х		
Protection System:						l l	Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all	0	8	0	0		
Comments:  Recommended Work:		Rehab	Replace	e e	Maintenanc	e Needs:		
		1-5 years	6-10 yea	ars	Urgent	1 year	2 year	
Element Group:	Beams/MLE	's		Length:	1.7	m		
Element Name:	Diaphragms	<u> </u>		Width:	0.08	0.08 m		
Location:	Intermediate			Height:	0.31			
Material:	Galvanaized	d Steel		Count:	8			
Element Type:	C-Channel			Total Quantity	: 8	each		
Environment:	Moderate			Limited Inspec	tion	х		
Protection System:				-		!!	Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all	0	8	0	0		
Comments:								
Recommended Work:		Rehab	Replace	9	Maintenanc	Maintenance Needs:		
		1-5 years	6-10 yea	ars	Urgent	1 year	2 year	

Liement Data											
Element Group:	Coatings				Length:		2.0	m			
Element Name:	Structural S	Steel			Width:		0.27	m			
Location:	Girder End				Height:		0.75	m			
Material:					Count:		10				
Element Type:					<b>Total Quantity</b>	:	46.2 Sq.m				
Environment:	Moderate				Limited Inspec	ctic	on	х			
Protection System:					_		<u> </u>				Perform.
Condition	U	Inits		Exc.	Good		Fair	Р	oor	D	eficiencies
Data:	<b>Sq.m</b> / m / e	each	/ % / all	22.3	21.6		2.3	(	0.0		
Comments:											
No coating on shoe plat	es										
Recommended Work:		I IR	Rehab	Replace		Maintenance Needs:					
		++	-5 years	6-10 year	S		Urgent	x 1 y			2 year
		ш.	o youro	o io your	<u> </u>	W	ire brush, p			ıt si	noe plates
							reduce rate				
FI	lo				Tr						
Element Group: Element Name:	Coatings	N4 I			Length:		1.8				
	Structural S				Width:		0.13				
Location:	End Diaphra				Height:		0.35 m				
Material:	Galvanized	Stee	<del></del>		Count:		8				
Element Type:					Total Quantity			Sq.m			
Environment:	Moderate				Limited Inspec	ctic	on	Х		_	
Protection System:											Perform.
Condition		Inits		Exc.	Good		Fair		oor	D	eficiencies
Data:	<b>Sq.m</b> / m / e	each	/ % / all	8.3	7.2		0.0	C	0.0	<u> </u>	
Comments:											
Recommended Work:		F	Rehab	Replace			Maintenance Needs:				
		1	-5 years	6-10 year	s		Urgent 1 year				2 year
		1 .	-		<u> </u>		<u>  0.go</u>		<u> </u>		
Element Group:	Abutments				Length:		8.5	m			
Element Name:	Abutment w	valls			Width:						
Location:	North/South	ո Abւ	utment		Height:		3.5	m			
Material:	Cast-in-plac	се со	ncrete		Count:		2				
Element Type:	Convention	al clo	osed		<b>Total Quantity</b>	<u>':</u>	59.5	Sq.m			
Environment:	Moderate				Limited Inspec	_					
Protection System:					_						Perform.
Condition	U	Inits		Exc.	Good		Fair	Р	oor	1	eficiencies
Data:	<b>Sq.m</b> / m / e	each	/ % / all	0.0	47.5		8.0		4.0		
Comments:			I					<u>I</u>			
N Wall: A full height me S Wall: Narrow to medic									ed (4.0x0	0.5r	m).
Recommended Work: Rehab Replace				Maintenance Needs:			ds:				
			-5 years	6-10 years				1 v	/ear		2 year
			,								

Element Group:	Abutments				Length:	8.5	m		
Element Name:	Ballast walls	s			Width:				
Location:	North/South	n Ab	outment		Height:	1.0	m		
Material:	Cast-in-plac	се с	oncrete		Count:	2			
Element Type:	Reinforced	con	crete		Total Quantity: 16.2 Sq.m				
Environment:	Moderate				Limited Inspec	Limited Inspection x			
Protection System:								Perform.	
Condition	Uı	nits	1	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	eac	h/%/all	0.0	16.2	0.0	0.0		
Comments: Hairline cracks were observed throughout.									
Recommended Work:			Rehab	Replace		Maintenanc	e Needs:		
			1-5 years	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Abutments				Length:	4.4	m		
Element Name:	Wingwalls				Width:				
Location:	North/South	n Ab	outment		Height:	4.5	4.5 m		
Material:	Cast-In-plac	ce c	concrete		Count:	4			
Element Type:	Reinforced	con	crete		<b>Total Quantity</b>	: 79.2	Sq.m		
Environment:	Benign				Limited Inspec	ction	х		
Protection System:								Perform.	
Condition	Units			Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	eac	h/%/all	57.0	22.2	0.0	0.0		
Comments: Top of wingwalls recons	tructed durin							ı	
Recommended Work:		$\vdash$	Rehab	Replace		Maintenanc		<u> </u>	
		Ш	1-5 years	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Abutments				Length:				
Element Name:	Bearings				Width:				
Location:	North/South	n Ab	outment		Height:				
Material:	Laminated E	Elas	stomeric B	earing	Count:	10			
Element Type:					Total Quantity	: 10	each		
Environment:	Moderate				Limited Inspec				
Protection System:					_		+ +	Perform.	
Condition	Uı	nits	1	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	eac	<b>h</b> / % / all	0	10	0	0		
Comments: Medium corrosion on sh	oe plates (ty	/p.)							
				1			T		
Recommended Work:		H	Rehab	Replace		Maintenanc	1 1	<del>                                     </del>	
			1-5 years	6-10 year	S	Urgent   x   1 year     2 year Wire brush, prime and coat shoe plates			
							prime and coa te of corrosion	•	

Element Data									
Element Group:	Embankmei	nts & Stream	s		Length:				
Element Name:	Streams and	d Waterways	;		Width:				
Location:					Height:				
Material:					Count:	1			
Element Type:					<b>Total Quantity</b>	Total Quantity: 1 all			
Environment:					Limited Inspec	tion			
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / <b>all</b>		0	0	1	0		
Comments: Stream alignment is shi	fted against s	T	ent	1					
Recommended Work:		Rehab		Replace		Maintenance			
		1-5 years		6-10 year		Urgent	1 year	x 2 year	
						Place scour   banks	protection ald	ong stream	
Element Group:	Embankmei	nts & Stream	s		Length:				
Element Name:	Embankme		_		Width:				
Location:	All Four Qua				Height:				
Material:					Count:				
Element Type:					Total Quantity		each		
Environment:	Moderate				Limited Inspec				
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all		0	4	0	0		
Comments:  Recommended Work:		Rehab	T	Replace	1	Maintenanc	e Needs:		
		1-5 years	$\vdash$	6-10 year		Urgent	1 year	2 year	
		vocas		<u> 10 10 year</u>	3	Orgoni	i yeai		
Element Group:	Embankme	nts & Stream	s		Length:				
Element Name:	Slope prote	ction			Width:				
Location:					Height:				
Material:					Count:	3			
Element Type:	Hand laid rip	prap			Total Quantity	: 3	each		
Environment:	Moderate				Limited Inspec	tion			
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	each / % / all		0	3	0	0		
Comments:			_						
Recommended Work:		Rehab	b Replace			Maintenance	1 1		
		1-5 years		6-10 year	S	Urgent	1 year	2 year	

						î					
Element Group:	Signs					Length:					
Element Name:	Signs					Width:					
Location:						Height:					
Material:						Count: 3					
Element Type:	Hazard Mar	rker	r Signs			Total Quantity: 3 each			each		
Environment:						Limited Inspection					
Protection System:									•	Perform.	
Condition	U	nits	3		Exc.	Good		Fair	Poor	Deficiencies	
Data:	Sq.m / m / 6	eac	<b>h</b> / % / all		0	3		0	0		
Comments:											
Recommended Work:			Rehab	F	Replace		M	aintenance	Needs:		
			1-5 years	6	6-10 years	S		Urgent	1 year	2 year	
Element Group:	Approaches	S				Length:		6.0	m		
Element Name:	Wearing su		ce			Width:		7.0			
Location:	North/South					Height:		7.0			
Material:	Asphalt	. , ,,	оргодон			Count:		2			
Element Type:	riopriait					Total Quantity	,·	84.0	Sa m		
Environment:	Moderate					Limited Inspe		1	1		
Protection System:	Woderate					Limited inspec	CLIC	J11		Daufaum	
Condition	Units					Cood	1	Fair	Daar	Perform.	
					0.0	Good		Fair 1.0	Poor 0.0	Deficiencies	
Data: Comments:	Sq.m / m / each / % / all				0.0	83.0		1.0	0.0		
<b>S Approach</b> : Settlemen (3.5x0.25m). <b>N Approac</b> 2x(1.0x0.25m)			with a light	cra	ck of 1.0 r		se	rved on bot	h sides of the		
Recommended Work:			Rehab Replace				M	aintenance	1 year		
			1-5 years	(	6-10 years	S		Urgent	x 2 year		
							Se	eal cracks			
Element Group:	Approaches	,				Longth:		6.0	m		
Element Name:	Approach S					Length: Width:		6.0 7.0			
Location:	North/South					Height:					
Material:	Cast-in-place	-				<u> </u>		0.25	III		
	Cast-III-piat	JE (	Juliciere			Count:		2	0		
Element Type:	Madarata					Total Quantity	_	84.0			
Environment:	Moderate					Limited Inspe	CTIC	on	Х		
Protection System:				1			1			Perform.	
Condition		nits			Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	eac	h/%/all		0.0	84.0		0.0	0.0		
Comments:											
Recommended Work:			Rehab Replace				M	aintenance	Needs:		
			1-5 years	<u> </u>	6-10 years	S		Urgent	1 year	2 year	

Element Group:	Approaches			Length:	10.0	m			
Element Name:	Curb/Gutters	3		Width:	0.3	m			
Location:	NE/NW/S	E		Height:	0.15	0.15 m			
Material:	Cast-in-place	e concrete		Count:	3	3			
Element Type:				<b>Total Quantity</b>	: 30.0	m			
Environment:	Moderate			Limited Inspec					
Protection System:							Perform.		
Condition	Ur	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m / <b>m</b> / e	ach / % / all	0.0	30.0	0.0	0.0			
Comments:									
Recommended Work:		Rehab	Replace		Maintenance	e Needs:			
		1-5 years	6-10 years	S	Urgent	1 year	x 2 year		



## Description

Road over the bridge. (Looking North)



## Description

Wearing surface at south approach



## Description

Wearing surface at south approach. (Looking East)



## Description

Wearing surface over the bridge. (Looking North)



## Description

Expansion joint at the south bridge approach. (Looking East)



## Description

Light spalling at northeast parapet end wall.



## Description

Deck drainge, and East parapet wall. (Looking North)



## Description

Railing system at southwest approach. (Looking North)



## Description

Railing system and spillway at northwest curb.



## Description

Missing bolt(s) for bottom of northwest guardrail.



## Description

West deck fascia, stream, and embankments. (Looking East)



## Description

East deck fascia, south abutment wall, stream, and embankments. (Looking South)



## Description

Deck soffit, main girders, and diaphrams. (Looking South)



# Description

End diaphrams at north abutment wall.



## Description

Bearing seat at north abutment wall. (Looking East)



# Description

Medium corrosion observed at bearing shoe plate (Typ.)



## Description

Medium crack with active wet areas and efflorescence at North abutment wall.



# Description

Medium crack with active wet ares and efflorescence at South abutment wall.



## Description

Embankments and waterway at East side. (Looking East)



## Description

Embankments and waterway at west side. (Looking South)



## Description

Waterway at west side. (Looking West)



# Description

Northeast embankments. (Looking North)

## **Ontario Structure Inspection Manual - Inspection Form**

Structure Number

1004

Inventory Data:			
Structure Name	Sullivan Drain at Twelfth Concession B	ridge	
Main Hwy/Road#	On x Under	Crossing Navig. Water Type: Rail	Non-Navig. x Ped. Road Other
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 Not Consid:  Designation Desig./not list	Cons/not App. List/n.d. Desig & List
MTO region		Road Class: Freeway Collector	Arterial Local x
MTO District		Posted Speed 50	No. of Lanes 2
Old County		AADT 650	% Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Concrete Non-Rigid Frame	Interchange Number	
Total Deck Length	7.5 m	Interchange Structure Number	
Overall Str. Width	9.3 m	Min. Vertical Clearance	m
Total Deck Area	69.8 sq. m	Special Transit Routes: School	Truck Bicycle
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;		m
Historical Data:			
Year Built	1965	Year of Last Major Rehab.	2019
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM Ir	nspection	Current Load Limit	
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #	
Last Underwater Inspec	ction	By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date / I	Description)		
	nted in Fall 2019. Work included: concret b reconstruction, concrete deck overlay.		ock retaining walls to improve

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number	1004
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comments	
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

				_
Ontario Structure	Inspection	Manual -	Inspection	Form

1004
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Field Inspection Informa	tion:				
Date of Inspection:	July 30, 2020	Type of Inspection	n: x OSIM	Enhanced OS	SIM
Inspector:	Jeremy Wammes, E	E.I.T. (Dillon Consulting L	imited)		
Others in Party:	Alessia Mussio, E.I.	T. (Dillon Consulting Limit	ited)		
Access Equipment Used:	Camera, Measuring	tape, Measuring wheel,	and Hammer		
Weather:	Sunny				
Temperature:	24 °C				
	<u>†</u>				
Additional Investigations	Required:			Priority	
			None	Normal	Urgent
Material Condition Survey					
Detailed Deck Condit	ion Survey		х		
		sphalt-Covered Deck:	X		
Concrete Substructur			х		
Detailed Coating Con			X		
Detailed Timber Inves			х		
Post-Tensioned Strar			X		
Underwater Investigation:	ia iiivooligalioiii		X		
Fatigue Investigation:			X		
Seismic Investigation:			X		
Structure Evaluation:			X		
Monitoring				I	
Monitoring of Deform	ations. Settlements a	nd Movements:	х		
Monitoring Crack Wic	lths:	X			
Investigation Notes:			<u> </u>		•
Overall Structure Notes:					
Recommended Work on S	Structure: None	Maintenance	Minor Reha	ab.	Replace
		<u> </u>	Major Reha	ab.	_
Timing of Recommended	Work:	1 to 5 years	6 to 10 yea	rs	
Overall Comments:		rehabilitated in 2019.			
Data of Next Increation:	luna 202	22			
Date of Next Inspection:	June 202				

Element Data									
Element Group:	Decks				Length:	7.5	m		
Element Name:	Wearing Su	rface			Width:	7.0	7.0 m		
Location:					Height:				
Material:	Asphalt				Count:			-	
Element Type:					<b>Total Quantity</b>	: 52.5	Sq.m		
Environment:	Moderate				Limited Inspec				
Protection System:					-		1 1	Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % /	all	49.0	3.5	0.0	0.0		
Comments: Repaved in 2019.			·				l		
Recommended Work:		Rehab		Replace		Maintenanc	e Needs:		
		1-5 ye	ars	6-10 year	S	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-plac		е		Count:				
Element Type:	Reinforced	concrete			Total Quantity		Sq.m		
Environment:	Moderate				Limited Inspec	ction	х		
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % /	all	60.2	4.3	0.0	0.0		
Comments: Concrete deck overlay in	n 2019.	<u> </u>							
Recommended Work:		Rehab		Replace		Maintenanc		1-	
		1-5 ye	ars	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Decks				Length:	6.8	m		
Element Name:	Soffit - Thicl	k slah			Width:	9.3			
Location:					Height:	0.0	***		
Material:	Cast-in-plac	e concret	<u> </u>		Count:				
Element Type:	Reinforced				Total Quantity	. 63.2	Sq.m		
Environment:	Benign	001101010			Limited Inspec				
Protection System:	Dorngii				Zimitoù mopos			Perform.	
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e		all	2.5	60.7	0.0	0.0	Bonorono	
Comments: Soffit patches in 2019. I									
Recommended Work:		Rehab		Replace		Maintenanc	e Needs:	T	
		1-5 ye		6-10 year		Urgent	1 year	2 year	
							<u> </u>		

Element Data									
Element Group:	Abutments				Length:		9.3	m	
Element Name:	Abutment V	Val	lls		Width:				
Location:	North/South	η A	butment		Height:		3.5	m	
Material:	Cast-in-place	се	concrete		Count:		2		
Element Type:	Reinforced	СО	ncrete		<b>Total Quantity</b>	<b>'</b> :	64.2	Sq.m	
Environment:	Benign				Limited Inspec	ctic	on	j	
Protection System:					-				Perform.
Condition	U	nit	s	Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ead	ch / % / all	0.0	64.2		0.0	0.0	2011010110100
Comments:			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			l			
Crack injection and pargundermined.	jing in 2019.	Li	ght scour a		erosion at footing	gs,	however fo	ootings are no	ot being
Recommended Work:			Rehab	Replace		Ma	aintenance	Needs:	
			1-5 years	6-10 year	s		Urgent	1 year	2 year
	1								
Element Group:	Abutments				Length:		4.6	m	
Element Name:	Wingwalls				Width:				
Location:					Height:		2.6	m	
Material:	Cast-in-place				Count:		4		
Element Type:	Reinforced	СО	ncrete		Total Quantity		l	Sq.m	
Environment:	Moderate				Limited Inspe	ctic	on		r
Protection System:									Perform.
Condition	U	nit	S	Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ead	ch / % / all	15.6	31.9		0.3	0.0	
Comments:									
Precast block retaining vertice  NE Wall: Medium vertice				erved.					
Recommended Work:			Rehab	Replace		Ma	aintenance	Needs:	
			1-5 years	6-10 year	s		Urgent	1 year	2 year
FI	0:1 "	_			II				
Element Group:	Sidewalks/0	Jui	rbs		Length:		23.0		
Element Name:	Curbs				Width:		0.3		
Location:	0 (: 1				Height:		0.4	m	
Material:	Cast-in-plac	се	concrete		Count:			_	
Element Type:					Total Quantity			Sq.m	
Environment:	Severe				Limited Inspec	ctic	on		
Protection System:						1			Perform.
Condition		nit		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ead	ch / % / all	9.2	6.9		0.0	0.0	
Comments: Curbs raised in 2019 to	accommoda	te	raise in asp	halt (due to	deck overlay).				
Recommended Work:			Rehab	Replace		Ma	aintenance	Needs:	
			1-5 years	6-10 year	S		Urgent	1 year	2 year

Element Data								
Element Group:	Embankmer	nts & Streams	3		Length:			
Element Name:	Streams and	d Waterways			Width:			
Location:		-			Height:			
Material:					Count:	1		
Element Type:					Total Quantity	: 1	all	
Environment:					Limited Inspec			
Protection System:					•		<u> </u>	Perform.
Condition	Uı	nits	E	C.	Good	Fair	Poor	Deficiencies
Data:		each / % / all		)	1	0	0	Deficiencies
Comments:	oq.m/ m/ c	, aoi 17 70 7 <b>ai</b> 1		•	'			
Consider drain & structu	ure realignme	ent during nex	t struct	ure re	eplacement.			_
Recommended Work:		Rehab	Rep	lace		Maintenanc	e Needs:	
		1-5 years	6-1	) year	s	Urgent	1 year	2 year
Element Group:	Embankmer	nts & Streams	3		Length:			
Element Name:	Embankmer	nts			Width:			
Location:	All Four Qua	adrants			Height:			
Material:					Count:	4		
Element Type:					<b>Total Quantity</b>	: 4	each	
Environment:					Limited Inspec	ction		
Protection System:								Perform.
Condition	Uı	nits	E	C.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	(	)	4	0	0	
Comments: Precast block retaining  Recommended Work:	walls installe	d in 2019 to e		embai	nkment slope. St	eep slopes d		f drain.
Necommended Work.		1-5 years	_	) year	·e	Urgent	1 year	2 year
		1 o years	[ [0 1	y cai	3	Orgent	T your	2 your
Element Group:	Embankmer	nts & Streams	3		Length:			
Element Name:	Slope Prote	ction			Width:			
Location:	All Four Qua	adrants			Height:			
Material:					Count:	4		
Element Type:	Hand laid rip	orap			Total Quantity	: 4	each	
Environment:	Moderate				Limited Inspec	ction		
Protection System:								Perform.
Condition	Uı	nits	E	C.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	4	ļ	0	0	0	
Comments:								
Recommended Work:		Rehab	Rep	lace		Maintenanc	e Needs:	
		1-5 years	6-1	) year	S	Urgent	1 year	2 year

Element Data									
Element Group:	Approaches	1			Length:				
Element Name:	Curb and G	utters - Spillw	ays		Width:				
Location:	NE, SE, SW	/ Quadrants	-		Height:				
Material:	Cast-in-Plac	ce Concrete			Count:	3			
Element Type:	Spillway				Total Quantity	: 3	each		
Environment:	Severe				Limited Inspec				
Protection System:					•			Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sa m / m / e	each / % / all		3	0	0	0		
Comments:			1 4 -		<u> </u>				
Spillways installed in 20	19. Noted to	be constructe	ea 100	o nign.					
Recommended Work:		Rehab	R	eplace		Maintenance	e Needs:		
		1-5 years	6-	-10 year	S	Urgent	1 year	2 year	
Element Group:	Signs				Length:				
Element Name:	Signs				Width:				
Location:	All Four Qua	adrants			Height:				
Material:					Count:	4			
Element Type:	Hazard Mar	ker Sians			Total Quantity		4 each		
Environment:					Limited Inspec				
Protection System:								Perform.	
Condition	Ui	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:		each / % / all		3	1	0	0	Benoiendes	
Comments: 3 new object markers in	stalled in 20°	19. NW corne							
Recommended Work:		Rehab	R	eplace		Maintenance	e Needs:		
		1-5 years	6-	-10 year	S	Urgent	1 year	2 year	
Element Group:	Approaches	1			Length:	6.0	m		
Element Name:	Wearing Su				Width:	7.0			
Location:	Would be	11400			Height:	7.0			
Material:	Asphalt				Count:	2			
Element Type:	Лорпан				Total Quantity		Sq.m		
Environment:	Moderate				Limited Inspec		5q.iii		
Protection System:	iviouerate				Lillited Hisped	,11011		T 5 (	
Condition	11	nits	l	Evo	Cood	Fair	Poor	Perform.	
				Exc.	Good			Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / all		78.4	5.6	0.0	0.0		
Comments: Repaved in 2019.									
Recommended Work:		Rehab	R	eplace		Maintenance	e Needs:		
		1-5 years	_	-10 year	s	Urgent	1 year	2 year	



## Description

Road over the bridge. (Looking North)



## Description

Wearing surface over the bridge. (Looking North)



## Description

Object marker and new raised curbs on West side (Looking South).



## Description

Concrete spillway, precast block retaining wall and raised curb at southwest structure corner. (Looking North).



## Description

East elevation. (Looking West)



## Description

West elevation. (Looking North)



# Description

Concrete soffit patch at East end of soffit.



# Description

Concrete soffit patch at near West end of



## Description

Crack repairs at North abutment.



## Description

Scour and concrete erosion at South abutment footings (Typ.).



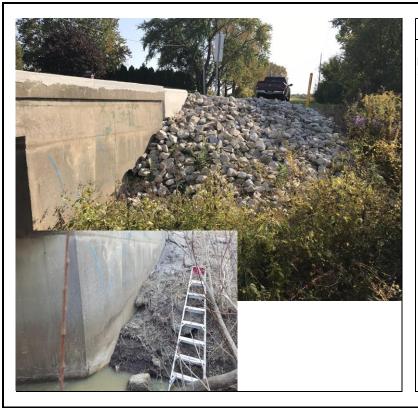
## Description

New precast block retaining wall and slope protection at northeast embankment. (Looking West)



## Description

New slope protection at southeast embankment. (Looking South)



## Description

New precast block retaining wall and slope protection at southwest embankment. (Looking South)



## Description

Waterway at west side. (Looking West)

## Ontario Structure Inspection Manual - Inspection Form

Structure Number

1005

Inventory Data:		
Structure Name	Pike Creek at Baseline Road Bridge	
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Collector x Local
MTO District		Posted Speed 60 No. of Lanes 2
Old County		AADT 1646 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Slab on Steel Girders	Interchange Number
Total Deck Length	15.3 m	Interchange Structure Number
Overall Str. Width	8.6 m	Min. Vertical Clearance m
Total Deck Area	131.6 sq. m	Special Transit Truck Routes: School Bicycle
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 m
Span Lengths	Total = 15.0 (1) = 15.0:	m
Historical Data:		
Year Built	1955	Year of Last Major Rehab. 2014
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM Ir	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date / I	Description)	
Major rehabilitation com	npleted in 2014, including but not limited	I to new beams, deck and parapet walls.

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nu	mber	1005
Scheduled Improvement	ents:			
Regional Priority Number	er	Programmed Work Year		
Nature of Program Wor	k:			
Appraisal Indices:		Comme	nts	
Fatigue	0.00			
Seismic	0.00			
Scour	0.00			
Flood	0.00			
Geometrics	0.00			
Barrier	0.00			
Curb	0.00		·	·

0.00

Load Capacity

Date of Next Inspection:

**Structure Number** 

1005
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•		•				
Field Inspection Informat	tion:					
Date of Inspection:	July 30, 2020		Type of Inspection:	x OSIM	Enhanced OS	IM
Inspector:	Jeremy Wamn	nes, E.I.T. (	Dillon Consulting Lim	ited)		
Others in Party:	Alessia Mussic	o, E.I.T. (Di	Ilon Consulting Limite	d)		
Access Equipment Used:	Camera, Meas	suring tape,	Measuring wheel, an	d Hammer		
Weather:	Sunny					
Temperature:	24 °C					
Additional Investigations	Required:				Priority	
				None	Normal	Urgent
Material Condition Survey					_	
Detailed Deck Conditi	ion Survey			Х		T
Non-Destructive Dela		v of Asphal	t-Covered Deck	X		+
Concrete Substructure			t-Oovered Deen.	X		†
Detailed Coating Con		vcy.		X		†
Detailed Timber Inves				X		+
Post-Tensioned Stran				X		†
Underwater Investigation:				Х		1
Fatigue Investigation:				Х		
Seismic Investigation:				Х		
Structure Evaluation:				Х		1
Monitoring						
Monitoring of Deforma		ents and Mo	ovements:	Х		
Monitoring Crack Wid	lths:			Х		
Investigation Notes: South fascia should be mo efflorescence and wet area		sverse narro	ow crack extends the	entire fascia lenç	th with observ	ed
Cilioropopilos ana not ales	10.					
Overall Structure Notes:						
Recommended Work on S	Structure: N	lone x	Maintenance	Minor Rehab		Replace
Timing of Recommended	Work:	х	1 to 5 years	6 to 10 years	 }	
Overall Comments:	Eros	sion protect	tion requires maintena outine maitenance. As	nce. Strip seal j	oints should be	

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Element Data							
Element Group:	Deck			Length:	14.4	m	
Element Name:	Wearing Su	ırface		Width:	8.0		
Location:				Height:			
Material:	Asphalt			Count:			
Element Type:	'			Total Quantity	: 115.0	Sa.m	
Environment:	Moderate			Limited Inspec			
Protection System:						<u> </u>	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:		each / % / all	69.0	28.8	17.3	0.0	1
Comments: WBL: Light pitting of 15	•		nd a medium		ck full length o	of structure.	
Recommended Work:		Rehab	Replace		Maintenance	Needs:	
		1-5 years	6-10 year	'S	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-plac	e concrete		Count:			
Element Type:				Total Quantity	123.7	Sq.m	
Environment:	Moderate			Limited Inspec	tion	x	
Protection System:						L	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	74.2	49.5	0.0	0.0	1
Comments:  Recommended Work:		Rehab	Replace		Maintenance	1 1	<u> </u>
		1-5 years	6-10 year	'S	Urgent	1 year	2 year
Element Group:	Decks			Length:	13.0	m	
Element Name:	Soffit - Thin	Slab - Exterio	or	Width:	0.9	m	
Location:				Height:			
Material:	Cast-in-plac	e concrete		Count:	2		
Element Type:				Total Quantity	23.4	Sq.m	
Environment:	Moderate			Limited Inspec	tion		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	14.0	3.8	4.0	1.5	
Comments: N & S Fascia: Longitud areas and efflorescence		13m)					crete wet
Recommended Work:		Rehab	Replace		Maintenance		<u> </u>
		1-5 years	6-10 year	'S	Urgent	1 year	2 year

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Element Group:	Decks				Length:		13.0	m	
Element Name:	Soffit - Thin	Slab	- Interio	r	Width:		6.8	m	
Location:					Height:				
Material:	Cast-in-place	се со	ncrete		Count:				
Element Type:					Total Quantity	<b>/</b> :	88.3	Sq.m	
Environment:	Benign				Limited Inspe	ctic	on		
Protection System:									Perform.
Condition	U	nits		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each	/ % / all	67.1	21.2		0.0	0.0	
Comments:			) a la a la	Ini.		laa.		- No ada	
Recommended Work:		1-1-	lehab -5 years	Replace		IVI	aintenance Urgent	1 year	2 year
			o yours	6-10 year					2 your
Element Group:	Decks				Length:		1.0		
Element Name:	Soffit - Thin	Slab	o - End		Width:		8.6	m	
Location:					Height:				
Material:	Cast-in-plac	ce co	ncrete		Count:		2		
Element Type:					Total Quantity			Sq.m	
Environment:	Moderate				Limited Inspe	ctic	on		
Protection System:						1			Perform.
Condition		Inits		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / 6	each	/ % / all	10.3	6.9		0.0	0.0	
Comments: Hairline cracking was of Recommended Work:	bserved in va		s location	s along the s	soffit.	M	aintenance	a Naads:	
recommended work.			-5 years	6-10 year	re	1010	Urgent	1 year	2 year
			o you.o				Jorgoni	[ ]	
Element Group:	Decks				Length:				
Element Name:	Drainage				Width:				
Location:					Height:				
Material:	Steel				Count:		6		
Element Type:	Metal drain	pipe	S		Total Quantity		-	each	
Environment:	Severe				Limited Inspe	ctic	on		
Protection System:			1			1			Perform.
Condition		Inits		Exc.	Good		Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each	/ % / all	0	6		0	0	
Comments: Four (4) additional PVC	of 2 inch dia	amete	er are loca	ated at the s	offit corners.				_
Recommended Work:		R	Rehab	Replace		Ma	aintenance	e Needs:	
		1	-5 years	6-10 year	rs		Urgent	1 year	2 year

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Element Data							
Element Group:	Joints			Length:	8.3	m	
Element Name:	Seals/seala	nts		Width:			
Location:	East/West A	Abutment		Height:			
Material:				Count:	2		
Element Type:	Strip Seal			Total Quantity	: 2	each	
Environment:	Severe			Limited Inspec		х	
Protection System:						! !	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	0	2	0	0	
Comments: Strip seal joints were fill	ed with debri		,		Mai: tanono	- Nordo	
Recommended Work:		Rehab	Replace		Maintenance	1 1	
		1-5 years	6-10 year	rs	Urgent	x 1 year	2 year
					Bridge joint o	cleaning.	
Element Group:	Joints			Length:	8.3	m	
Element Name:	Concrete E	nd Dams		Width:	0.5	m	
Location:	East/West A	Abutment		Height:			
Material:	Cast-in-plac	e concrete		Count:	4		
Element Type:				Total Quantity	: 16.5	Sq.m	
Environment:	Severe			Limited Inspec		T	
Protection System:					Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:		each / % / all	0.0	16.5	0.0	0.0	
Comments: Light rust staining was of Recommended Work:	bserved thro	oughout.	Replace		Maintenanc	o Noods:	
Necommenaca Herri		1-5 years	6-10 year	re	Urgent	1 year	2 year
		1-0 youro	10-10 you.	5	Jorgeni	i you	Z you
Element Group:	Joints			Length:	8.3	m	
Element Name:	Armouring/I	Retaining dev	ices	Width:			
Location:	East/West A	Abutment		Height:			
Material:	Steel			Count:	4		
Element Type:				Total Quantity		m	
Environment:	Severe			Limited Inspec	tion		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / e	each / % / all	0.0	33.0	0.0	0.0	
Comments: Light scraping and coati	ng removed						
Recommended Work:		Rehab	Replace		Maintenance	e Needs:	
		1-5 years	6-10 year	rs	Urgent	1 year	2 year

Element Group:	Barriers			Length:		1.0	m		
•									
Element Name:	Parapet Walls	s - Ends	Width:		0.3 m				
Location:	Solid parapet	at 4 corners	3	Height:		0.8	m		
Material:	Cast-in-place	concrete		Count:		4			
Element Type:	Parapet Wall			Total Quantity	<b>/</b> :	7.4	Sq	.m	
Environment:	Severe			Limited Inspec	ctio	n			
Protection System:									Perform.
Condition	Uni	ts	Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / ea	ach / % / all	0.0	7.1		0.2		0.1	
Comments: SE Corner: Light honey parapet end wall (0.15x		observed the	oughout. <b>NV</b>	<b>V Corner</b> : Light:	spal	ling obser	vec	d on the to	p of the
Recommended Work:		Rehab	Replace		Ма	intenance	N e	eeds:	
		1-5 years	6-10 year	rs		Urgent		1 year	2 year
			•			,			

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 i	railing	Total Quantity	: 85.1	Sq.m	
Environment:	Severe		Limited Inspec	ction		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / 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	Maintenanc		
	1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Barriers			Length:		23.0	m		
Element Name:	Hand Railing	g		Width:			m		
Location:				Height:			m		
Material:	Steel			Count:		2			
Element Type:	Parapet Wa	II with Single I	Railing	Total Quanti	ty:	46.0	m		
Environment:	Severe			Limited Insp	ecti	on			
Protection System:							•	•	Perform.
Condition	Ur	nits	Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	0.0	46.0		0.0		0.0	
Comments:									
Recommended Work:		Rehab	Replace		М	aintenance	e N	leeds:	
		1-5 years	6-10 yea	rs		Urgent		1 year	2 year

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Element Data							
Element Group:	Barriers			Length:	120.6	m	
Element Name:	Railing Syst	ems		Width:			
Location:	NW / SE / S	SW		Height:			
Material:	Steel			Count:			
Element Type:	Single Rail	(Steel Beam,	and Post)	Total Quantity	120.6	m	
Environment:	Moderate	•	·	Limited Inspec	tion		
Protection System:				·		!!	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sa.m / <b>m</b> / e	each / % / all	72.4	44.2	0.0	4.0	
Comments:	1-1					l	_ <u>I</u>
SW Barrier: Collision da	amage was d	bserved (4m)	. One (1) of	fset block missing	a. Slope erosi	on causing r	otation of posts
and potential performan						J	•
Recommended Work:		x Rehab	Replace		Maintenanc	e Needs:	
		x 1-5 years	6-10 yea		Urgent	1 year	2 year
Repair or replace dama	nged guidera		0 .0 ,00		0.90	. ,	
' '	0 0						
Element Group:	Beams/MLE	's		Length:	4.0	m	
Element Name:	Girders - Er	nd		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 Inspec		x	
Protection System:				-		!-!	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	27.7	18.5	0.0	0.0	
Comments:							
Dagamman dad Warks		Dahah	Danlass		Maintanana	- Noodo	1
Recommended Work:		Rehab	Replace		Maintenance		
		1-5 years	6-10 yea	ırs	Urgent	1 year	2 year
Element Group:	Beams/MLE	10		Length:	11.5	m	
Element Name:	Girders - Mi	-		Width:			
Location:	Girders - IVII	uule		Height:	0.3		
Material:	Weathering	Stool		Count:	0.8		
Element Type:	I type	Steel		Total Quantity	_		
Environment:	Benign			Limited Inspec		Sq.m	
Protection System:	Denign			Limited inspec	LIOII	X	Perform.
Condition	1.1	nits	Exc.	Cood	Fair	Poor	Deficiencies
			100.9	Good	0.0	0.0	Deliciencies
Data:	<b>3q.m</b> / m / 6	each / % / all	100.9	31.9	0.0	0.0	
Comments:							
Recommended Work:		Rehab	Donlass	1	Maintanara	o Noodo:	1
Necommended work:			Replace		Maintenance	1 1	2 1/02"
		1-5 years	6-10 yea	115	Urgent	1 year	2 year
I							

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Element Data							
Element Group:	Beams/MLE	's		Length:	1.8	m	
Element Name:	Diaphragms	s - End		Width:	0.1	m	
Location:				Height:	0.4	m	
Material:	Galvanized	Steel		Count:	8		
Element Type:	I-type			Total Quantity		each	
Environment:	Moderate			Limited Inspe		x	
Protection System:	moderate			Ziiiiiiou iiiopo		^	Perform.
Condition	11	nits	Exc.	Good	Fair	Poor	Deficiencies
		each / % / all	5		0	0	Deliciencies
Data:	5q.m / m / 6	each / % / all	<u> </u>	3	0		
Comments:					,		
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:	
		1-5 years	6-10 year	S	Urgent	1 year	2 year
Flamout Correct	Dear - /M.	-1-		I amouth:			
Element Group:	Beams/MLE			Length:	1.7		
Element Name:	Diaphragms	s - Intermediat	e	Width:	0.1		
Location:				Height:	0.3		
Material:	Galvanized	Steel		Count:	8		
Element Type:	I-type			Total Quantity		each	
Environment:	Benign			Limited Inspe	ction	x	
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	6	2	0	0	
Comments:							
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:	
		1-5 years	6-10 year	S	Urgent	1 year	2 year
	Io "			1			
Element Group:	Coatings			Length:	2.0		
Element Name:	Structural			Width:	0.3		
Location:	Girder Ends	<b>S</b>		Height:	0.8		
Material:				Count:	10		
Element Type:				Total Quantity		Sq.m	
Environment:	Moderate			Limited Inspe	ction		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	27.7	18.5	0.0	0.0	
Comments:							
Recommended Work:		Rehab	Replace		Maintenanc	1 1	
		1-5 years	6-10 year	s	Urgent	1 year	2 year

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#### **Element Data**

Element Group:	Abutments			Length:					
Element Name:	Abutment W	alls		Width:		8.6	m		
Location:	East/West A	butment		Height:		2.4	m		
Material:	Cast-in-plac	e concrete		Count:		2			
Element Type:	Conventiona	l closed		Total Quantity:	:	41.3	So	ı.m	
Environment:	Moderate			Limited Inspec	tion				
Protection System:									Perform.
Condition	Ur	nits	Exc.	Good	Fair			Poor	Deficiencies
Data:	Sq.m/m/e	ach / % / all	0.0	37.3	4.0			0.0	
Comments: Exisiting four (4) all dra	ins at each wa	all. <b>W Abutm</b> e	<b>ent</b> : North dr	ain is covered wi	th the dr	ain e	mb	ankment.	
SW Corner: Rust stain									
Recommended Work		Rehab	Replace		Mainter	ance	N	eeds:	
		1-5 years	6-10 year	·s	Urge	nt		1 year	2 year
	•		•						<u> </u>
İ									
Element Group:	Abutments			Length:					
Clauseut Names	Dolloot Wolle			Midth.		0.0			

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:			<b>Total Quantity</b>	: 13.8	Sq.m		
Environment:	Moderate		Limited Inspec	tion	х		
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair	Po	or	Deficiencies
Data:	<b>Sq.m</b> / m / each / % / all	8.3	4.7	0.8	0.	0	

#### Comments:

**E and W**: Narrow to hairline vertical cracks observed throughout both ballast walls.

Recommended Work:	Rehab	Replace	Maintenanc		
	1-5 years	6-10 years	Urgent	1 year	2 year

Element Group:	Abutments		Length:	Var.	m	
Element Name:	Wingwalls	Width:				
Location:	East/West Abutment	Height:	3.2	m		
Material:	Cast-In-place concrete	Cast-In-place concrete				
Element Type:	Reinforced concrete	Reinforced concrete			Sq.m	
Environment:	Benign		Limited Inspec	ction		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Fair Poor	
Data:	<b>Sq.m</b> / m / each / % / all	0.0	54.7	5.0	0.5	

#### Comments:

Crack Quantity (Length): NE and NW ±4.40m, SE ±3.20m, and SW ±6.80m. SW Corner: 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.

Recommended Work:	Rehab	Replace		Maintenance Needs:			
	1-5 years	6-10 years	Urgent	1 year	2 year		
-							

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Element Group:	Abutments					Length:						
Element Name:	Bearings					Width:						
Location:	East/West A	٩bι	utment			Height:						
Material:	Laminated I	Ξla	stomeric B	ea	ring	Count:		10				
Element Type:						Total Quantity: 10 each						
Environment:	Moderate					Limited Inspe	ctio	on				
Protection System:												Perform.
Condition	U	nits	3		Exc.	Good		Fair		Poor	D	eficiencies
Data:	Sq.m/m/e	ac	<b>h</b> / % / all		6	4		0		0		
Comments: Multiple anchor rods we	re observed	to	_	nec		ical) in the longi						
Recommended Work:			Rehab		Replace		M	aintenance			Ĺ.,	
			1-5 years		6-10 years	S		Urgent		1 year		2 year
Element Group:	Embankme	nts	& Streams	3		Length:						
Element Name:	Streams an	d V	Vaterways			Width:						
Location:						Height:						
Material:						Count:		1				
Element Type:						<b>Total Quantity</b>	<b>'</b> :	1	ea	ch		
Environment:						Limited Inspe	ctic	on				
Protection System:								•				Perform.
Condition	U	nits	3		Exc.	Good		Fair		Poor	D	eficiencies
Data:	Sq.m/m/e	ac	<b>h</b> / % / all		0	0		0		1		
Comments: Concrete debris in strea	nm. Stream is	s ot	_	ner		ucture.						
Recommended Work:			Rehab		Replace		M	aintenance			<u> </u>	
			1-5 years		6-10 years	S	Ļ	Urgent	_	1 year	X	2 year
							R	emove debr	IS I	n stream		
Element Group:	Embankme	nts	& Streams			Length:						
Element Name:	Embankme					Width:						
Location:	All Four Qu			liti	onal drain							
Material:	7 7 0 0 0.0.		,			Count:		5				
Element Type:						Total Quantity	,·		ead	ch.		
Environment:	Moderate					Limited Inspe				011		
Protection System:									l.			Perform.
Condition	U	nits	3		Exc.	Good		Fair		Poor		eficiencies
Data:	Sq.m/m/e				0	2	<u> </u>	3		0		
Comments: SE, SW and NW Emba			•	sio		<u> </u>						
Recommended Work:			Rehab		Replace		M	aintenance	Ne	eeds:		
			1-5 years		6-10 years	S		Urgent		1 year	Х	2 year
							In	stall erosion	pr	rotection.		

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#### Floment Data

Recommended Work:

Element Group:	Embankmer	nts & Streams		Length:			
Element Name:	Slope Prote	ction		Width:			
Location:				Height:			
Material:					,		
Element Type:	Hand laid rip	orap		Total Quantity	<i>'</i> :	l each	
Environment:	Moderate	-		Limited Inspec	ction		
Protection System:				-		- <del> </del> -	Perform.
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	ach / % / all	0	1	0	0	
Comments:		1		1			
NE Embankment: Slop	e protection p	orovided at the	e CSP outle	rt.			
Recommended Work:		Rehab	Replace		Maintenand	e Needs:	
		1-5 years	6-10 yea	rs	Urgent	1 year	x 2 year
					Consider er	osion protect	ion at all
					embankmer	nts.	
Element Group:	Signs			Length:			
Element Name:	Signs			Width:			
Location:				Height:			
Material:				Count: 5			
Element Type:				Total Quantity: 5 each			
Environment:				Limited Inspec	ction		
D 4 41 O 4						-11	Perform.
Protection System:							i ciioiii.
Condition	Uı	nits	Exc.	Good	Fair	Poor	
		nits ach / % / all	Exc.	Good 5	Fair 0	Poor 0	
Condition	Sq.m/m/e	ach / % / all	0 SPEED LIM	5	0 West railing	0 system, and	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA	Sq.m/m/e RKER Signs e.	ach / % / all	0 SPEED LIM Replace	5 IT Sign at South	0	0 system, and	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol	Sq.m/m/e RKER Signs e.	ach / % / all at 3 corners,	0 SPEED LIM	5 IT Sign at South	0 West railing	0 system, and	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol	Sq.m/m/e RKER Signs e.	at 3 corners, S	0 SPEED LIM Replace	5 IT Sign at South	0 West railing	0 system, and ce Needs:	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol	Sq.m/m/e RKER Signs e.	at 3 corners, \$  Rehab  1-5 years	0 SPEED LIM Replace	5 IT Sign at South	0 West railing	osystem, and se Needs:	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:	Sq.m/m/e RKER Signs e.	at 3 corners, S  Rehab  1-5 years	0 SPEED LIM Replace	IT Sign at South	0 West railing Maintenand Urgent	osystem, and se Needs:	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:	Sq.m / m / e RKER Signs e. Approaches	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	TSign at South	West railing  Maintenand Urgent  10.0	osystem, and se Needs: 1 year	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name: Location:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	IT Sign at South rs  Length: Width:	West railing  Maintenand Urgent  10.0 0.3	system, and ce Needs: 1 year  0 m 3 m	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name: Location: Material:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters NW / SE / S	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	TSign at South  rs  Length: Width: Height:	West railing  Maintenand Urgent  10.0 0.3	system, and  ce Needs:  1 year  m m  m m  m m  m m  m m  m m  m m  m	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name: Location: Material: Element Type:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters NW / SE / S	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	TSign at South  rs  Length: Width: Height: Count:	West railing  Maintenand Urgent  10.0 0.3 0.2 30.0	system, and  ce Needs:  1 year  m m  m m  m m  m m  m m  m m  m m  m	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters NW / SE / S Cast-in-place	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	TSign at South  IT Sign at South  rs  Length: Width: Height: Count: Total Quantity	West railing  Maintenand Urgent  10.0 0.3 0.2 30.0	system, and  ce Needs:  1 year  m m  m m  m m  m m  m m  m m  m m  m	Deficiencies
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name: Location: Material: Element Type: Environment:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters NW / SE / S Cast-in-place	at 3 corners, s Rehab 1-5 years	0 SPEED LIM Replace	TSign at South  IT Sign at South  rs  Length: Width: Height: Count: Total Quantity	West railing  Maintenand Urgent  10.0 0.3 0.2 30.0	system, and  ce Needs:  1 year  m m  m m  m m  m m  m m  m m  m m  m	CHECK  2 year  Perform.
Condition Data: Comments: Three (3) HAZARD MA BOARD Sign at the pol Recommended Work:  Element Group: Element Name: Location: Material: Element Type: Environment: Protection System:	Sq.m / m / e  RKER Signs e.  Approaches Curb/gutters NW / SE / S Cast-in-place Moderate	at 3 corners, 5 Rehab 1-5 years  W e concrete	0 SPEED LIM Replace 6-10 yea	Length: Width: Height: Count: Total Quantity Limited Inspec	Maintenand Urgent  10.0 0.3 0.2 30.0 ction	system, and se Needs: 1 year  0 m 3 m 2 m 3	Deficiencies  CHECK  2 year

Replace

6-10 years

Maintenance Needs:

1 year

2 year

Urgent

Rehab

1-5 years

1005

#### **Element Data**

Element Group:	Approaches		Length:	6.0	) m	1	
Element Name:	Wearing Surface	Wearing Surface			) m	1	
Location:	East/West Approaches	Height:					
Material:	Asphalt	Count:	2	2			
Element Type:					Total Quantity: 84.0 Sq.m		
Environment:	Moderate		Limited Inspec	ction			
Protection System:						•	Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / each / % / all	50.4	26.6	7.0		0.0	
Comments:	-			•		•	

East Approach: Medium transverse crack extends the full width and a medium to wide crack 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 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:			<b>Total Quantity</b>	: 84.0	Sq.m		
Environment:	Moderate		Limited Inspection x				
Protection System:							Perform.
Condition	Units	Units Exc. Good Fair Poor		oor	Deficiencies		
Data:	<b>Sq.m</b> / m / each / % / all	50.4	33.6	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.	



## Description

Road over the bridge. (Looking East)



## Description

Wearing surface over the bridge, curbs, railing system, and barriers at south edge



## Description

Railing system at southeast curb.



## Description

Barrier wall at bridge north edge. (Looking West)



# Description

Expansion joint at east of the bridge. (Looking South)



# Description

Deck drainge



# Description

SBEAT at east approach. (Looking East)



### Description

Railing system at southeast curb.



### Description

Spall on northwest corner of parapet end wall (Looking North)



### Description

North deck fascia, stream, and embankments (Looking West). Longitudinal cracks in fascia with active wet areas and efllorescence (typ.)



### Description

South deck fascia, and deck drainage, (Looking North). Longitudinal cracks in fascia with active wet areas and efllorescence (typ.)



### Description

Deck soffit, main girders, diaphrams, and deck drainage. (Looking West)



# Description

Bearing seat at east abutment wall with typical bent anchor bolt.
(Looking South)



# Description

Misaligned anchor rod at abutment bearings (typ.)



# Description Wall drains at East abutment. (Looking South)



# East abutment wall drains

Description



Description
Embankments northeast side. (Looking East)



# Description

Embankments and waterway at south side. (Looking South)



Description
Waterway. (Looking South)



Description
Embankments and waterway. (Looking North)

### Ontario Structure Inspection Manual - Inspection Form

Structure Number

1006

Inventory Data:		
Structure Name	Sullivan Creek at Baseline Road Bridge	e
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Collector x Local
MTO District		Posted Speed 60 No. of Lanes 2
Old County		AADT 1700 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Rigid Frame	Interchange Number
Total Deck Length	5.9 m	Interchange Structure Number
Overall Str. Width	19.8 m	Min. Vertical Clearance m
Total Deck Area	116.8 sq. m	Special Transit Truck Routes: School Bicycle
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 m
Span Lengths	Total = 5.2 (1) = 5.2;	m
Historical Data:		
Year Built	2015	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM Ir	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date / I	Description)	
Bridge was fully replace	ed in 2015	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nu	mber 1006
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comme	ents
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

O				
Ontario Structure	Inspection	wanuai -	inspection	Form

**Structure Number** 

1006
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Field Inspection Informa	tion:									
Date of Inspection:	July 30, 2020	Type of Inspectio	n: x OSIM	Enhanced OS	SIM					
I	I	T.T. (Diller Consolting L	::41)							
Inspector:	Jeremy wammes, E	E.I.T. (Dillon Consulting L	-imitea)							
Others in Party:	Alessia Mussio, E.I.	T. (Dillon Consulting Lim	iited)							
Access Equipment Used:	Camera, Measuring	tape, Measuring wheel,	and Hammer							
Weather:	Sunny									
Temperature:	24 °C									
	<u> </u>									
Additional Investigations	Required:			Priority						
			None	Normal	Urgent					
Material Condition Survey										
Detailed Deck Condition	ion Survey:		х	1						
		sphalt-Covered Deck:	X							
Concrete Substructur		Sprian Govered Deck.	X							
Detailed Coating Con			X							
Detailed Timber Inves			X							
Post-Tensioned Strar			X							
Underwater Investigation:	ia iiivooligatioiii		X	1						
Fatigue Investigation:			X							
Seismic Investigation:			X							
Structure Evaluation:			Х							
Monitoring			L		_1					
Monitoring of Deform	ations, Settlements a	nd Movements:	Х							
Monitoring Crack Wid	Iths:		Х							
Investigation Notes:			·							
Overall Structure Notes:										
Recommended Work on S	Structure: x None	Maintenance	Minor Reha	b	Replace					
			Major Rehal	b.						
Timing of Recommended	Work:	1 to 5 years	6 to 10 year	S						
Overall Comments:		II/delaminations noted at			S.					
Date of Next Inspection:	June 202	2								
Date of Mext Hispertion.	Julie 202	Julie 2022								

Element Group:	Decks			Length:	5.9	m				
Element Name:	Wearing sur	face		Width:	11.0	m				
Location:	Top of Deck			Height:						
Material:	Asphalt			Count:						
Element Type:				Total Quantity	Total Quantity: 64.9 Sq.m					
Environment:	Moderate				Limited Inspection					
Protection System:						1 1	Perform.			
Condition	Ur	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	<b>Sq.m</b> / m / e			21.6	0.0	0.0	1			
Comments:	·		1							
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:				
		1-5 years	6-10 yea	ırs	Urgent	1 year	2 year			
Element Group:	Barriers			Length:	7.0	m				
Element Name:	Railing Syst	em		Width:						
Location:				Height:	0.65	m				
Material:	Steel			Count:	2	2				
Element Type:	Box Beam F	Railing on Cu	ırb	Total Quantity	: 14.0	m				
Environment:	Moderate			Limited Inspec	ction					
Protection System:				-		l l	Perform.			
Condition	Ur	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sq.m / <b>m</b> / e	ach / % / all	9.3	4.7	0.0	0.0				
Comments:  Recommended Work:		Rehab	Replace		Maintenanc	e Needs:				
		1-5 years	++-		Urgent	1 1 1				
							2 year			
Element Group:	Barriers			Length:	Var.	m				
Element Name:	Railing Syst	em		Width:						
Location:	All four quad			Height:						
Material:	Steel			Count:	4	-	-			
Element Type:	SBGR w/ Cl	nannel OPSI	912.130	Total Quantity	: 34.2	m	-			
Environment:	Moderate			Limited Inspec						
Protection System:						<del>                                     </del>	Perform.			
Condition	Ur	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sq.m / <b>m</b> / e		22.8	11.4	0.0	0.0				
Comments: NE: 7.6m, NW: 11.4m, \$				und posts at NW	structure corn	ier.				
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:				
		1-5 years	6-10 yea	ırs	Urgent	1 year	2 year			

Element Group:	Barriers					Length:		Var.	m	
Element Name:	Railing Syst	tem				Width:				
Location:	All four qua	drar	nts			Height:				
Material:	Steel					Count:		4		
Element Type:	SBGR w/ec	cent	tric loader	е	nd treat	<b>Total Quantity</b>	:	95.1	m	
Environment:	Moderate					Limited Inspec		n		
Protection System:						•		L		Perform.
Condition	U	nits			Exc.	Good		Fair Poor		Deficiencies
Data:	Sq.m / <b>m</b> / 6	ach	n / % / all		63.4	31.7		0.0	0.0	
Comments: NE: 34.3m, NW: 15.2m, SE: 15.2m, and SW: 30.3m										
Recommended Work:		F	Rehab		Replace		Ma	aintenance	Needs:	
		Π	1-5 years		6-10 year	S		Urgent	1 year	2 year
Element Group:	Culverts				Length:		5.2	m		
Element Name:	Barrels - So	offit				Width:		19.8	m	
Location:						Height:				
Material:	Precast con	cret	te			Count:				
Element Type:						Total Quantity	:	103.0	Sa.m	
Environment:	Benign					Limited Inspec			1	
Protection System:	20111911									Perform.
Condition	Units				Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e				82.4	18.1		2.0	0.5	Bonolonolo
Comments: Six (6) locations of light	spalling or d	lelan	mination o	bs	served at p	recast joints on s	soff	it.		
Recommended Work:		F	Rehab		Replace		Ma	intenance		
		$\prod'$	1-5 years		6-10 year	S		Urgent	1 year	2 year
Element Group:	Culverts					Length:		19.8	m	
Element Name:	Barrels - Ve	ertica	al Walls			Width:				
Location:	East/West					Height:		2.8	m	
Material:	Precast con	cret	te			Count:		2		
Element Type:	Legs of rigio					Total Quantity	:	110.9	Sa.m	
Environment:	Benign					Limited Inspec				
Protection System:								<u> </u>	<u>.</u>	Perform.
Condition	U	nits			Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / 6				88.7	21.9		0.2	0.1	
Comments: Thirteen (13) light spalls	•			sc					-	
Recommended Work:		F	Rehab		Replace		Ma	intenance	Needs:	
			1-5 years		6-10 year	S		Urgent	1 year	2 year
		1			· ·			1		

Liement Data											
Element Group:	Culverts					Length:		Var.	m		
Element Name:	Inlet/Outlet	Со	mponents	۱ -	Wingwall	Width:					
Location:						Height:		3.0	m		
Material:	Precast Blo	cks	s (1.5*0.75 <sup>*</sup>	*0	.75)	Count:					
Element Type:	Reinforced	COI	ncrete			Total Quantity: 108.0 Sq.m					
Environment:	Moderate					Limited Inspec	ctio	n			
Protection System:									•	Perform.	
Condition	U	Inits	3		Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / 6	eac	h/%/all		72.0	33.0		2.0	1.0		
Comments: NE and NW: 12.0m; and SE and SW: 6.0m. Light to very s						re scaling obser				precast blocks.	
Recommended Work:			Rehab	L	Replace		<u> </u>	intenance		<u> </u>	
			1-5 years		6-10 years	S		Urgent	1 year	2 year	
Element Group:	Foundations	S				Length:		5.2	m		
Element Name:	Foundations	s (t	pelow grade	е	level)	Width:		19.8			
Location:						Height:					
Material:	Precast concrete					Count:					
Element Type:	Bottom of ri	igid	I Box			Total Quantity	<b>'</b> :	103.0	Sq.m		
Environment:	Benign					Limited Inspec			x		
Protection System:										Perform.	
Condition	Units Exc.				Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	eac	h/%/all		82.4	20.6		0.0	0.0		
Comments:  Recommended Work:			Rehab		Replace		Ma	intenance	Noods	T	
Recommended Work.			1-5 years	H	6-10 years	<u> </u>	-	1 year	2 year		
			1-5 years	<u> </u>	0-10 years	s Urgent			ı yeai	2 year	
Element Group:	Embankme	nts	& Streams	3		Length:					
Element Name:	Embankme			_		Width:					
Location:	All Four Qua					Height:					
Material:						Count:		4			
Element Type:						Total Quantity	·-		each		
Environment:	Benign					Limited Inspec					
Protection System:										Perform.	
Condition	U	Inits	 3		Exc.	Good		Fair	Poor	Deficiencies	
Data:	Sa.m/m/e				3	1		0	0		
Comments:											
Recommended Work:			Rehab		Replace		Ма	intenance	Needs:		
			1-5 years		6-10 years	s		Urgent	1 year	2 year	
				-							

Liement Data												
Element Group:	Embankme	nts	& Streams	3		Length:						
Element Name:	Streams an	d W	/aterways			Width:						
Location:						Height:						
Material:						Count:		1				
Element Type:						Total Quantity: 1 All						
Environment:						Limited Inspection						
Protection System:								•		Perform.		
Condition	П	nits			Exc.	Good	T	Fair	Poor	Deficiencies		
Data:	Sq.m/m/e				1	0	+	0	0	Demoiorioles		
Comments:	<u>  0q.m/ m/ c</u>	Jaci	17 70 7 <b>an</b>			1 0	<u> </u>	<u> </u>		<u> </u>		
Recommended Work:		1 1	Rehab Replace				м	laintenance	Noods:	<u> </u>		
itecommended work.		+	1-5 years		6-10 year	•	101	Urgent	1 year	2 year		
									·			
Element Group:	Embankments & Streams					Length:						
Element Name:	Slope prote	ctio	n			Width:						
Location:	All four emb	oanl	kments			Height:						
Material:						Count:						
Element Type:	Hand laid ri	pra	ρ			<b>Total Quantity</b>	<b>/</b> :	4	each			
Environment:	Moderate					Limited Inspe	cti	on				
Protection System:									l .	Perform.		
Condition	U	nits			Exc.	Good		Fair	Poor	Deficiencies		
Data:	Sq.m/m/	eac	h / % / all		3	1		0	0			
Comments:  Recommended Work:			Rehab		Replace		M	laintenance	Needs:			
			1-5 years		6-10 year	s		Urgent	1 year	2 year		
Element Group:	Signs					Length:						
Element Name:	Signs					Width:						
Location:	At Four core	ners	of Guide	ra	ils	Height:						
Material:						Count:		4				
Element Type:	Hazard Mar	rker	Signs			<b>Total Quantity</b>	<b>/</b> :	4	each			
Environment:						Limited Inspe		on		-		
Protection System:						•				Perform.		
Condition	U	nits			Exc.	Good	T	Fair	Poor	Deficiencies		
Data:	Sq.m/m/				0	4	T	0	0			
Comments:	104						1					
Recommended Work:			Rehab		Replace		M	laintenance	Needs:			
-			1-5 years		6-10 year	S	T	Urgent	1 year	2 year		
					•			- 1	1 -	<u> </u>		

Liement Data											
Element Group:	Approaches	3			Length:		6.0	m			
Element Name:	Wearing su	rfa	ce		Width:		11.0	m			
Location:	East/West a	app	oroaches		Height:						
Material:	Asphalt				Count:		2				
Element Type:					Total Quantity: 132.0 Sq.m						
Environment:	Moderate				Limited Inspec	ctio	1				
Protection System:					-						Perform.
Condition	U	nits	S	Exc.	Exc. Good		Fair	Poor		1 0	eficiencies
Data:	<b>Sq.m</b> / m / e	220	ch / % / all	88.0	43.0				0.0	T	
Comments:	104	Juc	70 7 dii								
E Approach: Medium tr	ansverse cra	ack	_		3.L. (4x0.25m)	1					
Recommended Work:			Rehab	Replace		M	aintenance				
			1-5 years	6-10 year	S		Urgent	x 1 y	⁄ear		2 year
			Ro	oute and se	eal						
FI	Approaches				II 41						
Element Group:		Length:		6.0							
Element Name:	Approach s				Width:		11.0	m			
Location:	East/West a				Height:		0.25				
Material:	Cast-in-plac	ce (	concrete		Count:		2				
Element Type:					Total Quantity		132.0	_i_			
Environment:	Moderate Limited Inspection x										
Protection System:						1				_	Perform.
Condition	U	nits	S	Exc.	Good		Fair	P	oor	D	Deficiencies
Data:	<b>Sq.m</b> / m / e	eac	ch / % / all	88.0	44.0		0.0	C	0.0		
Comments:			T=			1				T	
Recommended Work:			Rehab	Replace		M	Maintenance Needs:				T _
			1-5 years	6-10 year	S		Urgent	1 y	ear	<u> </u>	2 year
Element Group:	Approaches				Length:						
Element Name:	Curb/Gutter				Width:						
	All four Qua		onto								
Location:					Height:		<u> </u>				
Material:	Cast-in-plac			ODOD 005 0	Count:		4				
Element Type:	1	Jur	b Outlets) (	JPSD 605.0	Total Quantity			each			
Environment:	Moderate				Limited Inspec	ctic	on			_	D (
Protection System:	ļ.,,									┨_	Perform.
Condition		nits		Exc.	Good		Fair		oor	ᄕ	Deficiencies
Data:	Sq.m/m/e	eac	<b>:h</b> / % / all	3	1		0		0	<u> </u>	
	Comments: Hairline cracking was observed throughout.										
Recommended Work: Rehab Replace						M	aintenance	Nee	ds:		
			1-5 years	6-10 year	'S		Urgent	1 y	/ear		2 year
							<u>.                                      </u>				

**Structure Number** 

1006

Element Group:	Approaches	;			Length:	Length: Var. m					
Element Name:	Curb/Gutter				Width:						
Location:	All four Qua	dra	ants		Height:						
Material:	Cast-in-plac	e c	concrete		Count:		4				
Element Type:	Barrier Curb	s (	OPSD 605.	.040	Total Quantity	<b>/</b> :	36.0	m			
Environment:	Moderate				Limited Inspe	cti	on				
Protection System:											Perform.
Condition	Units			Exc.	Good		Fair	Poor		D	eficiencies
Data:	Sq.m / <b>m</b> / e	ac	h/%/all	24.0	12.0		0.0	0.0			
Comments:											
Recommended Work:			Rehab	Replace		M	aintenance	· N	leeds:		
		1-5 years 6-10 year			S		Urgent		1 year		2 year



# Description

Road over the bridge. (Looking West)



### Description

Wearing surface at west approach.



### Description

Wearing surface over the bridge. (Looking East)



### Description

Wearing surface over the bridge. (Looking South)



# Description

Spillway at SW corner. (Looking South)



### Description

South elevation. (Looking North)



Description
Discrete locations of light spalling at the south headwall.



Description
Structure barrel (Looking North).



# Description

Existing concrete parging at precast unit joint.



**Description**North embankments and waterway. (Looking North)



# **Description**Embankments and waterway. (Looking South)



# Description Embankments and retaining walls at north elevation. (Looking East)



**Description**Embankments and retaining walls at north elevation. (Looking West)



# Description

Embankments and retaining walls at south elevation. (Looking West)



# Description

Embankments and retaining walls at south elevation. (Looking East)

### Ontario Structure Inspection Manual - Inspection Form

Structure Number

1009

Inventory Data:		
Structure Name	Pike Creek at Malden Road Culvert	
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
Hwy/Road Name	Malden Road	
Structure Location	0.90 km South West from Manning Ro	ad
Latitude	42° 12' 44.7"	Longitude [-82° 52' 59.1"
Owners	Town of Tecumseh	Heritage Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local X
MTO District		Posted Speed 50 No. of Lanes 2
Old County		AADT 1115 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Rigid Frame	Interchange Number
Total Deck Length	5.5 m	Interchange Structure Number
Overall Str. Width	13.0 m	Min. Vertical Clearance
Total Deck Area	70.9 sq. m	Special Transit Truck Routes: School Bicycle
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;	m
Historical Data:		
Year Built	2007	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM Ir	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date / I	Description)	
The culvert was fully re	placed in 2007	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nu	1009					
Scheduled Improvement	ents:							
Regional Priority Number	er	Programmed Work Year						
Nature of Program Wor	k:							
Appraisal Indices:		Comments						
Fatigue	0.00							
Seismic	0.00							
Scour	0.00							
Flood	0.00							
Geometrics	0.00							
Barrier	0.00							
Curb	0.00							

0.00

Load Capacity

Stri	ictur	e Num	hor
่อแเ	uctur	= Nuii	ıbeı

1009
------

Field Inspection Information	n:							
Date of Inspection: Ju	ıly 31, 2020	Type of Inspection	: x OSIM	Enhanced (	OSIM			
Inspector: Je	eremy Wammes, E	E.I.T. (Dillon Consulting Li	imited)					
Others in Party: Al	essia Mussio, E.I.	T. (Dillon Consulting Limi	ted)					
Access Equipment Used: Ca	amera, Measuring	tape, Measuring wheel, a	and Hammer					
Weather: So	unny							
Temperature: 25	5.0 °C							
Additional Investigations Re	equired:			Priority				
			Non	e Normal	Urgent			
Material Condition Survey								
Detailed Deck Condition	Survey:		х					
Non-Destructive Delamir		sphalt-Covered Deck:	X					
Concrete Substructure C		•	Х					
Detailed Coating Conditi			Х					
Detailed Timber Investig	Х							
Post-Tensioned Strand I	nvestigation:		Х					
Underwater Investigation:			Х					
Fatigue Investigation:			X					
Seismic Investigation:			X					
Structure Evaluation:			Х					
Monitoring  Monitoring of Deformation	ne Sottlemente a	nd Movements:	х					
Monitoring Crack Widths		ilu iviovernents.	X					
Investigation Notes:			<b>-</b>					
Overall Structure Notes:								
Recommended Work on Stru	cture: None	x Maintenance	Minor R	ehab.	Replace			
			Major R	ehab.				
Timing of Recommended Wo	rk:	1 to 5 years	6 to 10	vears				
Overall Comments:		eplaced in 2007. Routine			d seal			
	asphalt cracks, improve embankment stability (additional rip rap, gabion repair), and guide rail repairs. Consider adding object markers to remaining							
Date of Next Inspection:	corners. June 202	22						
= 5.5 or 110/1 intopoolion.	134110 202							

1009

### **Element Data**

Element Group:	Decks			Length:		5.5	m	•	
Element Name:	Wearing Sur	face		Width:		7.0 m			
Location:				Height:		0.1	m		
Material:	Asphalt		Count:						
Element Type:						38.2	Sc	m.p	
Environment:	Moderate	Moderate				on			
Protection System:							•	Perform.	
Condition	Un	its	Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / ea	ach / % / all	0.0	31.2		3.5		3.5	
Surface have number transverse crack exter	nding the entire		road (7x0.5n		ersa	al directions	. N	lidspan:	Severe
Recommended Work	<b>:</b>	Rehab	Replace		M	aintenance	N :	leeds:	
		1-5 years	6-10 year	s		Urgent		1 year	2 year
Element Group:	Barriers			Length:		23.0	m		
Element Name:	Railing Syste	ms		Width:					
Location:	East/West R	nad Edge		Height:					

Element Group:	Barriers	Barriers					
Element Name:	Railing Systems	Railing Systems					
Location:	East/West Road Edge	Height:					
Material:	Steel	Count: 2					
Element Type:	Single Rail (Steel Beam,	Total Quantity: 46.0					
Environment:	Moderate		Limited Inspection				
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / each / % / all	6.1	37.9 1.0			1.0	
Comments:							

### Comments:

**NW and SE Corners**: Guiderails have protective end treatments. **W Edge**: Rail is bent at local area between two posts. **E Edge:** Rail is disconnected from offset block at SE corner.

Recommended Work:	Rehab	Replace	M	Maintenance Needs:			
	1-5 years	6-10 years		Urgent		1 year	2 year

Element Group:	Barriers		Length:	0.1	m		
•							
Element Name:	Posts		Width:	0.2	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 Inspec	tion			
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. **East Side**: Post settlement and rotation observed. Rail is disconnected from post at S corner. **West Side**: Two posts (2) are slightly bent. No guiderail end treatments were observed.

Recommended Work:	Rehab	Replace	Maintenance Needs:						
	1-5 years	6-10 years	Urgent x 1 year	2 year					
	Repair settled posts.	Repair settled posts.							

Element Data									
Element Group:	Culverts			Length:	4.8	m			
Element Name:	Barrels - Sc	offit		Width:	13.0	m			
Location:				Height:					
Material:	Cast-in-place	ce concrete		Count:					
Element Type:	Reinforced	concrete		Total Quantity	62.4	62.4 Sq.m			
Environment:	Benign			Limited Inspec	tion				
Protection System:							Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	30.0	32.4	0.0	0.0			
Comments:				,					
Recommended Work:		Rehab	Replace		Maintenanc		1-		
		1-5 years	6-10 year	S	Urgent	1 year	2 year		
Element Group:	Culverts			Length:	4.8	m			
Element Name:	Inlet / Outle	t Components	3	Width:					
Location:	East/West (	Culvert Ends		Height:	1.0	m			
Material:	Cast-in-plac	ce concrete		Count:	2	2			
Element Type:	Reinforced	concrete		Total Quantity		Sq.m			
Environment:	Moderate			Limited Inspec	tion				
Protection System:						,	Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	1.3	8.3	0.0	0.0			
Comments:  Both Fascia: Hairline c cracks extending from h		_					ascia. Hairline		
Recommended Work:		Rehab	Replace		Maintenance		10		
		1-5 years	6-10 year	S	Urgent	1 year	2 year		
Element Group:	Culverts			Length:	13.0	m			
Element Name:	Barrels - Ve	ertical Walls		Width:		<del></del>			
Location:	North/South			Height:	2.1	m			
Material:	Cast-in-plac	ce concrete		Count:	2				
Element Type:	Reinforced			Total Quantity		Sq.m			
Environment:	Benign			Limited Inspec		x			
Protection System:						<del></del>	Perform.		
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sg.m</b> / m / e	each / % / all	26.2	28.4	0.0	0.0			
Comments:									
Recommended Work:		Rehab	Replace		Maintenanc	<del></del>			
		1-5 years	6-10 year	S	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-plac	ce concrete		Count:	4	4			
Element Type:	Reinforced	Concrete		<b>Total Quantity</b>	otal Quantity: 37.2 Sq.m				
Environment:	Moderate			Limited Inspec	Limited Inspection				
Protection System:						•	Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / 6	each / % / all	5.0	32.2	0.0	0.0			
Comments: NW: One (1) hairline cra	ack was obse								
Recommended Work:		Rehab	Replace		Maintenance				
		1-5 years	6-10 year	'S	Urgent	1 year	2 year		
Element Group:	Retaining W	/alls		Length:	10.0	m			
Element Name:	Walls			Width:					
Location:	South-East	Embankment		Height:	2.0	m			
Material:	Gabions			Count:	1	1			
Element Type:				Total Quantity	: 20.0	Sq.m			
Environment:	Moderate			Limited Inspec	tion				
Protection System:							Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	2.7	17.1	0.1	0.1			
Comments: Two (2) ruptures in the	wire mesh we			,					
Recommended Work:		Rehab	Replace		Maintenance		x 2 year		
		1-5 years	6-10 year	'S	Urgent				
					Repair gabio	<u> </u>			
Element Group:	Retaining W	/alls		Length:					
Element Name:	Walls			Width:					
Location:	North-West	Embankmen	t	Height:					
Material:	Concrete BI	ocks		Count:	6				
Element Type:				Total Quantity	: 6	each			
Environment:	Moderate			Limited Inspec					
Protection System:					-		Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m/m/e	each / % / all	0	5	1	0			
Comments: Differential settlement o	f block adjac	ent to structu	re, as well as	corrosion stainii	ng.				
Recommended Work:		Rehab	Replace		Maintenance	Needs:			
		1-5 years	6-10 year	s	Urgent	1 year	2 year		

						1				_	
Element Group:	Embankme					Length:					
Element Name:	Streams an	d W	/aterways			Width:					
Location:						Height:					
Material:						Count: 2					
Element Type:						Total Quantity: 2 all					
Environment:						Limited Inspec	ctic	on			
Protection System:						-			l	Г	Perform.
Condition	U	nits			Exc.	Good		Fair	Poor	[	Deficiencies
Data:	Sq.m/m/e	each	n / % / <b>all</b>		0	1		0	1		
Comments:											
Decemberded Works		1 1	Dobob		Donlago		N/A	nintan an ac	Needer		
Recommended Work:		$\vdash$	Rehab		Replace		IVI	aintenance		<u> </u>	T <sub>0</sub>
			1-5 years		6-10 years	S		Urgent	1 year	Щ	2 year
Flament 0	Embankme	t 0	Ctroors			I amouth.				_	
Element Group:			Streams			Length:					
Element Name:	Embankme	กเร				Width:					
Location:						Height:					
Material:						Count:		6			
Element Type:						Total Quantity			each		
Environment:	Moderate					Limited Inspec	ctic	on		_	
Protection System:											Perform.
Condition		nits			Exc.	Good		Fair	Poor	╚	Deficiencies
Data:	Sq.m / m / 6	eacl	h / % / all		0	4		2	0	L	
Comments: Existing gabion baskets unstable.	are damage	ed a	t S corner	of	structure.	All embankmen	ts a	at East (inle	t) side noted	to	be
Recommended Work:			Rehab		Replace		Ma	aintenance	Needs:		
			1-5 years		6-10 years	S		Urgent 1 year		Х	2 year
			,				Routine maintenance.				
Element Group:	Embankme	nt 8	Streams			Length:				_	
Element Name:	Slope Prote					Width:					
Location:	NE/SW Em					Height:					
Material:						Count:		2		_	
Element Type:	Hand Laid r	inra	an			Total Quantity	, <b>.</b>		each	_	
Environment:	Moderate	.p.c	<u>'P</u>			Limited Inspec		·			
Protection System:	Moderate					Limited mope.	-	<b>711</b>			Perform.
Condition	U	nits			Exc.	Good		Fair	Poor	ı	Deficiencies
Data:	Units Exc. Sq.m/m/each/%/all 0					0		1	1	Ė	2011010110100
Comments:	3q.11171117 <b>6</b>	acı	11 / /0 / all			0		'	•		
NE: Poor rip-rap condition	on. Embankr	mer	nt slope at	this	s propety o	corner should be	e pu	ulled back.			
Recommended Work:			Rehab		Replace		Ma	aintenance	Needs:		
				6-10 years	S		Urgent	1 year	Х	2 year	
		1						_	rap needed.		
							1				

**Structure Number** 

1009

### **Element Data**

Element Group:	Signs			Length:				
Element Name:	Signs			Width:				
Location:	NW/SE Barriers			Height:				
Material:				Count:	2	2		
Element Type:	Hazard Marker Sign			Total Quantity	: 2	2 each		
Environment:				Limited Inspection				
Protection System:								Perform.
Condition	Unit	s	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / eac	<b>ch</b> / % / all	0	2	0	0 0		
Comments:								
Missing bridge OBJECT MARKER Signs on NE and SW								
Recommended Work:		Rehab	Replace		Maintenance Needs:			
		1-5 years	6-10 years	3	Urgent		1 year	x 2 year
				Install bridge	stall bridge object marker signs.			

Element Group:	Approaches	Length:	6.0	m		
Element Name:	Wearing surface	Width:	7.0	7.0 m		
Location:	North/South Approach	Height:	0.1	m		
Material:	Asphalt	Count:	2			
Element Type:		<b>Total Quantity</b>	: 84.0			
Environment:	Moderate		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / 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	s:		
	1-5 years	6-10 years	Urgent x 1 year	ar 2 year		
			Rout and seal			



### Description

Road over the bridge. (Looking North)



### Description

Load limit and speed limit signs.



### Description

Road at the north approach. (Looking West)



### Description

Wearing surface over the bridge. New transverse crack. (Looking West)



### Description

Guide rail end trreatment at the south-east corner



### Description

Guide rail end treatment at the south-west corner.



### Description

East elevation.



# Description

West elevation.



# Description

Typical cracking with stain at the headwalls.



# Description

Cracking with stain at the headwalls. (West elevation)



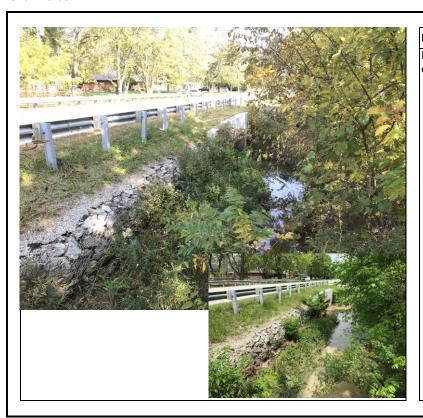
# Description

Inside box. (Looking West)



# Description

Pedestrian bridge at east elevation. (Looking South)



# Description

Embankments, retaining elements at west elevation. (Looking North)



# Description

Embankments, retaining elements at west elevation. (Looking South)



# Description

Waterway at the east inlet. (Looking East)



Description
Waterway at outlet (west).



# Description

C.S.P outlet, retaining structure, and pedestrian bridge and support, at west elevation. (Looking North)

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1010

Inventory Data:		
Structure Name	West Townline Drain at Malden Road (	Culvert
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial x Collector Local
MTO District		Posted Speed 80 No. of Lanes 2
Old County		AADT 1115 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Corrugated Steel Pipe Arch	Interchange Number
Total Deck Length	4.8 m	Interchange Structure Number
Overall Str. Width	25.2 m	Min. Vertical Clearancem
Total Deck Area	121.0 sq. m	Special Transit Truck Routes: School Bicycle
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;	m
Historical Data:		
Year Built	1995	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM I	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	ipment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date /	Description)	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number				
Scheduled Improvement	ents:					
Regional Priority Number	er	Programmed Work Year				
Nature of Program Wor	k:					
Appraisal Indices:		Comme	ents			
Fatigue	0.00					
Seismic	0.00					
Scour	0.00					
Flood	0.00					
Geometrics	0.00					
Barrier	0.00					
Curb	0.00					

0.00

Load Capacity

Ontario Structure Inspection Manua	al - Inspection For	m

Structure Number

Field Inspection Informat	ion:									
Date of Inspection:	July 31, 2	2020	Type of Inspection	on: x OSIM	Enhanced O	SIM				
Inspector:	Jeremy V	Vammes, E.	I.T. (Dillon Consulting	Limited)						
Others in Party:	Alessia M	lussio, E.I.T	. (Dillon Consulting Lin	mited)						
Access Equipment Used:	Camera,	Measuring t	tape, Measuring wheel	, and Hammer						
Weather:	Sunny									
Temperature:	24.0 °C									
Additional Investigations	Required	d:		None	Priority Normal	Urgent				
				None	Nomai	Urgeni				
Material Condition Survey										
Detailed Deck Condition				Х						
Non-Destructive Delar			phalt-Covered Deck:	Х						
Concrete Substructure				Х						
Detailed Coating Cond		/ey:		Х						
Detailed Timber Inves				Х						
Post-Tensioned Stran	d Investig	ation:		X						
Underwater Investigation:				X						
Fatigue Investigation: Seismic Investigation:				X						
Structure Evaluation:				X						
Monitoring				^						
Monitoring of Deforma	tions. Set	tlements an	d Movements:	Х						
Monitoring Crack Widt		ooo		Х						
Investigation Notes:										
Overall Structure Notes:										
Recommended Work on S	tructure:	None	x Maintenance	Minor Rehat	).	Replace				
				Major Rehat	<u> </u>					
Timing of Recommended V	Vork:		x 1 to 5 years	6 to 10 years	 S					
Overall Comments:			ce items include: crack so of object markers. Spen	ealing or repaving, re	pair of SBGR,					
Date of Next Inspection:		June 2022								
Date of Next Hisperiion.		JUDITIO ZUZZ								

Element Group:	Decks				Length:	4.8	m		
Element Name:	Wearing sur	rface			Width:	9.6	m		
Location:					Height:				
Material:	Asphalt				Count:				
Element Type:					Total Quantity	: 46.0	Sq.m		
Environment:	Moderate				Limited Inspec	tion			
Protection System:					-			Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / al	1	0.0	43.0	3.0	0.0		
Comments: Severe transverse cracks at the joint between the asphalt over the culvert and asphalt at both approaches (3 sq.m).								; (3 sq.m).	
Recommended Work:		Rehab		Replace		Maintenance	e Needs:		
		1-5 year	s (	6-10 years	S	Urgent	1 year	x 2 year	
						Crack seal p	rogram.		
Element Group:	Barriers				Length:	83.6	m		
Element Name:	Railing Syst	ems			Width:	00.0	111		
Location:	North/South				Height:				
Material:	Steel	Troad Luge			Count:				
Element Type:		Steel Ream	and	W/S nost	Total Quantity	. 02.6	83.6 m		
Environment:	Moderate	Oleei Deaii	i,aiiu	7770 post	Limited Inspec				
Protection System:	iviouerate				·			Perform.	
•	1.1	nits		Exc.	0	Fair	Poor		
Condition					Good			Deficiencies	
Data:	Sq.m / <b>m</b> / e	each / % / al		0.0	76.0	7.6	0.0		
Comments: N: Review height of guid Recommended Work:	derail for ade	quacy. Guid		l not conta		ks in several			
Recommended Work.		1-5 year				Urgent	x 1 year	2 year	
		1-5 year	,	o-10 years		Repair guide	,	2 year	
=1	ь .				I	<u> </u>			
Element Group:	Barriers				Length:				
Element Name:	Posts				Width:				
Location:	North/South		)		Height:				
Material:	Wood/Steel				Count:	46			
Element Type:					Total Quantity	-	each		
Environment:	Moderate				Limited Inspec	tion		T	
Protection System:								Perform.	
Condition		nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	each / % / al	I	0	21	20	5		
Comments: A number of offset block	ks are discon	nected and	guide	e rail not i	n contact with cli	ip angle at en	d treament.		
Recommended Work:		Rehab		Replace		Maintenance	e Needs:		
		1-5 year	S (	6-10 years	S	Urgent Straighten po	x 1 year osts and repai	2 year ir guiderail.	

Element Data								
Element Group:	Retaining W	/alls		Length:	15.2	m		
Element Name:	Walls			Width:			-	
Location:	South-East	Embankmen		Height:	1.9	m		
Material:	Cast-in-plac	e concrete		Count:	1			
Element Type:	Reinforced	concrete		Total Quantity:	29.0	Sq.m		
Environment:	Moderate			Limited Inspec				
Protection System:						<u> </u>	Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sa.m</b> / m / e	each / % / all	0.0	12.0	12.0	5.0		
Comments:			<u> </u>	1		<u> </u>		
Severe scaling, light spa	alling and vei	ry severe hor	evcombing a	along bottom port	ion of wall. P	ossible unde	rmining of	
footing from lowered dra	•	•		•			•	
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 year	rs	Urgent	1 year	2 year	
		,		-		. ,		
				L				
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	1		
Element Type:	Pipe arch			Total Quantity:	uantity: 294.5 Sq.m			
Environment:	Benign			Limited Inspection				
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / all	0.0	278.8	14.7	1.0		
Comments:	•					•		
Medium corrosion along	spring line.	Light to medi	um corrosior	of bolts at plate	joints. Sever	e corrosion b	elow pipe inlets	
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 year	rs	Urgent	1 year	2 year	
Element Group:	Culverts			Length:	10.8	m		
Element Name:	Inlet Compo	onents		Width:				
Location:	South Inlet			Height:	3.0	m		
Material:	Gabions			Count:	1			
Element Type:				Total Quantity:	32.4	Sq.m		
Environment:	Moderate			Limited Inspec	tion			
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / all	0.0	32.4	0.0	0.0		
Comments:								
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 year	rs	Urgent	1 year	2 year	

Element Data								
Element Group:	Culverts			Length:	13.0	m		
Element Name:	Outlet Comp	onents		Width:				
Location:	North Outlet			Height:	4.0	m		
Material:	Gabions			Count:	1			
Element Type:				Total Quantity	52.0	Sq.m		
Environment:	Moderate			Limited Inspec				
Protection System:				· ·		1	Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sa.m</b> / m / e	each / % / all	0.0	50.0	1.0	1.0		
Comments: One (1) rupture was obs			pasket (0.25	x0.25).				
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 year	rs	Urgent	1 year	x 2 year	
					Repair gabio	n basket		
Element Group:	Embankmer	nts & Streams	3	Length:				
Element Name:		d Waterways		Width:				
Location:				Height:				
Material:				Count:	1			
Element Type:				Total Quantity		1 all		
Environment:					Limited Inspection			
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:		ach / % / all	0	1	0	0	Bonolonoloo	
Comments:  Recommended Work:		Rehab	Replace		Maintenanc	e Needs:	T	
		1-5 years	6-10 year		Urgent	1 year	2 year	
Element Group:	Embankmer	nts & Streams	3	Length:				
Element Name:	Embankmer	nts		Width:				
Location:	All Four Qua	adrants		Height:				
Material:				Count:	4			
Element Type:				Total Quantity	: 4	each		
Environment:	Moderate			Limited Inspec	tion			
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	ach / % / all	0	4	0	0		
Comments:		1						
Recommended Work:		Rehab	Replace		Maintenanc		1 -	
		1-5 years	6-10 year	rs	Urgent	1 year	2 year	

Element Group:	Embankmei	nts	& Streams	3		Length:					
Element Name:	Slope protect	ctio	n			Width:					
Location:	NE/NW/S	SW	Embankm	ent	S	Height:					
Material:					Count:		3				
Element Type:	Hand laid rip	pra	p South we	est		Total Quantity	<b>/</b> :	3	each		
Environment:	Moderate					Limited Inspe		L	1		
Protection System:						Zimitoù mopo	-	···			Perform.
Condition	I b	nits			Exc.	Good		Fair	Poor		eficiencies
Data:	Sq.m/m/e				0	2		0	1		TICICITOICS
Comments: NE: embankment obser			1	ŭ	·						
Recommended Work:			Rehab	F	Replace		M	aintenance	Needs:		
			1-5 years	6	6-10 years	S		Urgent	1 year	x :	2 year
							M	onitor NE e	mbankment f	or s	tability.
Florent Crown	Ciana					I amouth.		1			
Element Group:	Signs					Length:					
Element Name:	Signs					Width:					
Location:						Height:		_			
Material:						Count:		2			
Element Type:	Var.					Total Quantity		2 each			
Environment:						Limited Inspection					
Protection System:										ı	Perform.
Condition	Uı	nits	;		Exc.	Good		Fair	Poor	De	eficiencies
Data:	Sq.m/m/e	ac	<b>h</b> / % / all		0	2		0	0		
Comments: No OBJECT MARKER Sother signs on site such				IEC	KBOARD		kists	s. It has to b	oe noted also	tha	t there are
Recommended Work:			Rehab	-	Replace	Maintenance Needs:					
			1-5 years	<u> </u> 6	6-10 years	S		Urgent stall object guiderails.	1 year markers at er		2 year reatments
							-				
Element Group:	Approaches	;				Length:		6.0	m		
Element Name:	Wearing Su	rfa	се			Width:		9.6	m		
Location:	East/West A	٦pp	roach			Height:					
Material:	Asphalt					Count:		2			
Element Type:	-					Total Quantity	<b>/</b> :	115.2	sq.m		
Environment:	Moderate					Limited Inspe					
Protection System:									1		Perform.
Condition	Uı	nits			Exc.	Good		Fair	Poor		eficiencies
Data:	<b>Sq.m</b> / m / e				0.0	65.2		50.0	0.0		
Comments: Medium to severe map of				es.			struc				
Recommended Work:			Rehab	F	Replace		M	aintenance	Needs:		
		-	1-5 years	-	6-10 years	S	Cı	Urgent rack sealing	x 1 year g or repave.		2 year



## Description

Road over the culvert (Looking East)



# Description

Wide crack at joint between wearing surface over the culvert section and east approach



# Description

Wide transverse cracking at east approach slab. (Looking North)



# Description

Wearing surface at west approach.



# Description

Load limit sign and loose guide rails at the north-west end treatment.



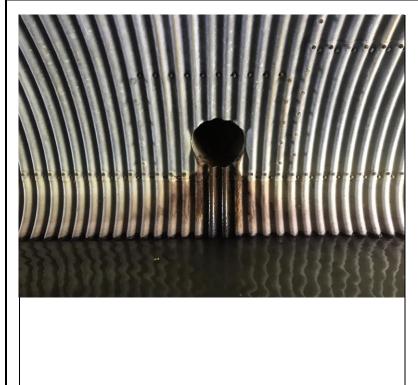
# Description

Loose guide rails at the south-west end treatment.



# Description

North culvert barrel and gabion headwalls.



# Description

Severe corrosion below inlet pipe at west wall.



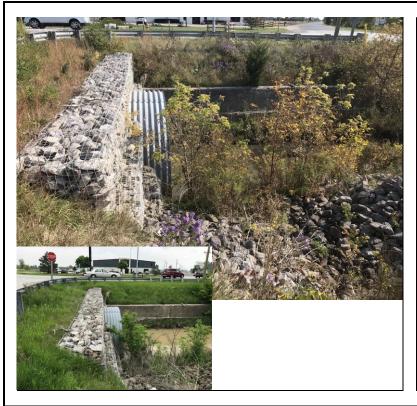
# Description

Rip-rap slope protection, and gabion basket wingwalls at south elevation. (Looking North)



# Description

Gabion basket wingwalls at north elevation, (Looking South) (Picture from 2016)



## Description

Retaining wall, gabion baskets, and culvert end at south elevation. (Looking East)

## Note:

The retaining wall is part of the drain which is attributted to the county road. However, it was addressed since it is located in the vicinity of the bridge.



## Description

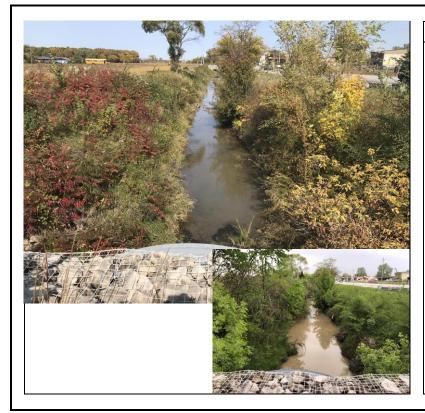
Medium spalling at retaining wall bottom at south east embankment.

Severe scaling, popouts and very severe honeycombing along the bottom portion of the wall.



# Description

Waterway at South. (Looking SE)



# Description

Waterway. (Looking North)

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1011

Inventory Data:		
Structure Name	Malden Road Drain at South Talbot Ro	ad Bridge
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
Hwy/Road Name	Malden Road	
Structure Location	Crossing South Talbot at Malden Inters	section
Latitude	42° 12' 3.0"	Longitude -82° 54' 0.3"
Owners	Town of Tecumseh	Heritage Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Collector x Local
MTO District		Posted Speed 80 No. of Lanes 2
Old County		AADT 319 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Rigid Frame Box	Interchange Number
Total Deck Length	4.3 m	Interchange Structure Number
Overall Str. Width	39.5 m	Min. Vertical Clearance m
Total Deck Area	169.9 sq. m	Special Transit Truck Routes: School Bicycle
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;	m
Historical Data:		
Year Built	2007	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM I	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date /	Description)	
Culvert replaced in 200	7.	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number 10				
Scheduled Improvement	ents:					
Regional Priority Number	er	Programmed Work Year				
Nature of Program Wor	k:					
Appraisal Indices:		Comme	ents			
	<u> </u>					
Fatigue	0.00					
Seismic	0.00					
Scour	0.00					
Flood	0.00					
Geometrics	0.00					
Barrier	0.00					
Curb	0.00					

0.00

Load Capacity

Structure Number

1011

Field Inspection Information:						
	2000	T (1 c	Loona	le	218.4	
Date of Inspection: July 31	, 2020	Type of Inspection	n: XIOSIM L	Enhanced OS	SIM	
Inspector: Jeremy	/ Wammes, E	.I.T. (Dillon Consulting L	imited)			
Others in Party: Alessia	Mussio, E.I.7	Γ. (Dillon Consulting Lim	ited)			
Access Equipment Used: Camer	a, Measuring	tape, Measuring wheel,	and Hammer			
NA/ a seth a sec						
Weather: Sunny						
Temperature: 28.0 °C	;					
Additional Investigations Requi	red:			Priority		
Additional investigations Requi	eu.		None	Normal	Urgent	
			110.10		o go n	
Material Condition Survey						
Detailed Deck Condition Surv	ey:		Х			
Non-Destructive Delamination	Survey of As	sphalt-Covered Deck:	Х			
Concrete Substructure Condi			Х			
Detailed Coating Condition S	urvey:		Х			
Detailed Timber Investigation			Х			
Post-Tensioned Strand Inves	tigation:		Х			
Underwater Investigation:			Х			
Fatigue Investigation:			Х			
Seismic Investigation:			Х			
Structure Evaluation:			х			
Monitoring				1		
Monitoring of Deformations, S	Settlements ar	nd Movements:	Х		1	
Monitoring Crack Widths:	ottionionio ai	ia movemento.	X		+	
Investigation Notes:						
Overall Structure Notes:						
Overall Structure Notes.						
Recommended Work on Structure	: None	x Maintenance	Minor Rehab	). <u> </u>	Replace	
			Major Rehab	).		
Timing of Recommended Work:		1 to 5 years	x 6 to 10 years	<u> </u>		
Overall Comments:	inspection	e interior only accessible from North end (confined space); camera n recommended. Maintenance should include sealing asphalt crass culvert interior cracks.				
Date of Next Inspection:	June 2022	2				
zate of Hom mopoulon.	5 10 L0L2					

Element Data										
Element Group:	Decks				Length:		4.3	m		
Element Name:	Wearing su	rface			Width:		16.0	m		
Location:	Top of Decl	(			Height:		0.1	m		
Material:	Asphalt				Count:					
Element Type:					<b>Total Quantity</b>	<b>'</b> :	68.8	Sc	m.r	
Environment:	Moderate				Limited Inspection					
Protection System:										Perform.
Condition	U	nits		Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sa.m</b> / m / e	each / % / all		0.0	63.8		5.0		0.0	
Comments:										
Recommended Work:		Rehab		Replace		Ma	aintenance	) N		
	1-5 years			6-10 year	S		Urgent		1 year	2 year
Element Group:	Culverts				Length:		3.7	m		
Element Name:	Barrels - Sc	offit	Width:		39.4	m				
Location:			Height:							
Material:	Cast-in-plac				Count:					
Element Type:	Reinforced	concrete			Total Quantity		145.8	Sc	q.m	
Environment:	Benign		Limited Inspec	ctic	on	Х				
Protection System:										Perform.
Condition	Units			Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m / m / each / % / all			70.0	72.1		3.7		0.0	
				nly throug	gh the north opening as the south end is closed a pace and requires trained personnel for entry.  Maintenance Needs:				sed and	
						Se	eal cracks.			
Element Group:	Culverts				Length:		39.4	m		
Element Name:	Barrels - Ve	ertical Walls			Width:		55.4			
Location:	East/West				Height:		2.6	m		
Material:	Cast-in-place	ce concrete			Count:		2.0	•••		
Element Type:	Reinforced				Total Quantity	, <u>.                                    </u>	204.9	Sr	m.r	
Environment:	Benign				Limited Inspec	_		х	1	
Protection System:	· - · · · · · · ·									Perform.
Condition	IJ	nits	Γ	Exc.	Good		Fair		Poor	Deficiencies
Data:		each / % / all	1	98.3	101.3		5.2		0.0	
Comments:	1 ~ 4···· / · · · / ·	- 30 / / UII	1			1	- · <del></del>		- 1 -	
(From 2016): E Wall:Tobserved (2.6x0.25 eac end of the culvert is close	h). Înspectio	n limited due	to	high water	level and confir		0			
Recommended Work:		Rehab		Replace		aintenance Needs:				
		1-5 years	H	6-10 year	S		Urgent		1 year	x 2 year
	1-5 years   0-10 years						eal cracks.		<b>y</b> * * * *	

Element Data												
Element Group:	Embankme	nts	s & Streams	S		Length:						
Element Name:	Slope Prote	ecti	ion			Width:				-		
Location:	NW / NE E	mb	ankments			Height:						
Material:	Gabions / R	Rip	-Rap			Count:		2				
Element Type:		•	•			Total Quantity	<b>':</b>	0.0	eac	 h		
Environment:	Moderate					Limited Inspe			T			
Protection System:											T	Perform.
Condition	U	nit	s		Exc.	Good	Fair		Poor	1 6	Deficiencies	
Data:	Sq.m/m/e		-		0.0	2.0		0.0 0.0			╁	
Comments: NE: Hand laid rip-rap. NW: Gabion baskets.  Recommended Work:		Rehab			Replace		м	aintenance	, No	ods:		
Recommended Work.					<del>  '</del>		IVI				+	0
			1-5 years		6-10 years	S		Urgent	1	year		2 year
Element Group:	Embankme	nts	s & Streams	S		Length:						
Element Name:	Streams an	ıd \	Waterways			Width:						
Location:						Height:						
Material:						Count:		1				
Element Type:							<b>':</b>		all			
Environment:						Total Quantity Limited Inspe			T			
Protection System:								•			Т	Perform.
Condition	Units				Exc.	Good		Fair		Poor	┧┌	Deficiencies
Data:	Sq.m / m / e				0	1		0		0	Ť	7011010110100
Comments:  Recommended Work:			Rehab		Replace		М	aintenance				2 voor
			1-5 years		6-10 years	8		Urgent	!	year		2 year
Element Group:	Signs					Length:						
Element Name:	Signs					Width:						
	Olgris											
Location: Material:						Height: Count:		4				
Element Type:	Var.					Total Quantity	,.		eac	<del></del>		
Environment:	vai.					Limited Inspe		· .	eac	.1		
Protection System:						Limited mspe	Cli	OII			_	Perform.
Condition	111	ام:4		_		Cood		Foir		Door	┨	Perioriii. Deficiencies
		nit			Exc.	Good		Fair		Poor	ᆣ	periciencies
Data:	Sq.m / m / e	ea	<b>ch</b> / % / all		0	4		0		0		
Comments: Four different signs wer Sign at the NW edge of							Si	gn at inters	ectio	on, HAZA	۱RE	) MARKER
Recommended Work:			Rehab		Replace		M	aintenance	Ne	eds:		
			1-5 years		6-10 years	S		Urgent	1	year		2 year

# **Ontario Structure Inspection Manual - Inspection Form**

**Structure Number** 

1011

#### **Element Data**

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 Inspec	ction			
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / each / % / all	0.0	35.0	30.0		10.0	

#### Comments:

**E Approach**: Severe map and transverse cracking was observed (approximately 20 sq.m). **W Approach**: Very severe transverse cracking and severe map cracking was observed (approximately 10 sq.m and 20 sq.m, respectively)

Recommended Work:	Rehab	Replace	М	Maintenance Needs:			
	1-5 years	6-10 years		Urgent	Х	1 year	2 year
			Cı	rack seal p	prog	ram.	



# Description

Road over the bridge. (Looking West)



# Description

Road over bridge deck. (Looking East)



# Description

Wearing surface cracking at the east approach. (Looking South)



# Description

Wearing surface cracking at the west approach, (Looking South)



# Description

Southern closed end of bridge with waterproofing on the top. (Looking North)



# Description

Waterproofing agent on the north top of deck showing signs of bubbling (Looking North)



# Description

North Inlet of the bridge section with exposed waterproofing at the decktop. (Looking South)



# Description

North end of box section of the bridge, looking south. Bend in box section located approximately below the road edge. (Picture from 2016)

Structure barrel access is deemed Confined Space Entry.



# Description

Two verticle cracks at the east abutment wall (Picture from 2016).

Structure barrel access is deemed Confined Space Entry.



# Description

North waterway, embankments and slope protection at the north inlet of the bridge section (Looking North)

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1013

Inventory Data:		
Structure Name	Merrick Creek at Eighth Concession R	oad Bridge
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local x
MTO District		Posted Speed Not posted No. of Lanes 2
Old County		AADT 426 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Non-Rigid Frame	Interchange Number
Total Deck Length	4.2 m	Interchange Structure Number
Overall Str. Width	9.2 m	Min. Vertical Clearance m
Total Deck Area	38.6 sq. m	Special Transit Truck Routes: School Bicycle
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	2018	Last Evaluation
Last Enhanced OSIM Ir	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	etion	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date / I	Description)	
2020 Rehab: Full depth	concrete deck repairs, concrete overlag	y, waterproofing and asphalt, enclosed drain at SE wingwall.

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number 1013					
Scheduled Improvement	ents:						
Regional Priority Number	er	Programmed Work Year					
Nature of Program Wor	k:						
Appraisal Indices:		Comments					
Fatigue	0.00						
Seismic	0.00						
Scour	0.00						
Flood	0.00						
Geometrics	0.00						
Barrier	0.00						
Curb	0.00						

0.00

Load Capacity

Ontario	Structura	Inspection	Manual -	Inenaction	Form

Structure Number

1013

Field Inspection Informati	ion:								
Date of Inspection:	October 9, 2020	Type of Inspection:	x OSIM	Enhanced OS	SIM				
Inspector:	Jeremy Wammes, E.I.T.	L (Dillon Consulting Lim	l iited)						
Others in Party:	Alessia Mussio, E.I.T. (Di	llon Consulting Limite	d)						
A acces Faurinment Head	Comono Manageria tona	Management	411						
Access Equipment Used:	Camera, Measuring tape,	weasuring wheel, an	ia Hammer						
Weather:	Sunny								
Temperature:	22.0 °C								
Additional Investigations	Required:		Nana	Priority	Lument				
			None	Normal	Urgent				
Material Condition Survey									
Detailed Deck Condition	on Survev:		х						
Non-Destructive Delan	х								
Concrete Substructure	Х								
Detailed Coating Cond	Х								
Detailed Timber Invest	Х								
Post-Tensioned Strand	d Investigation:		Х						
Underwater Investigation:	•		Х						
Fatigue Investigation:			Х						
Seismic Investigation:			Х						
Structure Evaluation:			Х						
Monitoring									
Monitoring of Deforma	tions, Settlements and Mo	ovements:	Х						
Monitoring Crack Widt	hs:		Х						
Investigation Notes:									
Overall Structure Notes:									
		T	T		T= :				
Recommended Work on St	ructure: None	Maintenance	Minor Rehab	). 	Replace				
			Major Rehab	).					
Timing of Recommended V	Vork:	1 to 5 years	6 to 10 years	3					
Overall Comments:	Major rehab co	empleted in 2020							
Date of Next Inspection:	June 2022								
= 2 3 0	0 3110 2022								

Element Data										
Element Group:	Decks				Length:	4.2	m			
Element Name:	Wearing Su	rface			Width:	6.3	m			
Location:					Height:					
Material:	Tar and chip	)			Count:					
Element Type:	-				<b>Total Quantity</b>	: 26.5	Sq.m			
Environment:	Moderate				Limited Inspec					
Protection System:							I I	Perform.		
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / al	ı	26.5	0.0	0.0	0.0			
Comments: Repaved in 2020.		,								
Recommended Work:		Rehab		Replace		Maintenanc	e Needs:			
		1-5 years	S	6-10 years	S	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-plac	e concrete			Count:					
Element Type:					<b>Total Quantity</b>	: 38.6	Sq.m			
Environment:	Moderate				Limited Inspec	ction	х			
Protection System:								Perform.		
Condition	Units			Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / al	ı	38.6	0.0	0.0	0.0			
Comments: Concrete overlay in 202 Recommended Work:	0.	Rehab		Replace		Maintenanc	o Noods:	1		
recommended Work.		1-5 years		6-10 years		Urgent	1 year	2 year		
		Tro your	<u> </u>	To To your	<u> </u>	jorgoni				
Element Group:	Decks				Length:	3.6	m			
Element Name:	Soffit - Thick	< Slab			Width:	9.2	2 m			
Location:					Height:					
Material:	Cast-in-plac	e concrete			Count:					
Element Type:					<b>Total Quantity</b>	: 33.1	Sq.m			
Environment:	Moderate				Limited Inspec	ction				
Protection System:								Perform.		
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / al	ı	4.3	28.8	0.0	0.0			
Comments: Concrete repair in 2020										
Recommended Work:		Rehab		Replace		Maintenanc	Maintenance Needs:			
		1-5 years	S	6-10 years	S	Urgent	1 year	2 year		

Liement Data												
Element Group:	Sidewalks/0	Cui	rbs			Length:		Var.	m			
Element Name:	Curbs					Width:		0.3	m			
Location:	East/West F	₹o	ad Edges			Height:		0.3	m			
Material:	Cast-in-place	е	concrete			Count:		2				
Element Type:						<b>Total Quantity</b>	:	9.3	Sq.m			
Environment:	Moderate						Limited Inspection					
Protection System:								I		Perform.		
Condition	U	nit	S		Exc.	Good		Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	220	ch / % / all		4.6	4.7		0.0	0.0			
Comments: E Curb: reconstructed i				alir	_	d.						
Recommended Work:			Rehab		Replace		Ма	intenance				
			1-5 years		6-10 years	S	L	Jrgent	1 year	2 year		
Element Group:	Abutments							9.2	m			
Element Name:	Abutment W	Abutment Walls										
Location:	North/South					Height:		2.1 m				
Material:	Cast-in-place concrete					Count:		2				
Element Type:						<b>Total Quantity</b>	:	35.0	Sq.m			
Environment:	Moderate					Limited Inspec	ctio	n				
Protection System:								•		Perform.		
Condition	U	nit	S		Exc.	Good		Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	eac	ch / % / all		0.0	35.0		0.0	0.0			
Comments: Light scaling observed of Recommended Work:	on both walls		Rehab		Replace		Ma	intenance	e Needs:			
			1-5 years		6-10 years	S	Į	Urgent 1 year		2 year		
Element Group:	Abutments					Length:		4.2	m			
Element Name:	Wingwalls					Width:						
Location:						Height:		2.8	m			
Material:	Cast-in-plac	е	concrete			Count:		4				
Element Type:						<b>Total Quantity</b>	:	47.0	Sq.m			
Environment:	Moderate					Limited Inspec	ctio					
Protection System:										Perform.		
Condition	U	nit	S		Exc.	Good		Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	eac	ch / % / all		0.0	47.0		0.0	0.0			
Comments: SE Wingwall: One (1) 0 wall.				th	e wingwall.		vas	observed	at the junction	n of abutment		
Recommended Work:		х	Rehab		Replace		Ма	intenance	Needs:			
			6-10 years	S	-	Jrgent	1 year	2 year				
Concrete repairs		<u> </u>			1			<u> </u>				

Liement Data										
Element Group:	Embankmer	nts & Streams	3	Length:						
Element Name:	Streams and	d Waterways		Width:						
Location:				Height:						
Material:				Count:	1					
Element Type:				Total Quantity	<i>r</i> : 1	all				
Environment:					mited Inspection					
Protection System:						1 1	Perform.			
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sa m / m / e	each / % / all	1	0	0	0				
Comments:										
Recommended Work:		Rehab	Replace	е	Maintenanc	e Needs:				
		1-5 years	6-10 ye	ars	Urgent	1 year	2 year			
Element Group:	Embankmer	nts & Streams	3	Length:						
Element Name:	Embankmer	nts		Width:						
Location:	All Four Qua	adrants		Height:						
Material:				Count:	4					
Element Type:				Total Quantity	r: 4	each				
Environment:				Limited Inspe	ction					
Protection System:						I I	Perform.			
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sa.m/m/e	each / % / all	4	0	0	0				
Comments:  Recommended Work:		Rehab	Replace	e	Maintenanc	e Needs:				
		1-5 years	6-10 ye	ars	Urgent	1 year	2 year			
Element Group:	Embankmer	nts & Streams	3	Length:						
Element Name:	Slope protect	ction		Width:						
Location:	NE/NW/S	W Embankm	ents	Height:						
Material:	Hand Laid F	Riprap		Count:	3					
Element Type:				Total Quantity	<i>r</i> : 3	each				
Environment:				Limited Inspe	ction					
Protection System:						<u> </u>	Perform.			
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies			
Data:	Sq.m/m/e	each / % / all	3	0	0	0				
Comments:					,					
Recommended Work:		Rehab	Replace	e	Maintenanc	e Needs:				
		1-5 years	6-10 ye	ars	Urgent	1 year	2 year			

1013

# **Element Data**

Element Group:	Signs			Length:				
Element Name:	Signs			Width:				
Location:	NW and SE	Wingwalls		Height:				
Material:				Count:	4	ļ		
Element Type:	Hazard Mark	er Signs		Total Quantity:		l ea	ach	
Environment:				Limited Inspec	tion			
Protection System:								Perform.
Condition	Uni	its	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / ea	<b>ich</b> / % / all	2	2	0		0	
Comments: Object markers added to Recommended Work:	o 2 remaining	Rehab 1-5 years	Replace 6-10 years		<b>Maintenand</b> Urgent	e N	Needs: 1 year	2 year
	T -			T				
Element Group:	Approaches			Length:		) m		
Element Name:	Wearing Surf	face		Width:	6.3	3 m		
Location:				Height:				
Material:	Tar and chip			Count:	2	2		
Element Type:				Total Quantity:	75.6	S	q.m	
Environment:	Moderate			<b>Limited Inspec</b>	tion			

Element Group:	Approaches			Length:		6.0	m			
Element Name:	Wearing Sui	face		Width:		6.3	m			
Location:				Height:						
Material:	Tar and chip	)		Count:		2				
Element Type:				Total Quantit	y:	75.6	Sq.m			
Environment:	Moderate			Limited Inspe	nspection					
Protection System:									Р	Perform.
Condition	Ur	nits	Exc.	Good		Fair	Poor	-	De	ficiencies
Data:	<b>Sq.m</b> / m / e	ach / % / all	75.6	0.0		0.0	0.0			
Comments:										
Recommended Work	:	Rehab	Replace		M	aintenanc	e Needs:			
		1-5 years	6-10 yea	rs		Urgent	1 yea	r	2	2 year



# Description

Road over structure. (Looking North)



# Description

Curb, wingwall, shoulder and object marker at SW corner of structure. (Looking North)



# Description

Wearing surface over the bridge. (Looking West)



# Description

North approach. (Looking South)



# Description

West elevation. (Looking East)



# Description

East elevation, C.S.P outlet through SE wingwall (Looking South)



# Description

Reconstructed curb at East side



# Description

South abutment wall and wall drains.



# Description

Full depth deck repair at soffit. Looking SW.



# Description

Full depth deck repair at soffit. Looking West.



# Description

East waterway, and slope protection rip-rap. Looking North.



# Description

West watercourse (Looking West).

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1014

inventory Data:		
Structure Name	Townline Road Drain at Sixth Concess	ion Road Culvert
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local X
MTO District		Posted Speed 60 No. of Lanes 2
Old County		AADT 500 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Non-Rigid Frame	Interchange Number
Total Deck Length	4.2 m	Interchange Structure Number
Overall Str. Width	15.3 m	Min. Vertical Clearancem
Total Deck Area	64.3 sq. m	Special Transit Truck Routes: School Bicycle
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 = $3.7(1) = 3.7$ ;	m
Historical Data:		
Year Built	1955	Year of Last Major Rehab. 2019
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM In	nspection	Current Load Limit 5.0
Enhanced Access Equi (ladder, boat, lift, etc.)	ipment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date /	Description)	
2019 Rehab: Remove a new CIP corner strip, w		ktent (E/W), install new precast block retaining walls adjacent to

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number	1014
Scheduled Improveme	nts:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Worl	K:		
Appraisal Indices:		Comments	
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Ontario	Structure	Inspection	Manual -	Inspection	Form
Unitario	Structure	mspection	iviai iuai -	mspection	FOITH

Date of Next Inspection:

Structure Number

	~ .	
- 1	വ	14

Field Inspection Informat	ion:					
Date of Inspection:	July 31, 2020		Type of Inspection:	x OSIM	Enhanced O	SIM
Inspector:	Jeremy Wammes	s, E.I.T. (	Dillon Consulting Lim	ited)		
Others in Party:	Alessia Mussio, E	.I.T. (Dil	Ion Consulting Limite	d)		
Access Equipment Used:	Camera, Measuri	ng tape,	Measuring wheel, an	d Hammer		
Weather:	Sunny					
Temperature:	28.0 °C					
Additional Investigations	Required:				Priority	
riaanionai mroonganono	rtoquii oui			None	Normal	Urgent
Material Condition Survey						
Detailed Deck Condition	on Survey			х	I	Т
Non-Destructive Delar	X					
Concrete Substructure	х		1			
Detailed Coating Cond	х					
Detailed Timber Inves		Х				
Post-Tensioned Stran	d Investigation:			Х		
Underwater Investigation:	-			Х		
Fatigue Investigation:				Х		
Seismic Investigation:				Х		
Structure Evaluation:				Х		
Monitoring				1		
Monitoring of Deforma	tions, Settlements	s and Mo	vements:	X		
Monitoring Crack Wid	ths:			Х		
Investigation Notes:						
Overall Structure Notes:						
Recommended Work on S	tructure: Non	e	Maintenance	Minor Rehat	L	Replace
Timing of Recommended V	Vork:	1 to 5 years	6 to 10 years	S		
Overall Comments:	Rehab	ilitated in				

June 2022

1014

### Element Data

	T= .								
Element Group:	Decks				Length:		4.2		
Element Name:	Wearing Su	ırface			Width:		8.5	m	
Location:					Height:				
Material:	Asphalt				Count:				
Element Type:					Total Quanti	ty:	35.7	Sq.m	
Environment:	Moderate				Limited Insp	ecti	on		
Protection System:									Perform.
Condition	U	nits		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % /	all	33.3	2.4		0.0	0.0	
Comments: Repaved in 2019.									_
Recommended Work:	:	Rehab	)	Replace	)	M	aintenance	e Needs:	
	1-5 ye	ars	6-10 yea	ars		Urgent	1 year	2 year	
Element Group:	Decks	Dooks					3.7	m	
Element Name:	Deck Top				Length:	Width: 15.5 m			
Location:	Dook Top				Height:	10.0			
Material:	Cast-in-plac	e concret	e		Count:				
Element Type:					Total Quanti	tv:	57.4	Sq.m	
Environment:	Benign				Limited Insp	_			
Protection System:					·				Perform.
Condition	U	nits		Exc.	Good		Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % /	all	0.0	57.4		0.0	0.0	
Comments: E/W deck extents (1.1r	m) replaced ir	1 2019 wit	h cu	rb on top.					
Recommended Work:	:	Rehab	)	Replace	)	М	aintenance		
		1-5 ye	ars	6-10 year	ars	1	Urgent	1 year	2 year

Element Group:	Decks		Length:	3.7	m			
Element Name:	Soffit		Width:	15.5	15.5 m			
Location:			Height:					
Material:	Cast-in-place concrete	Cast-in-place concrete						
Element Type:		<b>Total Quantity</b>	: 57.4	Sq.m				
Environment:	Benign	Benign			Limited Inspection			
Protection System:						Perform.		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m/m/each/%/all	7.8	49.6	0.0	0.0			

Comments: E/W deck extents (1.1m) replaced in 2019 with curb on top.

1	_				
I	-5 years	6-10 years	Urgent	1 year	2 year

1014

### Element Data

Liciliciii Dala									
Element Group:	Abutments				Length:	15.5	m		
Element Name:	Abutment V	Vall	s		Width:				
Location:	North/South	n Ab	outments		Height:	2.1	m		
Material:	Cast-in-place	се с	concrete		Count:	2			
Element Type:					Total Quantity:	65.1	Sc	m.p	
Environment:	Moderate				Limited Inspec	tion			
Protection System:									Perform.
Condition	U	Inits	3	Exc.	Good	Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	eac	h/%/all	0.0	65.1	0.0		0.0	
Comments: Light honeycomb throug	jhout barrel v	wall	ls.						<u></u>
Recommended Work:			Rehab	Replace		Maintenance	e N	eeds:	
			1-5 years	6-10 year	s	Urgent		1 year	2 year
Element Group:	Embankme	nts	& Streams		Length:				
Element Name:	Streams an	nd V	Vaterways		Width:				
Location:					Height:				
Material:					Count:	1			
Element Type:					Total Quantity:	: 1	all		
Environment:					Limited Inspec	tion			
Protection System:									Perform.
Condition	U	Units			Good	Fair		Poor	Deficiencies
Data:	Sq.m/m/e	eac	h / % / <b>all</b>	1	0	0		0	
Comments:  Recommended Work:			Rehab 1-5 years	Replace 6-10 year	s	Maintenance Urgent	e N	leeds:	2 year
Element Group:	Embankme	nts	& Streams		Length:				
Element Name:	Embankme	nts			Width:				
Location:	All Four Qu	ıadr	ants		Height:				
Material:					Count:	4			
Element Type:					Total Quantity:	: 4	ea	ıch	
Environment:					Limited Inspec	tion			
Protection System:									Perform.
Condition	U	Inits	3	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m/m/	eac	<b>h</b> / % / all	4	0	0		0	
Comments:									
<b>2019</b> : New HDPE pipes South embankments are					block retaining v	walls and rip	rap	laid at al	I 4 corners.
Recommended Work:			Rehab	Replace		Maintenance	laintenance Needs:		
			1-5 years	6-10 year	'S	Urgent		1 year	2 year
			•						

1014

#### **Element Data**

Element Group:	Embankme	mbankments & Streams			Length:				
Element Name:	Slope Prote	ection			Width:				
Location:	All Four Qu	adrants			Height:				
Material:					Count:	4			
Element Type:	Hand-laid ri	ip rap			<b>Total Quantity</b>	: 4	Sq.m		
Environment:					Limited Inspec	ction			
Protection System:							1 1	Perform.	
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/	each / %	/ all	4	0	0	0		
Comments:									
Recommended Work:		Reha	ab	Replace		Maintenance	e Needs:		
		1-5 y	ears	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Retaining V	Valls			Length:	1.5	m		
Element Name:	Walls				Width:				
Location:	4 Quadrant	s			Height:	2.3	m		
Material:	Precast blo	ck			Count:	4			
Element Type:					<b>Total Quantity</b>	: 13.8	Sq.m		
Environment:	Moderate				Limited Inspec	ction			
Protection System:							1 4	Perform.	
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / each / % / all			12.9	0.9	0.0	0.0		
Recommended Work:		Reha 1-5 y		Replace 6-10 year	s	Maintenance Urgent	e Needs:	2 year	
Flament Cassin	I A = = = = = = = = = = = = = = = = = =				I am mith.				
Element Group: Element Name:	Approaches				Length:	6.0			
Location:	Wearing su North/South		ob c =		Width:	8.5	III)		
		1 Approa	cnes		Height:				
Material:	Asphalt				Count:	2	0		
Element Type:	Martanete				Total Quantity		Sq.m		
Environment:	Moderate				Limited Inspec	tion		Perform.	
Protection System:				-		F-11	D		
Condition		nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m /	each / %	/ all	95.2	6.8	0.0	0.0		
Comments: Repaved in 2019.									
Recommended Work:		Reha	ıb	Replace		Maintenance	Maintenance Needs:		
		1-5 y	ears	6-10 year	S	Urgent	1 year	2 year	
				· <del></del>			<u></u>		



# Description

Road over the bridge. (Looking South)



# Description

Wearing surface at south approach. (Looking West)



# Description

Wearing surface at north approach. (Looking South)



# Description

Wearing surface over the structure section. (Looking East)



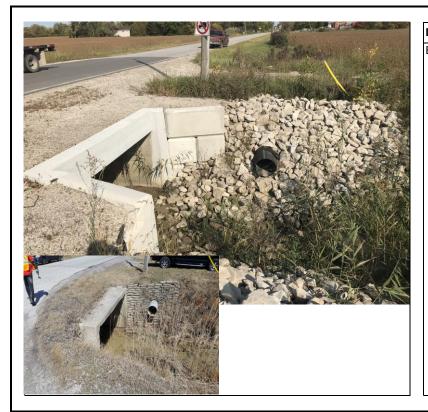
# Description

West elevation. (Looking NE)



# Description

Deck soffit at the west end.



# Description

East elevation. (Looking North)



# Description

Deck soffit at the east end.



# Description

Abutment wall and deck soffit inside the culvert section. (Looking North)



# Description

Concrete patch near North abutment of soffit.



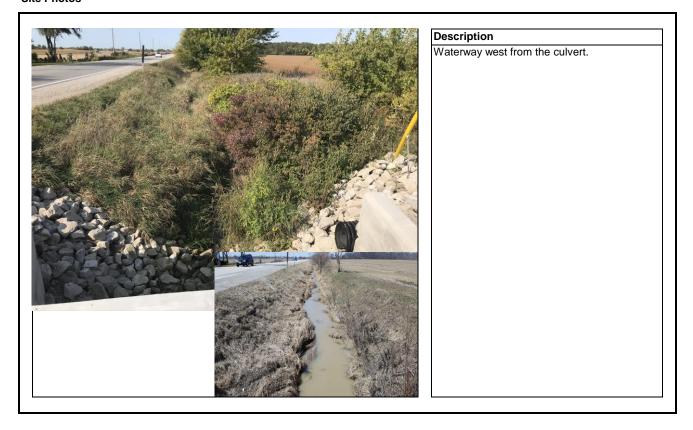
# Description

New precast block retaining walls, rip rap and subdrains at embankments. (Typ.)



# Description

Waterway east from the culvert.



# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1015

Inventory Data:		
Structure Name	Merrick Creek Drain at Sixth Concession	on Road Culvert
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local x
MTO District		Posted Speed 60 No. of Lanes 2
Old County		AADT 500 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Concrete Rigid Frame	Interchange Number
Total Deck Length	6.3 m	Interchange Structure Number
Overall Str. Width	15.0 m	Min. Vertical Clearance m
Total Deck Area	94.5 sq. m	Special Transit Truck Routes: School Bicycle
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;	m
Historical Data:		
Year Built	2007	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM I	nspection	Current Load Limit 5.0
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #
Last Underwater Inspec	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date /	Description)	
Bridge replaced in 2007	7	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nur	mber	1015
Scheduled Improvement	ents:			
Regional Priority Number	er	Programmed Work Year		
Nature of Program Wor	k:			
Appraisal Indices:		Comme	nts	
Fatigue	0.00			
Seismic	0.00			
Scour	0.00			
Flood	0.00			
Geometrics	0.00			
Barrier	0.00			
Curb	0.00			

0.00

Load Capacity

1015

Field Inspection Informatio	n:				
Date of Inspection: Ju	uly 31, 2020	Type of Inspection:	x OSIM	Enhanced OS	IM
Inspector: Je	eremy Wammes, E.I.T.	(Dillon Consulting Lim	ited)		
Others in Party: A	lessia Mussio, E.I.T. (D	illon Consulting Limite	d)		
Access Equipment Used: C	amera, Measuring tape	, Measuring wheel, an	d Hammer		
Weather: S	unny				
Temperature: 28	3 ℃				
IA LUC II C C B				D : '	
Additional Investigations R	equirea:		Ninn	Priority	Llanant
			None	Normal	Urgent
Material Condition Survey					
Detailed Deck Condition	Survey:		х		
Non-Destructive Delami		It-Covered Deck	X		
Concrete Substructure (	X				
Detailed Coating Conditi	X				
Detailed Timber Investig	X				
Post-Tensioned Strand	Х				
Underwater Investigation:	<u>.</u>		х		
Fatigue Investigation:			Х		
Seismic Investigation:			х		
Structure Evaluation:			х		
Monitoring					l
Monitoring of Deformation	ons, Settlements and M	ovements:	Х		
Monitoring Crack Widths			Х		
Investigation Notes:					
Overall Structure Notes:					
Recommended Work on Stru	icture: None 2	Maintenance	Minor Rehab		Replace
			Major Rehab		
Timing of Recommended Wo	ork:	1 to 5 years	6 to 10 years	·	
Overall Comments:	Maintenance i of the deck top	s recommended for nu and approaches (or r at SE shoulder.	imerous cracks i	n the wearing	
Date of Next Inspection:	June 2022				
•	<u>'</u>				

### **Element Data**

	Decks					6.3	m			
Element Name:	Wearing surfa	ace		Width:		6.5	m			
Location:				Height:						
Material:	Asphalt (Tar a	sphalt (Tar and Chip)		Count:						
Element Type:		Т		Total Quantity:		41.0	Sq	.m		
Environment:	Moderate			Limited Inspec	ctic	n				
Protection System:										Perform.
Condition	Uni	ts	Exc.	Good		Fair		Poor	D	eficiencies
Data:	<b>Sq.m</b> / m / ea	nch / % / all	0.0	9.0		16.0		16.0		
Comments:										
Deteriorated wearing s aproaches and extendi		pan. Light to	severe edg							ng at N&S
Deteriorated wearing s	ng toward mids			e cracking along	ĮΕ		of <sub> </sub>	pavemen		ng at N&S
Deteriorated wearing s aproaches and extendi	ng toward mids	pan. Light to	severe edg	e cracking along	Ma	&W edges	of p	pavemen	t.	ng at N&S 2 year

Element Group:	Culverts			Length:		5.5	m		
Element Name:	Barrels - So	Barrels - Soffit				15.0	m		
Location:									
Material:	Cast-in-plac	Cast-in-place concrete							
Element Type:					y:	82.5	S	q.m	
Environment:	Benign I			Limited Insp	ecti	on			
Protection System:									Perform.
Condition	U	nits	Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	39.6	42.9		0.0		0.0	
Comments:									
Recommended Work		Rehab	Replace		М	laintenanc	e N	leeds:	
		1-5 years	6-10 yea	rs		Urgent		1 year	2 year
		•	•			•	•		

Element Group:	Culverts		Length:	15.0	m	
Element Name:	Barrels - Vertical Walls		Width:			
Location:	North/South	North/South		3.2	m	
Material:	Cast-in-place concrete		Count:	2		
Element Type:	Reinforced Concrete	Reinforced Concrete		tal Quantity: 94.5 Sq.m		
Environment:	Benign		Limited Inspection			
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / each / % / all	45.4	43.7	3.6	1.8	

#### Comments:

N Wall: HDPE outlet with hairline cracking and efflorescence and a narrow vertical crack extending the full height of wall. S Wall: 2 HDPE outlets with hairline cracking and minor honeycombing was observed. Corrosion staining below west pipe.

Recommended Work:	Rehab	Replace	Maintenanc		
	1-5 years	6-10 years	Urgent	1 year	2 year

### **Element Data**

Element Group:	Culverts			Length:	5.	5 m	า		
Element Name:	Inlet/Outlet Co	mponents		Width:				•	·
Location:	East/West He	adwalls		Height:	0.0	6 m	า		
Material:	Cast-in-place	Cast-in-place concrete C				2			
Element Type:	Reinforced co	Reinforced concrete T			<i>r</i> : 6.0	6 S	iq.m		
Environment:	Moderate	Moderate			ction				
Protection System:							•	Per	form.
Condition	Unit	S	Exc.	Good	Fair		Poor	Defici	encies
Data:	<b>Sq.m</b> / m / ea	ch / % / all	0.9	5.7	0.0	0.0 0.0			
Comments:									
Recommended Work:		Rehab	Replace		Maintenan	ce l	Needs:		
		1-5 years	6-10 years		Urgent		1 year	2 ye	ear

Element Group:	Culverts	Culverts			m	
Element Name:	Inlet/Outlet Components -	Inlet/Outlet Components - Wingwalls		0.3	m	
Location:	North/South	North/South I		3.8	m	
Material:	Cast-in-place concrete C		Count:	4		
Element Type:	-		<b>Total Quantity</b>	Quantity: 53.2 Sq.m		
Environment:	Moderate		Limited Inspection			
Protection System:					•	Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / each / % / all	7.1	42.1	3.5	0.5	

### Comments:

NW: Hairline crack with efflorescence (1.0m). Light spall at top of wall. NE: Hairline crack (2.0m).

Recommended Work:	Rehab	Replace	Ma	Maintenance Needs:			
	1-5 years	6-10 years		Urgent		1 year	2 year

Element Group:	Embankments & Streams	Embankments & Streams				
Element Name:	Streams and Waterways V		Width:			
Location:			Height:			
Material:			Count: 2			
Element Type:			Total Quantity: 2 a		all	
Environment:			Limited Inspec	ction		
Protection System:						Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	1	1	

### Comments:

Debris build up in the waterway. Large tress and other vegatation at inlet end.

Recommended Work:	Rehab	Replace	Maintenan	Maintenance Needs:		
	1-5 years	6-10 years	Urgent	1 year	x 2 year	
	Remove debris.					

### **Element Data**

Recommended Work:

Element Group:	Embankments & Streams				Length:							
Element Name:	Embankments				Width:							
Location:					Height:							
Material:					Count: 6							
Element Type:					<b>Total Quantity</b>	:	6	ea	ıch			
Environment:					Limited Inspec	imited Inspection						
Protection System:										<u> </u>		Perform.
Condition	U	nits			Exc.	Good		Fair	Poor D		Deficiencies	
Data:	Sq.m / m / 6	each	/ % / all		0.0	0.0		4.0	2.0			
Comments:	<del>!                                    </del>					•		'				
Additional embankment	s located at	NE a	nd SW c	10:	ners. <b>SE</b> : 9	Severe erosion o	of th	ne shoulde	r at	t structure	e C	orner.
<b>NE</b> : Steep slope with file	tercloth expo	sed.										
Recommended Work:		R	ehab		Replace		aintenance	ntenance Needs:				
		1-	5 years		6-10 year	s Ur		Urgent		1 year		x 2 year
			-				Re	epair emba	nkı	ments.		
Element Group:	Embankments & Streams					Length:						
Element Name:	Slope prote	ction				Width:						
Location:	All Four Qua	adran	nts			Height:						
Material:						Count:		4				
Element Type:	Hand laid riprap				<b>Total Quantity</b>	:	4	ea	ıch			
Environment:						Limited Inspec	ction					
Protection System:												Perform.
Condition	U	nits			Exc.	Good		Fair Poor		Poor		Deficiencies
Data:	Sq.m / m / each / % / all				0	2		2 0				
Comments:	•											
NE and SE: Unstable /	steep rip-rap	).										
Recommended Work:		R	ehab		Replace		Ma	aintenance	e N	leeds:		
		1-	5 years		6-10 year	S		Urgent		1 year	- 1	x 2 year
							Ro	tuine main	iter	nance.		
Element Group:	Signs					Length:						
Element Name:	Signs				Width:							
Location:						Height:						
Material:					Count:	4						
Element Type:					<b>Total Quantity</b>							
Environment:						Limited Inspec	ctic	on				
Protection System:												Perform.
Condition	Units			Exc.	Good		Fair Poor		1	Deficiencies		
Data:	Sq.m / m / <b>each</b> / % / all				0	4	0		0			
Comments:												
Object markers at 4 cor	nore											

Replace

6-10 years

Maintenance Needs:

1 year

2 year

Urgent

Rehab

1-5 years

### **Ontario Structure Inspection Manual - Inspection Form**

**Structure Number** 

1015

### **Element Data**

Element Group:	Approaches	Length:	6.0	6.0 m			
Element Name:	Wearing Surface	Width:	6.5	6.5 m			
Location:	North/South Approaches	Height:					
Material:	Asphalt (Tar and Chip)	Count:	2				
Element Type:		<b>Total Quantity</b>	78.0	Sq.m			
Environment:	Moderate	Limited Inspection					
Protection System:					•	Perform.	
Condition	Units Exc.		Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / each / % / all	0.0	19.0	34.0	25.0		

### Comments:

N Approach: Severe alligator and progressive edge cracking along west edge of pavement (7.0x1.0m). Severe alligator cracking starting at the structure edge and extending into the approach wearing surface (6.2x1.5m)

S Approach: Severe alligator cracking starting at the structure edge extending into the wearing surface (6.2x2.0m)

Recommended Work:	Rehab	Replace	М	Maintenance Needs:				
	1-5 years	6-10 years		Urgent		1 year	х	2 year
			st	Wearing surface condition is localized at structure limits. Full replacement and pavement investigation is required to identif the underlying issue.				



# Description

Road over the bridge. (Looking North)



# Description

Cracking of asphalt pavement at junction of deck top and south approach. (Looking East)



# Description

Cracking of asphalt pavement at junction of deck top and north approach. (Looking South)



# Description

Edge cracks at north approach. (Looking North)



# Description

East elevation, wingwalls, abutment walls, and HDPE outlet. (Looking West)
Vegetation and heavy debris blocking flow.



# Description

Severe erosion of the shoulder at the southeast embankment.



# Description

West elevation, wingwalls, abutment walls, and HDPE outlet. (Looking East)



# Description

South abutment wall near west extent, HDPE outlet with corrosion staining beneath. (Looking South)



# Description

North-west wingwall. Vertical crack with efflorescence staining.



# Description

Waterway west from the bridge. (Looking West)



# Description

Waterway east from the bridge. (Looking East)



# Description

North-east embankment. (Looking North)



# Description

Waterway and south-west embankment with some debris blocking the flow.

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1016

Inventory Data:						
Structure Name	Collins Drain at Outer Drive Culvert					
Main Hwy/Road #	Outer Dr. On Under x	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other				
Hwy/Road Name	Outer Drive					
Structure Location	At transition from Outer Drive connector	or (North of Talbot Road) to Outer Drive				
Latitude	42° 13' 58.7"	Longitude -82° 59' 3.8"				
Owners	Town of Tecumseh	Heritage Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List				
MTO region		Road Class: Freeway Arterial Collector x Local				
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 Transit Truck x Routes: School Bicycle				
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	2018	Last Evaluation				
Last Enhanced OSIM Ir	nspection	Current Load Limit 5.0				
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #				
Last Underwater Inspec	etion	By-Law Expiry Date				
Last Condition Survey						
Rehab History: (Date / Description)						
Repaired and extended	in 2005 for the Hwy #3 and Hwy 401 im	provements including jacketing of footings.				

Ontario Structure Insp	ection Manual - Inspection Form	Structure Nu	1016
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comme	ents
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Ontario	Structura	Inenaction	Manual -	Inspection	Form

1016

•		•					
Field Inspection Informa	tion:						
Date of Inspection:	July 31, 2020		Type of Inspection	on:	x OSIM	Enhanced OS	IM
Inspector:	Jeremy Wamm	nes, E.I.T.	(Dillon Consulting	Limi	ted)		
Others in Party:	Alessia Mussic	o, E.I.T. (Di	llon Consulting Lir	mited	i)		
Access Equipment Used:	Camera, Meas	suring tape	, Measuring wheel	l, and	d Hammer		
Weather:	Sunny						
Temperature:	25.0 °C						
Additional Investigations	Required:					Priority	
					None	Normal	Urgent
Material Condition Survey							
Detailed Deck Condition	on Survey				х		1
Non-Destructive Dela		v of Asphal	t-Covered Deck:		X		
Concrete Substructur					х		1
Detailed Coating Con					х		
Detailed Timber Inves	stigation:				Х		
Post-Tensioned Stran					Х		
Underwater Investigation:					Х		
Fatigue Investigation:					Х		
Seismic Investigation:					Х		
Structure Evaluation:					Х		
Monitoring					T	T	1
Monitoring of Deforma		ents and Me	ovements:				-
Monitoring Crack Wid Investigation Notes:	tns:					Х	
Cracks at the deck soffit sl	nall be moniotor	ed for deg	redation.				
Overall Structure Notes:							
Recommended Work on S	structure: N	lone	Maintenance	L	Minor Rehal	o	Replace
					x Major Rehal	D.	
Timing of Recommended	Work:		1 to 5 years		x 6 to 10 years	S	
Overall Comments:		ommended	d rehabilitation wor				roofing,
	cond	crete patch	repairs and crack	k inje	ction to the orig	ginal culvert str	ucture.
Date of Next Inspection:	June	e 2022					
•							

1016

Element Buta											
Element Group:	Decks					Length:		3.6	m		
Element Name:	Wearing su	rfa	ice			Width:		23.6	m		
Location:	Top of Decl	k				Height:					
Material:	Asphalt					Count:					
Element Type:						Total Quantit	ty:	85.0	Sq.m		
Environment:	Moderate					Limited Inspe	ecti	on			
Protection System:											Perform.
Condition	U	nit	S	E	XC.	Good		Fair	Poor	7 c	Deficiencies
Data:	<b>Sq.m</b> / m /	ea	ch / % / all	7	3.6	11.3		0.0	0.0		
Comments: Road repayed in recent year	·s.						la.				
Recommended Work:			Rehab		place		M	aintenance	1	-	T_
			1-5 years	6-	10 yeaı	rs	_	Urgent	1 year	上	2 year
Element Group:	Barriers					Length:		55.0	m		
Element Name:	Railing Sys	ten	n			Width:					
Location:	West Road	Ed	dge			Height:					
Material:	Steel					Count:					
Element Type:	Single Rail	(St	teel Beam,	and P	ost)	Total Quantit	ty:	55.0	m		
Environment:	Moderate					Limited Inspe	ecti	on			
Protection System:									L 1		Perform.
Condition	U	nit	S	Е	XC.	Good		Fair	Poor	T [	Deficiencies
Data:	Sq.m / <b>m</b> / e	ead	ch / % / all	(	0.0	55.0		0.0	0.0	1	
Comments:  Recommended Work:			Rehab	Re	eplace		М	aintenance	e Needs:		
			1-5 years	6-1	10 yeai	rs		Urgent	1 year		2 year
Element Group:	Barriers					Length:				_	
Element Name:	Posts					Width:					
Location:	West Road	Ed	dge			Height:					
Material:	Steel					Count:		27			
Element Type:						Total Quantit	ty:	27	each		
Environment:	Moderate					Limited Inspe	ecti	on			
Protection System:										T	Perform.
Condition	U	nit	S	Е	XC.	Good		Fair	Poor	T [	Deficiencies
Data:	Sq.m/m/e	eac	<b>ch</b> / % / all		0	27		0	0	T	
Comments: Eight (8) wood posts wit offsets are used.				) stee	l posts	with wood offs	ets,	and four (4	) steel posts	and	d plastic
Recommended Work:			Rehab	Re	eplace		М	aintenance	e Needs:	$\perp$	,
			1-5 years	6-1	10 yeai	rs		Urgent	1 year	$\perp$	2 year

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Element Data							
Element Group:	Barriers			Length:	75.0	m	
Element Name:	Railing Syst	tem		Width:			
Location:	East Road I	Edge		Height:			
Material:	Steel			Count:			
Element Type:	Single Rail	(Steel Beam,	and Post)	Total Quantity	r: 75.0	m	
Environment:	Moderate		,	Limited Inspe			
Protection System:				-		1 1	Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sa.m / <b>m</b> / e	each / % / all	0.0	75.0	0.0	0.0	
Comments:							
Recommended Work:		Rehab	Replace		Maintenanc		
		1-5 years	6-10 yea	ars	Urgent	1 year	2 year
Element Group:	Barriers			Length:			
Element Name:	Posts			Width:			
Location:	East Road I	Edge		Height:			
Material:	Var.			Count:	39		
Element Type:				Total Quantity		each	
Environment:	Moderate			Limited Inspe	ction		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	0	38	0	1	
Comments: Eight (8) wood posts wit plastic offsets are used.		One (1) woo	d post was o	damaged and disc	connected fro	m the guardr	
Recommended Work:		Rehab	Replace		Maintenanc	1	1_
		1-5 years	6-10 yea	ars	x Urgent	1 year	2 year
					Repair poor	condition ele	ments.
Element Group:	Culverts			Length:	3.1		
Element Name:		offit - New Sec	rtion	Width:			
Location:	East/West E		JUOIT	Height:	Var.	m	
Material:	Cast-in-plac			Count:			
Element Type:	Rigid R.C fr			Total Quantity		Co	
Environment:	Moderate	anie		Limited Inspe		Sq.m	
Protection System:	Moderate			Limited insper	Clion		Perform.
	1.1	nits	Evo	0	l Foir	Door	Deficiencies
Condition			Exc.	Good	Fair	Poor	Deliciencies
Data:	<b>5q.m</b> / m / 6	each / % / all	0.0	68.2	0.0	0.0	
Comments: 22.0m was extended to	the old bridg	, ,			1		
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:	1
		1-5 years	6-10 yea	ars	Urgent	1 year	2 year

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#### **Element Data**

Element Group:	Culverts			Length:	3.1 r	m		
Element Name:	Barrels - Soff	it - Original S	Section	Width:	18.5 r	m		
Location:	Intermediate	section		Height:				
Material:	Cast-in-place	concrete		Count:				
Element Type:	Non-Rigid R.0	C frame		<b>Total Quantity</b>	57.4 \$	57.4 Sq.m		
Environment:	Moderate			Limited Inspec	ction			
Protection System:							Perform.	
Condition	Uni	ts	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / ea	ich / % / all	0.0	24.7	21.8	10.9		
Comments: Two (2) wide and (5) Me sealed in previous work:						Ū		
Recommended Work:		Rehab	Replace		Maintenance	Needs:		
	1-5 years 6-10 year			S	Urgent	1 year	x 2 year	
	-1	Monitor cracks likely in 1-5 ye		maintenance				

Element Group:	Culverts		Length:	40	5 m	1	
Element Name:	Barrels - Vertical Walls	Barrels - Vertical Walls					
Location:	North/South	Height:	2	0 m	1		
Material:	Cast-in-place concrete	Count:		2			
Element Type:	Reinforced concrete	Reinforced concrete			Total Quantity: 162.0 Sq.m		
Environment:	Benign		Limited Inspec	ction	Х		
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / each / % / all	64.8	93.2	2.0		2.0	
Comments:							

#### 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:	Rehab	Replace	Maintenance Needs:					
	1-5 years	6-10 years		Urgent		1 year	Х	2 year
				onitor cracl ely in 1-5 y			nai	ntenance

Element Group:	Embankmen	its & Streams	;	Length:					
Element Name:	Streams and	l Waterways		Width:					
Location:									
Material:				Count:	1				
Element Type:				Total Quantity	ntity: 1 all				
Environment:				Limited Inspe	Inspection				
Protection System:					•	•	Perform.		
Condition	Ur	nits	Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m/m/e	ach / % / <b>all</b>	0	0		1		0	
Comments: Minor debris build up w	as observed i	n the waterwa	ay, excessiv	e vegetation.					
Recommended Work:		Rehab	Replace		M	aintenance	e N	leeds:	
	1-5 years 6-10 year			ırs		Urgent	х	1 year	2 year
Remove debris, and complete r maintenace for the waterway.						J			

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Element Group:	Embankme	nts 8	& Streams	3		Length:				
Element Name:	Embankme	nts				Width:				
Location:	All Four Qua	adra	nts			Height:				
Material:						Count:		4		
Element Type:						<b>Total Quantity</b>	<b>/</b> :	4	each	
Environment:						Limited Inspection				
Protection System:								'		Perform.
Condition	U	nits			Exc.	Good		Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each	/ % / all		0	4		0	0	
Comments: Steep embankments. W	<b>/ End</b> : 1.0m	Dia.	and 0.6m	ı C	ia. CSP dr	ain into the emb	ank	kment.		
Recommended Work:		F	Rehab		Replace		Ma	aintenance	Needs:	
		1	I-5 years		6-10 year	S		Urgent	1 year	2 year
Element Group:	Embankme	nts 8	& Streams	3		Length:				
Element Name:	Slope prote	ction	1			Width:				
Location:	All Four Qua	adra	nts			Height:				
Material:						Count:		4		
Element Type:	Hand laid R	Rip-R	ар			<b>Total Quantity</b>	<b>/</b> :	4	each	
Environment:						Limited Inspe	ctio	n		
Protection System:										Perform.
Condition	U	nits			Exc.	Good		Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each	/ % / all		0	4		0	0	
Comments:  Recommended Work:		-	Rehab		Replace 6-10 year	s	Ma	aintenance Urgent	e Needs:	2 year
			o youro		10 10 your			Orgonic	ı you.	
Element Group:	Signs					Length:				
Element Name:	Signs					Width:				
Location:	All four corr	ners				Height:				
Material:						Count:		3		
Element Type:	Var.					<b>Total Quantity</b>	<b>/</b> :	3	each	
Environment:						Limited Inspe	ctio	n		
Protection System:										Perform.
Condition	U	Inits			Exc.	Good		Fair	Poor	Deficiencies
Data:	Sq.m/m/e	each	/ % / all		0	3		0	0	
Comments: Two (2) hazard marker marker signs present.	signs and on	· · ·		n '		ved to be in goo				orners: no
Recommended Work:		-	Rehab		Replace		1	aintenance		1
			I-5 years		6-10 year	S		Urgent	x 1 year	2 year
							Ad	ld object m	arkers.	

# Ontario Structure Inspection Manual - Inspection Form

**Structure Number** 

1016

Element Group:	Approaches			Length:		6.0	m		·
Element Name:	Wearing sur	Wearing surface				23.6	m		
Location:	North/South	Height:							
Material:	Asphalt	Count:		2					
Element Type:		Total Quantity	y:	283.2	Sc	η.m			
Environment:	Moderate	Limited Inspe	ctio	on					
Protection System:									Perform.
Condition	Ur	nits	Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	ach / % / all	245.4	37.8		0.0		0.0	
Comments: Road repaved in recent	years.								
Recommended Work:		Rehab	Replace		M	aintenanc	e N	leeds:	
	-	1-5 years	6-10 year			Urgent		1 year	2 year



# Description

Road over the bridge. (Looking Southwest)



# Description

North approach. (Looking Northeast)



# Description

South approach. (Looking East)



# Description

Centreline of the road wearing surface approximately at midpsan of the culvert.



# Description

E.B.L wearing surface (Looking NE)



# Description

Pavement joint on the deck and approach wearing surfaces. (Looking NE)



# Description

Wearing surface over the structure deck (Looking SE)



# Description

Settled, rotated post of railing system at the north-east corner, (Looking Northeast)



# Description

Missing hazard marker sign at NE corner (Looking Southwest)



# Description

East Elevation (Looking North).



# Description

Inside the bridge, showing the non-rigid original section of the bridge with jacketed footings, as well as the new rigid frame section extention. (Looking Northwest)



# Description

Typical delamination, cracking with staining at deck soffit within the original section of the bridge.



# Description

Typical cracking with stain at deck soffit. (Looking Northwest)



# Description

Cracks extending at from the deck soffit to the abutments at the north abutment wall.





# Waterway at east extent. (Looking Southeast)

Description

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1021

Inventory Data:		
Structure Name	Pike Creek at Twelfth Concession Roa	d Culvert
Main Hwy/Road #	On x Under	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other
Hwy/Road Name	Twelfth Concession Road (closed to tra	affic - walking path)
Structure Location	Pike Creek at Twelfth Concession Roa	d (South of Baseline Road in Pike Creek Park)
Latitude	42° 15' 1.4"	Longitude -82° 52′ 58.7"
Owners	Town of Tecumseh	Heritage Not Consid: Cons/not App. List/n.d. Designation Desig./not list Desig & List
MTO region		Road Class: Freeway Arterial Local x
MTO District		Posted Speed N/A No. of Lanes 1
Old County		AADT 0 % Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence
Structure Type	Corrugated Steel Pipe Arch	Interchange Number
Total Deck Length	6.5 m	Interchange Structure Number
Overall Str. Width	11.8 m	Min. Vertical Clearance m
Total Deck Area	76.7 sq. m	Special Transit Truck Routes: School Bicycle
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;	m
Historical Data:		
Year Built	1965	Year of Last Major Rehab.
Last OSIM Inspection	2018	Last Evaluation
Last Enhanced OSIM I	nspection	Current Load Limit
Enhanced Access Equi (ladder, boat, lift, etc.)	ipment	Load Limit By-Law #
Last Underwater Insped	ction	By-Law Expiry Date
Last Condition Survey		
Rehab History: (Date /	Description)	

Ontario Structure Insp	ection Manual - Inspection Form	Structure Numb	er 1021
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comments	3
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Ontario Structure Inspection Manua	al - Inspection For	m

1021

·									
Field Inspection Informa	tion:								
Date of Inspection:	July 31, 2020		Type of Insp			E	nhanced	OSIM	
Inspector:	Jeremy Wamme	s, E.I.T.	(Dillon Consul	ting Lim	ited)				
Others in Party:	Alessia Mussio,	E.I.T. (D	illon Consultin	g Limite	d)				
Access Equipment Used:	Camera, Measu	ring tape	, Measuring w	heel, an	d Hammer				
Weather:	Sunny								
Temperature:	24.0 °C								
	•								
Additional Investigations	Required:				Non		Priority	Llrace	
					Nor	ie	Normal	Urger	π
Material Condition Survey									
Detailed Deck Conditi	on Survey:				Х				
Non-Destructive Dela	mination Survey	of Aspha	It-Covered De	ck:	Х				
Concrete Substructur		ey:			Х				
Detailed Coating Con					Х				
Detailed Timber Inves					Х				
Post-Tensioned Strar	d Investigation:				Х				
Underwater Investigation:					Х				
Fatigue Investigation:					Х				
Seismic Investigation:					Х				
Structure Evaluation:					Х				
Monitoring	- t' O - ttl	( I NA				-			
Monitoring of Deforma		is and ivi	overnents:				Х		
Monitoring Crack Wid Investigation Notes:	tns:				Х				
Monitor the minor deforma	tion of the CSP s	ection.							
Overall Structure Notes:									
Recommended Work on S	structure: No	ne >	Maintenance	)	Minor F	Rehab.		Replac	;e
					Major F	Rehab.			
Timing of Recommended	Work:	)	1 to 5 years		6 to 10	years			
Overall Comments:	bolts.	deforma Mainten	ation was observance to improven.  Install object	e the e	rosion prote			-	
Date of Next Inspection:	June 2		o.a object	a.nor					
o	00.10 2								

Element Data							
Element Group:	Decks			Length:	6	3.5 m	
Element Name:	Wearing su	rface		Width:	3	3.7 m	
Location:				Height:			
Material:	Compacted	granular		Count:			
Element Type:				Total Quantity: 24.0 Sq.m			
Environment:	Severe			Limited Inspec	ction		
Protection System:							Perform.
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	0.0	24.0	0.0	0.0	
Comments: Compacted granular fill	approximate	ly 300mm thic		equired.			
Recommended Work:		Rehab	Replace		Maintenar	nce Needs:	
		1-5 years	6-10 year	s	Urgent	x 1 year	2 year
						riginal design ng analysis fo	documents or r fill
Element Group:	Culverts			Length:	1 6	3.5 m	
Element Name:	Barrels			Width:		.8 m	
Location:	<b>D</b> 0 0.1			Height:		3.5 m	
Material:	Corrugated	steel		Count:	-	1	
Element Type:	Pipe Arch			Total Quantity	: 180	0.0 Sq.m	
Environment:	Moderate			-	mited Inspection		
Protection System:							Perform.
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / 6	each / % / all	0.0	140.0	35.0	5.0	
Comments: Minor buckling along fas bolts were missing at rai		ns. Light corr	osion above		nd: Expose	d bottom sec	
Recommended Work:		Rehab	Replace			nce Needs:	
		1-5 years	6-10 year	S	Urgent	1 year	2 year
Element Group:	Embankme	nts & Streams	3	Length:			
Element Name:		d Waterways		Width:			
Location:				Height:			
Material:				Count:		2	
Element Type:				Total Quantity	<b>'</b> :	2 all	
Environment:				Limited Inspection			

Element Group:	Embankment	Embankments & Streams			Length:					
Element Name:	Streams and	Waterways			Width:					
Location:					Height:					
Material:					Count:		2			
Element Type:		Total Qu			<b>Total Quantity</b>	:	2	all		
Environment:			Limited Inspection							
Protection System:										Perform.
Condition	Units			Exc.	Good	Fa	ir		Poor	Deficiencies
Data:	Sq.m/m/ea	ch / % / <b>all</b>		0	0	2	2		0	
Comments: Minor erosion of downs	tream banks. [	ebris build	up do	ownstrea	am.					
Recommended Work:		Rehab	R	Replace		Mainte	nance	Ne	eds:	
	1-5 years 6-10 year			-10 years	3	Urge	ent	•	1 year	x 2 year
		Improv	e eros	ion	control.					

1021

Element Group:	Embankmen	nts	& Streams	;		Length:					
Element Name:	Embankmen	nts				Width:					
Location:						Height:					
Material:						Count:		5			
Element Type:	lement Type:				<b>Total Quantity</b>	<b>'</b> :	5	ea	ıch		
Environment:						Limited Inspec	ctic	n			
Protection System:				·					·	Perform.	
Condition	Units				Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m / m / e	Sq.m/m/each/%/all			0	0		5		0	
Comments: Steep embankments wit	th signs of er	osi	ion. Large o	COI	ncrete piec	es at each corn	er				
Recommended Work:			Rehab		Replace		Ma	aintenance	• N	leeds:	
			1-5 years		6-10 years	3		Urgent		1 year	x 2 year
							lm	prove eros	ior	n control	
		_		_							
Element Group:	Signs					Length:					
Element Name:	Signs					Width:					

	9							
Element Name:	Signs		Width:					
Location:			Height:					
Material:								
Element Type:		Total Quantity: 0 each						
Environment:			Limited Inspection					
Protection System:						Perform.		
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m / m / <b>each</b> / % / 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.								
I		1 1 .				1		

Recommended Work:	Rehab	Replace	M	Maintenance Needs:				
	1-5 years	6-10 years	х	Urgent		1 year		2 year
			In	stall signs				



# Description

Road over the bridge. (Looking North)



# Description

Road over bridge, and east Outlet. (Looking South)



# Description

West elevation. (Looking West)



# Description

Bridge barrel. (Looking West)



# Description

Bridge barrel. (Looking West)



# Description

Missing bolts in CSP joints.



# Description

North springline (Looking West)



# Description

Minor deformation in structure barrel.



# Description

Water flowing from south at east end. (Looking South)



# Description

Water flowing towards north at east end. (Looking North)

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

1028

Inventory Data:			
Structure Name	East Townline Drain at St. Thomas Str	eet Bridge	
Main Hwy/Road#	On x Under	Crossing Navig. Water Type: Rail	Non-Navig. x Ped. Road Other
Hwy/Road Name	St. Thomas Street		
Structure Location	At intersection with Manning Road		
Latitude	42° 19' 10.6"	Longitude -82° 52' 7.9"	
Owners	Town of Tecumseh	Heritage Not Consid:  Designation Desig./not list	Cons/not App. List/n.d. Desig & List
MTO region		Road Class: Freeway Collector	Arterial Local x
MTO District		Posted Speed 40	No. of Lanes 2
Old County		AADT 2000	% Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Concrete Rigid Frame	Interchange Number	
Total Deck Length	5.4 m	Interchange Structure Number	
Overall Str. Width	30.5 m	Min. Vertical Clearance	m
Total Deck Area	164.7 sq. m	Special Transit Routes: School	Truck Bicycle
Roadway Width	m	Detour Length Around Bridge	1.4 km
Skew Angle	0.0 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	0.6 m
Span Lengths	Total = 4.8 (1) = 4.8;		m
Historical Data:			
Year Built	1975	Year of Last Major Rehab.	
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM Ir	nspection	Current Load Limit	
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #	
Last Underwater Inspec	ction	By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date / I	Description)		
	0x2500 steel plate was added on the dec derstood this bridge is scheduled to be r		

Ontario Structure Insp	ection Manual - Inspection Form	Structure Numl	ber 1028
Scheduled Improvement	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Wor	k:		
Appraisal Indices:		Comment	s
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Ontario	Structura	Inenaction	Manual -	Inspection	Form

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- 1	บ/ถ

-		•					
Field Inspection Informa	tion:						
Date of Inspection:	July 30, 202	20	Type of Inspection:	x OSIM	Enhanced OS	SIM	
					,		
Inspector:	Jeremy Wa	mmes, E.I.	T. (Dillon Consulting Lir	mited)			
Others in Party:	Alessia Mus	sio, E.I.T.	(Dillon Consulting Limit	ed)			
Access Equipment Used:	Camera, Me	, Measuring tape, Measuring wheel, and Hammer					
Weather:	Sunny						
Temperature:	20 °C						
Additional Investigations	. Poquirod:				Driority		
Additional investigations	s Requireu.			None	Priority Normal	Urgent	
				140110	Homia	Orgoni	
Material Condition Survey							
Detailed Deck Condit		Х					
Non-Destructive Dela		Х					
Concrete Substructur	Х						
Detailed Coating Con	Х						
Detailed Timber Inves				Х			
Post-Tensioned Strar		on:		Х			
Underwater Investigation:				Х			
Fatigue Investigation:				х			
Seismic Investigation:				х			
Structure Evaluation:				Х			
Monitoring							
Monitoring of Deforma	ations, Settle	ments and	Movements:	х			
Monitoring Crack Wid				Х			
Investigation Notes:							
Deck suspect to deteriorat	tion due to co	ndition of	soffit below travelled roa	adway.			
Overall Structure Notes:							
Recommended Work on S	Structure:	None	Minor Rehab.	Major Rehab	).	x Replace	
Timing of Recommended	Work:		x 1 to 5 years	6 to 10 years			
Overall Comments:	R	tructure to	nt warranted. The Town be replaced by an enclo e Manning Road improv	of Tecumseh hat osed storm water	s scheduled th		
Date of Next Inspection:		une 2022	-				

Element Group:	Decks					Length:	5.4 m						
Element Name:	Wearing Su	ırfa	ice			Width:		20.0 m					
Location:						Height:	deight:						
Material:	Asphalt					Count:							
Element Type:						<b>Total Quantity</b>							
Environment:	Moderate					Limited Inspec	Limited Inspection						
Protection System:										Perform.			
Condition	U	nit	S	Exc.		Good		Fair	Poor	Deficiencies			
Data:	<b>Sq.m</b> / m /	ead	ch / % / all		0.0	76.0		16.0	16.0				
Comments: Two wide transverse cracks over the culvert section and wide central crack extending from pavement joint to the ea approach. New asphalt patch from 2016 steel plate rehab.													
Recommended Work:		Х	Rehab		Replace		Ma	aintenance	Needs:				
		Х	1-5 years		6-10 years	S		Urgent	1 year	2 year			
Asphalt repairs.													
Element Group:	Decks					Length:		5.4	m				
Element Name:	Deck Top					Width:		30.5					
Location:	Top of Decl	<				Height:		00.0	•••				
Material:	Cast-in-plac		concrete			Count:							
Element Type:						Total Quantity	<u>':</u>	164.7	Sa.m				
Environment:	Moderate				Limited Inspect				x				
Protection System:										Perform.			
Condition	U	nit	nits Exc.			Good		Fair	Poor	Deficiencies			
Data:	<b>Sq.m</b> / m / each / % / a				0.0	109.7		27.5	27.5	Denoierioles			
Comments: Deck is mostly unexpos assist in capacity.	ed and cond	itic	n was assı	ım	ned based o	on the soffit dete	erio	ration. Stee	el plate install	in 2016 to			
Recommended Work:			Rehab	Х	Replace		Ma	aintenance	Needs:				
			1-5 years		6-10 years	S		Urgent	1 year	2 year			
Replace structure deck,	new waterp	roc	ofing.										
Element Group:	Decks					Length:		30.5	m				
Element Name:	Soffit - Thic	k S	Slah			Width:		4.8 m					
Location:	Interior		, idb			Height:		4.0					
Material:	Cast-in-plac	ce :	concrete		Count:								
Element Type:						Total Quantity	·:	146.4					
Environment:	Benign					Limited Inspec							
Protection System:	Berngir									Perform.			
Condition	Units			Exc.	Good		Fair Poor		Deficiencies				
Data:	Sq.m / m / each / % / all				0.0	105.2		20.6	20.6	Bonolonolog			
Comments:			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			1							
Several regions under re severe corrosion. Hairlir									steel with mod	lerate to very			
Recommended Work:			Rehab	х	Replace		Ma	aintenance	Needs:				
		Х	1-5 years		6-10 years	S		Urgent	1 year	2 year			
Replace structure deck.													

Lienent Data													
Element Group:	Abutments					Length:	;	30.5 m					
Element Name:	Abutment walls					Width:							
Location:						Height:		1.7					
Material:	Cast-in-place	се с	oncrete			Count: 2							
Element Type:	Legs of rigid	d fra	ame			Total Quantity: 103.7 Sq.m							
Environment:	Benign					Limited Inspec	tion						
Protection System:								-	ı		Perform.		
Condition	U	Inits			Exc.	Good	Fair		Po	or	Deficiencies		
Data:	<b>Sq.m</b> / m / e	eac	h / % / all		0.0	70.7	16.5	;	16	.5			
Comments:  Narrow to wide cracks (some sealed) with efflorescence staining and discrete locations of severe to very severe											severe		
delamination observed t	hroughout.												
Recommended Work:		х	Rehab		Replace		Mainten	ance	Need	s:	<u>[</u>		
		Х	1-5 years		6-10 years	S	Urger	nt	1 ye	ar	2 year		
Concrete repairs.													
Element Group:	Embankme	nts	& Streams	3		Length:							
Element Name:	Slope Prote	ectio	n			Width:							
Location:						Height:							
Material:						Count:							
Element Type:	Bag Mortar					Total Quantity	:		each				
Environment:	Benign					Limited Inspec							
Protection System:	20111911					Ziiiiiiod iiiopoo		<u> </u>			Perform.		
Condition	Units				Exc.	Good	Fair		Po	or	Deficiencies		
Data:	Sq.m/m/each/%/all				0	0	3		1		Deliciencies		
Comments: Partial collapse and loss embankments have sett				ria	1	ankments. Curb	above sl	lope	protect	ion at I	NE and SE		
Recommended Work:		-	Rehab	- · · · · · ·				Maintenance Needs:			<b>—</b> ——		
		Х	1-5 years	6-10 years			Urger	nt	1 ye	ear	2 year		
Repair slope protection.													
Element Group:	Embankme	nts	& Streams	3		Length:							
Element Name:	Embankme		u otrourre			Width:							
Location:	Linbankino	1110				Height:							
Material:						Count:		4					
Element Type:													
Environment:	Benign												
Protection System:	Denign					Limited Inspection							
Condition	1.1-34-			Π	Evo	Good	Fair	Fair		or	Perform.		
Data:	Units Exc. Sq.m / m / each / % / all 0					1	2		2		Deficiencies		
	Sq.III / III / E	eac	n / % / all		0	0					_		
Comments: Steep embankment. So surcharge is a concern.	uth-west cor	ner	is unstable	e.	South-east	embankment is	collapsir	ng. Si	tability	under	vehicular		
Recommended Work:			Rehab	х	Replace		Maintenance Needs:						
· · · · · · · · · · · · · · · · · · ·		-	1-5 years	Г	6-10 years		Urger		1 ye		2 year		
Replace retaining wall a	t all corners.			1				<u> </u>					

Element Data												
Element Group:	Embankments & Streams					Length:						
Element Name:	Streams an	d W	Vaterways			Width:						
Location:						Height:						
Material:						Count: 1						
Element Type:						Total Quantity: 1 all						
Environment:	Benign					Limited Inspec	ctio	n				
Protection System:											Perform.	
Condition	U	nits	nits Exc.			Good		Fair	Poor		Deficiencies	
Data:	Sq.m / m / e	eacl	h / % / <b>all</b>		0	0		0		1		
Comments:  Vegetative growth in the stream causes waterway blockage during the spring and summer season.												
Recommended Work:			Rehab		Replace		Ma	aintenance	Ne	eds:		
			1-5 years		6-10 years	S		Urgent	x 1	year	2 year	
							Cle	ear vegetat	tion 1	to improv	e hydraulics.	
Element Group:	Signs					Length:						
Element Name:	Signs	Signs										
Location:						Height:						
Material:						Count:	Count: 2					
Element Type:					<b>Total Quantity</b>	<b>/</b> :	2	eacl	h			
Environment:						Limited Inspec	ctio	n				
Protection System:											Perform.	
Condition	U	nits Exc.			Good		Fair		Poor	Deficiencies		
Data:	Sq.m/m/e	ach / % / all 0		2		0	0					
Comments:  No Parking sign at manning road beside the north outlet of the bridge, and STOP Sign at the interseciton.												
Recommended Work:		+	Rehab Replace				Ь -	aintenance			2	
			1-5 years		6-10 years		Urgent x 1 year 2 year stall Object Marker signs to meet					
								ntario Traffi			to meet	
Element Group:	Approaches	S				Length:		31.9	m			
Element Name:	Curb and G		ers			Width:		0.5 m				
Location:						Height:		0.2				
Material:	Cast-in-plac	се с	concrete			Count:						
Element Type:						Total Quantity	<b>'</b> :	31.9	m			
Environment:	Moderate					Limited Inspec	ctio	n				
Protection System:						-					Perform.	
Condition	Units		;		Exc.	Good		Fair Poor		Poor	Deficiencies	
Data:	Sq.m / <b>m</b> / 6	eacl	h / % / all		0.0	14.9	5.5		11.5			
Comments: Cracked curbs and settlement located along Manning Road.												
Recommended Work:		х	x Rehab Replace				Ma	aintenance				
			1-5 years		6-10 years	s	Ш	Urgent	1	year	2 year	
Repair curbs. Roadside	saftey conce	erns	S									

1028

# **Element Data**

Element Group:	Approaches			Length:		6.0 ו	m				
Element Name:	Wearing Su	rface		Width:		12.3 ו	m				
Location:			Height:		0.1 ו	m					
Material:	Asphalt		Count:		2						
Element Type:			<b>Total Quantity</b>	<b>/</b> :	147.6						
Environment:	Moderate			Limited Inspec	ctic						
Protection System:									Perform.		
Condition	Ur	nits	Exc.	Good		Fair		Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	ach / % / all	0.0	97.6		25.0		25.0			
Comments:  East: Wide central and diagonal cracks, medium transverse crack at edge of Manning Rd. Settlement at NE corner.  West: Wide transverse cracks/pavement joints.											
Recommended Work:	Replace		Maintenance			eeds:					
	x 1-5 years 6-10 year			S		Urgent		1 year	2 year		
Asphalt Repairs.											

Element Group:	Accessories		Length:				
Element Name:	Utilities	Width:					
Location:	North Outlet	Height:					
Material:	Aluminium	Count: 2					
Element Type:		Total Quantity: 2			ich		
Environment:	Benign	Limited Inspec					
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	Sq.m / m / <b>each</b> / % / all	0	2	0		0	
Commontos	•					•	

## Comments:

Two pipes (2 in. dia.) hung along the soffit at the bridge north outlet.

Note: Water sampling station is located at the north side of the west approach.

Recommended Work:	Rehab	Replace	Maintenance Needs:					
	1-5 years	6-10 years		Urgent		1 year		2 year



# Description

Road over the bridge. (Looking South)



# Description

Wearing at west approach. (Looking South)



# Description

Wearing at east approach. (Looking South)



# Description

New asphalt patch over top of bridge from steel plate installed in July 2016. (Looking SE)



# Description

Settlement of curb & gutter and asphalt at NE corner of the bridge, (Looking NE)



# Description

Curbs and gutter settlement at the SE side of the bridge, (Looking East)



# Description

North elevation



# Description

South elevation, excessive vegetation.



# Description

Abutment walls and soffit (looking South).



# Description

Soffit deterioration. Very severe spall with exposed and severely corroded reinforcement, severe delamination in adjacent areas.



### Description

Soffit deterioration. Very severe spall with exposed and severely corroded reinforcement, delamination in adjacent area. Medium vertical cracks (sealed) with efflorescence staining on abutment wall near soffit deterioration.



### Description

Soffit deterioration. Severe spall with exposed and severely corroded reinforcement, delamination in adjacent area. Medium vertical cracks (sealed) with efflorescence staining on abutment wall near soffit deterioration.



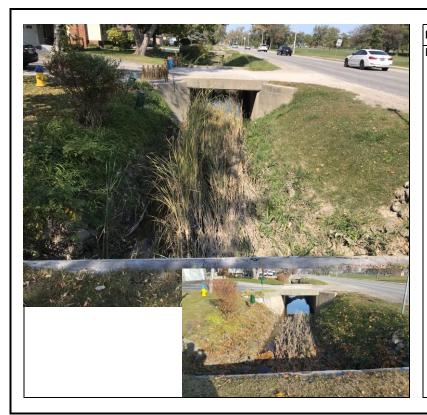
## Description

Mortar bags as retaining walls at the NE side.



## Description

Excessive vegetation at SW embankment and waterway.



## Description

Embankments and waterway at north side.



## Description

Embankments and waterway at south side, excessive vegetation.

## **Ontario Structure Inspection Manual - Inspection Form**

Structure Number

1029

Inventory Data:			
Structure Name	East Townline Drain at Little River Roa	d Bridge	
Main Hwy/Road#	On x Under	Crossing Navig. Water Type: Rail	Non-Navig. x Ped. Road Other
Hwy/Road Name	Little River Road		
Structure Location	At intersection with Manning Road		
Latitude	42° 19' 19.3"	Longitude -82° 52' 7.4"	
Owners	Town of Tecumseh	Heritage Not Consid:  Designation Desig./not list	Cons/not App. List/n.d. Desig & List
MTO region		Road Class: Freeway Collector	Arterial
MTO District		Posted Speed 50	No. of Lanes 2
Old County		AADT 2389	% Trucks
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Concrete Rigid Frame	Interchange Number	
Total Deck Length	5.4 m	Interchange Structure Number	
Overall Str. Width	30.5 m	Min. Vertical Clearance	m
Total Deck Area	164.7 sq. m	Special Transit Routes: School	Truck Bicycle
Roadway Width	m	Detour Length Around Bridge	0.8 km
Skew Angle	0.0 Degrees	Direction of Structure	E/W
No. of Spans	1.0	Fill on Structure	0.6 m
Span Lengths	Total = 4.8 (1) = 4.8;		m
Historical Data:			
Year Built	1975	Year of Last Major Rehab.	
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM Ir	nspection	Current Load Limit	
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #	
Last Underwater Inspec	ction	By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date / I	Description)		
	0x4000 steel plate was added on the dec derstood this bridge is scheduled to be r		

Ontario Structure Insp	ection Manual - Inspection Form	Structure Num	ber	1029
Scheduled Improvement	ents:			
Regional Priority Number	er	Programmed Work Year		
Nature of Program Wor	k:			
Appraisal Indices:		Commen	ts	
Fatigue	0.00			
Seismic	0.00			
Scour	0.00			
Flood	0.00			
Geometrics	0.00			
Barrier	0.00			
Curb	0.00			

0.00

Load Capacity

Ontario Structure Inspe	ction Manual	- Inspection	Form

Structure Number

1	<b>ന</b> 20	
- 1	029	

Field Inspection Informa	tion:						
Date of Inspection:	July 30, 2020		Type of Inspection	on:	x OSIM	Enhanced C	SIM
Inspector:	Jeremy Wamm	es, E.I.T.	(Dillon Consulting	Lim	ited)		
Others in Party:	Alessia Mussio,	, E.I.T. (D	illon Consulting Lin	nite	d)		
Access Equipment Used:	Camera, measu	uring tape	e, measuring wheel	l, ha	mmer		
Weather:	Sunny						
Temperature:	24°C						
Additional Investigations	Required:					Priority	<u> </u>
					None	Normal	Urgent
Material Condition Survey							
Detailed Deck Condition	ion Survov:	X					
Non-Destructive Dela		of Acaba	olt Covered Deek:		X		_
Concrete Substructur		X		_			
Detailed Coating Con		X		_			
Detailed Timber Inves		X		-			
Post-Tensioned Stran					X		-
Underwater Investigation:	iu irivestigation.				X		-
Fatigue Investigation:					×	+	_
Seismic Investigation:					X		
Structure Evaluation:					X		
Monitoring							
Monitoring of Deforma	ations Settleme	nts and M	Invements:		х		
Monitoring Crack Wid		nto and iv	iovernonto.		X		
Investigation Notes:	10.						
Deck suspect to deteriorat	ion due to condit	tion of so	ffit below road. Roa	adsid	de safety revie	₽W.	
Overall Structure Notes:							
Recommended Work on S	Structure: No	one	Minor Rehab.		Major Reha	ab.	x Replace
Timing of Recommended	Work:		x 1 to 5 years		6 to 10 year	ars	
Overall Comments:  Replacement warranted. The Town of Tecumseh has scheduled this structure to be replaced by storm water sewer within the second phase of the Manning Road improvements in 2021.							
Date of Next Inspection:	June	2022					

Element Group:	Decks					Length:		5.4	m		
Element Name:	Wearing Su	ırfac	се			Width:		20.6	m		
Location:	Top of Deck	K				Height:					
Material:	Asphalt					Count:					
Element Type:						<b>Total Quantity</b>	:	111.3 Sq.m			
Environment:	Moderate					Limited Inspec	ctic	on			
Protection System:										Perform.	
Condition	U	nits			Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each	n / % / all		0.0	65.9		22.7	22.7		
Comments: Two wide transverse cracks - one full length of deck, one partially repaired during previous 2016 steel plate installation.											
Recommended Work:		хI	Rehab		Replace		Ma	aintenance	Needs:		
		X	1-5 years		6-10 years	S		Urgent	1 year	2 year	
Asphalt repairs.											
Element Group:	Decks					Length:		5.4	m		
Element Name:	Deck Top							30.5			
Location:						Width: Height:		50.0			
Material:	Cast-in-plac	ce co	oncrete			Count:					
Element Type:						Total Quantity	·:	164.7	Sa m		
Environment:	Moderate					Limited Inspec			х		
Protection System:										Perform.	
Condition	Units Exc.					Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each	n / % / all	l	0.0	109.7		27.5	27.5		
Comments: Deck is mostly unexpos	ed and cond					on the soffit dete			· · · · · · · · · · · · · · · · · · ·	ed in 2016.	
Recommended Work:		-	Rehab	)	Replace		Ma	aintenance			
D     +			1-5 years	L	6-10 years			Urgent	1 year	2 year	
Deck replacement warra	anted. Struct	ure	то ре герв	ac	;ea in 2021.						
Element Group:	Decks					Length:		30.5	m		
Element Name:	Soffit - Thic	k SI	ab			Width:		4.8	m	-	
Location:	Underside d	of Do	eck			Height:					
Material:	Cast-in-plac	ce co	oncrete			Count:					
Element Type:						Total Quantity	<u>':</u>	146.4	Sq.m		
Environment:	Benign					Limited Inspec			İ		
Protection System:									<del>-                                    </del>	Perform.	
Condition	U	nits		Ī	Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / each / % / all 0.0					98.6		23.9	23.9		
Comments: Narrow to wide cracks w severe spalling, expose		evei	rely corroc	de	ed reinforcin					to very	
Recommended Work: Rehab x Replace				Ma	aintenance						
Deals replace			1-5 years	L	6-10 years		-	Urgent	1 year	2 year	
Deck replacement warranted. Structure to be replaced in 2021.											

Element Group:	Abutments				Length:		30.5	m		
Element Name:	Abutment w	/alls			Width:					
Location:	East/West A	Abutment			Height:		1.1	m		
Material:	Cast-in-place	ce concrete			Count:		2			
Element Type:	Reinforced	concrete			<b>Total Quantity</b>	<b>/</b> :	67.1	Sq.m		
Environment:	Benign				Limited Inspection					
Protection System:								•	Pe	erform.
Condition	Units			Exc.	Good		Fair	Poor	Def	iciencies
Data:	<b>Sq.m</b> / m / each / % / all			0.0	52.9		7.1	7.1		
Comments: Narrow to wide cracks v	Comments: Narrow to wide cracks with efflorescence staining throughout, some previously repaired (sealed).									
Recommended Work:		x Rehab		Replace		Ma	aintenance	e Needs:		
		x 1-5 years		6-10 years	S		Urgent	1 year	2	year
Seal cracks. Structure to	o be replaced	d in 2021.								
Flowant Crown	Cook on loss o	nto 9 Ctrooms	_		I amouth.					
Element Group: Element Name:		nts & Streams		Length: Width:						
	Slope Prote									
Location:	All lour Qua	adrants		Height:		4				
Material:	Dog mortor			Count:		4				
Element Type: Environment:	Bag mortar Benign			Total Quantity			each			
Protection System:	Denign				Limited Inspe	CUIC	ווכ			
Condition	11	nits		Exc.	Cood		Fair	Poor		erform.
		each / % / all		0	Good 0		3	1	Def	iciencies
Data:	5q.m / m / €	eacn / % / all		U	0		3			
Comments: Partial total collapse and SE have settled, section		e failed.	ma	_	embankments.				tion at N	NE and
Recommended Work:		x Rehab		Replace		Ma	aintenance	Needs:		
		x 1-5 years		6-10 years	S		Urgent	1 year	2	year
Repair slope protection.	•									
Element Group:	Embankma	nts & Streams	_		Length:		1			
•	Embankme		_		Width:					
Element Name: Location:	LIIIDalikiile	1113			Height:					
Material:					Count:		4			
Element Type:			Total Quantity	,·	·	4 4 each				
Environment:	Benign				Limited Inspe			Cacii		
Protection System:	Domgii					J.10			P	erform.
Condition	IJ	nits		Exc.	Good		Fair	Poor		iciencies
Data:		each / % / all		0	0	<u> </u>	3	1		
Comments:	1-4/			-	1 -	<u> </u>	-	•	l .	

Comments:

Steep embankments. SE and NE corners are unstable and vehicular surcharge is a concern.

Recommended Work:		Rehab	Х	Replace	Maintenance Needs:			
	Х	1-5 years		6-10 years		Urgent	1 year	2 year
Replace retaining wall at SE and NE	CC	orners.						

1029

Element Group:	Embankme	nts	& Streams	3		Length:					
Element Name:	Streams and	d١	Vaterways			Width:					
Location:						Height:					
Material:						Count:		1			
Element Type:						<b>Total Quantity</b>	<b>'</b> :	1	all		
Environment:	Benign					Limited Inspection					
Protection System:						-			,	Perform.	
Condition	U	nit	S		Exc.	Good		Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	eac	h / % / <b>all</b>		0	0		1	0		
Comments: Vegetative growth in the stream causes water way blockage during the spring and summer season.											
Recommended Work:			Rehab		Replace		Ma	aintenance			
			1-5 years		6-10 years	S		Urgent	x 1 year	2 year	
							Cl	ear vegetat	tion if affecting	g hydraulics.	
Floment Group:	Ciana					Length:					
Element Group: Element Name:		Signs									
	Signs					Width:					
Location:						Height:					
Material:	0, 0;					Count:		1			
Element Type:	Stop Sign					Total Quantity	_	·	each		
Environment:						Limited Inspec	ctic	on			
Protection System:										Perform.	
Condition	Uı	nit	S		Exc.	Good		Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	ac	<b>:h</b> / % / all		0	1		0	0		
Comments: Stop sign at the intersec	tion. No obje	ect	1	res	_		1				
Recommended Work:			Rehab		Replace		Ma	aintenance			
			1-5 years		6-10 years				nt x 1 year 2 year bject Marker signs to meet the		
								stall Object ntario Traffi		to meet the	
Element Crave	Approach					l angth:		0.0			
Element Group: Element Name:	Approaches		.00			Length:		6.0			
	Wearing Su					Width:		12.4			
Location:	East/West A	۱Þ۱	oroacnes			Height:		0.1	m		
Material:	Asphalt					Count:		2			
Element Type:						Total Quantity	_	148.8	Sq.m		
Environment:	Moderate					Limited Inspec	ctic	on			
Protection System:							1			Perform.	
Condition		nit			Exc.	Good		Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	eac	ch / % / all		0.0	122.4		13.2	13.2		
corners.	East: I wo wide longitudinal cracks extend to Manning Rd (one partially repaired by 2016 renab) Settlement at both										
Recommended Work:			Rehab		Replace			aintenance	Needs:		
		Х	1-5 years		6-10 years	S		Urgent	1 year	2 year	
Asphalt repairs.											

# **Ontario Structure Inspection Manual - Inspection Form**

**Structure Number** 

1029

Element Group:	Approaches	Approaches						31.0	m			
Element Name:	Curb and Gu	utte	ers		W	/idth:		0.45				
Location:	East/West A	East/West Approaches						0.15	m			
Material:	Cast-in-plac	ес	oncrete		С	Count:						
Element Type:					T	otal Quantity	y:	31.0	m			
Environment:	Moderate				Li	imited Inspe	cti	on				
Protection System:												Perform.
Condition	Ur	Units				Good		Fair		Poor	D	eficiencies
Data:	Sq.m / <b>m</b> / e	ac	h/%/all	0.0		14.0		5.0		12.0		
Comments: Cracked curbs and settl	Comments: Cracked curbs and settlement located along Manning Road. Curbs at SE have failed.											
Recommended Work:		Х	Rehab	Replace	Э		M	aintenance	e N	leeds:		
		Х	1-5 years	6-10 years				Urgent		1 year		2 year
Repair curbs for roadside safety.												



# Description

Wearing at west approach. (Looking West)

New asphalt patch on south side of road from steel plate install in July 2016.



## Description

Wearing at east approach. (Looking North)



## Description

Wearing surface over the culvert (Looking South)



## Description

Curbs and gutter at north side of the bridge (Looking North)



# Description

North elevation. Excessive vegetation.



# Description

South elevation.



## Description

Culvert soffit with very severe spalling and very severely corroded reinforcement. Severe delamination in surrounding regions. Medium vertical crack with efflorescence staining on abutment wall.



### Description

Culvert soffit with very severe spalling and very severely corroded reinforcement. Very severe delamination in surrounding regions. Wide vertical crack with efflorescence staining on abutment wall.

Steel plate placed on deck over this area in 2016.



## Description

Medium cracking on soffit and abutment wall with efflorescence and corrosion staining. Area of severe delamination extending from crack.



## Description

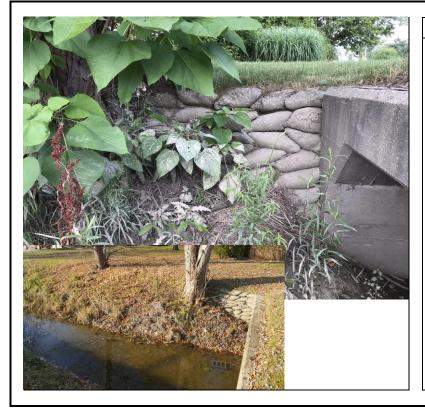
Very severe soffit spalling, reinforcement corrosion and delamination. A 36x5100x4000 steel plate was installed above this location in the 2016 rehabilitation.



# Description

Mortar bags used as retaining walls at the NE side

Excessive vegetation in waterway.



## Description

South-west embankment and retaining walls.



# Description

Embankments and waterways at north side. Excessive vegetation.



## Description

Embankments and waterways at south side.

# Ontario Structure Inspection Manual - Inspection Form

Structure Number

2001

inventory Data:								
Structure Name	Townline Road Drain at Eighth Conces	sion Road Bridge						
Main Hwy/Road #	On x	Crossing Navig. Water Non-Navig. x Ped. Type: Rail Road Other						
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 Not Consid: x Cons/not App. List/n.d. Designation Desig./not list Desig & List						
MTO region		Road Class: Freeway Arterial Local x						
MTO District		Posted Speed Not Posted No. of Lanes 2						
Old County		AADT 426 % Trucks						
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence						
Structure Type	Corrugated Steel Pipe Arch	Interchange Number						
Total Deck Length	3.1 m	Interchange Structure Number						
Overall Str. Width	25.5 m	Min. Vertical Clearancem						
Total Deck Area	79.1 sq. m	Special Transit Truck Routes: School Bicycle						
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;	m						
Historical Date:								
Historical Data:								
Year Built	2012	Year of Last Major Rehab.						
Last OSIM Inspection	2018	Last Evaluation						
Last Enhanced OSIM I	nspection	Current Load Limit						
Enhanced Access Equ (ladder, boat, lift, etc.)	ipment	Load Limit By-Law #						
Last Underwater Inspection		By-Law Expiry Date						
Last Condition Survey								
Rehab History: (Date / Description)								

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number 2001					
Scheduled Improvement	ents:						
Regional Priority Number	er	Programmed Work Year					
Nature of Program Wor	k:						
Appraisal Indices:		Comme	ents				
Fatigue	0.00						
Seismic	0.00						
Scour	0.00						
Flood	0.00						
Geometrics	0.00						
Barrier	0.00						
Curb	0.00						

0.00

Load Capacity

Ontario Structure Inspe	ction Manual	- Inspection	Form

Structure Number

~ ~		
20	1(11	

Field Inspection Informat	ion:						
Date of Inspection:	July 30, 2020		Type of Inspection	n:	x OSIM	Enhanced OS	SIM
Inspector:	Jeremy Wamme	s, E.I.T.	(Dillon Consulting L	Limit	ted)		
Others in Party:	Alessia Mussio,	E.I.T. (Di	llon Consulting Lim	nited	i)		
Access Equipment Used:	Camera, Measur	ring tape,	Measuring wheel,	and	d Hammer		
Weather:	Sunny						
Temperature:	25.0 °C						
Additional Investigations	Required:					Priority	
					None	Normal	Urgent
Material Condition Survey							
Detailed Deck Condition	on Survey				х		
Non-Destructive Delar		of Asphal	t-Covered Deck:		X		
Concrete Substructure					х		
Detailed Coating Cond		,			Х		
Detailed Timber Inves					х		
Post-Tensioned Strand					Х		
Underwater Investigation:					Х		
Fatigue Investigation:					Х		
Seismic Investigation:					Х		
Structure Evaluation:					X		
Monitoring						T	1
Monitoring of Deforma		ts and Mo	ovements:			Х	
Monitoring Crack Widt Investigation Notes:	ns:				Х		
Deformations and settleme	nt of the CSP se	ction sho	uld be monitored.				
0 1101 1 N 1				_			
Overall Structure Notes:							
Recommended Work on St	tructure: No	ne x	Maintenance	L	Minor Rehab	o	Replace
					Major Rehab	О.	
Timing of Recommended V	Vork:	х	1 to 5 years		6 to 10 years	S	
Overall Comments:	grout a	around C ation duri	e at structure requires at both the inleing summer months	et an	d outlet should		
Date of Next Inspection:	June 2	2022					

Wearing surface condition over culvert is typical of surrounding asphalt on CR8 & 8th Concession. Asphalt resurfacing recommended with next road reconstruction

**Structure Number** 

2001

#### **Element Data**

Element Group:	Decks					Length:		3.1	m		
Element Name:	Wearing sur	Wearing surface						11.0	m	•	
Location:	Top of Deck	Top of Deck				Height:					
Material:	Asphalt				Count:						
Element Type:	-					Total Quantit	y:	34.1	Sq	.m	
Environment:	Moderate					Limited Inspe	ecti	on			
Protection System:											Perform.
Condition	Ur	nits			Exc.	Good		Fair		Poor	Deficiencie
Data:	<b>Sq.m</b> / m / e	each /	/ % / all		0.0	31.1		3.0		0.0	
Comments:  W Side: Edge cracking (0.3 m x 5.5 m), sealed.  E Side: Medium to severe edge cracking was observed (1.5x2m).											
Recommended Work:		x Rehab Replace					M	aintenance	e No	eeds:	
		1-	5 years	Х	6-10 years	S		Urgent		1 year	2 year
144 1 6 1141							- 1				

Element Group:	Culverts		Length:	2	5.5 ı	m	
Element Name:	Barrels	Width:		3.1 ı	m		
Location:		Height:		1.8 ו	m		
Material:	Corrugated steel		Count:		1		
Element Type:	Pipe Arch	Pipe Arch			0.0	Sq.m	
Environment:	Benign		Limited Inspe	ction			
Protection System:							Perform.
Condition	Units	Exc.	Good	Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / each / % / all	28.0	147.0	15.0		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	Replace		Maintenance Needs:					
		1-5 years	6-10 years			Urgent	х	1 year		2 year
Monitor deformations.										

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	Pre-cast concrete blocks			Sq.m		
Environment:	Moderate		Limited Inspec	ction			
Protection System:						Perform.	
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / each / % / all	12.5	3.9	3.0	1.5		

### Comments:

Severe spalling of grout was observed from the CSP inlet (3x0.25m). Joint separation of units and cracking of grout. Precast units appear to be rotating (in plan view).

Recommended Work:	Rehab	Replace	М	Maintenance Needs:				
	1-5 years	6-10 years		Urgent	Х	1 year		2 year
Repair						_		

### **Structure Number**

Clear vegetation as required.

2001

Element Data											
Element Group:	Culverts					Length:		8.7	m		
Element Name:	Outlet Comp	oon	ent			Width:		2.4	m		
Location:	East Outlet					Height:					
Material:						Count:		1			
Element Type:	Pre-cast cor	ncre	ete blocks			<b>Total Quantity</b>	<b>'</b> :	20.9			
Environment:	Moderate					Limited Inspec	ctic	n			
Protection System:											Perform.
Condition	Ur	nits			Exc.	Good		Fair		Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each	h / % / all		12.5	3.9		3.0		1.5	
Comments: Severe spalling of grout	was observe	ed fi	rom the C	SP	inlet (3x0.	25m). Joint sep	ara	tion of unit	s aı	nd crackin	g of grout.
Recommended Work:			Rehab		Replace		Ma	aintenance	e N	eeds:	
			1-5 years		6-10 years	S		Urgent	Х	1 year	2 year
							Re	epair of gro	ut.		
Element Group:	Embankmer	nts (	& Streams	3		Length:					
Element Name:	Streams and	d W	/aterways			Width:					
Location:						Height:					
Material:						Count:		1			
Element Type:						<b>Total Quantity</b>	<b>:</b>	1	all		
Environment:						Limited Inspec	ctic	n			
Protection System:											Perform.
Condition	Ur	nits			Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m/m/e	ach	n / % / <b>all</b>		0	0		1		0	
Comments: Excessive vegetation in	waterway.										
Recommended Work:			Rehab		Replace		Ma	aintenance	e N	eeds:	
			1-5 years		6-10 years	S		Urgent	x	1 vear	2 vear

Element Group:	Embankments & Streams	1	Length:			
Element Name:	Embankments		Width:			
Location:	All Four Quadrants	All Four Quadrants				
Material:			Count:	4		
Element Type:					each	
Environment:			Limited Inspec	ction		
Protection System:					•	Perform.
Condition	Units	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all	0	0	4	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	Replace	Mainte	nance l		
	1-5 years	6-10 years	Urge	ent	2 year	

### **Structure Number**

2001

#### **Element Data**

Element Group:	Embankmei	nts & Streams	6	Length:				
Element Name:	Slope Prote	ction		Width:				
Location:	All Four Qua	adrants		Height:				
Material:				Count:	4			
Element Type:				Total Quantity	<i>r</i> : 4	each		
Environment:				Limited Inspe				
Protection System:				<u> </u>		<del>                                     </del>	Perform.	
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sa.m/m/e	each / % / all	0	4	0	0		
Comments:								
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 yea	rs	Urgent	1 year	2 year	
Element Group:	Signs			Length:				
Element Name:	Signs			Width:				
Location:				Height:				
Material:				Count:	1			
Element Type:	Stop Sign			Total Quantity	<b>/</b> : 1	each		
Environment:				Limited Inspe	ction			
Protection System:							Perform.	
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all	0	1	0	0		
Comments: Sign located at the inter	section at wo		l Danie		<b>Ind</b> .:	- Na ada		
Recommended Work:		Rehab	Replace		Maintenanc			
		1-5 years	6-10 yea	rs	Urgent	x 1 year	2 year	
						markers or del side safety at s		
Element Group:	Approaches	3		Length:	6.0	m		
Element Name:	Wearing Su			Width:	11.0			
Location:		Approaches		Height:				
Material:	Asphalt	.,		Count:	2			
Element Type:				Total Quantity		Sq.m		
Environment:	Moderate			Limited Inspe				
Protection System:						<b></b>	Perform.	
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:		each / % / all	0.0	49.0	58.0	25.0		
Comments:	1 <b>04</b> 7	sacri / /o / an						
N Approach: Medium to seve S Approach: Medium to wice								
Recommended Work:		x Rehab	Replace	)	Maintenance Needs:			
			x 6-10 yea		Urgent	1 year	2 year	
Wearing surface condition	over culvert	is typical of sur	rrounding asp	halt on CR8 &				

8th Concession. Asphalt resurfacing recommended with next road reconstruction



## Description

Road over the bridge. (Looking South)



## Description

Wearing surface at north approach.



## Description

Wearing surface at south approach. (Looking East)



# Description

Alligator cracking of wearing surface at southeast corner (Looking West)



# Description

Culvert barrel



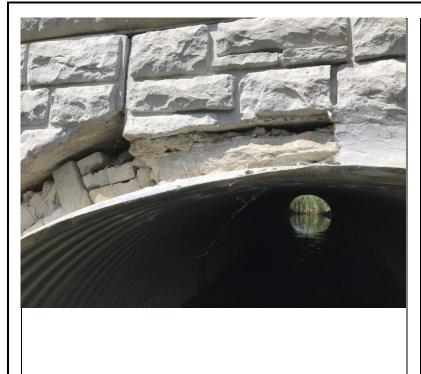
## Description

West Elevation (Looking North)
Excessive vegetation



## Description

East Elevation (Looking North) Excessive vegetation



## Description

Headwall joint at East elevation. Signs of precast block movement.



## Description

Waterway, embankments and vegetation (Looking East).



# Description

Waterway, embankments and vegetation (Looking West).

## Ontario Structure Inspection Manual - Inspection Form

Structure Number 1

Inventory Data:			
Structure Name	Lakewood Park Pedestrian Bridge		
Main Hwy/Road #	On Under	Crossing Navig. Water Type: Rail	Non-Navig. Ped. x Road Other
Hwy/Road Name	Manning Road (County Road 19) / Little	e River Blvd.	
Structure Location	Lakewood Park over Lakewood Park C	hannel	
Latitude	42° 19' 18.948" N	Longitude 82° 52' 3.252" W	
Owners	Town of Tecumseh	Heritage Not Consid: Designation Desig./not list	Cons/not App. List/n.d. Desig & List
MTO region		Road Class: Freeway Collector	Arterial Local
MTO District		Posted Speed n/a	No. of Lanes n/a
Old County		AADT n/a	% Trucks n/a
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Bowstring Pratt Truss	Interchange Number	
Total Deck Length	23.8 m	Interchange Structure Number	
Overall Str. Width	3.7 m	Min. Vertical Clearance	m
Total Deck Area	88.1 sq. m	Special Transit Routes: School	Truck Bicycle
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	m
Span Lengths	Total = 23.8 (1) = 23.8		m
Historical Data:			
Year Built	2016	Year of Last Major Rehab.	
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM I	nspection	Current Load Limit	8100.0 kg
Enhanced Access Equi (ladder, boat, lift, etc.)	ipment	Load Limit By-Law #	
Last Underwater Inspec	ction	By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date /	Description)		

Ontario Structure Insp	ection Manual - Inspection Form	Structure Number	1
Scheduled Improveme	ents:		
Regional Priority Number	er	Programmed Work Year	
Nature of Program Worl	k:		
Appraisal Indices:		Comments	
Fatigue	0.00		
Seismic	0.00		
Scour	0.00		
Flood	0.00		
Geometrics	0.00		
Barrier	0.00		
Curb	0.00		

0.00

Load Capacity

Ontario Structure Inspec	tion Manua	Si	Structure Number 1					
Field Inspection Informa	tion:							
Date of Inspection:	July 30, 20	)20	Type of Inspec	tion: x OSIM	1	Enhanced O	SIM	
Inspector:	Jeremy Wa	ammes, E.I.	T. (Dillon Consulting	g Limited)				
Others in Party:	Alessia Mu	ussio, E.I.T.	(Dillon Consulting L	imited)				
Access Equipment Used:	Camera, M	leasuring ta	pe, Measuring whee	el, and Hamm	er			
Weather:	Sunny							
Temperature:	24 °C							
Additional Investigations	Required:					Priority		
<b>3</b>				N	one	Normal	Urgent	
Material Condition Survey								
Detailed Deck Condit	ion Survey:				Х			
Non-Destructive Dela	mination Su	rvey of Asp	halt-Covered Deck:		Х			
Concrete Substructur					Х			
Detailed Coating Con		ey:			Х			
Detailed Timber Inves					Х			
Post-Tensioned Strar	nd Investigat	tion:			Х			
Underwater Investigation:					Х			
Fatigue Investigation:					Х			
Seismic Investigation:					Х			
Structure Evaluation:					Х			
Monitoring	0							
Monitoring of Deforma		ements and	Movements:		X			
Monitoring Crack Wid Investigation Notes:	itns:				Х			
Ŭ								
Overall Structure Notes:								
	· · · · · · · · · · · · · · · · · · ·	x None	Minor Rehab.	Maia	Dobob		Replace	
Recommended Work on S	ou ucture:	X INOHE	I INITIOI RETIAD.	į įiviajoi	r Rehab		rkepiace	

damage on North railing.

June 2022

| 1 to 5 years | 6 to 10 years | Maintenance: Wire brush and coat corroded welded connections and coating

Timing of Recommended Work:

Overall Comments:

Date of Next Inspection:

1
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Liement Data									
Element Group:	Decks			Length:	23.5	m			
Element Name:	Deck top			Width:	3.0	m			
Location:	Top of Deck	<		Height:					
Material:	Wood Plank	<b>KS</b>		Count:					
Element Type:				Total Quantity:	70.5				
Environment:	Moderate			Limited Inspec					
Protection System:				-		1 1	Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	<b>Sq.m</b> / m / e	each / % / all	51.7	18.8	0.0	0.0			
Comments:									
Recommended Work:		Rehab	Replace		Maintenanc				
		1-5 years	6-10 year	rs	Urgent	1 year	2 year		
Element Group:	Barriers			Length:					
Element Name:	Posts			Width:					
Location:	North/South	edges		Height:					
Material:	Steel			Count:	22	22			
Element Type:				Total Quantity:	22	each			
Environment:	Benign			Limited Inspec	tion				
Protection System:							Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m/m/e	each / % / all	18	4	0	0			
Comments:  Recommended Work:		Rehab	Replace		Maintenanc	e Needs:			
Troopining and Tronk		1-5 years	6-10 year		Urgent	1 year	2 year		
		[ ] r o youro	[			[ ]	2 you.		
Element Group:	Barriers			Length:	23.5				
Element Name:	Hand Railin	gs		Width:					
Location:	North/South	edges		Height:					
Material:	Steel			Count:	2.0				
Element Type:				Total Quantity:	47.0	m			
Environment:	Benign			Limited Inspec	tion				
Protection System:						•	Perform.		
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies		
Data:	Sq.m / <b>m</b> / e	each / % / all	39.5	7.5	0.0	0.0			
Comments:							ı		
Recommended Work:		Rehab	Replace		Maintenanc		<del>                                     </del>		
		1-5 years	6-10 year	rs	Urgent	1 year	2 year		

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Element Group:	Beams/MLE	's				Length:		3.5	m			
Element Name:	Floor Beams	Floor Beams				Width:		51	51 mm			
Location:						Height:		152	152 mm			
Material:	Steel					Count:		12	12			
Element Type:	HSS 152 x 5	51 :	x 6.4			<b>Total Quantity</b>	:	17.1 Sq.m				
Environment:	Moderate					Limited Inspec	ctic	on				
Protection System:												Perform.
Condition	Ur	nits			Exc.	Good	od Fair Poor		Poor	D	eficiencies	
Data:	<b>Sq.m</b> / m / each / % / all 0.0			0.0	17.1		0.0 0.0					
Comments:												
Light corrosion was observed at weld connections to stringers and wind bracing.												
Recommended Work:	mmended Work: Rehab Replace Ma			aintenance Needs:								
			1-5 years	6	3-10 years	1		Urgent	Х	1 year		2 year
	Wire brush and coat corroded welded connections											

Element Group:	Beams/MLE	E's		Length:		2.44	m		
Element Name:	Stringer			Width:		51	m	m	
Location:				Height:		152	m	m	
Material:	Steel			Count:		10			
Element Type:	HSS 152 x	HSS 152 x 51 x 6.4			ty:	100 each			
Environment:	Moderate			Limited Insp	ecti	on			
Protection System:									Perform.
Condition	U	nits	Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m/m/e	each / % / all	73	27		0		0	
Comments:									
Recommended Work:		Rehab	Replace		M	aintenance	e N	leeds:	
		1-5 years	6-10 year	rs		Urgent		1 year	2 year

Location: N Material: S Element Type: H Environment: B	op Chords North/South E Steel HSS 152 x 15 Benign	-		Width: Height: Count: Total Quanti	•	l		
Material: S Element Type: H Environment: B	Steel ISS 152 x 15	-		Count: Total Quanti	•	28.6		
Element Type: H Environment: B	ISS 152 x 15	52 x 6.4		Total Quanti	•	28.6	Sq.m	
Environment: B		52 x 6.4			•	l	Sq.m	
	Benign			Limited Insp	ectic	on		
Drotostian Custami								
Protection System:							•	Perform.
Condition	Units		Exc.	Good		Fair	Poor	Deficiencies
Data: S	<b>Sq.m</b> / m / ea	ch / % / all	24.0	4.6		0.0	0.0	
Comments:								
Recommended Work:		Rehab	Replace		Ma	aintenance	Needs:	
		1-5 years	6-10 yea	ırs		Urgent	1 year	2 year

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Element Group:	Trusses/Arc	ches			Length:	23.5	i m	
Element Name:	Bottom Cho	rds			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	<i>y</i> : 28.6	Sq.m	
Environment:	Moderate			Limited Inspe				
Protection System:	1						1 1	Perform.
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / a	all	21.0	7.6	0.0	0.0	
Comments:		Debeb		Donloss		Ba into a co	a Nacda	T
Recommended Work:		Rehab		Replace		Maintenand	1 1	
		1-5 yea	rs	6-10 year	S	Urgent	1 year	2 year
Element Group:	Trusses/Arc	ches			Length:	Varies	s m	
Element Name:	Verticals				Width:	51	mm	
Location:	North/South	Edges			Height:	76	5 mm	
Material:	Steel	-			Count:	24		
Element Type:	HSS 76x51:	x4.8			Total Quantity	r: 10.5	Sq.m	
Environment:	Moderate				Limited Inspe		T İ	
Protection System:	1						1 1	Perform.
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	Data: Sq.m / m / each / % / all		7.7	2.8	0.0	0.0		
Comments:			1					
Recommended Work:		Rehab		Replace		Maintenand	e Needs:	
		1-5 yea	rs	6-10 year	'S	Urgent	1 year	2 year
Element Group:	Trusses/Arc	ches			Length:	Varies		
Element Name:	Diagonals				Width:		mm	
Location:	North/South	Edges			Height:		mm	
Material:	Steel				Count:	16		
Element Type:	HSS 51x51	x4.8			Total Quantity			
Environment:	Moderate			Limited Inspe	ction			
Protection System:								Perform.
Condition	U	nits		Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / 6	each / % / a	all	7.3	2.7	0.0	0.0	
Comments:								
Recommended Work:		Rehab		Replace		Maintenand	e Needs:	
		1-5 yea	rs	6-10 year	'S	Urgent	1 year	2 year

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Liement Data								
Element Group:	Bracing			Length:	4.1 m			
Element Name:	Wind Bracing			Width:	51	51 m		
Location:	Undeside 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 Inspec	tion			
Protection System:							Perform.	
Condition		nits	Exc.	Good	Fair	Poor	Deficiencies	
Data: Sq.m/m/		n / m / <b>each</b> / % / all		3	0	0		
Comments:								
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:	1.2	1.2 m		
Location:	East/West Ends			Height:	2.5	2.5 m		
Material:	Cast-in-place concrete			Count:	4			
Element Type:				Total Quantity:	4	4 each		
Environment:	Moderate			Limited Inspec	tion x			
Protection System:							Perform.	
<b>Condition</b> U		its Exc.		Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all	0	4	0	0		
Comments:  Recommended Work:		Rehab	Replace	9	Maintenanc	e Needs:		
		1-5 years	6-10 ye	ars	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	1 all		
Environment:				Limited Inspec	ion			
Protection System:						•	Perform.	
Condition	Units		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/each/%/all		0	1	0	0		
Comments: Stagnant water flow.								
Recommended Work:		Rehab	Replace		Maintenanc	e Needs:		
		1-5 years	6-10 years		Urgent	1 year	x 2 year	
			•					

Structure Nur	~~~

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Е	lement	Data
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Element Data									
Element Group:	Embankmer	nts &	Streams		Length:				
Element Name:	Embankmer	nts			Width:				
Location:	All Four Qua	adran	ts		Height:				
Material:					Count:	2			
Element Type:					Total Quantity:	: 2	each		
Environment:	Moderate				Limited Inspec	tion			
Protection System:							1	Perform.	
Condition	Uı	Units Exc.			Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	ach /	/ % / all	2	0	0	0		
Comments:		·	1						
Recommended Work:			ehab -	Replace		Maintenance			
		1-	5 years	6-10 year	S	Urgent	1 year	2 year	
Element Group:	Embankmer	nts &	Streams	1	Length:				
Element Name:	Slope protect	ction			Width:				
Location:					Height:				
Material:					Count:	2			
Element Type:	Hand laid riprap			Total Quantity:	: 2	each			
Environment:					Limited Inspec	tion			
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	each /	/ % / all	2	0	0	0		
Comments:  Recommended Work:		□ P4	ehab	Replace		Maintenance	a Naode:		
Recommended Work.			5 years	6-10 year		Urgent	1 year	2 year	
			o yearo [	To To your		Orgoni	1 your		
Element Group:	Approaches	3			Length:	3.7	m 8.1	m	
Element Name:	Approach S	labs			Width:	3.0	3.0 m		
Location:	East/West A	Appro	ach		Height:	0.25	m		
Material:	Cast-in-plac	e con	ncrete		Count:	2			
Element Type:					Total Quantity:	35.4	Sq.m		
Environment:	Moderate				Limited Inspec	tion			
Protection System:								Perform.	
Condition	Uı	nits		Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each /	′ % / all	26.0	9.4	0.0	0.0		
Comments: E Approach: 3.0m x 8.1	1m; <b>W Appro</b>	oach:	3.0m x 3	3.7m					
Recommended Work:		Re	ehab	Replace		Maintenance	e Needs:		
		1-	5 years	6-10 year	S	Urgent	1 year	2 year	



# Description

North Elevation (Looking Southeast)



# Description

West approach slab (Looking East)



# Description

Deck top (Looking East)



# Description

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



# Description

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



# Description

Typical railing (Looking North)



# Description

Coating damage to North railing.



# Description

Underside of deck (Looking West)



# Description

Typical corrosion at weld locations.



# Description

Typical reinforced concete caisson and embankment.



# Description

Bridge ID found on NE corner

# Ontario Structure Inspection Manual - Inspection Form

Structure Number 2

Inventory Data:			
Structure Name	Malden Road Pedestrian Bridge		
Main Hwy/Road #	On Under	Crossing Navig. Water Type: Rail	Non-Navig. Ped. x Road Other
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 Not Consid: Designation Desig./not list	Cons/not App. List/n.d. Desig & List
MTO region		Road Class: Freeway Collector	Arterial Local
MTO District		Posted Speed n/a	No. of Lanes n/a
Old County		AADT n/a	% Trucks n/a
Geographic Twp.	Tecumseh (form. Sandwich South)	Inspection Route Sequence	
Structure Type	Pratt Truss	Interchange Number	
Total Deck Length	12.2 m	Interchange Structure Number	
Overall Str. Width	2.68 m	Min. Vertical Clearance	m
Total Deck Area	32.7 sq. m	Special Transit Routes: School	Truck Bicycle
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	m
Span Lengths	Total = 12.2 (1) = 12.2		m
	_		_
Historical Data:			
Year Built	2015	Year of Last Major Rehab.	
Last OSIM Inspection	2018	Last Evaluation	
Last Enhanced OSIM Ir	nspection	Current Load Limit	N/A
Enhanced Access Equi (ladder, boat, lift, etc.)	pment	Load Limit By-Law #	
Last Underwater Inspec	ction	By-Law Expiry Date	
Last Condition Survey			
Rehab History: (Date / I	Description)		

Ontario Structure Inspe	ection Manual - Inspection Form	Structure Nur	2	
Scheduled Improvement	nts:			
Regional Priority Numbe	r	Programmed Work Year		
Nature of Program Work	c			
Appraisal Indices:		Comme	nts	
Fatigue	0.00			
Seismic	0.00			
Scour	0.00			
Flood	0.00			
Geometrics	0.00			
Barrier	0.00			
Curb	0.00			

0.00

Load Capacity

Ontario Structure Inspec	tion Manual - Inspection I	Form	Struct	Structure Number		
Field Inspection Informa	tion:					
Date of Inspection:	July 30, 2020	Type of Inspection:	x OSIM	Enhanced OS	M	
Inspector:	Jeremy Wammes, E.I.T. (I	Dillon Consulting Lim	ited)			
Others in Party:	Alessia Mussio, E.I.T. (Dill	Ion Consulting Limite	d)			
Access Equipment Used:	Camera, Measuring tape,	Measuring wheel, an	d Hammer			
Weather:	Sunny					
Temperature:	24.0 °C					
Additional Investigations	Required:			Priority		

Access Equipment Used:	Camera, Measuring tape, Measuring wheel, and Hammer							
Weather:	Sunny							
Temperature:	24.0 °C							
Additional Investigations	Doguirod			Driority				
Additional Investigations	Required:		None	Priority Normal	Urgent			
Material Condition Current								
Material Condition Survey  Detailed Deck Condition	on Curvov		l x		1			
Non-Destructive Delan		halt-Covered Dock:	X					
Concrete Substructure		mail-Covered Deck.	X					
Detailed Coating Cond			X					
Detailed Timber Invest	•		X					
Post-Tensioned Strand			Х					
Underwater Investigation:			Х					
Fatigue Investigation:			Х					
Seismic Investigation:			Х					
Structure Evaluation:			Х					
Monitoring								
Monitoring of Deforma		Movements:	X					
Monitoring Crack Widt	hs:		Х					
Investigation Notes:								
Overall Structure Notes:								
Recommended Work on St	ructure: x None	Minor Rehab.	Major Rehab.		Replace			
Timing of Recommended V	Vork:	6 to 10 years						
Overall Comments:		•						
Date of Next Inspection:	June 2022							
	1							

Lieilieilt Data								
Element Group:	Decks			Length:	12.2	2 m		
Element Name:	Deck top			Width:	2.7	m m		
Location:	Top of Deck			Height:				
Material:	Wood Plank	(S		Count:				
Element Type:				Total Quantity	y: 32.9	Sq.m		
Environment:	Moderate			Limited Inspe		Tİ		
Protection System:						<u> </u>	Perform.	
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:		each / % / all	21.9	11.0	0.0	0.0	2 011010110100	
Comments:							_	
Recommended Work:		Rehab	Replace		Maintenand	e Needs:		
		1-5 years	6-10 yea	rs	Urgent	1 year	2 year	
Element Group:	Barriers			Length:	12.2	2 m		
Element Name:	Hand Railin	gs		Width:				
Location:	East/West edges			Height:				
Material:	Steel			Count:		2		
Element Type:				Total Quantity	_	24.4 m		
Environment:	Moderate			Limited Inspe				
Protection System:	Moderate			Lillited mape		1 1	Desfere	
Condition	Units Exc.			Good	Fair	Poor	Perform. Deficiencies	
Data:		each / % / all	16.3	8.1	0.0	0.0	Deliciencies	
Comments:								
Recommended Work:		Rehab	Replace		Maintenand	e Needs:		
Necommended Work.		1-5 years 6-10 year		ro	Urgent	1 year	2 year	
	In .							
Element Group:	Barriers			Length:	12.2	ı m		
Element Name:	Safety Raili			Width:				
Location:	East/West	edges		Height:				
Material:	Steel			Count:	12.0			
Element Type:				Total Quantity		l m		
Environment:	Moderate			Limited Inspe	ection			
Protection System:						•	Perform.	
Condition	Units		Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / <b>m</b> / e	each / % / all	97.6	48.8	0.0	0.0		
Comments:								
Recommended Work:		Rehab	Replace		Maintenand	e Needs:		
		1-5 years	6-10 yea	rs	Urgent	1 year	2 year	
		,	· ·		·			

Element Data								
Element Group:	Beams/MLE	's		Length:	2.7	m		
Element Name:	Floor Beam	S		Width:	51	51 mm		
Location:				Height:	152	mm		
Material:	Steel			Count:	11			
Element Type:	HSS 152 x :	51 x 4.8		Total Quantity:	12.1	Sq.m		
Environment:	Moderate			Limited Inspec				
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sa.m</b> / m / e	each / % / all	8.1	4.0	0.0	0.0		
Comments:	·							
Recommended Work:		Rehab	Replace		Maintenance	e Needs:		
		1-5 years	6-10 year	s	Urgent	1 year	2 year	
Element Group:	Beams/MLE	's		Length:	1.20	m		
Element Name:	Stringer			Width:	51	mm		
Location:				Height:	102	mm		
Material:	Steel			Count:	7	7		
Element Type:	HSS 102 x 51 x 4.8			Total Quantity:	70	70 each		
Environment:	Moderate			Limited Inspec	imited Inspection			
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	each / % / all	47	23	0	0		
Comments:								
Recommended Work:		Rehab 1-5 years	Replace 6-10 year		Maintenance Urgent	1 year	2 year	
		1-5 years	jo-10 year	5	orgent	i yeai	Z yeai	
Element Group:	Trusses/Arc	hes		Length:	12.2	m		
Element Name:	Top Chords			Width:	51	mm		
Location:	East/West E	Edges		Height:	76	mm		
Material:	Steel			Count:	2			
Element Type:	HSS 76 x 5	1 x 4.8		Total Quantity:		Sq.m		
Environment:	Benign			Limited Inspec	tion			
Protection System:							Perform.	
Condition	Uı	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	<b>Sq.m</b> / m / e	each / % / all	5.0	1.2	0.0	0.0		
Comments:			- In .	,			,	
Recommended Work:		Rehab	Replace		Maintenance			
		1-5 years	6-10 year	S	Urgent	1 year	2 year	

Element Data							
Element Group:	Trusses/Ard	ches		Length:	12.2	m	
Element Name:	Bottom Cho	ords		Width:	51	mm	
Location:	East/West I	Edges		Height:	76	mm	
Material:	Steel			Count:	2		
Element Type:	HSS 76 x 5	1 x 4.8		Total Quantity:	: 6.2	Sq.m	
Environment:	Moderate			Limited Inspec	tion		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	4.1	2.1	0.0	0.0	
Comments:	ļ	Į.					
No coating on shoe plat	es.						
Recommended Work:		Rehab	Replace		Maintenance	e Needs:	1
		1-5 years	6-10 year		Urgent	1 year	2 year
		i o years	o to your		Orgeni	i youi	
				· .	1		
Element Group:	Trusses/Ard	ches		Length:	1.6		
Element Name:	Verticals			Width:	51	mm	
Location:	North/South	n Edges		Height:	76	mm	
Material:	Steel			Count:	22		
Element Type:	HSS 76x51x4.8			Total Quantity:			
Environment:	Moderate			Limited Inspec	tion		
Protection System:							Perform.
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / e	each / % / all	5.9	3.0	0.0	0.0	
Comments:							
Recommended Work:		Rehab	Replace		Maintenance	o Noods:	1
Recommended work.					1		12
		1-5 years	6-10 year	S	Urgent	1 year	2 year
Element Group:	Trusses/Arc	ches		Length:	1.9		
Element Name:	Diagonals			Width:		mm	
Location:	North/South	Edges		Height:		mm	
Material:	Steel	. Lagoo		Count:	20		
Element Type:	HSS 51x51:	y4 8		Total Quantity:		Sq.m	
Environment:	Moderate	х-т.о		Limited Inspec		T	
Protection System:	Moderate			Limited mopes	,		Perform.
Condition		nits	Exc.	Good	Fair	Poor	Deficiencies
Data:	Sq.m / m / each / % / all 5.2			2.6	0.0	0.0	Deliciencies
Comments:	<b>-</b>   -   -   -   -   -   -   -   -   -	Jaon / /u / all	0.2	2.0	0.0	0.0	1
Comments.							
Recommended Work:		Rehab	Replace		Maintenance	e Needs:	1
		1-5 years	6-10 year	s	Urgent	1 year	2 year
		, , , , , , ,					

Element Data								
Element Group:	Bracing			Length:	3.0	m		
Element Name:	Bracing			Width:	51	m		
Location:	Undeside of	f Deck		Height:	51	m		
Material:	Steel			Count:	10			
Element Type:	HSS 51 x 5	1 x 4.8		Total Quantity	: 10	each		
Environment:	Moderate			Limited Inspec				
Protection System:						I I	Perform.	
Condition	U	nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sa.m/m/e	each / % / all	7	3	0	0		
Comments:	J 94 7 7 .					<u> </u>	I	
		<del></del>						
Recommended Work:		Rehab	Replace		Maintenance	e Needs:		
		1-5 years	6-10 year	s	Urgent	1 year	2 year	
		<u> </u>				_		
Floment Croun.	Retaining W	/ollo		l angth.	1 4 5			
Element Group: Element Name:	Ŭ		_	Length:	1.5			
		etaining Block	S	Width:	0.8			
Location:	North Emba			Height:	0.8	m		
Material:	Precast concrete			Count:	6			
Element Type:				Total Quantity:				
Environment:	Moderate			Limited Inspection x				
Protection System:							Perform.	
Condition		nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m / m / e	each / % / all	3	3	0	0		
Comments:								
Minor settlement of bloc	ck adiacent to	o bridae (soutl	h-most). Cor	rosion staining o	n top of block	KS.		
							T	
Recommended Work:		Rehab	Replace		Maintenance			
		1-5 years	6-10 years		Urgent	1 year	2 year	
Element Group:	Foundations	•		Length:	1			
Element Name:		concrete caiso		Width:	0.0			
			JII		0.9			
Location: Material:	North/South			Height:	2.5	m		
	Cast-in-plac	e concrete		Count:	4			
Element Type:	Madanta			Total Quantity		each		
Environment:	Moderate			Limited Inspec	tion	х	T	
Protection System:	.,	1					Perform.	
Condition		nits	Exc.	Good	Fair	Poor	Deficiencies	
Data:	Sq.m/m/e	each / % / all	3	1	0	0		
Comments:								
							_	
Recommended Work:		Rehab	Replace		Maintenanc			
		1-5 years	6-10 year	S	Urgent	1 year	2 year	
1								

Lieilleilt Data											
Element Group:	Embankme	Embankments & Streams									
Element Name:	Streams and Waterways				Width:	h:					
Location:						Height:					
Material:						Count: 1					
Element Type:						Total Quantity: 1 all					
Environment:							Limited Inspection				
Protection System:											Perform.
Condition	U	Jnits Exc.				Good		Fair		Poor	Deficiencies
Data:	Sq.m/m/e	eac	h / % / <b>all</b>		0	1	0			0	
Comments:		1	ls		In .						T
Recommended Work:			Rehab Replace					Maintenance Needs:			
			1-5 years		6-10 year	S		Urgent	1	year	2 year
Element Group:	Embankme	nts	& Streams	3		Length:					
Element Name:	Embankme	nts				Width:					
Location:	North/South	ı Eı	mbankmen	nt		Height:					
Material:						Count:		2			
Element Type:						Total Quantity: 2 each			<u></u>		
Environment:	Moderate					Limited Inspection				<u> </u>	
Protection System:	Moderate					Ziiiiiiod iiiopoo		···			Perform.
Condition	11	nits	<u> </u>		Exc.	Good		Fair		Poor	Deficiencies
Data:	Sq.m/m/e				0	1		1		0	Deficiencies
Comments: S Side: Erosion, steep of Recommended Work:	embankment		Rehab		Replace		Ma	aintenance	e Ne	eds:	
			1-5 years 6-10 yea			s		Urgent	1	year	2 year
			, , , , , ,			-		3- 3-		7	
Element Group:	Embankments & Streams					Length:					
Element Name:	Slope prote	Slope protection									
Location:	North/South			ıt		Height:					
Material:								2			
Element Type:	Count: 2							eacl	h		
Environment:	Hand laid riprap					Limited Inspec				•	
Protection System:											Perform.
Condition	U	nits	3		Exc.	Good		Fair		Poor	Deficiencies
Data:		Units q.m / m / <b>each</b> / % / all			0	0		2		0	Deliciencies
Comments: Unstable embankments	•		, ,0 ,					<u></u>			
Recommended Work:			Rehab Repla				Ma	Maintenance Needs:			
			1-5 years		6-10 year	s		Urgent	1	year	x 2 year
							Ins	stall additio	nal r	rip rap.	

Element Group:	Approaches			Length:	3.0	m	
Element Name:	Approach Sla	bs		Width:	3.0	m	
Location:	North/South A	Approach		Height:	0.25	m	
Material:	Cast-in-place	concrete		Count:	2		
Element Type:				<b>Total Quantity</b>	: 18.0	Sq.m	
Environment:	Moderate			Limited Inspec	ction		
Protection System:					<u>.</u>		Perform.
Condition	Unit	is	Exc.	Good	Fair	Poor	Deficiencies
Data:	<b>Sq.m</b> / m / ea	ch / % / all	12.0	6.0	0.0	0.0	
Comments:							
Recommended Work:	Rehab	Replace		Maintenance	Needs:		
1-5 years			6-10 year	S	Urgent	1 year	2 year



# Description

East elevation (Looking Northwest)



# Description

North approach slab (Looking South)



# Description

Deck top (Looking South)



# Description

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



# Description

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



# Description

Typical top chord, railing system, truss verticals and diagonals



# Description

North approach (Looking SW)



# Description

Underside of the deck (Looking South)



# Description

Concrete caissons at North end



# Description

CSP outlet (Looking North)



# Description

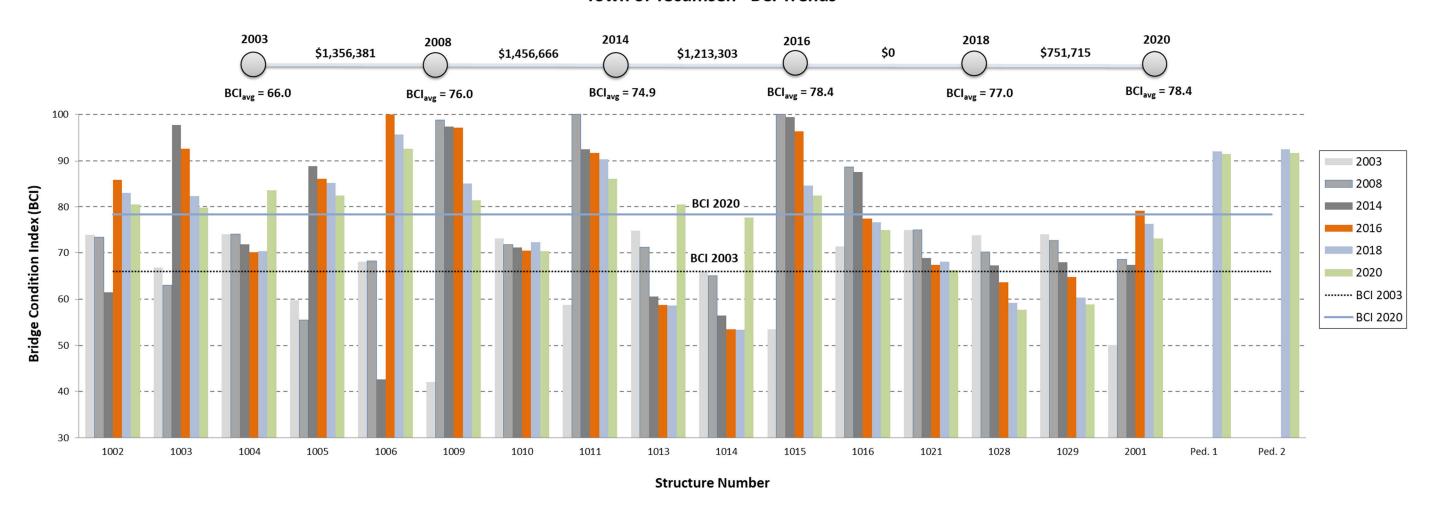
West elevation



# Description

Waterway downstream (Looking West)

# **Town of Tecumseh - BCI Trends**





# Town of Tecumseh - Historic Major Bridge (Rehab./Replacement) Spending (2003 - 2020)

