2021 OSIM Bridge Inspection Report

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

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Melancthon, ON L9V 2E6

R.J. Burnside & Associates Limited
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R.J. Burnside & Associates Limited

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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 one time costs such as placing rip-rap in washouts on slopes adjacent to bridge wingwalls. The total estimated value of the work to be completed by the Township is **$96,000.00.** 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 report, 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	
1 – 5 years	$1,788,000.00
6 – 10 years	$2,733,000.00
TOTAL	**$4,521,000.00**

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

Taking into consideration the structures calculated BCI's, several structures have been identified for replacement or rehabilitation. Within the next 1 to 5 years, six (6) structures have been identified as requiring rehabilitation and one (1) structure has 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 $2,186,000. However, this cost reduces to **$365,000** if costs to install guide rail on narrow Township roads with a platform width of 8.0 m or narrower are excluded for the maintenance and safety concerns noted in Section 2.3 Roadside Safety portion of this report.

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

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Disclaimer

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. 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.

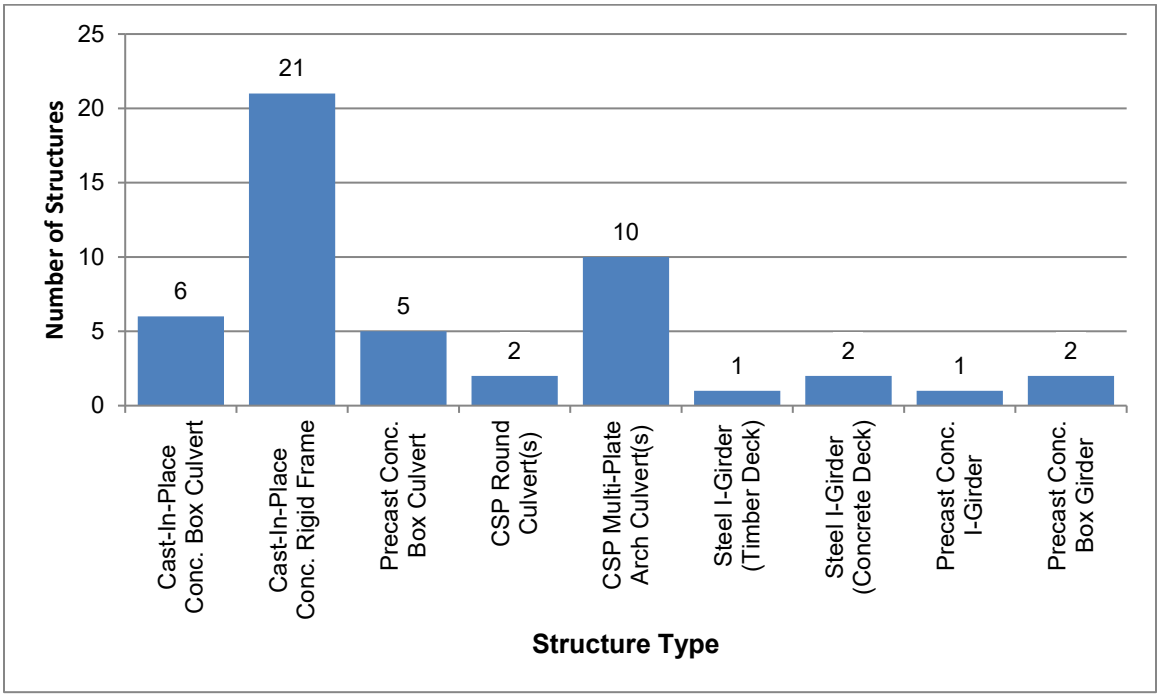
Burnside staff conducted a detailed element by element visual assessment of each bridge/culvert in order to identify any material defects, performance deficiencies and maintenance needs on a structure by structure basis. All data collected has been documented on the OSIM forms and provided in digital 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 **$96,000.00**. 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
001	Monitor Abutment Erosion	During Biennial Inspections – To determine if actively progressing	$0.00
008	Monitor Crack Widths	During Biennial Inspections – To determine if wet cracks are from humidity or moisture penetration	$0.00
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	Monitoring Program for 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	During Biennial Inspections – To determine if actively progressing until structure is replaced	$0.00
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	**$0.00**

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 current needs for costs relating to guide rail installation or investigation is **$356,000.00**.

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 $20,000.00 to $100,000.00, 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	-
1 – 5 years	$1,788,000.00
6 – 10 years	$2,733,000.00
TOTAL	**$4,521,000.00**

The total, 10-year estimated capital costs, which includes the above as well as all other associated costs including maintenance, additional investigations, and roadside protection costs, is $4,983,000.00. It should be noted that all costs are based on 2021 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.

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 (2021)

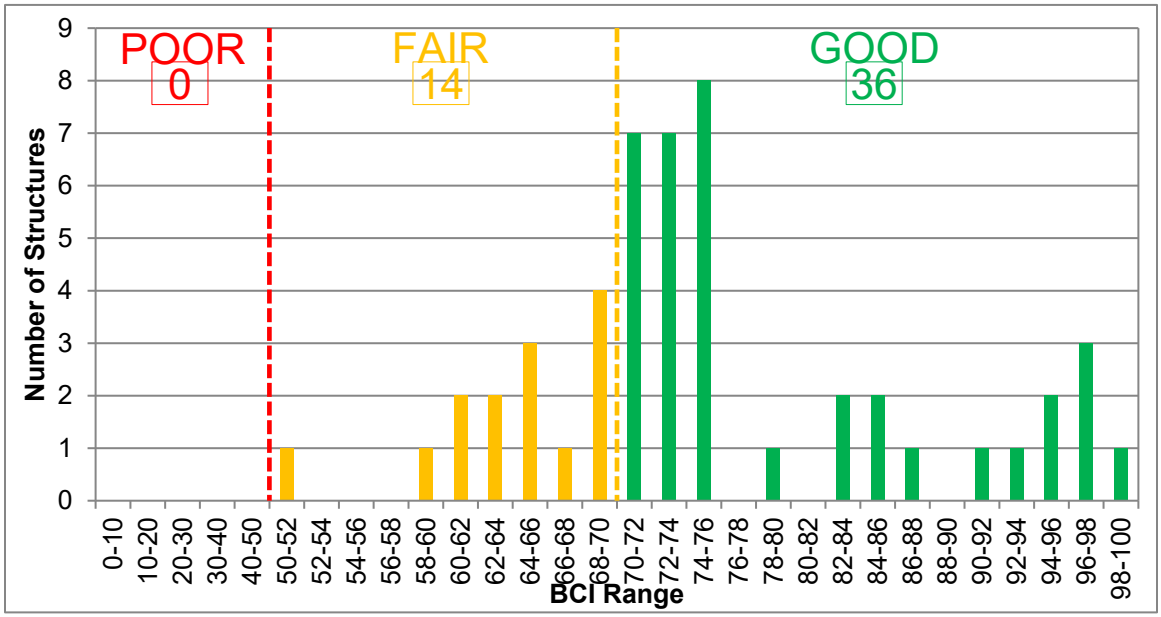
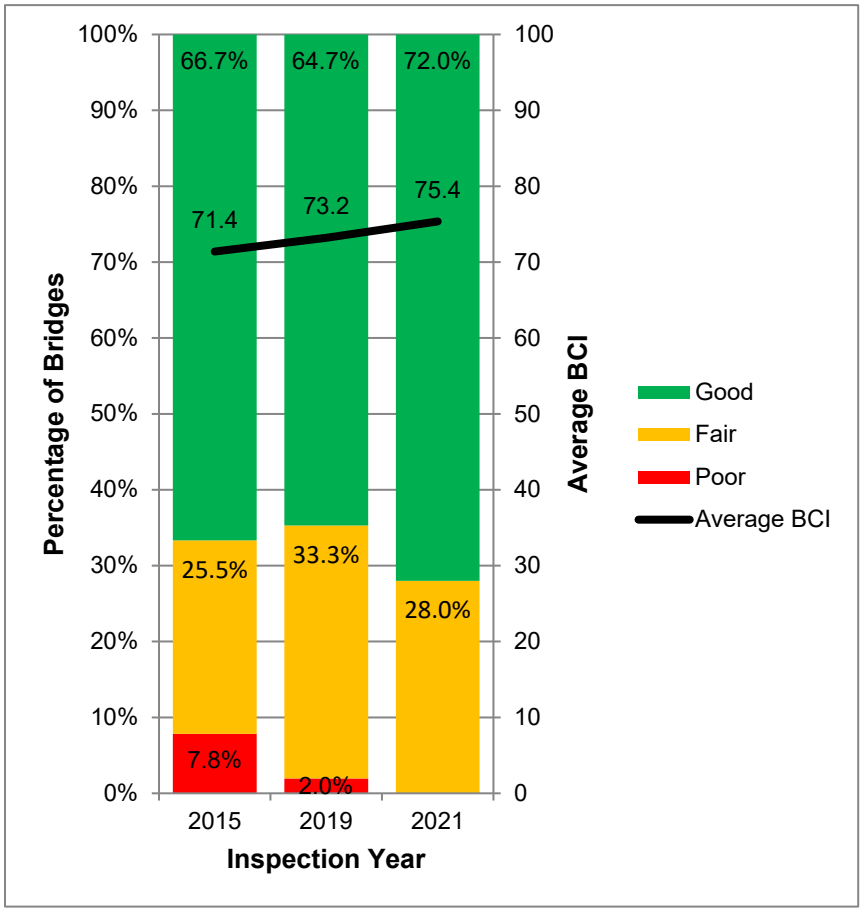


Figure 3: Bridge Condition Index Historical Trend



*Note: Structure 004 historical data included in 2015 & 2019 however removed for 2021 since structure is closed to traffic

Currently, approximately 72% of the Township's structures are within the "good" range, with 28% 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 to have 85% of their structures in "good" condition (BCI ≥ 70) by the year 2021, and to maintain that condition moving forward by addressing rehabilitations and replacements as necessary. Burnside recognizes that the above goal was not established by the Township. It should be noted that based on the current state of the inspected structures and the recent improvements made, the Township is only slightly underperforming on the management of their bridge assets when compared to the MTO's established goal.

The trend in Figure 3 identifies that the overall average BCI of the 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); and
- Structure No. 13 – 260 Sideroad Rehabilitation (2021).

Projects currently in design stage include:

- Structure No. 11 – 8th Line SW

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.

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 (costs include engineering and contingency estimates).

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

Structure No./Name	Road Name	Recommended Work	Estimated Construction Cost	Years to Rehabilitation/ Replacement
Replacements				
2021	2nd Line NE	Replace	$598,500	5
Rehabilitations				
2023	4th Line NE	Rehabilitate	$193,000	1
7	7th Line SW	Rehabilitate	$211,000	3
18	2nd Line NE	Rehabilitate	$237,000	4
11	8th Line SW	Rehabilitate	$255,000	4
16	250 Sideroad	Rehabilitate	$276,000	5
6	4th Line SW	Rehabilitate (waterproof and pave)	$37,000.00	1
		Total	**$1,807,500**	

The structures in the 10-year Capital Plan shown below in Table 3, have been ordered for rehabilitation of 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 **$200,000 to $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 re-assessed during each OSIM inspection cycle. It should be noted that if structures can be lumped together and tendered under one contract (i.e., Structure 7 & 18 and 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
2022			
11	8th Line SW	Construction - Rehabilitation	$215,000
006	4th Line SW	Construction – Waterproof and Pave	$20,000
2023	4th Line NE	Engineering - Design	$18,000

Structure No./Name	Road Name	Recommended Work	Estimated Cost
2023			
2023	4th Line NE	Construction - Rehabilitation	$160,000
7	7th Line SW	Engineering - Design	$25,000
18	2nd Line NE	Engineering - Design	$25,000
2024			
7	7th Line SW	Construction - Rehabilitation	$175,000
18	2nd Line NE	Construction - Rehabilitation	$197,500
2025			
*2021	2nd Line NE	Engineering - Design	$40,000
2026			
*2021	2nd Line NE	Construction - Replacement	$450,000
2027			
9	8th Line SW	Engineering – Design	$25,000
14	4th Line SW	Engineering - Design	$35,000
2028			
9	8th Line SW	Construction - Rehabilitation	$230,000
14	4th Line SW	Construction - Rehabilitation	$275,000
2029			
2011	20th Sideroad	Engineering - Design	$45,000
2030			
2011	20th Sideroad	Construction - Replacement	$450,000
2031			
2017	2nd Line NE	Engineering – Preliminary Design (determine if suitable for relining/invert paving)	$10,000
2032	2nd Line NE		$10,000
		Total	**$2,405,500**

Note: Construction contingencies and costs for engineering construction supervision 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 years to replacement to be updated following the 2023 biennial inspections depending on how the temporary welding steel reinforcing is preforming.

6.0 Summary

The 2021 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.

The Township has done a very good job addressing their top priority poor condition structures over the past number of years. If a budget can be committed to the structures listed in the proposed 10-Year Capital Plan, this will allow the Township to focus more on maintaining their large bridge and culvert assets which are still in fair or good condition, opposed to having to resort to replacing these structures when they fall to poor condition, freeing up funds to be allocated to other Township projects and initiatives. The Township can then focus on proactive bridge and culvert planning with minimal costs to help extend the service life of structures when timing is appropriate.

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.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Summary Reports

1.1 Structure No. 1 **2021 BCI: 72.2**

Structure Name:	Structure 001		
Road Name:	4th Line SW		
Location:	1 km North of Highway 89 (Lot 4, CON. 4 & 5 SW)		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	3.7 m
Overall Structure Width:	7.45m	Roadway Width:	6.8 m
Year of Construction:	1960	Current Load Limit:	N/A

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

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. The Township should consider installing rock protection along the abutments and wingwalls to prevent further concrete deterioration and help extend the service life of the structure. It is also recommended that erosion of the abutments & footings be monitored during future biennial inspections. The repairs listed above may be considered to help extend the lifespan of the structure; however, based on the current BCI, span, and low clearance a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 16 years.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs and around wingwalls and debris in watercourse	$2,000.00
Erosion Control	Install rock protection along abutments and wingwalls	$5,000.00
	Maintenance Needs Total	**$7,000.00**

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

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$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	$4,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	$5,000.00
Waterproof and pave	N/A	$25,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$111,500.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities - Utility relocation	N/A	$5,000.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$20,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$131,500.00	$370,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$14,000.00	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$37,000.00
	Total Capital Work Cost		**$160,500.00**	**$502,500.00**

1.2 Structure No. 3

2021 BCI: 65.3

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

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

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 delaminations noted on the soffit. Based on the current BCI, span, narrow driving platform and low clearance, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 13 years. However, the repairs listed above may be completed to help extend the lifespan of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs and around structure	$1,500.00
Erosion Control	Repair washout on NE & SE embankments, install rock protection along abutments	$5,000.00
	Maintenance Needs Total	**$6,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	$6,000.00
Type B concrete repairs to soffit,	N/A	$20,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	$8,000.00
Waterproof and pave	N/A	$25,000.00
Add slope stabilization	N/A	$12,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$146,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$161,000.00	$415,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$17,000.00	$42,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$17,000.00	$42,000.00
Total Capital Work Cost			**$195,000.00**	**$557,500.00**

1.3 Structure No. 5 **2021 BCI: 72.8**

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:	8.7m	Roadway Width:	7.9 m
Year of Construction:	1960	Current Load Limit:	N/A

Recommendation: Minor Rehabilitation is recommended within 6 years.

Justification:

Structure 005 is generally in good condition but is beginning to demonstrate signs of concrete deterioration, and moisture penetration on the soffit indicating that water is likely penetrating through the existing wearing course and waterproofing system (if waterproofing was completed during original structure) and requires replacement. Based on the current BCI, minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, and barrier replacement should be included in the rehabilitation project within approximately 6 years. Consideration should be given to investigating the need for a steel beam guide rail system with end treatments and structure connections to help protect oncoming traffic.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck wearing surface 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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type B concrete repairs to soffit,	6 to 10 years	$10,000.00
Type C concrete repairs to abutment walls, wingwalls,	6 to 10 years	$1,500.00
Replace barrier system	6 to 10 years	$30,000.00
Waterproof and pave	6 to 10 years	$25,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	$75,000.00
	Rehabilitation Cost Subtotal	**$141,500.00**

Estimate Value of Replacement Structure	$750,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$156,500.00	$765,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$16,000.00	$77,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$16,000.00	$77,000.00
	Total Capital Work Cost		**$189,500.00**	**$977,500.00**

1.4 Structure No. 6

2021 BCI: 78.6

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

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

Justification:

Structure 006 is generally in good condition with only minor maintenance recommended at this time. The Township should consider waterproofing and paving the deck top to help maximize the lifespan of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top and remove vegetation around wingwalls	$1,500.00
Erosion Control	Install rock protection along abutments and wingwalls	$8,000.00
	Maintenance Needs Total	**$9,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Waterproof and pave	1 to 5 years	$20,000.00
	Rehabilitation Cost Subtotal	**$20,000.00**

Estimate Value of Replacement Structure	$800,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$20,000.00	$800,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$2,000.00	$80,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$80,000.00
	Total Capital Work Cost		**$37,000.00**	**$1,018,500.00**

1.5 Structure No. 7

2021 BCI: 66.9

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

Recommendation: Minor Rehabilitation is recommended within 3 years.

Justification:

Structure 007 is generally in good to fair condition but is demonstrating signs of concrete deterioration throughout, and moisture penetration on the soffit. A minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, and barrier replacement should be included in the rehabilitation project within approximately 3 years. However, given the narrow, sub-standard driving platform width, consideration may be given to forgoing the rehabilitation and scheduling the replacement of the structure within 13 years.

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	$1,000.00
	Maintenance Needs Total	**$2,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	$5,000.00
Type B concrete repairs to soffit,	1 to 5 years	$10,000.00
Type C concrete repairs to abutment walls, wingwalls,	1 to 5 years	$15,000.00
Replace barrier system	1 to 5 years	$30,000.00
Waterproof and pave	1 to 5 years	$25,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$75,000.00
	Rehabilitation Cost Subtotal	**$160,000.00**

Estimate Value of Replacement Structure	$800,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$175,000.00	$815,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$18,000.00	$82,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$18,000.00	$82,000.00
	Total Capital Work Cost		**$211,000.00**	**$1,037,500.00**

1.6 Structure No. 8 **2021 BCI: 70.5**

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

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

Justification:
Structure 008 is generally in good to fair condition. Wet cracks were noted on the soffit which indicate a potential of moisture penetration through the deck but may also be due to the humid environment within the barrel. These cracks should be monitored during future inspections and consideration may be given to removing the fill from over the culvert to waterproof the deck top surface and help extend the service life of the structure. If the Township wishes to complete this work and associated paving/concrete repairs, the work is recommended to be completed within 5 years. Otherwise, the Township may wish to forgo rehabilitation due to the narrow driving platform width and schedule to replace the structure in approximately 15 years. Consideration should be given to investigating the need for a steel beam guide rail system with end treatments to help protect oncoming traffic.

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	Priority	Estimated Cost
Monitoring Crack Widths,	Normal	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	$10,000.00
Type C concrete repairs to barrels,	1 to 5 years	$10,000.00
Waterproof and pave	1 to 5 years	$20,000.00
Add slope stabilization	1 to 5 years	$8,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$75,000.00
Rehabilitation Cost Subtotal		**$123,000.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$138,000.00	$565,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$14,000.00	$57,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$57,000.00
	Total Capital Work Cost		**$168,000.00**	**$737,500.00**

1.7 Structure No. 9 **2021 BCI: 72.9**

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

Recommendation: Minor Rehabilitation is recommended within 6 years.

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. Based on the current BCI, a minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, and expansion joint replacement should be included in the rehabilitation project within approximately 6 years. Additionally, the Township should consider conversion of the structure to a semi-integral configuration during the rehabilitation work 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
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to barrier/parapet walls interior, deck top, concrete end dams,	6 to 10 years	$5,000.00
Type B concrete repairs to Girders, soffit,	6 to 10 years	$5,000.00
Replace expansion joints	6 to 10 years	$105,000.00
Waterproof and pave	6 to 10 years	$25,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	$75,000.00
	Rehabilitation Cost Subtotal	**$215,000.00**

Estimate Value of Replacement Structure	$850,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$230,000.00	$865,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$23,000.00	$87,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$23,000.00	$87,000.00
	Total Capital Work Cost		**$276,000.00**	**$1,097,500.00**

1.8 Structure No. 10

2021 BCI: 90.4

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	Span Lengths:	10.38 m
Overall Structure Width:	5.5m	Roadway Width:	4.9 m
Year of Construction:	2000	Current Load Limit:	N/A

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

Justification:

Structure 010 was rehabilitated in 2018 and is generally in excellent condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the lifespan of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top and flush expansion joints	$1,500.00
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$850,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$850,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$85,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$85,000.00
	Total Capital Work Cost		**N/A**	**$1,078,500.00**

1.9 Structure No. 11

2021 BCI: 69.6

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

Recommendation: Minor Rehabilitation is recommended within 5 years.

Justification:

Structure 011 is generally in good to fair condition but is demonstrating signs of concrete deterioration on the deck top, and moisture penetration primarily through the deck construction joint. The rehabilitation of Bridge 11 is tentatively scheduled for 2022 and is currently in design phase. Based on the presence of swallow nests noted during the inspection, it is recommended that bird netting be installed on the structure in the season ahead of the scheduled rehabilitation work.

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Install hazard warning sign in SW quadrant	$250.00
	Maintenance Needs Total	**$250.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	$35,000.00
Type B concrete repairs to soffit,	1 to 5 years	$20,000.00
Repair barrier system	1 to 5 years	$5,000.00
Extend deck drains	1 to 5 years	$2,500.00
Waterproof and pave	1 to 5 years	$35,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$75,000.00
Rehabilitation Cost Subtotal		**$172,500.00**

Estimate Value of Replacement Structure	$1,600,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental – Install Bird Netting	1 to 5 years	$7,500.00
Other -		$0.00
Total Associated Work Cost		**$22,500.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$195,000.00	$1,622,500.00
Roadside Protection:			$20,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$20,000.00	$163,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$20,000.00	$132,000.00
	Total Capital Work Cost		**$255,000.00**	**$1,976,000.00**

1.10 Structure No. 12 **2021 BCI: 86.3**

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	Span Lengths:	Clear=17.1 Skew=18 m
Overall Structure Width:	8.7m	Roadway Width:	7 m
Year of Construction:	2007	Current Load Limit:	N/A

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

Justification:
Structure 012, which was erected in 2007, is generally in excellent to good condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to maximize the lifespan of the structure.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$1,500,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$1,500,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$150,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$125,000.00
Total Capital Work Cost			**N/A**	**$1,833,500.00**

1.11 Structure No. 13

2021 BCI: **74.8**

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

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

Justification:

Structure 013 is generally in good condition with no capital works required at this time. A rehabilitation was completed in 2021 that consisted of concrete patch repairs, expansion joints replacement, waterproofing and paving, and erosion protection. Routine maintenance should be ongoing to help maximize the lifespan of the structure.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$1,300,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$1,315,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$132,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$116,000.00
	Total Capital Work Cost		**N/A**	**$1,621,500.00**

1.12 Structure No. 14

2021 BCI: 71.1

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

Recommendation: Minor Rehabilitation is recommended within 6 years.

Justification:

Structure 014 is generally in good condition but is demonstrating signs of concrete deterioration on the deck top and seized expansion joints. The majority of defects were noted to be in areas adjacent to leaking or unsealed joints in the barrier or deck. As such, a minor rehabilitation to seal the joints, waterproof and pave, and complete concrete repairs to help slow the rate of deterioration is recommended within the next 6 years. Additionally, the Township should consider conversion of the structure to a semi-integral configuration during the rehabilitation work 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
Joint Sealant	Replace deteriorated barrier sealant joint	$1,000.00
Hand Railing	Replace missing end cap	$250.00
	Maintenance Needs Total	**$2,750.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to barrier/parapet walls interior, deck top, concrete end dams,	6 to 10 years	$20,000.00
Type B concrete repairs to Girders,	6 to 10 years	$5,000.00
Waterproof and pave	6 to 10 years	$30,000.00
Replace expansion joints	6 to 10 years	$120,000.00
Install abutment rock protection	6 to 10 years	$10,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	$75,000.00
Rehabilitation Cost Subtotal		**$260,000.00**

Estimate Value of Replacement Structure	$1,300,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$275,000.00	$1,315,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$28,000.00	$132,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$28,000.00	$116,000.00
	Total Capital Work Cost		**$331,000.00**	**$1,621,500.00**

1.13 Structure No. 15

2021 BCI: 74.2

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

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

Justification:

Structure 015, which was rehabilitated in 2017, is generally in good condition with no capital works required at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$1,300,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$1,300,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$130,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$115,000.00
Total Capital Work Cost			**N/A**	**$1,603,500.00**

1.14 Structure No. 16 **2021 BCI: 70.5**

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

Recommendation: Minor Rehabilitation is recommended within 5 years.

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. Based on the current BCI, and the size of the structure, an additional minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, abrasive blasting and re-painting structural steel, and erosion protection should be included in the rehabilitation project within approximately 5 years. However, given the narrow, sub-standard driving platform width, consideration may be given to forgoing the rehabilitation and scheduling the replacement of the structure within 15 years.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Sweep deck top	$1,000.00
Handrail Maintenance	Repair Hand Railings	$1,000.00
Hazard Signs	Raise hazard warning signs and install narrow structure signs	$1,000.00
	Maintenance Needs Total	**$3,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	$10,000.00
Type C concrete repairs to abutment walls, wingwalls,	1 to 5 years	$10,000.00
Abrasive blasting and painting required to Structural Steel (Full length),	1 to 5 years	$85,000.00
Waterproof and pave	1 to 5 years	$25,000.00
Install rock protection along abutments	1 to 5 years	$10,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$75,000.00
Rehabilitation Cost Subtotal		**$215,000.00**

Estimate Value of Replacement Structure	$1,100,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$230,000.00	$1,115,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$23,000.00	$112,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$23,000.00	$106,000.00
	Total Capital Work Cost		**$276,000.00**	**$1,391,500.00**

1.15 Structure No. 17 **2021 BCI: 74.7**

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

Recommendation: Minor Rehabilitation is recommended within 7 years.

Justification:
Structure 017 is generally in good condition with only roadside safety upgrades recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to replacing the guide rail with a current code conforming steel beam guide rail system and end treatments to help protect oncoming traffic.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Replace guide rail, end treatments	1 to 5 Years	$56,000.00

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

Estimate Value of Replacement Structure	$1,200,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$1,200,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$120,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$110,000.00
		Total Capital Work Cost	**N/A**	**$1,488,500.00**

1.16 Structure No. 18 **2021 BCI: 69.1**

Structure Name:	Structure 018		
Road Name:	2nd Line NE		
Location:	750m South of County Road 21 (Lot 15, Con. 2 & 3 NE)		
Structure Type:	Cast-In-Place Conc. Rigid Frame		
Number of Spans:	1	Span Lengths:	7.4 m
Overall Structure Width:	8.65m	Roadway Width:	7.45 m
Year of Construction:	1960	Current Load Limit:	N/A

Recommendation: Minor Rehabilitation is recommended within 5 years.

Justification:
Structure 018 is generally in good to fair condition but is demonstrating signs of concrete deterioration, and moisture penetration. Based on the current BCI, a minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, barrier replacement, and erosion protection should be included in the rehabilitation project within approximately 4 years. However, given the narrow, sub-standard driving platform width, consideration may be given to forgoing the rehabilitation and scheduling the replacement of the structure within 14 years.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	1 to 5 years	$2,500.00
Type B concrete repairs to soffit,	1 to 5 years	$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	1 to 5 years	$15,000.00
Install thrie beam barrier system	1 to 5 years	$45,000.00
Waterproof and pave	1 to 5 years	$25,000.00
Install slope protection	1 to 5 years	$10,000.00
General Items - Insurance, Mobilization, Access etc.	1 to 5 years	$75,000.00
	Rehabilitation Cost Subtotal	**$177,500.00**

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities - Utility Relocation	1 to 5 years	$5,000.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$20,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$197,500.00	$620,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$20,000.00	$62,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$20,000.00	$62,000.00
		Total Capital Work Cost	**$237,500.00**	**$802,500.00**

1.17 Structure No. 2001 **2021 BCI: 70.7**

Structure Name:	Structure 2001		
Road Name:	3rd Line		
Location:	2.5 km South of County Road 17 (Lot 6 Con. 2 & 3 O.S.)		
Structure Type:	CSP Multi-Plate Arch Culvert(s)		
Number of Spans:	1	Span Lengths:	3.5 m
Overall Structure Width:	15.8m	Roadway Width:	7.9 m
Year of Construction:	1989	Current Load Limit:	N/A

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

Justification:
Structure 2001 is generally in good condition but is demonstrating signs of light to moderate surface corrosion along the waterline. Based on the structure type and span a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 15 years. Consideration should also be given to replacing the guide rail with a current code conforming steel beam guide rail system with end treatments to help protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Replace Guide Rail, end treatments	1 to 5 Years	$56,000.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
Total Capital Work Cost			**N/A**	**$538,500.00**

1.18 Structure No. 2002 **2021 BCI: 75**

Structure Name:	Structure 2002		
Road Name:	5th Sideroad		
Location:	200m 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:	22.5m	Roadway Width:	6.5 m
Year of Construction:	1988	Current Load Limit:	N/A

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

Justification:
Structure 2002 is generally in good condition with only minor maintenance recommended at this time. It is also recommended that the slight sag in the culvert barrel be monitored during future biennial inspections.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove tree growing close to inlet	$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	Priority	Estimated Cost
Monitoring of Deformations, Settlements and Movements,	Normal	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$450,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$45,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$45,000.00
	Total Capital Work Cost		**N/A**	**$598,500.00**

1.19 Structure No. 2003 **2021 BCI: 75**

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

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

Justification:
Structure 2003 is generally in good condition after steel reinforced invert paving was completed in 2019. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to repairing the 3-cable guide rail system to help protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Replace rotten posts and raise 3-cable guide rail	1 to 5 Years	$6,000.00

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

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$565,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$57,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$57,000.00
Total Capital Work Cost			**N/A**	**$737,500.00**

1.20 Structure No. 2004 **2021 BCI: 73.9**

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

Recommendation: Minor Rehabilitation is recommended within 7 years.

Justification:
Structure 2004 is generally in good condition but is demonstrating signs of moisture penetration on the soffit. Based on the current BCI, a minor rehabilitation should be considered as the BCI approaches 60 to ensure the structure does not deteriorate beyond repair. Concrete repairs, waterproofing and paving, and erosion protection should be included in the rehabilitation project within approximately 7 years. However, given the narrow, sub-standard driving platform width, consideration may be given to forgoing the rehabilitation and scheduling the replacement of the structure within 17 years.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation around wingwalls	$1,000.00
Stream and Waterways	Remove blockage at inlet and silt build-up	$2,500.00
	Maintenance Needs Total	**$3,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	6 to 10 years	$1,000.00
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	$1,000.00
Waterproof and pave	6 to 10 years	$25,000.00
Add slope stabilization	6 to 10 years	$8,000.00
General Items - Insurance, Mobilization, Access etc.	6 to 10 years	$75,000.00
Rehabilitation Cost Subtotal		**$115,000.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$130,000.00	$565,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$13,000.00	$57,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$57,000.00
	Total Capital Work Cost		**$158,000.00**	**$737,500.00**

1.21 Structure No. 2005 **2021 BCI: 94.7**

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:	17m	Roadway Width:	8.4 m
Year of Construction:	2014	Current Load Limit:	N/A

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

Justification:
Structure 2005 is generally in excellent condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. The Township may consider removing this structure from future biennial inspection lists since the span is less than 3 metres.

Maintenance Need	Element and Comments	Estimated Cost
Guide Rail	Tighten loose end treatment cables	$500.00
	Maintenance Needs Total	**$500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs			
Cost		**Rehabilitation**	**Replacement**
Subtotal:		N/A	$350,000.00
Roadside Protection:		N/A	$56,000.00
Staging:		N/A	$0.00
Environmental Assessment		N/A	$2,500.00
Contingencies:	10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M	N/A	$35,000.00
Total Capital Work Cost		**N/A**	**$478,500.00**

1.22 Structure No. 2006 **2021 BCI: 73.9**

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

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

Justification:
Structure 2006 is generally in good condition with only minor maintenance recommended at this time. Based on the current BCI, span of 3m (less than 4.5m), and low clearance a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 17 years.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	$500.00
Hazard Signs	Install hazard warning sign at structure in SE corner	$250.00
Bridge Cleaning	Remove silt and vegetation build-up in stream	$2,000.00
	Maintenance Needs Total	**$2,750.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$350,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$35,000.00
	Total Capital Work Cost		**N/A**	**$478,500.00**

1.23 Structure No. 2007 **2021 BCI: 69.1**

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

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

Justification:
Structure 2007 is generally in good to fair condition but is demonstrating signs of moisture penetration through the cracks in the soffit. Based on the span and low clearance, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 15 years. Consideration should also be given to investigating the need for a steel beam guide rail system with end treatments to help protect oncoming traffic. The repairs listed above may be completed to help extend the lifespan of the structure but would not be considered economical as a standalone contract.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation around wingwalls	$1,000.00
Erosion Control	Repair washout on SE embankment	$1,000.00
Hazard Signs	Straighten hazard warning signs at structure, raise SE hazard warning sign	$250.00
	Maintenance Needs Total	**$2,250.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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	N/A	$20,000.00
Add slope stabilization	N/A	$8,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$113,000.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$128,000.00	$365,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$13,000.00	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$37,000.00
	Total Capital Work Cost		**$157,000.00**	**$497,500.00**

1.24 Structure No. 2008 **2021 BCI: 72.8**

Structure Name:	Structure 2008		
Road Name:	15th Sideroad		
Location:	600m 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:	9.25m	Roadway Width:	6.2 m
Year of Construction:	1970	Current Load Limit:	N/A

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

Justification:
Structure 2008 is generally in good condition with only minor maintenance recommended at this time. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 16 years. The repairs listed above may be completed to help extend the lifespan of the structure but would not be considered economical as a standalone contract.

Maintenance Need	Element and Comments	Estimated Cost
Streams and Waterways	Remove fallen trees blocking inlet	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type B concrete repairs to soffit,	N/A	$1,000.00
Type C concrete repairs to wingwalls,	N/A	$3,500.00
Waterproof and pave	N/A	$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$99,500.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$114,500.00	$415,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$12,000.00	$42,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$42,000.00
	Total Capital Work Cost		**$141,500.00**	**$557,500.00**

1.25 Structure No. 2009 **2021 BCI: 85.7**

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

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

Justification:
Structure 2009 is generally in excellent to good condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to replacing the steel beam guide rail system, and end treatments to help protect oncoming traffic as well as installing a drip edge detail in the concrete soffit to help prevent future water damage.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	$1,000.00
Other	Consider installing drip edge detail in soffit	$2,500.00
	Maintenance Needs Total	**$3,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Replace Guide Rail, end treatments	1 to 5 Years	$56,000.00

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

Estimate Value of Replacement Structure	$600,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$600,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$60,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$60,000.00
	Total Capital Work Cost		**N/A**	**$778,500.00**

1.26 Structure No. 2010 **2021 BCI: 96.9**

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

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

Justification:
Structure 2010 was replaced in 2016 and is generally in excellent condition. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to investigating the need for steel beam guide rail with end treatments to help protect oncoming traffic.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
Total Capital Work Cost			**N/A**	**$538,500.00**

1.27 Structure No. 2011 **2021 BCI: 61.2**

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

Recommendation: Structure replacement is recommended within 8 years.

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. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 7 years. The repairs listed above may be completed to help extend the lifespan of the structure but are not considered economical as a standalone contract.

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 in NW corner	$250.00
Guide Rail	Tighten loose end treatment cables	$500.00
	Maintenance Needs Total	**$5,750.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	N/A	$2,500.00
Type B concrete repairs to soffit,	N/A	$8,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	$25,000.00
Remove fill and waterproof	N/A	$45,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$155,500.00**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities – Utility Relocation	6 to 10 years	$5,000.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$20,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$175,500.00	$470,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$18,000.00	$47,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$18,000.00	$47,000.00
	Total Capital Work Cost		**$211,500.00**	**$622,500.00**

1.28 Structure No. 2012 **2021 BCI: 70.2**

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

Recommendation: Structure replacement is recommended within 10 years.

Justification:
Structure 2012 is generally in good condition with the exception of wide cracks & movement noted in the wingwalls. It is recommended that the cracks & movement in the wingwalls be monitored during future biennial inspections. Based on the current BCI, span, and low clearance, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 10 years. The repairs listed above may be completed to help extend the lifespan of the structure but are not considered economical as a standalone contract.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along curbs and around wingwalls	$1,500.00
Hazard Signs	Replace damaged hazard warning signs at structure & install narrow bridge signs	$1,000.00
	Maintenance Needs Total	**$2,500.00**

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

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	$3,500.00
Type B concrete repairs to soffit,	N/A	$1,500.00
Type C concrete repairs to wingwalls,	N/A	$4,000.00
Install wingwall reinforcement	N/A	$8,000.00
Install barrier system	N/A	$15,000.00
Waterproof and pave	N/A	$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
	Rehabilitation Cost Subtotal	**$127,000.00**

Estimate Value of Replacement Structure	$500,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
	Total Associated Work Cost	**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$127,000.00	$500,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$13,000.00	$50,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$50,000.00
	Total Capital Work Cost		**$155,000.00**	**$658,500.00**

1.29 Structure No. 2013 **2021 BCI: 99.6**

Structure Name:	Structure 2013		
Road Name:	30th Sideroad		
Location:	500m 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:	14.63m	Roadway Width:	8 m
Year of Construction:	2020	Current Load Limit:	N/A

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

Justification:
Structure 2013 was replaced in 2020 and is generally in excellent condition with no capital works needed at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
Total Capital Work Cost			**N/A**	**$538,500.00**

1.30 Structure No. 2014 **2021 BCI: 73.4**

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

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

Justification:
Structure 2014 is generally in good condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities – Utility Relocation	N/A	$5,000.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$5,000.00**

Total Capital Works Costs			
Cost		**Rehabilitation**	**Replacement**
Subtotal:		N/A	$555,000.00
Roadside Protection:		N/A	$56,000.00
Staging:		N/A	$0.00
Environmental Assessment		N/A	$2,500.00
Contingencies:	10%	N/A	$56,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M	N/A	$56,000.00
Total Capital Work Cost		**N/A**	**$725,500.00**

1.31 Structure No. 2015 **2021 BCI: 82.9**

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

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

Justification:
Structure 2015, which was constructed in 2008, is generally in excellent to good condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove vegetation along guide rail	$500.00
Concrete Repair	Repair large spall on interior precast unit	$1,500.00
Erosion Control	Place rock protection along abutments	$2,000.00
Other	Install missing nuts/bolts in guide rail posts	$250.00
	Maintenance Needs Total	**$4,250.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$450,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$45,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$45,000.00
	Total Capital Work Cost		**N/A**	**$598,500.00**

1.32 Structure No. 2016 **2021 BCI: 71.1**

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

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

Justification:
Structure 2016, which has been previously rehabilitated, is generally in good condition but is demonstrating signs of concrete deterioration, and moisture penetration. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 16 years. Consideration should be given to investigating the need for steel beam guide rail, and end treatments to help protect oncoming traffic. The Township may consider removing this structure from their biennial bridge inspection list since the span is less than 3m.

Maintenance Need	Element and Comments	Estimated Cost
Rout and Seal	Rout and seal cracks in wearing surface	$500.00
Hazard Signs	Install hazard warning signs at structure	$1,000.00
	Maintenance Needs Total	**$1,500.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$350,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$35,000.00
	Total Capital Work Cost		**N/A**	**$478,500.00**

1.33 Structure No. 2017 **2021 BCI: 58.9**

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

Recommendation: Structure replacement is recommended within 9 years.

Justification:
Structure 2017 is generally in fair to poor condition and is demonstrating signs of severe section loss > 10% along the waterline. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 9 years. Alternatively, the repairs listed above may be completed to help extend the lifespan of the structure. Consideration should be given to investigating the need for steel beam guide rail, and end treatments to help protect oncoming traffic.

Maintenance Need	Element and Comments	Estimated Cost
Erosion Control	Repair washouts 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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Culvert paving with shotcrete	N/A	$100,000.00
Welded wire fabric	N/A	$5,000.00
Add slope stabilization	N/A	$8,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$188,000.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	6 to 10 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$203,000.00	$365,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$21,000.00	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$21,000.00	$37,000.00
	Total Capital Work Cost		**$246,000.00**	**$497,500.00**

1.34 Structure No. 2018 **2021 BCI: 69.2**

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

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

Justification:
Structure 2018 is generally in good to fair condition but is demonstrating signs of severe concrete deterioration on the culvert inlet. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 14 years. Consideration should also be given to installing a steel beam guide rail system with end treatments to help protect oncoming traffic. The repairs listed above may be completed to help extend the lifespan of the structure but would not be considered economical as a standalone contract. The Township may consider removing this structure from their biennial inspection list since the span is less than 3 metres.

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	$500.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Install Guide Rail, end treatments	1 to 5 Years	$56,000.00

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, outlet,	N/A	$15,000.00
Waterproof and pave	N/A	$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$115,000.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$130,000.00	$365,000.00
Roadside Protection:			$56,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$13,000.00	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$37,000.00
	Total Capital Work Cost		**$214,000.00**	**$497,500.00**

1.35 Structure No. 2019 **2021 BCI: 74.9**

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

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

Justification:
Structure 2019 is generally in good condition with only minor maintenance recommended at this time. The repairs listed above may be completed to help extend the lifespan of the structure but would not be considered economical as a standalone contract. Consideration should be given to installing steel beam guide rail with end treatments to help protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Install Guide Rail, end treatments	1 to 5 Years	$56,000.00

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	$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$101,000.00**

Estimate Value of Replacement Structure	$550,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$101,000.00	$550,000.00
Roadside Protection:			$56,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$11,000.00	$55,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$55,000.00
	Total Capital Work Cost		**$183,000.00**	**$718,500.00**

1.36 Structure No. 2020 **2021 BCI: 96.6**

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

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

Justification:
Structure 2020 is generally in excellent condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to investigating the need for steel beam guide rail to help protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
Total Capital Work Cost			**N/A**	**$538,500.00**

1.37 Structure No. 2021 **2021 BCI: 50.5**

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

Recommendation: Structure replacement is recommended within 5 years.

Justification:
Structure 2021 is generally in poor condition with bolt hole cracking throughout the culvert barrel. Based on the structure type a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 5 years. Steel reinforcement was welded to the bolt hole cracks in 2019 however, the Township should establish a monitoring program for the bolt hole cracking until the structure can be replaced. Consideration should be given to investigating the need for steel beam guide rail, end treatments to help protect oncoming traffic.

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

Additional Investigations	Priority	Estimated Cost
Monitoring Crack Widths,	Normal	$5,000.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$450,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$45,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$45,000.00
	Total Capital Work Cost		**N/A**	**$598,500.00**

1.38 Structure No. 2022 **2021 BCI: 74.2**

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

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

Justification:
Structure 2022 is generally in good condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to investigating the need for steel beam guide rail, and end treatments to help protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$350,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$35,000.00
	Total Capital Work Cost		**N/A**	**$478,500.00**

1.39 Structure No. 2023 **2021 BCI: 62.6**

Structure Name:	Structure 2023		
Road Name:	4th Line NE		
Location:	400 m South of County Road 21 (Lot16, Con. 4 & 5 NE)		
Structure Type:	Cast-In-Place Conc. Box Culvert		
Number of Spans:	1	Span Lengths:	3.6 m
Overall Structure Width:	14.1m	Roadway Width:	6.5 m
Year of Construction:	Unknown	Current Load Limit:	N/A

Recommendation: Minor Rehabilitation is recommended within 1 years.

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. Given the relatively small span, The Township may wish to continue monitoring the structure's BCI during future biennial inspections and consider replacement as the BCI reaches 40, which is estimated to occur in approximately 11 years. However, given that the culvert interior is generally in good condition, reconstructing the culvert ends, exposing the deck to repair and apply waterproofing, backfilling and paving would help extend the service life and is the recommended action. With the current BCI approaching 60, rehabilitation should be scheduled within 1-2 years. Consideration should also be given to investigating the need for steel beam guide rail, and end treatments to help protect oncoming traffic.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove fill and overgrown vegetation over culvert ends and around hazard warning signs	$2,000.00
	Maintenance Needs Total	**$2,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top,	1 to 5 years	$5,000.00
Type C concrete repairs to barrels, 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	$75,000.00
	Rehabilitation Cost Subtotal	**$145,000.00**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	1 to 5 years	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$160,000.00	$465,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$16,000.00	$47,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$16,000.00	$47,000.00
		Total Capital Work Cost	**$193,000.00**	**$617,500.00**

1.40 Structure No. 2024 **2021 BCI: 96.5**

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

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

Justification:
Structure 2024 was recently replaced in 2016 and is generally in excellent condition. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should be given to investigating the need for steel beam guide rail with end treatments to help protect oncoming traffic.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$350,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$35,000.00
Total Capital Work Cost			**N/A**	**$478,500.00**

1.41 Structure No. 2025 **2021 BCI: 65.5**

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

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

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. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 13 years. Consideration should be given to investigating the need for steel beam guide rail, and end treatments to protect oncoming traffic.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
Total Capital Work Cost			**N/A**	**$538,500.00**

1.42 Structure No. 2026 **2021 BCI: 83.3**

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

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

Justification:
Structure 2026 is generally in excellent to good to excellent condition. However, several areas of minor localized deformations and cusping were noted but may be from original construction. The deformations and cusping should be monitored during future biennial inspections to ensure they are not actively progressing. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. Consideration should also be given to replacing the steel beam guide rail system and end treatments to help protect oncoming traffic.

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

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

Roadside Protection Repairs	Priority	Estimated Cost
Replace Guide Rail, end treatments	1 to 5 Years	$56,000.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$365,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$37,000.00
		Total Capital Work Cost	**N/A**	**$497,500.00**

1.43 Structure No. 2027 **2021 BCI: 95**

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

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

Justification:
Structure 2027 is generally in excellent condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Guide Rail	Bury channel ends, tighten loose end treatment cables	$1,000.00
	Maintenance Needs Total	**$1,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
	Total Capital Work Cost		**N/A**	**$538,500.00**

1.44 Structure No. 2028 **2021 BCI: 92.5**

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

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

Justification:
Structure 2028 is generally in excellent condition with only minor maintenance recommended at this time. The Township should ensure routine maintenance is completed to help maximize the service life of the structure. The Township may wish to consider removing the culvert from the future bridge inspection list as the span of the new structure is less than 3 metres.

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	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$350,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$35,000.00
	Total Capital Work Cost		**N/A**	**$478,500.00**

1.45 Structure No. 2029 **2021 BCI: 74**

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

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

Justification:
Structure 2029 is generally in good condition but is demonstrating signs of potential movement/rotation of the south abutment and SE wingwall. Based on the span, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 17 years. However, if the movements/rotations in the substructure progress then the replacement timeline should be expedited. It is also recommended that a monitoring program be established to monitor the movement/rotation observed in the substructure. The repairs listed above may be completed to help extend the lifespan of the structure but would not be considered economical as a standalone contract.

Maintenance Need	Element and Comments	Estimated Cost
Hazard Signs	Raise hazard warning signs at structure	$500.00
	Maintenance Needs Total	**$500.00**

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

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$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	$500.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$78,500.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$78,500.00	$350,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$8,000.00	$35,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$35,000.00
	Total Capital Work Cost		**$101,500.00**	**$478,500.00**

1.46 Structure No. 2030 **2021 BCI: 63.8**

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

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

Justification:
Structure 2030 is generally in fair condition and is demonstrating signs of concrete deterioration and moisture penetration throughout. Based on the span, and sub-standard driving platform width, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 12 years. The repairs listed above may be completed to help extend the lifespan of the structure.

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

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type A concrete repairs to deck top, curbs,	N/A	$8,000.00
Type B concrete repairs to soffit,	N/A	$5,000.00
Type C concrete repairs to abutment walls, wingwalls,	N/A	$15,000.00
Waterproof and pave	N/A	$20,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$75,000.00
Rehabilitation Cost Subtotal		**$123,000.00**

Estimate Value of Replacement Structure	$350,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$138,000.00	$365,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$14,000.00	$37,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$15,000.00	$37,000.00
	Total Capital Work Cost		**$167,000.00**	**$497,500.00**

1.47 Structure No. 2031 **2021 BCI: 85.2**

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

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

Justification:
Structure 2031 is generally in excellent to good condition. It is recommended that the localized deformation in the culvert barrel be monitored during future biennial inspections to ensure it is not actively progressing. The Township should ensure routine maintenance is completed to help maximize the service life of the structure.

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	Priority	Estimated Cost
Monitoring of Deformations, Settlements and Movements,	Normal	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$0.00

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

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$400,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$40,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$40,000.00
	Total Capital Work Cost		**N/A**	**$538,500.00**

1.48 Structure No. 2032 **2021 BCI: 61.7**

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

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

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. Based on the structure type, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 11 years. It is recommended that the deformations noted in the south culvert barrel be monitored during future biennial inspections to ensure they are not actively progressing. Consideration should also be given to investigating the need for a steel beam guide rail system, and end treatments to help protect oncoming traffic.

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

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

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

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

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -		$0.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
	Total Associated Work Cost	**$0.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			N/A	$450,000.00
Roadside Protection:			N/A	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	N/A	$45,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		N/A	$45,000.00
		Total Capital Work Cost	**N/A**	**$598,500.00**

1.49 Structure No. 2033 **2021 BCI: 71.7**

Structure Name:	Structure 2033		
Road Name:	7th Line SW		
Location:	0.25km 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:	12.2m	Roadway Width:	6 m
Year of Construction:	Unknown	Current Load Limit:	N/A

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

Justification:
Structure 2033 is generally in good condition however, the existing embankments are eroded, very steep and appear unstable. Based on the span, and low clearance, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 17 years. However, it is recommended that the Township consider constructing headwalls, retaining walls, and placing slope protection within 1 year to avoid potential failure of the embankments and loss of road material. Consideration should also be given to investigating the need for a steel beam guide rail system with end treatments to help protect oncoming traffic.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove tree growing over inlet	$1,000.00
Hazard Signs	Raise hazard warning signs on west side of structure	$250.00
	Maintenance Needs Total	**$1,250.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
Investigate need for Guide Rail	1 to 5 Years	$1,000.00

Rehabilitation/Repair Required	Priority	Estimated Cost
Type C concrete repairs to barrels, inlet, outlet,	N/A	$5,000.00
Install headwalls & retaining walls	Within 1 year	$50,000.00
Add slope stabilization	Within 1 year	$12,000.00
General Items - Insurance, Mobilization, Access etc.	N/A	$70,000.00
Rehabilitation Cost Subtotal		**$137,000.00**

Estimate Value of Replacement Structure	$400,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	Within 1 year	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$152,000.00	$415,000.00
Roadside Protection:			$1,000.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$16,000.00	$42,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$16,000.00	$42,000.00
	Total Capital Work Cost		**$185,000.00**	**$557,500.00**

1.50 Structure No. 2034 **2021 BCI: 65.9**

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

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

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. Based on the span and low clearance, a rehabilitation is not recommended and replacement of the structure is recommended once the BCI reaches 40, in approximately 13 years. However, the repairs listed above may be completed to help extend the lifespan of the structure.

Maintenance Need	Element and Comments	Estimated Cost
Bridge Cleaning	Remove overgrown vegetation blocking waterway	$2,500.00
Erosion Control	Repair erosion on SE embankment	$1,000.00
Hazard Signs	Install additional hazard warning signs at structure	$500.00
	Maintenance Needs Total	**$4,000.00**

Additional Investigations	Priority	Estimated Cost
N/A	N/A	$0.00

Roadside Protection Repairs	Priority	Estimated Cost
N/A	N/A	$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	$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	$75,000.00
Rehabilitation Cost Subtotal		**$147,000.00**

Estimate Value of Replacement Structure	$450,000.00

Associated Work	Priority	Estimated Cost
Approaches -		$0.00
Detours -		$0.00
Traffic Control -	N/A	$15,000.00
Utilities -		$0.00
Right of Way -		$0.00
Environmental -		$0.00
Other -		$0.00
Total Associated Work Cost		**$15,000.00**

Total Capital Works Costs				
Cost			**Rehabilitation**	**Replacement**
Subtotal:			$162,000.00	$465,000.00
Roadside Protection:			$0.00	$56,000.00
Staging:			N/A	$0.00
Environmental Assessment			N/A	$2,500.00
Contingencies:		10%	$17,000.00	$47,000.00
Engineering Design:	10% of first $1M + 5% of cost above $1M		$17,000.00	$47,000.00
Total Capital Work Cost			**$196,000.00**	**$617,500.00**

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
001	2021	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	72.16
003	2021	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
005	2021	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
006	2021	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	78.61
007	2021	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
008	2021	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	CC	70.47
009	2021	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
010	2021	Structure 010	280 Sideroad	LOT 11 & 12, CON 10 SW	Steel I-Girder (Timber Deck)	10.38	5.5	61.88	BR	90.43
011	2021	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-1	69.55
012	2021	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	86.26
013	2021	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	74.82
014	2021	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	71.14
015	2021	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	74.19
016	2021	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	70.46
017	2021	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	BR-1	74.75
018	2021	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	69.06
2001	2021	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	2021	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	2021	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	75.00
2004	2021	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	73.88
2005	2021	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	94.66
2006	2021	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	73.92
2007	2021	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	2021	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	2021	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	85.74
2010	2021	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	96.94
2011	2021	Structure 2011	20th Sideroad	2 km East of 5th Line (Lots 20 & 21, Con. 3 O.S.)	Cast-In-Place Conc. Rigid Frame	3.65	12.7	57.15	CC	61.15
2012	2021	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	70.24
2013	2021	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	99.62
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	73.41
2015	2021	Structure 2015	10th Line Northeast	300m Northeast of 5th Line (Lot 25, Con. 10 & 11)	Precast Concrete Box Culvert	4	9.5	44.65	BR	82.89
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	71.10
2017	2021	Structure 2017	2nd Line NE	1.4 km South of County Road 9 (Lot 28, Con. 2 & 3 NE)	CSP Multi-Plate Arch Culvert(s)	2.5	17.2	43	CS	58.92
2018	2021	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	2021	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	BR	74.86
2020	2021	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	96.62
2021	2021	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	50.50
2022	2021	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	2021	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	96.54
2025	2021	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	2021	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	2021	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	94.99
2028	2021	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	92.51
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	74.01
2030	2021	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	63.81
2031	2021	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	2021	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	2021	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	2021	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	Roadside Protection	Structure Repair/ Replacement	Associated Work	Staging	Environmental Assessment	Contingency	Engineering Design	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
2021	2021	2nd Line NE	CS	50.50	N/A	5.25	N/A	$ 598,500.00	Replace	$ 1,000.00	$ 5,000.00	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ 598,500.00	$ -	$ 598,500.00
2017	2021	2nd Line NE	CS	58.92	N/A	9.46	$ 246,000.00	$ 497,500.00	Replace	$ 2,500.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ 497,500.00	$ 497,500.00
2011	2021	20th Sideroad	CC	61.15	N/A	7.50	$ 211,500.00	$ 622,500.00	Replace	$ 5,750.00	$ -	$ 56,000.00	$ 450,000.00	$ 20,000.00	$ -	$ 2,500.00	$ 47,000.00	$ 47,000.00	$ -	$ -	$ 622,500.00	$ 622,500.00
2032	2021	2nd Line Northeast	CS	61.74	N/A	10.87	N/A	$ 598,500.00	Replace	$ 2,000.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2023	2021	4th Line NE	BR-1	62.56	1.28	11.28	$ 193,000.00	$ 617,500.00	Rehabilitate	$ 2,000.00	$ -	$ 1,000.00	$ 145,000.00	$ 15,000.00	N/A	$ -	$ 16,000.00	$ 16,000.00	$ -	$ 193,000.00	$ -	$ 193,000.00
2030	2021	240 Sideroad	BR	63.81	N/A	11.91	$ 167,000.00	$ 497,500.00	Replace	$ 2,750.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
003	2021	5th Sideroad	BR	65.31	N/A	12.66	$ 195,000.00	$ 557,500.00	Replace	$ 6,500.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
2025	2021	Sideroad 260	CS	65.52	N/A	12.76	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2034	2021	Mulmur-Melancthon Townline	BR	65.85	N/A	12.93	$ 196,000.00	$ 617,500.00	Replace	$ 4,000.00	$ -	$ 56,000.00	$ 450,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 47,000.00	$ 47,000.00	$ -	$ -	$ -	$ -
007	2021	7th Line SW	BR-1	66.89	3.45	13.45	$ 211,000.00	$ 1,037,500.00	Rehabilitate	$ 2,500.00	$ -	$ -	$ 160,000.00	$ 15,000.00	N/A	$ -	$ 18,000.00	$ 18,000.00	$ -	$ 211,000.00	$ -	$ 211,000.00
018	2021	2nd Line NE	BR-1	69.06	4.53	14.53	$ 237,500.00	$ 802,500.00	Rehabilitate	$ -	$ -	$ -	$ 177,500.00	$ 20,000.00	N/A	$ -	$ 20,000.00	$ 20,000.00	$ -	$ 237,500.00	$ -	$ 237,500.00
2007	2021	15th Sideroad	BR	69.13	N/A	14.56	$ 157,000.00	$ 497,500.00	Replace	$ 2,250.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2018	2021	2nd Line NE	CC	69.23	N/A	14.61	$ 214,000.00	$ 497,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
011	2021	8th Line SW	BR-1	69.55	4.78	14.78	$ 255,000.00	$ 1,976,000.00	Rehabilitate	$ 250.00	$ -	$ -	$ 172,500.00	$ 22,500.00	N/A	$ -	$ 20,000.00	$ 20,000.00	$ -	$ 235,000.00	$ -	$ 235,000.00
2012	2021	30th Sideroad	BR	70.24	N/A	10.00	$ 155,000.00	$ 658,500.00	Replace	$ 2,500.00	$ -	$ 56,000.00	$ 500,000.00	$ -	$ -	$ 2,500.00	$ 50,000.00	$ 50,000.00	$ -	$ -	$ 658,500.00	$ 658,500.00
016	2021	250 Sideroad	BR-1	70.46	5.40	15.23	$ 276,000.00	$ 1,391,500.00	Rehabilitate	$ 3,000.00	$ -	$ -	$ 215,000.00	$ 15,000.00	N/A	$ -	$ 23,000.00	$ 23,000.00	$ -	$ 276,000.00	$ -	$ 276,000.00
008	2021	7th Line SW	CC	70.47	N/A	15.47	$ 168,000.00	$ 737,500.00	Replace	$ 2,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 57,000.00	$ 57,000.00	$ -	$ -	$ -	$ -
2001	2021	3rd Line	CS	70.68	N/A	15.38	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2016	2021	4th Line NE	CC	71.10	N/A	16.10	N/A	$ 478,500.00	Replace	$ 1,500.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
014	2021	4th Line SW	BR-1	71.14	5.57	15.57	$ 331,000.00	$ 1,621,500.00	Rehabilitate	$ 2,750.00	$ -	$ -	$ 260,000.00	$ 15,000.00	N/A	$ -	$ 28,000.00	$ 28,000.00	$ -	$ -	$ 331,000.00	$ 331,000.00
2033	2021	7th Line SW	CC	71.69	N/A	16.69	$ 185,000.00	$ 557,500.00	Replace	$ 1,250.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
001	2021	4th Line SW	BR	72.16	N/A	16.08	$ 160,500.00	$ 502,500.00	Replace	$ 7,000.00	$ -	$ 56,000.00	$ 350,000.00	$ 20,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
005	2021	2nd Line SW	BR-1	72.76	6.38	16.38	$ 189,500.00	$ 977,500.00	Rehabilitate	$ 1,500.00	$ -	$ 1,000.00	$ 141,500.00	$ 15,000.00	N/A	$ -	$ 16,000.00	$ 16,000.00	$ -	$ -	$ 189,500.00	$ 189,500.00
2008	2021	15th Sideroad	BR	72.84	N/A	16.42	$ 141,500.00	$ 557,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
009	2021	8th Line SW	BR-1	72.93	6.46	16.46	$ 276,000.00	$ 1,097,500.00	Rehabilitate	$ 1,500.00	$ -	$ -	$ 215,000.00	$ 15,000.00	N/A	$ -	$ 23,000.00	$ 23,000.00	$ -	$ -	$ 276,000.00	$ 276,000.00
2014	2021	4th Line	BR	73.41	N/A	16.71	N/A	$ 725,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 5,000.00	$ -	$ 2,500.00	$ 56,000.00	$ 56,000.00	$ -	$ -	$ -	$ -
2004	2021	5th Sideroad	BR-1	73.88	6.94	16.94	$ 158,000.00	$ 737,500.00	Rehabilitate	$ 3,500.00	$ -	$ -	$ 115,000.00	$ 15,000.00	N/A	$ -	$ 13,000.00	$ 15,000.00	$ -	$ -	$ 158,000.00	$ 158,000.00
2006	2021	3rd Line	BR	73.92	N/A	16.96	N/A	$ 478,500.00	Replace	$ 2,750.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2029	2021	220 Sideroad	BR	74.01	N/A	17.00	$ 101,500.00	$ 478,500.00	Replace	$ 500.00	$ 5,000.00	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
015	2021	2nd Line SW	BR-1	74.19	N/A	30.19	N/A	$ 1,603,500.00	Replace	$ -	$ -	$ 56,000.00	$ 1,300,000.00	$ -	$ -	$ 2,500.00	$ 130,000.00	$ 115,000.00	$ -	$ -	$ -	$ -
2022	2021	4th Line NE	CC	74.19	N/A	19.19	N/A	$ 478,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
017	2021	250 Sideroad	BR-1	74.75	7.37	17.37	N/A	$ 1,488,500.00	Rehabilitate	$ -	$ -	$ 56,000.00	$ -	$ -	N/A	$ -	N/A	N/A	$ -	$ -	$ -	$ -
013	2021	260 Sideroad	BR-1	74.82	N/A	30.00	N/A	$ 1,621,500.00	Replace	$ -	$ -	$ 56,000.00	$ 1,300,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 132,000.00	$ 116,000.00	$ -	$ -	$ -	$ -
2019	2021	4th Line NE	BR	74.86	N/A	17.43	$ 183,000.00	$ 718,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ -	$ -	$ 2,500.00	$ 55,000.00	$ 55,000.00	$ -	$ -	$ -	$ -
2002	2021	5th Sideroad	CS	74.96	N/A	17.76	N/A	$ 598,500.00	Replace	$ 2,250.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2003	2021	3rd Line	CS	75.00	0.00	17.78	N/A	$ 737,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 57,000.00	$ 57,000.00	$ -	$ -	$ -	$ -
006	2021	4th Line SW	BR-1	78.61	14.80	24.80	$ 37,000.00	$ 1,018,500.00	Rehabilitate	$ 9,500.00	$ -	$ -	$ 20,000.00	$ -	N/A	$ -	$ 2,000.00	$ 15,000.00	$ -	$ 37,000.00	$ -	$ 37,000.00
2015	2021	10th Line Northeast	BR	82.89	N/A	28.19	N/A	$ 598,500.00	Replace	$ 4,250.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2026	2021	8th Line SW	CS	83.26	N/A	22.37	N/A	$ 497,500.00	Replace	$ -	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2031	2021	240 Sideroad	CS	85.22	N/A	23.46	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2009	2021	15th Sideroad	BR	85.74	N/A	29.62	N/A	$ 778,500.00	Replace	$ 3,500.00	$ -	$ 56,000.00	$ 600,000.00	$ -	$ -	$ 2,500.00	$ 60,000.00	$ 60,000.00	$ -	$ -	$ -	$ -
012	2021	7th Line SW	BR-1	86.26	19.63	29.63	N/A	$ 1,833,500.00	Rehabilitate	$ 1,000.00	$ -	$ -	$ -	$ -	N/A	$ -	N/A	N/A	$ -	$ -	$ -	$ -
010	2021	280 Sideroad	BR	90.43	N/A	39.17	N/A	$ 1,078,500.00	Replace	$ 1,500.00	$ -	$ 56,000.00	$ 850,000.00	$ -	$ -	$ 2,500.00	$ 85,000.00	$ 85,000.00	$ -	$ -	$ -	$ -
2028	2021	Main Street(County Road 14)	CC	92.51	N/A	37.51	N/A	$ 478,500.00	Replace	$ 1,250.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2005	2021	3rd Line	CS	94.66	N/A	28.70	N/A	$ 478,500.00	Replace	$ 500.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2027	2021	15 Sideroad	CC	94.99	N/A	39.99	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2024	2021	2nd Line NE	CC	96.54	N/A	41.54	N/A	$ 478,500.00	Replace	$ -	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2020	2021	4th Line NE	CC	96.62	N/A	41.62	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2010	2021	3rd Line	CS	96.94	N/A	29.97	N/A	$ 538,500.00	Replace	$ -	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2013	2021	30th Sideroad	BR	99.62	N/A	41.81	N/A	$ 538,500.00	Replace	$ -	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
Sub Totals										**$ 96,000.00**	**$ 10,000.00**	**$ 2,186,000.00**	**$ 19,621,500.00**	**$ 372,500.00**	**$ -**	**$ 95,000.00**	**$ 2,008,000.00**	**$ 1,992,000.00**	**$ -**	**$ 1,788,000.00**	**$ 2,733,000.00**	**$ 4,521,000.00**

TOWNSHIP OF MELANCTHON - REHABILITATION CAPITAL WORKS

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	Roadside Protection	Structure Repair/ Replacement	Associated Work	Staging	Environmental Assessment	Contingency	Engineering Design	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	BR-1	62.56	1.28	11.28	$ 193,000.00	$ 617,500.00	Rehabilitate	$ 2,000.00	$ -	$ 1,000.00	$ 145,000.00	$ 15,000.00	N/A	$ -	$ 16,000.00	$ 16,000.00	$ -	$ 193,000.00	$ -	$ 193,000.00
007	2021	7th Line SW	BR-1	66.89	3.45	13.45	$ 211,000.00	$ 1,037,500.00	Rehabilitate	$ 2,500.00	$ -	$ -	$ 160,000.00	$ 15,000.00	N/A	$ -	$ 18,000.00	$ 18,000.00	$ -	$ 211,000.00	$ -	$ 211,000.00
018	2021	2nd Line NE	BR-1	69.06	4.53	14.53	$ 237,500.00	$ 802,500.00	Rehabilitate	$ -	$ -	$ -	$ 177,500.00	$ 20,000.00	N/A	$ -	$ 20,000.00	$ 20,000.00	$ -	$ 237,500.00	$ -	$ 237,500.00
011	2021	8th Line SW	BR-1	69.55	4.78	14.78	$ 255,000.00	$ 1,976,000.00	Rehabilitate	$ 250.00	$ -	$ -	$ 172,500.00	$ 22,500.00	N/A	$ -	$ 20,000.00	$ 20,000.00	$ -	$ 235,000.00	$ -	$ 235,000.00
016	2021	250 Sideroad	BR-1	70.46	5.40	15.23	$ 276,000.00	$ 1,391,500.00	Rehabilitate	$ 3,000.00	$ -	$ -	$ 215,000.00	$ 15,000.00	N/A	$ -	$ 23,000.00	$ 23,000.00	$ -	$ 276,000.00	$ -	$ 276,000.00
014	2021	4th Line SW	BR-1	71.14	5.57	15.57	$ 331,000.00	$ 1,621,500.00	Rehabilitate	$ 2,750.00	$ -	$ -	$ 260,000.00	$ 15,000.00	N/A	$ -	$ 28,000.00	$ 28,000.00	$ -	$ -	$ 331,000.00	$ 331,000.00
005	2021	2nd Line SW	BR-1	72.76	6.38	16.38	$ 189,500.00	$ 977,500.00	Rehabilitate	$ 1,500.00	$ -	$ 1,000.00	$ 141,500.00	$ 15,000.00	N/A	$ -	$ 16,000.00	$ 16,000.00	$ -	$ -	$ 189,500.00	$ 189,500.00
009	2021	8th Line SW	BR-1	72.93	6.46	16.46	$ 276,000.00	$ 1,097,500.00	Rehabilitate	$ 1,500.00	$ -	$ -	$ 215,000.00	$ 15,000.00	N/A	$ -	$ 23,000.00	$ 23,000.00	$ -	$ -	$ 276,000.00	$ 276,000.00
2004	2021	5th Sideroad	BR-1	73.88	6.94	16.94	$ 158,000.00	$ 737,500.00	Rehabilitate	$ 3,500.00	$ -	$ -	$ 115,000.00	$ 15,000.00	N/A	$ -	$ 13,000.00	$ 15,000.00	$ -	$ -	$ 158,000.00	$ 158,000.00
017	2021	250 Sideroad	BR-1	74.75	7.37	17.37	N/A	$ 1,488,500.00	Rehabilitate	$ -	$ -	$ 56,000.00	$ -	$ -	N/A	$ -	N/A	N/A	$ -	$ -	$ -	$ -
006	2021	4th Line SW	BR-1	78.61	14.80	24.80	$ 37,000.00	$ 1,018,500.00	Rehabilitate	$ 9,500.00	$ -	$ -	$ 20,000.00	$ -	N/A	$ -	$ 2,000.00	$ 15,000.00	$ -	$ 37,000.00	$ -	$ 37,000.00
012	2021	7th Line SW	BR-1	86.26	19.63	29.63	N/A	$ 1,833,500.00	Rehabilitate	$ 1,000.00	$ -	$ -	$ -	$ -	N/A	$ -	N/A	N/A	$ -	$ -	$ -	$ -
Sub Totals										**$ 27,500.00**	**$ -**	**$ 58,000.00**	**$ 1,621,500.00**	**$ 147,500.00**	**$ -**	**$ -**	**$ 179,000.00**	**$ 194,000.00**	**$ -**	**$ 1,189,500.00**	**$ 954,500.00**	**$ 2,144,000.00**

TOWNSHIP OF MELANCTHON - REPLACEMENT CAPITAL WORKS

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	Roadside Protection	Structure Repair/ Replacement	Associated Work	Staging	Environmental Assessment	Contingency	Engineering Design	Capital Works Within 1 year	Capital Works 1 - 5 Years	Capital Works 6 - 10 Years	10-Year Capital Works Cost
2021	2021	2nd Line NE	CS	50.50	N/A	5.25	N/A	$ 598,500.00	Replace	$ 1,000.00	$ 5,000.00	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ 598,500.00	$ -	$ 598,500.00
2011	2021	20th Sideroad	CC	61.15	N/A	7.50	$ 211,500.00	$ 622,500.00	Replace	$ 5,750.00	$ -	$ 56,000.00	$ 450,000.00	$ 20,000.00	$ -	$ 2,500.00	$ 47,000.00	$ 47,000.00	$ -	$ -	$ 622,500.00	$ 622,500.00
2017	2021	2nd Line NE	CS	58.92	N/A	9.46	$ 246,000.00	$ 497,500.00	Replace	$ 2,500.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ 497,500.00	$ 497,500.00
2012	2021	30th Sideroad	BR	70.24	N/A	10.00	$ 155,000.00	$ 658,500.00	Replace	$ 2,500.00	$ -	$ 56,000.00	$ 500,000.00	$ -	$ -	$ 2,500.00	$ 50,000.00	$ 50,000.00	$ -	$ -	$ 658,500.00	$ 658,500.00
2032	2021	2nd Line Northeast	CS	61.74	N/A	10.87	N/A	$ 598,500.00	Replace	$ 2,000.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2030	2021	240 Sideroad	BR	63.81	N/A	11.91	$ 167,000.00	$ 497,500.00	Replace	$ 2,750.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
003	2021	5th Sideroad	BR	65.31	N/A	12.66	$ 195,000.00	$ 557,500.00	Replace	$ 6,500.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
2025	2021	Sideroad 260	CS	65.52	N/A	12.76	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2034	2021	Mulmur-Melancthon Townline	BR	65.85	N/A	12.93	$ 196,000.00	$ 617,500.00	Replace	$ 4,000.00	$ -	$ 56,000.00	$ 450,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 47,000.00	$ 47,000.00	$ -	$ -	$ -	$ -
2007	2021	15th Sideroad	BR	69.13	N/A	14.56	$ 157,000.00	$ 497,500.00	Replace	$ 2,250.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2018	2021	2nd Line NE	CC	69.23	N/A	14.61	$ 214,000.00	$ 497,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2001	2021	3rd Line	CS	70.68	N/A	15.38	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
008	2021	7th Line SW	CC	70.47	N/A	15.47	$ 168,000.00	$ 737,500.00	Replace	$ 2,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 57,000.00	$ 57,000.00	$ -	$ -	$ -	$ -
001	2021	4th Line SW	BR	72.16	N/A	16.08	$ 160,500.00	$ 502,500.00	Replace	$ 7,000.00	$ -	$ 56,000.00	$ 350,000.00	$ 20,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2016	2021	4th Line NE	CC	71.10	N/A	16.10	N/A	$ 478,500.00	Replace	$ 1,500.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2008	2021	15th Sideroad	BR	72.84	N/A	16.42	$ 141,500.00	$ 557,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
2033	2021	7th Line SW	CC	71.69	N/A	16.69	$ 185,000.00	$ 557,500.00	Replace	$ 1,250.00	$ -	$ 56,000.00	$ 400,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 42,000.00	$ 42,000.00	$ -	$ -	$ -	$ -
2014	2021	4th Line	BR	73.41	N/A	16.71	N/A	$ 725,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 5,000.00	$ -	$ 2,500.00	$ 56,000.00	$ 56,000.00	$ -	$ -	$ -	$ -
2006	2021	3rd Line	BR	73.92	N/A	16.96	N/A	$ 478,500.00	Replace	$ 2,750.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2029	2021	220 Sideroad	BR	74.01	N/A	17.00	$ 101,500.00	$ 478,500.00	Replace	$ 500.00	$ 5,000.00	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2019	2021	4th Line NE	BR	74.86	N/A	17.43	$ 183,000.00	$ 718,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ -	$ -	$ 2,500.00	$ 55,000.00	$ 55,000.00	$ -	$ -	$ -	$ -
2002	2021	5th Sideroad	CS	74.96	N/A	17.76	N/A	$ 598,500.00	Replace	$ 2,250.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2003	2021	3rd Line	CS	75.00	0.00	17.78	N/A	$ 737,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 550,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 57,000.00	$ 57,000.00	$ -	$ -	$ -	$ -
2022	2021	4th Line NE	CC	74.19	N/A	19.19	N/A	$ 478,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2026	2021	8th Line SW	CS	83.26	N/A	22.37	N/A	$ 497,500.00	Replace	$ -	$ -	$ 56,000.00	$ 350,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 37,000.00	$ 37,000.00	$ -	$ -	$ -	$ -
2031	2021	240 Sideroad	CS	85.22	N/A	23.46	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2015	2021	10th Line Northeast	BR	82.89	N/A	28.19	N/A	$ 598,500.00	Replace	$ 4,250.00	$ -	$ 56,000.00	$ 450,000.00	$ -	$ -	$ 2,500.00	$ 45,000.00	$ 45,000.00	$ -	$ -	$ -	$ -
2005	2021	3rd Line	CS	94.66	N/A	28.70	N/A	$ 478,500.00	Replace	$ 500.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2009	2021	15th Sideroad	BR	85.74	N/A	29.62	N/A	$ 778,500.00	Replace	$ 3,500.00	$ -	$ 56,000.00	$ 600,000.00	$ -	$ -	$ 2,500.00	$ 60,000.00	$ 60,000.00	$ -	$ -	$ -	$ -
2010	2021	3rd Line	CS	96.94	N/A	29.97	N/A	$ 538,500.00	Replace	$ -	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
013	2021	260 Sideroad	BR-1	74.82	N/A	30.00	N/A	$ 1,621,500.00	Replace	$ -	$ -	$ 56,000.00	$ 1,300,000.00	$ 15,000.00	$ -	$ 2,500.00	$ 132,000.00	$ 116,000.00	$ -	$ -	$ -	$ -
015	2021	2nd Line SW	BR-1	74.19	N/A	30.19	N/A	$ 1,603,500.00	Replace	$ -	$ -	$ 56,000.00	$ 1,300,000.00	$ -	$ -	$ 2,500.00	$ 130,000.00	$ 115,000.00	$ -	$ -	$ -	$ -
2028	2021	Main Street(County Road 14)	CC	92.51	N/A	37.51	N/A	$ 478,500.00	Replace	$ 1,250.00	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
010	2021	280 Sideroad	BR	90.43	N/A	39.17	N/A	$ 1,078,500.00	Replace	$ 1,500.00	$ -	$ 56,000.00	$ 850,000.00	$ -	$ -	$ 2,500.00	$ 85,000.00	$ 85,000.00	$ -	$ -	$ -	$ -
2027	2021	15 Sideroad	CC	94.99	N/A	39.99	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2024	2021	2nd Line NE	CC	96.54	N/A	41.54	N/A	$ 478,500.00	Replace	$ -	$ -	$ 56,000.00	$ 350,000.00	$ -	$ -	$ 2,500.00	$ 35,000.00	$ 35,000.00	$ -	$ -	$ -	$ -
2020	2021	4th Line NE	CC	96.62	N/A	41.62	N/A	$ 538,500.00	Replace	$ 1,000.00	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
2013	2021	30th Sideroad	BR	99.62	N/A	41.81	N/A	$ 538,500.00	Replace	$ -	$ -	$ 56,000.00	$ 400,000.00	$ -	$ -	$ 2,500.00	$ 40,000.00	$ 40,000.00	$ -	$ -	$ -	$ -
Sub Totals										**$ 68,500.00**	**$ 10,000.00**	**$2,128,000.00**	**$ 18,000,000.00**	**$ 225,000.00**	**$ -**	**$ 95,000.00**	**$ 1,829,000.00**	**$ 1,798,000.00**	**$ -**	**$ 598,500.00**	**$ 1,778,500.00**	**$ 2,377,000.00**

TOWNSHIP OF MELANCTHON - MAINTENANCE NEEDS

Structure Name	Road Name	Maintenance Need	Estimated Maintenance Costs
001	4th Line SW	Remove vegetation along curbs and around wingwalls and debris in watercourse; Install rock protection along abutments and wingwalls	$7,000.00
003	5th Sideroad	Remove vegetation along curbs and around structure; Repair wahsout on NE & SE embankments, install rock protection along abutments	$6,500.00
005	2nd Line SW	Sweep deck wearing surface and remove vegetation along curb; Raise hazard warning signs at structure	$1,500.00
006	4th Line SW	Sweep deck top and remove vegetation around wingwalls; Install rock protection along abutments and wingwalls	$9,500.00
007	7th Line SW	Remove vegetation along curbs and around wingwalls; Replace hazard warning signs at structure	$2,500.00
008	7th Line SW	Remove fill over exposed deck top ends; Install hazard warning signs at structure	$2,000.00
009	8th Line SW	Sweep deck top and flush expansion joints	$1,500.00
010	280 Sideroad	Sweep deck top and flush expansion joints	$1,500.00
011	8th Line SW	Install hazard warning sign in SW quadrant	$250.00
012	7th Line SW	Rout and seal cracks in wearing surface	$1,000.00
014	4th Line SW	Sweep deck top and flush expansion joints; Replace deteriorated barrier sealant joint; Replace missing end cap	$2,750.00
016	250 Sideroad	Sweep deck top; Repair Hand Railings; Raise hazard warning signs and install narrow structure signs	$3,000.00
2001	3rd Line	Install hazard warning signs at structure	$1,000.00
2002	5th Sideroad	Remove tree growing close to inlet; 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 around wingwalls; Remove blockage at inlet and silt build-up	$3,500.00
2005	3rd Line	Tighten loose end treatment cables	$500.00
2006	3rd Line	Rout and seal cracks in wearing surface; Install hazard warning sign at structure in SE corner; Remove silt and vegetation build-up in stream	$2,750.00
2007	15th Sideroad	Remove vegetation around wingwalls; Repair washout on SE embankment; Straighten hazard warning signs at structure, raise SE hazard warning sign	$2,250.00
2008	15th Sideroad	Remove fallen trees blocking inlet	$1,000.00
2009	15th Sideroad	Rout and seal cracks in wearing surface; Consider installing drip edge detail in soffit	$3,500.00
2011	20th Sideroad	Remove vegetation around guide rail, wingwalls, and fascia; Install hazard warning sign in NW corner; Tighten loose end treatment cables	$5,750.00
2012	30th Sideroad	Remove vegetation along curbs and around wingwalls; Replace damaged hazard warning signs at structure & install narrow bridge signs	$2,500.00
2014	4th Line	Remove vegetation along curbs	$1,000.00
2015	10th Line Northeast	Remove vegetation along guide rail; Repair large spall on interior precast unit; Place rock protection along abutments; Install missing nuts/bolts in guide rail posts	$4,250.00
2016	4th Line NE	Rout and seal cracks in wearing surface; Install hazard warning signs at structure	$1,500.00
2017	2nd Line NE	Repair washouts 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	$1,000.00
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 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 fill and overgrown vegetation over culvert ends and around hazard warning signs	$2,000.00
2025	Sideroad 260	Install hazard warning signs at structure	$1,000.00
2027	15 Sideroad	Bury channel ends, tighten loose end treatment cables	$1,000.00
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	Raise hazard warning signs at structure	$500.00
2030	240 Sideroad	Install rock protection along abutments; Install narrow bridge sign on approach	$2,750.00
2031	240 Sideroad	Install hazard warning signs at structure	$1,000.00
2032	2nd Line Northeast	Repair erosion on NE embankment; Install hazard warning signs at structure	$2,000.00
2033	7th Line SW	Remove tree growing over inlet; Raise hazard warning signs on west side of structure	$1,250.00
2034	Mulmur-Melancthon Townline	Remove overgrown vegetation blocking waterway; Repair erosion on SE embankment; Install additional hazard warning signs at structure	$4,000.00
Total			**$96,000.00**

TOWNSHIP OF MELANCTHON - ADDITIONAL INVESTIGATIONS REQUIRED

Priority	Structure Name	Road Name	Additional Investigations Required	Estimated Cost
Normal	001	4th Line SW	Monitoring of Deformations, Settlements and Movements,	$0
Normal	008	7th Line SW	Monitoring Crack Widths,	$0
Normal	2002	5th Sideroad	Monitoring of Deformations, Settlements and Movements,	$0
Normal	2012	30th Sideroad	Monitoring of Deformations, Settlements and Movements, Monitoring Crack Widths,	$0
Normal	2021	2nd Line NE	Monitoring Crack Widths,	$5,000
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	**$10,000.00**

TOWNSHIP OF MELANCTHON - CURRENT ROADSIDE SAFETY NEEDS

Structure Name	Road Name	Roadside Safety Need	Estimated Cost
005	2nd Line SW	Investigate need for Guide Rail	$1,000.00
008	7th Line SW	Investigate need for Guide Rail	$1,000.00
017	250 Sideroad	Replace guide rail, end treatments	$56,000.00
2001	3rd Line	Replace Guide Rail, end treatments	$56,000.00
2003	3rd Line	Replace rotten posts and raise 3-cable guide rail	$6,000.00
2007	15th Sideroad	Investigate need for Guide Rail	$1,000.00
2009	15th Sideroad	Replace Guide Rail, end treatments	$56,000.00
2010	3rd Line	Investigate need for Guide Rail	$1,000.00
2016	4th Line NE	Investigate need for Guide Rail	$1,000.00
2017	2nd Line NE	Investigate need for Guide Rail	$1,000.00
2018	2nd Line NE	Install Guide Rail, end treatments	$56,000.00
2019	4th Line NE	Install Guide Rail, end treatments	$56,000.00
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	Replace Guide Rail, end treatments	$56,000.00
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	**$356,000.00**

BURNSIDE

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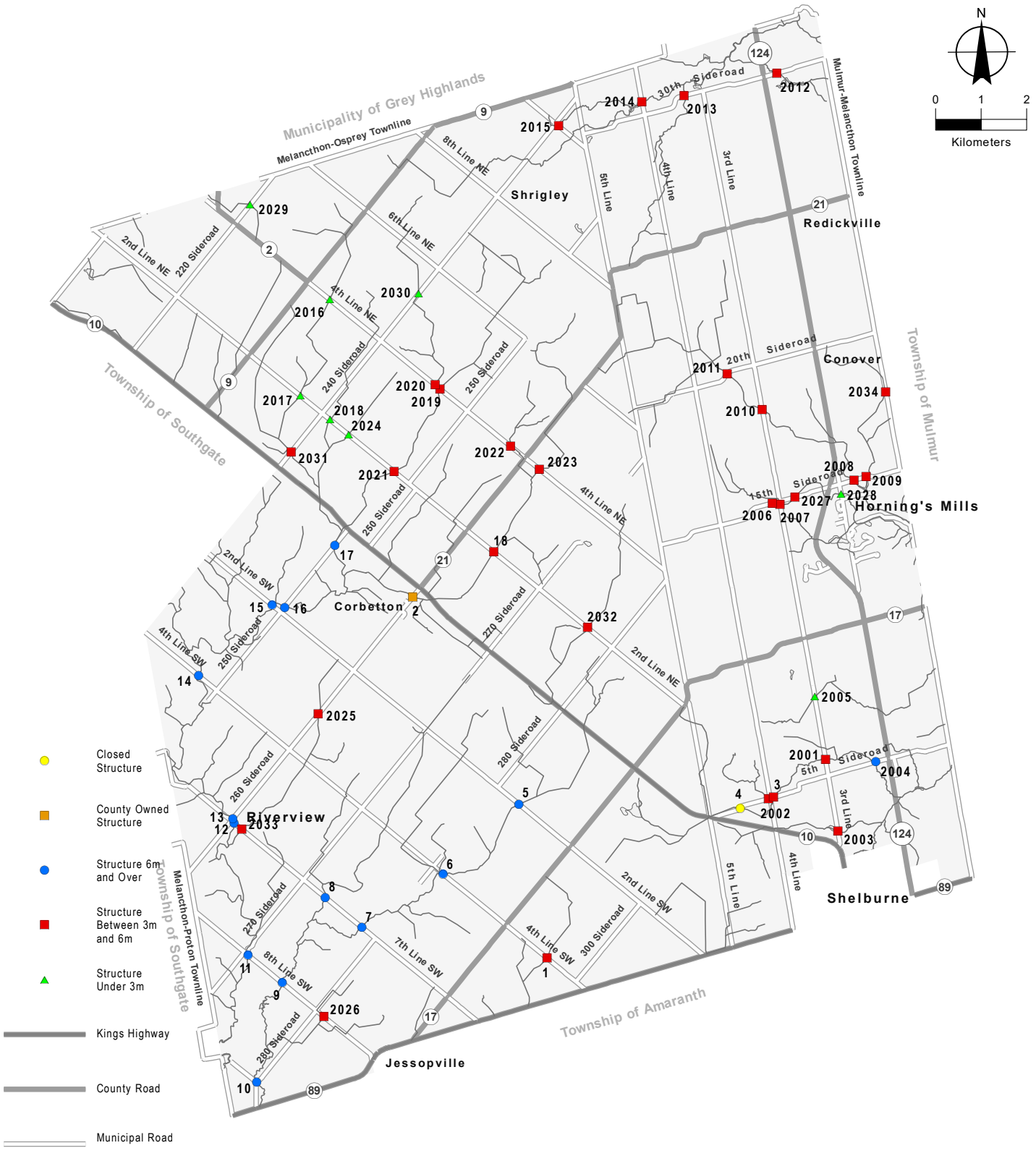
Appendix C

Structure Location Map



BURNSIDE

Map Title

2021 BRIDGE INSPECTIONS

BRIDGE AND CULVERT LOCATIONS

Client

TOWNSHIP OF MELANCTHON

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Appendix D

OSIM Forms and Photos

(Provided Separately)