Environmental Noise & Vibration Study

Proposed Residential Development
Stage 2-2
McLaughlin Road and Tim Manley Avenue
21T-20005C
Town of Caledon, Region of Peel

Prepared for

Caledon Developments #2 LP

December 10, 2020

File: 16-051-03

Actinium Engineering Inc.
16 Industrial Pkwy S, Unit 401
Aurora, ON L4G 0R4

T: 289-468-1221
F: 289-963-2505
www.actinium.ca

This page intentionally left blank
for two-sided printing purposes.

Summary

The proposed development consists of 393 two and three storey dwellings to be constructed on the west side of McLaughlin Road in the Town of Caledon. This report address Stage 2 only, Stage 1 was addressed in a previous Environmental Noise and Vibration Report by AEI.

It is subject to noise from road and rail sources. The sound levels were calculated at the noise sensitive receptors and compared to the applicable sound level limits.

To comply with the applicable sound level limits, mitigation in the form of forced air ventilation or air conditioning to allow windows to remain closed and sound barriers are required for some dwellings. See Figure 2 and Table 3 for a summary of the acoustical requirements.

This page intentionally left blank
for two-sided printing purposes.

Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

Actinium Engineering Inc. was retained by Caledon Developments #2 LP to prepare a Environmental Noise and Vibration Report to investigate the potential impact of noise on the proposed development to the satisfaction of the Town of Caledon and propose mitigation if required.

The Proposed Residential Development is comprised of 393 dwellings in two and three storey buildings. It is identified as:

McLaughlin Road and Tim Manley Avenue
21T-20005C
Town of Caledon
Region of Peel

A Key Plan and Site Plan are included in this report as Figures 1 and 2 respectively.

The preliminary report for these lands addressed Stage 1 and Stage 2. A Detailed Environmental Noise and Vibration Study was previously prepared for Stage 1. This report addresses Stage 2 only.

The proposed development is bounded by greenspace to the north, future development to the west and south and McLaughlin Road to the east. Nearby land uses include future/existing residential and commercial developments.

This report is based on the draft plan prepared by Malone Given Parsons dated September 9, 2020 received September 11, 2020 and grading plan prepared by WSP received December 7, 2020.

2 Noise and Vibration Sources

The major noise sources with the potential to affect the proposed development are road and rail sources. The proposed development is not affected by existing aircraft, industrial or commercial sources.

There are no significant sources of vibration that affect this development.

2.1 Transportation Sources

The dominant transportation noise source is vehicle traffic on nearby roads. To a lesser extent, rail traffic also influences sound levels on the site.

See Table 1 for a summary of the traffic data used in the analysis. See Appendix A for correspondence regarding traffic.

2.1.1 Road

Road traffic AADT data was obtained from the Town of Caledon for Street A (called Collector Road A in the Paradigm report and likely Galvin Avenue/Lippa Drive), McLaughlin Road and Tim Manley Avenue (previously known as The Spine Road). Expected truck percentages were provided by Paradigm Traffic Solutions over the phone. Speed limits were provided by the Town of Caledon. This data was confirmed by the Town as being still applicable in September 2020.

For the analysis, traffic volumes applicable to the year 2031 were provided and escalated by 2% per year to apply to 2040.

The future GTA West highway (Hwy 413) is located more than 1000 m north of the proposed development. As such, it was considered acoustically insignificant and not analyzed further.

2.1.2 Rail

Current rail traffic data was obtained from the Orangeville Railway Development Corporation (ORDC) on September 3, 2020. As per the ORDC, to account for future growth, the data was escalated by 2% per year to the year 2040.

Freight trains currently do a round trip 2 days a week. The tourist train that previously used the line is no longer in operation.

The current speed limit is 40 km/h. The Paradigm Traffic report and ORDC brought up the possibility of a speed increase to 72 km/h. According to the ORDC, there is no plan to increase train speed at this time and 40 km/h is a reasonable speed to use for the impact assessment.

The closest receptors in Stage 2 are 275 m from the rail line.

2.1.3 Aircraft

The proposed development is located outside of NEF/NEP 25 from the Brampton Airport. The 2023/2028 NEF/NEP contours were used for this report. These were confirmed as applicable by the airport operator on September 2, 2020. A map showing the noise contours and proposed site is included in Appendix A.

2.2 Stationary Sources

Potential stationary noise sources both within and outside of the development were investigated.

2.2.1 Within the Development

Other than noise sources such as HVAC which may be part of the School Block, there are no stationary noise sources proposed in this stage of the development. As no information is available on the School Block, those potential sources should be addressed by the proponent of the School Block once further information is available.

2.2.2 Outside the Development

Based on the site visit conducted by Actinium Engineering Inc. on September 16, 2020 the following facilities were identified as potential stationary noise sources.

- a farm at 12700 McLaughlin Rd with large storage bins approximately 500m north of the proposed development.

No significant sources of vibration were identified during the site visit.

Due to the nature of the operations, the separation distances and the proposed intervening development, all facilities are expected to be acoustically insignificant at the proposed site.

3 Environmental Noise Criteria

The Ministry of the Environment Conservation and Parks (MECP) (previously called the Ministry of the Environment and Climate Change [MOECC]) guidelines presented in "updated final version #22" of their document "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning Publication NPC-300" dated August 2013 were used for this report. A summary of the guidelines is presented in Appendix B.

3.1 Transportation Sources

For transportation sources, NPC-300 provides outdoor sound level limits that apply to outdoor living areas and the outside façade of windows and/or doors as well as indoor sound level limits.

Where sound level limits are exceeded, warning clauses are required and, depending on the exceedance, mitigation is either recommended or required.

3.1.1 Indoors

In order to allow control of indoor sound levels, when sound level limits at façades containing noise-sensitive receptors are exceeded, the MECP requires a system to allow the windows to remain closed. Depending on the exceedance, this can be either a ducted heating system sized for the addition of central air conditioning (known as provision for central air conditioning) or central air conditioning installed before occupancy (known as mandatory central air conditioning). See Appendix B for the applicable sound level limits.

In addition to the ventilation requirements, upgraded architectural components (e.g. windows, doors and exterior walls) may be required to meet the applicable indoor sound level limits.

3.1.2 Outdoors

For outdoor living areas (OLA), if the MECP specified sound level limits are exceeded by less than 5 dBA, mitigation should be considered, where the exceedance is greater than 5 dBA, mitigation is generally required to

reduce the sound level to meet the guidelines. Mitigation is typically in the form of a berm and/or acoustic fence.

The MECP defines the outdoor living area as a part of a noise sensitive land use that is intended and designed for the quiet enjoyment of the outdoor environment that is readily accessible from the building. OLA's include, but are not limited to:

- Backyards, front yards, gardens, terraces and patios;
- Balconies and elevated terraces with a minimum depth of 4 metres, provided that they are unenclosed and the only OLA for the occupant or they are a common OLA for a high-rise building

3.1.3 Rail

The ORDC generally follows the MECP guidelines with respect to sound level limits. Whistle noise is to be included when determining the required acoustical performance of building components. Whistle noise is not included when determining the requirement for air conditioning or outdoor living area sound levels.

Residential lands directly abutting a rail corridor typically require some form of safety berm and sound barrier. The size of this berm/barrier is dictated by the classification of the rail line (e.g. branch line, principal main line, etc.).

Sensitive receptors within 75 m of the rail line should be assessed to determine if vibration mitigation is required.

A warning clause is required for all dwellings within 300 m of the rail corridor.

3.1.4 Aircraft

New residential developments at NEF/NEP 30 or above are prohibited by the Provincial Policy Statement published by the Ontario Ministry of Municipal Affairs & Housing.

For residential dwellings between NEF/NEP 25 and 30, the MECP requires that the dwelling be designed with the provision for central air conditioning.

Below NEF/NEP 25 aircraft noise is not considered a problem.

3.2 Stationary Sources

NPC-300 requires stationary sources to be analyzed by considering the worst-case predictable hour. Continuous and impulsive noise sources are both required to be addressed as well as vibration (if sources creating substantial vibration such as punch-presses are present). Vibration guidelines are presented in NPC-207.

The MECP provides guidance on which noise sources are considered stationary noise sources. Some noise sources are not stationary but are included (such as trucks moving around a commercial site), other noise sources are excluded (such as backup beepers as they are considered a safety device).

The MECP guidelines require specific sound level limits to be met. Inaudibility is not required. Where the sound level limits are exceeded, warning clauses and mitigation are required. The MECP prefers mitigation at the noise source when possible.

3.2.1 Indoors

For stationary sources, there are no MECP indoor sound level limits and using upgraded building components and/or forced air ventilation is not allowed to mitigate noise from stationary sources. The notable exception to this is the possibility of utilizing air conditioning and enclosed noise buffers in a Class 4 area to eliminate the noise sensitive receptors.

3.2.2 Outdoors

For stationary noise sources, NPC-300 provides outdoor sound level limits that apply to outdoor living areas and the outside façade of windows and/or doors. Where sound level limits are exceeded, mitigation at source and/or sound barriers are typically the most effective solutions, however in certain situations, special building designs to eliminate noise sensitive receptors are allowed by the MECP.

The sound level limits are set by the higher of the ambient sound level and the exclusion limits included in NPC-300. The ambient sound level is normally due to road traffic, but in certain situations rail traffic and/or measurements may be used to determine ambient sound level.

3.2.3 MECP Approvals

The MECP requires most industries to possess a valid Environmental Compliance Approval (ECA) or its precursor, a Certificate of Approval (C of A) to operate. These approvals address the acoustical impact of the industry at existing and zoned noise-sensitive lands. The industry must operate in compliance with this approval.

Where new noise-sensitive lands are zoned, it is the responsibility of the proponent of those lands to conduct analysis and provide mitigation if required so as to allow the industry to remain in compliance with their ECA.

3.2.4 MECP Separation Guidelines

The MECP produced Guideline D-6, Compatibility Between Industrial Facilities and Sensitive Land Uses, last revised in July 1995. This document identifies potential influence areas (inside which adverse impacts due to air and noise emissions may be experienced) as well as minimum separation distances between industrial and sensitive uses that should be respected for different classes of industry. See Table A below for these distances.

Table A – MECP D-6 Recommended Distances by Industry Classification

	Influence Distance (m)	Minimum Separation Distance (m)
Class I	70	20
Class II	300	70
Class III	1000	300

It should be noted that complying with the above distances does not necessarily mean that compliance with the applicable sound level limits is assured.

3.3 Town By-laws

A brief summary of the applicable Town of Caledon By-laws has been provided below. The full text of the by-laws should be consulted if further details are required.

By-laws 86-110 and 95-67 regulate noise. They contain prohibitions by time and place as well as numerical sound level limits for some sources.

Section 4.4 of the Zoning By-law (2006-50) outlines the required setback for air conditioner condenser units. In the rear or interior side yard, they can be no closer than 0.6m from any lot line. In an exterior side yard, the minimum exterior side yard requirement must be met.

3.4 Region of Peel Guidelines

The Region of Peel generally follows the MECP guidelines with slight changes to dwellings requiring mandatory central air conditioning and warning clauses. They require air-cooled condenser units to be located in a noise insensitive area and have an AHRI sound level rating of 7.6 bels or less.

4 Noise and Vibration Impact Assessment

4.1 Transportation Sources

Some lots within Stage 2 are within 300m of the rail line. A warning clause regarding the rail line has been provided for these lots.

4.1.1 Noise

Indoors

The spectrum of the noise sources has been taken into account in the analysis.

As detailed architectural plans are not yet available, a typical design has been used to predict the required acoustical performance of the building envelope. A typical worst-case room is a top floor corner room with windows on each wall (25% of the floor area on each wall) and wall area equal to 55% of the floor area on each wall. When an acoustical drawing review is conducted with the final architectural plans, these ratios and the calculated STC values may vary slightly.

For the worst-case dwelling (Block 325), the predicted sound transmission class (STC) ratings for the walls and windows are STC 38 and STC 28 respectively.

Based on the calculated sound levels at the façades, some dwellings require the provision for adding central air conditioning, some others require mandatory central air conditioning in order to allow the windows to stay closed for noise control. See Figure 2 and Table 3 for a comprehensive list of dwellings requiring provision for or mandatory air conditioning.

Outdoors

The impact of the road traffic was calculated in terms of energy equivalent sound level (Leq) for both daytime and nighttime periods using the traffic noise prediction model produced by the MECP (ORNAMENT). Rail Traffic was similarly analyzed using the rail traffic model produced by the MECP (STEAM). Both of these models are implemented in STAMSON 5.04 which was used to perform the analysis.

Topography, ground cover and screening have all been included in the analysis.

Receptor heights for the townhouse blocks were 7.5 m to represent the 3rd storey. The lots were analyzed at 4.5 m high for the 2nd storey and 1.5 m high for the OLA. The number of storeys chosen for each building type was a conservative approach, shorter buildings can be constructed if desired without altering the proposed mitigation.

The worst-case façade receptor (Block 325), has predicted sound levels at the façade of 67 dBA and 60 dBA daytime and nighttime respectively.

The laneway townhouses will have elevated decks above the driveways. As they are less than 4 metres deep, they are not considered as outdoor living areas as per the MECP guidelines. Typical rear yards were assumed for the detached houses.

The worst-case outdoor living area is Lot 106 with a predicted daytime unmitigated sound level of 64 dBA.

Sound levels due to the ORDC rail line were calculated at a typical fully exposed receptor and were found to be acoustically insignificant compared to road traffic noise. Therefore, the rail line was not included in the remaining calculations. Currently, level crossings are proposed at Tim Manley Avenue and Collector Road A. The ORDC policy is to whistle at every crossing, therefore whistle noise was included in the analysis and even then, rail noise was acoustically insignificant compared to road traffic noise.

Table 2 provides a summary of the calculated unmitigated sound levels.

Where the predicted sound levels exceed the applicable sound level limits, mitigation and warning clauses are warranted. See Section 5.1 for details.

4.1.2 Vibration

Vibration from rail lines can be significant for dwellings within 75 m of a rail line. As this site is more than 75 m away, vibration is predicted to be insignificant. No vibration measurements are required when the 75 m setback is respected and consequently, none were conducted.

4.2 Stationary Sources

4.2.1 Within the Development

The Elementary School Block (Block 318) does not have information available at this time. The proponent of the Elementary School should ensure that a noise report is prepared to address their proposed design.

No significant sources of vibration are expected.

There is a commercial block included in Stage 1 of this development. It is screened from Stage 2 by proposed residential dwellings. There are also medium density blocks and an affordable housing block in Stage 1 that may have stationary noise sources. The proponent of the commercial, medium density and affordable housing blocks should have noise reports prepared once plans are available.

4.2.2 Outside the Development

One existing facility was identified as potential sources of stationary noise and are shown on Figure 1.

A farm and storage silos 500 m north of the site have existing residential receptors within 250 m of them.

The existing stationary sources are required to achieve compliance with the applicable noise guidelines at the existing receptors. As the proposed site is substantially further away, compliance at the existing receptors ensures compliance at the proposed site.

5 Noise Abatement Requirements

Figure 2 and Table 3 provide a summary of the acoustical requirements for the proposed development. A Draft Noise Attenuation Statement (included in this report as Appendix D) summarizes the acoustical mitigation measures required.

5.1 Transportation Sources

5.1.1 Indoors

The worst-case STC rating of STC 38 for the exterior walls is met by standard construction. No upgraded construction is predicted to be required.

The worst-case STC rating of STC 28 for the windows is met by most manufacturer's standard windows.

5.1.2 Outdoor Living Areas

See Figure 2 for the location and height of the proposed sound barriers.

Dwellings adjacent to Street A have predicted unmitigated rear yard sound levels of up to 56 dBA. This exceeds the Town of Caledon's guideline of 55 dBA but is within the 5-dB exceedance allowed by the MECP. 1.8 m high sound barriers have been included in these locations in accordance with the Towns policy. With 1.8 m high acoustic fences, mitigated sound levels are less than 55 dBA.

Sound barrier are required for lots flanking McLaughlin Road. Due to varying grades, the height of acoustic fence required is 2.0 m to 2.4 m for mitigated sounds levels of 55 dBA.

A 2.6 m high sound barrier is required on lots flanking Tim Manley Avenue for predicted mitigated sound levels of 55 dBA. On an April 29, 2019 phone call, the Town of Caledon indicated that an acoustic fence that exceeded the towns typical maximum height was acceptable in this location and preferable to a berm if increased height was required to achieve 55 dBA. With a 2.4 m high acoustic fence, the mitigated rear yard sound level would be predicted to be 56 dBA. If analyzed as per a typical GTA development, using the posted speed limit, a 2.3 m high acoustic fence is needed for a predicted mitigated sound level in the rear yard of

55 dBA. The sound barrier on Lot 105 should be joined to the sound barrier on the adjacent Mattamy site that should be proceeding at the same time. If the Mattamy site is substantially delayed for some reason, the need for sound barriers to address the interim condition should be considered.

Acoustically, sound barriers can be constructed of a berm and/or acoustic fence however given the space limitations of development, typically the use of berms is minimized.

Sound barriers should be continuous with no gaps and have a surface density of 20 kg/m^2 or more. Even small gaps within a sound barrier can substantially degrade the acoustic performance. If drainage is required under an acoustic fence, special designs are available to accommodate water flow while minimizing the acoustical impact. To avoid excessive noise going around the end of the barrier, the sound barrier should be constructed as shown on Figure 2. Other layouts are possible, but before construction, they should be reviewed by an acoustical engineer to ensure they are acoustically effective.

Gates in an acoustic fence may have a small gap at the bottom and must have a surface density of more than 10 kg/m^2. When gates are installed in an acoustic fence, they should be placed in a segment of the fence perpendicular to the road.

The Town of Caledon requires noise barrier walls to be constructed of concrete or vinyl panels. Wood panels are not acceptable. The maximum noise wall height is 2.4 m. For this development, the Town has indicated that taller noise walls may be acceptable in certain situations.

Where sound barriers are installed or where sound level limits will be exceeded without the addition of mitigation, warning clauses should be incorporated in development agreements and offers of purchase and sale.

5.2 Stationary Sources

5.2.1 Within the Development

Conducting a numerical analysis of the potential school at this point is premature due to the number of assumptions that would need to be made. A noise report should be prepared when information is available by the proponent of this block.

Typical noise sources include mechanical equipment such as HVAC units and exhaust fans. Mitigation, if required, can take many forms including site design, selection of quieter equipment or silencers and sound barriers. In any case, mitigation on the block containing the noise source is the most effective solution.

As discussed in Section 4.2.1, the commercial, medium density and affordable housing blocks should have noise reports prepared by their proponents when information is available.

5.2.2 Outside the Development

As discussed in Section 4.2.2, no mitigation is required to achieve compliance with the applicable noise and vibration guidelines. Due to the separation distance, no warning clauses are proposed.

5.3 Warning Clauses

Warning clauses are to be placed in development agreements and included in offers of purchase or sale and lease agreements. See Table 3 for a summary of the warning clauses required for each Lot/Block.

Type A is used where a sound level excess is predicted but no mitigation is installed, Type B is used where physical mitigation has been provided, Types C, D E, G and H are self-explanatory, Type F is only used in designated Class 4 areas;

A. “Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”

B. “Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.”

C. “This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion.

Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

D. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

E. "Purchasers/tenants are advised that due to the proximity of the adjacent commercial property, noise from the commercial property may at times be audible."

F. "Purchasers/tenants are advised that sound levels due to the adjacent industry are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

G. "That the acoustical berm and/or barrier as installed, shall be maintained or repaired by the owner. Any maintenance, repair or replacement shall be with the same material, or to the same standards, and having the same colour and appearance of the original."

H. "WARNING: the Orangeville-Brampton Railway operates a railway right-of-way within 300 metres of these lands. There may be alterations to or expansions of railway facilities or operations in the future. This expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration control attenuating measures in the design of the development and individual dwellings. The Orangeville-Brampton Railway or the Town of Orangeville will not be responsible for any complaints or claims arising from the use of,

or noise generated from, such facilities and/or operations on, over or under the rail right-of-way."

I. "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic will on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

The wording of A to F presented above is taken from sample warning clauses prepared by the MECP in NPC-300, they can be modified by the municipality as required. The guidelines prepared by the Region of Peel in 2012 contain similar warning clauses. The wording of clause G is taken from the Peel guidelines. Warning clause H is provided by the ORDC. Warning Clause I replaces "may" from warning clause B with "will" as per the Region of Peel.

Contained within the Draft Plan Conditions for this development are additional warning clauses to be provided for all lots/blocks, some of which reference noise. They include things such as notification of agriculture, commercial and airport operations in the vicinity. As these clauses are general in nature, apply to all dwellings and are not related to a numerical analysis, they were not included in this report. The warning clauses provided by the Draft Plan Conditions should be incorporated in all Purchase and Sale and Lease Agreements in addition to the warning clauses required by this report.

6 Conclusion

With the incorporation of the required mitigation (see Figure 2 and Table 3), all noise-sensitive receptors within the development are predicted to comply with the applicable sound level limits. Where mitigation is required, warning clauses have been provided to notify future occupants.

Prior to the issuance of building permits, dwelling and sound barrier designs should be reviewed by an acoustical consultant to ensure compliance with the applicable guidelines and development agreements.

Prior to the issuance of occupancy permits, dwellings and sound barriers should be inspected to ensure that they were constructed as per the approved plans.

The school block should similarly have a noise report, acoustical drawing review and acoustical final clearance inspection prepared.

Respectfully submitted,

Actinium Engineering Inc.

Jamie Paterson

Digitally signed by Jamie Paterson
DN: cn=Jamie Paterson, o=Actinium Engineering Inc, ou, email=jamie@actinium..., c=CA
Date: 2020.12.10 21:30:48 -05'00'

LICENSED PROFESSIONAL ENGINEER
J.M. PATERSON
100099338
PROVINCE OF ONTARIO
Dec 10/2020

Jamie Paterson, P.Eng

JP
16-051-03 ENVR.docx

Actinium ENGINEERING

7 References

American Society for Testing and Materials (ASTM) 2016, Standard E413 Classification for Rating Sound Insulation.

Jade Acoustics Inc. May 13, 2010. Environmental Noise and Vibration Impact Assessment Mayfield West Phase 2 Secondary Plan Part B Evaluation of Land-Use Options.

Jade Acoustics Inc. July 26, 2018, 2nd Response to Region of Peel Comments, Addendum to Environmental Noise and Vibration Impact Assessment, Mayfield West Phase 2, Stage 2.

NAK Design Strategies, February 2016. Community Design Plan Mayfield West Phase 2.

Ontario Ministry of the Environment (MOE) 1995, Guideline D-6 Compatibility Between Industrial Facilities & Sensitive Land Uses.

Ontario Ministry of the Environment (MOE) 1978, Model Municipal Noise Control By-Law Final Report.

Ontario Ministry of the Environment (MOE) 1989, ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation.

Ontario Ministry of the Environment (MOE) 1983, Publication NPC-207 Impulse Vibration in Residential Buildings.

Ontario Ministry of the Environment (MOE) 2013, Publication NPC-300 Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning.

Ontario Ministry of Municipal Affairs and Housing 2014. Provincial Policy Statement under the Planning Act.

Orangeville Railway Development Corporation 2001. Policy on the Environmental Protection of New Residential Development Adjacent to the Orangeville – Brampton Railway.

Paradigm Transportation Solutions Ltd December 2015. Mayfield West Phase 2 Secondary Plan Transportation Master Plan Final Report.

Region of Peel November 2012. General Guidelines for the Preparation of Acoustical Reports in the Region of Peel.

Town of Caledon. Noise By-law 86-110. Retrieved from www.caledon.ca on January 15, 2020

Town of Caledon. Zoning By-law 2006-50. Retrieved from www.caledon.ca on January 15, 2020

Town of Caledon. 2009. Development Standards, Polices & Guidelines. Retrieved from www.caledon.ca on January 15, 2020.

Table 1A – Summary of Road Traffic Information

Road	Ultimate AADT*	Day/Night Volume Split (%)	Medium/Heavy Trucks (%)	Lanes	Gradient (%)	Posted Speed (km/h)
Street A (Galvin Avenue/ Lippa Drive)	5100	90/10**	1/1	2	2**	50
McLaughlin Rd	10200	90/10/**	2.5/2.5	4	2**	60
Tim Manley Ave	16300	90/10**	2.5/2.5	3	2**	60

* Annual Average Daily Traffic applicable to 2040

** Assumed

Table 1B – Summary of Rail Traffic Information

Train Type*	No. of Trains** (Day/Night)	No. of Locomotives	No. of Cars	Speed*** (km/h)
Freight	2/0	2	12	40

* ORDC has indicated that either freight or tourist trains will use the line on any given day. To ensure a conservative analysis, a day with freight trains was used in the analysis.

** This is applicable to the worst-case day in 2019. As per the ORDC, this data has been escalated by 2%/year until 2040 to account for growth.

*** ORDC indicated that for the foreseeable future, the speed limit is 40 km/h.

Table 1C – Aircraft Traffic

Airport	NEF/NEP
Brampton Airport	<25

Table 2 – Predicted Unmitigated Sound Levels Outdoors Due to Transportation Sources

Analyzed Location (Lot/Block)	Location[1]	Source[2]	Distance (m)	Daytime Leq (dBA)		Nighttime Leq (dBA)	
				Separate	Combined	Separate	Combined
1	OLA	MR	25	62	--	--	--
	East Facade	MR ORDC[3,5]	22 290	64 36	64	57 --	57
		MR ORDC[4,5]	22 290	64 45	64	57 --	57
3	OLA	MR	47.5	55	--	--	--
105	OLA	TMA	25	62	--	--	--
106	OLA	TMA	23.5	64	--	--	--
	South Facade	TMA	19	67	--	60	--
147	OLA	TMA	25	62	--	--	--
161	OLA	SA	18.5	57	--	--	--
	South Facade	SA	11	62	--	56	--
284	OLA	SA	18.5	57	--	--	--
300	OLA	MR	26.5	61	--	--	--
318	East Facade	MR	45	60	--	54	--
325	South Facade	TMA	20.5	67	--	60	--

Notes to Table 2

1 Wall location taken at 4.5 and 7.5 m above grade for the top floor of two and three storey dwellings respectively. OLA location taken 3 m out from the centre of the rear wall, 1.5 m above grade.
2 MR=McLaughlin Road, ORDC=Orangeville Railway Development Corporation Line, SA=Street A, TMA=Tim Manley Avenue

3 Whistles not included
4 Whistles included
5 As ORDC was acoustically insignificant, it was not included in the remainder of the calculations

Table 3 – Minimum Noise Abatement Measures

Lots/Blocks[1]	Air Conditioning[2]	Wall[3]	Window[3]	Sound Barrier[4]	Warning Clauses[5]
Lots 105, 106 and 147	Mandatory	N/R	N/R	2.6	D, G, I
All units of Blocks 325 to 328	Mandatory	N/R	N/R	2.6	D, I
Lots 274 and 300	Provision	N/R	N/R	2.0	C, G, I
Lots 47, 148, 161, 162, 238, 239, 273 and 284	Provision	N/R	N/R	1.8	C, G, I
Lot 1	Provision	N/R	N/R	2.4	C, G, H, I
Lots 2 and 3 and all units of Block 317	Provision	N/R	N/R	No	B, C, H
Lots 44 to 46, 101 to 104, 107 to 110, 143 to 146, 275 to 283 and 297 to 299, all units of Blocks 318 to 323 and all units except the east unit of Block 324	Provision	N/R	N/R	No	B, C
East unit of Block 324	Provision	N/R	N/R	No	C, I
Lot 4	N/R	N/R	N/R	No	A, H
All other lots	N/R	N/R	N/R	No	No

Notes to Table 3

1 See Figure 2 for the location of the Lots/Blocks.

2 Provision for air conditioning requires a dwelling designed for the addition of central air conditioning at the occupants' discretion and expense. This typically involves the installation of a ducted heating system.
Mandatory air conditioning includes a central air conditioning system that allows windows to remain closed.
For air-cooled condenser units, the AHRI sound rating must not exceed 7.6 bels.

3 Calculated using typical dwelling design. See Section 5.1.1 for details. When detailed architectural drawings are analyzed, these values may change.
STC is the Sound Transmission Class.
N/R denotes no requirements beyond standard construction.

4 All heights noted are acoustic fence heights. No berms are proposed for this development. See Figure 2 and Section 5.1.2 for further details.

5 Warning clauses are to be placed in development agreements and included in offers of purchase or sale and lease agreements.
B and I are a general warning where mitigation has been provided.
C is for provision for A/C. D is for mandatory A/C.
E is regarding nearby commercial.
G is regarding sound barriers.
H is regarding rail
See Section 5.3 for details and suggested wording.

Table 4 - Predicted Mitigated Sound Levels Outdoors Due to Transportation Sources

Lot	Base of Source (m)	Base of Barrier (m)	Base of Receiver (m)	Sound Barrier Height (m)	Top of Barrier[1] (m)	Daytime Leq (dBA)
1	261.51	261.59	261.69	2.4[2]	263.99	55
105	264.75	265.10	264.81	2.6[3]	267.70	55
106	264.49	264.71	264.61	2.6[3]	267.31	55
147	264.30	264.62	264.30	2.0[4]	266.62	55
161	261.87	262.10	262.08	1.8[5]	263.90	51
284	263.36	263.50	263.47	1.8[5]	265.30	51
300	263.97	264.37	264.19	2.0[4]	266.37	55

1 This is the top of fence elevation at a on a line perpendicular to the street centreline through the analyzed receptor. The top of fence elevation will vary as the base of barrier elevation changes along the property line.
2 2.4 m high acoustic fence
3 2.6 m high acoustic fence
4 2.0 m high acoustic fence
5 1.8 m high acoustic fence

Figure 1 - Key Plan

This page intentionally left blank
for two-sided printing purposes.

Greenbelt Lands

2.4 m high Acoustic Fence

BLOCK 332
Environmental Policy Area

OPEN SPACE

BLOCK 331
Stormwater Management Pond

BLOCK 329
Neighbourhood Park

BLOCK 330
Elementary School

STREET P (HEWSON TERRACE)
STREET Q
(TANTALO PLACE)
STREET O (PRESTWICK TERRACE)
(SAINT RITA DRIVE)
STREET N
STREET T (SOVA ROAD)
(VERATA DRIVE)
STREET S
ST. R
(FALSETTO DRIVE)
STREET 'A' (LIPPA DRIVE)
2.0 m High Acoustic Fence
1.8 m High Acoustic Fence
STREET 'G' (VINCENA ROAD)
STREET 'I' (GATHERWOOD TERRACE)
STREET 'F' (COULTERVILLE DRIVE)
STREET 'H' (CAMINO REAL DRIVE)
STREET 'K' (UMBRIA PLACE)
LANEWAY C (FALABELLA PLACE)
(WILTON DOWNEY WAY)
LANEWAY B
STREET 'A' (GALVIN AVENUE)
STREET M (DAMARA ROAD)
STREET L (SPEERS AVENUE)
STREET L (SPEERS AVENUE)
LANEWAY D
ALMA AVENUE
TIM MANLEY AVENUE
2.6 m High Acoustic Fence
STREET 'B' (PATTULO DRIVE)
STREET 'A' (PETCH AVENUE)
STREET 'E' (DEL GRAPPA STREET)
McLaughlin Road
FUTURE RESIDENTIAL

Block 354
Medium Density
0.96 ha 71 units

Block 355
Medium Density
0.85 ha 62 units

Block 356
Medium Density
1.04 ha 76 units

Block 357
Affordable Housing
Lands
Region of Peel
0.71 ha

Block 358
Commercial
(98 Jobs)
1.46 ha

Block 359
Open Space - Woodlot
7.35 ha

Additional Lands Held by the Applicant

LEGEND:

- ▲ Mandatory Central Air Conditioning and Warning Clause
- ● Provision for Central Air Conditioning and Warning Clause
- Sound Barrier
- ✳ Rail Warning Clause H
- ◯ Analyzed Location

NOTE:
See Table 3 as well as Section 5.3 for Further Details on Warning Clauses

Actinium ENGINEERING
16 Industrial Pkwy South Unit 401
Aurora, Ontario L4G 0R4
T:(289)468-1221
www.actinium.ca

File No:	16-051-03
Date:	December 2020
Scale:	N.T.S.
True North:	
Project North:	

Proposed Residential Development
Mayfield West Phase 2-2
McLaughlin Road and Tim Manley Avenue
Town of Caledon

Plan Showing Noise Abatement Measures

Figure 2

Appendices

Appendix A – Traffic Data

RE: Brookvalley Caledon (Mayfield West) Traffic (AEI File: 16-051)

Hello Jamie,

Please see the table below that indicates the AADT values for MW2. Also, please find a link below to the travel lanes for the Spine Road and McLaughlin Road. Unfortunately I cannot provide you with truck percentages.

https://www.caledon.ca/en/townhall/resources/Spine-McL_PlanProf-Spine-Road.pdf

Roadway	Section	Forecasted 2031 AADT	Posted Speed
Spine Road	Hurontario Street to a point 200 metres west of McLaughlin Road	39,000	60 km/h
	200 metres west of McLaughlin Road to Chinguacousy Road	16,000	
McLaughlin Road	Mayfield Road to a point 200 metres south of the Spine Road	19,000	60 km/h
	200 metres south of the Spine Road to a point 200 metres north of the Spine Road (Village Centre)	22,000	
	200 metres north of the Spine Road to MW2 study limits	10,000	
All Collectors		5000	50 km/hr

RE: Brookvalley Caledon (Mayfield West) Traffic (AEI File: 16-051)

Regards,

Drew Haines, E.I.T.

Senior Development Engineering Coordinator

Planning and Development

Community Services

Office: 905.584.2272 x. 4188

Email: drew.haines@caledon.ca

Town of Caledon | www.caledon.ca | www.visitcaledon.ca | Follow us @YourCaledon

Schedule 'A' to Development Approval & Planning Policy Report DP-2016-012
Page 1 of 518

paradigm
TRANSPORTATION SOLUTIONS LIMITED

Mayfield West Phase 2 Secondary Plan Transportation Master Plan Final Report

Paradigm Transportation Solutions Limited

December 2015

Actinium ENGINEERING

Project Summary

Project Number
101380P

December 2015

Client
Town of Caledon
6311 Old Church Road
Caledon, ON L7C 1J6

Client Contact
Ms. Kathy Ash, MCIP, RPP
Senior Policy Planner
Policy & Sustainability Section

Consultant Project Team
Paradigm Transportation Solutions Limited

In Association with

AMEC Environment & Infrastructure
Vandermark Consulting

Paradigm Transportation Solutions Limited
22 King Street South Suite 300
Waterloo ON N2J 1N8
p: 519.896.3163
www.ptsl.com

Mayfield West Phase 2 Secondary Plan Transportation Master Plan Final Report

List of Revisions

Version	Date	Author	Description
1	July 2014	PTSL	Draft Report
2	October 2015	PTSL	Final Report
3	December 2015	PTSL	Final Report (updated)

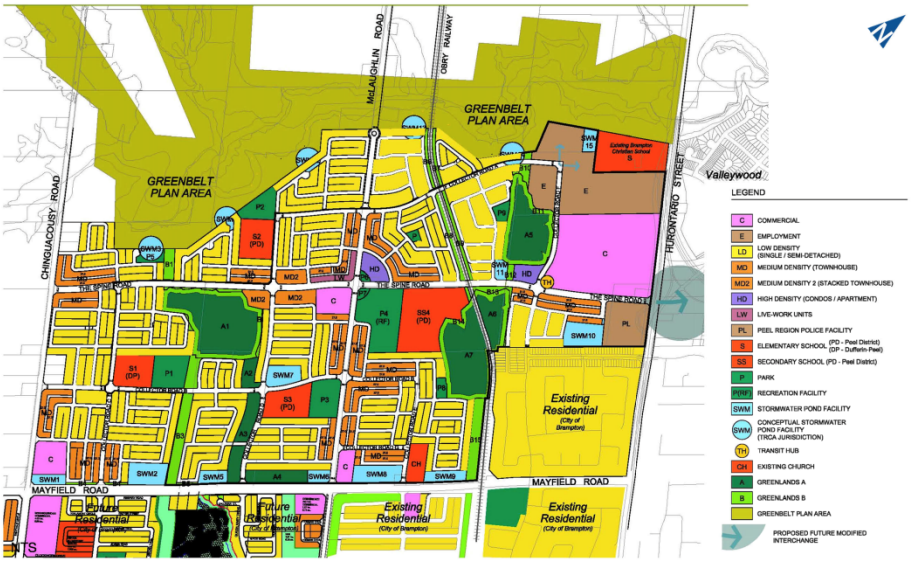
Signatures and Seals

Signature

Disclaimer

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authorization of Paradigm Transportation Solutions Limited being obtained. Paradigm Transportation Solutions Limited accepts no responsibility or liability for the consequence of this document being used for a purpose other than the purposes for which it was commissioned. Any person using or relying on the document for such other purpose agrees, and will by such use or reliance be taken to confirm their agreement to indemnify Paradigm Transportation Solutions Limited for all loss or damage resulting there from. Paradigm Transportation Solutions Limited accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned.

To the extent that this report is based on information supplied by other parties, Paradigm Transportation Solutions Limited accepts no liability for any loss or damage suffered by the client, whether through contract or tort, stemming from any conclusions based on data supplied by parties other than Paradigm Transportation Solutions Limited and used by Paradigm Transportation Solutions Limited in preparing this report.



paradigm TRANSPORTATION SOLUTIONS LIMITED

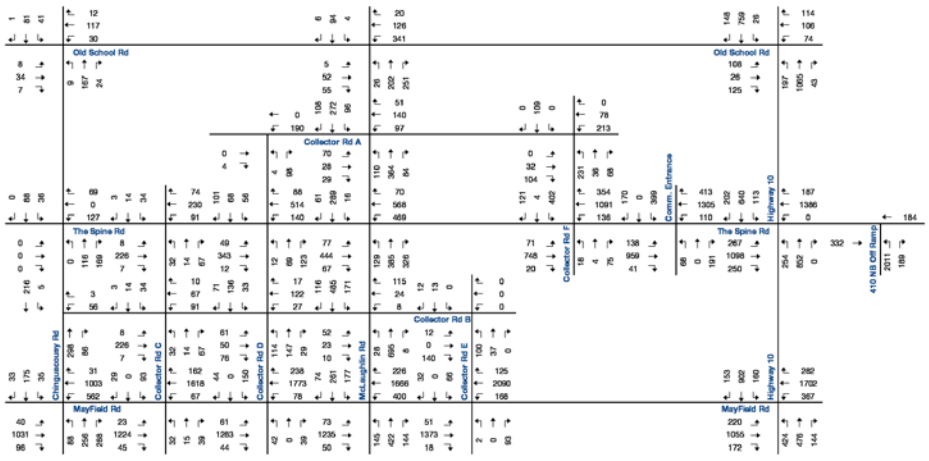
Endorsed Framework Plan

Mayfield West Phase 2 Secondary Plan Transportation Master Plan
101380P

Figure 2.2

Schedule 'A' to Development Approval & Planning Policy Report DP-2016-012
Page 37 of 518

Actinium ENGINEERING

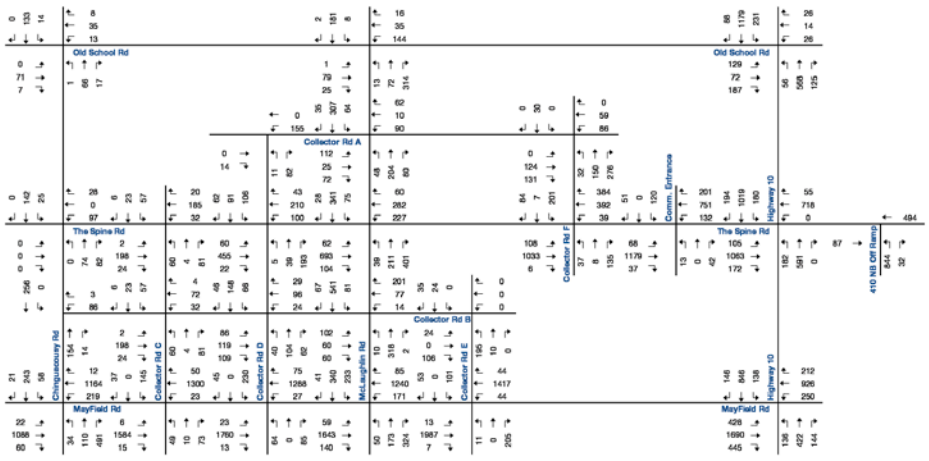


paradigm TRANSPORTATION SOLUTIONS LIMITED

Future Total Traffic – PM Peak Hour

Mayfield West Phase 2 Secondary Plan Transportation Master Plan
101380P

Figure 6.6

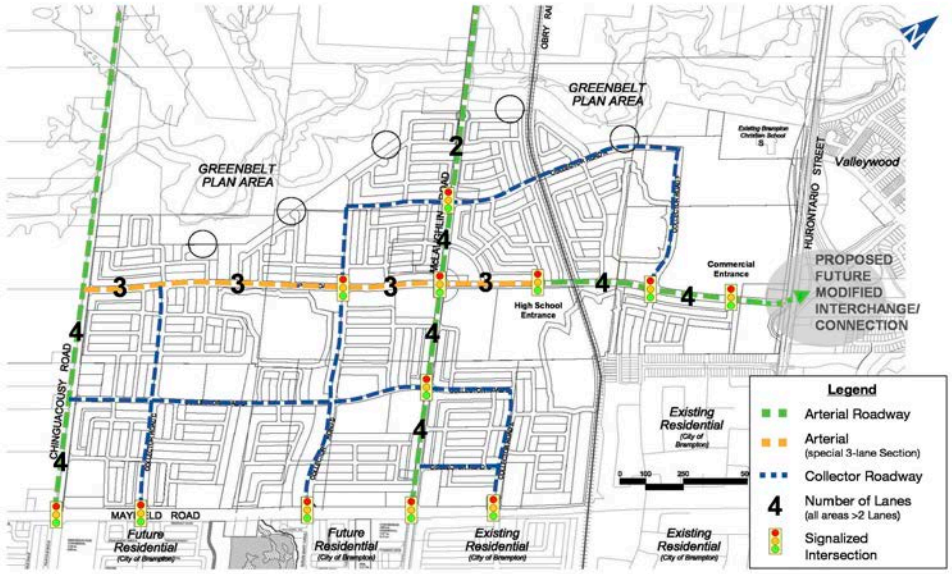


paradigm TRANSPORTATION SOLUTIONS LIMITED

Future Total Traffic – AM Peak Hour

Mayfield West Phase 2 Secondary Plan Transportation Master Plan
101380P

Figure 6.5



paradigm TRANSPORTATION SOLUTIONS LIMITED

Recommended Road Network Plan

Mayfield West Phase 2 Secondary Plan Transportation Master Plan
101380P

Figure 7.1

Schedule 'A' to Development Approval & Planning Policy Report DP-2016-012
Page 83 of 518

7.3 Road Design Guidelines

Future design activities undertaken as part of detail design should conform to current practices and standards as per the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, Ministry of Transportation of Ontario (MTO) Geometric Design Standards for Ontario Highways, Region of Peel Public Works Design Standards, Specification & Procedures Manual and the Town of Caledon Development Standards, Policies and Guidelines.

7.3.1 Traffic Control

A number of intersections throughout the Spine Road and McLaughlin Road corridors are anticipated to require traffic signals under future 2031 traffic conditions. It is estimated that up to 9 new intersections will require traffic signal control, in conjunction with other geometric requirements including auxiliary turn lanes.

The future need for traffic control signals was determined based on the results of the traffic operations analysis and reflects the long-term traffic demands anticipated as a result of full build-out of Mayfield West Phase 2. The actual need for traffic control signals and the approximate timing of installation at each location will be subject to future signal warrant assessment in accordance with Town of Caledon and Region of Peel policies. The design details and timing for implementation of intersection traffic control and geometric improvements should be established as part of site-specific traffic assessment studies which will be submitted in support of individual development applications.

7.4 Rail Crossings

7.4.1 Current Rail Operations

There are two planned crossings of the Orangeville Brampton Railway (OBRY); the Spine Road is to cross the rail line at a point 520 metres east of McLaughlin Road, while Collector Road A crosses the line at a point 345 metres east of McLaughlin Road. A single road crossing of the rail line (e.g., the Spine Road crossing only) was determined to not support the overall circulation needs of the Mayfield West Phase 2 land use plan. The second Collector Road A crossing of the rail line is needed to provide sufficient east – west traffic capacity; to accommodate future local bus service; to provide a reasonable level of connectivity within the urban area for not only vehicular traffic and pedestrians but also for cyclists, pedestrians and service vehicles; and to ensure flexibility for emergency vehicles in the event of road closures.

Currently, rail traffic along the line is relatively low and consists of four scheduled freight trips between Orangeville and Mississauga per week (two trips on Tuesday and two trips on Friday) with occasional increases in freight trains in order to meet specific customer needs as well as infrequently

scheduled maintenance. Excursion trains (Credit Valley Explorer) consists of a return trip between Orangeville and Mayfield Road and operate during weekends with higher frequency trips during the fall months (September and October). Overall, rail traffic averages approximately two crossings per day.

Recent discussions with OBRY representatives confirms that there are no immediate plans for significant increases in rail traffic within the short term (5-year forecast), and long term traffic estimates are difficult to forecast at this time. It was noted that the current designation of the rail line permits speeds of up to approximately 40 km/h (25 mph). It was also noted that in the future, the rail line may be upgraded to a Class 3 railway and as such, be permitted to operate at speeds of up to 72 km/h (45 mph).

7.4.2 Assessment of Future Rail Operations

As summarized in the Canadian Railway-Roadway Grade Crossing Standards[13] (CRRGCS) document, a cross-product (number of trains daily multiplied by the average annual daily traffic (AADT)) of 200,000 is often used as an indicator that a grade separation may be warranted, and that a detailed engineering study should be undertaken. In circumstances where the forecast cross-product is 50,000 or more or if the maximum railway operating speed is 50 mph or more, the grade crossing warning system should include gates. In low volume areas, guidelines indicate that a grade crossing warning system consisting of warning signals and bells shall be installed if the forecast cross-product is greater than 1,000 and the maximum railway operating speed exceeds 15 mph.

Unrestricted grade crossings for pedestrian or cyclists use only shall have a grade crossing warning system where the maximum railway operating speed exceeds 60 mph; or the maximum railway operating speed exceeds 15 mph and there are two or more tracks at the grade crossing where trains may be passing one another.

The resulting cross-product review, as per the forecasted 2031 AADT volumes and anticipated rail traffic, is summarized in **Table 7.3**. A detailed analysis of the cross-product review is provided in **Appendix F** for further reference.

[13] Canadian Railway-Roadway Grade Crossing Standards (CRRGCS) Draft Report; (Transportation Canada), January 2012.

TABLE 7.3: CROSS-PRODUCT REVIEW

Location	Projected AADT (vehicles/day)	# of Trains (trains/day)	Cross-Product
Spine Road	22,600	2	45,200
Collector Road A	2,000	2	4,000

The analysis confirms that neither a grade-separated crossing nor gates are warranted at the Spine Road or Collector Road "A" rail crossings based on projected future traffic volumes. Should future traffic volumes and/or rail operations increase (i.e. 4 train crossings per day), detailed engineering studies shall be undertaken in order to review the need for gates and/or grade-separated crossings.

Recognizing that the current cross-product estimate is close to the threshold for gates at the Spine Road, it is noted that even a marginal increase in either vehicular traffic or train traffic would satisfy the requirement for gates. In addition, the location of this particular crossing is considered somewhat sensitive in terms of its close proximity to the commercial node, secondary school and high levels of associated pedestrian and cyclist traffic. As such, it is recommended that given the uncertainty in estimating traffic demands for the 2031 horizon, and sensitive characteristics of the adjacent land use, that provision for gates be maintained at the crossing of the OBRY rail line at the Spine Road.

In terms of pedestrian and cycling facilities, the CRRGCS notes that a grade crossing warning system is warranted under the following conditions:

- The maximum railway operating speed exceeds 60 mph; or
- The maximum railway operating speed exceeds 15 mph and there are two or more tracks at the grade crossing where trains may be passing one another.

At this time the maximum railway operating speed is anticipated to be less than 60 mph (96 km/hr) which would indicate that a grade crossing warning system is not likely to be warranted where the multi-use trails cross the rail line. Warning signage and bollards should be satisfactory in terms of providing protection and advance warning when approaching the rail line. If the railway operating speed increases in the future, or should rail operations be expanded and an additional track be provided, the need for pedestrian and cyclist path protection will need to be re-examined.

TABLE 9.4: PEDESTRIAN AND CYCLING INFRASTRUCTURE REQUIREMENTS

Roadway	Section	Forecasted 2031 AADT	Sidewalk	Bike Lanes
Spine Road	Hurontario Street to a point 200 metres west of McLaughlin Road	24,000 – 39,000	1.5 metre north side, 2.0 metre south side	2.0 metre west of Collector Road F
	200 metres west of McLaughlin Road to Chinguacousy Road	5,000 – 16,000	1.5 metre	1.8 metre
McLaughlin Road	Mayfield Road to a point 200 metres south of the Spine Road	19,000	1.5 metre	1.8 metre
	200 metres south of the Spine Road to a point 200 metres north of the Spine Road (Village Centre)	22,000	1.5 metres with additional surface to building face	1.8 metre
	200 metres north of the Spine Road to MW2 study limits	10,000	1.5 metre	1.8 metre
Chinguacousy Road	Mayfield Road to MW2 study limits	6,000	1.5 metre	1.8 metre paved shoulders
Collectors	As shown in **Figure 9.1**	3,000 – 5,000	1.5 metre	1.5 metre shared lanes or bike lanes

RE: Ultimate Speed Limits Within Mayfield West Phase 2

Subject: RE: Ultimate Speed Limits Within Mayfield West Phase 2
From: Dean McMillan <Dean.McMillan@caledon.ca>
Date: 2016-06-22 9:53 AM
To: Jamie Paterson <jamie@actinium.ca>

Good Morning Jamie,

Typically, our speed limits would be reviewed utilizing the TAC methodology, however, without having undertaken that work yet for this area, I would suggest using the following speeds for the streets you are analyzing:

Collector Road A 50 km/h
Spine Road This could be 50km/h or 60km/h
McLaughlin Road This could be 50km/h or 60km/h

Again, this is just after my brief review of the area and the proposed layout of the plan area.

If you have any questions or concerns, please contact me at the number below,

Dean McMillan
Acting Manager, Transportation
Transportation
Finance & Infrastructure Services

Town of Caledon
6311 Old Church Road
Caledon, ON L7C 1J6
1.888.225.3366
905.584.2272 x.4093

www.caledon.ca
www.visitcaledon.ca

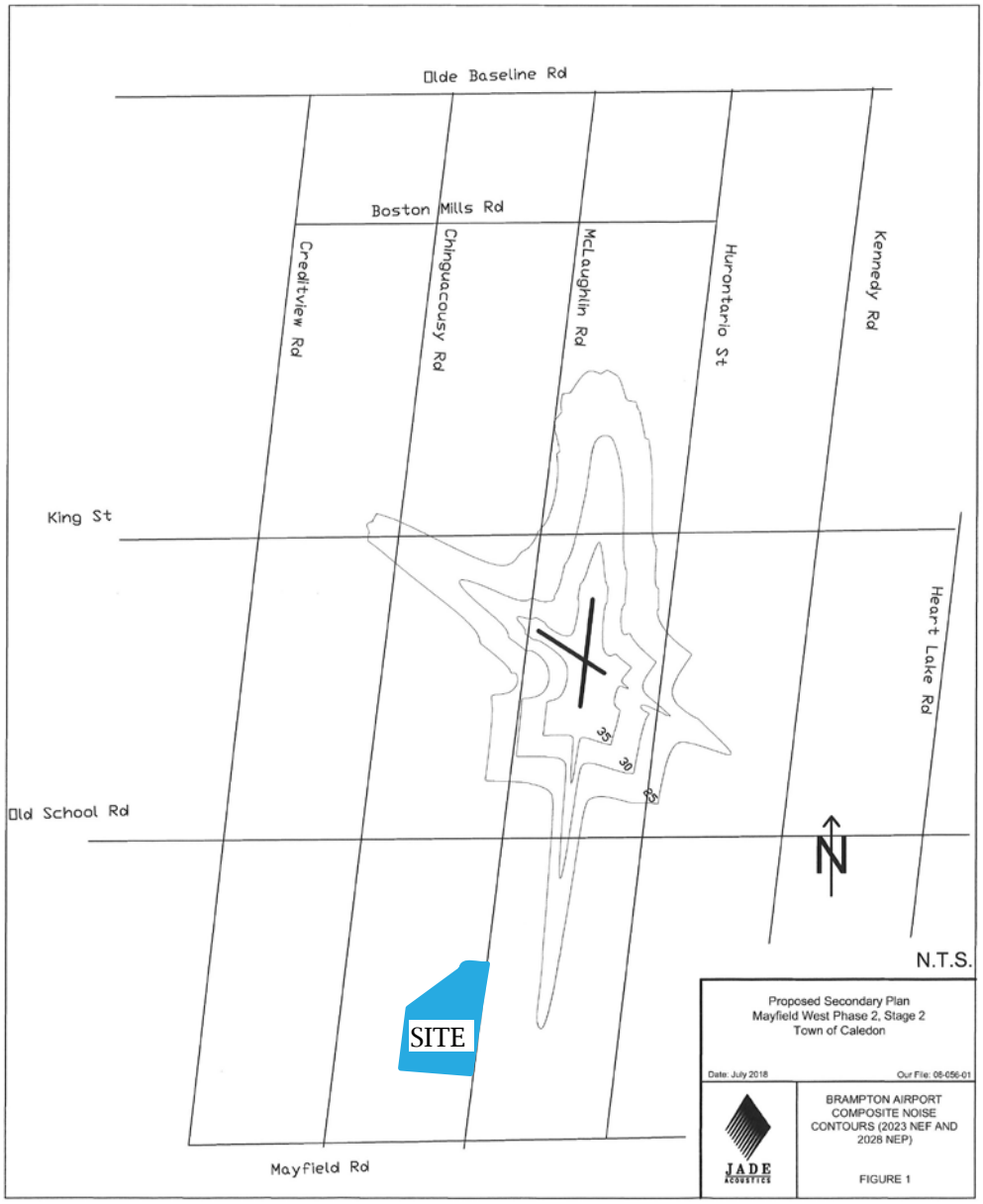
-----Original Message-----
From: Jamie Paterson [mailto:jamie@actinium.ca]
Sent: Tuesday, June 21, 2016 10:02 AM
To: Dean McMillan
Subject: Ultimate Speed Limits Within Mayfield West Phase 2

Dean,

As discussed on the phone, I am working on an Environmental Noise Report for a proposed subdivision within the Mayfield West Phase 2 Secondary Plan. As per our discussion, for ultimate traffic volumes, I have used data from the Paradigm Traffic report for this area. In order to complete my analysis, I need the ultimate speed limits for the adjacent roads. The site I am working on is on the west side of McLaughlin Road at the Spine Road (this is just south of an existing creek/valley). I need speed limits for McLaughlin Road, The Spine Road, and Collector Road A. The Spine Road and Collector Road A do not currently exist, I believe the current speed limit on Mayfield Road is 60 km/h.

The client would like me to complete my report this week and I need these speed limits to complete my analysis. Sorry for the short notice, the client just authorized this late last week.

Thanks for your help,



Map from Jade Acoustics 2018

Appendix B – Environmental Noise Criteria

Tables C-1 to C-10 and section C7.1.2 below are extracted from NPC-300 published by the Ontario Ministry of Environment, Conservation and Parks.

Road and Rail

Table C-1 -Sound Level Limit for Outdoor Living Areas, Road and Rail

Time Period	Leq(16)(dBA)
16 hr, 07:00 – 23:00	55

Table C-2 – Indoor Sound Level Limits, Road and Rail

Type of Space	Time Period	Leq(dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 7:00	40	35

Table C-9 – Supplementary Indoor Sound Level Limits, Road and Rail

Type of Space	Time Period	Leq (Time Period) (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

Plane of Window Ventilation Requirements

Required Ventilation	Leq (Time Period) (dBA)	
	Day 07:00 to 23:00	Night 23:00 to 07:00
Provision for installation of central air conditioning in the future at the occupant's discretion	>55 to ≤65	>50 to ≤60
Mandatory central air conditioning	>65	>60

Aircraft

Table C-3 – Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

Table C-4 – Indoor Aircraft Noise Limit (Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, nursing homes, schools, nursing/retirement homes, daycare centres, etc.	5
Sleeping quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine the acoustical insulation requirements based on the NEF/NEP contour maps.

Table C-10 – Supplementary Indoor Aircraft Noise Limits (Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private office, conference rooms, etc.	10
Living/dining/den areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

* The indoor NEF/NEP values listed in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

Stationary Sources

Table C-5 – Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA), Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Table C-6 - Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA), Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

Table C-7 – Exclusion Limit Values for Impulsive Sound Level (LLM, dBAI), Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

Table C-8 - Exclusion Limit Values for Impulsive Sound Level (LLM, dBAI), Plane of Window – Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-23:00)/ (23:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

Peel Guidelines

C7.1.2 Plane of a Window – Ventilation Requirements

C7.1.2.1 Daytime Period, 07:00 – 23:00 Hours

Noise control measures may not be required if the Leq (16) daytime sound level in the plane of a bedroom or living/dining room window is less than or equal to 55 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the daytime sound level in the plane of a bedroom or living/dining room window is greater than 65 dBA, installation of central air conditioning should be implemented with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2.

C7.1.2.2 Nighttime Period, 23:00 – 07:00 Hours

Noise control measures may not be required if the Leq (8) nighttime sound level in the plane of a bedroom or living/dining room window is less than or equal to 50 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 50 dBA and less than or equal to 60 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the nighttime sound level in the plane of a bedroom or living/dining room window is greater than 60 dBA, installation of central air conditioning should be implemented, with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2.

Appendix C – Sample Calculations

```
STAMSON 5.0        NORMAL REPORT        Date: 11-09-2020 237:08:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 1sw.te               Time Period: Day/Night 16/8 hours
Description: Lot 1 Side Wall

Rail data, segment # 1: ORDC (day/night)
----------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. ORDC        !   3.0/0.0   !  40.0 !  2.0 ! 12.0 !Diesel!  No

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. ORDC           !   2.0/0.0   !    2.00  !   21.00  !

Data for Segment # 1: ORDC (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 290.00 / 290.00 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: ORDC (day)
-------------------------------

LOCOMOTIVE (0.00 + 35.87 + 0.00) = 35.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.50  56.27 -19.23  -1.17   0.00   0.00   0.00  35.87
-------------------------------------------------------------------

WHEEL (0.00 + 27.31 + 0.00) = 27.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.60  49.25 -20.58  -1.35   0.00   0.00   0.00  27.31
-------------------------------------------------------------------

Segment Leq : 36.44 dBA

Total Leq All Segments: 36.44 dBA

Results segment # 1: ORDC (night)
---------------------------------

LOCOMOTIVE (0.00 + -20.40 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.50   0.00 -19.23  -1.17   0.00   0.00   0.00 -20.40
-------------------------------------------------------------------
```

```
WHEEL (0.00 + -21.94 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60   0.00 -20.58  -1.35   0.00   0.00   0.00 -21.94
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA

Road data, segment # 1: McL (day/night)
---------------------------------------
Car traffic volume  :  8721/969   veh/TimePeriod  *
Medium truck volume :   230/26    veh/TimePeriod  *
Heavy truck volume  :   230/26    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10200
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: McL (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: McL (day)
------------------------------

Source height = 1.26 m

ROAD (0.00 + 63.86 + 0.00) = 63.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  67.80   0.00  -2.62  -1.32   0.00   0.00   0.00  63.86
-------------------------------------------------------------------------------

Segment Leq : 63.86 dBA

Total Leq All Segments: 63.86 dBA

Results segment # 1: McL (night)
--------------------------------

Source height = 1.26 m
```

```
ROAD (0.00 + 57.37 + 0.00) = 57.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  61.31   0.00  -2.62  -1.31   0.00   0.00   0.00  57.37
-------------------------------------------------------------------------------

Segment Leq : 57.37 dBA

Total Leq All Segments: 57.37 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 63.87
                           (NIGHT): 57.37
```

```
STAMSON 5.0        NORMAL REPORT        Date: 11-09-2020 237:08:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 1swwstl.te           Time Period: Day/Night 16/8 hours
Description: Lot 1 Side Wall w Train Whistle


Rail data, segment # 1: ORDC (day/night)
-----------------------------------------
Train            ! Trains      ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             ! (Left)      ! (Right)     !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------------+-------+------+------+------+----
  1. ORDC        !   1.5/0.0   !   1.5/0.0   !  40.0 !  2.0 ! 12.0 !Diesel!  No

Data for Segment # 1: ORDC (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 290.00 / 290.00 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Whistle Angle             :     50 deg   Track 1
Reference angle           :   0.00

Results segment # 1: ORDC (day)
--------------------------------

LOCOMOTIVE (0.00 + 35.87 + 0.00) = 35.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.50  56.27 -19.23  -1.17   0.00   0.00   0.00  35.87
-------------------------------------------------------------------------

WHEEL (0.00 + 27.31 + 0.00) = 27.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60  49.25 -20.58  -1.35   0.00   0.00   0.00  27.31
-------------------------------------------------------------------------

LEFT WHISTLE (0.00 + 43.21 + 0.00) = 43.21 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -11     50   0.50  67.40 -19.23  -4.97   0.00   0.00   0.00  43.21
-------------------------------------------------------------------------

RIGHT WHISTLE (0.00 + 36.87 + 0.00) = 36.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    50     69   0.50  67.40 -19.23 -11.30   0.00   0.00   0.00  36.87
-------------------------------------------------------------------------

Segment Leq : 44.80 dBA

Total Leq All Segments: 44.80 dBA

Results segment # 1: ORDC (night)
----------------------------------
```

```
LOCOMOTIVE (0.00 + -20.40 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.50   0.00 -19.23  -1.17   0.00   0.00   0.00 -20.40
-------------------------------------------------------------------------

WHEEL (0.00 + -21.94 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.60   0.00 -20.58  -1.35   0.00   0.00   0.00 -21.94
-------------------------------------------------------------------------

LEFT WHISTLE (0.00 + 43.21 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -11     50   0.50   0.00 -19.23  -4.97   0.00   0.00   0.00  43.21
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA

Road data, segment # 1: McL (day/night)
---------------------------------------
Car traffic volume  :  8721/969   veh/TimePeriod  *
Medium truck volume :   230/26    veh/TimePeriod  *
Heavy truck volume  :   230/26    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10200
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: McL (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: McL (day)
------------------------------

Source height = 1.26 m

ROAD (0.00 + 63.86 + 0.00) = 63.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  67.80   0.00  -2.62  -1.32   0.00   0.00   0.00  63.86
```

```
--------------------------------------------------------------------------------

Segment Leq : 63.86 dBA

Total Leq All Segments: 63.86 dBA

Results segment # 1: McL (night)
--------------------------------

Source height = 1.26 m

ROAD (0.00 + 57.37 + 0.00) = 57.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -90     90   0.58  61.31   0.00  -2.62  -1.31   0.00   0.00   0.00  57.37
--------------------------------------------------------------------------------

Segment Leq : 57.37 dBA

Total Leq All Segments: 57.37 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 63.91
                           (NIGHT): 57.37
```

```
STAMSON 5.0        NORMAL REPORT        Date: 11-09-2020 237:04:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 1ola1s.te            Time Period: Day/Night 16/8 hours
Description: Lot 1 Rear Yard Unmitigated


Road data, segment # 1: McL (day/night)
----------------------------------------
Car traffic volume  :  8721/969   veh/TimePeriod  *
Medium truck volume :   230/26    veh/TimePeriod  *
Heavy truck volume  :   230/26    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10200
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: McL (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   43.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: McL (day)
------------------------------

Source height = 1.26 m

ROAD (0.00 + 61.76 + 0.00) = 61.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     43   0.66  67.80   0.00  -3.68  -2.35   0.00   0.00   0.00  61.76
-------------------------------------------------------------------------------

Segment Leq : 61.76 dBA

Total Leq All Segments: 61.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.76
```

```
STAMSON 5.0         NORMAL REPORT         Date: 06-12-2020 36:36:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 1ola1s.te             Time Period: Day/Night 16/8 hours
Description: Lot 1 w 2.4 m high Acoustic Fence


Road data, segment # 1: McL (day/night)
---------------------------------------
Car traffic volume  :  8721/969   veh/TimePeriod  *
Medium truck volume :   230/26    veh/TimePeriod  *
Heavy truck volume  :   230/26    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  10200
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   2.50
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: McL (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   43.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 43.00 deg
Barrier height            :   2.40 m
Barrier receiver distance :   7.50 / 7.50   m
Source elevation          : 261.51 m
Receiver elevation        : 261.69 m
Barrier elevation         : 261.59 m
Reference angle           :   0.00

Results segment # 1: McL (day)
------------------------------

Source height = 1.26 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.26 !        1.50 !        1.47 !       263.06

ROAD (0.00 + 54.87 + 0.00) = 54.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     43   0.52  67.80   0.00  -3.38  -2.18   0.00   0.00  -7.36  54.87
-------------------------------------------------------------------------------

Segment Leq : 54.87 dBA

Total Leq All Segments: 54.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.87
```

Appendix D – Draft Noise Attenuation Statement

Noise Attenuation Statement

Subdivision File:	21T-16005C***
Owner:	Caledon Developments #2 LP
Subdivision Name:	Mayfield West 2 – (Brookvalley) Stage 2

1. Noise Attenuation Works

The Subdivision Agreement for the Plan requires the Owner to install the following noise attenuation works on the following lots and blocks:

1.1. An acoustical barrier and associated earth works on:

Lots 1, 47, 105, 106, 147, 148, 161, 162, 238, 239, 273, 274, 284 and 300.

1.2. A ducted heating system sized to accommodate the addition of central air conditioning at a later date in dwellings to be constructed on:

Lots 2, 3, 44 to 46, 101 to 104, 107 to 110, 143 to 146, 275 to 283 and 297 to 299, all units of Blocks 317 to 323 and all units except the east unit of Block 324.

1.3. A ducted heating system sized to accommodate the addition of central air conditioning at a later date in dwellings to be constructed on:

Lots 1, 47, 148, 161, 162, 238, 239, 273, 274, 284 and 300 and the east unit of Block 324.

1.4. Central air conditioning in the dwelling units to be located on:

Lots 105, 106 and 147, all units of Blocks 325 to 328.

The air-cooled condenser unit shall have a sound rating not exceeding 7.6 bels and shall be located so as to have the least possible noise impact on the outdoor activities of the occupants and their neighbours.

2. Restrictive Covenants

The Subdivision Agreement for the Plan requires the Owner to register the following restrictive covenant on title to the following lots and blocks:

2.1. Lands Affected

As specified in Section 1.1 of this statement

Restrictive Covenant

1. "The lands to which these restrictions shall be annexed hereinafter are sometimes referred to as "the lands"."

2. "The owner(s) from time to time of each lot or block included within the lands covenants and agrees to not alter or remove the original material or colour of the acoustical wall or alter the original grades within 2.0 metres of the wall unless authorized in writing from the Town of Caledon or as required pursuant to the following covenant."

3. The owner(s) from time to time of each lot or block included within the lands covenants and agrees to not allow the acoustical wall to fall into disrepair, and to repair, and replace at their own expense, all acoustical walls as necessary to maintain them in their original condition. Any repairs and replacements shall be made to the same standard and using the same materials and colours as the original acoustical wall."

4. "To the intent that benefit of these covenants may be annexed to and run with the lands, each purchaser or transferee of each lot or block within the lands, from time to time by accepting or registering a transfer or other document or entitlement of ownership, use and/or possession of any part of the lands, covenants and agrees on behalf of themselves, their heirs, assigns, executors, administrators, successors and assigns to strictly, keep, observe, perform and comply with the covenants, restrictions, and provisions herein.

3. Warning Clauses

The Subdivision Agreement for the Plan requires the Owner to attach a copy of the following warning clauses to all agreements of purchase and sale for the following lots or blocks, or deliver a copy of these warning clauses to the purchaser of the following lots or blocks prior to completion of their agreements of purchase and sale:

3.1. Lands Affected

As specified in Section 1.2

Warning Clause

"Purchasers/tenants are advised that despite the inclusion of noise control features in this development area and within the building units, noise due to increasing road traffic may on occasions interfere with some activities of the occupants as the sound levels may exceed the noise criteria of the Ontario Ministry of the Environment, Conservation and Parks."

3.2. Lands Affected

As specified in Sections 1.3 and 1.4

Warning Clause

"Purchasers/tenants are advised that despite the inclusion of noise control features in this development area and within the building units, noise due to increasing road traffic will on occasions interfere with some activities of the occupants as the sound levels may exceed the noise criteria of the Ontario Ministry of the Environment, Conservation and Parks."

3.3. Lands Affected

As specified in Section 1.1

Warning Clause

"Purchasers/tenants are advised that the acoustical berm and/or barrier as installed, shall be maintained or repaired by the owner. Any maintenance, repair or replacement shall be with the same material, or to the same standards, and having the same colour and appearance of the original."

3.4. Lands Affected

As specified in Sections 1.2 and 1.3

Warning Clause

"Purchasers/tenants are advised that this dwelling unit has been fitted with provisions, which include a fan forced heating system, suitably sized ducts, plenum, electrical power wiring, thermostatic control wiring, a nearby floor drain, etc. sized to accommodate the future addition of central air conditioning by the occupant at their expense and discretion. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks. Future installation of the air-cooled condenser unit shall have a sound rating not exceeding 7.6 bels and shall be located so as to have the least possible noise impact on the outdoor activities of the occupants and their neighbours.

3.5. Lands Affected

As specified in Section 1.4

Warning Clause

"Purchasers/tenants are advised that this dwelling unit has been supplied with a central air conditioning system which will allow the windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound

level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

3.6. Lands Affected

Lots 1 to 4 and all units of Block 317

Warning Clause

"WARNING: the Orangeville-Brampton Railway operates a railway right-of-way within 300 metres of these lands. There may be alterations to or expansions of railway facilities or operations in the future. This expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration control attenuating measures in the design of the development and individual dwellings. The Orangeville-Brampton Railway or the Town of Orangeville will not be responsible for any complaints or claims arising from the use of, or noise generated from, such facilities and/or operations on, over or under the rail right-of-way."

Caledon Developments #2 LP

_____
Name of Signatory
I/We have Authority to bind the Corporation

APPROVED BY THE CORPORATION OF THE TOWN OF CALEDON

_____
Rob Hughes, Manager of Development – West
Town of Caledon

Glossary

bel – one bel is 10 decibels

dBA – The A-weighted sound level in decibels as commonly written. It is technically correct (but less common) to use LA = x dB.

dBAI – The A-weighted impulsive sound level. It is technically correct (although less common) to use LAI = x dB.

Daytime – Includes the time from 07:00 to 23:00 as per the MECP.

Decibel (dB) – A logarithmic number used to express the ratio between a level and a reference level

A-Weighting – A weighting network designed to be similar to the response of humans at low sound levels. Actinium Engineering follows the standard practice of using A-weighted sound levels regardless of sound level.

C-Weighting – A weighting network designed for higher sound levels than A-weighting. It can also be used to determine if the potential for a low-frequency noise problem exists by comparing the A and C weighted sound levels.

Equivalent Sound Level (Leq_{time}) – The energy-averaged sound level. The Leq is the constant sound level that would contain the same energy as the varying sound level during the analyzed time period.

Hertz (Hz) – The frequency of a sound (or centre frequency of a band). One hertz equals one cycle per second.

Impulsive Sound – A single or multiple sound pressure peak(s) with a rise time less than 200 ms and a total duration less than 200 ms.

Nighttime – Includes the time from 23:00 until 07:00.

Noise Exposure Forecast/Prediction (NEF/NEP) – Calculated values used to predict the impact of planes using an aerodrome on surrounding lands. NEF/NEP represent five/ten years in the future respectively. In practise, they are composited and the higher of the NEF/NEP is used to create the contour lines applicable to the aerodrome. Leq_{24} is approximately NEF/NEP +32.

Octave – a range of frequencies whose upper frequency limit is twice that of its lower frequency limit. Also commonly divided into 1/3 octave bands to better characterize sources.

Root Mean Square (RMS) – Obtained by squaring the amplitude of the sound (or vibration) at each instant, calculating the average of these values and then taking the square root of this average.

Sound – Any pressure variation that the human ear can detect. Typically considered to be between 20 Hz and 20 KHz. In air sound propagates at 343 m/s.

Sound Level – See Sound Pressure Level

Sound Power Level (PWL or Lw) – Expressed in decibels as 10 times the logarithm of the ratio of the sound power and a reference power. The standard reference power of 1 pW is used by Actinium Engineering for all projects.

Sound Pressure – The difference between the pressure produced by a sound wave and the ambient pressure.

Sound Pressure Level (SPL or L) – Expressed in decibels as 20 times the logarithm of the ratio of the sound pressure and a reference pressure. The standard reference pressure of 20 µPa (the typical threshold of hearing) is used by Actinium Engineering for all projects.

Sound Transmission Class (STC) – An integer rating of how well a partition attenuates airborne sound. See ASTM E413 for further information.

Vibration –Motion of a body or particles.

Vibration Acceleration Level (La) - Expressed in decibels as 20 times the logarithm of the ratio of the acceleration of interest and a reference acceleration. The standard reference acceleration of 1 $\mu m/s^2$ is used by Actinium Engineering for all projects.

Vibration Velocity Level (Lv)- Expressed in decibels as 20 times the logarithm of the ratio of the vibration velocity and a reference velocity. The standard reference velocity of 1 nm/s is used by Actinium Engineering for all projects.

Peak Particle Velocity (PPV) – The maximum speed of a particle as it is moved by a passing wave.

Z-Weighting – Zero frequency weighting as per ISO 61672. In encompasses the range from 10 Hz to 20 kHz ± 1.5 dB. This has replaced the weightings previously known as flat or linear.