ASSET MANAGEMENT PLAN
ROAD NETWORK AND BUILDINGS/STRUCTURES

Prepared for:

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INTRODUCTION

The Township recognizes that in order to sustain services for its residents and for the competitiveness of its businesses, agriculture and industry, it must manage the Municipality's assets cost effectively. In 2014, the Township of North Algona Wilberforce developed an Asset Management Plan for the municipality's Road Network. The purpose of the plan is to guide the Township into the future, providing a "road map" for employees, a reference document for taxpayers and community volunteers, and a decision-making template for Council.

As a matter of policy, North Algona Wilberforce Township provides services in areas where it clearly outperforms the private sector, and has exited from areas of business that are more effectively performed privately or through contracting out. All services offered (directly or contracted out) address necessary aspects of the everyday life of taxpayers, and are characterized by Council's responsibility for dependability, reliability, responsiveness and efficiency. The following are some of the core services and related activities provided by the township which emphasize how much of the municipality's goals relate to infrastructure in order to better serve its rate payers:

- Roads, parking, transportation, and Sidewalks;
- Parks, recreation and culture;
- Clean water and sewer services within the Township; and
- Waste management.

For this reason, the Municipality is continuing to develop Asset Management Plans for its infrastructure, in which the focus of this plan is on Municipal Buildings and Structures, in addition to updating the plan for the Road Network. Once the plans are developed for the various components of the infrastructure (underground utilities, etc.) the municipality will assimilate and synthesize the information into a comprehensive plan.

The asset management plan is a comprehensive document that inventories and assesses the Municipality's infrastructure and develops a plan to best maintain the infrastructure. The plan outlines sustainability and provides strategies on how to finance the operation, maintenance, renewal and expansion of the system. The plan must take into account timely maintenance and capital repairs in order to best preserve the asset, while maintaining the desired levels of service to the public.

An asset management plan should take a long view perspective on managing the asset through life cycle cost analysis in which timely maintenance and rehabilitation can save money in the long term. For example, Figure 1 shows two ways to manage an asset. The first option is to allow the asset to deteriorate until it needs to be replaced, while the second option shows timely rehabilitation. At the end of the 64-year life cycle, Option 1 costs $120 million (the initial investment plus the cost to replace the asset) and Option 2 costs $100 million. Note that the asset's condition in Option 2 is far better than in Option 1.

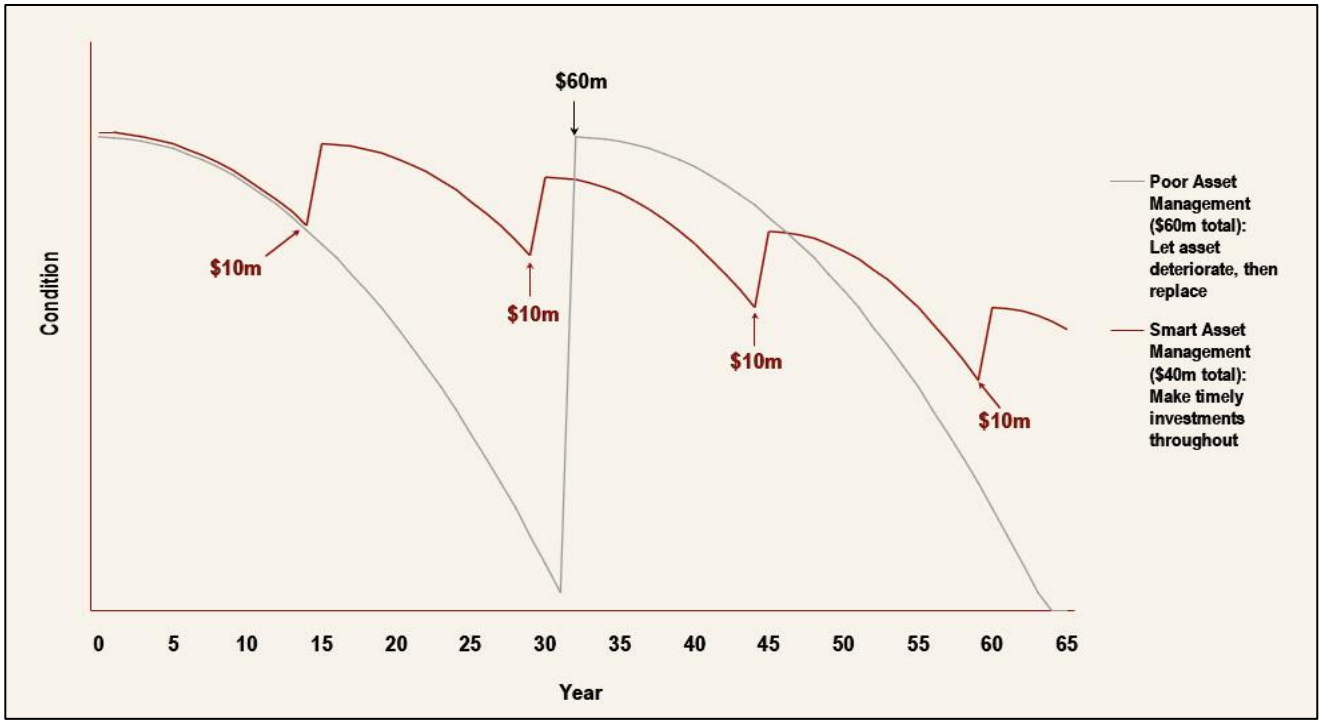

Figure 1: Lifecycle of Two Renewal Options [1]

McIntosh Perry Consulting Engineers Ltd. was commissioned by the Township to work with Senior Municipal Staff and Council to develop the Asset Management Plan for Municipal Buildings and Structures, as well as update the plan for the Municipal Road Network previously completed in 2014. The Plan is to be presented at Council for public input. The Plan will also be made available to the public for its information and input. The asset management plan covers a period of ten (10) years in which the plan is to be updated every five (5) years. The update will be an opportunity to evaluate the assumptions made in this study and how the plan is maintaining and improving the road network as well as how it is meeting service-level targets.

[1] Resource from "Building together – Guide for municipal asset management plans", Ministry of Infrastructure, Ontario, 2016

PART A – ROADS

1.0 STUDY METHODOLOGY

The Ministry of Transportation of Ontario "Inventory Manual for Municipal Roads for Small Lower Tier Municipalities" has been used in preparing this study and is briefly outlined in the sections below.

1. All road sections are listed with their condition rating by road type:

    a. Earth Roads (Listed in inventory but not rated. Typically, these roads have little or no maintenance, only used seasonally);

    b. Gravel Roads;

    c. Cold Laid Bituminous Mix (CLB) or Dense Graded Cold Mix Roads;

    d. Surface Treated or Low Class Bituminous (LCB) Roads; and

    e. Hot Mix Paved or High Class Bituminous (HCB) Roads.

2. With the exception of Earth Roads, future condition ratings are calculated for each road and from this, predicted maintenance and capital expenditures can be produced. Newly reconstructed roads have a 10-point condition rating, and roads requiring partial reconstruction are assigned three points. Roads should not be allowed to go below three points due to the severity of the road conditions, e.g. very poor ride, difficult to maintain, usually a safety hazard.

    Generally speaking, the Township roads have low traffic volumes, which are consistent throughout its road network. It has been assumed that asphalt roads will need to be resurfaced within 15 years and if not resurfaced, then reconstructed in 30 years. Note that roads cannot perpetually be resurfaced and at some point the roads must be reconstructed. It has been assumed that a surface treated road has a life expectancy of approximately 15 years before reconstruction is required.

    The above noted life cycle assumptions should not have a great impact on the overall assessment of the road network, but some roads may experience slower or faster rates of deterioration. The capital program may need to be adjusted to account for this and other factors such as variations in pavement structure, sub-surface conditions, drainage, and truck traffic. For example, a street scheduled for reconstruction in year 10 may have to be moved up in the 10-year capital program and vice versa, a street scheduled for year three could be pushed back since its condition has not deteriorated as fast as earlier predicted.

    Through regularly measuring the performance of its road system (e.g. updated asset management plan every five years, traffic counts, etc.), the Municipality will be able to better predict the deterioration rates of individual segments and therefore the overall network.

The condition rating for each road type will decrease every year unless maintenance and/or rehabilitation activities are performed. For gravel roads it is assumed that the condition of the road will be maintained with regular gravel resurfacing. Hard surface roads with no maintenance and/or no rehabilitation (which is not recommended) will need reconstruction within 15 years for surface treated roads, 20 years for cold laid roads, and 30 years for asphalt roads. The following calculations show the assumed rate of deterioration for these various surface types.

Gravel: No change in rating with regular maintenance

Surface Treatment: $$\frac{10 - 3 \text{ point condition rating}}{15 \text{ year life cycle before reconstructing}} = 0.47 \text{ pt/yr}$$

Cold Laid: $$\frac{10 - 3 \text{ point conditions rating}}{20 \text{ year life cycle before reconstructing}} = 0.35 \text{ pt/yr}$$

Asphalt: $$\frac{10 - 3 \text{ point conditions rating}}{30 \text{ year life cycle before reconstructing}} = 0.23 \text{ pt/yr}$$

Based on the foregoing discussion, Table 1 provides an example of how the condition rating is forecasted for each surface type. In this example, it is assumed that road reconstruction was performed in the Base Year for each surface type.

TABLE 1: FORECASTING CONDITION RATING EXAMPLE

SURFACE TYPE	BASE YEAR	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
GRAVEL[1]	10.00	10.00	10.00	10.00	10.00	10.00
SURFACE TREATMENT	10.00	9.53	9.06	8.59	8.12	7.65
COLD LAID	10.00	9.65	9.30	8.95	8.60	8.25
ASPHALT	10.00	9.77	9.54	9.31	9.08	8.85

[1]Gravel Roads have a stable, unchanging life expectancy as long as routine loose top maintenance is performed. Gravel roads will remain this way until improvements are made.

3. The average condition rating is determined for each road type but summing the product of individual segment length (L) multiplied by the condition rating (CR), and then dividing by the total length of the road system. This will result in an average condition rating for the three road surface types. Table 2 provides an example of how average condition rating is calculated.

TABLE 2: AVERAGE CONDITION RATING BY SURFACE TYPE EXAMPLE

ROAD SEGMENT	LENGTH (L) (km)	CONDITION RATING (CR)	PRODUCT (L x CR)
1	1.00	7.00	7.00
2	2.00	3.00	6.00
3	3.00	5.00	15.00
TOTAL	**6.00**		**28.00**

Where: Average Condition Rating $= \frac{\text{SUM (L} \times \text{CR)}}{\text{Total Length}} = \frac{28.00}{6.00} = 4.70$

An overall condition rating can be calculated for the total municipal system by combining the three surface types.

4. The above noted analysis will determine if and when a road requires improvements within the next 10 years.

5. To estimate the cost of construction, benchmark costs are used and are associated with the type of capital improvement. Average unit costs have been developed based on local construction costs.

   Fixed costs are costs associated with maintenance of the existing road system and include overhead, salaries, etc. Fixed costs are generally met from the Township's budget prior to capital construction funds being allocated. Fixed costs for forecast requirements were derived from historical expenditures.

   For future capital expenditures, the report presents cost estimates in 2017 dollars. At the time of budgeting, the Municipality should adjust capital expenditure by an appropriate cost of inflation.

6. The 10-year capital program presented in this report is a tool for Municipal Staff and Council in selecting the 10-year program. As mentioned above, there may be other factors that must be considered and/or adjusted in order to reflect changes not foreseen at the time of writing this report.

1.1 BENCHMARK COSTING

The estimated cost for identified improvements is calculated on an approximate basis, using average unit prices for roads, water distribution and sanitary sewers. For bridges and structural culverts, and water and sewage treatment plants, rough order magnitude cost estimates are prepared for each asset. Prices are in 2017 dollars and adjustments should be made for inflation each budget year. HST is extra.

TABLE 3 – UNIT PRICES (2017 DOLLARS)

ITEM	UNIT	UNIT PRICE
Earth Excavation, Grading	cu.m.	$ 13.00
Earth Excavation, Ditching	m	$ 20.00
Road Widening per Shoulder	m	$ 35.00
Removal – Pulverize	sq.m.	$ 2.00
Removal – Asphalt	sq.m.	$ 6.00
Removal – Mill Wear Course	sq.m.	$ 6.00
Removal – Concrete Curb	m	$ 8.00
Removal – Concrete Sidewalk	sq.m.	$ 20.00
Removal of Asphalt Key	each	$ 500.00
Remove and Replace 16m x 600mm Diameter CSP	each	$ 6,500.00
Remove and Replace Driveway Culvert	each	$ 2,000.00
Granular A	tonne	$ 25.00
Granular B	tonne	$ 17.00
Single Surface Treatment (SST)	sq.m.	$ 3.50
Double Surface Treatment (DST)	sq.m.	$ 7.00
Asphalt – Wear Course	tonne	$ 150.00
Asphalt – Base Course	tonne	$ 150.00
Rout & Seal	m	$ 3.00
Rejuvenating Oil	sq.m.	$ 2.00
Dense Graded Cold Mix	sq.m.	$ 14.50
RAP Cold Mix	sq.m.	$ 8.00
Tack Coat	sq.m.	$ 1.50
Iron Adjustment	each	$ 400.00
Concrete Sidewalk	sq.m.	$ 75.00
Concrete Barrier Curb	m	$ 70.00
Topsoil & Sod	sq.m.	$ 17.00
Topsoil & Seed	sq.m.	$ 6.50

Typical types of reconstruction and maintenance for rural hard surfaced roads (resurfacing, partial reconstruction, full depth reconstruction, rout and seal, and rejuvenating oil) are presented in Tables 4 to 9 on the following pages. Full depth reconstruction includes an allowance for geotechnical investigation and testing as well as for engineering design and construction supervision. In some instances, the Township may also use a professional engineer for resurfacing and/or partial reconstruction due to the complexity of the project and/or workload. Prices are in 2017 dollars and adjustments should be made for inflation each budget year. HST is extra.

TABLE 4 – SURFACE TREATMENT OR LOW CLASS BITUMINOUS (LCB)

CODE	DESCRIPTION	UNIT PRICE ($ per km)
LCB-R1	**Resurfacing** Single surface treatment 8.0m wide	$25,000
LCB-R2	**Partial Depth Reconstruction** Pulverize or scarify, 50-150mm G.A., double surface treatment, 10% spot drainage improvements, culvert replacement & 10% contingency	$169,000
LCB-R3	**Full Depth Reconstruction** Earth exc., 150mm G.A., 300mm G.B., DST, culvert replacement, engineering, geotechnical and 10% contingency	$536,000

TABLE 5 – ASPHALT OR HIGH CLASS BITUMINOUS (HCB) RURAL ROADS

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-R1	**Resurfacing** 40mm lift of HL3 asphalt by 8.0m and 10% contingency	$105,000
HCB-R2	**Partial Depth Reconstruction** Pulverize, 50-150mm G.A., 50mm lift of HL4 asp, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	$249,000
HCB-R3	**Full Depth Reconstruction** Remove asphalt, earth exc., 150mm G.A., 300mm G.B., 50mm Lift of HL4 asphalt, shouldering, culvert replacement, engineering, geotechnical and 10% contingency	$682,000
HCB-R4	**Rout and Seal** Routing of cracks	$5,000
HCB-R6	**Rejuvenating Oil** Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio.	$13,000

TABLE 6 – ASPHALT OR HIGH CLASS BITUMINOUS (HCB) SEMI-URBAN ROADS

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-S1	**Resurfacing** 40mm lift of HL3 asphalt by 8.0m wide, adjust iron, asphalt keys, tie-in driveways and 10% contingency	$133,000
HCB-S2	**Partial Depth Reconstruction** Remove asphalt, earth exc., 150mm G.A., 50mm lift of HL4 asphalt, shouldering, adjust iron, tie-in driveways, road culvert replacement, 10% spot drainage and 10% contingency	$325,000
HCB-S3	**Full Depth Reconstruction** Remove asphalt, earth exc., 150mm G.A., 300mm G.B., 50mm HL4 asp, shouldering, adjust iron, tie-in driveways, road & driveway culvert replacement, drainage, engineering, geotechnical & 10% contingency	$979,000
HCB-S4	**Rout and Seal** Routing of cracks	$5,000
HCB-S6	**Rejuvenating Oil** Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio.	$13,000

TABLE 7 – ASPHALT OR HIGH CLASS BITUMINOUS (HCB) URBAN ROADS

CODE	DESCRIPTION	UNIT PRICE ($ per km)
HCB-U1	**Resurfacing** 40mm Lift of HL3 asphalt by 8.5m wide, adjust iron, milling and 10% contingency	$208,000
HCB-U2	**Partial Depth Reconstruction** Remove asphalt, 10% curb and sidewalk repairs, earth exc., 150mm G.A., 40mm lift of HL3 and 40mm lift of HL4 asphalt, adjust iron and 10% contingency	$488,000
HCB-U3	**Full Depth Reconstruction** Remove asphalt, curbs and sidewalk, earth exc., 150mm G.A., 300mm G.B., 2 lifts of asphalt, adjust iron, curbs, sidewalk, tie-in driveways and lawns, geotechnical, engineering and 10% contingency	$1,229,000
HCB-U4	**Rout and Seal** Routing of cracks	$5,000
HCB-U6	**Rejuvenating Oil** Oil that penetrates an asphalt surface and restores the Maltene to asphalt ratio.	$19,000

TABLE 8 – COLD LAID BITUMINOUS (CLB) - RURAL (R)

CODE	DESCRIPTION	UNIT PRICE (PER KM)
CLB-R2	**Partial Depth Reconstruction** Pulverize, 50-150mm G.A., 75mm lift of cold mix asphalt, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	$ 229,000
CLB-R3	**Full Depth Reconstruction** Remove cold mix asphalt, earth exc., 150mm G.A., 300mm G.B., 75mm lift of cold mix asphalt, shouldering, culvert replacement, engineering, geotechnical and 10% contingency	$ 660,000

TABLE 9 – RECOVERED ASPHALT PAVEMENT (RAP) - RURAL (R)

CODE	DESCRIPTION	UNIT PRICE (PER KM)
RAP-R1	**Resurfacing** Pulverize recovered asphalt pavement, 150mm G.A.	$ 64,000

2.0 DESIRED LEVEL OF SERVICE

The desired levels of service for maintenance are based on Ontario Regulation 239/02, Minimum Maintenance Standards for Municipal Highways. The Regulations classifies roads from 1 to 6 based on the volume of traffic and the posted or statutory speed limit. The standards outline the minimum maintenance standards for the following activities:

1. Patrolling,
2. Plowing, salting, and/or applying abrasive materials to the roadway for snow accumulation,
3. Salting and/or applying abrasive materials to icy roads and ice formation prevention,
4. Pothole repairs,
5. Shoulder drop repairs,
6. Crack repairs,
7. Debris removal,
8. Maintaining illumination,
9. Maintaining traffic control signals,
10. Repairing bridge spalls,
11. Sign replacement and repairs, and
12. Road and sidewalk surface discontinuities.

The desired level of service for maintaining the road system is based on the optimum life cycle of the road structure, i.e. the renewal and reconstruction strategy presented in Table 12, Section 4.3.1. Over the life cycle for the surface type the average condition rating for each surface type is as follows:

Surface Type	Average Condition Rating
Gravel	6.00
Surface Treatment	6.57
Cold Laid	6.83
Asphalt	7.17

Section 3.0 presents the state of the local infrastructure and Section 4.0 sets out the strategy to maintain the infrastructure. The measure for the desired level of service for the road system will be based on the optimum average condition rating by surface type, which can be measured against the existing inventory of the road system. Section 5.0 will discuss the current gap in spending infrastructure and strategies on how to address the spending shortfall.

3.0 STATE OF LOCAL INFRASTRUCTURE

This section summarizes (1) the asset types (Gravel, Surface Treatment, Cold Laid and Asphalt); (2) replacement cost valuation; and (3) asset condition.

3.1 ASSEST TYPES

Map 1 presents the roads by surface type, in which there is approximately a 60/40 split between hard surface and gravel roads. See Table 10 for the lengths for Gravel Roads (Year Round), Low Class Bituminous Roads (LCB or surface treatment), Cold Laid Bituminous Roads (CLB), High Class Bituminous Roads (HCB or asphalt) and Crushed Recycled (CR) Material Roads. Earth roads (totalling 16.5km) are excluded from the rating of the roads. Figure 2 presents the length of each surface type.

TABLE 10 - ROAD LENGTHS

SURFACE TYPE	LENGTH (km)	LENGTH (%)
GRAVEL	78.8	41.6%
LCB	79.5	41.9%
HCB	13.4	7.1%
COLD LAID	14.8	7.8%
C. R. Materials	3.10	1.6%
TOTAL	**189.6**	**100%**

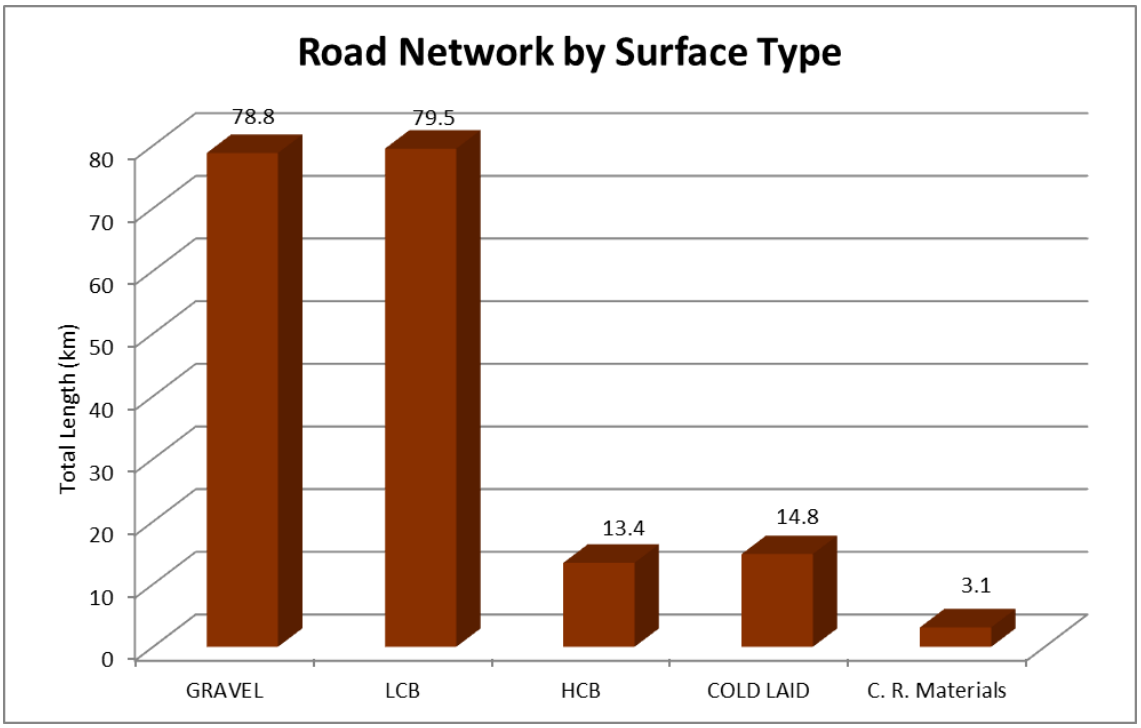

FIGURE 2 – ROAD NETWORK LENGTH BY SURFACE TYPE (km)

3.2 REPLACEMENT COST VALUATION

The replacement value of the road infrastructure is $81.4million (2017 dollars), which accounts for current standards. For example, a rural road with a current platform width of 6.0m would now be constructed to current standards of 8.0m. Table 11 presents the replacement value by asset type. Appendix A shows the inventory for each road segment, including the replacement value.

TABLE 11 – ASSET REPLACEMENT COST VALUATION

SURFACE TYPE	COST
GRAVEL	$31,902,000
LCB	$32,345,600
HCB	$9,559,200
CLB	$6,353,100
TOTAL	**$80,159,900**

3.3 ASSET AGE AND REMAINING LIFE

The age distribution for gravel, surface treatment (LCB) and asphalt (HCB) roads is presented in Figures 3 to 5. The average remaining life of each asset type is presented in Table 12.

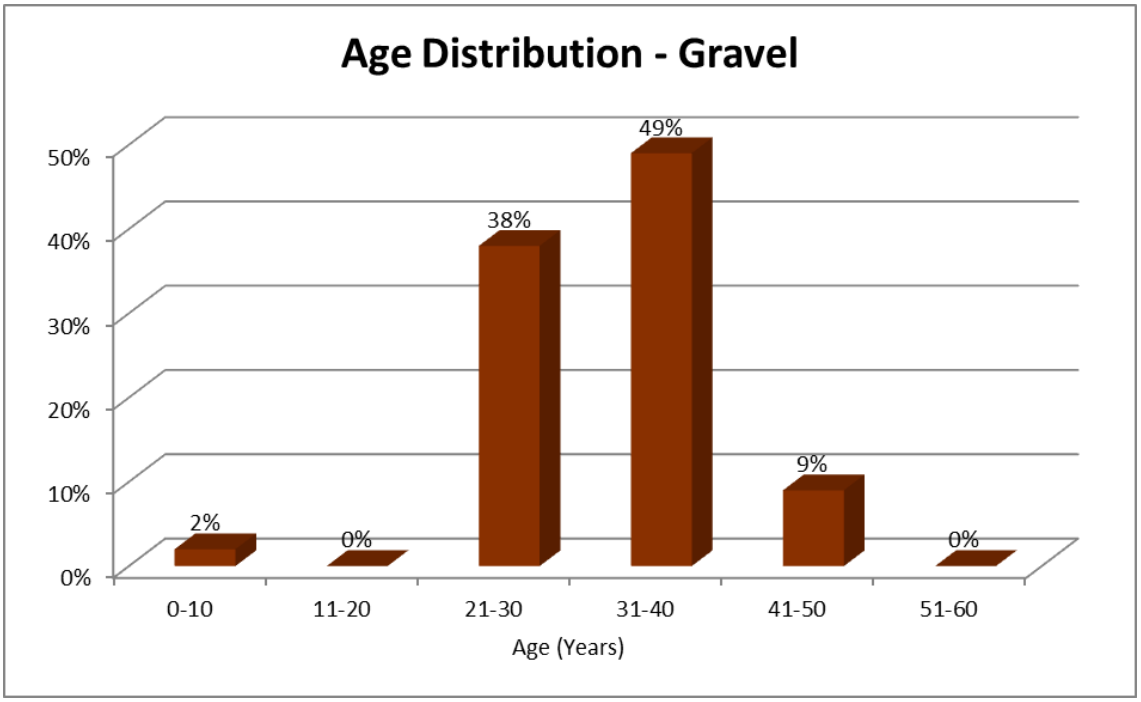

FIGURE 3 - AGE DISTRIBUTION - GRAVEL ROADS

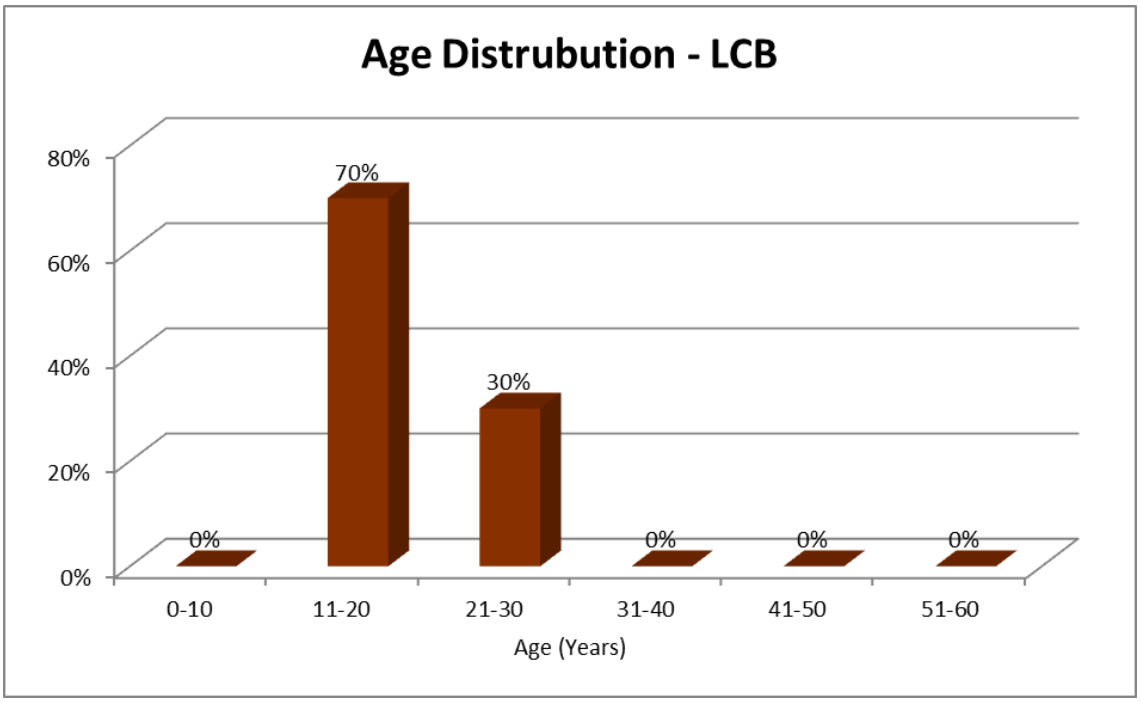

FIGURE 4 - AGE DISTRIBUTION - SURFACE TREATED ROADS (LCB)

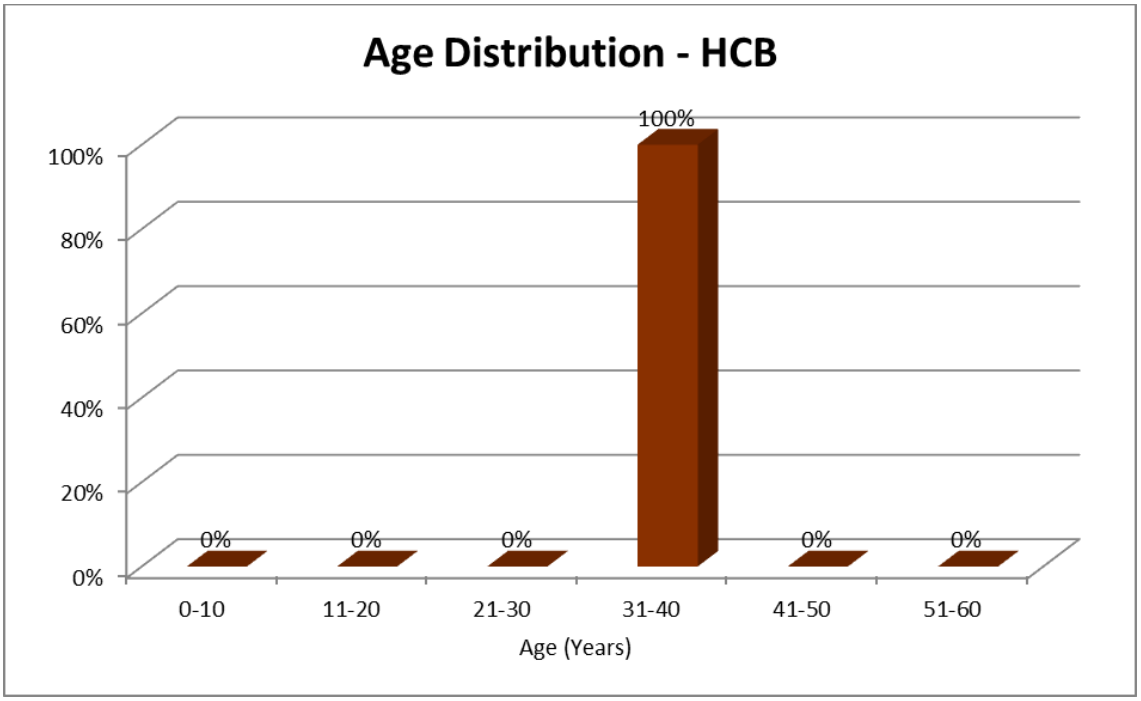

FIGURE 5 - AGE DISTRIBUTION - ASPHALT ROADS (HCB)

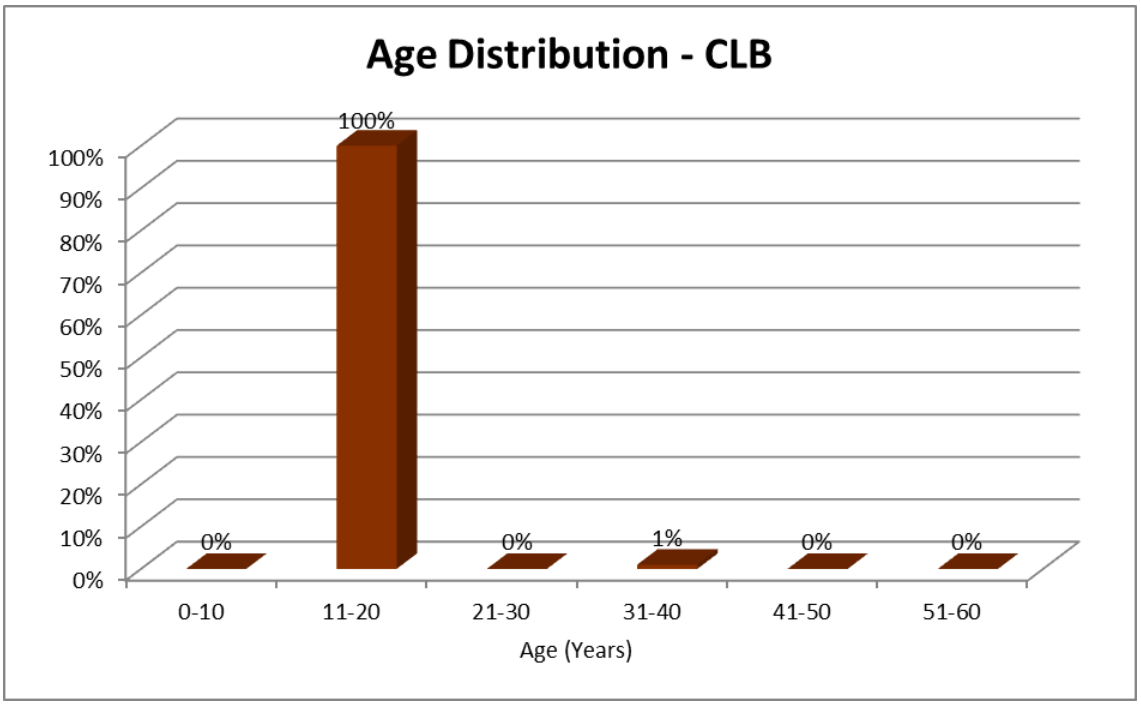

FIGURE 6 - AGE DISTRIBUTION – COLD LAID (CLB) ROADS

TABLE 12 - AVERAGE REMAINING LIFE BY ROAD TYPE (YEARS)

GRAVEL	COLD LAID	SURFACE TREATMENT	ASPHALT
10	26	21	23

3.4 ASSET CONDITION RATING

The condition of each road has been categorized as “Very Poor”, “Poor”, “Fair”, “Good” and “Excellent” based on the condition rating assigned for the road segment. See Table 13 for the rating system.

TABLE 13 – ASSET CONDTION RATINGS

VERY POOR	POOR	FAIR	GOOD	EXCELLENT
1 - 2	3 - 4	5 - 6	7 - 8	9 - 10

Figures 7 - 10 present the condition of each road type. The overall average structural condition of North Algona Wilberforce’s road system at the time of this report is Fair, based on an overall rating of 5.94. Map 2 shows the now deficient roads, i.e. roads with a condition rating of less than 5.0 in 2017.

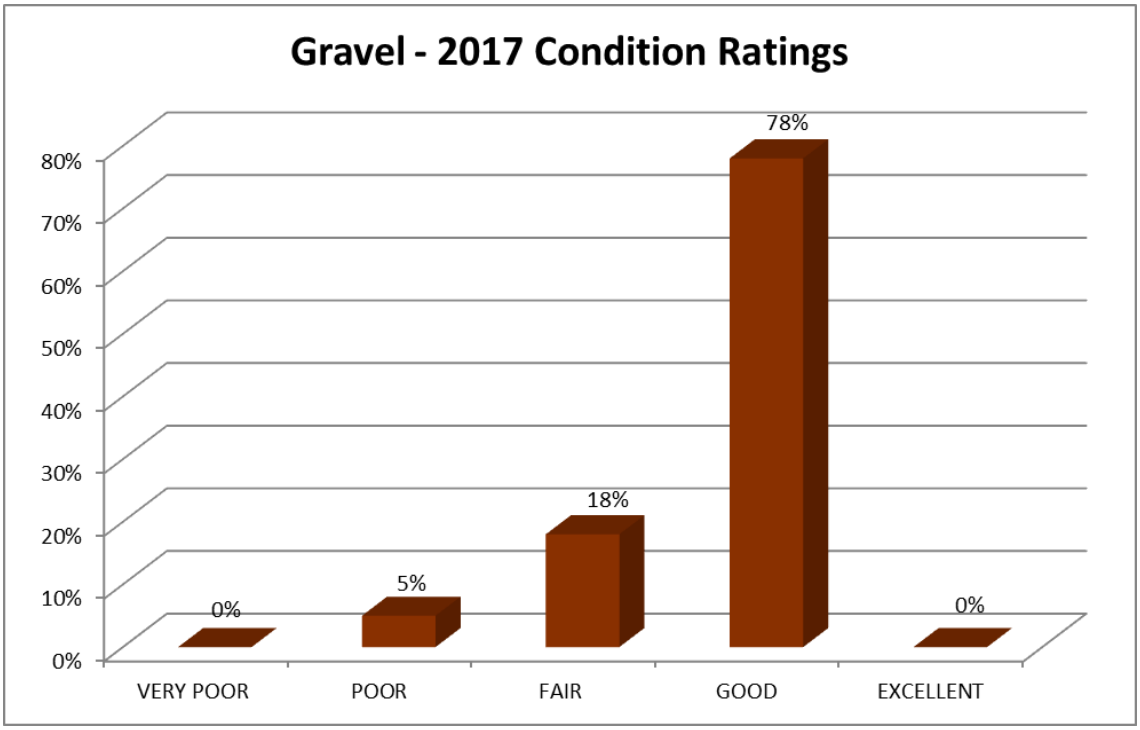

FIGURE 7 - CONDITION RATING DISTRIBUTION - GRAVEL ROAD

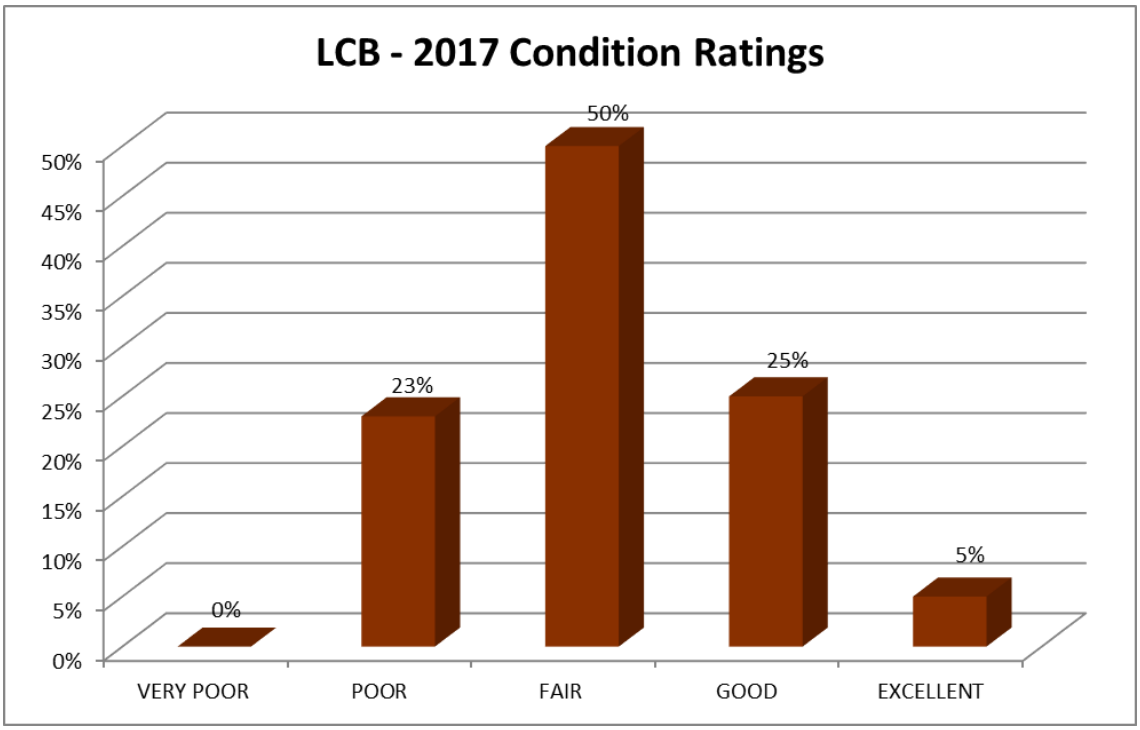

FIGURE 8 - CONDITION RATING DISTRIBUTION - SURFACE TREATED ROADS (LCB)

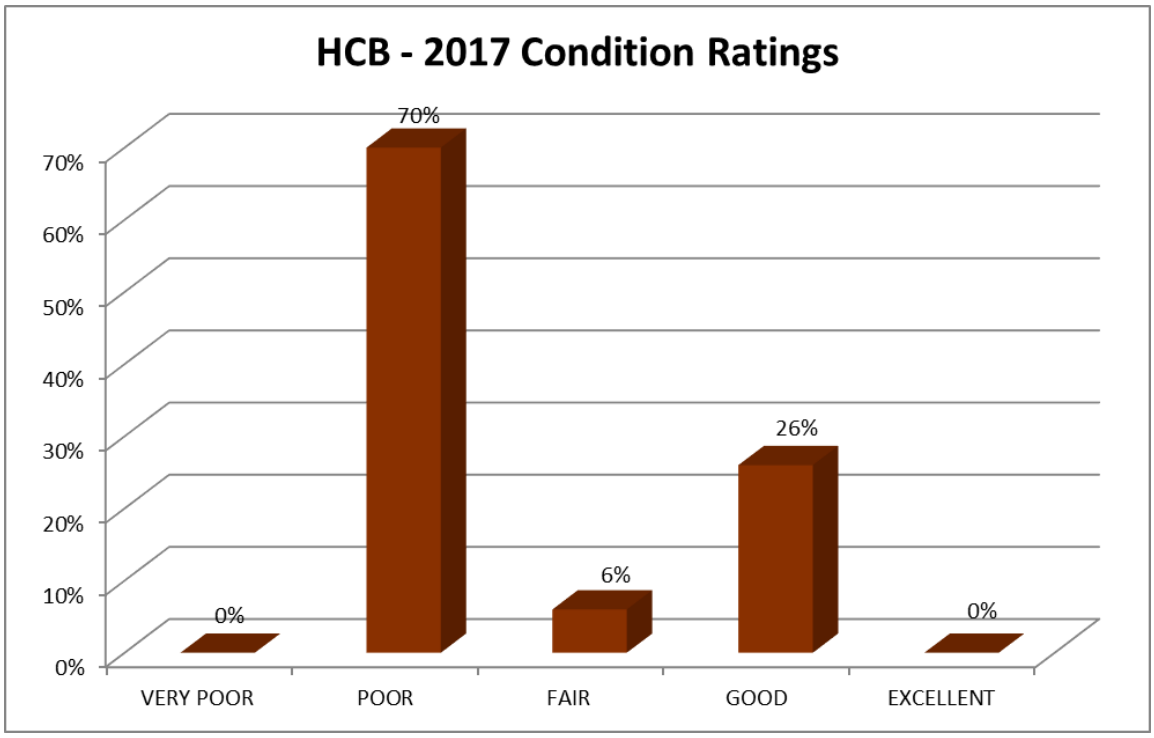

FIGURE 9 - CONDITION RATING DISTRIBUTION - ASPHALT ROADS (HCB)

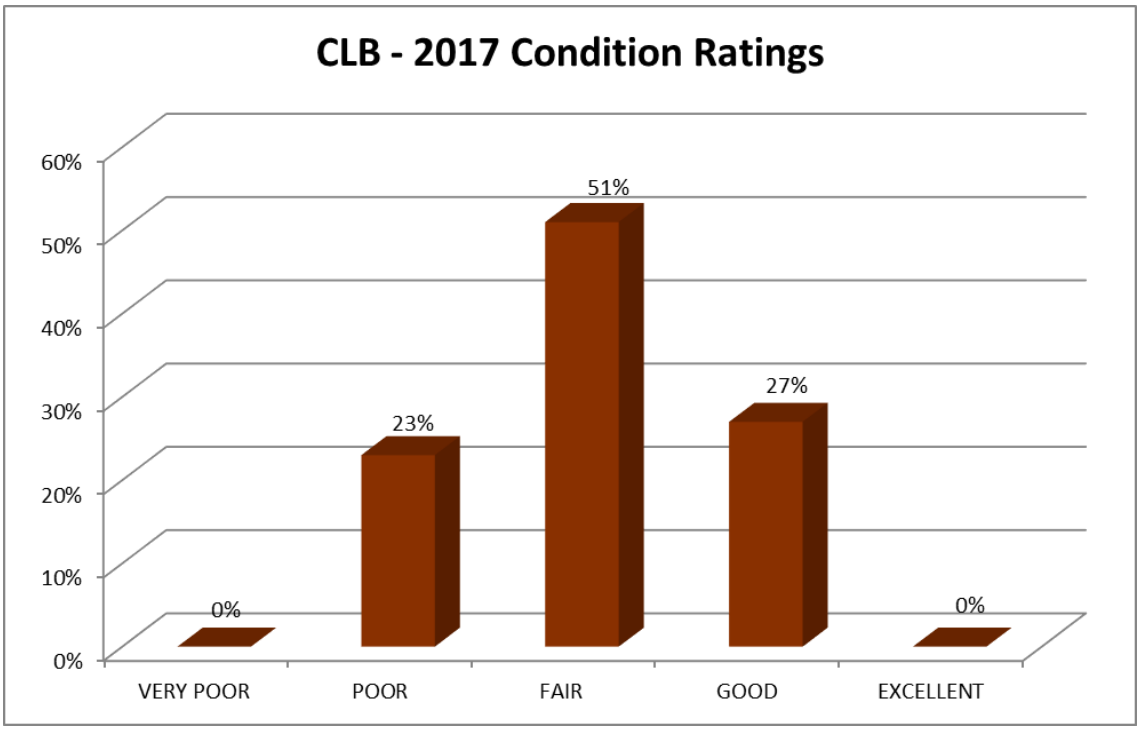

FIGURE 10 - CONDITION RATING DISTRIBUTION - COLD LAID (CLB)

4.0 ASSET MANAGEMENT STRATEGY

This section identifies the asset management strategies planned to sustain the assets at the desired level of service, including:

1. Non-infrastructure solutions,
2. Maintenance activities,
3. Renewal and reconstruction activities,
4. Disposal activities,
5. Expansion activities,
6. Procurement methods, and
7. Risks.

4.1 NON-INFRASTRUCTURE SOLUTIONS

The Official Plan adopted by the County of Renfrew aims to guide all municipalities (via public administrators and private interests) towards the most desirable form of development under the anticipated conditions. The Plan was established in order to set the overall goals, objectives and policies consistent with the future development needs, and to promote "Smart Growth". The municipality recognizes that growth is beneficial when it is well managed, as it generates employment and a stronger tax base. The municipality recognizes the interdependence between a healthy environment, healthy communities, and a strong economy. To foster a healthy environment, healthy communities, and a strong economy, the official plan identifies a number of goals and objectives, in which upgrading and replacing the road infrastructure is a priority. The Official Plan details the County's strategy for sustainability of infrastructure, with emphasis on residential development and associated public spending.

4.2 MAINTENANCE ACTIVITIES

It is recommended that the municipality review its policy for maintaining its asphalt roads in order to better preserve the asphalt pavement structure, and thus maintain the road at higher service levels and reduce costs in the long run. The two low cost maintenance strategies that McIntosh Perry would recommend for immediate implementation are: (1) Rout and Seal and (2) Rejuvenating Oil, which are further described in the following sections.

4.2.1 Rout and Seal

Description: Rout and seal involves routing of cracks to a standardized size, cleaning and heating of routed cracks with a lance, followed by hot poured rubberized asphalt including squeegee. By keeping the water out, it prohibits freeze/thaw reactions in winter, and guards against reduced strength due to water infiltration at other times, thus retarding the development of alligator cracks.

Life Extension: 3+ years

When to use: Routing and sealing is typically use in earlier portion of a pavement's life cycle, with cracks less than 12mm in width and with less than 1,500 linear metres of cracks per kilometre of pavement. Not normally used in single lift pavements over granular as it can promote full depth cracking where routed.

Cost: $3.00 per lineal metre.

4.2.2 Rejuvenating Oil

Description: Rejuvenating oil penetrates an asphalt surface and restores the maltene to asphalt ratio, extending the life of the surface. Following application and prior to traffic, a layer of manufactured sand is applied to provide temporary friction. This is subsequently swept up and reused.

Life Extension: 3+ years

When to use: Typically around the seven to 10 year mark of a pavement's life cycle.

Cost: Approximately $2.00 per square metre.

4.3 RENEWAL AND RECONSTRUCTION ACTIVITIES

4.3.1 Renewal and Reconstruction Strategy

The renewal and reconstruction strategy for preserving the road structure is presented in Table 14.

TABLE 14 – RENEWAL AND RECONSTRUCTION STRATEGY

SURFACE TYPE	ENVIRONMENT	LIFE-CYCLE YEAR	STRATEGY	AVERAGE CONDITION RATING
GRAVEL	RURAL	N/A	Maintain through regular gravel resurfacing	6.00
LCB (Surface Treatment)	RURAL	0	Construction of Asset	6.45
		8	Single Surface Treatment Overlay	
		19	Partial Depth Reconstruction	
		25	Single Surface Treatment Overlay	
		36	Partial Depth Reconstruction	
		42	Single Surface Treatment Overlay	
		55	Full-Depth Reconstruction	
CLB (COLD LAID)	RURAL	0	Construction of Asset	6.83
		11	Asphalt Overlay	
		15	Route and Seal	
		19	Rejuvenating Oil	
		33	Partial Depth Reconstruction	
		41	Asphalt Overlay	
		45	Route and Seal	
		49	Rejuvenating Oil	
HCB (Asphalt)	RURAL	0	Construction of Asset	7.49
		8	Rejuvenating Oil	
		20	Asphalt Overlay	
		24	Route and Seal	
		28	Rejuvenating Oil	
		52	Partial Depth Reconstruction	
		60	Rejuvenating Oil	
		68	Asphalt Overlay	
		72	Route and Seal	
		76	Rejuvenating Oil	

Based on the above-noted strategy the life cycle for each road type and environment has been developed and is presented in Appendix B. Table 15 summarizes the average condition rating over the life of the asset and the yearly life-cycle cost for each road type.

TABLE 15 - LIFE CYCLE CONDITION RATING AND COST

TYPE	AVERAGE CONDITION RATING OVER ASSET LIFE	LIFE CYCLE COST PER YEAR
SURFACE TREATMENT (LCB)	6.45	$ 17,255
COLD LAID (CLB)	6.83	$ 17,462
ASPHALT (HCB)	7.49	$ 12,030

In developing the priority of road improvements, the first consideration for the available funds is for preserving the road system. Improvements to preserve the surface will be timed in order to provide the best value for maintaining the asset. Where the road has deteriorated to the point that only major and costly improvements will restore the structural strength of the road, improvements will be timed in order to take full advantage of the remaining life of the infrastructure, but not to the extent were the road falls below Minimum Maintenance Standards.

The second major component in the decision matrix is the Average Annual Daily Traffic (AADT) which provides an indication on the number of users of the road network. Priority is given to roads with higher AADT. As an example, if one street is a dead end and one street is a minor collector, and both cost the same per kilometre to reconstruct the minor collector would be selected over the dead end since it serves more commuters.

Other factors that may have to be considered are safety, truck traffic, development, economic, social, and timely scheduling of construction to coincide with other infrastructure works (e.g. sewers, watermain, etc).

Section 4.3.1 presents a 10-year plan based on current spending levels and analyzes the adequacy of the current spending levels. Section 4.3.2 presents the spending levels required in order to maintain the condition of roads at an optimum level of service based on the reconstruction strategy presented in Table 14.

4.3.2 Ten Year Plan Based on Current Spending Level

The recommended 10-year plan based on spending levels of $225,000/year is presented in Table 16 and is shown in Map 3. The “Type of Construction” codes are presented in Tables 4 to 9.

TABLE 16 – NORTH ALGONA WILBERFORCE – 2017 TEN-YEAR CAPITAL PLAN

No.	STREET	FROM	TO	Km	TYPE OF CONSTRUCTION		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
072	Lett's Cemetery Road	Highway 41	Bonnechere Valley Twp. Boundary	3.90	LCB-R1, 25% R2	Overlay with 25% Partial Depth Reconstruction (2018)	$ 237.90									
044	Woito Station Road	County Road 56	Black Creek Road	1.20	LCB-R1	Overlay (2019)		$ 30.00								
045	Black Creek Road	Woito Station Road	Doering Road	2.30	LCB-R1	Overlay (2019)		$ 57.50								
094	Shaw Woods Road	0.2km South of Highway 41	Highway 41	0.20	HCB-R2	Partial Depth Reconstruction (2019)		$ 49.80								
078	Grist Mill Road	Highway 60	5.1km West of Highway 60	5.10	LCB-R1, 20% R2	Overlay with 20% Partial Depth Reconstruction (2020)			$ 274.38							
078A	Grist Mill Road	5.1km West of Highway 60	Bonnechere Valley Boundary	2.80	LCB-R1	Overlay (2020)			$ 70.00							
071	Snodrifter's Road	Highway 60	Lett's Cemetery Road	1.60	LCB-R1	Overlay (2021)				$ 40.00						
073	Snodrifter's Road	Lett's Cemetery Road	Mink Lake Road	1.80	LCB-R1	Overlay (2021)				$ 45.00						
027	Roeseler Road	Highway 60	Berndt Road	1.10	LCB-R1	Overlay (2021)				$ 27.50						
028	Berndt Road	Roesler Road	Highway 60	2.30	LCB-R1	Overlay (2021)				$ 57.50						
029	Panke Road	Berndt Road	Dead End	0.10	CLB Patching	Patching/Spot Repairs (2021)				$ 2.50						
053	B-Line Road	County Road 56	Highway 41	2.50	HCB-R1	Overlay (2022)					$ 262.50					
003	Traymore Road	Highway 60	1.9km NW of Highway 60	2.00	HCB-R2	Partial Depth Reconstruction (2023-2024)						$ 249.00	$ 249.00			
004	Traymore Road	1.9km NW of Highway 60	3.2km NW of Highway 60	1.30	CLB-R2	Partial Depth Reconstruction (2025)								$ 219.70		
017	Griffith-Wagner Road	Highway 60	0.8km North	0.80	LCB - R2	Partial Depth Reconstruction (2026)									$ 135.20	
026	Island View Drive	1.4km West of Highway 60	Highway 60	1.40	LCB - R2	Partial Depth Reconstruction (2027)										$ 236.60
						Total	$ 237.90	$ 137.30	$ 344.38	$ 172.50	$ 262.50	$ 249.00	$ 249.00	$ 219.70	$ 135.20	$ 236.60

TOTAL OVER 10 YEARS: $2,244,080

Despite the municipality planning to spend over $2.2 million over the next 10 years, the road system will deteriorate from an overall average condition rating of 5.93 to 4.43, with the condition rating for hard surface roads anticipated to fall from 5.49 to 2.93. Full analysis is contained in Appendix C.

4.3.3 Condition Rating Maintenance Program

Timely rehabilitation reduces spending in the long run and is the most cost beneficial strategy for the municipality and rate payers. In order to maintain the road network at this level, sufficient spending is necessary. Table 17 presents an estimate of the additional spending required over the next 10 years to maintain the average overall condition rating for hard surface roads.

TABLE 17 – SUMMARY OF WORK OVER TEN (10) YEARS IN ORDER TO MAINTAIN OVERALL CONDITION RATING ($1000s)

CODE	DESCRIPTION	km	Cost
DENSE GRADED COLD MIX			
CLB-R2	**Partial Depth Reconstruction** Pulverize or scarify, 50-150mm G.A., double surface treatment, 10% spot drainage improvements, culvert replacement & 10% contingency	5.30	$ 1,213.70
SURFACE TREATMENT OR LOW COST BITUMINOUS (LCB)			
LCB-R1	**Resurfacing** Single surface treatment 6.0m wide	32.00	$ 800.00
LCB-R2	**Partial Depth Reconstruction** Pulverize or scarify, 50-150mm G.A., double surface treatment, 10% spot drainage improvements, culvert replacement & 10% contingency	34.40	$ 5,813.60
LCB-R3	**Full Depth Reconstruction** Earth exc., 150mm G.A., 300mm G.B., DST, culvert replacement, engineering, geotechnical and 10% contingency	2.80	$ 1,500.80
ASPHALT OR HIGH COST BITUMINOUS (HCB) - RURAL ROADS			
HCB-R2	**Partial Depth Reconstruction** Pulverize, 50-150mm G.A., 50mm lift of HL4 asp, shouldering, 10% spot drainage improvements, culvert replacement & 10% contingency	1.90	$ 473.10
	TOTAL:	**76.40**	**$ 9,801.20**

Based on the foregoing, the municipality will need to more than quadruple its current spending level on roads to maintain the overall average condition rating of the road network. As additional spending becomes available, more of the roads in need of improvements may be addressed. The backlog of needs is presented in Appendix D.

4.4 DISPOSAL ACTIVITIES

The Municipal Act provides the mechanism to close a road. The municipality has not identified any roads for closure at the time of writing this report.

4.5 EXPANSION ACTIVITIES

The Official Plan sets the policy for the planned expansion activities. For further discussion please refer to Section 4.1.

4.6 PROCUREMENT METHODS

It is important to consider a variety of procurement methods to ensure the most cost effective allocation of The Township's resources. Some examples include working with other municipalities to combine resources for cost savings, or the consideration of the Alternate Financing and Procurement (AFP) model for major projects. Although the Township has participated in joint tenders with other municipalities in the past, the general consensus is that it is more cost effective to be the sole tenderer on most construction projects due to various geographic challenges, such as the location of gravel pits in comparison to the location of construction. Unless projects are very close in proximity, the cost to procure materials and/or services for the construction and maintenance of the road network is generally lower for the Township when it obtains them on its own. Further details can be found in the Township Procurement Policy.

4.7 RISKS

The biggest risk to the municipality is inadequate spending levels as demonstrated in Section 4.3.2. The consequences of underfunding are the deterioration of the road system and loss of the underlying gravel base in the pavement structure. The consequences are escalating to repair and maintain costs. It is recommended that the following actions be taken to help mitigate some of the spending shortfall:

1. Adopt Ten Year Capital Plan for Road Reconstruction as presented in Table 16,
2. Complete additional work as presented in Table 17 as additional funds become available, and
3. Increase maintenance spending for low cost maintenance strategies and pavement preservation as presented in Section 4.2.

PART B – BUILDINGS/STRUCTURES

1.0 BACKGROUND

McIntosh Perry Consulting Engineers Ltd. (MPCE) was retained by The Township of North Algona – Wilberforce (TNAW) to conduct Building Condition Assessments (BCA) on various building assets that they currently own, operate and maintain. Based on the assessments, a 10-year Capital Expenditure Forecast (CEF) encompassing all of the Township building assets was developed. The BCA and CEF were performed following the Scope of Work as defined within MPCE's PCM-16-0636 dated November, 30, 2017. Additionally, the BCA assessment was performed in general accordance with the standard ASTM E2018, except as outlined herein.

In total there are 17 structures included in the portfolio of building assets which are spread out through the Township but are concentrated in six main locations, as shown in Figure 1. "Area 1" is located at 1091 Shaw Woods Road., Eganville, and is the location of The Township of North Algona – Wilberforce Municipal Office and various on-site storage and garage facilities. "Area 2" is located at 3310 Lake Dore Road., Golden Lake, and is the location of the Golden Lake Community Centre, Golden Lake Fire Station and various on-site storage and garage facilities. "Area 3" is located at Melissa Bishop Park on Township Park Road., Eganville, and contains a seasonal dwelling, gazebo and on-site storage and change room facilities. "Area 4" is the Rankin Fire Station, located on Marsh Road., Pembroke. "Area 5" is the Deacon Fire Station, located on Old Bridge Road., Golden Lake. Finally, "Area 6" is located at Biederman Park at 57 Biederman Road, Golden Lake. All major occupancy buildings were observed to have electricity delivered through the provincial energy provider "OntarioHydro energy", domestic water supplied by wells and sanitary waste disposed of through adjacent septic beds. All minor occupancy buildings either do not have a need for utilities or share utilities from another major occupancy building located in close proximity. Costs associated with the servicing of such utilities are not included in the Capital Expenditure Forecast as they are considered routine general maintenance currently managed by TNAW through private agreements.

Each building asset was assessed based on the same parameters, with adjustments made for the specific features and uses of each. The items of assessment include site features, interior/exterior building envelope and finishes, building structure and mechanical/electrical/emergency equipment.

The information presented in this report provides a summary for the survey of the current conditions of the interior and exterior features of the aforementioned buildings, within the terms of reference and limitations outlined in the body of this report. MPCE has been asked to make recommendations and provide opinions based solely on the visual sampling of existing components. Test cuts, coring, design review, quantity surveys, destructive testing, or instrument testing were not carried out. Consequently, further investigation or additional testing may change our current recommendations and opinions. In this report we have indicated the current levels of service and expected remaining service life of such components during our site review.

2.0 METHODOLOGY

2.1 General

This report is intended to provide an overview of the existing conditions for the building, as well as our professional opinion on what remedial work is recommended. The report presents observations, as well as cost estimates to perform the repair work on deficient items observed. A master and replacement/repair summary table is provided.

This report has been prepared by Greg Doroszkiewicz, M.Eng., with senior review provided by Fraser Armstrong, P.Eng., of McIntosh Perry Consulting Engineers Ltd. (MPCE). Fraser has over 20 years' experience in the Building Science discipline.

Visual review of the buildings was performed on November 14, 22 and 27, 2017.

2.2 Terms of Reference

This assessment is based on a visual review of the buildings for purposes of identifying deficiencies within the primary building components. Observations were limited to those areas that were readily accessible during a "walk-through" type of examination. MPCE has been asked to make observations and conclusions based solely on a visual sampling of building components. Intrusive efforts such as test cuts, destructive testing, coring, design review, quantity surveys, or instrument testing were not performed. This report has been prepared for preliminary planning type purposes. Further investigation or additional testing may provide a basis for MPCE to revise its recommendations and opinions. For this reason, it is recommended that future follow up assessments should be performed at regular intervals.

Review of environmental issues is not part of the agreed scope of work and as such, discussion with respect to environmental issues is not presented.

No detailed review of secondary fixtures and fittings or tenant leasehold improvements observed was undertaken. Life-cycle forecasting is based on a visual review of components, industry standards and consideration of the information supplied by the Client and/or Site Representative.

The following scope of work was requested and undertaken:

- The various visible and accessible systems, structures and services were visually evaluated based on a "walk-through" type of examination;
- The residual service life of major components with immediate repair or replacement requirements estimated;
- Current conditions were assessed and recommendations were made for repair work based on the current use of the building continuing as is; and
- Repair and replacement cost summary tables were provided.

The scope of work was conducted using standard engineering practices and consideration of the age and usage of the building. All recommended remedial work, in the opinion of MPCE, is necessary and reasonably consistent with current practice.

Per the term of MPCE scope of work, the main components/systems reviewed include the following:

- Site Features,
- Building Structure,
- Interior/Exterior Building Envelope and Finishes, and
- Mechanical/Electrical/Emergency Equipment.

2.3 Building Condition Assessment

A Building Condition Assessment (BCA) is a report that outlines a snap shot in time for the condition of various building components and should not be considered as an exhaustive survey. A BCA provides an estimated cost in present day dollar values to replace a building component and the year that replacement is likely to occur. The Building Condition Assessment (BCA) will be used to assist The Township of North Algona - Wilberforce in making decisions on:

1. What capital remediation work is required to maintain the buildings in a state-of-good repair assuming proper and diligent maintenance programs being implemented;
2. Provide a 10-year expenditure plan; and
3. What annual capital investments are likely required over the next 10-years.

2.4 Capital Plan: 10-Year Capital Expenditure Forecast

The capital plan incorporates the information from the Building Condition Assessment to predict monetary requirements over the 10-year period beginning in 2018 (Year 1) and ending in 2027 (Year 10). Probable costs are presented in 2017 (Year 0) dollars and exclude inflation, engineering costs and project management costs.

Over the next 10-years it is anticipated that the majority of equipment and systems will require minimal repair or replacement, to maintain the building in a state-of-good repair under the current operational model. The Capital Expenditure Forecast table for a 10-year study period presenting a capital repair/replacement summary for the reviewed components is appended to this report.

2.5 Cost Estimate Methodology

The replacement costs of the various components detailed in this report are based on the unit rates contained within the 2016 edition of "Yardsticks for Costing" published by Southam Business Information and Communications Group Inc., and “Building Construction Cost Data – 2016” by RS Means, combined with relevant in-house experience with the repair and renovation of residential, commercial, and industrial buildings. The estimated replacement and maintenance costs contained within this report are based on information and quantities that were obtained by visual review of the property.

The replacement cost of each component is based on the following assumptions:

1. Standard building materials will be used, purchased at the contractor's list price;
2. Current construction techniques will be used in replacement or repair of building components;
3. Quality of construction will be in accordance with the current edition of the relevant Building Codes; and
4. Components will be replaced with like components.

2.6 Definitions

Life Expectancy

This is the normal expected service life for a component in terms of years and is considered to be a representative average useful life for components under normal operating conditions. The actual life expectancy for a component may vary considerably depending on the service conditions that they are subjected to, the design, and the quality of materials used, quality of installation, and the environment as well as level of applied maintenance. The assumptions regarding the life expectancy of each of the various components forming the common elements of this development, as detailed in this report, are based on the technical literature of manufacturers, ASHRAE data references, on relevant technical publications, and our own experience with the materials and equipment forming the common element components of the development. The estimations of the remaining life expectancies of the common element components are based on an assessment of their present condition and effective age made during our visual review of the property.

Building Components

This is the inventory of the building components, systems and equipment that have been included in the Capital Plan. These elements usually perform a given function, regardless of the design specification, construction method or material used.

Remaining Life

The remaining useful life of the component based on the date of visual review and the assumption of a normal level of maintenance.

Capital Work

Work that extends the useful life of a building component. Repairs that maintain the functionality of a component are not considered capital work, but rather routine operational maintenance.

2.7 Assumptions

This BCA report is divided into sections according to the major components of the building. Each section presents observations and cost estimates to perform the required repairs/replacements on deficient components observed. The repairs/replacement work has been categorized according to the following definitions:

- Life Safety – Hazardous conditions that should not be deferred and which could lead to loss of life or critical/extremely severe injury.
- Structural Integrity – Conditions that lead to the deterioration of structural elements.
- Legislative Requirements – Conditions that require updating to comply with legislation.
- Component Functionality – Conditions that require the repair and/or replacement of components which have reached or surpassed their useful life.
- Cost Effective Initiatives - Repairs or replacements intended to obtain a savings in the future operating of the building.

3.0 TOWNSHIP OF NORTH ALGONA WILBERFORCE – MUNICIPAL OFFICE GROUNDS

3.1 Municipal Office General Configuration

The Township of North Algona and The Township of Wilberforce amalgamated in 1999 to form what is now known as The Township of North Algona – Wilberforce. The Municipal Office is located at 1091 Shaw Woods Road, Eganville, ON. Assessment for the Municipal Office was conducted on November 27, 2017. The original building predates amalgamation, after which, a garage addition was constructed in approximately 2000 with additional auxiliary building additions off of the garage constructed in approximately 2002. The building is now a one-story, multi-use facility containing office space, organized assembly areas and a vehicle garage. The gross plan dimensions of the footprint measure 50ft. by 125ft. (6,250 ft^2). Other storage and garage facilities are located on the same grounds as the Municipal Office building and are to be discussed in subsequent sections.

3.1.1 Site Features

The site encompasses an area of approximately 100,000 ft^2, including a paved parking lot with an area of 24,000 ft^2 along the front (north side) of the Municipal Office. The remaining being a mixture of grass and loose granular gravel in the area servicing the four sand, salt and equipment storage sheds at the rear. Both are relatively lightly trafficked areas and as such they are observed to be in good condition. Access the rear service area is by asphalt paved laneways situated on the east and west sides of the building. In the parking area the asphalt displays minor cracking patterns but no signs of potholes. Fluorescent yellow paint used for marking parking stalls is becoming worn out and will require an extra coat of paint within the study period.

From the parking area to the front door of the Municipal Office there is an area of interlocking stone for pedestrian traffic that measures approximately 300 ft^2, along which there are planters with shrubs and trees.

There are no other notable landscaping features on the property, which is surrounded by native forest and grass. A 30" tall concrete retaining wall extending along the east side of the aforementioned walkway displays signs of distress in the form of full height cracks repeating periodically down its length. The retaining wall is expected to require minor repair/sealing within the study period to mitigate future damage and increase its longevity to meet current expected levels of service.

The site in general is sufficiently graded away from structures with no excess accumulation of water or soil erosion, except for a small area located directly in front of the sand storage dome that had pooled water on the date of the site visit. Typically, with routine maintenance, including crack sealing, patchwork and/or minor regrading areas of asphalt and granular gravel can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the parking area and access lanes observed.

3.1.2 Building Structure

The Municipal Office building is composed of three sections, all constructed at various times as mentioned previously, namely the administrative addition, original vehicle garage section and auxiliary building additions attached to the garage. The foundations of the administrative and vehicle garage sections are constructed of reinforced concrete foundation walls which are only made visible along the east side of the building. In this area the foundation wall acts as a retaining wall which protrudes above grade up to 32" depending on the difference in finished grade elevations. In these sections the building is constructed of 10" concrete masonry units (CMU) walls extending up to the underside of gabled roofs. The construction of the two smaller auxiliary building additions are not exposed but appear be thickened slab on grade foundations with concrete curbs all around and conventional wood framed construction stud walls extending up to the underside of monosloped roofs. All roof construction is of conventional wood framed roof trusses. Roof overhangs of 1ft. to 2ft. are common all around the perimeter of the building.

The majority of the foundation construction is not exposed but is deemed to be in good condition as no signs of excess differential settlement, deflection or cracking of interior finishes were observed. The CMU wall construction is exposed at the interior of the vehicle garage and is generally in satisfactory condition; however, some major cracking and debonding within mortared head and bed joints, specifically at the northwest corner was observed. This is evidence of localized differential settlement at this location, which is not uncommon for structures of this age. Due to the time elapsed, it is reasonable to assume that the settlement processes have since finished and will not progress further. It is recommended that the CMU wall be repointed in areas exhibiting cracking. The roof structure is only viewable from a small hatch in the east gable end of the administrative section. The roof structure as observed is in good condition showing no signs of excess deflection, sagging or physical damage. In addition, there is a tall brick abandoned chimney located at the rear of the garage that remains in excellent condition.

3.1.3 Exterior Building Envelope and Finishes

The exterior of the building structure is finished with corrugated sheet metal siding on all sides and sheet metal roofing along trusses and undersides of the soffits. Eavetroughs direct water runoff to various downspouts located around the perimeter of the building. The exposed foundation wall is covered in a cementitious parge coating. Exterior finishes are deemed to be in satisfactory condition with the following deficiencies observed:

1. Localized areas of discoloration and/or rusting in sheet metal at exhaust vent locations.
2. Localized areas of physical damage in sheet metal caused by vehicle impact.
3. Flashing and fascia deficiencies at northwest corner of administrative section causing interior water damage - to be discussed with interior finishes, recommend immediate repair.
4. Downspouts do not sufficiently direct water away from foundation, recommend elongated extensions.
5. Cementitious parge coating spalling off, recommend remove and reparge foundation wall.

Exterior windows include a combination of 30 fixed pane and horizontal swing windows of various sizes. All of the windows are of different ages and correspond to the dates of original construction for each section of the building. Caulking is observed to be losing some elasticity and debonding is common. No physical damage of windows is observed and all are reported operable. It is foreseen that existing windows will need to be recaulked within the study period. Exterior doors include one single automatic swing metal door, five single manual metal doors and four overhead garage doors measuring 14ft. by 14ft. No signs of damage are noted and all of the doors are operable. The two doors located at the rear of the building were never painted at the time of installation and are foreseen to be painted within the study period.

3.1.4 Interior Building Finishes

The interior of the building structure walls are finished with painted drywall throughout except for the interior of the garage and mechanical room where the walls are exposed CMU block. Ceilings are primarily finished with painted drywall, acoustic ceiling tiles are used within the hallway/kitchen and the garage is finished with corrugated sheet metal. Floors are finished with ceramic tile at the entrance area, exposed concrete slab within the garage/mechanical room/auxiliary building additions, carpeting within office areas and vinyl tile elsewhere. All finishes are in good condition with the exception of the following observed deficiencies:

1. Drywall at the northwest corner of the administrative section is saturated with water, causing significant bubbling in the paint. This is associated with a deficiency in the flashing and fascia of the roof above, in addition to repairing the roof the interior finishes will require repair.
2. Minor damage to some acoustic tile, replace with new as needed.
3. Cracking within exposed concrete slab on grade within garage, recommend sealing.

Interior doors include eighteen wooden manual single doors throughout and three metal manual single doors at entrances to garage. No significant damage is noted and all are operational. No replacements are foreseen within the study.

3.1.5 Mechanical/Electrical/Emergency Equipment

The building receives electricity from a HydroOntario transformer located across the street to the front (north) of the building. The main panel is a 120/240V electrical panel by "EATON" located in the mechanical room with associated switchgear by "D SQUARED". The electricity is then delivered to two 120/240V subpanels by "D SQUARED" within the Municipal Office (1 located in the garage and 1 located in the auxiliary building addition) and to the three surrounding exterior storage sheds. The following is a list of the mechanical and building systems equipment servicing the building:

1. **"PARADOX"** multi zone security system
2. **"NORTHERN TELECOM"** telephone system (MODEL # MQTPET 25 HPFL)
3. **"MASK COMMUNICATIONS INC."** telephone system (MODEL # STRATA DK 40i)
4. **"CARRIER"** weather maker two zone comfort zoning system with digital thermostats
5. **"HONEYWELL"** thermostats for radiant baseboard heaters located throughout building
6. **"KEEPRITE"** air conditioning unit at rear of building (MODEL # NAC048AKC3 / SERIAL # E052226773)
7. **"LENNOX"** gas furnace (MODEL # G51MP)
8. **"GENERAC POWER SYSTEMS INC."** RTS transfer switch for emergency electric generator at rear of building
9. **"SUPERFLUE"** propane water heater (MODEL # 6G50PVH-ES-06 / SERIAL # S1123 F705416)
10. Air compressor in garage
11. Two large **"RE-VERBER-RAY"** radiant heating units on ceiling of garage, one of which is not operational
12. Two overhead fans in office area and two overhead fans in vehicle garage which industrial exhaust vent.
13. Four above ground diesel fuel storage tanks with pumps dated 2002, 2009, 2010, 2011

Domestic water is received from a well adjacent to the building and services four interior sinks, three toilets, one shower, one bath/basin and exterior hose bibs. A combination of PVC and copper piping is utilized for supply and discharge of the water. Sewage treatment is provided by an on-site septic system.

Kitchen appliances include an electric stove and fridge.

Emergency equipment is provided in the form of smoke detectors throughout, nine fire extinguishers and adequate signage.

Exterior lighting is provided by surface mounted lights on exterior building faces as well as flood lights. Interior lighting is provided primarily by fluorescent troffer lighting fixtures with some incandescent fixtures. It is worth noting that this building is one of the five buildings included in a Request for Quotation #ENR2017-01 issued by the TNAW for the removal and replacement of all lights in order to upgrade to high efficiency lighting fixtures and qualify for the SaveOnEnergy rebate program. Lighting upgrade will therefore no be included in forecasted expenditures.

The life expectancy of all electrical equipment will exceed the duration of the study period. The life expectancy of mechanical equipment and appliances can range from 10 to 20 years and as such it is expected that large equipment including the electric stove/refrigerator, air conditioning unit, gas furnace, water heater, air compressor, ceiling mounted radiant heater fuel pumps with associated fuel storage tanks will require replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time.

1.1 EQUIPMENT & SALT STORAGE SHED

Located adjacent to the Municipal Office is a salt storage shed for which the date of construction is unknown. The building is a one-story, multi-use structure containing a central section for storing salt and two bays for vehicle storage. The two bays on each side of the central section are not original to construction. The salt storage shed was assessed on November 22, 2017. The gross plan dimensions of the footprint measure 30ft. by 64ft. (1,920 ft^2).

3.1.6 Building Structure

The foundation of the central section (salt storage) consists of 10” thick reinforced concrete foundation walls that protrude above grade 46” all around the perimeter. Extending off the foundation walls at two locations on each of the three sides are 3ft. long by 10” thick concrete buttresses for retaining the applied pressure from the contents of the shed. From the top of the foundation walls conventional wood frame construction (2”x6” stud walls at 16” centre to centre) extend to the underside of the roof structure. The roof structure in this section is of conventional wood framed construction with trusses spaced at 24” centre to centre (c/c). The two side bays (vehicle storage) share common foundation walls and stud walls with the salt storage shed on the interior side and are supported by wood posts (6”x6”) from grade to underside of roof structure on the exterior side. The roof structure in this section is of conventional wood framed construction comprised of monosloped 12” TJI roof joists at 24” c/c.

The structure as a whole is deemed to be in fair condition with the following observed deficiencies. At the foundation level minor cracks are noted in select locations around the perimeter and anchor bolts are severely corroded. Stud walls show signs of saturation and rotting near the foundation level and some of the 6x6 posts are beginning to crack longitudinally along the grain. All of the TJI roof joists and most of the roof trusses are observed to be in good condition, though some bottom chords of the trusses appear to have been broken. It is recommended that affected wood framing components be repaired or replaced accordingly.

3.1.7 Exterior/Interior Building Envelope and Finishes

The foundation wall is exposed concrete with no bituminous coating on the interior face to protect the structure from corrosive contents of the shed (sand and salt). It is recommended that a bituminous coating be applied over the entire inside face of the foundation wall when the shed is emptied for other repair work taking place within the study period. There is no cementitious parge coating on the exterior face.

The roof and walls of the entire structure are finished with corrugated sheet metal siding. The sheet metal for the salt storage structure has severe physical damage from vehicle impact and corrosion damage from salt. In some locations the sheet metal is corroded all the way through, creating holes for easy water infiltration. Within the study period it is foreseen that some siding will need to be replaced and a more effective flashing detail will need to be installed along the top of the foundation wall.

There is one exterior double sliding manual door measuring 14ft. by 16ft. tall constructed of the same wood framing and metal siding as the structure. The sliding door reveals physical damage from equipment impact at its base and is not easily operational. Replacing this door with new is recommended within the study period.

3.1.8 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by "EATON" receives electricity from the adjacent building utilities to service interior and exterior lighting and electrical outlets within the two side bays as well as an auxiliary equipment storage shed. External and internal lighting is operational but one of the incandescent bulb sockets in the salt storage shed appears to be damaged.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. are within the equipment storage shed. Although a fire extinguisher is available in the auxiliary storage shed nearby, it is recommended that a fire extinguisher be installed within the side bays due to the nature of the equipment and chemicals stored within.

1.2 SAND STORAGE DOME

Also located adjacent to the Municipal Office is a sand storage dome for which the date of construction is unknown. The building is a one-story, sand storage structure with circular foundation and dome shaped roof. The sand storage dome was assessed on November 22, 2017. The gross plan dimensions of the sand dome footprint measures 60ft. in diameter (2,830 ft^2).

3.1.9 Building Structure

The foundation of the sand storage shed consists of 18" thick reinforced concrete foundation walls that widen at the base which protrude above grade 5'-4" all around the circumference. At the entrance of the dome there are four severely rusted steel angles (4"x4") affixed to foundation wall for protection from equipment impact. Replacement of the steel angles is left to the discretion of the TNAW. From the top of the foundation wall conventional wood frame construction extends up at an angle of approximately 60^o from the horizontal until converging at the peak of the dome approximately 40ft. above the top of foundation wall. An

additional gable roof truss section extends off of the structure above the entrance to the dome. The foundation wall as well as all wood frame construction, with associated anchorage, is deemed to be in good condition as there are no signs of cracking, rotting, or rusting.

3.1.10 Exterior/Interior Building Envelope and Finishes

The foundation wall is exposed concrete with black bituminous coating on the interior face to protect the structure from corrosive contents of the shed. The bituminous coating has since eroded away from most of the concrete face due to the abrasive sand being stored within the building. It is recommended that this bituminous coating be reapplied over the entire inside face of the foundation wall if, and when, the shed is emptied and repurposed for salt storage. It is unknown if this will occur within the study period. There is no existing cementitious parge coating on the exterior face.

The roof structure above the dome is finished with asphalt shingles while the gable roof structure is finished with sheet metal siding. The shingles are in good condition over the majority of the roof. At the valleys where the dome meets the gable roof structure and water runoff is concentrated some wear and curling of the shingles can be seen. It is foreseen that some minor repairs will be required in these locations within the study period.

3.1.11 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by “D SQUARED” receives electricity from adjacent building utilities and delivers to lights and electrical outlets within the storage shed. Located at the peak of the dome there are 20 equally spaced non-mechanical, free-flow roof vents.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. are within the building.

1.3 CANVAS SAND STORAGE SHED

Adjacent to the Municipal Office is an additional sand storage shed for which the date of construction is unknown; construction of this shed appears to be newer. The building is a one-story structure with rectangular foundation and curved canvas roof used for sand storage. The canvas sand storage shed was assessed on November 22, 2017. The gross plan dimensions of the footprint measure 42ft. by 60ft. (2,520 ft^2).

3.1.12 Building Structure

The foundation of the sand storage shed consists of 10” thick reinforced concrete foundation walls which protrude 6ft. above grade all around the perimeter. From the top of the foundation wall seven steel arched trusses forming the roof are anchored to opposite sides of the structure by 3/8” anchor bolts. Similarly the canvas cover is anchored by means of ratchet strap tie downs at seven locations along each side and at five locations along the rear (south) wall; the ratchet strap tie downs are equally spaced at 10ft. c/c. Extending off the foundation walls at three locations along each side are 5ft. long by 10” thick concrete buttresses for retaining the pressure from the contents of the shed. The steel arched trusses forming the roof extend approximately 25ft. at the highest point above foundation wall.

The roof structure is in good condition as there are no observed signs of rust in the steel trusses/baseplates or abrasion in the canvas. The foundation wall exhibits cracking and spalling at all anchorage locations, with the most extreme cases concentrated at the corners. This is a structural deficiency that should be repaired immediately because the foundation wall experiences very high tensile forces in these locations, due to both the canvas tightening as well as lateral wind pressure. If not repaired it is foreseen that cracking will propagate further and will be amplified by the effects of water infiltration and freeze/thaw cycles. The concrete buttresses are observed to be in good condition.

3.1.13 Exterior/Interior Building Envelope and Finishes

The foundation wall is exposed concrete with black bituminous coating on the interior face to protect the structure from corrosive contents of the shed. The bituminous coating has since eroded away from most of the concrete face due to the abrasive sand being stored. It is recommended that this bituminous coating be reapplied over the entire inside face of the foundation wall if, and when, the shed is emptied and repurposed for salt storage. It is unknown if this will occur within the study period. There is no existing cementitious parge coating on the exterior face.

The roof structure is finished with a white canvas cover that shows no signs of wear and tear and is not foreseen to require replacement within the study period.

3.1.14 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by “EATON” receives electricity from adjacent building utilities and delivers to electrical outlets within the storage shed.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. was observed within the building.

1.4 AUXILIARY EQUIPMENT STORAGE SHED

Also located adjacent to the Municipal Office is an auxiliary equipment storage shed for which the date of construction is unknown. The building is a one-story, vehicle and miscellaneous equipment storage structure. This equipment storage shed was assessed on November 22, 2017. The gross plan dimensions of the building’s footprint measure 25ft. by 50ft. (1,250 ft^2).

3.1.15 Building Structure

The foundation of the auxiliary equipment storage shed consists twelve wood posts (6”x6”), equally spaced around the structure. The posts extend from grade to underside of roof structure. Walls are constructed of infilled wood framing (2”x4” at 16” c/c) in between the wood posts. The roof structure in this section is of conventional wood framed construction with monosloped roof trusses spaced at 24” c/c. All structural components are deemed to be in good condition with no significant saturation/rotting/splitting of wood or excess deflection/ physical damage observed within roof trusses. No repairs are foreseen within the study period.

3.1.16 Exterior/Interior Building Envelope and Finishes

The roof and walls of the entire structure are finished with corrugate sheet metal siding. The sheet metal siding has some physical damage from vehicle impact but not to the point of compromising the functionality of the structure. There are three exterior sliding manual doors (1 double and 2 single) of similar construction as the walls measuring 14ft. by 24ft. and 12ft. by 14ft., respectively. Rust is not observed to be prevalent. Within the study period it is not foreseen that the siding will need replacement.

3.1.17 Mechanical/Electrical/Emergency Equipment

The storage shed contains two incandescent light bulbs and electrical outlets which receive electricity from adjacent salt storage building utilities. A fire extinguisher can be found on the inside of the door closest to the salt storage shed with signage indicating such.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. were observed within the building.

4.0 GOLDEN LAKE COMMUNITY CENTRE GROUNDS

4.1 GOLDEN LAKE COMMUNITY CENTRE GENERAL CONFIGURATION

The Golden Lake Community Centre is located at 3310 Lake Dore Road, Golden Lake, ON and was assessed on November 27, 2017. Date of construction is unknown. The foundation walls for the community centre are constructed with rubble stone; this would indicate an older type of construction. The building is a two-story, multi-use facility containing office space, organized assembly areas and an attached post office. The gross plan dimensions of the footprint measure 40ft. by 70ft. (2,800 ft^2). A fire station, as well as three storage sheds are located on the same grounds; these structures will be discussed in subsequent sections.

1.4.1 *Site Features*

The site encompasses an area of approximately 75,000 ft^2, including an adjoined paved parking lot of 20,000 ft^2along the front and sides of the Community Center and Fire Station. The remaining area is a mixture of grass and loose granular gravel in the area servicing the three sand and equipment storage sheds at the rear. Both the parking lot and the service areas are relatively lightly trafficked areas and as such they are observed to be in good condition. The asphalt displays minor cracking patterns but not signs of potholes. Fluorescent yellow paint used for marking parking stalls is becoming worn out in the parking lot surrounding the Community Center and is nonexistent in the parking lot surrounding the Fire Station; the marking paint will require an extra coat of paint within the study period.

At the parking area surrounding the Fire Station, there are no sidewalks or walkways leading into the structure. Further to this there are no notable landscaping features on the property.

There are four entrances to the Community Centre, each with reinforced concrete stairs each with varying levels of distress; total plan area for the stairs measures approximately 550 ft^2 Although the rear (north) entrance stairs and side (west) entrance stairs are in good condition, the two larger entrances on the south

side have large cracks along their length and multiple areas containing signs of rusting steel and spalling. These signs of distress will require repair/sealing within the study period to mitigate future damage and increase their longevity in order to meet current expected levels of service. While the property is surrounded by native forest and grass, there are no other notable landscaping features on the property aside from small shrubs and trees contained within interlocking stone planters which appear to be level and plumb.

The site in general is sufficiently graded away from structures with no excess accumulation of water or soil erosion. Typically, with routine maintenance including crack sealing, patchwork and/or minor regrading, areas of asphalt and granular gravel can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the parking area and laneways observed.

1.4.2 *Building Structure*

The Community Centre is composed of three sections, namely the assembly area at the center, the "Canada Post" post office addition, and the entranceway/stairway addition; all of the sections were constructed at various times. The foundations of the assembly area and post office are constructed of unreinforced rubble stone foundation walls which are visible from the outside as well as in the basement. The foundation construction of the entranceway/stairway addition is not exposed but appears be thickened slab on grade with concrete curbs all around. All wall and floor assemblies are constructed of conventional wood framed construction stud walls extending up to the underside of the roofs. All roof construction is of conventional wood framed gabled roof trusses with overhangs of 1ft. to 2ft. common all around the building perimeter.

The majority of the foundation construction is exposed and despite the age of construction of the building they are observed to be in satisfactory condition as no signs of excess differential settlement, deflection or deterioration were observed. Mortar between stones is drying out and as a result is debonding and cracking away from the stones. This is not a major structural concern but it is recommended that the loose mortar be removed and the foundation wall be repointed in the affected areas to prolong the longevity of the structure. The relatively newly constructed thickened slab on grade below the entrance way addition is in good condition with no current issues noted. Being covered by interior and exterior finishes the wood wall, floor and roof assemblies are not exposed at any locations above grade; however they are deemed to be in good condition as no signs of excess deflection, sagging, physical damage or water infiltration/condensation were observed.

Within the basement level, various structural posts, two 8" deep steel drop beams and a wood joist floor assembly (2"x8"at 24" c/c) were observed. The condition of these structural elements reinforces our opinion that wood construction in this building has been well maintained. In addition, there is a tall unused bell tower that rises above the assembly area that has since been finished in vinyl siding; the former bell tower and vinyl remain in excellent condition.

1.4.3 *Exterior Building Envelope and Finishes*

The exterior of the assembly and post office areas are finished in matching red painted brick veneer. The entranceway/stairway addition is finished in vinyl siding as is the unused bell tower. With the exception of the entranceway/stairway addition which is finished in asphalt shingles, roofing is finished with corrugated sheet metal throughout. Soffits are finished with sheet metal. Eavetroughs direct water runoff to various downspouts located around the perimeter of the building. The rubble stone foundation wall is covered in a cementitious parge coating in some locations but has since spalled off around the majority of the foundation wall above grade. Exterior finishes are deemed to be satisfactory in condition with the following deficiencies observed:

1. Brick veneer is cracking and spalling, most notably at the front of the post office, recommend repairs.
2. Downspouts do not sufficiently direct water away from foundation, recommend elongated extensions.
3. Cementitious parge coating spalling off, recommend remove and reparge entire foundation wall, where exposed.

Exterior windows include a combination of 20 fixed pane and vertical sliding windows of various sizes. All are of different ages which correspond to the dates of original construction for each section of the building. Caulking is observed to be losing some elasticity and debonding is common. No physical damage of windows is observed and all are reported operable. It is foreseen that existing windows will need to be recaulked within the study period. Exterior doors include seven single manual swing metal doors. No signs of damage are noted with the doors; all are operable.

1.4.4 *Interior Building Finishes*

Walls and ceilings within the interior of the building structure are finished primarily with painted drywall throughout with the exception of the ground floor assembly area and post office which have ceilings finished with acoustic ceiling tiles. Floors are primarily finished with vinyl tile throughout, with the exception of the carpeting used within the second floor assembly area and the exposed concrete slab within the unfinished basement. All finishes are in good condition and are not in need of any major repairs within the study period.

Interior doors include one metal manual double door at the storage room, six metal manual single doors, 11 wood manual single doors and one metal store front style door with glazing within the post office vestibule. Only two interior windows are found throughout the building, one at the top of the stairs leading to the second floor assembly area and the other inside the post office. No significant damage is noted with the doors or the interior windows; all are operational. No replacements are foreseen within the study period.

1.4.5 *Mechanical/Electrical/Emergency Equipment*

The building receives electricity from a HydroOntario transformer located at the front of the post office. The main panel is a 120/240V electrical panel by “D SQUARED” located in the electrical room in the basement. The electricity is then delivered to five 120/240V subpanels (two “D SQUARED” and one “EATON” located

within the same electrical room, one "D SQUARED" located in the second floor assembly area and one "D SQUARED" located in the post office). The following is a list of the mechanical and building systems equipment servicing the building:

1. **"DSC"** multi zone security system
2. **"KOOLTEMP-VALLEY"** multi zone comfort zoning system with digital thermostats
3. **"HONEYWELL"** thermostats for air conditioning and heating throughout
4. Air conditioning unit at rear of building (inaccessible at time of visit, model and make unknown)
5. **"ICG BARRIERE of KEEPRITE"** oil fired warm air furnace (MODEL # BOL 124/169)
6. **"GRANBY INDUSTRIES"** aboveground steel fuel tank (MODEL # 89674), dated 2002
7. Emergency electric generator at rear of building (inaccessible at time of visit, model and make unknown)
8. **"GIANT"** electric water heater rental from HydroOntario (MODEL # 152E-30H-1), dated 92-02
9. Two overhead fans in ground floor assembly area.
10. Two window mounted air conditioning units (one in second floor assembly area and one in post office)

Water is received from a well adjacent to the building and services nine interior sinks, five toilets/one urinal, and exterior taps. A combination of copper piping and PVC is used for supply and wastewater discharge. It was noted that the toilet in the post office washroom is not consistently operational and will require repair or replacement in the study period. Sewage treatment is provided by an on-site septic system.

Kitchen appliances include an electric stove and fridge.

Emergency equipment is provided in the form of smoke detectors throughout, six fire extinguishers and adequate signage.

Exterior lighting is provided by surface mounted lights on exterior building faces as well as flood lights. Interior lighting is provided primarily by fluorescent troffer lighting fixtures with some incandescent fixtures. It is worth noting that this building is one of the five buildings included in a Request for Quotation #ENR2017-01 issued by the TNAW for the removal and replacement of all lights in order to upgrade to high efficiency lighting fixtures and qualify for the SaveOnEnergy rebate program. Lighting upgrade will therefore no be included in forecasted expenditures.

The life expectancy of all electrical equipment will exceed the duration of the study period. The life expectancy of mechanical equipment and appliances can range from 10 to 20 years and as such it is expected that large equipment including the electric stove/refrigerator, air conditioning units, furnace and associated fuel storage tank will require replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time. The water heater is part of an existing rental and servicing agreement with HydroOntario and therefore no costs associated with the water heater (repair or replacement) will included in forecasted expenditures.

1.5 GOLDEN LAKE FIRE STATION GENERAL CONFIGURATION

Located adjacent to the Golden Lake Community Center is the Golden Lake Fire Station, situated at 11212 Hwy. 60, Golden Lake, ON. The Golden Lake Fire Station was assessed on November 22, 2017. Construction of the building took place during 1974. The building is a one-story, three-bay vehicle garage facility shared between the municipality and fire department (one bay is owned and operated by the municipality and two bays are owned and operated by the fire department). The gross plan dimensions of the footprint measure 40ft. by 80ft. (3,200 ft^2).

1.5.1 *Building Structure*

The Golden Lake Fire Station is composed of two sections, namely the two bay fire department garage and one bay municipal garage. The foundation is constructed of reinforced concrete foundation walls which do not protrude above grade. Within the bounds of the foundation wall is a poured 6" thick concrete slab on grade with saw cuts equally spaced in each direction. The building is constructed of 10" CMU exterior walls and a 10" CMU demising wall between the municipal and fire department sections. The CMU walls extend up to the underside of the gabled roof which is 21ft. at the peak. All roof construction is of conventional wood framed roof trusses with 1ft. overhangs common all around the building perimeter.

The majority of the foundation construction is not exposed but is deemed to be in good condition as no signs of excess differential settlement, deflection or cracking of interior finishes were observed. From the exterior side, the CMU wall joints are debonding and cracking at the south west corner as well as the full height stress release joint at the rear, where the construction of the two sections meet. This is due to aging of the mortar and sealant, resulting in drying, contracting and eventually debonding from the CMU blocks. It is recommended to rout out all debonded material and repoint/reseal, as required. The matching stress release joint at the front of the structure is hidden beneath corrugated steel siding. The roof structure is not exposed but is deemed to be in good condition as no signs of excess deflection, sagging, physical damage or water infiltration/condensation were observed. In addition there is a structural steel crane hoist inside the municipal garage constructed with a 16" deep steel beam between two 8" deep steel columns.

1.5.2 *Exterior/Interior Building Envelope and Finishes*

The exterior of the building structure is exposed CMU block wall that is finished with corrugated sheet metal siding on the front of the building and at gable ends. Roofing is finished with corrugated sheet metal along trusses and undersides of soffits. Eavetroughs direct water runoff to various downspouts located around the building perimeter and discharges the water at a sufficient distance away from the foundation. None of the expose CMU walls or foundation are covered in cementitious parge coating. Exterior finishes are deemed to be satisfactory condition with only those deficiencies discussed in the previous structural section. It is recommended to add concrete bollards at sides of garage doors protect the finishes as well as the structure from vehicle impact.

Exterior windows include a two vertical sliding windows (1 in each section), each of different age. The one within the municipal garage is in good condition. While operational the window within the fire department

garage is outdated. No physical damage of windows is observed and all are reported operable. Exterior doors include three single manual swing metal doors and four overhead garage doors (3 measuring 12ft. by 12ft. and 1 measuring 12ft. by 14ft.). No signs of damage are noted with the doors; all are operable.

The interior of the fire department garage walls and ceiling are finished with painted drywall throughout except for wall surfaces comprising the demising wall and washroom enclosure in which they are painted CMU block. The interior of the municipal garage walls are finished with corrugated sheet metal throughout except for the demising wall which is painted CMU block. Ceilings in the municipal garage are painted plywood. Floors are all exposed concrete slab on grade. All finishes are in good condition with the exception of the following observed deficiencies:

1. Some areas of drywall within fire department garage display physical damage, recommend repairs.
2. Cracking within exposed concrete slab on grade within both garages originating from corners of CMU wall, recommend sealing.

Interior doors include one wooden manual single door to the washroom and one metal manual single door in the demising wall that separates the two garages. The metal demising wall door is operational but significantly damaged and is foreseen to need replacing within the study period.

1.5.3 *Mechanical/Electrical/Emergency Equipment*

The building receives electricity from a HydroOntario transformer located across the grounds to the rear (south) of the building. The main panel is a 120/240V electrical panel by “D SQUARED” and is located in the fire department garage. Electricity is then delivered to a 120/240V subpanel by “EATON” located within the fire department garage and to the surrounding exterior storage sheds. The following is a list of the mechanical and building systems equipment servicing the building:

1. **“PARADOX”** multi zone security system throughout
2. Multi zone climate control system with digital thermostats throughout
3. **“REZNOR”** propane heater and exhaust vent in municipal garage
4. **“FLEX-LITE”** water storage tank (MODEL # FL12 / SERIAL # FL1256636), dated 05/19/11
5. **“FRANKLIN ELECTRIC**” submersible pump used in the well (MODEL # 2445070117)
6. Propane furnace and hot water heater (inaccessible at time of visit, model and make unknown)
7. Emergency electric generator at east side of building
8. **“INGERSOLL RAND”** air compressor in fire department garage (MODEL # SS-3 / SERIAL # A052021)
9. Two industrial mechanical exhaust vents with fans in fire department garage
10. Two overhead fans in fire department garage and one overhead fan in municipal garage

Water is received from a well adjacent to the building and services one interior sink and one toilet. A combination of PVC and copper piping services the building. Sewage treatment is provided by an on-site septic system.

Kitchen appliances include an outdated electric fridge, to be replaced at the discretion of the owner.

Emergency equipment is provided in the form of smoke detectors throughout, two fire extinguishers and adequate signage.

Exterior lighting is provided by surface mounted lights on exterior building faces as well as flood lights. Interior lighting is provided primarily by fluorescent troffer lighting fixtures with some incandescent fixtures. It is worth noting that this building is one of the five buildings included in a Request for Quotation #ENR2017-01 issued by the TNAW for the removal and replacement of all lights in order to upgrade to high efficiency lighting fixtures and qualify for the SaveOnEnergy rebate program. Lighting upgrade will therefore no be included in forecasted expenditures.

The life expectancy of all electrical equipment will exceed the duration of the study period. The life expectancy of mechanical equipment and appliances can range from 10 to 20 years and as such it is expected that large equipment including the refrigerator, gas furnace, water heater, water storage tank, propane heater and air compressor will require replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time.

1.6 SAND STORAGE SHED

Also located adjacent to the Golden Lake Community Center are three storage sheds (sand, salt, equipment) for which the dates of construction are unknown. The sand storage shed is a one-story, structure, with gross plan dimensions of the footprint measuring 40ft. by 60ft. (2,400 ft^2). The sand storage shed was assessed on November 22, 2017. The date of its construction is unknown.

1.6.1 *Building Structure*

The foundation of the sand storage shed consists of 8” thick reinforced concrete foundation walls which protrude 5ft. above grade all around the building perimeter. From the top of the foundation wall, 4 steel frames complete with c-channel purlins and wind girts (forming a butler system structure) are anchored to opposite sides at reinforced concrete piers poured monolithically into the wall; the frames are equally spaced at 20ft. centres. Piers measured 10” by 12”, 12” by 12” and 12” by 16”, depending on location. The steel frames forming the roof extend approximately 20ft. above grade at the peak.

The roof structure is in satisfactory condition as there are no signs of excess deflection or physical damage; rusting is only seen at the base plate locations of the steel frames. The foundation wall is also in satisfactory condition, exhibiting only minor cracking, coinciding with locations of rust stains from rebar. One large crack in the foundation wall can be seen on the exterior of the south wall. It is recommended that this crack be repaired by resealing along its full length in order to prevent future damage and mitigate the effects of water infiltration and freeze/thaw cycles. The concrete piers are observed to be in good condition. Unless noted, the observed structural distresses are not at a level warranting concern at this time and therefore are not foreseen to require work within the study period; however, these deficiencies should be monitored.

1.6.2 *Exterior/Interior Building Envelope and Finishes*

The foundation wall is exposed concrete with no cementitious parge coating on the exterior face or black bituminous coating on the interior face for protection from corrosive contents of the shed. It is recommended that bituminous coating be applied over the entire inside face of the foundation wall if, and when, the shed is emptied and repurposed for salt storage. It is unknown if this will occur within the study period.

The steel frame structure (butler system) is finished with corrugated sheet metal which show signs of rust where the sheet metal meets the top of foundation wall along the rear (east) wall, as well as some minor physical damage due to falling branches from adjacent trees. The observed damage is not at a level warranting concern at this time and therefore is not foreseen to require work within the study period, but should be monitored. It is recommended to prune adjacent trees and clean up fallen branches as preventative maintenance.

Exterior doors include one manual single metal door at the small electrical room. The shed contains an opening at the front measuring 16ft. by 18ft. with no door.

1.6.3 *Mechanical/Electrical/Emergency Equipment*

One 120/240V electrical panel by “D SQUARED” receives electricity from adjacent building utilities and then supplies electricity to the interior electrical outlets and flood light as well as to the pumps of the two exterior diesel fuel storage tanks (2000 and 2009) and an exterior flood light. The life expectancy of mechanical equipment can range from 10 to 20 years and as such it is expected that the fuel pumps and associated fuel storage tanks will require replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. were observed with the building.

1.7 SALT STORAGE SHED

The salt storage shed located adjacent to the Golden Lake Community Center is a one-story, salt storage structure, with gross plan dimensions of the footprint measuring 28ft. by 50ft. (1,400 ft^2). The salt storage shed was assessed on November 22, 2017. The date of construction is unknown.

1.7.1 *Building Structure*

The foundation of the salt storage shed consists of 9” thick reinforced concrete foundation walls which protrude 4ft. above grade all around the building perimeter. At the entrance of the shed, there are two severely rusted steel angles (4”x4”) affixed to foundation wall to protect the wall from equipment impact. Replacement of the steel angles is left to the discretion of the TNAW. From the top of the foundation wall, conventional wood framed stud walls construction (2”x6” at 24” c/c) extend to the underside of roof

structure. The roof structure consists of wood roof trusses spaced at 24" c/c and extend approximately 22 ft. above grade at the peak.

The roof structure is in good condition as there are no signs of excess deflection or physical damage. The foundation wall, however, is in poor condition exhibiting severe cracking, spalling, delamination and corrosion of cast in place reinforcement over a majority of the interior face. Anchor bolts are not exposed due to plywood sheathing applied to the interior face of the stud wall but they are expected to be corroded as well. This is a structural deficiency that should be repaired within the study period. The observed damage will propagate and be amplified by the effects of the salinity and freeze/thaw cycles the longer that repairs are offset. It is recommended that the foundation wall be repaired by removing loose or damaged concrete and applying new parge coating and bituminous coating to mitigate future damage. Anchor bolts will be inspected at the same time and replaced, as required.

1.7.2 *Exterior/Interior Building Envelope and Finishes*

The foundation wall is exposed concrete with no cementitious parge coating on the exterior face or black bituminous coating on the interior face for protection from corrosive contents of the shed. It is recommended that bituminous coating be applied over the entire inside face of the foundation wall if, and when, the shed is emptied for repairs to the foundation wall, as mentioned in the previous section.

All exterior sides of the building structure are finished with corrugated sheet metal which does not show significant signs of rust or discoloration while the interior of the building structure is finished with plywood sheathing. Both are deemed to be in good condition at this time.

There is one exterior double sliding manual door measuring 14ft. by 18ft. tall constructed of the same wood framing and metal siding as the structure. One half of the door is currently missing and there is physical damage from equipment impact at the base of remaining half. Replacement of this door with new is recommended within the study period.

1.7.3 *Mechanical/Electrical/Emergency Equipment*

The storage shed contains two fluorescent troffer lighting fixtures and electrical outlets which receive electricity from adjacent building utilities.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc.

1.8 EQUIPMENT STORAGE SHED

The equipment storage shed located adjacent to the Golden Lake Community Center is a one-story, sand storage structure, with gross plan dimensions of the footprint measuring 19ft. by 33ft. (627 ft^2). The equipment storage shed was assessed on November 22, 2017. The date of construction is unknown.

1.8.1 *Building Structure*

Equipment storage shed consists of two separate sections, the main equipment storage shed and a small extension off the rear (north) side. At the main storage shed, the foundation consists of 8” thick reinforced concrete foundation walls which protrude 2ft. above grade all around the building perimeter. From the top of the foundation wall, conventional wood framed stud walls (2”x6” at 24” c/c) extend to the underside of roof structure. The roof structure consists of gabled wood roof trusses spaced at 24” c/c and extend approximately 18ft. above grade at the peak. At the extension, the interior side shares a common foundation and stud wall with the main storage shed on the interior side and is supported by wood posts (4”x 4”) on 14” diameter concrete sonotubes from grade to the underside of roof structure on the exterior side. The roof structure in this section is conventional wood framed construction monosloped roof rafters (2”x6” at 24” c/c). The walls are infilled with conventional wood framed construction stud walls (2”x4” at 24” c/c).

The roof structure is in good condition as there are no signs of excess deflection or physical damage. The foundation walls; however, are in poor condition exhibiting a concentration of severe cracking, spalling, delamination and corrosion of cast in place reinforcement at the interior face of the north east corner. Anchor bolts are not exposed due to plywood sheathing applied to the interior face of the stud wall. The outlined concrete deficiency is structural in nature and that should be repaired within the study period. Anchor bolts will be inspected at the same time and replaced, as required.

1.8.2 *Exterior/Interior Building Envelope and Finishes*

The foundation wall is exposed concrete with no cementitious parge coating on the exterior face or black bituminous coating on the interior face. It is recommended that the bituminous coating be applied over the entire inside face of the foundation wall if, and when, the shed is repurposed for salt storage. It is unknown if this will occur within the study period.

The exterior of the building structure is finished with corrugated sheet metal on all sides of the building. The sheet metal is corroded all the way through at the north east corner, creating holes for easy water infiltration. Within the study period it is foreseen that some siding will need to be replaced. The interior of the building structure is finished with plywood sheathing that is deemed to be in good condition at this time.

There is one exterior double sliding manual door at the front of the main storage shed, measuring 12ft. by 14ft. tall, constructed of the same wood framing and metal siding as the structure. This door has been physically damaged and corroded all the way through at the base. There is also one exterior double swing manual door measuring 6ft. by 7ft. at the side entrance of the rear extension that is damaged to the point of being inoperable. Reframing and replacement of these doors with new is recommended within the study period.

1.8.3 *Mechanical/Electrical/Emergency Equipment*

Electricity for the storage shed is provided from adjacent building utilities. The storage shed contains one incandescent lighting fixture.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. were observed within the shed.

5.0 MELISSA BISHOP PARK GROUNDS

5.1 SEASONAL DWELLING GENERAL CONFIGURATION

The seasonal cabin dwelling located at Melissa Bishop Park, on the shore of Dore Lake, is located on Township Park Road, Eganville, ON; assessment was performed on November 14, 2017. Date of construction for this structure is unknown. The building is a two-story, residential building, with gross plan dimensions of the footprint measuring 35ft. by 60ft. (2,100 ft^2). Also located at Melissa Bishop Park are a gazebo, on-site storage and canteen/change room facilities; these structures will be discussed in subsequent sections.

5.1.1 Site Features

The site encompasses an area of approximately 42,000 ft^2, including a 5,000 $ft.^2$ loose granular gravel parking lot and driveway servicing the on-site amenities. In addition to the buildings included in the building condition assessment, the site contains a beach, baseball diamond and children's play structure. The remaining area is covered by a mixture of grass, mature trees and a few newly planted trees. As a publicly accessible assembly area, the grounds are heavily trafficked and the parking area displays some minor areas of erosion and rutting; notwithstanding these areas are observed to be in good condition nonetheless. Herd paths from the parking area to the surrounding on-site amenities are observed in the grass. There are no established parking stalls for vehicles or sidewalks/walkways leading to the structures. To demarcate the parking area several vertical logs are embedded in the ground along the perimeter which serve as guards. On the date of the site visit there were thirteen wooden picnic tables stored within the gazebo.

The site in general is sufficiently graded away from structures and towards the nearby lake with no excess accumulation of water or soil erosion, except for in those places noted. Typically, with routine maintenance, including minor regrading and reseeding, areas of granular gravel and grass can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the parking areas and surrounding grounds.

5.1.2 Building Structure

The seasonal swelling building is two-storey structure with the second storey centrally positioned in the middle of the structure. The foundation is constructed with a combination of CMU blocks, wood blocking and large boulders bearing at finished grade on native soil. Due to the apparent age of the structure and the lack of settlement issues this foundation has proven to be structurally sound; however, this is not a conventional method for foundation construction of a two-storey building. The building is constructed of conventional wood frame construction extending up to the underside of the roof structures which differ by section. The two building one-storey sections at the sides are constructed with monosloped wood rafters while the middle section is a gable roof truss construction. Roof overhangs of 1ft. to 2ft. are common all around the building's roof perimeters. The wood roof structure and building structure are not exposed but appear to be in in good condition as no signs of excess deflection or physical damage were observed.

5.1.3 Exterior/Interior Building Envelope and Finishes

The exterior of the building structure is finished with vinyl siding on all sides and at gable ends of roof structure. The roof structure is finished with corrugated sheet metal siding along the trusses and the underside of the soffits. Siding and roofing show some discoloration and physical damage but are deemed to be in satisfactory condition at this time, therefore these are not expected to require major repair or replacement within the study period.

Exterior windows include eleven slider windows, seven horizontal swing windows and four vertical swing windows. All are of different age; however no physical damage was noted and all are operable. Window frame perimeter caulking ranges from satisfactory condition to nonexistent. Exterior doors include two manual single doors with slider windows. No signs of damage are noted and all are operational. No replacements are foreseen within the study.

The interior walls of the building structure are finished with a combination of OSB plywood panels (assembly area), faux wood panels, and painted drywall. Ceilings are finished with a combination of OSB plywood panels (assembly area), decorative wood tiling or painted drywall. Flooring is painted wood plank decking throughout with vinyl tile exclusively in the kitchen. Most of the finishes are in good condition with remaining service life exceeding the study period with the exception of the vinyl tile which shows signs of physical damage and debonding that will warrant replacement within the study period.

Interior windows include one horizontal swing window and one large vertical swing “lift” window separating the assembly area from the living room. The large vertical swing “lift” window has a sizeable crack but as this window only serves aesthetic purposes, replacement is not required at this time. Interior doors include four wooden manual single doors on the ground floor and five wooden manual single doors on the second floor. No signs of damage are noted and all are operational. No replacements are foreseen within the study.

5.1.4 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by “D SQUARED” receives electricity from a HydroOntario transformer located adjacent to the front (east) of the building and delivers to lighting and electrical outlets within the dwelling as well as to all other facilities on the Melissa Bishop Park grounds.

Water is received from a well adjacent to the building and services four interior sinks, two toilets, one shower and two exterior taps. Distribution and waste piping is a combination of copper and PVC piping. Hot water is provided within the building by a “GSW Inc.” electric water heater (MODEL # 2 EU25-465 / SERIAL # 8704235421). Kitchen appliances include an electric stove and fridge. Sanitary service is provided through an on-site septic system.

Air movement is provided throughout the building by eight overhead fans (4 on second floor and 4 on ground floor). Emergency equipment is provided in the form of smoke detectors located in most rooms and outside all bedrooms, three fire extinguishers and adequate signage. No signs of damage are noted and all are reported operational.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. were observed within the building.

5.2 EQUIPMENT STORAGE SHED

Located directly adjacent to the seasonal dwelling cabin is an equipment storage shed for which the date of construction is unknown. The building is a one-story structure used for vehicle and miscellaneous equipment storage. This equipment storage shed was assessed on November 14, 2017. The gross plan dimensions of the footprint measure 18ft. by 14ft. (250 ft^2).

5.2.1 Building Structure

The storage shed is raised from grade bearing on large boulders at the each corner of the building. Due to the apparent age of the structure, this foundation has proven to be structurally sound because there is no settlement issues observed. However, this is not a conventional method for foundation construction and does not adequately raise the superstructure off the ground. This leaves the wood framing exposed to rain and snow and prone to rotting and deterioration that was observed at its base. The building is constructed of wood frame construction with studs at variable spacing extending up to the underside of the roof structure. The roof structure is similar wood framed construction with rafters spaced at 18" c/c. The roof structure is in good condition as no signs of excess deflection, rotting or physical damaged were observed.

The exterior of the building structure is finished with wood siding painted brown on four sides. The exterior paint is showing severe signs of wear and aging. The roof structure is finished with corrugated sheet metal siding on wood decking above rafters. The roof does not show signs of rusting or physical damage and is deemed to be in good condition.

Exterior windows include one swing window that is kept closed due to the crowded interior. Exterior doors include one wood manual single door and one 8ft. by 6ft. wood manual double barn door with similar wear as wood walls; the doors are operational.

The storage shed contains one incandescent light bulb which receives electricity from adjacent building utilities. There is no other existing utility equipment such as plumbing, lighting, heating, ventilation, emergency systems etc.

Please note that in general the structure is in a state of disrepair, nonetheless it is foreseen to have a remaining life expectancy of 15+ years, which exceeds the current study period. It is in our opinion that the storage shed be used for the remainder of its service life without major repair, at which point a complete replacement which meets the needs of the township is recommended.

5.3 SPORTS CANTEEN AND CHANGE ROOM

Also located in Melissa Bishop Park is a multi-use structure located beside the baseball diamond for which the date of construction is unknown. The building is a one-story structure; assessment was on November 14, 2017. Usage of this structure is for a canteen and change room for public use during recreational sporting events. The gross plan dimensions of the footprint measure 16ft. by 24ft. (385 ft^2).

5.3.1 Building Structure

The foundation of the canteen and change room structure utilizes a helical pile system for the main structure and concrete paver footings for front and rear deck extensions. The building is constructed of conventional wood frame construction extending up to the underside of the gable roof structure. The roof structure is conventional wood framed construction with trusses spaced at 24" c/c. There is a 6ft. roof overhang extending from the building to cover the front (east) deck but the rear (west) deck is not covered.

The wood roof structure and building structure are not exposed and appear to be in in good condition as no signs of excess deflection or physical damage were observed. It is noted that the roof structure is experiencing minor sagging at the center of the ridge beam as seen from the outside; this sag should be monitored. The foundation elements do not show signs of differential settlement.

5.3.2 Exterior/Interior Building Envelope and Finishes

The exterior of the building structure is finished with vinyl siding on all sides and at the gable ends of the roof structure. The roof structure is finished with corrugated sheet metal siding along trusses and undersides of soffits. The roofing does not show signs of rusting or physical damage and is deemed to be in good condition. The roof is not expected to require major repair or replacement within the study period; however, a section of the gable end fascia is missing on the north side of the building which should be replaced. The vinyl siding is damaged in various locations on the south side of the building, and will require replacement within the study period; this is possibly due to use of the adjacent baseball diamond.

Exterior windows include two slider windows. Caulking seals the window perimeters and reveals no signs of cracking. Exterior doors include five hollow metal manual single doors (1 to enter canteen, 2 to enter change rooms and 2 to enter washrooms). No indications of damage are noted and all are operational. No replacements are foreseen within the study, except for repairs due to accidental physical damage; repairs and/or replacement would be on an as needed basis.

The interior of the canteen is finished on the ceiling, walls and floors with exposed OSB plywood panels of which the ceiling and walls are painted white and the floors are left bear. No significant signs of wear or physical damage were observed. The canteen is not in operation at the present time. Kitchen cabinetry is stored within the canteen for future installation when the canteen is put into service. The interior of the change rooms and washrooms are finished with white plastic sheathing on the ceiling and walls and vinyl flooring resembling hardwood. Some warping is observed within the plastic sheathing from what appears is due to temperature fluctuations and is nothing more than an aesthetic issue, otherwise finishes are in good condition.

5.3.3 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by "D SQUARED" receives electricity from adjacent building utilities and delivers to lighting and electrical outlets within the canteen, change rooms and washrooms.

Water is received from a well adjacent to the building and services three interior sinks, two toilets and an exterior tap. Waste and supply piping is a combination of PVC and copper piping. No signs of damage are

noted and all are reported operational. Hot water is not available within the building but there are plans to install a hot water heater, within the study period, when the canteen is put into service. New kitchen appliances will be required when the canteen is brought back into service. Sanitary service is provided through an on-site septic system.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. are present within the structure. It is recommended that a fire extinguisher be installed when the canteen is put into service.

5.4 MELISSA BISHOP PARK GAZEBO

Also located in Melissa Bishop Park is a rectangular gazebo for public assembly. Gross plan dimensions of the gazeebo footprint measure 20ft. by 20ft. (400 ft^2). The assessment was conducted on November 14, 2017. Date of construction is unknown.

5.4.1 Building Structure

The foundation of the gazebo is a rectangular shaped 6” thick concrete slab on grade with saw cut control joints at all post locations. Extending up from the slab on grade to the underside of the roof structure are eight wood posts (6”x6”) located at equal distances around the perimeter. The roof structure is conventional wood framed construction with trusses spaced at 24” c/c. On three side of the gazeebo between the wood posts are 3 ft. tall wood fence infill panels.

The wood roof structure and support posts are in good condition as no signs of excess deflection, splitting or rotting were observed. The slab on grade does not show signs of differential settlement or cracks due to the adequately spaced saw cut control joints. A notable deficiency is found at the rear (west) side of the foundation where excess erosion can be seen where water runoff is drained away from the structure; this erosion can lead to undermining and settlement issues of the slab on grade. This area will require preventative maintenance such as backfilling and regrading within the study period to mitigate future damage and increase the structures longevity to meet current expected levels of service. The perimeter fence is in good condition

5.4.2 Exterior/Interior Building Envelope and Finishes

The wood support posts and perimeter fence are painted matching green and show no signs of wear. The roof structure is finished with corrugated sheet metal siding along trusses, at gable ends and at undersides of soffits. The roofing does not show signs of rusting or physical damage and is deemed to be in good condition, and is therefore not expected to require major repair or replacement within the study period.

5.4.3 Mechanical/Electrical/Emergency Equipment

One 120/240V electrical panel by “EATON” receives electricity from adjacent building utilities with delivery to three electrical outlets within the gazebo.

No other existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. are present or associated with the gazeebo.

6.0 RANKIN FIRE STATION

6.1 RANKIN FIRE STATION GENERAL CONFIGURATION

The Rankin Fire Station is located on Marsh Road, Pembroke, ON and was assessed on November 14, 2017. Constructed in 2000, the Rankin Fire Station is a two-storey multi-use facility containing office space, assembly areas and a three-bay vehicle garage. The gross plan dimensions of the footprint measure 40ft. by 60ft. (2,400 ft^2). No other additional facilities are located on the grounds.

6.1.1 Site Features

The site encompasses an area of approximately 48,000 ft^2, including a 5,000 ft^2 paved area along the front and west side of the building. A loose granular gravel area of 8,000 ft^2 for parking and servicing on-site amenities surrounds the paved area. The remaining area is covered by a grassy field with some mature trees. As a relatively lightly trafficked area, the grounds are observed to be well maintained and in good condition. The asphalt displays minor cracking patterns but not signs of potholes. There are no established parking stalls for vehicles or sidewalks/walkways leading to the structures. A structural steel stairway that displays no signs of paint deterioration, rust or deficiencies with anchorage to the structure is located along the rear of the structure and provides for direct access to the second floor.

The site in general is sufficiently graded away from structures with no excess accumulation of water or soil erosion. Typically, with routine maintenance, including crack sealing, patchwork and/or minor regrading of areas, asphalt and granular gravel can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the areas observed.

6.1.2 Building Structure

The Rankin Fire Station is composed of two sections, namely a one storey three bay fire department garage with high ceilings and a two storey administration and assembly section. The foundation of the entire structure is constructed of 8” reinforced concrete foundation walls which protrude above grade by 4” to 16” all around the perimeter depending on variations in finished grade elevation. Within the bounds of the foundation wall is a poured 6” thick concrete slab on grade. There are no saw cuts within the concrete slab due to in floor heating conduits embedded within the slab. The building structure is constructed of full height wood stud walls with wood plank sheathing. The second floor of the two storey section is constructed with TJI floor joists spaced at 16” c/c. The wood stud walls extend up to the underside of the wood roof trusses. The roof trusses extend up to 30ft. above grade at the peak and 2ft.; overhangs are common all around the building perimeter.

The foundation is exposed all around the perimeter, in varying amounts, and is deemed to be in good condition with no signs of differential settlement, deflection or cracking (both in the interior finishes as well as the exterior concrete face and brick veneer) observed. The roof structure is not exposed but is deemed to

be in good condition well as no signs of excess deflection, sagging, physical damage or water infiltration/condensation were observed. In addition, there is a structural steel stairway located at the rear of the structure that displays no signs of paint deterioration, rust or deficiencies with anchorage to the structure, as discussed previously.

6.1.3 Exterior/Interior Building Envelope and Finishes

The exterior of the building structure is primarily finished with corrugated sheet metal siding with some brick veneer covering the front of the building. Roofing is consists of corrugated sheet metal along trusses and undersides of soffits. Eavetroughs direct water runoff to various downspouts on the side of the building with the paved area, managing water from both roofs and discharging it away from the exterior doors and the foundation. None of the exposed foundation walls are covered with a cementitious parge coating. Exterior finishes are deemed to be satisfactory condition with the only deficiencies being deformation and dents observed at the sides of the garage doors. It is recommended to add concrete bollards in these locations to protect the finishes as well as the structure from vehicle impact.

Exterior windows include eight horizontal sliding windows, all of which are original to construction. Exterior doors include three single manual swing metal doors and three overhead garage doors (2 measuring 12ft. by 14ft. and 1 measuring 10ft. by 10ft.). All of the exterior windows and doors are in good condition and operational; replacements are not foreseen within the study period.

The interior finishes within the fire station vary by area. Interior walls within the fire department garage are finished with corrugated sheet metal and the remainder of the building including office, washrooms, mechanical room and upstairs assembly area are finished with painted drywall. Ceilings within the fire department garage are also finished with corrugated sheet metal, while the office, downstairs washroom, and mechanical room are finished with acoustic ceiling tile and the stairs and second floor assembly area are painted drywall. Flooring within the garage and mechanical room are exposed concrete, while the office, washrooms, and kitchen are vinyl tile and the stairs and second floor assembly area are carpeted. All finishes are in good condition with the exception of the following observed deficiencies:

1. Some cracking within exposed concrete slab on grade due to the lack of saw cut control joints, recommend resealing.
2. Carpeting is becoming worn down, recommend recarpeting the stairs and second floor assembly area within the study period.

Interior windows doors include one horizontal sliding window on the ground floor separating the office and garage and one horizontal sliding window on the second floor overlooking the garage. Interior doors include five wooden manual single doors (mechanical room, downstairs washroom, stairway, office, upstairs washroom). All interior windows and doors are in good condition and operational; replacements are not foreseen within the study period.

6.1.4 Mechanical/Electrical/Emergency Equipment

The building receives electricity from HydroOntario through a buried conduit which enters the building on the east side of the building where the meter is found on the exterior and main electrical panel is located on the interior. The main panel is a 120/240V electrical panel by "CUTLER-HAMMER" which then delivers to a 120/240V an emergency subpanel by "CUTLER-HAMMER" and then to the miscellaneous equipment throughout the garage. The following is a list of the mechanical and building systems equipment servicing the building:

1. **"PARADOX"** multi zone security system throughout
2. In floor heating embedded in concrete slab and within TJI second floor assembly provide heat to the structure with a **"TEKMAR"** mixing control (MODEL # 354)
3. Aboveground fuel storage tank (SERIAL # A-60974727), dated Q3/2015
4. **"WELL-RITE"** water storage tank (MODEL # WR60R), dated 05/30/01
5. **"FRANKLIN ELECTRIC**" submersible pump used in the well (MODEL # 2801074915)
6. **"NEWMAC"** oil fired hot water boiler (SERIAL # NBR2001 110701 D 003234)
7. **"GENERAC POWER SYSTEMS INC."** emergency electric generator at rear of building
8. **"CAMPBELL HAUSFELD"** air compressor (MODEL # VT627504AJ / SERIAL # L8/17/02 - 00318)
9. Four industrial mechanical exhaust vents with fans in fire department garage
10. Two overhead fans in fire department garage and one overhead fan in municipal garage
11. One above ground diesel fuel storage tanks with pump

Water is received from a well adjacent to the building and services four interior sinks (each bathroom, mechanical room, and kitchen), two toilets, and one shower. Supply and waste discharge piping is primarily copper piping with some PVC. Sanitary service is provided through an on-site septic system.

Kitchen appliances include an electric stove and fridge.

Emergency equipment is provided in the form of smoke detectors throughout, three fire extinguishers and adequate signage.

Exterior lighting is provided by surface mounted lights on the exterior building faces as well as flood lights. Interior lighting is provided primarily by fluorescent troffer lighting fixtures with some incandescent fixtures. It is worth noting that this building is one of the five buildings included in a Request for Quotation #ENR2017-01 issued by the TNAW for the removal and replacement of all lights in order to upgrade to high efficiency lighting fixtures and qualify for the SaveOnEnergy rebate program. Lighting upgrade will therefore no be included in forecasted expenditures.

The life expectancy of all electrical equipment will exceed the duration of the study period. The life expectancy of mechanical equipment and appliances can range from 10 to 20 years, and as such it is expected that large equipment including the electric stove/refrigerator, oil fired hot water boiler, oil storage tank, air compressor, water storage tank and diesel fuel pump with associated fuel storage tank will require

replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time.

7.0 DEACON FIRE STATION

7.1 DEACON FIRE STATION GENERAL CONFIGURATION

The Deacon Fire Station is located on Old Bridge Road, Golden Lake, ON and was assessed on November 14, 2017. Construction of the one-story, single bay vehicle garage facility building took place in 1993. The gross plan dimensions of the footprint measure 20ft. by 40ft. (800 ft^2). No other additional facilities are located on the grounds.

7.1.1 Site Features

The site encompasses an area of approximately 14,000 ft^2 including a 7,000 ft^2 loose granular gravel area for vehicles along the front (west) side of the building. A small 200 ft^2 paved area is provided at the entrance to the overhead door leading to the garage. The remaining area is covered by a grass and native trees. As a relatively lightly trafficked area, the grounds are observed to be well maintained and in good condition. The asphalt displays minor cracking patterns around the edges. There are no established parking stalls for vehicles or sidewalks/walkways leading to the structures. There is a 6" thick concrete pad measuring 4ft. by 4ft. at the only man door entrance to the structure that displays no signs of cracking.

The site in general is sufficiently graded away from structure towards the adjacent Bonnechere River waterway; excess accumulation of water or soil erosion was not observed. Typically, with routine maintenance, including crack sealing, patchwork and/or minor regrading areas, asphalt and granular gravel can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the areas observed.

7.1.2 Building Structure

The Deacon Fire Station is a single bay vehicle garage facility. The foundation is constructed of reinforced 8" CMU foundation walls which protrude above grade by two courses of block. Within the bounds of the foundation wall is a poured 6" thick concrete slab on grade with saw cuts equally spaced in each direction. The exterior walls of the building are constructed of conventional wood framed construction extending up to the underside of the roof. The roof structure is conventional wood frame gabled roof truss construction which is 19ft. at the peak. Common all around the building perimeter are 1ft. to 2ft. overhangs. In addition, at the main entrance door there is an awning that extends from the side of the building; the awning covers a 4ft. by 4ft. by 6" concrete pad.

The majority of the foundation construction is not exposed, though it is deemed to be in good condition as no signs of excess differential settlement, deflection or cracking of interior finishes were observed. From what is exposed on the exterior side of the CMU, the mortared head and bed joints do not show signs of debonding and/or cracking. The roof structure is not exposed and is deemed to be in good condition as no signs of excess deflection, sagging, physical damage or water infiltration/condensation were observed.

7.1.3 Exterior/Interior Building Envelope and Finishes

The exterior of the building structure is finished with corrugated sheet metal siding on all sides, roof, awning and soffits. Eavetroughs were not installed at the time of the site visit. None of the exposed CMU foundation wall is covered in cementitious parge coating. All exterior finishes are deemed to be good condition as there are no signs of rust and discoloration in sheet metal or cracking and spalling in concrete.

The interior of the fire department garage walls and ceiling are finished with painted drywall throughout. There is a small washroom at the back of the fire station that is constructed of conventional wood framed partition wall and floor assemblies. The washroom walls are painted drywall on the interior and painted plywood on the exterior. The washroom floor is finished with vinyl tiling. All interior finishes are deemed to be in good condition.

The building contains one exterior single manual swing metal door and one overhead garage door measuring 12ft. by 14ft. Concrete bollards are position on either side of the overhead door to protect building framing. Interior doors include one wooden manual single door (washroom) which is in good working condition. No significant repairs or replacements to doors are foreseen.

7.1.4 Mechanical/Electrical/Emergency Equipment

The building receives electricity from HydroOntario through a buried conduit which enters the building at the south west corner of the building where the meter is found on the exterior and main electrical panel is located on the interior. The main panel is a 120/240V electrical panel by “D SQUARED” which supplies a 120/240V subpanel by “CUTLER-HAMMER” and then to the miscellaneous equipment throughout the garage. The following is a list of the mechanical and building systems equipment servicing the building:

1. **“FBII”** security system
2. **“TEMPSTAR”** propane furnace and associated ductwork to
3. **“SPACESAVER”** hot water storage tank (MODEL # SS025SE15 / SERIAL # R1005N700760)
4. **“MASTERCRAFT**” pump and motor (PUMP MODEL # 561473 / MOTOR MODEL # S48C93C09)
5. One industrial mechanical exhaust vents with fan
6. One industrial mechanical louvre
7. One overhead fan

Water is received from a well adjacent to the building and services one interior sink and one toilet as well as an interior tap. Discharge waste and distribution piping is a combination of PVC and copper piping. Sewage treatment is provided by an on-site septic system.

Emergency equipment is provided in the form of one fire extinguisher and adequate signage. No smoke detectors or fire alarms are installed in the garage facility and it is recommended to do so within the study period.

Exterior lighting is provided by surface mounted lights on the exterior building faces. Interior lighting is provided by seven fluorescent troffer lighting fixtures in the garage and an incandescent fixture in the

washroom. Replacement of lights is routine maintenance and a full upgrade for energy efficiency is left at the discretion of the TNAW and therefore will not be included in forecasted expenditures.

The life expectancy of all electrical equipment will exceed the duration of the study period. The life expectancy of mechanical equipment can range from 10 to 20 years and as such, it is expected that large equipment including the gas furnace, water heater and pump will require replacement within the study period. No signs of damage are noted and all equipment is reported operational at this time.

8.0 BIEDERMAN PARK

8.1 BIEDERMAN PARK GAZEBO

Biederman Park, on the shore of Dore Lake, is located at 57 Biederman Road, Golden Lake, ON. The park contains a building for change rooms and an octagonal gazebo for public assembly. The gazebo has a gross plan dimension of the footprint measuring 15ft. across (200 ft^2). The assessment was conducted on November 14, 2017. Date of construction is unknown.

8.1.1 Site Features

The site in its entirety encompasses an area of approximately 110,000 ft^2, including a long 500ft. driveway extending from Biederman Road to the 3,000 ft^2 parking lot and boat launch; the driveway and parking area are both loose granular gravel covered. The remaining area is covered by a mixture of grassy field and mature trees. As a publicly accessible assembly area, the grounds are heavily trafficked but are observed to be in good condition nonetheless. Herd paths from the parking area to the surrounding on-site amenities are observed in the grass. There are no established parking stalls for vehicles. There is a concrete sidewalk measuring 60 ft^2 with a crack down the middle that leads to the entrance of the gazebo; the concrete sidewalk is expected to require minor repair/sealing within the study period.

In addition, there are two CMU park benches with concrete toppings measuring 7ft. long by 2ft. wide and 1'-6" tall on 8ft. long by 2ft. wide concrete pads. The benches are covered in moss and display discoloration which will warrant cleaning but are nonetheless in good condition. On the date of the site visit there were seven wooden picnic tables stored within the gazebo.

The site in general is sufficiently graded away from structures towards the nearby lake with no excess accumulation of water or soil erosion. Typically, with routine maintenance, including minor regrading and reseeding, areas of granular gravel and grass can have a life expectancy of 30+ years before any major repairs are required. It is our opinion that this will be sufficient over the study period for the parking areas and surrounding grounds.

8.1.2 Building Structure

The foundation of the gazebo is an octagonal shaped concrete slab on grade with no saw cut control joints. A three course 10" CMU knee wall surrounds the perimeter of the concrete slab. From the top of the knee wall, eight 3 ½" square HSS structural steel members are located at each corner and extend up to the roof structure. The CMU wall has a 1ft. wide x 2½" thick concrete topping casting the baseplates of the HSS

columns in place. The roof structure is conventional wood framed construction. The top bearing plates of the HSS columns are visible and support the roof beams (6”x6”) to the roof rafters (2”x6”).

The roof structure is in good condition as no signs of excess deflection, splitting or rotting were observed in the wood members. The HSS structural steel members exhibit signs of rust at top plates and locally throughout the full height of the member. The HSS members are deemed to be in satisfactory condition with no major cause for concern within the study period. The slab on grade has a crack through the center along its full diameter and the concrete topping has reoccurring cracks at regular intervals around the perimeter. These cracks are regarded as aesthetic issues at the present but require repair/sealing within the study period to mitigate future damage and increase the structures longevity to meet current expected levels of service. The perimeter knee wall is in good condition with no signs of cracking and/or debonding of mortar joints.

8.1.3 Exterior/Interior Building Envelope and Finishes

The HSS columns and steel bearing plates are painted white along their full height and show signs of wear in areas of scratches and rust. The rusting process has not progressed significantly and is therefore regarded as an aesthetic issue at the present. A new coat of paint is foreseen near the end of the study period.

The roof structure is finished with asphalt shingles that show only minor wear and curling at the ends of the overhangs around the entire perimeter. Generally the shingles are in good condition and are not expected to require major repair or replacement within the study period, but their condition should be monitored.

8.1.4 Mechanical/Electrical/Emergency Equipment

No existing utility equipment such as plumbing/lighting/heating/ventilation/emergency systems etc. was observed.

9.0 CAPITAL EXPENDITURE FORECAST

The capital expenditure forecast incorporates the information from the Building Condition Assessments to predict monetary requirements over a 10-year period. Probable costs are presented in 2017 (Year 0) dollars and exclude inflation rate, engineering costs and project management costs.

Based on our visual review of the property and discussions with the Client and Site Representative, MPCE is of the opinion that the Sites, Buildings and related components are well maintained and in serviceable condition. Further to this, with routine maintenance, which has been provided, many of the building’s components will likely achieve and possibly surpass their industry standard life expectations. The total cumulative expenditures to maintain the property in a state-of-good repair are forecasted to be in the range of $307,120.43 over the study period, beginning in 2018 (Year 1) and ending in 2027 (Year 10).

The Capital Expenditure Forecast table presenting a capital repair/replacement summary for the assessed buildings and their components is displayed in Table 18.

TABLE 18 – NORTH ALGONA WILBERFORCE – CAPITAL EXPENDITURES FORECAST FOR BUILDINGS/STRUCTURES

	LINE NUMBER & DESCRIPTION	2017 (Year 0)	2018 (Year 1)	2019 (Year 2)	2020 (Year 3)	2021 (Year 4)	2022 (Year 5)	2023 (Year 6)	2024 (Year 7)	2025 (Year 8)	2026 (Year 9)	2027 (Year 10)
AREA 1												
TOWNSHIP OF NORTH ALGONA - WILBERFORCE MUNICIPAL OFFICE												
1	PARKING LOT LINE PAINTING	$589.00		$589.00								
2	SEAL EXTERIOR CONCRETE RETAINING WALL CRACKS	$136.60	$136.60									
3	ROUTE, REPOINT AND RESEAL GARAGE CMU WALL CRACKS	$140.55	$140.55									
4	REPLACEMENT OF DISCOLORED/DAMAGED SHEET METAL	$1,089.00							$1,089.00			
5	REPAIR FLASHING AND FASCIA DEFICIENCIES	$520.50	$520.50									
6	ADDITIONAL DOWNSPOUTS	$50.00	$50.00									
7	REPARGE CEMENTIOUS PARGE COATING	$1,312.50	$1,312.50									
8	RECAULKING EXTERIOR WINDOWS AND DOORS	$3,600.00		$3,600.00								
9	PAINT TWO EXTERIOR REAR DOORS	$520.04	$520.04									
10	DRYWALL REPAIRS	$590.00	$590.00									
11	SEAL INTERIOR CONCRETE SLAB ON GRADE CRACKS	$512.25	$512.25									
12	REPLACEMENT OF AIR CONDITIONING UNIT	$5,825.00				$5,825.00						
13	REPLACEMENT OF GAS FURNACE	$3,750.00		$3,750.00								
14	REPLACEMENT OF WATER HEATER	$4,300.00				$4,300.00						
15	REPLACEMENT AIR COMPRESSOR	$3,000.00	$3,000.00									
16	REPLACEMENT OF FUEL PUMPS AND STORAGE TANKS	4500 EACH					$4,500.00			$4,500.00	$4,500.00	$4,500.00
17	REPLACEMENT OF CEILING MOUNTED RADIANT HEATER	$1,200.00	$1,200.00									
18	REPLACE REFRIGERATOR	$780.00			$780.00							
19	REPLACE STOVE	$2,325.00			$2,325.00							
EQUIPMENT & SALT STORAGE SHED												
20	SEAL EXTERIOR CONCRETE RETAINING WALL CRACKS	$327.84	$327.84									
21	REPLACEMENT OF ANCHOR BOLTS	$504.50	$504.50									
22	REPAIR WOOD WALL/ROOF FRAMING COMPONENTS	$2,500.00	$2,500.00									
23	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$730.08						$730.08				
24	SHEET METAL REPLACEMENT AND FLASHING AT FOUNDATION WALL	$1,612.80	$1,612.80									
25	REPLACEMENT OF SLIDING DOOR	$2,452.50	$2,452.50									
26	ADDITIONAL FIRE EXTINGUISHER	$150.00	$150.00									
SAND STORAGE DOME												
27	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$1,698.45						$1,698.45				
28	REPLACE ROOF SHINGLES	$369.00	$369.00									
CANVAS SAND STORAGE SHED												
29	REPAIR CONCRETE CRACKING/SPALLING AT ANCHOR BOLT LOCATIONS	$19,060.55	$19,060.55									
	a. REMOVALS	$15,137.50										
	b. CLEAN	$100.00										
	c. FORM	$2,709.00										
	d. MIXED AND PLACED	$690.28										
	e. REPLACE ANCHOR BOLTS	$423.78										
30	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$2,068.56						$2,068.56				
AUXILIARY EQUIPMENT STORAGE SHED												
---		$0.00										

TABLE 18 – NORTH ALGONA WILBERFORCE – CAPITAL EXPENDITURES FORECAST FOR BUILDINGS/STRUCTURES (cont.)

	LINE NUMBER & DESCRIPTION	2017 (Year 0)	2018 (Year 1)	2019 (Year 2)	2020 (Year 3)	2021 (Year 4)	2022 (Year 5)	2023 (Year 6)	2024 (Year 7)	2025 (Year 8)	2026 (Year 9)	2027 (Year 10)
AREA 2												
GOLDEN LAKE COMMUNITY CENTRE												
31	PARKING LOT LINE PAINTING	$589.00		$589.00								
32	REPAIR CONCRETE CRACKING AND SPALLING AT STAIRS	$532.74	$532.74									
33	ROUTE AND REPARGE CEMENTIOUS PARGE COATING	$2,693.70	$2,693.70									
34	REPAIR BRICK VENEER AT FRONT OF STRUCTURE	$597.04	$597.04									
35	ADDITIONAL DOWNSPOUTS	$50.00	$50.00									
36	RECAULKING EXTERIOR WINDOWS AND DOORS	$4,725.00		$4,725.00								
37	REPAIR/REPLACE TOILET PLUMBING FIXTURE IN POST OFFICE	$505.00	$505.00									
38	REPLACE AIR CONDITIONING UNITS	$7,335.00				$7,335.00						
39	REPLACE OIL FIRED FURNACE	$3,750.00		$3,750.00								
40	REPLACE OIL STORAGE TANK	4500 EACH					$4,500.00					
41	REPLACE REFRIGERATOR	$780.00			$780.00							
42	REPLACE STOVE	$2,325.00			$2,325.00							
GOLDEN LAKE FIRE STATION												
43	STRUCTURAL REPOINTING JOINT	$140.55	$140.55									
44	ROUTE, REPOINT AND RESEAL EXTERIOR CMU WALL	$140.55	$140.55									
45	INSTALL CONCRETE BOLLARDS	$3,920.00		$3,920.00								
46	DRYWALL REPAIRS	$590.00							$590.00			
47	SEAL INTERIOR CONCRETE SLAB ON GRADE CRACKS	$546.40	$546.40									
48	REPLACE PROPANE HEATER	$1,500.00						$1,500.00				
49	REPLACE WATER STORAGE TANK	$750.00					$750.00					
50	REPLACE PROPANE FURNACE	$3,750.00		$3,750.00								
51	REPLACE WATER HEATER	$4,300.00				$4,300.00						
52	REPLACE AIR COMPRESSOR	$3,000.00				$3,000.00						
53	REPLACE REFRIGERATOR	$780.00			$780.00							
SAND STORAGE SHED												
54	REPAIR CONCRETE CRACKING AT EXTERIOR OF FOUNDATION WALL	$136.60	$136.60									
55	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$1,690.00						$1,690.00				
56	SHEET METAL REPLACEMENT AND FLASHING AT FOUNDATION WALL	$1,728.00	$1,728.00									
57	REPLACEMENT OF FUEL PUMPS AND STORAGE TANKS	$9,000.00				$9,000.00						
SALT STORAGE SHED												
58	REMOVE CONCRETE AND REPARGE WITH PARGE COATING	$8,580.00	$8,580.00									
59	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$1,054.56						$1,054.56				
60	REPLACEMENT OF SLIDING DOOR	$2,452.50	$2,452.50									
EQUIPMENT STORAGE SHED												
61	REMOVE CONCRETE AND REPARGE WITH PARGE COATING	$2,392.50	$2,392.50									
62	APPLY BITUMINOUS COATING TO INTERIOR OF FOUNDATION WALL	$294.06						$294.06				
63	SHEET METAL REPLACEMENT AND FLASHING AT FOUNDATION WALL	$588.00	$588.00									
64	REPLACEMENT OF SLIDING AND SWING DOOR	$2,452.50	$2,452.50									

TABLE 18 – NORTH ALGONA WILBERFORCE – CAPITAL EXPENDITURES FORECAST FOR BUILDINGS/STRUCTURES (cont.)

LINE NUMBER & DESCRIPTION		2017 (Year 0)	2018 (Year 1)	2019 (Year 2)	2020 (Year 3)	2021 (Year 4)	2022 (Year 5)	2023 (Year 6)	2024 (Year 7)	2025 (Year 8)	2026 (Year 9)	2027 (Year 10)
AREA 3												
SEASONAL DWELLING												
65	REPLACEMENT OF VINYL TILE IN KITCHEN	$1,154.40		$1,154.40								
66	REPLACEMENT OF ELECTRIC HOT WATER HEATER	$1,000.00		$1,000.00								
67	REPLACEMENT OF REFRIGERATOR	$780.00			$780.00							
68	REPLACEMENT OF ELECTRIC STOVE	$2,325.00			$2,325.00							
EQUIPMENT STORAGE SHED												
---		$0.00										
SPORTS CANTEEN AND CHANGE ROOM												
69	SHEET METAL FASCIA REPAIRS	$87.00	$87.00									
70	REPLACEMENT OF VINYL SIDING	$732.80	$732.80									
71	NEW ELECTRIC HOT WATER HEATER	$1,000.00			$1,000.00							
72	NEW REFRIGERATOR	$1,025.00			$1,025.00							
73	NEW ELECTRIC STOVE	$2,325.00			$2,325.00							
MELISSA BISHOP PARK GAZEBO												
74	BACKFILLING AND REGRADING AT AREAS OF ERODED SUBGRADE	$566.50	$566.50									
AREA 4												
RANKIN FIRE STATION												
75	INSTALL CONCRETE BOLLARDS	$2,450.00		$2,450.00								
76	SEAL INTERIOR CONCRETE SLAB ON GRADE CRACKS	$273.20	$273.20									
77	REPLACEMENT OF SECOND FLOOR CARPETING	$12,400.00							$12,400.00			
78	REPLACE OIL FIRED HOT WATER BOILER	$4,100.00				$4,100.00						
79	REPLACE OIL STORAGE TANK	$4,500.00					$4,500.00					
80	REPLACE AIR COMPRESSOR	$3,000.00				$3,000.00						
81	REPLACE WATER STORAGE TANK	$750.00					$750.00					
82	REPLACEMENT OF FUEL PUMPS AND STORAGE TANKS	$4,500.00					$4,500.00					
83	REPLACE REFRIGERATOR	$780.00			$780.00							
84	REPLACE ELECTRIC STOVE	$2,325.00			$2,325.00							
AREA 5												
DEACON FIRE STATION												
85	REPLACE GAS FURNACE	$3,750.00					$3,750.00					
86	REPLACE WATER HEATER AND STORAGE TANK	$300.00					$300.00					
87	INSTALL NEW SMOKE DETECTOR, PULL STATION, AND HORN	$500.00	$500.00									
AREA 6												
BIEDERMAN PARK GAZEBO												
88	SEAL CONCRETE S.O.G., PERIMETER TOPPING AND SIDEWALK CRACKS	$211.73	$211.73									
89	PREPARE SURFACE AND REPAINT HSS COLUMNS, 2 COATS	$348.63		$348.63								
ANNUAL SUB TOTALS			$60,866.94	$29,626.03	$17,550.00	$40,860.00	$23,550.00	$9,035.71	$14,079.00	$4,500.00	$4,500.00	$4,500.00
HST (13%)			$7,912.70	$3,851.38	$2,281.50	$5,311.80	$3,061.50	$1,174.64	$1,830.27	$585.00	$585.00	$585.00
VARIANCE/CONTINGENCY (20%)			$20,633.89	$10,043.22	$5,949.45	$13,851.54	$7,983.45	$3,063.11	$4,772.78	$1,525.50	$1,525.50	$1,525.50
TOTAL INFLATION ADJUSTED EXPENDITURES			**$307,120.43**									

NOTES

1. THE ABOVE COST ESTIMATE IS A CLASS 'D' ORDER OF MAGNITUDE COST ESTIMATE INTENDED FOR BUDGETARY PURPOSES ONLY AS DETAILED STRUCTURAL DESIGN HAS YET TO BE COMPLETED ,
2. CLASS 'D' ESTIMATES FOR LOW COMPLEXITY BUILDING PROJECTS CAN EQUATE TO AN ESTIMATE VARIANCE OF +/- 30% ,
3. THE ABOVE COST ESTIMATE IS BASED ON NATIONAL ANNUAL AVERAGE COSTS AND THEREFORE WILL VARY DEPENDING ON FACTORS INCLUDING, BUT NOT LIMITED TO, EASE OF ACCESS, SEASON, LOCAL WEATHER, LOCAL BY LAWS, OWNER'S SPECIAL REQUIREMENTS ETC. , AND
4. THE ABOVE COST ESTIMATE DOES NOT CONSIDER REQUIREMENTS FOR REMOVAL/REINSTATEMENT OF UTILITIES SUCH AS MECHANICAL EQUIPMENT, PLUMBING AND/OR ELECTRICAL.

10.0 LIMITATIONS

This Building Condition Assessment (BCA) report was prepared by McIntosh Perry Consulting Engineers Ltd. (MPCE) for the exclusive use by The Township of North Algona – Wilberforce and may not be reproduced in whole or in part, without the prior written consent of MPCE, or used or relied upon in whole or in part by a party other than The Township of North Algona – Wilberforce.

Any use which a third party makes of this report, or any reliance on or decision made based upon it, are the sole responsibility of such third party. MPCE accepts no responsibility of any damages of any kind or nature whatsoever suffered by any third party as a result of decisions made or actions based upon this report.

The information presented in this report provides an assessment of the current conditions at the sites, within the terms of reference and limitations outlined within this report. We have been asked to make recommendations and opinions based solely on a visual sampling of existing components. Test cuts, coring, design review, quantity surveys, destructive testing, or instrument testing was not carried out. Consequently, further investigation or additional testing may change our current recommendations and opinions.

Some of the building components reviewed within this BCA report involve aesthetic qualities, such as interior and exterior finishes, and consequently there is an element of judgment in identifying costs and life cycles for certain elements. Repair and replacement costs are estimated based on assumptions to the scope of work and nature of methods that would be required to undertake the repairs. Actual costing can only be obtained through a completive tendering process and can vary greatly from estimated values.

The conditions observed, conclusions drawn and recommendations made are limited by the accuracy and completeness of the information supplied and limits imposed by the non-performance of destructive investigation.

Unless otherwise indicated, all reviews were of a visual nature only and based on an assessment of the available information.

We cannot assume responsibility for:

- Information that was not provided by the owner
- The accuracy of information in reports/plans that were provided
- Items concealed within wall and roof assemblies and therefore not directly visible based on the building surfaces
- Items found in areas that could not be or were not accessed. Please note, as well, that we did not carry out detailed structural or mechanical calculations as part of the review.

In order to achieve the objectives outlined within this report we arrived at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice, we do not act as absolute insurers of the conclusions we reach, but we commit ourselves to the care and competence in reaching those conclusions.

APPENDIX A

ASSET INVENTORY, NET BOOK VALUE OF ASSETS AND REPLACEMENT COST VALUATION

TABLE A.1 – NET BOOK VALUE OF ASSETS AND REPLACEMENT COST VALUATION

ASSET ID	STREET	YEAR PLACED IN SERVICE	ASSET LIFE (Yrs/Mos)	NET BOOK VALUE	REPLACEMENT COST VALUATION
1	Weckworth Street	1999	40.00	$ 14,870.00	$ 44,800
2	Thur Street	1995	40.00	$ 11,713.00	$ 44,800
3	Traymore Road	1986	60.00	$ 116,706.00	$ 1,138,000
4	Traymore Road	2002	40.00	$ 271,891.00	$ 705,900
5	Traymore Road	1978	60.00	$ 14,940.00	$ 796,600
6	Traymore Road	1982	60.00	$ 61,107.00	$ 1,081,100
7	Eaciv Road	1991	40.00	$ 63,125.00	$ 273,000
8	Kiihv Road	1991	40.00	$ 36,071.00	$ 156,000
9	Old Bridge Road	1993	40.00	$ 41,327.00	$ 179,200
10	Chapel Road	1995	40.00	$ 11,713.00	$ 44,800
11	Kranz Road	1986	40.00	$ 128,689.00	$ 1,014,000
13	Martha's Road	1986	40.00	$ 19,799.00	$ 156,000
14	Cartv Road	1991	40.00	$ 27,054.00	$ 117,000
15	Karmack-Haven Road	1986	40.00	$ 24,748.00	$ 195,000
15a	Karrnack-Haven Road	1986	40.00	$ 10,694.00	$ -
16	Griffith-Wagner Road	1991	40.00	$ 306,604.00	$ 1,326,000
17	Griffith-Wagner Road	2002	40.00	$ 144,501.00	$ 358,400
18	Black Point Road	2002	40.00	$ 180,627.00	$ 448,000
19	Black Point Road	1991	40.00	$ 81,159.00	$ 351,000
20	McNee Drive	1978	60.00	$ 10,671.00	$ 569,000
21	McMilian Road	2005	40.00	$ 395,123.00	$ 868,800
22	Goldfinch Drive	2005	40.00	$ 123,476.00	$ 271,500
23	Goldfinch Drive	2002	40.00	$ 209,148.00	$ 543,000
24	Island View Drive	1982	60.00	$ 61,107.00	$ 1,081,100
25	Rad Pine Camp Way	1980	40.00	$ 1,635.00	$ 39,000
26	Island View Drive	2002	40.00	$ 252,879.00	$ 627,200
27	Roeseler Road	2002	40.00	$ 209,148.00	$ 543,000
28	Berndt Road	2002	40.00	$ 460,124.00	$ 1,194,600
29	Panke Road	1999	40.00	$ 14,870.00	$ 44,800
30	Roeseler Road	1993	40.00	$ 165,309.00	$ 716,800
31	Roeseier Road	1991	40.00	$ 27,054.00	$ 117,000
32	Sperberg Road	1991	40.00	$ 144,284.00	$ 624,000
34	Roeseler Road	1991	40.00	$ 270,533.00	$ 1,170,000
35	Old Camp Road	1980	40.00	$ 27,783.00	$ 663,000
37	Eurchat Road	1986	40.00	$ 306,875.00	$ 2,418,000
38	Traiiblazer Road	1986	40.00	$ 217,782.00	$ 1,716,000

TABLE A.1 – NET BOOK VALUE OF ASSETS AND REPLACEMENT COST VALUATION (CONT.)

ASSET ID	STREET	YEAR PLACED IN SERVICE	ASSET LIFE (Yrs/Mos)	NET BOOK VALUE	REPLACEMENT COST VALUATION
42	Dore Eiav Road	1986	40.00	$ 64,345.00	$ 507,000
43	Woito Station Road	1975	40.00	$ 10,472.00	$ 2,262,000
44	Woito Station Road	2002	40.00	$ 216,753.00	$ 537,600
45	Black Creek Road	1999	40.00	$ 342,007.00	$ 1,030,400
46	Doering Road	1986	40.00	$ 24,748.00	$ 195,000
47	Black Creek Road	1986	40.00	$ 376,169.00	$ 2,964,000
48	Green Lake Road	1991	40.00	$ 144,284.00	$ 624,000
49	Green Lake Road	2002	40.00	$ 857,504.00	$ 2,226,300
50	Lemke Road	1991	40.00	$ 171,338.00	$ 741,000
50a	Lemke Road	1991	40.00	$ 27,966.00	$ -
51	Lemke Road	1980	40.00	$ 31,052.00	$ 741,000
52	Marsh Road	1993	40.00	$ 619,909.00	$ 2,688,000
52b	Marsh Road	1993	40.00	$ 37,211.00	$ -
53	B-Line Road	1978	60.00	$ 26,678.00	$ 1,422,500
55	Rankin Rink Road	1980	40.00	$ 13,074.00	$ 312,000
56	Hewitt‘s Corner Road	1993	40.00	$ 41,327.00	$ 179,200
57	Hewitt's Corner Road	1993	40.00	$ 113,650.00	$ 492,800
57b	Hewitt‘s Corner Road	2011	40.00	$ 66,329.00	$ -
58	Bluebird Road	1991	40.00	$ 207,408.00	$ 897,000
59	Sell Road	2004	40.00	$ 324,182.00	$ 716,800
60	Walsh's Road	1975	40.00	$ 21,011.00	$ 741,000
60a	Walsh's Road	2011	40.00	$ 38,016.00	$ -
61	Reiche Road	1997	40.00	$ 398,315.00	$ 1,344,000
62	Schecneman Road	1991	40.00	$ 63,125.00	$ 273,000
62a	Scheuneman Road	1991	40.00	$ 21,453.00	$ -
63	Limestone Road	1991	40.00	$ 27,054.00	$ 117,000
64	Kutschke Road	1986	40.00	$ 84,143.00	$ 663,000
66	Schoot Road	1991	40.00	$ 90,178.00	$ 390,000
67	Royal Pines Road	1999	40.00	$ 877,323.00	$ 2,643,200
68	Duquelte Road	1991	40.00	$ 99,196.00	$ 429,000
69	Wilber Heights Road	1978	60.00	$ 6,403.00	$ 341,400
70	Crooked Rapids Road	1995	40.00	$ 456,793.00	$ 1,747,200
70a	Crooked Rapids Road	2011	40.00	$ 13,863.00	$ -
71	Snodrifters Road	1997	40.00	$ 238,989.00	$ 806,400
72	Lett's Cemetery Road	2004	40.00	$ 749,671.00	$ 1,657,600
73	Snodrifters Road	2002	40.00	$ 289,004.00	$ 716,800

TABLE A.1 – NET BOOK VALUE OF ASSETS AND REPLACEMENT COST VALUATION (CONT.)

ASSET ID	STREET	YEAR PLACED IN SERVICE	ASSET LIFE (Yrs/Mos)	NET BOOK VALUE	REPLACEMENT COST VALUATION
74	Kilev Road	1980	40.00	$ 6,538.00	$ 156,000
75	Mink Lake Rd	2004	40.00	$ 587,579.00	$ 1,299,200
76	Ott Road	1991	40.00	$ 36,071.00	$ 156,000
77	Link Road	1991	40.00	$ 81,159.00	$ 351,000
78	Grist Mill Rd	2004	40.00	$ 1,580,387.00	$ 3,494,400
78a	Grist Mill Rd	2011	40.00	$ 27,242.00	$ -
78b	Grist Mill Rd	2012	40.00	$ 59,771.00	$ -
79	Wilkens Road	1991	40.00	$ 45,088.00	$ 195,000
80	Fourth Chute Road	1999	40.00	$ 446,096.00	$ 1,344,000
81	Guflitz Road	1986	40.00	$ 79,193.00	$ 624,000
82	Stone Hedge Road	1997	40.00	$ 265,543.00	$ 896,000
83	Township Park Road	1991	40.00	$ 36,071.00	$ 156,000
84	Point Church Road	1978	60.00	$ 41,619.00	$ 2,219,100
85	Point Church Road	1982	60.00	$ 51,459.00	$ 910,400
86	Smiths Bav Road	1993	40.00	$ 307,926.00	$ 940,800
87	Smiths Bay Road	1991	40.00	$ 180,355.00	$ 780,000
87a	Smiths Eiav Road	2009	40.00	$ 22,551.00	$ 780,000
88	Germanicus Road	1997	40.00	$ 743,520.00	$ 2,508,800
89a	Passaw Road		40.00	$ 45,682.00	$ -
90	Meadow Wood Road	1980	40.00	$ 11,441.00	$ 273,000
91a	Cold Creek Road	1995	40.00	$ 234,253.00	$ 896,000
91b	Cold Creek Road	1995	40.00	$ 245,966.00	$ 940,800
91c	Cold Creek Road	1995	40.00	$ 234,253.00	$ 896,000
91f	Cold Creek Road	1995	40.00	$ 42,924.00	$ -
92	Jessup Road	1997	40.00	$ 371,760.00	$ 1,254,400
94	Shaw Woods Road	2002	40.00	$ 36,126.00	$ 89,600
95	Mink Lake Road	1986	40.00	$ 108,891.00	$ 858,000
96	Mink Lake Road	1986	40.00	$ 183,135.00	$ 1,443,000
97	Stonehedge Road	1991	40.00	$ 387,763.00	$ 1,677,000
98	Roeseler Road	1980	40.00	$ 26,150.00	$ 624,000
101	Shaw Woods Road	1991	40.00	$ 378,746.00	$ 1,638,000
103	North Algonaf/Wilberforce	1999	40.00	$ 44,610.00	$ 134,400
104	North Algonaf/Wilberforce	1999	40.00	$ 118,959.00	$ 358,400
105	North Algonaf/Wilberforce	1999	40.00	$ 14,870.00	$ 44,800
106	North Algonaf/Wilberforce	1999	40.00	$ 44,610.00	$ 134,400
107	North Algonaf/Wilberforce	1999	40.00	$ 14,870.00	$ 44,800
TOTAL				**$ 18,799,259**	**$ 80,159,900**

APPENDIX B

LIFE CYCLE ANALYSIS FOR ROADS BY SURFACE TYPE

TABLE B.1 – LIFE-CYCLE FOR LCB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 0	LCB-R3	**10.00**	$ 448,000
Year 1		9.53	
Year 2		9.06	
Year 3		8.59	
Year 4		8.12	
Year 5		7.65	
Year 6		7.18	
Year 7		6.71	
Year 8	LCB-R1	**8.24**	$ 23,000
Year 9		7.77	
Year 10		7.30	
Year 11		6.83	
Year 12		6.36	
Year 13		5.89	
Year 14		5.42	
Year 15		4.95	
Year 16		4.48	
Year 17		4.01	
Year 18		3.54	
Year 19	LCB-R2	**9.00**	$ 126,000
Year 20		8.53	
Year 21		8.06	
Year 22		7.59	
Year 23		7.12	
Year 24		6.65	
Year 25	LCB-R1	**8.18**	$ 23,000
Year 26		7.71	
Year 27		7.24	
Year 28		6.77	
Year 29		6.30	
Year 30		5.83	
Year 31		5.36	
Year 32		4.89	
Year 33		4.42	
Year 34		3.95	
Year 35		3.48	
Year 36	LCB-R2	**9.00**	$ 126,000
Year 37		8.53	
Year 38		8.06	
Year 39		7.59	
Year 40		7.12	
Year 41		6.65	
Year 42	LCB-R1	**8.18**	$ 23,000
Year 43		7.71	
Year 44		7.24	
Year 45		6.77	
Year 46		6.30	
Year 47		5.83	
Year 48		5.36	
Year 49		4.89	
Year 50		4.42	
Year 51		3.95	
Year 52		3.48	
Year 53		3.01	
Year 54		2.54	
Year 55		2.07	
AVERAGE		**6.45**	**$ 13,982**

TABLE B.2 – LIFE-CYCLE FOR CLB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 0	CLB-R3	**10.00**	$ 543,000
Year 1		9.65	
Year 2		9.30	
Year 3		8.95	
Year 4		8.60	
Year 5		8.25	
Year 6		7.90	
Year 7		7.55	
Year 8		7.20	
Year 9		6.85	
Year 10		6.50	
Year 11	HCB-R1	**9.15**	$ 95,000
Year 12		8.80	
Year 13		8.45	
Year 14		8.10	
Year 15	HCB-R4	**8.50**	$ 4,000
Year 16		8.15	
Year 17		7.80	
Year 18		7.45	
Year 19	HCB-R6	**7.85**	$ 10,000
Year 20		7.50	
Year 21		7.15	
Year 22		6.80	
Year 23		6.45	
Year 24		6.10	
Year 25		5.75	
Year 26		5.40	
Year 27		5.05	
Year 28		4.70	
Year 29		4.35	
Year 30		4.00	
Year 31		3.65	
Year 32		3.30	
Year 33	CLB-R2	**9.00**	$ 168,000
Year 34		8.65	
Year 35		8.30	
Year 36		7.95	
Year 37		7.60	
Year 38		7.25	
Year 39		6.90	
Year 40		6.55	

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 41	HCB-R1	**9.20**	$ 95,000
Year 42		8.85	
Year 43		8.50	
Year 44		8.15	
Year 45	HCB-R4	**8.55**	$ 4,000
Year 46		8.20	
Year 47		7.85	
Year 48		7.50	
Year 49	HCB-R6	**7.90**	$ 10,000
Year 50		7.55	
Year 51		7.20	
Year 52		6.85	
Year 53		6.50	
Year 54		6.15	
Year 55		5.80	
Year 56		5.45	
Year 57		5.10	
Year 58		4.75	
Year 59		4.40	
Year 60		4.05	
Year 61		3.70	
Year 62		3.35	
Year 63		3.00	
Year 64		2.65	
Year 65		2.30	
AVERAGE		**6.83**	**$ 14,292**

TABLE B.3 – LIFE-CYCLE FOR HCB-RURAL

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 0	HCB-R3	**10.00**	$ 569,000
Year 1		9.77	
Year 2		9.54	
Year 3		9.31	
Year 4		9.08	
Year 5		8.85	
Year 6		8.62	
Year 7		8.39	
Year 8	HCB-R6	**8.91**	$ 10,000
Year 9		8.68	
Year 10		8.45	
Year 11		8.22	
Year 12		7.99	
Year 13		7.76	
Year 14		7.53	
Year 15		7.30	
Year 16		7.07	
Year 17		6.84	
Year 18		6.61	
Year 19		6.38	
Year 20	HCB-R1	**9.65**	$ 95,000
Year 21		9.42	
Year 22		9.19	
Year 23		8.96	
Year 24	HCB-R4	**9.48**	$ 4,000
Year 25		9.25	
Year 26		9.02	
Year 27		8.79	
Year 28	HCB-R6	**9.31**	$ 10,000
Year 29		9.08	
Year 30		8.85	
Year 31		8.62	
Year 32		8.39	
Year 33		8.16	
Year 34		7.93	
Year 35		7.70	
Year 36		7.47	
Year 37		7.24	
Year 38		7.01	
Year 39		6.78	
Year 40		6.55	

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 41		6.32	
Year 42		6.09	
Year 43		5.86	
Year 44		5.63	
Year 45		5.40	
Year 46		5.17	
Year 47		4.94	
Year 48		4.71	
Year 49		4.48	
Year 50		4.25	
Year 51		4.02	
Year 52	HCB-R2	**9.00**	$ 193,000
Year 53		8.77	
Year 54		8.54	
Year 55		8.31	
Year 56		8.08	
Year 57		7.85	
Year 58		7.62	
Year 59		7.39	
Year 60	HCB-R6	**7.91**	$ 10,000
Year 61		7.68	
Year 62		7.45	
Year 63		7.22	
Year 64		6.99	
Year 65		6.76	
Year 66		6.53	
Year 67		6.30	
Year 68	HCB-R1	**9.57**	$ 95,000
Year 69		9.34	
Year 70		9.11	
Year 71		8.88	
Year 72	HCB-R4	**9.40**	$ 4,000
Year 73		9.17	
Year 74		8.94	
Year 75		8.71	
Year 76	HCB-R6	**9.23**	$ 10,000
Year 77		9.00	
Year 78		8.77	
Year 79		8.54	
Year 80		8.31	
Year 81		8.08	

YEAR	RECONST. TYPE	CONDIT'N RATING	$$$/KM
Year 82		7.85	
Year 83		7.62	
Year 84		7.39	
Year 85		7.16	
Year 86		6.93	
Year 87		6.70	
Year 88		6.47	
Year 89		6.24	
Year 90		6.01	
Year 91		5.78	
Year 92		5.55	
Year 93		5.32	
Year 94		5.09	
Year 95		4.86	
Year 96		4.63	
Year 97		4.40	
Year 98		4.17	
Year 99		3.94	
Year 100		3.71	
AVERAGE		**7.49**	**$ 10,000**

APPENDIX C

CONDITION RATING FORECAST

TABLE C.1 - ASSET INVENTORY AND VALUATION - LOW CLASS BITUMINOUS SURFACE

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	SCHOOL BUS ROUTE	TRAFFIC RANGE	CR IN 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
001	Weckworth Street	Lake Dore Road	Dead End	0.1	NO	R	LCB	YES	0-49	4.00	3.53	3.06	2.59	2.12	2.00	2.00	2.00	2.00	2.00	2.00
002	Thur Street	Lake Dore Road	Dead End	0.1	NO	SU	LCB	NO	0-49	3.00	2.53	2.06	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
017	Griffith-Wagner Road	Highway 60	0.8km North	0.8	NO	R	LCB	NO	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	**9.00**	8.53
023	Goldfinch Drive	0.5km East of McMillan Road	Dead End	1.0	NO	R	LCB	YES	0-49	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00
026	Island View Drive	1.4km West of Highway 60	Highway 60	1.4	NO	R	LCB	YES	50-199	4.00	3.53	3.06	2.59	2.12	2.00	2.00	2.00	2.00	2.00	**9.00**
044	Woito Station Road	County Road 56	Black Creek Road	1.2	YES	R	LCB	YES	200-399	7.00	6.53	**8.06**	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30
045	Black Creek Road	Woito Station Road	Doering Road	2.3	NO	R	LCB	YES	200-399	6.00	5.53	**7.06**	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30
047A	Black Creek Road	Burchat Road	Lake Dore Road	2.1	NO	R	LCB	YES	0-49	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00
049	Green Lake Road	100m West of Lemke Road	Highway 41	4.3	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
051	Lemke Road	Marsh Road	Woitu Station Road	2.0	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
052	Marsh Road	Black Creek Road	Lemke Road	1.6	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
052A	Marsh Road	Lemke Road	B Line Road	4.3	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
056	Hewitt's Corner Road	Highway 41	Blue Bird Road	1.8	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
059	Sell Road	Bluebird Road	Highway 41	2.0	NO	R	LCB	YES	50-199	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00
061	Reiche Road	Green Lake Road	1km South of Green Lake Road	1.0	NO	R	LCB	YES	50-199	9.00	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30
061A	Reiche Road	1km South of Green Lake Road	Dead End	2.2	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
062	Sheuneman Road	Lake Dore Road	Dead End	0.7	NO	R	LCB	NO	0-49	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
067	Royal Pines Road	Lake Dore Road	Highway 60	6.1	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
070	Crooked Rapids Road	Highway 60	Highway 60	4.0	NO	R	LCB	YES	200-399	4.00	3.53	3.06	2.59	2.12	2.00	2.00	2.00	2.00	2.00	2.00
071	Snodrifter's Road	Highway 60	Lett's Cemetery Road	1.6	NO	R	LCB	YES	400-999	8.00	7.53	7.06	6.59	**8.12**	7.65	7.18	6.71	6.24	5.77	5.30
072	Lett's Cemetery Road	Highway 41	Bonnechere Valley Twp. Boundary	3.9	NO	R	LCB	YES	200-399	5.00	**7.15**	6.68	6.21	5.74	5.27	4.80	4.33	3.86	3.39	2.92
073	Snodrifter's Road	Lett's Cemetery Road	Mink Lake Road	1.8	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	**7.12**	6.65	6.18	5.71	5.24	4.77	4.30
075	Mink Lake Road	Snodrifter's Road	Highway 60	2.8	NO	R	LCB	YES	50-199	4.00	3.53	3.06	2.59	2.12	2.00	2.00	2.00	2.00	2.00	2.00
078	Grist Mill Road	Highway 60	5.1km West of Highway 60	5.1	NO	R	LCB	YES	200-399	4.00	3.53	3.06	**5.47**	5.00	4.53	4.06	3.59	3.12	2.65	2.18
078A	Grist Mill Road	5.1km West of Highway 60	Bonnechere Valley Boundary	2.8	NO	R	LCB	YES	200-399	4.00	3.53	3.06	**4.59**	4.12	3.65	3.18	2.71	2.24	2.00	2.00
080	Fourth Chute Road	Bromley Township Boundary	Bonnechere Valley Boundary	3.3	NO	R	LCB	YES	200-399	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
082	Stone Hedges Road	Bulger Road (County Road 9)	Shaw Woods Road	2.0	NO	R	LCB	YES	50-199	8.00	7.53	7.06	6.59	6.12	5.65	5.18	4.71	4.24	3.77	3.30
086	Smiths Bay Road	Point Church Road	Germanicus Road	2.1	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
088	Germanicus Road	Royal Pines Road	2.2km South of Royal Pines Road	2.2	NO	R	LCB	YES	50-199	7.00	6.53	6.06	5.59	5.12	4.65	4.18	3.71	3.24	2.77	2.30
088A	Germanicus Road	2.2km South of Royal Pines Road	1.5km North of Highway 41	2.2	NO	R	LCB	YES	50-199	8.50	8.03	7.56	7.09	6.62	6.15	5.68	5.21	4.74	4.27	3.80
088B	Germanicus Road	1.5km North of Highway 41	Highway 41	1.5	NO	R	LCB	YES	50-199	**9.00**	8.53	8.06	7.59	7.12	6.65	6.18	5.71	5.24	4.77	4.30
091	Cold Creek Road	Lett's Cemetery Road	3.2km East of Cemetery Road	3.2	NO	R	LCB	YES	50-199	6.00	5.53	5.06	4.59	4.12	3.65	3.18	2.71	2.24	2.00	2.00
091A	Cold Creek Road	3.2km East of Cemetery Road	Bulger Road (County Road 9)	3.2	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
092	Jessup Road	Bulger Road (County Road 9)	Dead End	2.8	NO	R	LCB	YES	50-199	5.00	4.53	4.06	3.59	3.12	2.65	2.18	2.00	2.00	2.00	2.00
									WEIGHTED AVERAGE	**5.50**	**5.18**	**4.81**	**4.62**	**4.25**	**3.83**	**3.43**	**3.11**	**2.83**	**2.66**	**2.57**
			TOTAL	79.5						79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5

TABLE C.2 - ASSET INVENTORY AND VALUATION - COLD LAID SURFACE

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	SCHOOL BUS ROUTE	TRAFFIC RANGE	CR IN 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
004	Traymore Road	1.9km NW of Highway 60	3.2km NW of Highway 60	1.30	NO	R	CL	YES	200-399	5.00	4.65	4.30	3.95	3.60	3.25	2.90	2.55	9.00	8.65	8.30
005	Traymore Road	3.2km NW of Highway 60	4.6km NW of Highway 60	1.40	NO	R	CL	YES	50-199	3.00	2.65	2.30	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
006	Traymore Road	4.6km NW of Highway 60	Haggarty/Richards Boundary	1.90	NO	R	CL	YES	200-399	3.00	2.65	2.30	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
018	Black Point Road	Highway 60	1.1km South (to Hokum Saw Mill)	1.00	NO	R	CL	YES	50-199	6.00	5.65	5.30	4.95	4.60	4.25	3.90	3.55	3.20	2.85	2.50
021	McMillan Road	Highway 60	Dead End	1.60	NO	R	CL	YES	50-199	5.00	4.65	4.30	3.95	3.60	3.25	2.90	2.55	2.20	2.00	2.00
022	Goldfinch Drive	McMillan Road	0.5km East	0.50	NO	R	CL	NO	50-199	7.00	6.65	6.30	5.95	5.60	5.25	4.90	4.55	4.20	3.85	3.50
027	Roeseler Road	Highway 60	Berndt Road	1.10	NO	R	CL	YES	50-199	7.00	6.65	6.30	5.95	7.60	7.25	6.90	6.55	6.20	5.85	5.50
028	Berndt Road	Roesler Road	Highway 60	2.30	NO	R	CL	YES	200-399	7.00	6.65	6.30	5.95	7.60	7.25	6.90	6.55	6.20	5.85	5.50
029	Panke Road	Berndt Road	Dead End	0.10	NO	R	CL	NO	0-49	4.00	3.65	3.30	2.95	4.60	4.25	3.90	3.55	3.20	2.85	2.50
030	Roeseler Road	Berndt Road	2.0km North of Berndt Road	2.00	NO	R	CL	YES	0-49	6.00	5.65	5.30	4.95	4.60	4.25	3.90	3.55	3.20	2.85	2.50
084A	Point Church Road	Mink Lake Road	Hwy 41 North	1.60	NO	R	CL	NO	50-199	5.00	4.65	4.30	3.95	3.60	3.25	2.90	2.55	2.20	2.00	2.00
									WEIGHTED AVERAGE	5.28	4.93	4.58	4.24	4.44	4.17	3.90	3.62	3.95	3.71	3.51
			TOTAL	14.8						14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8

TABLE C.3 - ASSET INVENTORY AND VALUATION – HIGH CLASS BITUMINOUS SURFACE

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	SCHOOL BUS ROUTE	TRAFFIC RANGE	CR IN 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
003	Traymore Road	Highway 60	1.9km NW of Highway 60	2.00	NO	R	HCB	YES	200-399	4.00	3.77	3.54	3.31	3.08	2.85	5.81	7.29	7.06	6.83	6.60
009	Old Bridge Road	Traymore Road	Dead End	0.40	NO	R	HCB	NO	0-49	3.00	2.77	2.54	2.31	2.08	2.00	2.00	2.00	2.00	2.00	2.00
010	Chapel Road	Old Bridge Road	Highway 60	0.10	NO	R	HCB	YES	0-49	7.00	6.77	6.54	6.31	6.08	5.85	5.62	5.39	5.16	4.93	4.70
020	McNee Drive	Highway 60	Highway 60	0.80	NO	R	HCB	YES	50-199	8.00	7.77	7.54	7.31	7.08	6.85	6.62	6.39	6.16	5.93	5.70
024	Island View Drive	Highway 60	1.9km South	1.90	NO	R	HCB	YES	50-199	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
052B	Marsh Road	B Line Road	Cul-de-Sac East of B Line Road	0.20	NO	R	HCB	-	0-49	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
053	B-Line Road	County Road 56	Highway 41	2.50	NO	R	HCB	NO	400-999	7.00	6.77	6.54	6.31	6.08	9.35	9.12	8.89	8.66	8.43	8.20
069	Wilber Heights Road	Highway 60	Highway 60	0.60	NO	R	HCB	YES	0-49	3.00	2.77	2.54	2.31	2.08	2.00	2.00	2.00	2.00	2.00	2.00
084	Point Church Road	Smiths Bay Road	Mink Lake Road	2.20	NO	R	HCB	NO	50-199	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
085	Point Church Road	Smiths Bay Road	Highway 41	1.70	NO	R	HCB	YES	50-199	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
094	Shaw Woods Road	0.2km South of Highway 41	Highway 41	0.20	NO	R	HCB	YES	50-199	3.00	2.77	9.00	8.77	8.54	8.31	8.08	7.85	7.62	7.39	7.16
104	Biederman Road	Lake Dore Road	Diana Court	0.60	NO	R	HCB	YES	0-49	5.00	4.77	4.54	4.31	4.08	3.85	3.62	3.39	3.16	2.93	2.70
106	Diana Court	Biederman Road	Biederman Road	0.10	NO	R	HCB	NO	0-49	5.00	4.77	4.54	4.31	4.08	3.85	3.62	3.39	3.16	2.93	2.70
107	Kirk Court	Biederman Road	Biederman Road	0.10	NO	R	HCB	NO	0-49	4.00	3.77	3.54	3.31	3.08	2.85	2.62	2.39	2.16	2.00	2.00
									WEIGHTED AVERAGE	4.78	4.55	4.42	4.19	3.96	4.39	4.66	4.70	4.49	4.31	4.20
			TOTAL	13.4						13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4

TABLE C.4 - ASSET INVENTORY AND VALUATION – CRUSHED RECYCLED MATERIAL

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE	SCHOOL BUS ROUTE	TRAFFIC RANGE	CR IN 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
066	School Road	Lake Dore Road	Royal Pines Road	0.9	NO	R	CR	YES	0-49	5.00	4.50	4.00	3.50	3.00	2.50	2.00	2.00	2.00	2.00	2.00
068	Duquette Road	Highway 60	Highway 60	1.1	NO	R	CR	YES	0-49	4.00	3.50	3.00	2.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
076	Ott Road	Highway 60	Dead End	0.5	NO	R	CR	NO	0-49	5.00	4.50	4.00	3.50	3.00	2.50	2.00	2.00	2.00	2.00	2.00
097	Stone Hedges Road	Point Church Drive	0.6km East of Point Church Drive	0.6	NO	R	CR	YES	0-49	5.00	4.50	4.00	3.50	3.00	2.50	2.00	2.00	2.00	2.00	2.00
									WEIGHTED AVERAGE	**4.65**	**4.15**	**3.65**	**3.15**	**2.65**	**2.32**	**2.00**	**2.00**	**2.00**	**2.00**	**2.00**
			TOTAL	**3.1**						**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**

TABLE C.5 – FORECAST CONDITION RATING BY YEAR (SUMMARY)

CATEGORY	2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027	
	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR	Km	CR
GRAVEL (YEAR ROUND)	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54	78.9	6.54
LOW CLASS BITUMINOUS	79.5	5.50	79.5	5.18	79.5	4.81	79.5	4.62	79.5	4.25	79.5	3.83	79.5	3.43	79.5	3.11	79.5	2.83	79.5	2.66	79.5	2.57
COLD LAID	14.8	5.28	14.8	4.93	14.8	4.58	14.8	4.24	14.8	4.44	14.8	4.17	14.8	3.90	14.8	3.62	14.8	3.95	14.8	3.71	14.8	3.51
CRUSHED RECYCLED	3.1	4.65	3.1	4.15	3.1	3.65	3.1	3.15	3.1	2.65	3.1	2.32	3.1	2.00	3.1	2.00	3.1	2.00	3.1	2.00	3.1	2.00
HIGH CLASS BITUMINOUS	13.4	4.78	13.4	4.55	13.4	4.42	13.4	4.19	13.4	3.96	13.4	4.39	13.4	4.66	13.4	4.70	13.4	4.49	13.4	4.31	13.4	4.20
HARD SURFACE	**110.8**	**5.36**	**110.8**	**5.04**	**110.8**	**4.70**	**110.8**	**4.47**	**110.8**	**4.19**	**110.8**	**3.90**	**110.8**	**3.60**	**110.8**	**3.34**	**110.8**	**3.16**	**110.8**	**2.98**	**110.8**	**2.88**
ALL	**189.7**	**5.85**	**189.7**	**5.67**	**189.7**	**5.47**	**189.7**	**5.33**	**189.7**	**5.17**	**189.7**	**5.00**	**189.7**	**4.82**	**189.7**	**4.67**	**189.7**	**4.57**	**189.7**	**4.46**	**189.7**	**4.40**

APPENDIX D

BACKLOG OF ROAD NEEDS

TABLE D.1 – BACKLOG OF ROAD NEEDS

No.	STREET	FROM	TO	Km	BOUND RD.	ENVIR	TYPE
001	Weckworth Street	Lake Dore Road	Dead End	0.1	NO	R	LCB
002	Thur Street	Lake Dore Road	Dead End	0.1	NO	SU	LCB
005	Traymore Road	3.2km NW of Highway 60	4.6km NW of Highway 60	1.40	NO	R	CL
006	Traymore Road	4.6km NW of Highway 60	Haggarty/Richards Boundary	1.90	NO	R	CL
009	Old Bridge Road	Traymore Road	Dead End	0.40	NO	R	HCB
021	McMillan Road	Highway 60	Dead End	1.60	NO	R	CL
023	Goldfinch Drive	0.5km East of McMillan Road	Dead End	1.0	NO	R	LCB
024	Island View Drive	Highway 60	1.9km South	1.90	NO	R	HCB
047A	Black Creek Road	Burchat Road	Lake Dore Road	2.1	NO	R	LCB
051	Lemke Road	Marsh Road	Woitu Station Road	2.0	NO	R	LCB
052A	Marsh Road	Lemke Road	B Line Road	4.3	NO	R	LCB
052B	Marsh Road	B Line Road	Cul-de-Sac East of B Line Road	0.20	NO	R	HCB
059	Sell Road	Bluebird Road	Highway 41	2.0	NO	R	LCB
061A	Reiche Road	1km South of Green Lake Road	Dead End	2.2	NO	R	LCB
066	School Road	Lake Dore Road	Royal Pines Road	0.9	NO	R	CR
067	Royal Pines Road	Lake Dore Road	Highway 60	6.1	NO	R	LCB
068	Duquette Road	Highway 60	Highway 60	1.1	NO	R	CR
069	Wilber Heights Road	Highway 60	Highway 60	0.60	NO	R	HCB
070	Crooked Rapids Road	Highway 60	Highway 60	4.0	NO	R	LCB
075	Mink Lake Road	Snodrifter's Road	Highway 60	2.8	NO	R	LCB
076	Ott Road	Highway 60	Dead End	0.5	NO	R	CR
080	Fourth Chute Road	Bromley Township Boundary	Bonnechere Valley Boundary	3.3	NO	R	LCB
084	Point Church Road	Smiths Bay Road	Mink Lake Road	2.20	NO	R	HCB
084A	Point Church Road	Mink Lake Road	Hwy 41 North	1.60	NO	R	CL
085	Point Church Road	Smiths Bay Road	Highway 41	1.70	NO	R	HCB
091	Cold Creek Road	Lett's Cemetery Road	3.2km East of Cemetery Road	3.2	NO	R	LCB
091A	Cold Creek Road	3.2km East of Cemetery Road	Bulger Road (County Road 9)	3.2	NO	R	LCB
092	Jessup Road	Bulger Road (County Road 9)	Dead End	2.8	NO	R	LCB
097	Stone Hedges Road	Point Church Drive	0.6km East of Point Church Driv	0.6	NO	R	CR
107	Kirk Court	Biederman Road	Biederman Road	0.10	NO	R	HCB
			TOTAL	**55.9**			