

2023 OSIM Bridge Inspections Report

**Township of Melancthon
157101 Highway 10
Melancthon, ON L9V 2E6**



BURNSIDE

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157101 Highway 10
Melancthon, ON L9V 2E6**

**R.J. Burnside & Associates Limited
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2023

Executive Summary

R.J. Burnside & Associates Limited (Burnside) was engaged by the Township of Melancthon to undertake the inspection of 50 bridge and culvert structures. It should be noted that Structure No. 004 on the 5th Sideroad was closed to through traffic in 2020 and the Township has requested to have it removed from their biennial inspection list while closed. The visual inspections were carried out on an element-by-element basis in accordance with the Ministry of Transportation - Ontario Structure Inspection Manual (OSIM). The inspections were completed under the direction of a Professional Engineer to assess their condition and identify any material defects, performance deficiencies, maintenance needs, additional studies and/or repairs/rehabilitation work required on a structure-by-structure basis.

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

The routine maintenance work often requires a minimal scope of work, and in most cases can be carried out by Township staff. The items included in the maintenance needs include recurring items that should be completed each year, i.e., cleaning winter sand/salt off bridge decks, and onetime costs such as placing rip-rap in washouts on slopes adjacent to bridge wingwalls. The total estimated value of the work to be completed by the Township is **\$80,500.00**. We recommend that a general allowance to complete the works described above be included in the Township's annual road budget.

Additional studies, investigations, and monitoring programs, as summarized in the table below, are recommended to structures currently demonstrating severe material defects or performance deficiencies which may necessitate an inspector to require more detailed information. These investigations have been identified based on a "normal" or "urgent" priority.

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

Capital Works Costs and Timeframes

Time Frame	Capital Cost
< 1 year	\$50,000.00
1 – 5 years	\$752,000.00
6 – 10 years	\$2,924,500.00
TOTAL	\$3,726,500.00

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

Taking into consideration the structures calculated BCI's, several structures have been identified for replacement or rehabilitation. Within the next year, one (1) structure has been identified as requiring rehabilitation and zero (0) structures have been identified for replacement. Within the next 1 to 5 years, six (6) structures have been identified as requiring rehabilitation and zero (0) structures have been identified for replacement.

The roadside safety needs include a general allowance for guide rail and/or end treatments at all bridge locations as required. The total estimated cost for roadside safety is **\$811,000.00**.

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

Table of Contents

1.0	Introduction	1
2.0	Inspection Observations and Recommendations	2
2.1	Routine Maintenance	2
2.2	Additional Studies/Investigations	3
2.3	Roadside Safety	4
2.3.1	Pedestrian and Inspector Safety	5
2.4	Repair, Rehabilitation or Replacement.....	6
2.5	Load Postings and Recommendations.....	7
3.0	Bridge Condition Index	8
4.0	Structure Inventory Trends	10
5.0	Prioritization and Recommended Work	13
6.0	Summary	17

Figures

Figure 1: Types of Structures	2
Figure 2: Bridge Condition Index Distribution (2023).....	10
Figure 3: Bridge Condition Index Historical Trend.....	11

Tables

Table 1: Additional Investigations	4
Table 2: Capital Works Costs and Timeframes.....	7
Table 3: Top Priority Structures based on Condition Rating (BCI) (within 5 years).....	14
Table 4: 10-Year Capital Plan.....	15

Appendices

Appendix A Summary Reports	
Appendix B Structure Inventory and Cost Summaries	
Appendix C Structure Location Map	
Appendix D Photo Summary Sheets	
Appendix E OSIM Forms and Photos Provided Digitally	

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been engaged by the Township of Melancthon to undertake the inspection of 50 road bridge and culvert structures over the span of 3.0 m. It should be noted that Structure No. 004 on the 5th Sideroad was closed to through traffic in 2020 and the Township has requested to have it removed from their biennial inspection list while closed.

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

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

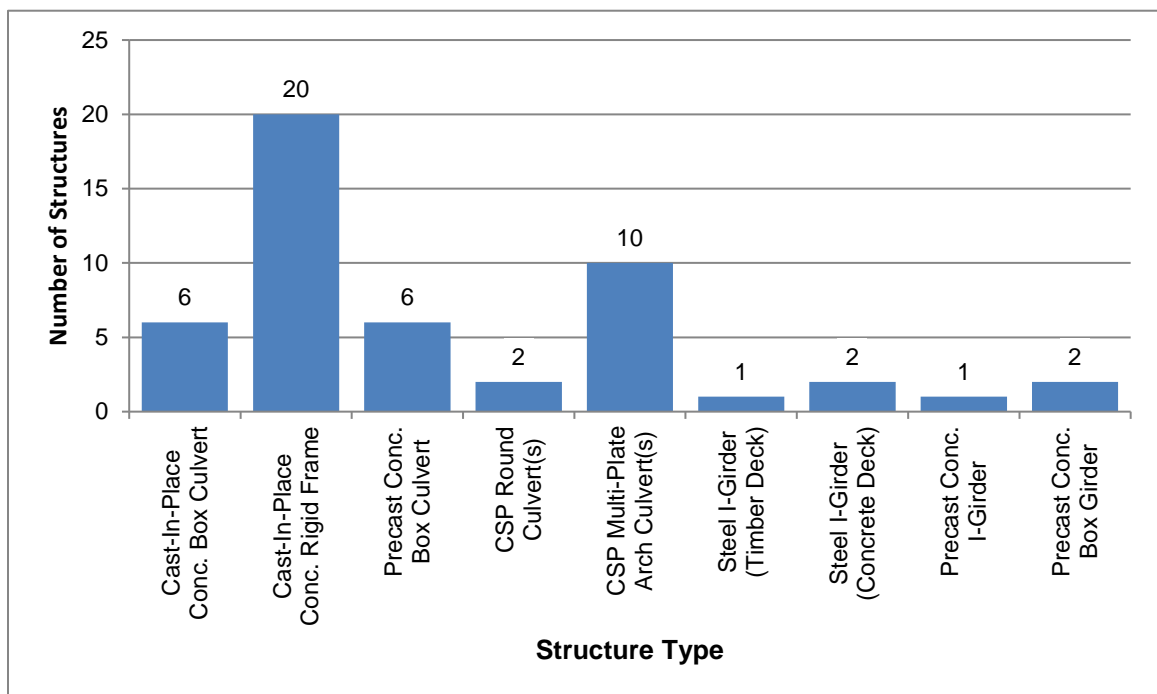
Burnside staff conducted a detailed element by element visual assessment of each bridge/culvert in order to identify any material defects, performance deficiencies and maintenance needs on a structure-by-structure basis. All data collected has been documented on the OSIM forms and provided in digital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

2.0 Inspection Observations and Recommendations

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

The Township of Melancthon has an inventory of 50 structures, which is comprised of a variety of structure types. Figure 1 below summarizes the number and types of structures within the inventory.

Figure 1: Types of Structures



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

2.1 Routine Maintenance

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

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

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

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

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

The total estimated value of the work to be completed by the Township is approximately **\$80,500.00**. We recommend that a general allowance to complete the works described above be included in the Township's annual road maintenance budget.

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

2.2 Additional Studies/Investigations

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

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

A summary of the additional investigations recommended for the Township are summarized in Table 1 below:

Table 1: Additional Investigations

Structure No./Name	Additional Investigation	Reasoning	Estimated Cost
2002	Monitor Barrel Deformations	During Biennial Inspections – To ensure culvert system is stable	\$0.00
2012	Monitor Wingwall Cracks and Movement	During Biennial Inspections – To ensure wingwall is stable	\$0.00
2021	Monitor Bolt Hole Cracks	During Biennial Inspections - To review temporary repair work and determine if actively progressing until structure is replaced	\$0.00
2026	Monitor Barrel Deformations	During Biennial Inspections – To ensure culvert system is stable	\$0.00
2029	Monitoring Program for Substructure Movement	To determine if actively progressing until structure is replaced	\$5,000.00
2031	Monitor Barrel Deformations	During Biennial Inspections – To ensure culvert system is stable	\$0.00
2032	Monitor Barrel Deformations	During Biennial Inspections – To ensure culvert system is stable	\$0.00
Total			\$5,000.00

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

2.3 Roadside Safety

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

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

As is discussed in more detail in the Manual, risk management is critical in assessing the need for roadside safety installations. At some structures, and on some roadways, the installation of guide rail systems may be seen as more of a hazard than not having a system. This may be a result of a reduction in road platform width, the ability to remove

snow effectively, and the space available to place and anchor end treatments. Section 4.2.2.1 from the MTO - Roadside Design Manual states *that guide rail systems must be offset a minimum of 4.25 m from the roadway centerline, to provide clearance to snowplowing operations.* In addition, local use of a roadway by farm equipment and the location of driveway and field entrances around structures should also be considered in determining the need and effectiveness of guide rail systems.

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

For the purpose of this Report, where a high level review indicated that guide rail or guiderail components would be required (apparent substandard length of need, substandard end treatments, rigid barriers on the structure, small clear zone between the edge of road and edge of structure, etc.) a general allowance for a typical guide rail system installation has been provided, however, site specific and detailed assessments of need at each structure is not included in this Report. Where the need for a guiderail system was not evident based on high level review, an allowance for an investigation into the need for guiderail was provided. The total estimated cost relating to guide rail installation or investigation is **\$811,000.00**.

Where recommendations have been made for installation or corrective measures, Burnside has identified that the work is to be completed within 1-5 years. However, as each site has unique characteristics relating to the requirements of guiderail, Burnside also recommends that a further investigation and risk analysis of each of the identified sites be completed by the Township within one year to classify the structures as high, medium, or low priority for guide rail installation or improvements. The study may also outline a timeline for guide rail upgrades based on annual guide rail budget.

2.3.1 Pedestrian and Inspector Safety

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

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

present, a guard shall be installed on culvert ends, or on top of retaining walls to protect inspectors from fall hazards.

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

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

2.4 Repair, Rehabilitation or Replacement

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

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

For repair programs that require a number of prolonged on-site activities, we have assigned a variable general cost that may range from \$40,000.00 to \$125,000.00, to address some of the mobilization, insurance, bonding and related costs of being on-site.

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

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

The total estimated cost for the capital works for all 50 structures within the Township, (including rehabilitation/repair and replacement costs) has been estimated as follows:

Table 2: Capital Works Costs and Timeframes

Time Frame	Capital Cost
< 1 year	\$50,000.00
1 – 5 years	\$752,000.00
6 – 10 years	\$2,924,500.00
TOTAL	\$3,726,500.00

The total, 10-year estimated capital costs, which includes the above as well as all other associated costs including maintenance, additional investigations, and roadside protection costs, is \$4,623,000.00. It should be noted that all costs are based on 2023 prices and do not account for inflation. A summary of the capital works needs can be found in Appendix B.

2.5 Load Postings and Recommendations

Load postings may be recommended for structures based on age, condition, noted performance deficiencies or based on the findings of a structural evaluation. There are currently no structures in the Township's inventory that have load postings and none that are being recommended for load posting consideration.

Structure 004 previously had a load posting of 5 Tonnes but was closed to through traffic in 2020 and has been removed from the Township's biennial bridge inspection inventory while closed.

3.0 Bridge Condition Index

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

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

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

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

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

Good – BCI Range 70 to 100

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

Fair – BCI Range 50 to 70

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

Poor – BCI Less than 50

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

4.0 Structure Inventory Trends

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

Figure 2: Bridge Condition Index Distribution (2023)

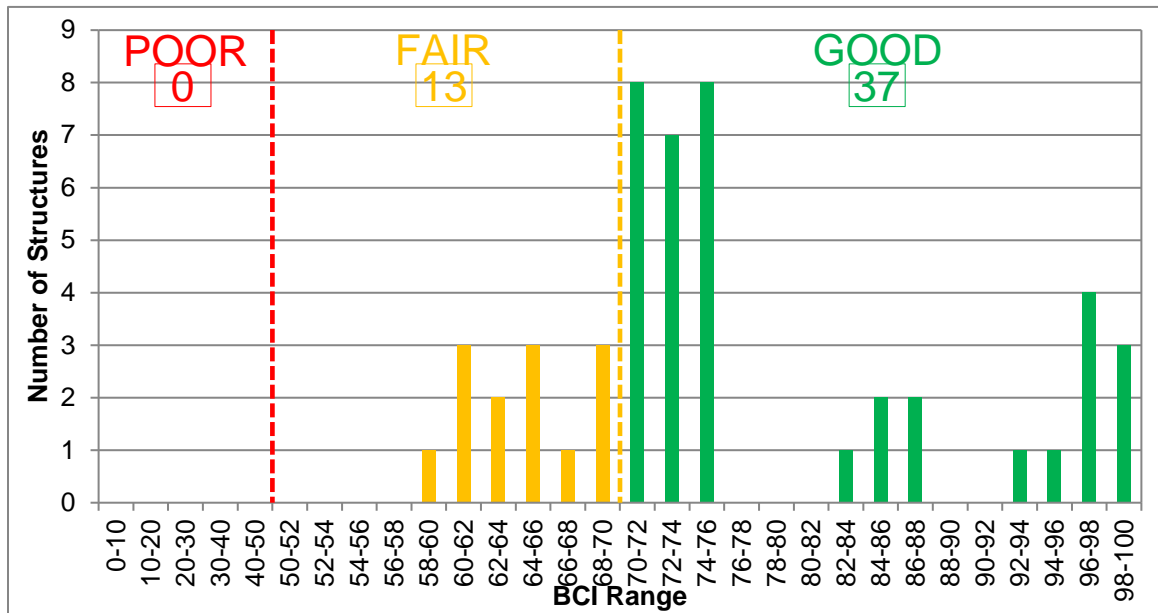
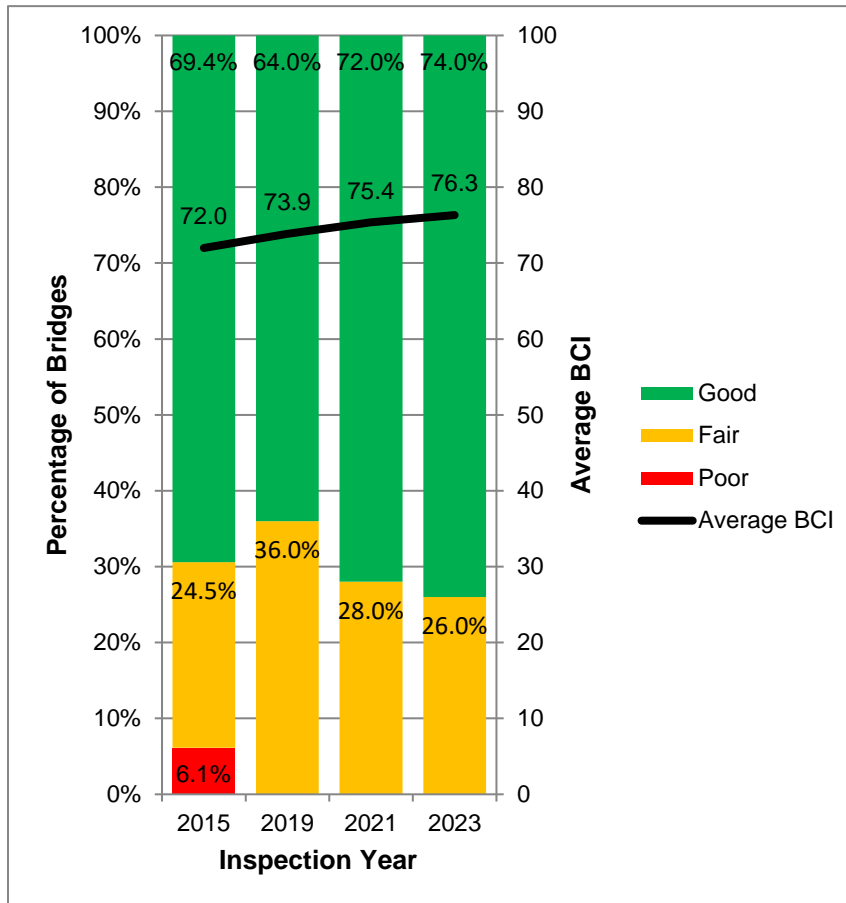


Figure 3: Bridge Condition Index Historical Trend



Currently, only approximately 74% of the Municipality’s structures are within the “good” range, with 26% of the structures classified as “fair” and 0% classified as “poor”, as illustrated in Figure 3 above. Of interest, the MTO has established a goal of maintaining 85% of their structures in “good” condition (BCI \geq 70) by addressing rehabilitations and replacements as necessary. Burnside recognizes that the above goal was not established by the Township, but it is noted that, based on the current state of the inspected structures, the Township is underperforming on the management of their bridge assets when compared to the MTO’s established goal, however for a smaller municipality, in relative terms the Township is performing well on the management of their bridge assets.

The trend in Figure 3 identifies that the overall average BCI of the Township’s inventory has generally increased over the last 6 years due to recently completed capital works projects completed since the 2015 inspections, which include the following:

- Structure No. 2028 – Main Street, Replacement (2015);
- Structure No. 2010, 2020 & 2024 – Replacement (2016);
- Structure No. 15 – 2nd Line SW, Rehabilitation (2017);

- Structure No. 10 – 280 Sideroad, Rehabilitation (2018);
- Structure No. 2003 – 3rd Line, Rehabilitation (2019);
- Structure No. 2021 – 2nd Line NE, Temporary Repair (2019);
- Structure No. 2013 – 30th Sideroad, Replacement (2020);
- Structure No. 13 – 260 Sideroad, Rehabilitation (2021); and
- Structure No. 11 – 8th Line SW, Rehabilitation (2022).

Projects currently in design stage include:

- Structure No. 2023 – 4th Line NE Rehabilitation

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

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

For the purposes of this report, culverts and bridges less than 4.5 m in span are assumed not to have a rehabilitation cycle. These structures will be monitored and planned for replacement when their BCI drops below a lower limit of 40. However, even though our recommendation is to replace a structure, the costs to repair identified defects are included on the OSIM forms should the Township wish to repair these structures.

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

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

5.0 Prioritization and Recommended Work

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

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

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

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

Table 3: Top Priority Structures based on Condition Rating (BCI) (within 5 years)

Structure No./Name	Road Name	Recommended Work	Estimated Cost	Years to Rehabilitation/ Replacement
Replacements				
N/A				
Rehabilitations				
2023	4 th Line NE	Rehabilitate	\$215,000	1
2033	7 th Line SW	Rehabilitate (Embankment Stabilization)	\$60,000	1-2
6	4 th Line SW	Waterproof and Pave	\$50,000	1-2
2007	15 th Sideroad	Waterproof and Pave	\$40,000	1-2
16	250 Sideroad	Rock Protection along Abutment Walls	\$15,000	1-2
Total			\$380,000	

The structures in the 10-year Capital Plan shown below in Table 3, have been ordered for rehabilitation or replacement based on their condition during the latest completed inspection, but also take into account additional factors through recent discussions with Township staff, such as low traffic volume roads, schedule reconstruction projects, close proximity and similar scope of work on priority structures, etc. It is recommended the Township budget approximately **\$250,000** in their annual capital works budget for bridges and culverts to work towards the 10-year capital plan needs.

Costing breakdown for planning and engineering design has been provided for the 10-year capital plan provided below. It should be noted that they may change and will need to be reassessed during each OSIM inspection cycle. It should be noted that if structures can be lumped together and tendered under one contract (i.e., Structure 6 & 2007, Structure 7 & 18, and Structure 9 & 14) there will likely be cost savings above and beyond the estimates presented below.

Table 4: 10-Year Capital Plan

Structure No./Name	Road Name	Recommended Work	Estimated Cost
2024			
2023	4 th Line NE	Construction - Rehabilitation	\$215,000
2025			
2033	7 th Line SW	Engineering – Design (Embankment Stabilization)	\$12,500
6	4 th Line SW	Engineering – Design (Waterproof & Pave)	\$10,000
2007	15 th Sideroad	Engineering – Design (Waterproof & Pave)	\$10,000
2033	7 th Line SW	Construction – Rehabilitation (Embankment Stabilization)	\$60,000
6	4 th Line SW	Construction – Waterproof and Pave	\$50,000
2007	15 th Sideroad	Construction - Waterproof and Pave	\$40,000
16	250 Sideroad	Construction – Rock Protection along Abutment Walls	\$15,000
2026			
7	7 th Line SW	Engineering – Design (Rehabilitation)	\$35,000
18	2 nd Line NE	Engineering – Design (Rehabilitation)	\$25,000
2027			
7	7 th Line SW	Construction - Rehabilitation	\$370,000
18	2 nd Line NE	Construction – Rehabilitation (keeping existing barrier)	\$230,000
2028			
14	4 th Line SW	Engineering – Design (Scoped Rehabilitation)	\$25,000
9	8 th Line SW	Engineering – Design (Scoped Rehabilitation)	\$25,000
2029			
14	4 th Line SW	Construction – Scoped Rehabilitation	\$200,000
9	8 th Line SW	Construction – Scoped Rehabilitation	\$250,000
2030			
2011	20 th Sideroad	Engineering – Design (Replacement)	\$60,000
2031			
2011	20 th Sideroad	Construction - Replacement	\$650,000
2032			
2017	2 nd Line NE	Engineering – Design (Replacement)	\$50,000

Structure No./Name	Road Name	Recommended Work	Estimated Cost
2033			
2017	2 nd Line NE	Construction - Replacement	\$500,000
Total			\$2,832,500

Note: Construction contingencies, utility relocation work and costs for engineering construction supervision are not included in the above noted costs

- Structure No. 16 Rehabilitation has been omitted from the 10-Year Capital Plan at the request of the Township taking into consideration this bridge has been previously rehabilitated.
- Structure No. 2021 temporary repairs to be monitored during the 2025 biennial inspections and can be added to the next 10-year plan depending on how the steel welding is performing.

6.0 Summary

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

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



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Appendix A

Summary Reports

1.1 Structure No. 001

<u>Structure Name:</u>	Structure 001	2023 BCI =72.13
<u>Road Name:</u>	4th Line SW	
<u>Location:</u>	1 km North of Highway 89 (Lot 4, CON. 4 & 5 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.7 m
<u>Overall Structure Width:</u>	7.45 m	<u>Roadway Width:</u> 6 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	22.1

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

Structure 001 is generally in good condition but is demonstrating signs of concrete deterioration and erosion specifically on the abutments, wingwalls and exposed portion of the foundation.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove overgrown vegetation around structure	\$1,500.00
Maintenance Needs Total		\$1,500.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$2,500.00
Type B concrete repairs to soffit,	N/A	\$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$5,000.00
Widen deck platform (cantilever)	N/A	\$50,000.00
Install side mounted barrier and approach guide rail	N/A	\$95,000.00
Waterproof and pave	N/A	\$25,000.00
Add slope stabilization	N/A	\$10,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$317,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$332,500.00	\$415,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$34,000.00	\$42,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$34,000.00	\$42,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$21,000.00
Total Capital Work Cost	\$418,000.00	\$645,000.00

1.2 Structure No. 003

<u>Structure Name:</u>	Structure 003	2023 BCI =65.31
<u>Road Name:</u>	5th Sideroad	
<u>Location:</u>	100 m West of 4th Line (Lot 5/6, Con. 4 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.7 (skew = 4.25) m
<u>Overall Structure Width:</u>	8 m	<u>Roadway Width:</u> 3.9 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.3

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

Structure 003 is generally in good to fair condition but is demonstrating signs of concrete deterioration and moisture penetration through the deck based on delamination's noted on the soffit.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation blocking signs and in close proximity to structure	\$1,000.00
Erosion Control	Install rock protection NE & SE	\$1,000.00
Maintenance Needs Total		\$2,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$7,500.00
Type B concrete repairs to soffit,	N/A	\$25,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$8,000.00
Waterproof and Pave	N/A	\$15,000.00
Add slope stabilization	N/A	\$16,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$196,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$500,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$211,500.00	\$515,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$22,000.00	\$52,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$22,000.00	\$52,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$26,000.00
Total Capital Work Cost	\$273,000.00	\$770,000.00

1.3 Structure No. 005

Structure Name: Structure 005
Road Name: 2nd Line SW
Location: 1.4 km North of County Road 17 (Lot 283, CON. 2 & 3 SW)
Structure Type: Cast-In-Place Conc. Rigid Frame
Number of Spans: 1 Span Lengths: 7.8 m
Overall Structure Width: 8.7 m Roadway Width: 7.9 m
Year of Construction: 1960 Current Load Limit: N/A

2023 BCI =72.76


	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	12.8	22.8

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

Structure 005 is generally in good condition but is beginning to demonstrate signs of concrete deterioration, and moisture penetration on the soffit.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck and remove vegetation along curb	\$1,000.00
Hazard Signs	Raise hazard warning signs at structure	\$500.00
Maintenance Needs Total		\$1,500.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type B concrete repairs to soffit,	N/A	\$12,500.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$2,500.00
Replace barrier system	N/A	\$60,000.00
Waterproof and pave	N/A	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$225,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$800,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$240,000.00	\$815,000.00
Roadside Protection:	\$95,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$24,000.00	\$82,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$24,000.00	\$82,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$41,000.00
Total Capital Work Cost	\$400,500.00	\$1,145,000.00

1.4 Structure No. 006

<u>Structure Name:</u>	Structure 006	2023 BCI =86.05
<u>Road Name:</u>	4th Line SW	
<u>Location:</u>	1.7 km North of County Road 17 (Lot 281 & 11, Con. 4 & 5 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 10 m
<u>Overall Structure Width:</u>	7.9 m	<u>Roadway Width:</u> 6.7 m
<u>Year of Construction:</u>	2003	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	26.1	36.1

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

Structure 006 is generally in good to excellent condition with only minor defects noted. The costs for waterproof and paving can be reduced if combined with other structures.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top and remove vegetation around wingwalls	\$1,500.00
Maintenance Needs Total		\$1,500.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Install proper guide rail end treatments	\$40,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Waterproof and pave	1 to 5 years	\$30,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	\$15,000.00
Rehabilitation Cost Subtotal		\$45,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$950,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$60,000.00	\$965,000.00
Roadside Protection:	\$40,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$6,000.00	\$97,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$97,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$49,000.00
Total Capital Work Cost	\$143,500.00	\$1,333,000.00

1.5 Structure No. 007

<u>Structure Name:</u>	Structure 007	2023 BCI =66.89
<u>Road Name:</u>	7th Line SW	
<u>Location:</u>	1.5 km South of 270 Sideroad (Lot 13, Con. 6 & 7 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 9.4 m
<u>Overall Structure Width:</u>	8.6 m	<u>Roadway Width:</u> 7.4 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	6.9	16.9

Recommendation:	Minor Rehabilitation is recommended within 7 years.
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Justification:

Structure 007 is generally in good to fair condition but is demonstrating signs of concrete deterioration throughout, and moisture penetration on the soffit.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove overgrown vegetation around structure	\$1,500.00
Hazard Signs	Install hazard warning signs at structure	\$750.00
Maintenance Needs Total		\$2,250.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to posts, deck top, curbs,	6 to 10 years	\$10,000.00
Type B concrete repairs to soffit,	6 to 10 years	\$12,500.00
Type C concrete repairs to abutment walls, wingwalls,	6 to 10 years	\$15,000.00
Replace barrier system	6 to 10 years	\$50,000.00
Waterproof and Pave	6 to 10 years	\$40,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	\$125,000.00
Rehabilitation Cost Subtotal		\$252,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$800,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$267,500.00	\$815,000.00
Roadside Protection:	\$95,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$27,000.00	\$82,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$27,000.00	\$82,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$41,000.00
Total Capital Work Cost	\$434,000.00	\$1,145,000.00

1.6 Structure No. 008

<u>Structure Name:</u>	Structure 008	2023 BCI =70.47
<u>Road Name:</u>	7th Line SW	
<u>Location:</u>	1.5 km South of 270 Sideroad (Lot 15, Con. 6 & 7 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 6.1 m
<u>Overall Structure Width:</u>	18.2 m	<u>Roadway Width:</u> 6.9 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	10.5	20.5

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

Structure 008 is generally in good condition with moisture penetration noted through the soffit.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove fill over exposed deck top ends	\$1,000.00
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Maintenance Needs Total		\$2,000.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$10,000.00
Type C concrete repairs to barrels,	N/A	\$12,500.00
Waterproof and pave	N/A	\$30,000.00
Add slope stabilization	N/A	\$8,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$185,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$700,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$200,500.00	\$715,000.00
Roadside Protection:	\$1,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$21,000.00	\$72,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$21,000.00	\$72,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$36,000.00
Total Capital Work Cost	\$261,000.00	\$1,020,000.00

1.7 Structure No. 009

<u>Structure Name:</u>	Structure 009	2023 BCI =72.93
<u>Road Name:</u>	8th Line SW	
<u>Location:</u>	2.5 km North of HWY 89 (Lot 14, Con. 8 & 9 SW)	
<u>Structure Type:</u>	Precast Concrete Box Girder	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 10.4 m
<u>Overall Structure Width:</u>	8.8 m	<u>Roadway Width:</u> 7.8 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	12.9	22.9

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

Structure 009 is generally in good condition but is demonstrating signs of concrete deterioration caused by the salt laden water leaking through the expansion joints. The Township should consider conversion of the structure to a semi-integral configuration in order to eliminate future maintenance and repairs associated with the expansion joint system (a cost estimate for this work can be provided upon request).

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top and flush expansion joints	\$1,500.00
Other	Replace sealant in parapet walls	\$1,000.00
Maintenance Needs Total		\$2,500.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to barrier/parapet walls interior, deck top, concrete end dams,	N/A	\$7,500.00
Type B concrete repairs to Girders, soffit,	N/A	\$5,000.00
Replace expansion joints	1 to 5 years	\$100,000.00
Waterproof and pave	1 to 5 years	\$30,000.00
Install abutment rock protection	N/A	\$10,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$277,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$850,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$292,500.00	\$865,000.00
Roadside Protection:	\$95,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$30,000.00	\$87,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$30,000.00	\$87,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$44,000.00
Total Capital Work Cost	\$465,000.00	\$1,208,000.00

1.8 Structure No. 010

Structure Name: Structure 010
Road Name: 280 Sideroad
Location: LOT 11 & 12, CON 10 SW
Structure Type: Steel I-Girder (Timber Deck)
Number of Spans: 1
Overall Structure Width: 5.5 m
Year of Construction: 2018

2023 BCI =85.9

Span Lengths: 10.38 m
Roadway Width: 4.9 m
Current Load Limit: N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	35.2

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

Structure 010 was rehabilitated in 2018 and is generally in excellent condition with only minor defects noted

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck	\$1,000.00
Maintenance Needs Total		\$1,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$1,200,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,200,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$110,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$110,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$60,000.00
Total Capital Work Cost	N/A	\$1,605,000.00

1.9 Structure No. 011

<u>Structure Name:</u>	Structure 011	2023 BCI =74.11
<u>Road Name:</u>	8th Line SW	
<u>Location:</u>	3.4 km North of HWY 89 (Lot 16, Con. 8 & 9 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 16.2 (skew = 19.8) m
<u>Overall Structure Width:</u>	8.5 m	<u>Roadway Width:</u> 7.3 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	21.1	32.7

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

Structure 011 was rehabilitated in 2022 and is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs	\$500.00
Maintenance Needs Total		\$500.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$1,800,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,815,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$141,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$141,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$91,000.00
Total Capital Work Cost	N/A	\$2,313,000.00

1.10 Structure No. 012

Structure Name: Structure 012
Road Name: 7th Line SW
Location: Lot 21, Conc. 6 & SW
Structure Type: Steel I-Girder (Concrete Deck)
Number of Spans: 1

Overall Structure Width: 8.7 m
Year of Construction: 2007

2023 BCI =95.95

Span Lengths: Clear=17.1
 Skew=18 m

Roadway Width: 7 m

Current Load Limit: N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	33.9	43.9

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

Structure 012 is generally in excellent to good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	\$1,000.00
Maintenance Needs Total		\$1,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate Need for Replacing with Longer Guide Rail	\$500.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$1,600,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,600,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$130,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$130,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$80,000.00
Total Capital Work Cost	N/A	\$2,065,000.00

1.11 Structure No. 013

<u>Structure Name:</u>	Structure 013	2023 BCI =75.67
<u>Road Name:</u>	260 Sideroad	
<u>Location:</u>	200 m East of 7th Line SW (Lot 21 & 22, Con. 6 & 7 SW)	
<u>Structure Type:</u>	Precast Concrete I-Girder	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 17.8 m
<u>Overall Structure Width:</u>	10.7 m	<u>Roadway Width:</u> 8.6 m
<u>Year of Construction:</u>	1968	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	32.6

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

Structure 013 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Flush drains	\$1,000.00
Maintenance Needs Total		\$1,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$1,400,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,400,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$120,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$120,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$70,000.00
Total Capital Work Cost	N/A	\$1,835,000.00

1.12 Structure No. 014

<u>Structure Name:</u>	Structure 014	2023 BCI =71.08
<u>Road Name:</u>	4th Line SW	
<u>Location:</u>	500m North of 250 Sideroad (Lot 28, Con. 4 & 5 SW)	
<u>Structure Type:</u>	Precast Concrete Box Girder	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 16.35 m
<u>Overall Structure Width:</u>	8.6 m	<u>Roadway Width:</u> 7.7 m
<u>Year of Construction:</u>	1977	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	11.1	21.1

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

Structure 014 is generally in good condition but is demonstrating signs of concrete deterioration on the deck top and seized expansion joints.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck and flush expansion joints	\$1,500.00
Other	Replace joint sealant in parapet walls	\$1,000.00
Other	Replace missing end cap on hand railing	\$250.00
Maintenance Needs Total		\$2,750.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Install proper guide rail end treatments	\$40,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to barrier/parapet walls interior, deck top, concrete end dams,	N/A	\$20,000.00
Type B concrete repairs to Girders,	N/A	\$5,000.00
Waterproof and pave	1 to 5 years	\$30,000.00
Replace expansion joints	1 to 5 years	\$100,000.00
Install abutment rock protection	N/A	\$10,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$290,000.00

Estimate Value of Replacement Structure	
	\$1,500,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$305,000.00	\$1,515,000.00
Roadside Protection:	\$40,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$31,000.00	\$126,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$31,000.00	\$126,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$76,000.00
Total Capital Work Cost	\$424,500.00	\$1,968,000.00

1.13 Structure No. 015

<u>Structure Name:</u>	Structure 015	2023 BCI =71.66
<u>Road Name:</u>	2nd Line SW	
<u>Location:</u>	70m North of 250 Sideroad (Lot 249, Con. 2 & 3 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 15.3 m
<u>Overall Structure Width:</u>	7.45 m	<u>Roadway Width:</u> 6.2 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	27.2

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

Structure 015, which was rehabilitated in 2017, is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$1,300,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,300,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$115,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$115,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$65,000.00
Total Capital Work Cost	N/A	\$1,720,000.00

1.14 Structure No. 016

<u>Structure Name:</u>	Structure 016	2023 BCI =70.42
<u>Road Name:</u>	250 Sideroad	
<u>Location:</u>	2 km West of Hwy 10 (Lot 250/251, Con. 1 SW)	
<u>Structure Type:</u>	Steel I-Girder (Concrete Deck)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 13.4 m
<u>Overall Structure Width:</u>	6.3 m	<u>Roadway Width:</u> 5.3 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.2

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

Structure 016, which was rehabilitated in 1990, is generally in good condition but is demonstrating signs of concrete deterioration, and peeling/flaking of structural steel coating.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top	\$1,000.00
Handrail Maintenance	Replace damaged sections of handrail	\$1,000.00
Hazard Signs	Install narrow structure signs, replace NE sign	\$500.00
Other	Replace missing bolts in guiderail	\$250.00
Maintenance Needs Total		\$2,750.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Install proper guide rail end treatments	\$40,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$10,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$10,000.00
Abrasive blasting and painting required to structural steel (Full length),	N/A	\$100,000.00
Waterproof and pave	N/A	\$30,000.00
Install rock protection along abutment walls	1 to 5 years	\$15,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$290,000.00

Estimate Value of Replacement Structure	
	\$1,200,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$305,000.00	\$1,215,000.00
Roadside Protection:	\$40,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$31,000.00	\$111,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$31,000.00	\$111,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$61,000.00
Total Capital Work Cost	\$424,500.00	\$1,623,000.00



1.15 Structure No. 017

<u>Structure Name:</u>	Structure 017	2023 BCI =74.75
<u>Road Name:</u>	250 Sideroad	
<u>Location:</u>	370 m West of Hwy 10 (Lot 250/251, Con. 1 SW)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	2	<u>Span Lengths:</u> 5.89, 5.89 m
<u>Overall Structure Width:</u>	12.8 m	<u>Roadway Width:</u> 7.3 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	17.6

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

Structure 017 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install hazard warning sign NW	\$250.00
Maintenance Needs Total		\$250.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Replace guide rail, end treatments	\$95,000.00

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

Estimate Value of Replacement Structure	
	\$1,200,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$1,200,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$110,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$110,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$60,000.00
Total Capital Work Cost	N/A	\$1,605,000.00

1.16 Structure No. 018

<u>Structure Name:</u>	Structure 018	2023 BCI =69
<u>Road Name:</u>	2nd Line NE	
<u>Location:</u>	750 m South of County Road 21 (Lot 15, Con. 2 & 3 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 7.4 m
<u>Overall Structure Width:</u>	8.65 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	9.0	19.0

Recommendation:	Minor Rehabilitation is recommended within 9 years.
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Justification:

Structure 018 is generally in good to fair condition but is demonstrating signs of concrete deterioration, and moisture penetration. Roadside protection is recommended at this location; however the Township may wish to delay this work until a rehabilitation is complete including replacement of existing barrier with thrie beam barrier.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	6 to 10 years	\$2,500.00
Type B concrete repairs to soffit,	6 to 10 years	\$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	6 to 10 years	\$17,500.00
Replace barrier system	6 to 10 years	\$40,000.00
Waterproof and pave	6 to 10 years	\$30,000.00
Install slope protection	6 to 10 years	\$10,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	\$125,000.00
Rehabilitation Cost Subtotal		\$230,000.00

Estimate Value of Replacement Structure	\$650,000.00
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Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$15,000.00	\$15,000.00
Utilities - Utility relocation	\$5,000.00	\$5,000.00
Right of Way -	\$0.00	\$0.00
Environmental - bird nests present	\$10,000.00	\$10,000.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$30,000.00	\$30,000.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$260,000.00	\$680,000.00
Roadside Protection:	\$95,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$26,000.00	\$68,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$26,000.00	\$68,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$34,000.00
Total Capital Work Cost	\$424,500.00	\$975,000.00

1.17 Structure No. 2001

<u>Structure Name:</u>	Structure 2001	2023 BCI =70.68
<u>Road Name:</u>	3rd Line	
<u>Location:</u>	2.5 km South of County Road 17 (Lot 6 Con. 2 & 3 O.S.)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.5 m
<u>Overall Structure Width:</u>	15.8 m	<u>Roadway Width:</u> 8 m
<u>Year of Construction:</u>	1989	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.4

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

Structure 2001 is generally in good condition but is demonstrating signs of light to moderate surface corrosion along the waterline.

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

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$450,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$45,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$45,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$23,000.00
Total Capital Work Cost	N/A	\$688,000.00



1.18 Structure No. 2002

Structure Name: Structure 2002

Road Name: 5th Sideroad

Location: 200 m East of 4th Line (Lot 5 & 6 Con. 3 O.S.)

Structure Type: CSP Multi-Plate Arch Culvert(s)

Number of Spans: 1 Span Lengths: 3.4 m

Overall Structure Width: 22.5 m Roadway Width: 6.5 m

Year of Construction: 1988 Current Load Limit: N/A

2023 BCI =74.96



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

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

Structure 2002 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove tree in close proximity to structure	\$1,000.00
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Other	Tighten loose nuts in barrel	\$250.00
Maintenance Needs Total		\$2,250.00

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

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

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

Estimate Value of Replacement Structure	\$450,000.00
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Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$450,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$45,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$45,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$23,000.00
Total Capital Work Cost	N/A	\$688,000.00

1.19 Structure No. 2003

<u>Structure Name:</u>	Structure 2003	2023 BCI =74.94
<u>Road Name:</u>	3rd Line	
<u>Location:</u>	1 km South of 5th Sideroad (Lot 4 Con. 2 & 3 O.S.)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.8 m
<u>Overall Structure Width:</u>	26 m	<u>Roadway Width:</u> 7 m
<u>Year of Construction:</u>	1970	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	17.7

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

Structure 2003 is generally in good condition after steel reinforced invert paving was completed in 2019.

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

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Replace rotten posts and raise 3-cable guide rail	\$10,000.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$550,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$550,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$55,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$55,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$28,000.00
Total Capital Work Cost	N/A	\$813,000.00

1.20 Structure No. 2004

<u>Structure Name:</u>	Structure 2004	2023 BCI =73.83
<u>Road Name:</u>	5th Sideroad	
<u>Location:</u>	300 m West of county Road 124 (Lots 5 & 6, Con. 2 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 6.1 m
<u>Overall Structure Width:</u>	8 m	<u>Roadway Width:</u> 7.4 m
<u>Year of Construction:</u>	1990	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	13.8	23.8

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

Structure 2004 is generally in good condition but is demonstrating signs of moisture penetration on the soffit. Given the narrow, sub-standard driving platform width and low clearance, it is recommended to forgo the rehabilitation and replace the structure in the future.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation in close proximity to structure	\$1,000.00
Other	Remove debris blocking inlet	\$1,000.00
Maintenance Needs Total		\$2,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$1,000.00
Type B concrete repairs to soffit,	N/A	\$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$1,500.00
Waterproof and pave	N/A	\$25,000.00
Widen deck platform (cantilever)	N/A	\$50,000.00
Install side mounted barrier and approach guide rail	N/A	\$95,000.00
Add slope stabilization	N/A	\$8,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$310,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$600,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$325,500.00	\$615,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$33,000.00	\$62,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$33,000.00	\$62,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$31,000.00
Total Capital Work Cost	\$409,000.00	\$895,000.00



1.21 Structure No. 2005

Structure Name: Structure 2005

Road Name: 3rd Line

Location: 1.1 km South of County Road 17 (Lot 8, Con. 2 & 3 O.S.)

Structure Type: CSP Multi-Plate Arch Culvert(s)

Number of Spans: 1 Span Lengths: 2.3 m

Overall Structure Width: 17 m Roadway Width: 8.4 m

Year of Construction: 2014 Current Load Limit: N/A

2023 BCI =99.58



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	31.4

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

Structure 2005 is generally in excellent condition with only minor maintenance recommended at this time.

Maintenance Need	Element and Comments	Estimated Cost
Other	Tighten end treatment cables	\$250.00
Maintenance Needs Total		\$250.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$350,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$350,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$35,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$35,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$18,000.00
Total Capital Work Cost	N/A	\$563,000.00

1.22 Structure No. 2006

<u>Structure Name:</u>	Structure 2006	2023 BCI =71.25
<u>Road Name:</u>	3rd Line	
<u>Location:</u>	70 m South of 15th Sideroad (Lot 15, Con. 2 & 3 O.S)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3 m
<u>Overall Structure Width:</u>	8 m	<u>Roadway Width:</u> 7.4 m
<u>Year of Construction:</u>	1990	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	21.2

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

Structure 2006 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	\$500.00
Bridge Cleaning	Clear vegetation along front face of curb	\$500.00
Erosion Control	Add erosion protection along SW wingwall	\$1,000.00
Maintenance Needs Total		\$2,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

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

1.23 Structure No. 2007

<u>Structure Name:</u>	Structure 2007	2023 BCI =69.13
<u>Road Name:</u>	15th Sideroad	
<u>Location:</u>	50 m West of 3rd Line (Lot 15 & 16, Con. 3 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3 m
<u>Overall Structure Width:</u>	8 m	<u>Roadway Width:</u> 7 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	19.1

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

Structure 2007 is generally in good to fair condition but is demonstrating signs of moisture penetration through the cracks in the soffit.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation around wingwalls	\$500.00
Erosion Control	Add rock protection all quadrants	\$2,000.00
Hazard Signs	Reinstate leaning signs.	\$250.00
Maintenance Needs Total		\$2,750.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$5,000.00
Type B concrete repairs to soffit,	N/A	\$5,000.00
Waterproof and Pave	1 to 5 years	\$30,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	\$50,000.00
Rehabilitation Cost Subtotal		\$90,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$105,000.00	\$365,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$11,000.00	\$37,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$37,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$19,000.00
Total Capital Work Cost	\$153,500.00	\$583,000.00

1.24 Structure No. 2008

Structure Name: Structure 2008
Road Name: 15th Sideroad
Location: 600 m East of County Road 124 (Lots 15 & 16, Con. 1 O.S.)
Structure Type: Cast-In-Place Conc. Rigid Frame
Number of Spans: 1 Span Lengths: 3.7 m
Overall Structure Width: 9.25 m Roadway Width: 6.2 m
Year of Construction: 1970 Current Load Limit: N/A

2023 BCI =72.84


	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	22.8

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

Structure 2008 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Raise hazard warning signs	\$250.00
Bridge Cleaning	Clear vegetation surrounding hazard warning signs	\$500.00
Maintenance Needs Total		\$750.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type B concrete repairs to soffit,	N/A	\$1,500.00
Type C concrete repairs to wingwalls,	N/A	\$5,000.00
Waterproof and Pave	N/A	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$50,000.00
Rehabilitation Cost Subtotal		\$81,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$500,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$96,500.00	\$515,000.00
Roadside Protection:	\$95,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$10,000.00	\$52,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$52,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$26,000.00
Total Capital Work Cost	\$239,000.00	\$770,000.00

1.25 Structure No. 2009

<u>Structure Name:</u>	Structure 2009	2023 BCI =92.25
<u>Road Name:</u>	15th Sideroad	
<u>Location:</u>	1 km East of County Road 124 (Lot 16, Con. 1, O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 5.5 m
<u>Overall Structure Width:</u>	9.11 m	<u>Roadway Width:</u> 8 m
<u>Year of Construction:</u>	2008	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	39.7

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

Structure 2009 is generally in excellent to good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	\$1,500.00
Other	Consider installing drip edge detail in soffit exterior	\$3,000.00
Maintenance Needs Total		\$4,500.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate Need for Replacing with Longer Guide Rail	\$500.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Waterproof and Pave	N/A	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$150,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$600,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$165,000.00	\$615,000.00
Roadside Protection:	\$500.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$17,000.00	\$62,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$62,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$31,000.00
Total Capital Work Cost	\$220,000.00	\$895,000.00

1.26 Structure No. 2010

<u>Structure Name:</u>	Structure 2010	2023 BCI =99.88
<u>Road Name:</u>	3rd Line	
<u>Location:</u>	850 m South of 20th Sideroad (Lot 19, Con 2 & 3, OS)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.89 m
<u>Overall Structure Width:</u>	19.6 m	<u>Roadway Width:</u> 6.7 m
<u>Year of Construction:</u>	2016	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	31.6

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

Structure 2010 is generally in excellent condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$400,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$40,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$40,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$20,000.00
Total Capital Work Cost	N/A	\$625,000.00

1.27 Structure No. 2011

<u>Structure Name:</u>	Structure 2011	2023 BCI =60.76
<u>Road Name:</u>	20th Sideroad	
<u>Location:</u>	2 km East of 5th Line (Lots 20 & 21, Con. 3 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.65 m
<u>Overall Structure Width:</u>	12.7 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	1985	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	7.5

Recommendation:	Structure replacement is recommended within 8 years.
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Justification:

Structure 2011 is generally in fair condition and is demonstrating signs of severe concrete deterioration and moisture penetration. The overgrown vegetation and excess fill overtop of the wingwalls, and fascia appear to be contributing to the concrete defects and should be removed to prevent further deterioration.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation around guide rail, wingwalls, and fascia	\$5,000.00
Hazard Signs	Install hazard warning sign at NW corner	\$250.00
Guide Rail	Tighten loose end treatment cables	\$250.00
Maintenance Needs Total		\$5,500.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$3,000.00
Type B concrete repairs to soffit,	N/A	\$9,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$30,000.00
Remove fill and waterproof	N/A	\$45,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$212,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$15,000.00	\$15,000.00
Utilities - utility relocation	\$5,000.00	\$5,000.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$20,000.00	\$20,000.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$232,000.00	\$470,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$24,000.00	\$47,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$24,000.00	\$47,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$24,000.00
Total Capital Work Cost	\$297,500.00	\$713,000.00

1.28 Structure No. 2012

<u>Structure Name:</u>	Structure 2012	2023 BCI =73.18
<u>Road Name:</u>	30th Sideroad	
<u>Location:</u>	250 m East of County Road 124 (Lots 30 & 31, Con. 1 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.65 m
<u>Overall Structure Width:</u>	7.45 m	<u>Roadway Width:</u> 5.6 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	10.0

Recommendation:	Structure replacement is recommended within 10 years.
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Justification:

Structure 2012 is generally in good condition with the exception of wide cracks. Replacement timelines have been expedited due to the movement noted in the wingwalls.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs and around wingwalls	\$1,500.00
Hazard Signs	Replace hazard warning signs at structure and install narrow bridges signs	\$1,500.00
Maintenance Needs Total		\$3,000.00

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

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$4,000.00
Type B concrete repairs to soffit,	N/A	\$2,000.00
Type C concrete repairs to wingwalls,	N/A	\$4,000.00
Install wingwall reinforcement	N/A	\$10,000.00
Install barrier system	N/A	\$15,000.00
Waterproof and pave	N/A	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$185,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$500,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$200,000.00	\$515,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$20,000.00	\$52,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$52,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$26,000.00
Total Capital Work Cost	\$257,500.00	\$770,000.00



1.29 Structure No. 2013

Structure Name: Structure 2013

Road Name: 30th Sideroad

Location: 500 m West of 3rd Line (Lots 30 & 31, Con. 3 O.S.)

Structure Type: Precast Concrete Box Culvert

Number of Spans: 1 Span Lengths: 3 m

Overall Structure Width: 14.63 m Roadway Width: 8 m

Year of Construction: 2020 Current Load Limit: N/A

2023 BCI =99.37



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	41.8

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

Structure 2013 was replaced in 2020 and is generally in excellent condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	
	\$400,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$400,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$40,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$40,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$20,000.00
Total Capital Work Cost	N/A	\$625,000.00

1.30 Structure No. 2014

<u>Structure Name:</u>	Structure 2014	2023 BCI =73.32
<u>Road Name:</u>	4th Line	
<u>Location:</u>	900 m South of Melancthon-Osprey Townline (Lot 31, Con. 3 & 4 O.S.)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 4.85 m
<u>Overall Structure Width:</u>	8 m	<u>Roadway Width:</u> 5 m
<u>Year of Construction:</u>	1950	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	23.3

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

Structure 2014 is generally in good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs	\$1,000.00
Maintenance Needs Total		\$1,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Widen deck platform (cantilever)	N/A	\$50,000.00
Install side mounted barrier and approach guide rail	N/A	\$95,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$25,000.00
Rehabilitation Cost Subtotal		\$170,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$800,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$185,000.00	\$815,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$19,000.00	\$82,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$82,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$41,000.00
Total Capital Work Cost	\$241,500.00	\$1,145,000.00

1.31 Structure No. 2015

<u>Structure Name:</u>	Structure 2015	2023 BCI =85.96
<u>Road Name:</u>	10th Line Northeast	
<u>Location:</u>	300 m Northeast of 5th Line (Lot 25, Con. 10 & 11)	
<u>Structure Type:</u>	Precast Concrete Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 4 m
<u>Overall Structure Width:</u>	9.5 m	<u>Roadway Width:</u> 6 m
<u>Year of Construction:</u>	2008	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	31.0

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

Structure 2015, which was constructed in 2008, is generally in excellent to good condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Other	Install missing nut/bolts in guide rail posts	\$250.00
Maintenance Needs Total		\$250.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
Investigate Need for Replacing with Longer Guide Rail	\$500.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

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

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

1.32 Structure No. 2016

<u>Structure Name:</u>	Structure 2016	2023 BCI =70.48
<u>Road Name:</u>	4th Line NE	
<u>Location:</u>	600 m South of County Road 9 (Lot 30, Con. 4 & 5 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 2.4 m
<u>Overall Structure Width:</u>	14.85 m	<u>Roadway Width:</u> 6.6 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.5

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

Structure 2016, which has been previously rehabilitated, is generally in good condition but is demonstrating signs of concrete deterioration and moisture penetration.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	\$1,000.00
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Maintenance Needs Total		\$2,000.00

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

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

1.33 Structure No. 2017

<u>Structure Name:</u>	Structure 2017	2023 BCI =58.92
<u>Road Name:</u>	2nd Line NE	
<u>Location:</u>	1.4 km South of County Road 9 (Lot 28, Con. 2 & 3 NE)	
<u>Structure Type:</u>	CSP Round Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 2.5 m
<u>Overall Structure Width:</u>	17.2 m	<u>Roadway Width:</u> 6.3 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	9.5

Recommendation: Structure replacement is recommended within 9 years.

Justification:

Structure 2017 is generally in fair to poor condition demonstrating signs of severe section loss > 10% along the waterline.

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Repair washout on east embankments	\$1,500.00
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Maintenance Needs Total		\$2,500.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Culvert invert paving with shotcrete	N/A	\$100,000.00
Welded wire fabric	N/A	\$10,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$235,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$250,000.00	\$365,000.00
Roadside Protection:	\$1,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$25,000.00	\$37,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$25,000.00	\$37,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$19,000.00
Total Capital Work Cost	\$318,500.00	\$583,000.00

1.34 Structure No. 2018

<u>Structure Name:</u>	Structure 2018	2023 BCI =69.23
<u>Road Name:</u>	2nd Line NE	
<u>Location:</u>	250 m South of Sideroad 240 (Lot 26, Con. 2 & 3 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 2.44 m
<u>Overall Structure Width:</u>	12.25 m	<u>Roadway Width:</u> 6.3 m
<u>Year of Construction:</u>	1960	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	14.6

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

Structure 2018 is generally in good to fair condition but is demonstrating signs of severe concrete deterioration on the culvert inlet.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation around hazard warning signs	\$500.00
Hazard Signs	Raise hazard warning signs at structure	\$250.00
Maintenance Needs Total		\$750.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$7,500.00
Type C concrete repairs to barrels, inlet, outlet,	N/A	\$15,000.00
Waterproof and pave	N/A	\$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$167,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$182,500.00	\$365,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$19,000.00	\$37,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$37,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$19,000.00
Total Capital Work Cost	\$239,000.00	\$583,000.00

1.35 Structure No. 2019

<u>Structure Name:</u>	Structure 2019	2023 BCI =74.86
<u>Road Name:</u>	4th Line NE	
<u>Location:</u>	2.5 km North of County Road 21 (Lot 23, Con. 4 & 5 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 5 m
<u>Overall Structure Width:</u>	18.4 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	19.9

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

Structure 2019 is generally in good condition with only minor defects noted.

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

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top	N/A	\$5,000.00
Type C concrete repairs to barrels, inlet,	N/A	\$1,000.00
Waterproof and pave	N/A	\$30,000.00
Rehabilitation Cost Subtotal		\$36,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$550,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$51,000.00	\$565,000.00
Roadside Protection:	\$1,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$6,000.00	\$57,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$57,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$29,000.00
Total Capital Work Cost	\$95,500.00	\$833,000.00

1.36 Structure No. 2020

<u>Structure Name:</u>	Structure 2020	2023 BCI =97.22
<u>Road Name:</u>	4th Line NE	
<u>Location:</u>	2.4 km North of County Road 21 (Lot 22, Con 4 & 5 NE)	
<u>Structure Type:</u>	Precast Concrete Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3 m
<u>Overall Structure Width:</u>	16.8 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	2016	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	42.2

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

Structure 2020 is generally in excellent condition with only minor defects noted.

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

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

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

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

1.37 Structure No. 2021

<u>Structure Name:</u>	Structure 2021	2023 BCI =62.5
<u>Road Name:</u>	2nd Line NE	
<u>Location:</u>	2 km North of Country Road 21 (Lot 21 Con. 2 & 3 NE)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 5.2 m
<u>Overall Structure Width:</u>	19.8 m	<u>Roadway Width:</u> 6.3 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	11.2

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

Structure 2021 is generally in poor condition with section loss/perforations noted along the waterline with bolt hole cracking throughout the culvert barrel. Repairs have been completed to weld reinforcing steel across bolt hole cracks to extend the service life of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove small beaver dam west of culvert	\$1,000.00
Maintenance Needs Total		\$1,000.00

Additional Investigations	Estimated Cost
Monitoring Crack Widths,	\$0.00

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

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

Estimate Value of Replacement Structure	\$500,000.00
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Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$15,000.00	\$15,000.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$15,000.00	\$15,000.00

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

1.38 Structure No. 2022

<u>Structure Name:</u>	Structure 2022	2023 BCI =74.19
<u>Road Name:</u>	4th Line NE	
<u>Location:</u>	150 m North of county Road 21 (Lot 17, Con. 4 & 5 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.1 m
<u>Overall Structure Width:</u>	18.5 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	1980	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	19.2

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

Structure 2022 is generally in good condition with only minor defects noted.

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

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

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

1.39 Structure No. 2023

<u>Structure Name:</u>	Structure 2023	2023 BCI =62.56
<u>Road Name:</u>	4th Line NE	
<u>Location:</u>	400 m South of County Road 21 (Lot16, Con. 4 & 5 NE)	
<u>Structure Type:</u>	Cast-In-Place Conc. Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.6 m
<u>Overall Structure Width:</u>	14.1 m	<u>Roadway Width:</u> 6 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	1.3	11.3

Recommendation:	Minor Rehabilitation is recommended within 1 years.
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Justification:

Structure 2023 is generally in fair condition and is demonstrating signs of severe concrete deterioration specifically at the culvert ends. The vegetation and fill overtop of the culvert ends appear to be contributing to the concrete deterioration and should be removed as soon as possible. A rehabilitation for this structure is currently in the design phase with construction anticipated in 2024.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation blocking hazard warning signs and fill on culvert ends	\$2,500.00
Maintenance Needs Total		\$2,500.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	\$5,000.00
Reconstruct culvert ends	1 to 5 years	\$40,000.00
Waterproof and pave	1 to 5 years	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	\$125,000.00
Rehabilitation Cost Subtotal		\$195,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$195,000.00	\$450,000.00
Roadside Protection:	\$1,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$20,000.00	\$45,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$45,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$23,000.00
Total Capital Work Cost	\$253,500.00	\$688,000.00

1.40 Structure No. 2024

<u>Structure Name:</u>	Structure 2024	2023 BCI =97.26
<u>Road Name:</u>	2nd Line NE	
<u>Location:</u>	800 m South of Sideroad 240 (Lot 25, Con 2 & 3)	
<u>Structure Type:</u>	Precast Concrete Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3 m
<u>Overall Structure Width:</u>	17 m	<u>Roadway Width:</u> 6.3 m
<u>Year of Construction:</u>	2016	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	42.3

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

Structure 2024 was recently replaced in 2016 and is generally in excellent condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

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

1.41 Structure No. 2025

<u>Structure Name:</u>	Structure 2025	2023 BCI =65.52
<u>Road Name:</u>	Sideroad 260	
<u>Location:</u>	3.2 km West of Highway 10 (Lot 260-261 Con.3 SW)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.1 m
<u>Overall Structure Width:</u>	19.1 m	<u>Roadway Width:</u> 8.5 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	12.8

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

Structure 2025 is generally in good to fair condition but is demonstrating signs of moderate to severe surface corrosion and section loss throughout the culvert barrel.

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Erosion Control	Repair washout on NE embankment	\$1,500.00
Maintenance Needs Total		\$2,500.00

Additional Investigations	Estimated Cost
	\$0.00

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$500,000.00

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

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

1.42 Structure No. 2026

<u>Structure Name:</u>	Structure 2026	2023 BCI =83.26
<u>Road Name:</u>	8th Line SW	
<u>Location:</u>	1 km North of Highway 89 (Lot 11 Con.8 & 9 SW)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.4 m
<u>Overall Structure Width:</u>	17 m	<u>Roadway Width:</u> 8 m
<u>Year of Construction:</u>	2008	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	22.4

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

Structure 2026 is generally in excellent condition. Several areas of minor localized deformations and cusping were noted but may be from original construction.

Maintenance Need	Element and Comments	Estimated Cost
		\$0.00
		\$0.00
Maintenance Needs Total		\$0.00

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

Current Roadside Protection Needs	Estimated Cost
Investigate Need for Replacing with Longer Guide Rail	\$500.00

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

Estimate Value of Replacement Structure	
	\$350,000.00

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

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

1.43 Structure No. 2027

<u>Structure Name:</u>	Structure 2027	2023 BCI =97.01
<u>Road Name:</u>	15 Sideroad	
<u>Location:</u>	2 km West of County Road 124 (Lot 15 & 16, Conc. 2 OS)	
<u>Structure Type:</u>	Precast Concrete Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.6 m
<u>Overall Structure Width:</u>	10 m	<u>Roadway Width:</u> 8.5 m
<u>Year of Construction:</u>	2015	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	42.0

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

Structure 2027 is generally in excellent condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Other	Tighten loose end treatment cables	\$250.00
Maintenance Needs Total		\$250.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

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

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

1.44 Structure No. 2028

<u>Structure Name:</u>	Structure 2028	2023 BCI =96.89
<u>Road Name:</u>	Main Street (County Road 14)	
<u>Location:</u>	0.5 km South of Sideroad 15 (Lot 15, Conc. 1 & 2 OS)	
<u>Structure Type:</u>	Precast Concrete Box Culvert	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 2.44 m
<u>Overall Structure Width:</u>	16.8 m	<u>Roadway Width:</u> 6.5 m
<u>Year of Construction:</u>	2014	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	41.9

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

Structure 2028 is generally in excellent condition with only minor defects noted.

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install additional rock protection at inlet	\$1,000.00
Other	Trim exposed filter fabric on east retaining wall	\$250.00
Maintenance Needs Total		\$1,250.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

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

1.45 Structure No. 2029

<u>Structure Name:</u>	Structure 2029	2023 BCI =73.96
<u>Road Name:</u>	220 Sideroad	
<u>Location:</u>	0.5 km East of County Road 2 (Lots 36 & 37, Con. 5 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 2.42 m
<u>Overall Structure Width:</u>	8.04 m	<u>Roadway Width:</u> 4.7 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	24.0

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

Structure 2029 is generally in good condition but is demonstrating signs of potential movement/rotation of the south abutment and SE wingwall.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Clear vegetation along the interior face of curbs	\$1,000.00
Hazard Signs	Reinstate leaning hazard warning signs	\$250.00
Maintenance Needs Total		\$1,250.00

Additional Investigations	Estimated Cost
Monitoring of Deformations, Settlements and Movements,	\$5,000.00

Current Roadside Protection Needs	Estimated Cost
Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$1,500.00
Type B concrete repairs to soffit,	N/A	\$1,500.00
Type C concrete repairs to abutment walls,	N/A	\$1,000.00
Widen deck platform (cantilever)	N/A	\$50,000.00
Install side mounted barrier and approach guide rail	N/A	\$95,000.00
Waterproof and pave	N/A	\$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$294,000.00

Estimate Value of Replacement Structure	\$350,000.00
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Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$15,000.00	\$15,000.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$15,000.00	\$15,000.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$309,000.00	\$365,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$31,000.00	\$37,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$31,000.00	\$37,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$19,000.00
Total Capital Work Cost	\$388,500.00	\$583,000.00

1.46 Structure No. 2030

<u>Structure Name:</u>	Structure 2030	2023 BCI =60.95
<u>Road Name:</u>	240 Sideroad	
<u>Location:</u>	1.3 km East of 4th Line NE (Lots 26 & 27, Con. 5 SW)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 1.5 (2.5m skew span) m
<u>Overall Structure Width:</u>	8.2 m	<u>Roadway Width:</u> 4.55 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	11.0

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

Structure 2030 is generally in fair condition and is demonstrating signs of severe erosion and moisture penetration throughout.

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Install rock protection along abutments	\$2,500.00
Hazard Signs	Install additional narrow bridge sign	\$250.00
Maintenance Needs Total		\$2,750.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	\$10,000.00
Type B concrete repairs to soffit,	N/A	\$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	\$20,000.00
Waterproof and pave	N/A	\$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$180,000.00

Estimate Value of Replacement Structure	Estimated Cost
	\$350,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$195,000.00	\$365,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$20,000.00	\$37,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$20,000.00	\$37,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$19,000.00
Total Capital Work Cost	\$252,500.00	\$583,000.00

1.47 Structure No. 2031

<u>Structure Name:</u>	Structure 2031	2023 BCI =85.22
<u>Road Name:</u>	240 Sideroad	
<u>Location:</u>	0.5 km East of Highway 10 (Lot 240 & 241, Conc. 1 NE)	
<u>Structure Type:</u>	CSP Multi-Plate Arch Culvert(s)	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 3.73 m
<u>Overall Structure Width:</u>	16 m	<u>Roadway Width:</u> 6.7 m
<u>Year of Construction:</u>	2005	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	23.5

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

Structure 2031 is generally in excellent to good condition with localized deformations noted.

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

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

Current Roadside Protection Needs	Estimated Cost
	\$0.00

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

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

Associated Work	Rehabilitation	Replacement
Approaches -	\$0.00	\$0.00
Detours -	\$0.00	\$0.00
Traffic Control -	\$0.00	\$0.00
Utilities -	\$0.00	\$0.00
Right of Way -	\$0.00	\$0.00
Environmental -	\$0.00	\$0.00
Other -	\$0.00	\$0.00
Total Associated Work Cost	\$0.00	\$0.00

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	N/A	\$400,000.00
Roadside Protection:	N/A	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	N/A	\$40,000.00
Environmental Assessment:	N/A	\$10,000.00
Engineering Design:	N/A	\$40,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	N/A	\$20,000.00
Total Capital Work Cost	N/A	\$625,000.00

1.48 Structure No. 2032

<u>Structure Name:</u>	Structure 2032	2023 BCI =61.74
<u>Road Name:</u>	2nd Line Northeast	
<u>Location:</u>	0.7 km North of Sideroad 280	
<u>Structure Type:</u>	CSP Round Culvert(s)	
<u>Number of Spans:</u>	2	<u>Span Lengths:</u> 1.8 m
<u>Overall Structure Width:</u>	14.6 m	<u>Roadway Width:</u> 6 m
<u>Year of Construction:</u>	Unknown	<u>Current Load Limit:</u> N/A



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

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

Structure 2032 is generally in fair condition but is demonstrating signs of moderate to severe surface corrosion with section loss greater than 15% in localized areas.

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Repairs erosion on NE corner	\$1,000.00
Hazard Signs	Install hazard warning signs at structure	\$1,000.00
Maintenance Needs Total		\$2,000.00

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

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

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

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

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

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

1.49 Structure No. 2033

Structure Name: Structure 2033

2023 BCI =71.69

Road Name: 7th Line SW

Location: 0.25 km South of 260 Sideroad

Structure Type: Cast-In-Place Conc. Rigid Frame

Number of Spans:

Span Lengths: 3.65 (4.0m skew span) m

Overall Structure Width: 12.2 m

Roadway Width: 6 m

Year of Construction: Unknown

Current Load Limit: N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	16.7

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

Structure 2033 is generally in good condition however, the existing embankments are eroded, very steep and appear unstable.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove tree growing over inlet and remove overgrown vegetation over outlet	\$1,500.00
Erosion Control	Install rock protection and repair washouts on embankments	\$4,000.00
Hazard Signs	Clear vegetation and raise hazard warning signs	\$500.00
Maintenance Needs Total		\$6,000.00

Additional Investigations	Estimated Cost
	\$0.00

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

Rehabilitation/Repair Required	Priority	Estimated Cost
Type C concrete repairs to barrels, inlet, outlet,	N/A	\$5,500.00
Install concrete headwalls and retaining walls	Within 1 year	\$50,000.00
Waterproof and Pave	N/A	\$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$205,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$400,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$220,500.00	\$415,000.00
Roadside Protection:	\$1,000.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$23,000.00	\$42,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$23,000.00	\$42,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$21,000.00
Total Capital Work Cost	\$285,000.00	\$645,000.00

1.50 Structure No. 2034

<u>Structure Name:</u>	Structure 2034	2023 BCI =65.85
<u>Road Name:</u>	Mulmur-Melancthon Townline	
<u>Location:</u>	North of 15th Sideroad (Lot 18, Conc. I/III)	
<u>Structure Type:</u>	Cast-In-Place Conc. Rigid Frame	
<u>Number of Spans:</u>	1	<u>Span Lengths:</u> 4.25 m
<u>Overall Structure Width:</u>	9.6 m	<u>Roadway Width:</u> 5.5 m
<u>Year of Construction:</u>	1950	<u>Current Load Limit:</u> N/A



	Rehabilitation	Replacement
Estimated Capital Works Timelines (Years):	N/A	15.9

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

Structure 2034 is generally in good to fair condition but is demonstrating signs of concrete deterioration, specifically on the original portion of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove overgrown vegetation blocking waterway and signs	\$2,500.00
Hazard Signs	Install additional hazard warning signs at structure	\$500.00
Maintenance Needs Total		\$3,000.00

Additional Investigations	Estimated Cost
	\$0.00

Current Roadside Protection Needs	Estimated Cost
	\$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	\$5,500.00
Type B concrete repairs to soffit,	N/A	\$15,000.00
Type C concrete repairs to abutment walls,	N/A	\$15,000.00
Waterproof and pave	N/A	\$25,000.00
Add slope stabilization	N/A	\$12,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	\$125,000.00
Rehabilitation Cost Subtotal		\$197,500.00

Estimate Value of Replacement Structure	Estimated Cost
	\$450,000.00

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

Total Capital Works Costs		
Cost	Rehabilitation	Replacement
Rehab / Replacement Works:	\$212,500.00	\$465,000.00
Roadside Protection:	\$0.00	\$95,000.00
Staging Costs:	N/A	N/A
Construction Contingencies:	\$22,000.00	\$47,000.00
Environmental Assessment:	\$2,500.00	\$10,000.00
Engineering Design:	\$22,000.00	\$47,000.00
Geotechnical Investigation:	N/A	\$20,000.00
Contract Administration:	\$15,000.00	\$24,000.00
Total Capital Work Cost	\$274,000.00	\$708,000.00



BURNSIDE

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Appendix B

Structure Inventory and Cost Summaries

TOWNSHIP OF MELANCTHON - STRUCTURE INVENTORY

Structure No.	Inspect. Year	Structure Name	Road Name	Location	Structure Type	Span(s) (m)	Width (m)	Deck Area (m2)	Deterioration Curve	BCI
1	2023	Structure 001	4th Line SW	1 km North of Highway 89 (Lot 4, CON. 4 & 5 SW)	Cast-In-Place Conc. Rigid Frame	3.7	7.45	33.525	BR	72.13
3	2023	Structure 003	5th Sideroad	100 m West of 4th Line (Lot 5/6, Con. 4 O.S.)	Cast-In-Place Conc. Rigid Frame	3.7 (skew = 4.25)	8	46.4	BR	65.31
5	2023	Structure 005	2nd Line SW	1.4 km North of County Road 17 (Lot 283 , CON. 2 & 3 SW)	Cast-In-Place Conc. Rigid Frame	7.8	8.7	80.04	BR-1	72.76
6	2023	Structure 006	4th Line SW	1.7 km North of County Road 17 (Lot 281 & 11, Con. 4 & 5 SW)	Cast-In-Place Conc. Rigid Frame	10	7.9	90.85	BR-1	86.05
7	2023	Structure 007	7th Line SW	1.5 km South of 270 Sideroad (Lot 13, Con. 6 & 7 SW)	Cast-In-Place Conc. Rigid Frame	9.4	8.6	92.45	BR-1	66.89
8	2023	Structure 008	7th Line SW	1.5 km South of 270 Sideroad (Lot 15, Con. 6 & 7 SW)	Cast-In-Place Conc. Rigid Frame	6.1	18.2	127.4	BR-1	70.47
9	2023	Structure 009	8th Line SW	2.5 km North of HWY 89 (Lot 14, Con. 8 & 9 SW)	Precast Concrete Box Girder	10.4	8.8	96.8	BR-1	72.93
10	2023	Structure 010	280 Sideroad	LOT 11 & 12, CON 10 SW	Steel I-Girder (Timber Deck)	10.38	5.5	61.88	BR-1	85.90
11	2023	Structure 011	8th Line SW	3.4 km North of HWY 89 (Lot 16, Con. 8 & 9 SW)	Cast-In-Place Conc. Rigid Frame	16.2 (skew = 19.8)	8.5	187	BR-2	74.11
12	2023	Structure 012	7th Line SW	Lot 21, Conc. 6 & SW	Steel I-Girder (Concrete Deck)	Clear=17.1 Skew=18	8.7	189.66	BR-1	95.95
13	2023	Structure 013	260 Sideroad	200 m East of 7th Line SW (Lot 21 & 22, Con. 6 & 7 SW)	Precast Concrete I-Girder	17.8	10.7	203.3	BR-1	75.67
14	2023	Structure 014	4th Line SW	500m North of 250 Sideroad (Lot 28, Con. 4 & 5 SW)	Precast Concrete Box Girder	16.35	8.6	143.62	BR-1	71.08
15	2023	Structure 015	2nd Line SW	70m North of 250 Sideroad (Lot 249, Con. 2 & 3 SW)	Cast-In-Place Conc. Rigid Frame	15.3	7.45	129.63	BR-1	71.66
16	2023	Structure 016	250 Sideroad	2 km West of Hwy 10 (Lot 250/251, Con. 1 SW)	Steel I-Girder (Concrete Deck)	13.4	6.3	93.87	BR-1	70.42
17	2023	Structure 017	250 Sideroad	370m West of Hwy 10 (Lot 250/251, Con. 1 SW)	CSP Multi-Plate Arch Culvert(s)	5.89, 5.89	12.8	169.344	CS	74.75
18	2023	Structure 018	2nd Line NE	750m South of County Road 21 (Lot 15, Con. 2 & 3 NE)	Cast-In-Place Conc. Rigid Frame	7.4	8.65	69.2	BR-1	69.00
2001	2023	Structure 2001	3rd Line	2.5 km South of County Road 17 (Lot 6 Con. 2 & 3 O.S.)	CSP Multi-Plate Arch Culvert(s)	3.5	15.8	55.3	CS	70.68
2002	2023	Structure 2002	5th Sideroad	200m East of 4th Line (Lot 5 & 6 Con. 3 O.S.)	CSP Multi-Plate Arch Culvert(s)	3.4	22.5	76.5	CS	74.96
2003	2023	Structure 2003	3rd Line	1 km South of 5th Sideroad (Lot 4 Con. 2 & 3 O.S.)	CSP Multi-Plate Arch Culvert(s)	3.8	26	98.8	CS	74.94
2004	2023	Structure 2004	5th Sideroad	300m West of county Road 124 (Lots 5 & 6, Con. 2 O.S.)	Cast-In-Place Conc. Rigid Frame	6.1	8	54.4	BR-1	73.83
2005	2023	Structure 2005	3rd Line	1.1 km South of County Road 17 (Lot 8, Con. 2 & 3 O.S.)	CSP Multi-Plate Arch Culvert(s)	2.3	17	39.1	CS	99.58
2006	2023	Structure 2006	3rd Line	70m South of 15th Sideroad (Lot 15, Con. 2 & 3 O.S)	Cast-In-Place Conc. Rigid Frame	3	8	28.8	BR	71.25
2007	2023	Structure 2007	15th Sideroad	50m West of 3rd Line (Lot 15 & 16, Con. 3 O.S.)	Cast-In-Place Conc. Rigid Frame	3	8	28.8	BR	69.13
2008	2023	Structure 2008	15th Sideroad	600m East of County Road 124 (Lots 15 & 16, Con. 1 O.S.)	Cast-In-Place Conc. Rigid Frame	3.7	9.25	40.7	BR	72.84
2009	2023	Structure 2009	15th Sideroad	1 km East of County Road 124 (Lot 16, Con. 1, O.S.)	Cast-In-Place Conc. Box Culvert	5.5	9.11	56.2998	BR	92.25
2010	2023	Structure 2010	3rd Line	850m South of 20th Sideroad (Lot 19, Con 2 & 3, OS)	CSP Multi-Plate Arch Culvert(s)	3.89	19.6	76.3	CS	99.88
2011	2023	Structure 2011	20th Sideroad	2 km East of 5th Line (Lots 20 & 21, Con. 3 O.S.)	Cast-In-Place Conc. Box Culvert	3.65	12.7	57.15	CC	60.76
2012	2023	Structure 2012	30th Sideroad	250m East of County Road 124 (Lots 30 & 31, Con. 1 O.S.)	Cast-In-Place Conc. Rigid Frame	3.65	7.45	32.035	BR	73.18
2013	2023	Structure 2013	30th Sideroad	500m West of 3rd Line (Lots 30 & 31, Con. 3 O.S.)	Precast Concrete Box Culvert	3	14.63	62.47	BR	99.37
2014	2021	Structure 2014	4th Line	900m South of Melancthon-Osprey Townline (Lot 31, Con. 3 & 4 O.S.)	Cast-In-Place Conc. Rigid Frame	4.85	8	44	BR	73.32
2015	2023	Structure 2015	10th Line Northeast	300m Northeast of 5th Line (Lot 25, Con. 10 & 11)	Precast Concrete Box Culvert	4	9.5	44.65	CC	85.96
2016	2021	Structure 2016	4th Line NE	600m South of County Road 9 (Lot 30, Con. 4 & 5 NE)	Cast-In-Place Conc. Rigid Frame	2.4	14.85	47.52	CC	70.48
2017	2023	Structure 2017	2nd Line NE	1.4 km South of County Road 9 (Lot 28, Con. 2 & 3 NE)	CSP Round Culvert(s)	2.5	17.2	43	CS	58.92
2018	2023	Structure 2018	2nd Line NE	250m South of Sideroad 240 (Lot 26, Con. 2 & 3 NE)	Cast-In-Place Conc. Box Culvert	2.44	12.25	36.75	CC	69.23
2019	2023	Structure 2019	4th Line NE	2.5 km North of County Road 21 (Lot 23, Con. 4 & 5 NE)	Cast-In-Place Conc. Box Culvert	5	18.4	106.72	CC	74.86
2020	2023	Structure 2020	4th Line NE	2.4 km North of County Road 21 (Lot 22, Con 4 & 5 NE)	Precast Concrete Box Culvert	3	16.8	58.8	CC	97.22
2021	2023	Structure 2021	2nd Line NE	2 km North of Country Road 21 (Lot 21 Con. 2 & 3 NE)	CSP Multi-Plate Arch Culvert(s)	5.2	19.8	102.96	CS	62.50
2022	2023	Structure 2022	4th Line NE	150m North of county Road 21 (Lot 17, Con. 4 & 5 NE)	Cast-In-Place Conc. Box Culvert	3.1	18.5	68.45	CC	74.19
2023	2021	Structure 2023	4th Line NE	400 m South of County Road 21 (Lot16, Con. 4 & 5 NE)	Cast-In-Place Conc. Box Culvert	3.6	14.1	63.45	BR-1	62.56
2024	2023	Structure 2024	2nd Line NE	800 m South of Sideroad 240 (Lot 25, Con 2 & 3)	Precast Concrete Box Culvert	3	17	59.5	CC	97.26
2025	2023	Structure 2025	Sideroad 260	3.2 km West of Highway 10 (Lot 260-261 Con.3 SW)	CSP Multi-Plate Arch Culvert(s)	3.1	19.1	59.21	CS	65.52
2026	2023	Structure 2026	8th Line SW	1 km North of Highway 89 (Lot 11 Con.8 & 9 SW)	CSP Multi-Plate Arch Culvert(s)	3.4	17	57.8	CS	83.26
2027	2023	Structure 2027	15 Sideroad	2 km West of County Road 124 (Lot 15 & 16, Conc. 2 OS)	Precast Concrete Box Culvert	3.6	10	42	CC	97.01
2028	2023	Structure 2028	Main Street(County Road 14)	0.5 km South of Sideroad 15 (Lot 15, Conc. 1 & 2 OS)	Precast Concrete Box Culvert	2.44	16.8	47.712	CC	96.89
2029	2021	Structure 2029	220 Sideroad	0.5 km East of County Road 2 (Lots 36 & 37, Con. 5 SW)	Cast-In-Place Conc. Rigid Frame	2.42	8.04	24.12	BR	73.96
2030	2023	Structure 2030	240 Sideroad	1.3 km East of 4th Line NE (Lots 26 & 27, Con. 5 SW)	Cast-In-Place Conc. Rigid Frame	1.5 (2.5m skew span)	8.2	52.07	BR	60.95
2031	2023	Structure 2031	240 Sideroad	0.5 km East of Highway 10 (Lot 240 & 241, Conc. 1 NE)	CSP Multi-Plate Arch Culvert(s)	3.73	16	59.68	CS	85.22
2032	2023	Structure 2032	2nd Line Northeast	0.7 km North of Sideroad 280	CSP Round Culvert(s)	1.8	14.6	68.62	CS	61.74
2033	2023	Structure 2033	7th Line SW	0.25km South of 260 Sideroad	Cast-In-Place Conc. Rigid Frame	3.65 (4.0m skew span)	12.2	48.8	CC	71.69
2034	2023	Structure 2034	Mulmur-Melancthon Townline	North of 15th Sideroad (Lot 18, Conc. I/III)	Cast-In-Place Conc. Rigid Frame	4.25	9.6	48	BR	65.85

TOWNSHIP OF MELANCTHON - CAPITAL WORKS BY BCI

Structure No.	Inspect. Year	Road Name	Deterioration Curve	BCI	Years to Rehab	Years to Replace	Total Cost of Rehabilitation	Total Cost of Replacement	Recommended Work	Maintenance Needs	Additional Investigations	Current Roadside Protection Needs	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
2017	2023	2nd Line NE	CS	58.92	N/A	9.46	\$ 318,500.00	\$ 583,000.00	Replace	\$ 2,500.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ 583,000.00	\$ 583,000.00
2011	2023	20th Sideroad	CC	60.76	N/A	7.50	\$ 297,500.00	\$ 713,000.00	Replace	\$ 5,500.00	\$ -	\$ -	\$ -	\$ -	\$ 713,000.00	\$ 713,000.00
2030	2023	240 Sideroad	BR	60.95	N/A	10.95	\$ 252,500.00	\$ 583,000.00	Replace	\$ 2,750.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2032	2023	2nd Line Northeast	CS	61.74	N/A	10.87	N/A	\$ 708,000.00	Replace	\$ 2,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2021	2023	2nd Line NE	CS	62.50	N/A	11.25	N/A	\$ 770,000.00	Replace	\$ 1,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2023	2021	4th Line NE	BR-1	62.56	1.28	11.28	\$ 253,500.00	\$ 688,000.00	Rehabilitate	\$ 2,500.00	\$ -	\$ 1,000.00	\$ -	\$ 253,500.00	\$ -	\$ 253,500.00
3	2023	5th Sideroad	BR	65.31	N/A	15.31	\$ 273,000.00	\$ 770,000.00	Replace	\$ 2,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2025	2023	Sideroad 260	CS	65.52	N/A	12.76	N/A	\$ 770,000.00	Replace	\$ 2,500.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2034	2023	Mulmur-Melancthon Townline	BR	65.85	N/A	15.85	\$ 274,000.00	\$ 708,000.00	Replace	\$ 3,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	2023	7th Line SW	BR-1	66.89	6.89	16.89	\$ 434,000.00	\$ 1,145,000.00	Rehabilitate	\$ 2,250.00	\$ -	\$ 95,000.00	\$ -	\$ -	\$ 434,000.00	\$ 434,000.00
18	2023	2nd Line NE	BR-1	69.00	9.00	19.00	\$ 424,500.00	\$ 975,000.00	Rehabilitate	\$ -	\$ -	\$ 95,000.00	\$ -	\$ -	\$ 424,500.00	\$ 424,500.00
2007	2023	15th Sideroad	BR	69.13	N/A	19.13	\$ 153,500.00	\$ 583,000.00	Replace	\$ 2,750.00	\$ -	\$ -	\$ -	\$ 80,000.00	\$ -	\$ 80,000.00
2018	2023	2nd Line NE	CC	69.23	N/A	14.61	\$ 239,000.00	\$ 583,000.00	Replace	\$ 750.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
16	2023	250 Sideroad	BR-1	70.42	N/A	15.21	\$ 424,500.00	\$ 1,623,000.00	Replace	\$ 2,750.00	\$ -	\$ 40,000.00	\$ -	\$ 15,000.00	\$ -	\$ 15,000.00
8	2023	7th Line SW	BR-1	70.47	10.47	20.47	\$ 261,000.00	\$ 1,020,000.00	Replace	\$ 2,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2016	2021	4th Line NE	CC	70.48	N/A	15.48	N/A	\$ 583,000.00	Replace	\$ 2,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2001	2023	3rd Line	CS	70.68	N/A	15.38	N/A	\$ 688,000.00	Replace	\$ 1,000.00	\$ -	\$ 95,000.00	\$ -	\$ -	\$ -	\$ -
14	2023	4th Line SW	BR-1	71.08	11.08	21.08	\$ 424,500.00	\$ 1,968,000.00	Rehabilitate	\$ 2,750.00	\$ -	\$ 40,000.00	\$ -	\$ 130,000.00	\$ -	\$ 130,000.00
2006	2023	3rd Line	BR	71.25	N/A	21.25	N/A	\$ 583,000.00	Replace	\$ 2,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
15	2023	2nd Line SW	BR-1	71.66	N/A	27.23	N/A	\$ 1,720,000.00	Replace	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2033	2023	7th Line SW	CC	71.69	N/A	16.69	\$ 285,000.00	\$ 645,000.00	Replace	\$ 6,000.00	\$ -	\$ 1,000.00	\$ 50,000.00	\$ -	\$ -	\$ 50,000.00
1	2023	4th Line SW	BR	72.13	N/A	22.13	\$ 418,000.00	\$ 645,000.00	Replace	\$ 1,500.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5	2023	2nd Line SW	BR-1	72.76	12.76	22.76	\$ 400,500.00	\$ 1,145,000.00	Rehabilitate	\$ 1,500.00	\$ -	\$ 95,000.00	\$ -	\$ -	\$ -	\$ -
2008	2023	15th Sideroad	BR	72.84	N/A	22.84	\$ 239,000.00	\$ 770,000.00	Replace	\$ 750.00	\$ -	\$ 95,000.00	\$ -	\$ -	\$ -	\$ -
9	2023	8th Line SW	BR-1	72.93	12.93	22.93	\$ 465,000.00	\$ 1,208,000.00	Rehabilitate	\$ 2,500.00	\$ -	\$ 95,000.00	\$ -	\$ 130,000.00	\$ -	\$ 130,000.00
2012	2023	30th Sideroad	BR	73.18	N/A	10.00	\$ 257,500.00	\$ 770,000.00	Replace	\$ 3,000.00	\$ -	\$ -	\$ -	\$ -	\$ 770,000.00	\$ 770,000.00
2014	2021	4th Line	BR	73.32	N/A	23.32	\$ 241,500.00	\$ 1,145,000.00	Replace	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2004	2023	5th Sideroad	BR-1	73.83	13.83	23.83	\$ 409,000.00	\$ 895,000.00	Replace	\$ 2,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2029	2021	220 Sideroad	BR	73.96	N/A	23.96	\$ 388,500.00	\$ 583,000.00	Replace	\$ 1,250.00	\$ 5,000.00	\$ -	\$ -	\$ -	\$ -	\$ -
11	2023	8th Line SW	BR-2	74.11	21.13	32.71	N/A	\$ 2,313,000.00	Rehabilitate	\$ 500.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2022	2023	4th Line NE	CC	74.19	N/A	19.19	N/A	\$ 583,000.00	Replace	\$ 1,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
17	2023	250 Sideroad	CS	74.75	N/A	17.64	N/A	\$ 1,605,000.00	Replace	\$ 250.00	\$ -	\$ 95,000.00	\$ -	\$ -	\$ -	\$ -
2019	2023	4th Line NE	CC	74.86	N/A	19.86	\$ 95,500.00	\$ 833,000.00	Replace	\$ 1,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2003	2023	3rd Line	CS	74.94	N/A	17.75	N/A	\$ 813,000.00	Replace	\$ 1,000.00	\$ -	\$ 10,000.00	\$ -	\$ -	\$ -	\$ -
2002	2023	5th Sideroad	CS	74.96	N/A	17.76	N/A	\$ 688,000.00	Replace	\$ 2,250.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
13	2023	260 Sideroad	BR-1	75.67	N/A	32.64	N/A	\$ 1,835,000.00	Replace	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2026	2023	8th Line SW	CS	83.26	N/A	22.37	N/A	\$ 583,000.00	Replace	\$ -	\$ -	\$ 500.00	\$ -	\$ -	\$ -	\$ -
2031	2023	240 Sideroad	CS	85.22	N/A	23.46	N/A	\$ 625,000.00	Replace	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
10	2023	280 Sideroad	BR-1	85.90	N/A	35.20	N/A	\$ 1,605,000.00	Replace	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2015	2023	10th Line Northeast	CC	85.96	N/A	30.96	N/A	\$ 708,000.00	Replace	\$ 250.00	\$ -	\$ 500.00	\$ -	\$ -	\$ -	\$ -
6	2023	4th Line SW	BR-1	86.05	26.05	36.05	\$ 143,500.00	\$ 1,333,000.00	Rehabilitate	\$ 1,500.00	\$ -	\$ 40,000.00	\$ 1,500.00	\$ 143,500.00	\$ -	\$ 143,500.00
2009	2023	15th Sideroad	BR	92.25	N/A	39.75	\$ 220,000.00	\$ 895,000.00	Replace	\$ 4,500.00	\$ -	\$ 500.00	\$ -	\$ -	\$ -	\$ -
12	2023	7th Line SW	BR-1	95.95	33.95	43.95	N/A	\$ 2,065,000.00	Rehabilitate	\$ 1,000.00	\$ -	\$ 500.00	\$ -	\$ -	\$ -	\$ -
2028	2023	Main Street(County Road 14)	CC	96.89	N/A	41.89	N/A	\$ 583,000.00	Replace	\$ 1,250.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2027	2023	15 Sideroad	CC	97.01	N/A	42.01	N/A	\$ 645,000.00	Replace	\$ 250.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2020	2023	4th Line NE	CC	97.22	N/A	42.22	N/A	\$ 645,000.00	Replace	\$ 1,000.00	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2024	2023	2nd Line NE	CC	97.26	N/A	42.26	N/A	\$ 583,000.00	Replace	\$ -	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
2013	2023	30th Sideroad	BR	99.37	N/A	41.81	N/A	\$ 625,000.00	Replace	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2005	2023	3rd Line	CS	99.58	N/A	31.43	N/A	\$ 563,000.00	Replace	\$ 250.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2010	2023	3rd Line	CS	99.88	N/A	31.60	N/A	\$ 625,000.00	Replace	\$ -	\$ -	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -
Sub Totals										\$ 80,500.00	\$ 5,000.00	\$ 811,000.00	\$ 50,000.00	\$ 752,000.00	\$ 2,924,500.00	\$ 3,726,500.00

TOWNSHIP OF MELANCTHON - REHABILITATION CAPITAL WORKS

Structure No.	Inspect. Year	Road Name	BCI	Years to Rehab	Years to Replace	Recommended Work	Construction Cost - Rehabilitation ⁽¹⁾	Contingency - Rehabilitation	E.A. - Rehabilitation	Engineering - Rehabilitation	Geotechnical - Rehabilitation	Contract Admin. - Rehabilitation	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
2023	2021	4th Line NE	62.56	1.28	11.28	Rehabilitate	\$ 196,000.00	\$ 20,000.00	\$ 2,500.00	\$ 20,000.00	\$ -	\$ 15,000.00	\$ -	\$ 253,500.00	\$ -	\$ 253,500.00
7	2023	7th Line SW	66.89	6.89	16.89	Rehabilitate	\$ 362,500.00	\$ 27,000.00	\$ 2,500.00	\$ 27,000.00	\$ -	\$ 15,000.00	\$ -	\$ -	\$ 434,000.00	\$ 434,000.00
18	2023	2nd Line NE	69.00	9.00	19.00	Rehabilitate	\$ 355,000.00	\$ 26,000.00	\$ 2,500.00	\$ 26,000.00	\$ -	\$ 15,000.00	\$ -	\$ -	\$ 424,500.00	\$ 424,500.00
14	2023	4th Line SW	71.08	11.08	21.08	Rehabilitate	\$ 345,000.00	\$ 31,000.00	\$ 2,500.00	\$ 31,000.00	\$ -	\$ 15,000.00	\$ -	\$ 130,000.00	\$ -	\$ 130,000.00
5	2023	2nd Line SW	72.76	12.76	22.76	Rehabilitate	\$ 335,000.00	\$ 24,000.00	\$ 2,500.00	\$ 24,000.00	\$ -	\$ 15,000.00	\$ -	\$ -	\$ -	\$ -
9	2023	8th Line SW	72.93	12.93	22.93	Rehabilitate	\$ 387,500.00	\$ 30,000.00	\$ 2,500.00	\$ 30,000.00	\$ -	\$ 15,000.00	\$ -	\$ 130,000.00	\$ -	\$ 130,000.00
11	2023	8th Line SW	74.11	21.13	32.71	Rehabilitate	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	2023	4th Line SW	86.05	26.05	36.05	Rehabilitate	\$ 100,000.00	\$ 6,000.00	\$ 2,500.00	\$ 20,000.00	\$ -	\$ 15,000.00	\$ -	\$ 143,500.00	\$ -	\$ 143,500.00
12	2023	7th Line SW	95.95	33.95	43.95	Rehabilitate	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Sub Totals							\$ 2,081,000.00	\$ 164,000.00	\$ 17,500.00	\$ 178,000.00	\$ -	\$ 105,000.00	\$ -	\$ 657,000.00	\$ 858,500.00	\$ 1,515,500.00

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

TOWNSHIP OF MELANCTHON - REPLACEMENT CAPITAL WORKS

Structure No.	Inspect. Year	Road Name	BCI	Years to Rehab	Years to Replace	Recommended Work	Construction Cost - Replacement ⁽¹⁾	Contingency - Replacement	E.A. - Replacement	Engineering - Replacement	Geotechnical - Replacement	Contract Admin. - Replacement	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost	
2011	2023	20th Sideroad	60.76	N/A	7.50	Replace	\$ 565,000.00	\$ 47,000.00	\$ 10,000.00	\$ 47,000.00	\$ 20,000.00	\$ 24,000.00	\$ -	\$ -	\$ 713,000.00	\$ 713,000.00	
2017	2023	2nd Line NE	58.92	N/A	9.46	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ 583,000.00	\$ 583,000.00	
2012	2023	30th Sideroad	73.18	N/A	10.00	Replace	\$ 610,000.00	\$ 52,000.00	\$ 10,000.00	\$ 52,000.00	\$ 20,000.00	\$ 26,000.00	\$ -	\$ -	\$ 770,000.00	\$ 770,000.00	
2032	2023	2nd Line Northeast	61.74	N/A	10.87	Replace	\$ 560,000.00	\$ 47,000.00	\$ 10,000.00	\$ 47,000.00	\$ 20,000.00	\$ 24,000.00	\$ -	\$ -	\$ -	\$ -	
2030	2023	240 Sideroad	60.95	N/A	10.95	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
2021	2023	2nd Line NE	62.50	N/A	11.25	Replace	\$ 610,000.00	\$ 52,000.00	\$ 10,000.00	\$ 52,000.00	\$ 20,000.00	\$ 26,000.00	\$ -	\$ -	\$ -	\$ -	
2025	2023	Sideroad 260	65.52	N/A	12.76	Replace	\$ 610,000.00	\$ 52,000.00	\$ 10,000.00	\$ 52,000.00	\$ 20,000.00	\$ 26,000.00	\$ -	\$ -	\$ -	\$ -	
2018	2023	2nd Line NE	69.23	N/A	14.61	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
16	2023	250 Sideroad	70.42	N/A	15.21	Replace	\$ 1,310,000.00	\$ 111,000.00	\$ 10,000.00	\$ 111,000.00	\$ 20,000.00	\$ 61,000.00	\$ -	\$ 15,000.00	\$ -	\$ 15,000.00	
3	2023	5th Sideroad	65.31	N/A	15.31	Replace	\$ 610,000.00	\$ 52,000.00	\$ 10,000.00	\$ 52,000.00	\$ 20,000.00	\$ 26,000.00	\$ -	\$ -	\$ -	\$ -	
2001	2023	3rd Line	70.68	N/A	15.38	Replace	\$ 545,000.00	\$ 45,000.00	\$ 10,000.00	\$ 45,000.00	\$ 20,000.00	\$ 23,000.00	\$ -	\$ -	\$ -	\$ -	
2016	2021	4th Line NE	70.48	N/A	15.48	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
2034	2023	Mulmur-Melancthon Townline	65.85	N/A	15.85	Replace	\$ 560,000.00	\$ 47,000.00	\$ 10,000.00	\$ 47,000.00	\$ 20,000.00	\$ 24,000.00	\$ -	\$ -	\$ -	\$ -	
2033	2023	7th Line SW	71.69	N/A	16.69	Replace	\$ 510,000.00	\$ 42,000.00	\$ 10,000.00	\$ 42,000.00	\$ 20,000.00	\$ 21,000.00	\$ 50,000.00	\$ -	\$ -	\$ 50,000.00	\$ 50,000.00
17	2023	250 Sideroad	74.75	N/A	17.64	Replace	\$ 1,295,000.00	\$ 110,000.00	\$ 10,000.00	\$ 110,000.00	\$ 20,000.00	\$ 60,000.00	\$ -	\$ -	\$ -	\$ -	
2003	2023	3rd Line	74.94	N/A	17.75	Replace	\$ 645,000.00	\$ 55,000.00	\$ 10,000.00	\$ 55,000.00	\$ 20,000.00	\$ 28,000.00	\$ -	\$ -	\$ -	\$ -	
2002	2023	5th Sideroad	74.96	N/A	17.76	Replace	\$ 545,000.00	\$ 45,000.00	\$ 10,000.00	\$ 45,000.00	\$ 20,000.00	\$ 23,000.00	\$ -	\$ -	\$ -	\$ -	
2007	2023	15th Sideroad	69.13	N/A	19.13	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ 80,000.00	\$ -	\$ 80,000.00	
2022	2023	4th Line NE	74.19	N/A	19.19	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
2019	2023	4th Line NE	74.86	N/A	19.86	Replace	\$ 660,000.00	\$ 57,000.00	\$ 10,000.00	\$ 57,000.00	\$ 20,000.00	\$ 29,000.00	\$ -	\$ -	\$ -	\$ -	
8	2023	7th Line SW	70.47	10.47	20.47	Replace	\$ 810,000.00	\$ 72,000.00	\$ 10,000.00	\$ 72,000.00	\$ 20,000.00	\$ 36,000.00	\$ -	\$ -	\$ -	\$ -	
2006	2023	3rd Line	71.25	N/A	21.25	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
1	2023	4th Line SW	72.13	N/A	22.13	Replace	\$ 510,000.00	\$ 42,000.00	\$ 10,000.00	\$ 42,000.00	\$ 20,000.00	\$ 21,000.00	\$ -	\$ -	\$ -	\$ -	
2026	2023	8th Line SW	83.26	N/A	22.37	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
2008	2023	15th Sideroad	72.84	N/A	22.84	Replace	\$ 610,000.00	\$ 52,000.00	\$ 10,000.00	\$ 52,000.00	\$ 20,000.00	\$ 26,000.00	\$ -	\$ -	\$ -	\$ -	
2014	2021	4th Line	73.32	N/A	23.32	Replace	\$ 910,000.00	\$ 82,000.00	\$ 10,000.00	\$ 82,000.00	\$ 20,000.00	\$ 41,000.00	\$ -	\$ -	\$ -	\$ -	
2031	2023	240 Sideroad	85.22	N/A	23.46	Replace	\$ 495,000.00	\$ 40,000.00	\$ 10,000.00	\$ 40,000.00	\$ 20,000.00	\$ 20,000.00	\$ -	\$ -	\$ -	\$ -	
2004	2023	5th Sideroad	73.83	13.83	23.83	Replace	\$ 710,000.00	\$ 62,000.00	\$ 10,000.00	\$ 62,000.00	\$ 20,000.00	\$ 31,000.00	\$ -	\$ -	\$ -	\$ -	
2029	2021	220 Sideroad	73.96	N/A	23.96	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
15	2023	2nd Line SW	71.66	N/A	27.23	Replace	\$ 1,395,000.00	\$ 115,000.00	\$ 10,000.00	\$ 115,000.00	\$ 20,000.00	\$ 65,000.00	\$ -	\$ -	\$ -	\$ -	
2015	2023	10th Line Northeast	85.96	N/A	30.96	Replace	\$ 560,000.00	\$ 47,000.00	\$ 10,000.00	\$ 47,000.00	\$ 20,000.00	\$ 24,000.00	\$ -	\$ -	\$ -	\$ -	
2005	2023	3rd Line	99.58	N/A	31.43	Replace	\$ 445,000.00	\$ 35,000.00	\$ 10,000.00	\$ 35,000.00	\$ 20,000.00	\$ 18,000.00	\$ -	\$ -	\$ -	\$ -	
2010	2023	3rd Line	99.88	N/A	31.60	Replace	\$ 495,000.00	\$ 40,000.00	\$ 10,000.00	\$ 40,000.00	\$ 20,000.00	\$ 20,000.00	\$ -	\$ -	\$ -	\$ -	
13	2023	260 Sideroad	75.67	N/A	32.64	Replace	\$ 1,495,000.00	\$ 120,000.00	\$ 10,000.00	\$ 120,000.00	\$ 20,000.00	\$ 70,000.00	\$ -	\$ -	\$ -	\$ -	
10	2023	280 Sideroad	85.90	N/A	35.20	Replace	\$ 1,295,000.00	\$ 110,000.00	\$ 10,000.00	\$ 110,000.00	\$ 20,000.00	\$ 60,000.00	\$ -	\$ -	\$ -	\$ -	
2009	2023	15th Sideroad	92.25	N/A	39.75	Replace	\$ 710,000.00	\$ 62,000.00	\$ 10,000.00	\$ 62,000.00	\$ 20,000.00	\$ 31,000.00	\$ -	\$ -	\$ -	\$ -	
2013	2023	30th Sideroad	99.37	N/A	41.81	Replace	\$ 495,000.00	\$ 40,000.00	\$ 10,000.00	\$ 40,000.00	\$ 20,000.00	\$ 20,000.00	\$ -	\$ -	\$ -	\$ -	
2028	2023	Main Street(County Road 14)	96.89	N/A	41.89	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
2027	2023	15 Sideroad	97.01	N/A	42.01	Replace	\$ 510,000.00	\$ 42,000.00	\$ 10,000.00	\$ 42,000.00	\$ 20,000.00	\$ 21,000.00	\$ -	\$ -	\$ -	\$ -	
2020	2023	4th Line NE	97.22	N/A	42.22	Replace	\$ 510,000.00	\$ 42,000.00	\$ 10,000.00	\$ 42,000.00	\$ 20,000.00	\$ 21,000.00	\$ -	\$ -	\$ -	\$ -	
2024	2023	2nd Line NE	97.26	N/A	42.26	Replace	\$ 460,000.00	\$ 37,000.00	\$ 10,000.00	\$ 37,000.00	\$ 20,000.00	\$ 19,000.00	\$ -	\$ -	\$ -	\$ -	
Sub Totals							\$ 26,650,000.00	\$ 2,224,000.00	\$ 410,000.00	\$ 2,224,000.00	\$ 820,000.00	\$ 1,155,000.00	\$ 50,000.00	\$ 95,000.00	\$ 2,066,000.00	\$ 2,211,000.00	

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

TOWNSHIP OF MELANCTHON - MAINTENANCE NEEDS

Structure Name	Road Name	Maintenance Need	Estimated Maintenance Costs
1	4th Line SW	Remove overgrown vegetation around structure	\$1,500.00
3	5th Sideroad	Remove vegetation blocking signs and in close proximity to structure; Install rock protection NE & SE	\$2,000.00
5	2nd Line SW	Sweep deck and remove vegetation along curb; Raise hazard warning signs at structure	\$1,500.00
6	4th Line SW	Sweep deck top and remove vegetation around wingwalls	\$1,500.00
7	7th Line SW	Remove overgrown vegetation around structure; Install hazard warning signs at structure	\$2,250.00
8	7th Line SW	Remove fill over exposed deck top ends; Install hazard warning signs at structure	\$2,000.00
9	8th Line SW	Sweep deck top and flush expansion joints; Replace sealant in parapet walls	\$2,500.00
10	280 Sideroad	Sweep deck	\$1,000.00
11	8th Line SW	Remove vegetation along curbs	\$500.00
12	7th Line SW	Rout and seal cracks in wearing surface	\$1,000.00
13	260 Sideroad	Flush drains	\$1,000.00
14	4th Line SW	Sweep deck and flush expansion joints; Replace joint sealant in parapet walls; Replace missing end cap on hand railing	\$2,750.00
16	250 Sideroad	Sweep deck top; Replace damaged sections of handrail; Install narrow structure signs, replace NE sign; Replace missing bolts in guiderail	\$2,750.00
17	250 Sideroad	Install hazard warning sign NW	\$250.00
2001	3rd Line	Install hazard warning signs at structure	\$1,000.00
2002	5th Sideroad	Remove tree in close proximity to structure; Install hazard warning signs at structure; Tighten loose nuts in barrel	\$2,250.00
2003	3rd Line	Install hazard warning signs at structure	\$1,000.00
2004	5th Sideroad	Remove vegetation in close proximity to structure; Remove debris blocking inlet	\$2,000.00
2005	3rd Line	Tighten end treatment cables	\$250.00
2006	3rd Line	Rout and seal cracks in wearing surface; Clear vegetation along front face of curb; Add erosion protection along SW wingwall	\$2,000.00
2007	15th Sideroad	Remove vegetation around wingwalls; Add rock protection all quadrants; Reinstate leaning signs.	\$2,750.00
2008	15th Sideroad	Raise hazard warning signs; Clear vegetation surrounding hazard warning signs	\$750.00
2009	15th Sideroad	Rout and seal cracks in wearing surface; Consider installing drip edge detail in soffit exterior	\$4,500.00
2011	20th Sideroad	Remove vegetation around guide rail, wingwalls, and fascia; Install hazard warning sign at NW corner; Tighten loose end treatment cables	\$5,500.00
2012	30th Sideroad	Remove vegetation along curbs and around wingwalls; Replace hazard warning signs at structure and install narrow bridges signs	\$3,000.00
2014	4th Line	Remove vegetation along curbs	\$1,000.00
2015	10th Line Northeast	Install missing nut/bolts in guide rail posts	\$250.00
2016	4th Line NE	Rout and seal cracks in wearing surface; Install hazard warning signs at structure	\$2,000.00
2017	2nd Line NE	Repair washout on east embankments; Install hazard warning signs at structure	\$2,500.00
2018	2nd Line NE	Remove vegetation around hazard warning signs; Raise hazard warning signs at structure	\$750.00
2019	4th Line NE	Install hazard warning signs at structure	\$1,000.00
2020	4th Line NE	Install hazard warning signs at structure	\$1,000.00
2021	2nd Line NE	Remove small beaver dam west of culvert	\$1,000.00
2022	4th Line NE	Install hazard warning signs at structure	\$1,000.00
2023	4th Line NE	Remove vegetation blocking hazard warning signs and fill on culvert ends	\$2,500.00
2025	Sideroad 260	Install hazard warning signs at structure; Repair washout on NE embankment	\$2,500.00
2027	15 Sideroad	Tighten loose end treatment cables	\$250.00
2028	Main Street(County Road 14)	Install additional rock protection at inlet; Trim exposed filter fabric on east retaining wall	\$1,250.00
2029	220 Sideroad	Clear vegetation along the interior face of curbs; Reinstate leaning hazard warning signs	\$1,250.00
2030	240 Sideroad	Install rock protection along abutments; Install additional narrow bridge sign	\$2,750.00
2031	240 Sideroad	Install hazard warning signs at structure	\$1,000.00
2032	2nd Line Northeast	Repairs erosion on NE corner; Install hazard warning signs at structure	\$2,000.00
2033	7th Line SW	Remove tree growing over inlet and remove overgrown vegetation over outlet; Install rock protection and repair washouts on embankments; Clear vegetation and raise hazard warning signs	\$6,000.00
2034	Mulmur-Melancthon Townline	Remove overgrown vegetation blocking waterway and signs; Install additional hazard warning signs at structure	\$3,000.00
Total			\$80,500.00

TOWNSHIP OF MELANCTHON - ADDITIONAL INVESTIGATIONS REQUIRED

Priority	Structure Name	Road Name	Additional Investigations Required	Estimated Cost
Normal	2002	5th Sideroad	Monitoring of Deformations, Settlements and Movements,	\$0
Normal	2012	30th Sideroad	Monitoring of Deformations, Settlements and Movements, Monit	\$0
Normal	2021	2nd Line NE	Monitoring Crack Widths,	\$0
Normal	2026	8th Line SW	Monitoring of Deformations, Settlements and Movements,	\$0
Normal	2029	220 Sideroad	Monitoring of Deformations, Settlements and Movements,	\$5,000
Normal	2031	240 Sideroad	Monitoring of Deformations, Settlements and Movements,	\$0
Normal	2032	2nd Line Northeast	Monitoring of Deformations, Settlements and Movements,	\$0
Total				\$5,000.00

TOWNSHIP OF MELANCTHON - CURRENT ROADSIDE SAFETY NEEDS

Structure Name	Road Name	CURRENT Roadside Safety Need	Estimated Cost
1	4th Line SW	Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00
5	2nd Line SW	Install Guide Rail, end treatments and structure connections	\$95,000.00
6	4th Line SW	Install proper guide rail end treatments	\$40,000.00
7	7th Line SW	Install Guide Rail, end treatments and structure connections	\$95,000.00
8	7th Line SW	Investigate need for Guide Rail	\$1,000.00
9	8th Line SW	Install Guide Rail, end treatments and structure connections	\$95,000.00
12	7th Line SW	Investigate Need for Replacing with Longer Guide Rail	\$500.00
14	4th Line SW	Install proper guide rail end treatments	\$40,000.00
16	250 Sideroad	Install proper guide rail end treatments	\$40,000.00
17	250 Sideroad	Replace guide rail, end treatments	\$95,000.00
18	2nd Line NE	Install Guide Rail, end treatments and structure connections	\$95,000.00
2001	3rd Line	Replace Guide Rail, end treatments	\$95,000.00
2002	5th Sideroad	Investigate need for Guide Rail	\$1,000.00
2003	3rd Line	Replace rotten posts and raise 3-cable guide rail	\$10,000.00
2004	5th Sideroad	Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00
2008	15th Sideroad	Install Guide Rail, end treatments	\$95,000.00
2009	15th Sideroad	Investigate Need for Replacing with Longer Guide Rail	\$500.00
2010	3rd Line	Investigate need for Guide Rail	\$1,000.00
2014	4th Line	Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00
2015	10th Line Northeast	Investigate Need for Replacing with Longer Guide Rail	\$500.00
2016	4th Line NE	Investigate need for Guide Rail	\$1,000.00
2017	2nd Line NE	Investigate need for Guide Rail	\$1,000.00
2019	4th Line NE	Investigate need for Guide Rail	\$1,000.00
2020	4th Line NE	Investigate need for Guide Rail	\$1,000.00
2021	2nd Line NE	Investigate need for Guide Rail	\$1,000.00
2022	4th Line NE	Investigate need for Guide Rail	\$1,000.00
2023	4th Line NE	Investigate need for Guide Rail	\$1,000.00
2024	2nd Line NE	Investigate need for Guide Rail	\$1,000.00
2025	Sideroad 260	Investigate need for Guide Rail	\$1,000.00
2026	8th Line SW	Investigate Need for Replacing with Longer Guide Rail	\$500.00
2029	220 Sideroad	Narrow structure - Install guide rail if structure widened during rehabilitation / replacement	\$0.00
2032	2nd Line Northeast	Investigate need for Guide Rail	\$1,000.00
2033	7th Line SW	Investigate need for Guide Rail	\$1,000.00
Total			\$811,000.00

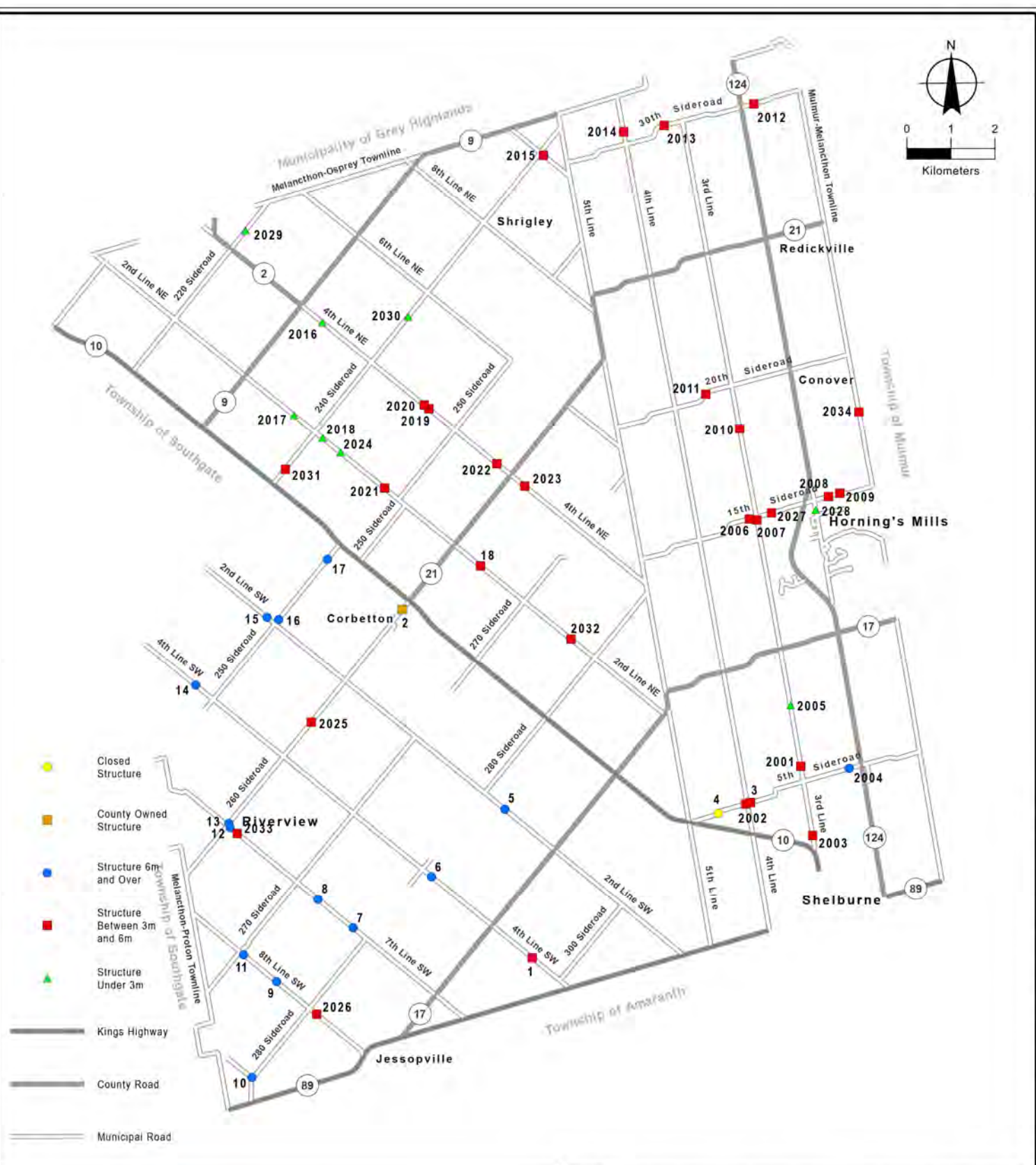
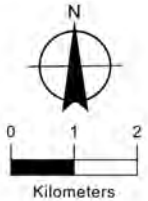


BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Structure Location Map



	Map Title			Figure No.
	2023 BRIDGE INSPECTIONS BRIDGE AND CULVERT LOCATIONS			
Client	Drawn	Checked	Date	1
	PS	MC	2023/10/02	
	Scale:	Project No.		
TOWNSHIP OF MELANCTHON			H 1:120,000	300052974



BURNSIDE

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Appendix D

Photo Summary Sheets

052974: Structure 1: (4th Line South West)



UTM Coordinates (WGS84) | 17-556987m.E 4879882m.N

Road or Location Description | 4th Line South West

Signs (South East)

Photo



Comments

| -

Soffit - Thin Slab - Ext (West)

Photo



Comments

| Spall with exposed corroded rebar

Abutment Walls (North)

Photo



Comments | Narrow full length crack

Abutment Walls (South)

Photo



Comments | Erosion

Soffit - Thin Slab - Ext (East)

Photo



Comments

| Small popouts

052974: Structure 3: Sideroad 5



UTM Coordinates (WGS84) | 17-561845m.E 4883382m.N

Road or Location Description | Sideroad 5

Approach Wearing Surface (East)

Photo



Comments

| -

Signs (North East)

Photo



Comments

| Leaning

Curbs (North)

Photo



Comments

| Exposed corroded rebar

Wingwalls (South East)

Photo



Comments

| Severe spall with exposed corroded rebar

Soffit - Thick Slab - Ext (South)

Photo



Comments

| Delaminations

Soffit - Thick Slab - Ext (South)

Photo



Comments

| Medium spall with exposed corroded rebar

Abutment Walls (East)

Photo



Comments

Medium spalls with exposed corroded rebar

Abutment Walls (North East)

Photo



Comments

Severe spall with exposed corroded rebar

052974: Structure 5: (2nd Line South West)



UTM Coordinates (WGS84) | 17-556366m.E 4883260m.N

Road or Location Description | 2nd Line South West

Signs (North East)

Photo



Comments

| -

Approach Wearing Surface (North)

Photo



Comments

| Wide transverse crack

End Post (East)

Photo



Comments

| -

Soffit - Thick Slab - Ext (North West)

Photo



Comments

| Light to moderate honeycombing

Abutment Walls (North)

Photo



Comments

| Severe honeycombing

Soffit - Thick Slab - Int (Centre)

Photo



Comments

| Medium full span crack and exposed corroded rebar

052974: Structure 6: (4th Line South West)



UTM Coordinates (WGS84) | 17-554702m.E 4881728m.N

Road or Location Description | 4th Line South West

Signs (South West)

Photo



Comments

| Bent and leaning

Deck Top (West)

Photo



Comments

| abrasion

Wingwalls (North West)

Photo



Comments

Medium stained cracks

Soffit - Thin Slab - Ext (South West)

Photo



Comments

-

Abutment Walls (South)

Photo



Comments | Narrow stained crack, staining around drain

Soffit - Thick Slab - Int (South)

Photo



Comments | Full width transverse crack

052974: Structure 7: 7th Line South West



UTM Coordinates (WGS84) | 17-552915m.E 4880562m.N

Road or Location Description | 7th Line South West

Approach Wearing Surface (North)

Photo



Comments

| Severe alligator cracking

Signs (South West)

Photo



Comments

| Leaning and low reflectivity

Railing System (East)

Photo



Comments

Medium cracks

End Post (South West)

Photo



Comments

Exposed corroded rebar

Wingwalls (North West)

Photo



Comments

| Efflorescence staining

Abutment Walls (North)

Photo



Comments

| Medium vertical crack

Soffit - Thick Slab - Ext (East)

Photo



Comments

| Efflorescence stained cracks

052974: Structure 8: (7th Line South West)



UTM Coordinates (WGS84) | 17-552115m.E 4881215m.N

Road or Location Description | 7th Line South West

Approach Wearing Surface (North)

Photo



Comments

| Severe alligator cracking

Outlet (West)

Photo



Comments

| -

Barrels (Interior)

Photo



Comments | Moisture penetration pattern cracking

Barrels (South)

Photo



Comments | Light honeycombing

Barrels (South)

Photo



Comments

Narrow stained vertical cracks

052974: Structure 9: (8th Line South West)



UTM Coordinates (WGS84) | 17-551173m.E 4879341m.N

Road or Location Description | 8th Line South West

Approach Wearing Surface (South)

Photo



Comments

| -

Barrier/Parapet Walls Interior (North West)

Photo



Comments

| Narrow stained cracks

Armouring/Retaining Device (South)

Photo



Comments

| Missing Bolts

Deck Top (South East)

Photo



Comments

| Delamination

Wingwalls (North East)

Photo



Comments

| -

Girders - Ends (South)

Photo



Comments

| Narrow cracks

Girders - Middle (South)

Photo



Comments

| Efflorescence

052974: Structure 10: (Sideroad 280)



UTM Coordinates (WGS84) | 17-550614m.E 4877164m.N

Road or Location Description | Sideroad 280

Approach Guide Rail (South West)

Photo



Comments

| Impact damage

Approach Wearing Surface (West)

Photo



Comments

| -

Deck Top (South)

Photo



Comments

| -

Wingwalls (North East)

Photo



Comments

| -

Abutment Walls (North East)

Photo



Comments

| Delamination

Girders - Middle (East)

Photo



Comments

| -

Abutment Walls (South East)

Photo



Comments

| Small Spall

Wingwalls (South East)

Photo



Comments

| Spall

052974: Structure 11: (8th Line South West)



UTM Coordinates (WGS84) | 17-550423m.E 4879949m.N

Road or Location Description | 8th Line South West

Deck Wearing Surface (North)

Photo



Comments

| -

Soffit - Thin Slab - Ext (East)

Photo



Comments

| -

Soffit - Thin Slab - Int (South)

Photo



Comments

| -

Abutment Walls (South)

Photo



Comments

| -

052974: Structure 12: (7th Line South West)



UTM Coordinates (WGS84) | 17-550117m.E 4882849m.N

Road or Location Description | 7th Line South West

Deck Wearing Surface (North)

Photo



Comments | 3 wide transverse crack full width

Barrier/Parapet Walls Interior (South West)

Photo



Comments | -

A. Bearings (South East)

Photo



Comments

| -

Wingwalls (North East)

Photo



Comments

| Efflorescence stained crack

Abutment Walls (North)

Photo



Comments

Medium vertical crack

Girders - Middle (South)

Photo



Comments

corrosion

052974: Structure 13: (Sideroad 260)



UTM Coordinates (WGS84) | 17-550088m.E 4882944m.N

Road or Location Description | Sideroad 260

Approach Wearing Surface (North East)

Photo



Comments

| -

Abutment Walls (West)

Photo



Comments

| Narrow cracks

Soffit - Thin Slab - Int (South East)

Photo



Comments

| Narrow stained cracking

Girders - Middle (South West)

Photo



Comments

| -

052974: Structure 14: (4th Line South West)



UTM Coordinates (WGS84) | 17-549335m.E 4886082m.N

Road or Location Description | 4th Line South West

Barrier/Parapet Walls Interior (West)

Photo



Comments

| Sealant deteriorating

Approach Guide Rail (All quadrants)

Photo



Comments

| Improper structure connection

Deck Top (South)

Photo



Comments

| Wide longitudinal crack

Deck Top (South)

Photo



Comments

| Delamination

Seals / Sealants (South)

Photo



Comments

| -

Girders - Ends (South West)

Photo



Comments

| Narrow cracking

Girders - Middle (West)

Photo



Comments

| Water penetration with efflorescence

Girders - Middle (Centre)

Photo



Comments

| Spall

Abutment Walls (South)

Photo



Comments

| Cold joint

052974: Structure 15: 2nd Line South West



UTM Coordinates (WGS84) | 17-550956m.E 4887628m.N

Road or Location Description | 2nd Line South West

Approach Wearing Surface (South)

Photo



Comments

| -

Wingwalls (South West)

Photo



Comments

| Delamination

Abutment Walls (South West)

Photo



Comments

| Delamination

Abutment Walls (South)

Photo



Comments

| Narrow stained crack

Soffit - Thick Slab - Int (South)

Photo



Comments

| Light delamination

052974: Structure 16: Sideroad 250



UTM Coordinates (WGS84) | 17-551221m.E 4887580m.N

Road or Location Description | Sideroad 250

Signs (South West)

Photo



Comments

| Light impact damage

Railing System (North East)

Photo



Comments

| Bolt missing

Wingwalls (South East)

Photo



Comments

| Delamination

Abutment Walls (East)

Photo



Comments

| Wide vertical crack

Girders - Middle (East)

Photo



Comments

Moderate surface corrosion

052974: Structure 17: Sideroad 250



UTM Coordinates (WGS84) | 17-552330m.E 4888945m.N

Road or Location Description | Sideroad 250

Signs (South)

Photo



Comments

| Low reflectivity

Outlet (South)

Photo



Comments

| Narrow vertical crack

Barrels (North)

Photo



Comments

| Silt partially blocking West culvert inlet

052974: Structure 18: (2nd Line North East)



UTM Coordinates (WGS84) | 17-555815m.E 4888798m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Posts (West)

Photo



Comments

| -

Curbs (West)

Photo



Comments

| -

Wingwalls (North East)

Photo



Comments

| Honeycombing

Wingwalls (South East)

Photo



Comments

| Scaling

Soffit - Thin Slab - Ext (East)

Photo



Comments

| -

Abutment Walls (South)

Photo



Comments

| Scaling

Soffit - Thin Slab - Int (East)

Photo



Comments

| Efflorescence stained crack

Soffit - Thin Slab - Int (North)

Photo



Comments

Delamination

Soffit - Thin Slab - Int (South)

Photo



Comments

Corroded form ties

052974: Structure 2001: (3rd Line)



UTM Coordinates (WGS84) | 17-563098m.E 4884240m.N

Road or Location Description | 3rd Line

Deck Wearing Surface (South)

Photo

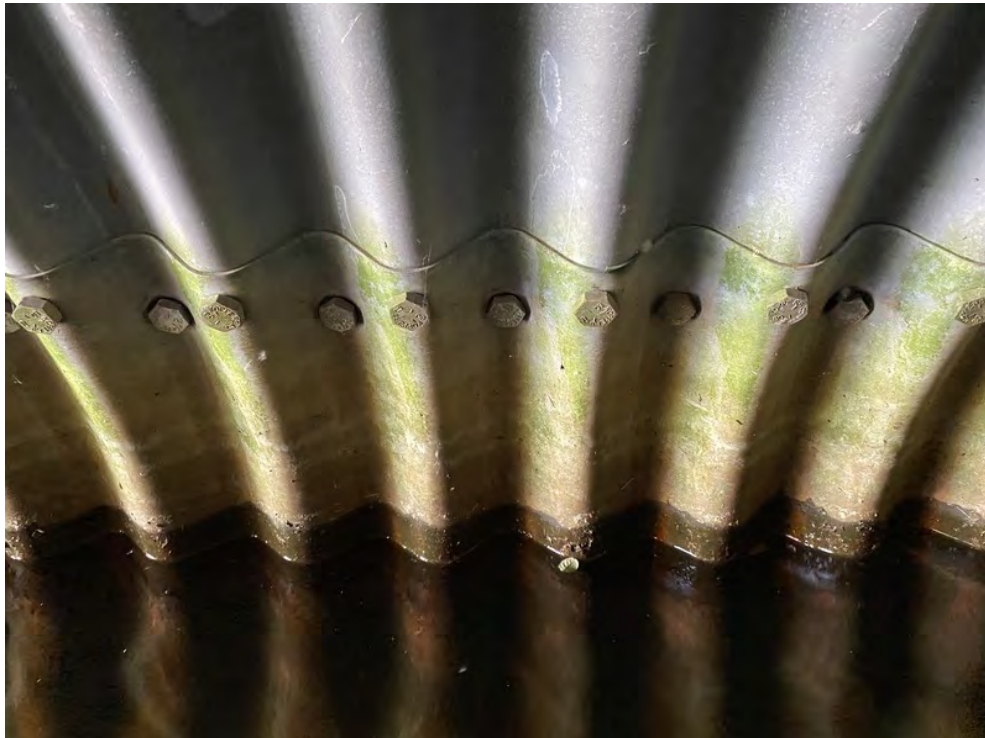


Comments

| Wide longitudinal crack

Barrels (South)

Photo



Comments

| Incorrect bolting pattern

Barrels (West)

Photo



Comments

| Construction damage

Barrels (West)

Photo



Comments

| -

052974: Structure 2002: (Sideroad 5)



UTM Coordinates (WGS84) | 17-561954m.E 4883415m.N

Road or Location Description | Sideroad 5

Approach Wearing Surface (East)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| Section loss

Barrels (West)

Photo

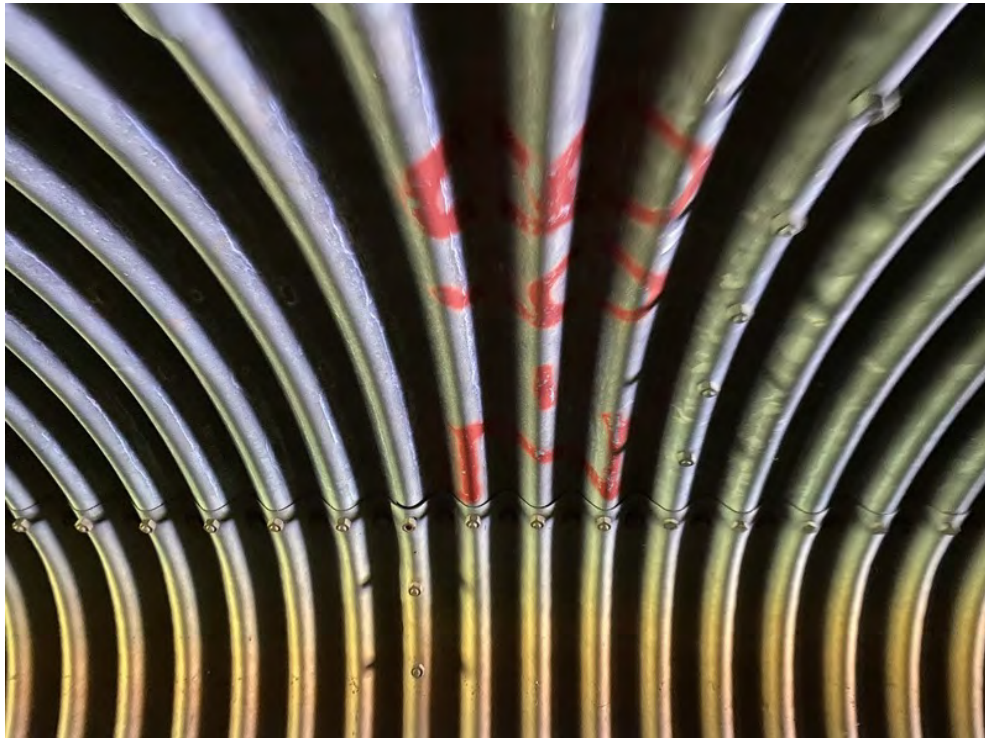


Comments

| Light cusping

Barrels (West)

Photo



Comments

| -

052974: Structure 2003: (3rd Line)



UTM Coordinates (WGS84) | 17-563367m.E 4882667m.N

Road or Location Description | 3rd Line

Deck Wearing Surface (North)

Photo



Comments

| -

Barrels (East)

Photo



Comments

| -

Barrels (North)

Photo



Comments

Medium crack

052974: Structure 2004: Sideroad 5



UTM Coordinates (WGS84) | 17-564200m.E 4884190m.N

Road or Location Description | Sideroad 5

Approach Wearing Surface (West)

Photo



Comments

| -

Signs (South West)

Photo



Comments

| -

Curbs (South)

Photo



Comments

Narrow crack

Soffit - Thick Slab - Ext (North)

Photo



Comments

Exposed corroded rebar

Abutment Walls (East)

Photo



Comments

Medium scaling

Soffit - Thick Slab - Int (West)

Photo



Comments

Narrow to medium full span crack

Wingwalls (South)

Photo



Comments

Small spall with exposed corroded rebar

Soffit - Thick Slab - Ext (North)

Photo



Comments

Medium to wide stained cracks

052974: Structure 2005: 3rd Line



UTM Coordinates (WGS84) | 17-562860m.E 4885620m.N

Road or Location Description | 3rd Line

Approach Wearing Surface (South)

Photo



Comments

| -

Streams and Waterways (West)

Photo



Comments

| Heavy aggradation throughout

Barrels (East)

Photo



Comments

| -

052974: Structure 2006: 3rd Line



UTM Coordinates (WGS84) | 17-562096m.E 4889841m.N

Road or Location Description | 3rd Line

Approach Wearing Surface (North)

Photo



Comments

| -

Curbs (South West)

Photo



Comments

| Small spall

Wingwalls (North East)

Photo



Comments

| Exposed corroded rebar

Soffit - Thick Slab - Ext (East)

Photo



Comments

| Medium spall with exposed corroded rebar

Soffit - Thick Slab - Int (South)

Photo



Comments

| Cold joint

Soffit - Thick Slab - Ext (West)

Photo



Comments

| Narrow efflorescence stained cracks

052974: Structure 2007: (Sideroad 15)



UTM Coordinates (WGS84) | 17-562073m.E 4889900m.N

Road or Location Description | Sideroad 15

Approach Wearing Surface (West)

Photo



Comments

| Alligator cracking

Soffit - Thin Slab - Ext (South)

Photo



Comments

| Medium cracking

Soffit - Thin Slab - Int (South)

Photo



Comments

Narrow wet cracks

Utilities (North East)

Photo



Comments

Conduit displaced

052974: Structure 2008: Sideroad 15



UTM Coordinates (WGS84) | 17-563726m.E 4890372m.N

Road or Location Description | Sideroad 15

Approach Wearing Surface (West)

Photo



Comments

Severe alligator cracking and settlement

Wingwalls (South)

Photo



Comments

Disintegration with exposed corroded rebar

Soffit - Thick Slab - Ext (South)

Photo



Comments

Medium spall

Soffit - Thick Slab - Int (East)

Photo



Comments

Delamination

Abutment Walls (West)

Photo



Comments

| -

Soffit - Thick Slab - Ext (North)

Photo



Comments

| Narrow to medium stained crack

052974: Structure 2009: (Sideroad 15)



UTM Coordinates (WGS84) | 17-563986m.E 4890446m.N

Road or Location Description | Sideroad 15

Approach Wearing Surface (East)

Photo



Comments

| -

Signs (South East)

Photo



Comments

| Sign dented

Deck Wearing Surface (North)

Photo



Comments

| Settlement

Outlet (South West)

Photo



Comments

| Narrow efflorescence stained cracks

Barrels (East)

Photo



Comments | Narrow efflorescence stained crack

Inlet (North)

Photo



Comments | -

052974: Structure 2010: 3rd Line



UTM Coordinates (WGS84) | 17-561705m.E 4891915m.N

Road or Location Description | 3rd Line

Approach Wearing Surface (South)

Photo



Comments

| -

Barrels (West)

Photo



Comments

| -

Barrels (West)

Photo



Comments

| -

052974: Structure 2011: (Sideroad 20)



UTM Coordinates (WGS84) | 17-560934m.E 4892705m.N

Road or Location Description | Sideroad 20

Approach Guide Rail (South)

Photo



Comments

| Light impact damage

Wingwalls (North East)

Photo



Comments

| Medium scaling

Soffit - Thin Slab - Int (North)

Photo



Comments

| -

Abutment Walls (North East)

Photo



Comments

| Delamination and scaling

Soffit - Thick Slab - Ext (South)

Photo



Comments

| Excessive fill

052974: Structure 2012: (Sideroad 30)



UTM Coordinates (WGS84) | 17-562029m.E 4899302m.N

Road or Location Description | Sideroad 30

Approach Wearing Surface (East)

Photo



Comments

| -

Signs (South East)

Photo



Comments

| -

Curbs (South East)

Photo



Comments

| -

Wingwalls (South East)

Photo



Comments

| Separation

Soffit - Thin Slab - Int (West)

Photo



Comments

| -

Abutment Walls (East)

Photo



Comments

| -

Wingwalls (North East)

Photo



Comments

| -

052974: Structure 2013: (Sideroad 30)



UTM Coordinates (WGS84) | 17-559988m.E 4898811m.N

Road or Location Description | Sideroad 30

Deck Wearing Surface (East)

Photo



Comments

| -

Railing System (South)

Photo



Comments

| -

Outlet (South)

Photo



Comments

| Spall

Barrels (East)

Photo



Comments

| -

052974: Structure 2014: (4th Line)



UTM Coordinates (WGS84) | 17-559069m.E 4898670m.N

Road or Location Description | 4th Line

Approach Wearing Surface (South)

Photo



Comments

| -

Signs (North West)

Photo



Comments

| -

Curbs (West)

Photo



Comments

Medium Crack

Curbs (East)

Photo



Comments

-

Wingwalls (South West)

Photo



Comments

| Scaling

Abutment Walls (North)

Photo



Comments

| -

Soffit - Thin Slab - Int (East)

Photo



Comments

| -

052974: Structure 2015: (10th Line North East)



UTM Coordinates (WGS84) | 17-557523m.E 4897914m.N

Road or Location Description | 10th Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Railing System (East)

Photo



Comments

| -

Wingwalls (South East)

Photo



Comments

| -

Outlet (South)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| spall

Inlet (North East)

Photo



Comments

| narrow stained cracks

052974: Structure 2016: (4th Line North East)



UTM Coordinates (WGS84) | 17-552213m.E 4894338m.N

Road or Location Description | 4th Line North East

Deck Wearing Surface (South)

Photo



Comments

| -

Deck Top (West)

Photo



Comments

| -

Soffit - Thin Slab - Ext (West)

Photo



Comments

| Delamination

Soffit - Thin Slab - Int (North)

Photo



Comments

| Delmaination

Soffit - Thin Slab - Int (North)

Photo



Comments

| Delamination

Abutment Walls (South)

Photo



Comments

| Exposed corroded rebar

Abutment Walls (North)

Photo



Comments

| Patches

Foundation (below ground level) - Abut (East)

Photo



Comments

| -

052974: Structure 2017: (2nd Line North East)



UTM Coordinates (WGS84) | 17-551575m.E 4892226m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Barrels (East)

Photo



Comments

| Deformation

Barrels (South)

Photo



Comments

| Section loss

Barrels (North)

Photo



Comments

| Section loss

052974: Structure 2018: (2nd Line North East)



UTM Coordinates (WGS84) | 17-552225m.E 4891701m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Signs (South West)

Photo



Comments

| Low Sign

Inlet (South East)

Photo



Comments

| Disintegration and delamination

Barrels (South East)

Photo



Comments

| Efflorescence

Barrels (North East)

Photo



Comments

| Efflorescence

Barrels (South)

Photo



Comments

| Honeycombing

Barrels (South)

Photo



Comments

Cold joint

052974: Structure 2019: (4th Line North East)



UTM Coordinates (WGS84) | 17-554530m.E 4892463m.N

Road or Location Description | 4th Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Deck Top (East)

Photo



Comments

| -

Inlet (West)

Photo



Comments

| -

Barrels (South)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| -

052974: Structure 2020: (4th Line North East)



UTM Coordinates (WGS84) | 17-554639m.E 4892373m.N

Road or Location Description | 4th Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Outlet (West)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| -

Inlet (East)

Photo



Comments

| -

Barrels (North)

Photo



Comments

Narrow crack

052974: Structure 2021: (2nd Line North East)



UTM Coordinates (WGS84) | 17-553630m.E 4890563m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Signs (South East)

Photo



Comments

| -

Barrels (South)

Photo



Comments

| Welded rebar

Barrels (South)

Photo



Comments

| Section loss

Barrels (South)

Photo

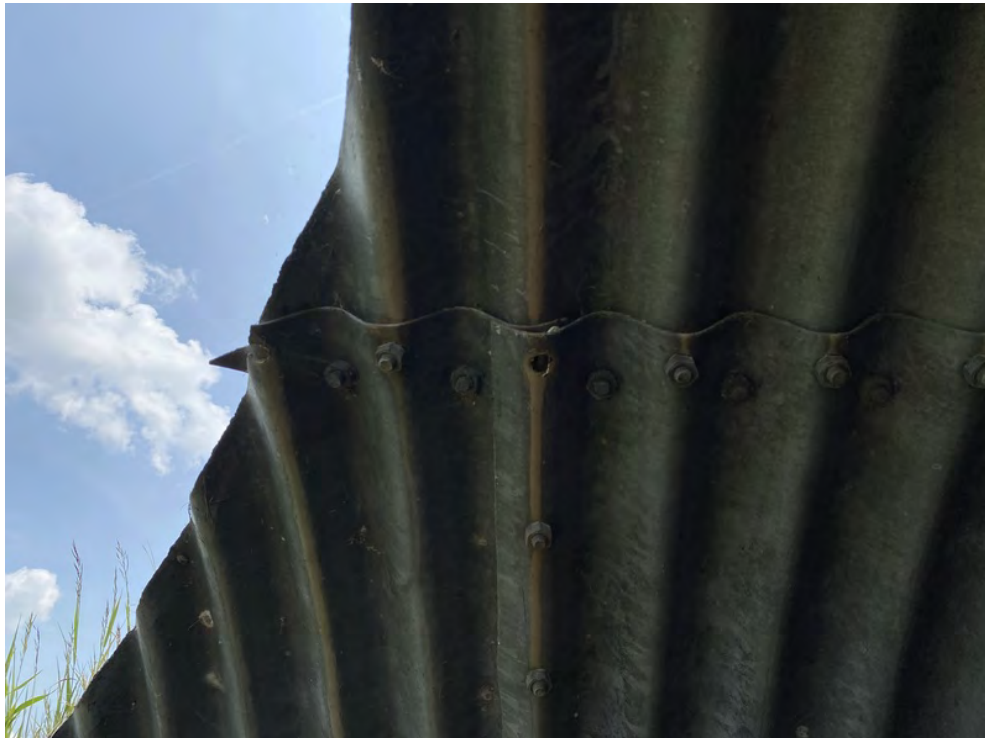


Comments

| -

Barrels (West)

Photo



Comments

| Missing bolt

052974: Structure 2022: (4th Line North East)



UTM Coordinates (WGS84) | 17-556382m.E 4890957m.N

Road or Location Description | 4th Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Outlet (South)

Photo



Comments

| -

Barrels (West)

Photo



Comments

Scaling

Barrels (East)

Photo



Comments

Scaling

052974: Structure 2023: (4th Line North East)



UTM Coordinates (WGS84) | 17-556814m.E 4890612m.N

Road or Location Description | 4th Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Outlet (West)

Photo



Comments

| Severe disintegration

Barrels (North East)

Photo



Comments

| Delamination

Barrels (South)

Photo



Comments

| Exposed corroded rebar

Inlet (East)

Photo



Comments

Severe disintegration

052974: Structure 2024: (2nd Line North East)



UTM Coordinates (WGS84) | 17-552629m.E 4891374m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Inlet (East)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| -

Barrels (West)

Photo



Comments

| Moisture penetration

Outlet (North West)

Photo



Comments

| -

052974: Structure 2025: (Sideroad 260)



UTM Coordinates (WGS84) | 17-551966m.E 4885241m.N

Road or Location Description | Sideroad 260

Approach Wearing Surface (West)

Photo



Comments | Wide transverse crack and alligator cracking

Barrels (West)

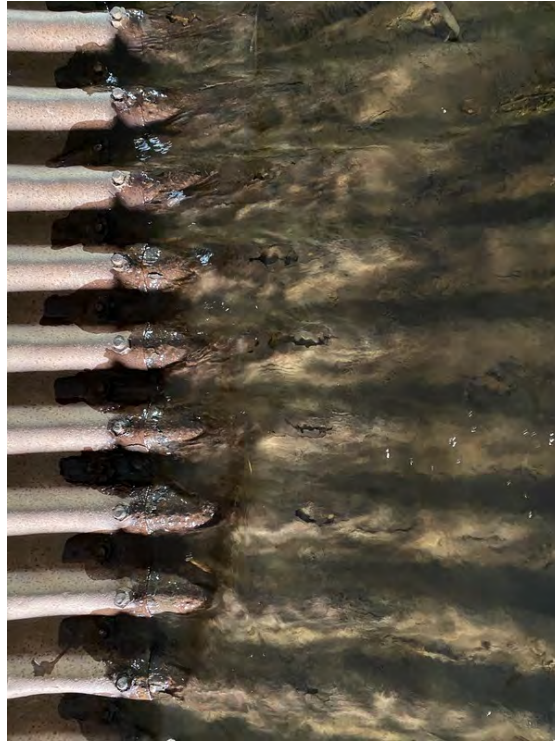
Photo



Comments | Incorrect bolting pattern

Barrels (East)

Photo



Comments

| Perforations

Barrels (East)

Photo



Comments

| -

052974: Structure 2026: (8th Line South West)



UTM Coordinates (WGS84) | 17-552085m.E 4878598m.N

Road or Location Description | 8th Line South West

Approach Wearing Surface (South)

Photo



Comments

| -

Barrels (East)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| Cusping

Barrels (South)

Photo



Comments

| Incorrect bolting pattern

Barrels (South West)

Photo



Comments

| Slight Deformation

052974: Structure 2027: (Sideroad 15)



UTM Coordinates (WGS84) | 17-562429m.E 4889998m.N

Road or Location Description | Sideroad 15

Approach Wearing Surface (West)

Photo



Comments

| -

Approach Guide Rail (South West)

Photo



Comments

| Rotated posts

Wall (South West)

Photo



Comments

| -

Barrels (East)

Photo



Comments

| Large gap between joints

Outlet (North)

Photo



Comments

| Hairline stained map cracking

052974: Structure 2028: Main Street



UTM Coordinates (WGS84) | 17-563437m.E 4890067m.N

Road or Location Description | Main Street

Approach Wearing Surface (North)

Photo



Comments

| -

Signs (North West)

Photo



Comments

| Low reflectivity

Barrels (West)

Photo



Comments

| Water penetration through joint

Outlet (East)

Photo



Comments

| Small pop out

Wall (North East)

Photo



Comments

| Filter fabric exposed

052974: Structure 2029: (Sideroad 220)



UTM Coordinates (WGS84) | 17-550467m.E 4896418m.N

Road or Location Description | Sideroad 220

Signs (North East)

Photo



Comments

| -

Curbs (West)

Photo



Comments

| -

Utilities (East)

Photo



Comments | No conduit

Soffit - Thin Slab - Ext (West)

Photo



Comments | Narrow stained cracks

Wingwalls (South West)

Photo



Comments

| -

Abutment Walls (South East)

Photo



Comments

| Honeycombing

Soffit - Thin Slab - Int (South)

Photo



Comments

| -

052974: Structure 2030: (Sideroad 240)



UTM Coordinates (WGS84) | 17-554164m.E 4894463m.N

Road or Location Description | Sideroad 240

Approach Wearing Surface (East)

Photo



Comments

| -

Signs (South East)

Photo



Comments

| -

Curbs (North East)

Photo



Comments

| Disintegration and delamination

Wingwalls (North East)

Photo



Comments

| Erosion

Abutment Walls (North West)

Photo



Comments

| Severe erosion

Soffit - Thin Slab - Int (North)

Photo



Comments

| -

Abutment Walls (South East)

Photo



Comments

| Delamination and honeycombing

Soffit - Thin Slab - Ext (South)

Photo



Comments

| Exposed corroded rebar

052974: Structure 2031: (Sideroad 240)



UTM Coordinates (WGS84) | 17-551373m.E 4890991m.N

Road or Location Description | Sideroad 240

Approach Wearing Surface (North)

Photo



Comments

| -

Railing System (North)

Photo

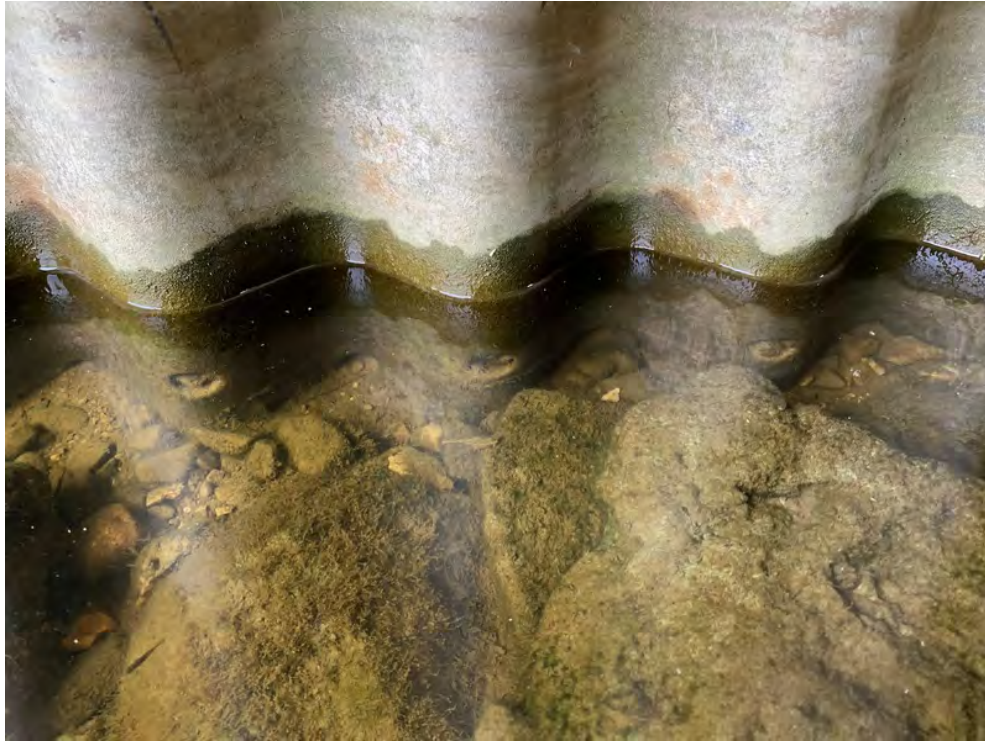


Comments

| Detached cable

Barrels (North)

Photo



Comments

| -

Barrels (East)

Photo



Comments

| -

052974: Structure 2032: (2nd Line North East)



UTM Coordinates (WGS84) | 17-557870m.E 4887135m.N

Road or Location Description | 2nd Line North East

Approach Wearing Surface (South)

Photo



Comments

| -

Barrels (North)

Photo



Comments

| Section loss

Barrels (South)

Photo



Comments

Section loss

Barrels (South)

Photo



Comments

-

052974: Structure 2033: (7th Line South West)



UTM Coordinates (WGS84) | 17-550283m.E 4882714m.N

Road or Location Description | 7th Line South West

Signs (West)

Photo



Comments

| Low

Deck Wearing Surface (North West)

Photo



Comments

| Alligator cracking

Outlet (West)

Photo



Comments

Narrow stained cracks

Barrels (West)

Photo



Comments

Honeycombing throughout

Inlet (South East)

Photo



Comments

| Exposed footing from washout



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

OSIM Forms and Photos

Provided Digitally

