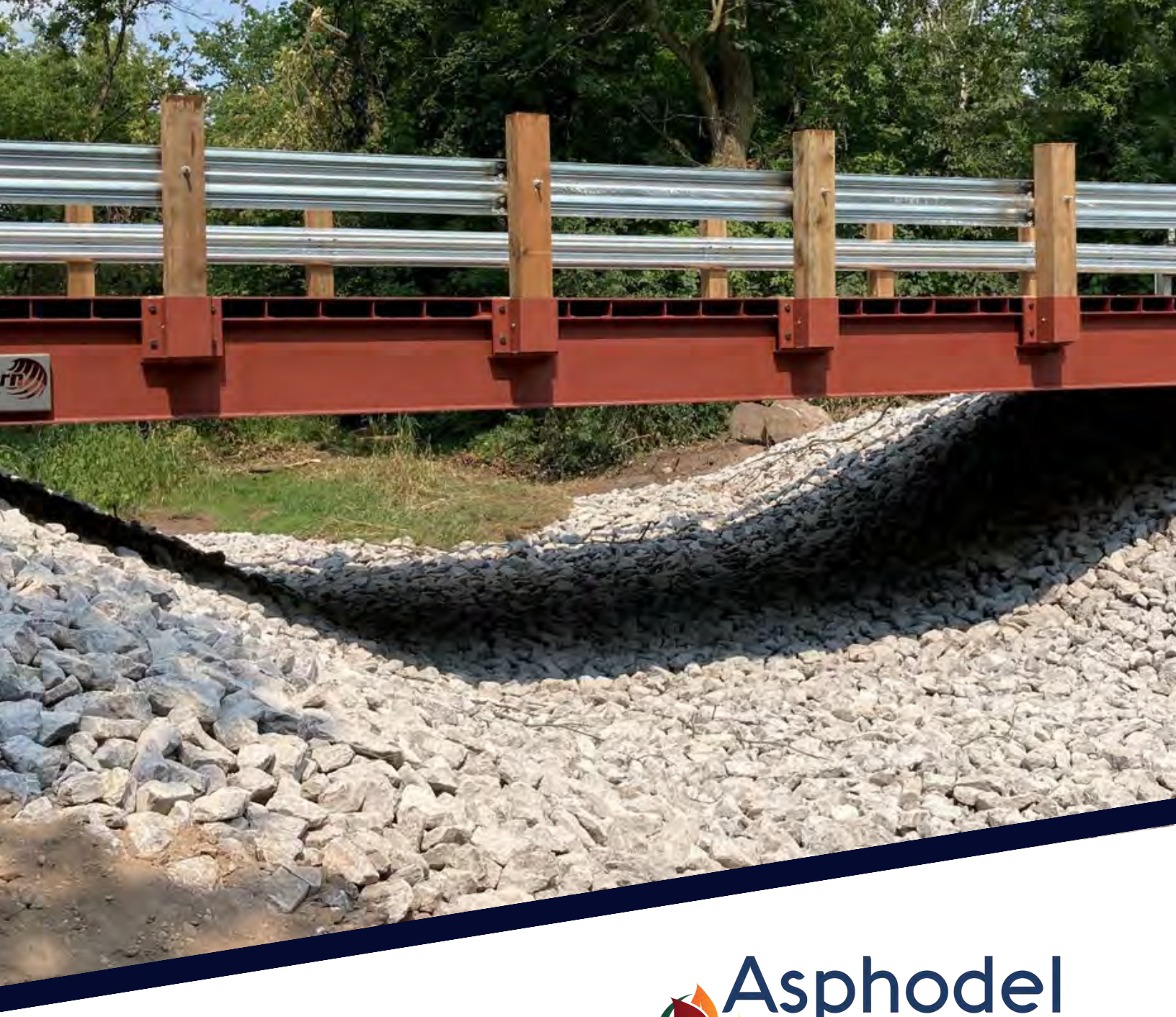

Asphodel Norwood
A Growing Success

FIVE YEAR

BRIDGE, CULVERT, AND DAM **PLAN**

2024 – 2028

Prepared October 2023

PURPOSE AND BACKGROUND

This document represents the first cycle of the five-year Bridge, Culvert, and Dam Plan for the Township. Culverts that are 3.0m in diameter and larger will be included because they are structural in nature and therefore considered to be a structure. The previous version of this Plan, known as the Bridge and Dam Plan, focused only on Bridges and Dams.

The same can be said for this Plan as for other five-year Plans that have been developed within the Township in that these plans are invaluable when it comes to budget forecasts, long term planning, and capital project scheduling. Such plans give the Township direction with respect to current and future capital asset needs.

This Plan will also ensure compliance with O.Reg. 588/17 and the requirement to develop an Asset Management Plan (AMP) for all Core Municipal Infrastructure Assets, and is compliant with the deadlines defined in the regulation. This Plan will form part of the overall AMP.

Reports such as the Township's 2022 Ontario Structures Inspection Manual (OSIM) Bridge and Culvert Inspection report and the 2020 Dam Inspection report were used along with site inspections of the structures in order to complete this Plan. This Plan addresses maintenance and reconstruction needs identified in the reports and site inspections.

The 2024-2028 cycle will focus on replacement, maintenance, and preventative measures of the Township's bridges, culverts, and dams in order to mitigate pre-mature degradation and improve the condition of these structures.

PURPOSE AND BACKGROUND

CONTINUED

Bridges and culverts are evaluated by a qualified engineer and are given a Bridge Condition Index (BCI) value through a series of calculations using pre-determined formulas. The OSIM report lists over 50 individual elements of a bridge that can be evaluated; however, most bridges will typically only have 20 of the 50 elements. The BCI is impacted by only 12 of the total number of elements on a bridge and was developed as a means of indicating the overall condition of a bridge structure. The BCI is a weighted average of all elements and all condition states. Each element is individually rated as either: excellent, good, fair, or poor. The engineer evaluates each element, inputs the results of the evaluation, and the BCI is calculated. A bridge's BCI rating begins at 100, when the bridge is in new condition, and theoretically becomes 0 if all elements are rated as poor. A BCI of 0 is impossible to reach since rehabilitation work is performed on the bridge before all elements are allowed to reach poor condition, or is typically replaced prior to reaching a state where the BCI would be 0.

The following table illustrates overall ratings as Good, Fair, Poor based on the BCI rating:

Rating	Index	Criteria
Good	BCI: 70-100	For a bridge or structure with a BCI 70 or greater (up to 100), maintenance work is not usually required within the next five years.
Fair	BCI: 60-69	For a bridge or structure with a BCI 60 or greater and less than 70, the maintenance work is usually scheduled within the next five years. This is the ideal time to schedule major bridge or structure repairs from an economic perspective.
Poor	BCI: 0-59	For a bridge or structure with a BCI rating of less than 60, maintenance work is usually scheduled within approximately one year. A poor rating does not necessarily mean the bridge or structure is unsafe or unsuitable for use. It may mean that repairs are needed to improve its rating to Fair or Good.

PURPOSE AND BACKGROUND

CONTINUED

Dams are evaluated for condition based on a number of elements ranging from structural integrity to public safety. The structures are rated as good, fair, or poor as a result of the engineering review. Dams that have a fair rating or higher typically only require maintenance or minor rehabilitation, and dams rated as poor would typically require replacement or major rehabilitation.

This Plan will also ensure that the life-cycle of these assets is being maximized by implementing a maintenance program. There are two structures that are considered to be at the end of their life cycle and will be reconstructed within the term of this five-year plan. Once reconstruction has been completed it will reset the life cycle for these structures. The life cycle of a bridge or culvert structure typically has a duration of 60-75 years. During that term maintenance should be completed as needed or recommended within the OSIM report in order to maximize the life span.

The allocation of funds will be presented in the current budget year work is expected to be completed.

The Township's current inventory of bridges, culverts, and dams is detailed in Appendices 1 and 2 of the Plan.

2024 BRIDGE, CULVERT, AND DAM PLAN

The 2024 Bridge, Culvert, and Dam plan will include replacement of the:

- Mill Street Bridge.

There will also be maintenance work completed on the upper and lower Millpond Dams such as:

- Concrete repairs,
- Safety hand rails, and
- Sink hole repairs.

This work will also require engineering design.

Structure	Location	Proposed Work
Mill Street Bridge	Mill Street – 0.1km South of Hwy 7	Full replacement with a correlated steel pipe
Upper Millpond Dam	Upper Millpond outlet at Hwy 7	Concrete and sink hole repairs
Lower Millpond Dam	Lower Millpond at Mill St	Safety railings, signage, and new gantry

The total estimated cost to complete bridge, culvert and dam repairs/replacement in **2024** will be determined in the current budget year.

2025 BRIDGE, CULVERT, AND DAM PLAN

The 2025 Bridge, Culvert, and Dam plan will include the full replacement of the:

- Alma Street Pedestrian Bridge.

Structure	Location	Proposed Work
Alma Street Pedestrian Bridge	Alma Street - between Victoria St and Queen St	Full Replacement with new bridge

The total estimated cost to complete bridge, culvert and dam repairs/replacement in **2025** will be determined in the current budget year.

2026 BRIDGE, CULVERT, AND DAM PLAN

The 2026 Bridge, Culvert, and Dam plan will include completing maintenance on the:

- Sand Road Bridge.

Structure	Location	Proposed Work
Sand Road Bridge	Sand Road and Asphodel 7th Line	Repair concrete deck soffit, rehabilitate/replace curbs, and install approach guiderail and railings

The total estimated cost to complete bridge, culvert and dam repairs/replacement in **2026** will be determined in the current budget year.

2027 BRIDGE, CULVERT, AND DAM PLAN

The 2027 Bridge, Culvert, and Dam plan will include rehabilitation of the:

- Asphodel 7th Line Culvert.

Structure	Location	Proposed Work
Asphodel 7th Line Culvert	Asphodel 7th Line - 0.3 km North of Hwy 7	Rehabilitation embankments

The total estimated cost to complete bridge, culvert and dam repairs/replacement in **2027** will be determined in the current budget year.

2028 BRIDGE, CULVERT, AND DAM PLAN

There is no planned maintenance or replacements scheduled for **2028**.

PLAN SUMMARY

Based on recommendations from the OSIM report, engineering reviews, and staff recommendations the 2024-2028 five-year Bridge, Culvert, and Dam Plan is summarized as follows:

Year	Summary of Proposed Work
2024	• Replacement of the Mill Street bridge, and • Maintenance on the upper and lower Millpond dams
2025	• Full replacement of the Alma Street pedestrian bridge
2026	• Maintenance on the Sand Road bridge
2027	• Rehabilitation of the Asphodel 7th Line Culvert
2028	• None

It is recommended that this plan be adopted and implemented to ensure that the Township is compliant with maintaining levels of service as mandated by current legislation.

APPENDIX 1

Township of Asphodel-Norwood
Current Inventory of Bridges and Culverts

Structure Name	Location	Structure Type	Year Constructed	BCI Value/Condition
Sand Road Bridge	Sand Road and Asphodel 7th Line	Solid Slab - Bridge	1960	60.9
Mill Street Bridge	Mill Street - 0.1 km South of Hwy 7	Solid Slab - Bridge	1960	53.4
Norwood Transfer Station Bridge	Norwood Transfer Station Entrance	Girder Bridge	2021	99.5
Alma Street Pedestrian Bridge	Alma Street - between Victoria St and Queen St	T-Beam Bridge	1920	52.8
Asphodel 7th Line Culvert	Asphodel 7th Line - 0.3 km North of Hwy 7	Arch Culvert	1960	71.2
Asphodel 6th Line Culvert	Asphodel 6th Line - 1.2 km South of County Rd 2	Pipe Culvert	1960	22.1
River Road Culvert	River Road - 0.28 km West of Asphodel 6th Line	Pipe Culvert	1960	57.8

The current replacement value of these assets is estimated at **$2,500,000.00**.

APPENDIX 2

Township of Asphodel-Norwood Current Inventory of Dams		
Structure Name	Location	Condition
Upper Millpond Dam	Upper Millpond outlet at Hwy 7	Good to Fair
Lower Millpond Dam	Lower Millpond at Mill Street	Good to Fair

The current replacement value of these assets is estimated at **$2,500,000.00**.