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REPORT

Noise Impact Study

Municipal Class EA for the Proposed Coleraine Drive Grade Separation, South of Old Ellwood Drive, Town of Caledon

Region of Peel Project 16-439

Submitted to:

CIMA+

3027 Harvester Road, Suite 400
Burlington, ON
L7N 3G7

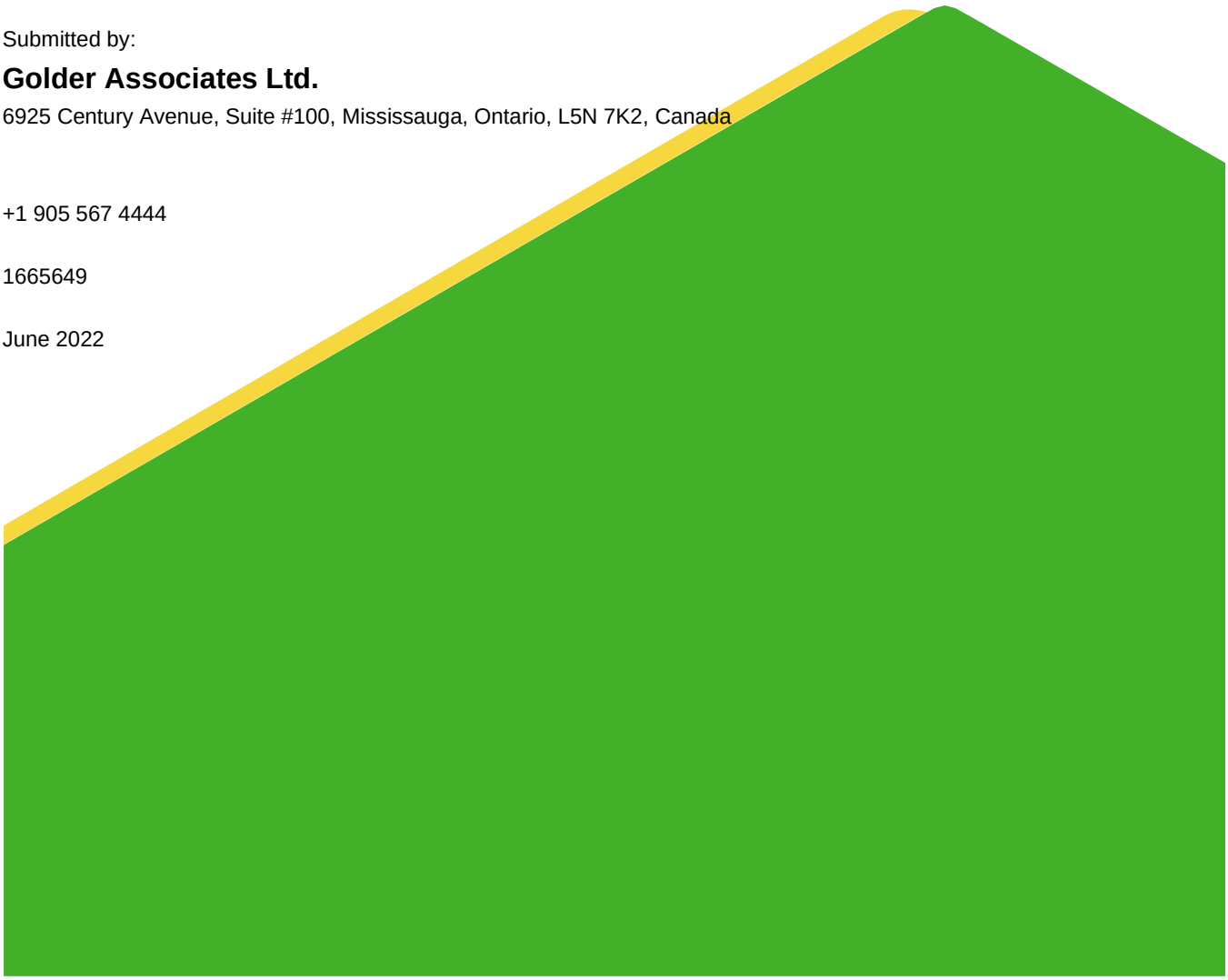
Submitted by:

Golder Associates Ltd.
6925 Century Avenue, Suite #100, Mississauga, Ontario, L5N 7K2, Canada

+1 905 567 4444

1665649

June 2022



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IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Standard of Care

Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report

This report was prepared for the exclusive use of CIMA+ (the Client) and, once finalised, are intended to fulfil the Regional Municipality of Peel (Region of Peel) requirements in support of the environmental assessment. The report is based on review of the project design (the Project), discussions with the Client, review of documentation provided by Client and calculations made to identify potential noise impacts due to the Project. The reports cannot account for changes to the Project after it has been finalised and submitted by Client to the Region of Peel. The information, recommendations and opinions expressed in this report are for the sole benefit of the Client and the applicable regulatory authorities that are authorized to rely on the report as Authorized Users, subject to the limitations and purposes described herein. No other party may use or rely on this report or any portion thereof without Golder's express written consent. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client and any Authorized Users can not rely upon the electronic media versions of Golder's report or other work products unless it was directly provided by Golder.

When evaluating the Project and developing this report, Golder has relied on information provided by Client, the regulatory authorities, and others. Golder has acted in good faith and accepts no responsibility for any deficiencies, misstatements, or inaccuracies contained in this report resulting from omissions, misinterpretations or falsifications by those who provided Golder with information.

While ensuring that the report was prepared in general conformance with regulatory and guideline requirements, Golder cannot guarantee that the Region of Peel will approve the environmental assessment once the final report has been submitted.

Physical sampling of atmospheric emission sources was not completed as part of the scope of work.

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by CIMA+ (CIMA) to complete a Noise Impact Study (NIS) as supporting documentation for the Municipal Class Environmental Assessment (EA) for Coleraine Drive grade separation, south of Old Ellwood Drive, in the Town of Caledon, Ontario (the Project). As part of this EA, this NIS has been prepared to assess the potential noise impact of the Project.

This NIS provides a summary of the noise impact assessment for the Project on the identified neighbouring sensitive receptors. In addition, the NIS also identifies the applicable municipal noise by-law, describes a noise complaint process for construction activities, and provides a general discussion regarding noise arising from construction activities.

This NIS summarizes the analysis of the potential noise impacts of the Project on the existing acoustical environment, in accordance with the Ontario Ministry of Environment, Conservation and Parks (MECP (formally the MOE)) and Ministry of Transportation (MTO) document '*A Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highways Environmental Assessments'* (MECP/MTO Noise Protocol) and supplemented accordingly with the MTO's *Environmental Guide for Noise* (MTO Noise Guide). Additional guidance was taken from the Region's *Corporate Policy W30-04 Noise Attenuation Barriers* (the Region's Noise Policy).

2.0 PROJECT DESCRIPTION

It is understood that a Scehdule ‘C’ Municipal Class Environmental Assessment (EA) was completed for an approximately 1.0 kilometre (km) section of Coleraine Drive between Harvest Moon Drive/King Street West and Holland Drive, in the Town of Caledon, Ontario (Project Site) that includes a Canadian Pacific (CP) rail crossing.

2.1 Existing Conditions

The existing Coleraine Drive is an arterial road with four through lanes and a center turning lane. The CP Rail traverses Coleraine Drive south of Old Ellwood Drive. Residential developments are located to the north of the CP Rail while industrial/commercial developments are located to the south.

The posted speed limit is 60 km/hr and the 2017 Annual Average Daily Traffic (AADT) count for Coleraine Drive is 7,054 northbound and 6,511 southbound within the Project Site.

2.2 Proposed Future Conditions

For the purposes of the NIS, it is understood the future proposed condition (i.e., 10 years after completion of construction or ultimate traffic) is for the year 2041 and includes a grade separation of Coleraine Drive. The posted speed limit will remain at 60 km/hr and the 2041 AADT is 23,213 for Coleraine Drive within the Project Site. It is Golder’s understanding that the future traffic volumes are established on future population growth and not the roadway design itself. For the purposes of the NIS, only existing sensitive land uses in the vicinity of the Project Site were evaluated.

The details of the grade separation structure are not available at this time and both; overhead (a structure carrying a road over a railway) and subway (a structure carrying a railway over a road) options are being considered. It is understood that the road over rail option is preferred method, however both are assessed in this NIS.

3.0 DESCRIPTION OF TECHNICAL TERMS

To help understand the analysis and recommendations made in this report, the following is a brief discussion of technical noise terms.

Sound pressure level is expressed on a logarithmic scale in units of decibels (dB). Since the scale is logarithmic, a sound that is twice the sound pressure level as another will be three decibels (3 dB) higher.

The noise data and analysis in this report have been given in terms of frequency distribution. The levels are grouped into octave bands. Typically, the centre frequencies for each octave band are 31.5, 63, 125, 250, 500, 1000, 2000, 4000 and 8000 Hertz (Hz). The human ear responds to the pressure variations in the atmosphere that reach the ear drum. These pressure variations are composed of different frequencies that give each sound we hear its unique character.

It is common practice to sum sound levels over the entire audible spectrum (i.e., 20 Hz to 20 kHz) to give an overall sound level. However, to approximate the hearing response of humans, each octave band measured has a weighting applied to it. The resulting “A-weighted” sound level is often used as a criterion to indicate a maximum allowable sound level. In general, low frequencies are weighted higher, as human hearing is less sensitive to low frequency sound.

Environmental noise levels vary over time, and are described using an overall sound level as the L_{eq}, or energy averaged sound level. The L_{eq} is the equivalent continuous sound level, which in a stated time, and at a stated location, has the same energy as the time varying noise level. It is common practice to measure L_{eq} sound levels in order to obtain a representative average sound level.

4.0 RELEVANT GUIDELINES AND POLICIES

The following guidance documents and policies can be applicable for providing criteria and additional guidance for the assessment of noise from road traffic for this Project. These documents and their relevance to the NIS are summarized in Table 1 below, followed by a cursory review of each document. These documents are provided in Appendix A.

Table 1: Applicable Guidance Documents

Governing Body	Guidance Document	Intended Use
Ontario Ministry of Environment / Ontario Ministry of Transportation	A Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highways Environmental Assessments (MECP/MTO Noise Protocol). February 1986.	Roadways
Region of Peel	Corporate Policy W30-04 Noise Attenuation Barriers (Region's Noise Policy). June 1996.	Roadways
Ontario Ministry of Transportation	Environmental Guide for Noise (MTO Noise Guide). October 2006.	Roadways

4.1 MECP/MTO Noise Protocol

The MECP/MTO Noise Protocol provides requirements for noise mitigation relating to the construction of new or the expansion of existing roadways in Ontario. Noise assessments typically consider average noise levels over a given averaging period. An averaging period is not clearly stated in the MECP/MTO Noise Protocol but is generally considered over the daytime period. Other guidance documents (i.e., the Region's Noise Policy and the MTO Noise Guide) use a 16-hour daytime average between 07:00 and 23:00. The MECP/MTO Noise Protocol states that the objective for outdoor sound levels is either 55 dBA or the existing ambient. If noise increases above ambient by more than 5 dBA, mitigation should be investigated. Mitigation should be considered along the ROW and should achieve a minimum of 5 dBA of attenuation, if administratively, economically, and technically feasible.

According to the MECP/MTO Noise Protocol, future traffic conditions are to be analyzed based on 10-year traffic projections after the completion of construction. As described in Section 2.2, a future horizon year of 2041 has been considered representative of 10 years post-construction.

4.2 Region of Peel's Noise Policy

The Region's Noise Policy states that candidate homes for noise attenuation measures include dwellings with Outdoor Living Areas (OLA)s that experience a daytime (07:00 to 23:00) noise level of 60 dBA or higher. Mitigation will only be considered where rear yards or side yards abut a municipal road.

A combination of the MECP/MTO Noise Protocol and the Region's Noise Policy has been applied as the assessment criteria for noise sensitive uses for the Project. Table 2 below summarizes the criterion considered for noise mitigation in this NIS.

Table 2: MECP/MTO Noise Protocol and Region's Noise Policy Criteria Considered for Mitigation

Predicted Conditions [a, b, c]	Mitigation Effort Required
▪ ≤ 55 dBA future with the Project OR ▪ ≤ 5 dB increase due to the Project and ▪ < 60 dBA future with the Project.	▪ None.
▪ > 55 dBA future with the Project and > 5 dB increase due to the Project. OR ▪ ≥ 60 dBA future with the Project.	▪ Introduce noise control measures along the property line of the ultimate ROW, immediately adjacent to the road or private property if necessary, where technically and economically appropriate. ▪ Noise control measures, where introduced, should achieve a minimum of 5 dB attenuation, in the outdoor living areas of affected properties.

(a) Values represent average levels established over the daytime period (07:00 to 23:00).

(b) Calculated noise levels based on projected future traffic counts for 10 years post-construction.

(c) Future noise levels with the Project compared with future noise levels without the Project to determine change due to the Project

4.3 MTO's Environmental Guide for Noise

The MTO's Environmental Guide for Noise (MTO Noise Guide) provides requirements for noise assessments and mitigation relating to the construction of new or the expansion of existing Provincial Highways. The MTO Noise Guide updates, improves, and supersedes the MOE/MTO Noise Protocol and the *MTO Quality and Standards Directive A-1 - Noise Policy and Acoustical Standards for Provincial Highways*. The requirements for noise assessments have been summarized into the following two Environmental Protection Requirement(s) (EPR(s)) for noise according to the *MTO Environmental Protection Requirements Section 6*:

NOISE-1 *During design of a new or modified highway, a noise assessment by a qualified acoustical specialist is required for the Most Exposed Side and the OLAs of Noise Sensitive Areas. As an initial screening, future sound levels shall be assessed with and without the proposed improvements for the Most Exposed Side. The objective for outdoor sound levels is to achieve the future predicted ambient that would occur without the proposed highway. The significance of a noise impact will be quantified by using this objective in addition to the change in sound level above the ambient (i.e., the future sound level without the proposed improvements is compared to the future sound level with the proposed improvement).*

The determination of the provision of mitigation is based on the analysis of the predicted noise level at the OLAs.

Table 3, which is a copy of Table 2.1 of the MTO Noise Guide, summarizes the criteria for the requirement of noise mitigation efforts:

Table 3: MTO Noise Guide - Mitigation Effort Required for the Projected Noise Level with the Proposed Improvements

Change in Noise Level Above Ambient / Projected Noise Levels with Proposed Improvements	Mitigation Effort Required
▪ <5 dBA change & <65 dBA	▪ None
▪ ≥ 5 dBA change OR ▪ ≥ 65 dBA	▪ Investigate noise control measures on right-of-way. ▪ Introduce noise control measures within right-of-way and mitigate to ambient if technically, economically and administratively feasible. ▪ Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers.

NOISE-2 *Highway construction shall be undertaken in a manner to minimize noise levels and identify a process for dealing with public complaints during construction. Pile driving and blasting operations shall be in accordance with Ontario Provincial Standard Specifications (OPSS 120) and Ministry of the Environment Publication NPC-119.*

As described in the MTO Noise Guide, a noise analysis is carried out as follows during the Transportation Planning stage to meet EPR Noise-1:

- identification of the area of investigation;
- identification of noise sensitive areas;
- determination of future ambient noise levels (i.e., without the Project);
- determination of future noise levels with the undertaking (i.e., with the Project);
- determination of potential impact;
- determination of significance;
- assessment of mitigation; and
- summarize the noise analysis in a noise report.

5.0 METHODOLOGY

The following methodology was carried out to assess the potential noise impacts due to the Project proposed roadway improvements;

- identification of the Area of Investigation;
- identification of Noise Sensitive Areas (NSAs);
- determination of existing ambient noise levels without the Project;
- determination of future ambient noise levels (i.e., without the Project);
- determination of future noise levels with the undertaking (i.e., with the Project);
- determination of potential impact;
- determination of significance; and
- assessment of mitigation.

In addition, a qualitative assessment of the construction phase was completed, identifying the applicable municipal noise by-law, describing a noise complaint process for construction activities, and provide a general discussion regarding noise arising from construction activities.

5.1 Area of Investigation

The Area of Investigation defines an area surrounding the Project where potential noise effects are assessed at sensitive receptor locations. For the NIS, sensitive receptors up to 600 m from the edge of the Project Site were identified. Figure 1 illustrates the Area of Investigation.

5.2 Noise Sensitive Areas

In assessing potential noise effects, Noise Sensitive Areas (NSAs) and respective OLAs (i.e., receiver locations) were identified within the Area of Investigation and in accordance with the MTO Noise Guide and/or Region of Peel's guidance documents as further described below.

The MTO Noise Guide defines NSA(s) as one of the following land uses, with an OLA associated with them:

- private homes such as single-family residences (owned or rental);
- townhouses (owned or rental);
- multiple unit buildings, such as apartments with OLAs for use by all occupants; and
- hospitals, nursing homes for the aged, where there are OLAs for the patients.

Where a new freeway/highway corridor or route is planned, the following land uses would quality as NSAs, provided they have OLAs, in addition to the land uses noted above;

- education facilities and day care centres;
- campgrounds that provide overnight accommodation; and
- Hotels/motels with OLAs (i.e. swimming pool area, etc.) for visitors.

Land uses by themselves that do not qualify as NSAs include the following:

- apartment balconies above ground floor;
- churches;
- cemeteries;
- parks and picnic areas which are not inherently part of a NSA;
- all commercial; and
- all industrial.

The MTO Noise Guide defines the receiver location at 1.2. m above ground, at a distance of 3 m away from the dwelling unit at the most exposed side. A receiver height of 1.5 m was conservatively considered in accordance with MECP and Region of Peel requirements.

The Region of Peel's Noise Barrier Policy and Private Noise Attenuation Walls Conversion Policy focuses on existing residences. The Region of Peel's Acoustical Report Guideline identifies the height of a receiver location to be 1.5 m above the ground at a point located 3.0 m from the real wall of the dwelling unit. This guideline is not explicit which side of the dwelling unit is to be assessed, but it is implied the rear or side lot abutting Regional roads shall be considered.

For the purposes of the NIS, OLAs (i.e., receiver location) were assessed at a height of 1.5 m and 3 m from the rear and/or side building façade.

5.2.1 Noise Sensitive Areas Identification

NSAs were selected that were representative of the acoustic environment within the Area of Investigation and the potential impact due to the Project.

As discussed in Section 2.2, for the purposes of the NIS, only existing sensitive land uses were evaluated with the understanding that project-specific noise studies would be prepared in support of all future developments, and they will include the potential noise impacts due to the Project. Consequently, two (2) NSAs were identified within the Area of Investigation, as shown in Figure 2.

Using orthoimagery, OLAs were identified for the dwellings within each NSA that are anticipated to be the most highly impacted due to the Project. Then a representative OLA for each dwelling, which corresponds to the OLA with the maximum noise level for each dwelling, was carried forward and discussed in the results section (Section 6.0). A total of six (6) OLAs were identified. The identified OLAs considered in this assessment are shown in Figure 2.

5.3 Traffic Volumes

The existing and future noise levels were established using total traffic volumes provided by CIMA as AADT values for both 2017 and 2041. The percentage breakdown of heavy and medium trucks was based on typical percentages of commercial vehicles and typical composition of commercial vehicles on urban highways (AASHTO 2008). The daytime and nighttime period percentage were assumed based on the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) Technical Document (MECP 1989). Traffic data is presented in Appendix B. Table 4 provides the summary of traffic volumes for the roadways considered.

The following assumptions regarding traffic volumes were considered when conducting the noise prediction modelling:

- the 2041 AADTs are applicable for the prediction of future noise levels (i.e., 10 years after completion of construction or ultimate traffic) with and without the Project;

Table 4: Traffic Data Summary

Roadway	AADT (2017)	AADT (2041)	% Commercial	Truck % (Medium/Heavy)	Time of Day % (Daytime/Nighttime)[1]	Speed Limit (km/h)
Coleraine Drive	13,656	25,213	19	12 / 7	90 / 10	60
Old Ellwood Drive	- [2]	10,830	3	3 / 0	90 / 10	60

Note:
1: Daytime (16 Hours) – 07:00 to 23:00. Nighttime (8 Hours) – 23:00 to 07:00.
2: Traffic data was not provided for 2017

5.4 Noise Prediction Modelling

As required by the MTO and MECP guides, Golder used the approved ORNAMENT prediction methodology and the commercially available software package Cadna/A V 2020 to predict the proposed future conditions at the selected OLAs.

All predictions were carried out for the daytime (07:00 to 23:00), which represents a 16 hour equivalent sound level and is consistent with the MTO Noise Guide and the Region of Peel's Noise Barrier Policy. Noise predictions were undertaken for three time frames: 1) future (2041) without the Project , 2) future (2041) with grade separation (road over rail) and 3) future (2041) with grade separation (rail over road). If the future noise levels are greater than 60 dBA or an increase in future noise levels greater than 5 dB were predicted at the OLA, investigation of mitigation was carried out.

In addition to including traffic volumes and respective traffic breakdowns for the relevant roadways, the following additional inputs were considered for modelling:

- angle of exposure from the roadway to the OLA;
- perpendicular distance between the roadway and the OLA;
- topography changes between the roadway and the OLA;
- pavement type of "average" acoustic absorption for the roadway;
- type of surface between the roadway and the OLA (i.e., hard versus soft ground);
- road grades;
- relative source and OLA heights; and
- posted speed limits.

The OLAs and topography changes between the roadway and OLA have been assumed to not change outside the Project Site for all three scenarios assessed. However, grade separation topographical details were considered in the modelling. Features of the Project design, including a median jersey barrier and curbs separating the vehicle lanes and the multi-use trails for the road over rail scenario as shown in Figure 3, were also considered in the modelling.

Following a conservative approach, the prediction modelling did not consider potential attenuation due to the presence of any woodlots, but shielding from each OLAs' associated dwelling or existing acoustic fencing between the roadway and an OLA (shown in Figure 3) was considered, if applicable.

Furthermore, the NIS considers traffic to be predominantly free-flowing along the Project roadways and does not include specific inputs for vehicles accelerating or decelerating. A more comprehensive assessment approach can be used at the detailed design stage, which can include certain acoustic effects of traffic flow controls.

6.0 RESULTS

Following the methodology described in Section 5.0, noise prediction modelling was completed using the Cadna/A model calibrated to the ORNAMENT prediction model. Table 5 summarizes the potential noise impact results at the identified representative OLAs.

Table 5: Summary of Predicted Road Traffic Noise Levels (L_{eq}, 16 hours)

OLA ID	Predicted Daytime Outdoor Noise Level (dBA) for 2041 Without the Project	Predicted Daytime Outdoor Noise Level (dBA) for 2041 with the Project – Rail over Road	Predicted Daytime Outdoor Noise Level (dBA) for 2041 with the Project – Road over Rail
OLA01	54	48	57
OLA02	59	53	55
OLA03	59	51	56
OLA04	59	56	56
OLA05	56	54	58
OLA06	59	56	58

The results in Table 5 indicate that noise levels due to the rail over road alternative are expected to be similar-to or lower than the road over rail alternative. However, neither of the alternatives require mitigation beyond the current Project design based on the criteria presented in Section 4. Therefore, the options are acoustically similar as it relates to road traffic noise and there is not a strong preferred alternative. The road over rail scenario is expected to provide additional shielding from the rail activities at the OLAs when compared to the rail over road scenario. It is important to note that the rail over road design introduces a specific risk with potential “tunneling effect” of the road traffic noise, and similar potential effects of rail traffic noise for the road over rail scenario when rail traffic is in the area. This will need to be considered in the detailed design as to not introduce a design which starts creating strong reflections. Improvements to existing acoustic fencing is not expected to be required due to the Project.

7.0 CONSTRUCTION NOISE ASSESSMENT

The construction phase of any project is typically considered temporary or short term relative to the entire life cycle of a project. The following is a summary of the items to be considered relating to construction noise according to the MTO Noise Guide.

7.1 Construction Equipment and Activities

As construction noise could impact receptors in the vicinity of the Project Site, some general recommendations to assist in minimizing noise impacts due to the Project's construction equipment and activities are provided below:

- All construction equipment should be properly maintained according to manufacturer's recommendations and be in accordance MECP Model Municipal Noise Control by-law (i.e., NPC-115, etc.).
- If any of the construction activities involve Piling or Blasting, they will need to be carried out in accordance with OPSS 120 and MECP NPC-119.
- Construction equipment and/or activities typically known to be of annoyance (e.g., piling) should consider some of the following:
  - limit operating time within the daytime period when ambient noise levels are expected to be higher;
  - maintain an acceptable setback distance from the identified nearby NSAs;
  - carry out additional noise studies or monitoring program to verify and document noise levels;
  - implement temporary acoustic barriers or other localized noise mitigation measures;
  - investigate other alternative construction equipment or processes to complete the task.

7.2 Noise Complaints Process

A process for dealing with noise complaints during the construction phase is recommended. Noise complaints are usually received directly from the complainant or a municipal by-law officer. Note that compliance with noise guidelines or regulations does not ensure noise complaints will not occur. The following is a general recommended process dealing with noise complaints based on Golder's past project experiences:

- Identify an individual or group on the Project (i.e., Site Supervisor, Health and Safety representative, etc.) to handle the noise complaints and someone that can be easily contacted.
- Document the noise complaint. Include the date, time and the individual's contact information from whom the noise complaint was received. Specific information such as the location, duration, time and type of sound heard (i.e., steady, impulsive, etc.) should be included as it will assist in the investigation process. Be aware of any time constraints put in place by the municipality for the noise complaint to be addressed.
- Investigate the noise complaint and identify the source of the noise complaint. Document the investigation.
- If the noise complaint is justified, in that excessive noise levels were generated, minimize or eliminate the source of the noise complaint. Document the action taken.
- Follow up with the complainant and provide the results of the noise complaint investigation.

7.3 Applicable By-Laws

Golder reviewed applicable by-laws to investigate the requirements for a noise by-law exemption for proposed Project activities. Generally, each regulating jurisdiction has a by-law dealing with noise, with often slightly differing by-law requirements. The jurisdiction with by-law authority in the vicinity of the Project is the Town of Caledon.

Through an initial review of the Town of Caledon By-law No. 86-110 (Town of Caledon Noise By-Law), construction projects are subject to a noise curfew between the hours of 23:00 and 06:00. One may apply and seek approval for a noise by-law exemption for construction equipment. Further discussion between the Town of Caledon and relevant parties regarding noise by-law exemptions may be required.

8.0 CONCLUSIONS

This NIS provides a summary of the noise impact assessment for the Project on the neighbouring sensitive receptors and identifies: the applicable municipal noise by-law, describes a noise complaint process for construction activities, and provides a general discussion regarding noise arising from construction activities.

Based on the Noise Impact Study carried out by Golder Associates Ltd. for CIMA+, the following conclusions were determined:

- The Region of Peel's Noise Barrier Policy noise level limit criterion of 60 dBA was met at all identified representative OLAs when considering future traffic volumes with the Project, for both alternatives (rail over road and road over rail) when considering the current Project design. It is understood that road over rail is the preferred option.
- An outline regarding construction noise, a noise complaint process and the applicable noise by-law during the construction phase of the Project has been provided. Based on a review of available information, an exemption from the applicable by-law may be required.

9.0 REFERENCES

The Corporation of the Town of Caledon. (August 1986). By Law No. 86-110.

Ontario Ministry of the Environment, Conservation and Parks. (October 1989). Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) Technical Document.

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Region of Peel (October 2016). Noise Attenuation Barriers Policy No. W30-04 - Private Noise Attenuation Walls Conversion Policy.

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

Signature Page

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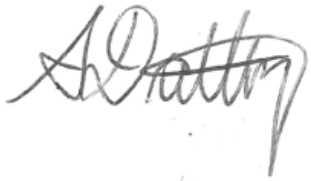

Shira Daltrop, M.A.Sc.
Noise Specialist

Joe Tomaselli, M. Eng., P. Eng.
Associate/Acoustics, Noise and Vibration Engineer

MA/SD/JT/ng

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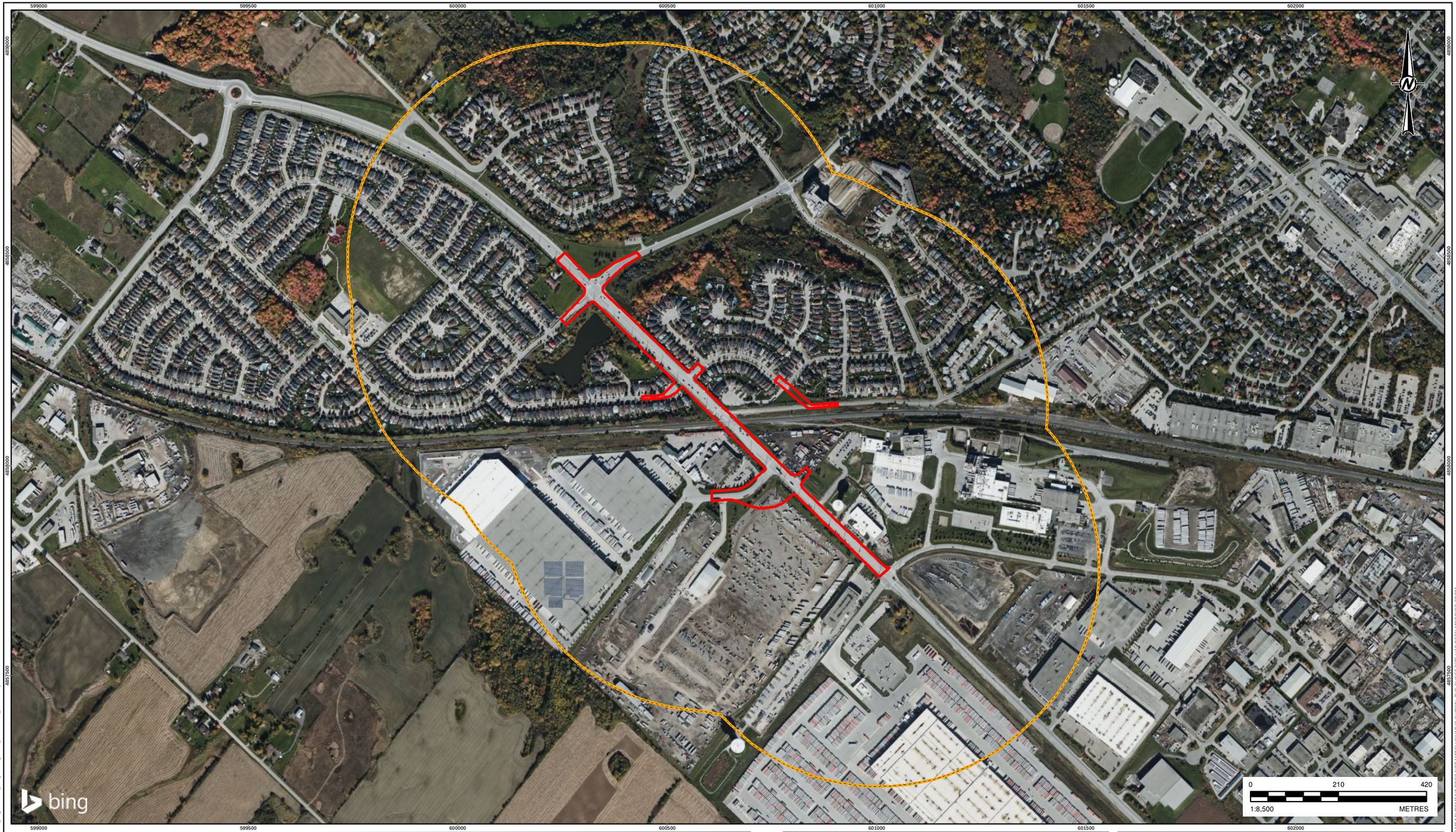
FIGURES



LEGEND

- 500m Buffer of Project Area
- Project Area

REFERENCES

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PROJECT
MUNICIPAL CLASS EA FOR THE PROPOSED COLERAINE DRIVE GRADE SEPARATION, SOUTH OF OLD ELLWOOD DRIVE, TOWN OF CALEDON – NOISE IMPACT STUDY

TITLE
SITE LOCATION

PROJECT NO.	PHASE	REV.	FIGURE
1665649	0	A	**1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
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600500

601000

4885000

TERRASTONE COURT

BOLTONVIEW CRESCENT

COUNTRY STROLL CRESCENT

TRY STROLL CRESCENT

NATUREWAY COURT

NSA01

ELLWOOD DRIVE WEST

WAKELY BOULEVARD

PINEVIEW CRESCENT

OLA006

OLA004

NSA02

JACK KENNY COURT

OLA005

OLA003

COLERAINE DRIVE

OLA002

GRAPEVINE ROAD

AIDA COURT

PINEVIEW CRESCENT

OLA001

OLD ELLWOOD DRIVE WEST

MANCHESTER COURT

bing

0 50 100

1:2,000 METRES

600500

601000

4884000

LEGEND

- Outdoor Living Area
- Project Area
- Building Location

REFERENCES

BASEDATA - MNRF LIO, OBTAINED 2020
PRODUCED BY GOLDER ASSOCIATES LTD UNDER LICENCE FROM
ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
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COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT
CIMA +

CONSULTANT
GOLDER

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APPROVED	-

PROJECT
MUNICIPAL CLASS EA FOR THE PROPOSED COLERAINE DRIVE GRADE SEPARATION, SOUTH OF OLD ELLWOOD DRIVE, TOWN OF CALEDON – NOISE IMPACT STUDY

TITLE
NOISE SENSITIVE AREAS AND OUTDOOR LIVING AREAS

PROJECT NO.	PHASE	REV.	FIGURE
1665649	0	A	**2**

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
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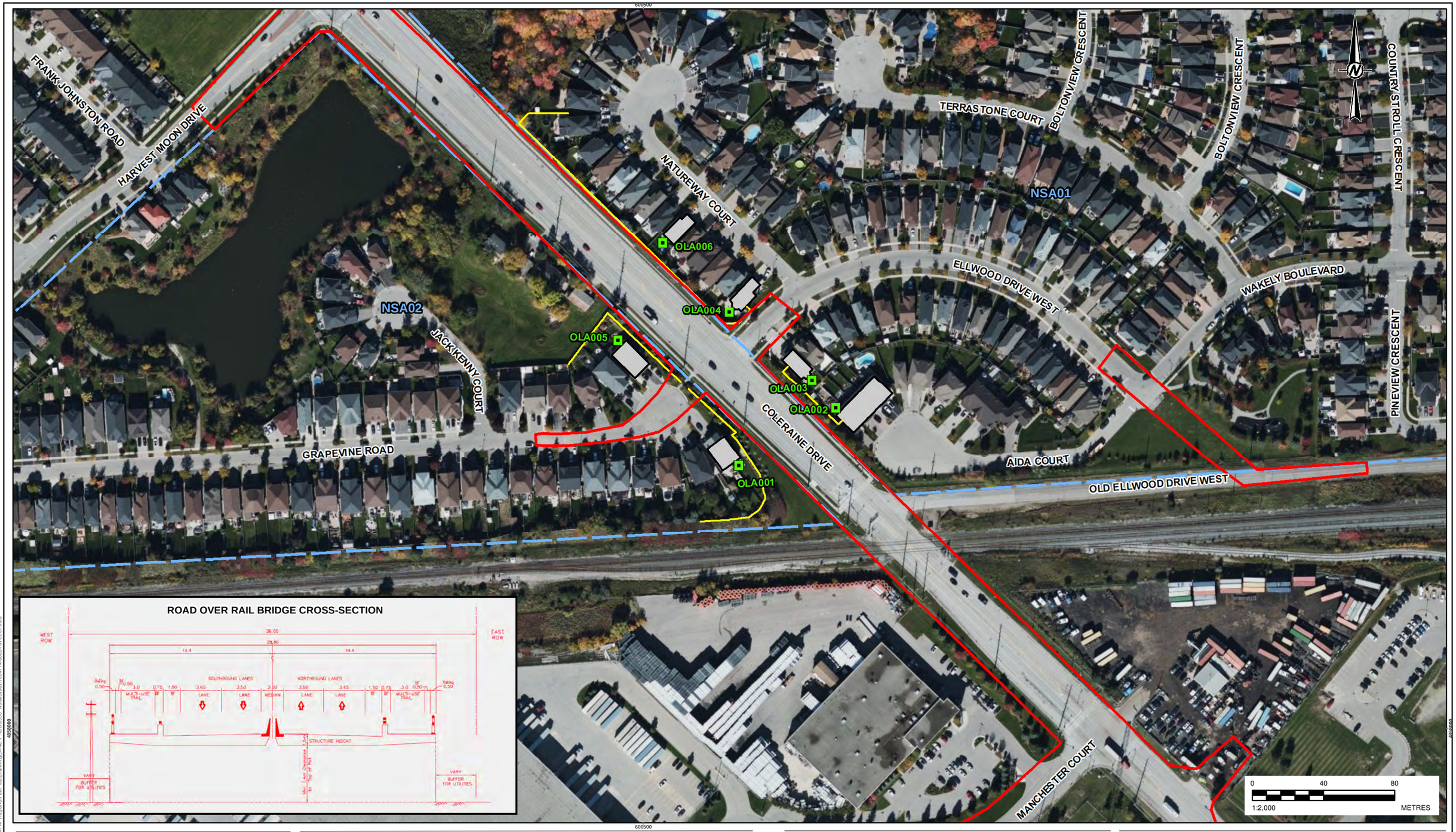

ROAD OVER RAIL BRIDGE CROSS-SECTION

LEGEND

- OUTDOOR LIVING AREA
- PROJECT AREA
- EXISTING ACOUSTIC FENCING
- BUILDING LOCATION

REFERENCES

BASEDATA - MNRF LIO, OBTAINED 2020
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COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983

CLIENT
CIMA +

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-19
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REVIEW	MA
APPROVED	-

PROJECT
MUNICIPAL CLASS EA FOR THE PROPOSED COLERAINE DRIVE GRADE SEPARATION, SOUTH OF OLD ELLWOOD DRIVE, TOWN OF CALEDON – NOISE IMPACT STUDY

TITLE
PROJECT SITE LAYOUT

PROJECT NO.	PHASE	REV.	FIGURE
1665649	0	A	**3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
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APPENDIX A

Relevant Guidelines and Policies

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

A. PURPOSE

On September 10, 2015, under Resolution 2015-663, Regional Council endorsed a program to rebuild and relocate private noise attenuation walls adjacent to Regional roads on the property line bounding the Regional Road. This program was approved to be funded in full by the Region of Peel.

The policy provides a fair and consistent approach for the conversion of existing noise attenuation walls on private property and adjacent to Regional Roads to be rebuilt and reconstructed onto the property line abutting Regional Property.

Based on asset management best practices, including regularly assessing the condition of the private noise attenuation walls, the conversion program will span over an estimated timeframe of 30 years. This program provides for a timely and justifiable approach to determining the priority of work while providing fairness to residents and providing the Region with the ability to reconstruct over a reasonable timeframe. As well, planning for the use of taxpayer funded reserves to fund the conversion program to maintain long term financial sustainability will be achieved.

B. SCOPE

This policy applies to existing noise attenuation walls on private property with reverse frontage adjacent to Regional Roads (a rear or side lot), existing as of September 10, 2015, representing Regional Council's resolution endorsing the conversion program.

C. DEFINITIONS

1. "Noise Attenuation Wall" means a continuous, solid concrete or wooden structure to lower sound levels.

2. "Regional Noise Attenuation Wall" means a noise attenuation wall built on the property line abutting Regional Property.

3. "Private Noise Attenuation Wall" means an existing noise attenuation wall on private property with rear yards or side yards abutting a Regional road. The Region will participate only in noise attenuation walls designed in accordance with current technology to give a minimum anticipated noise attenuation of 5 decibels.

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

4. "Permission to Enter" means formal permission that must be obtained from the resident before entering a property.

5. "Conversion" means the reconstruction and relocation of existing private noise attenuation walls onto the property line abutting Regional Property.

D. POLICY

Noise attenuation walls in existence as of Regional Council's endorsement of the noise wall conversion program, being September 10, 2015 that are currently located on private property adjacent to Regional Roads will be rebuilt and relocated onto the property line abutting Regional Property. The cost of the replacement of the walls including design, construction and maintenance will be funded in full by the Region of Peel.

1. GENERAL

a) The replacement of private noise attenuation walls will be determined based on priority – primarily according to the level of deterioration of the walls. For more details, refer to the Prioritization Criteria section on page four (4).

b) The construction costs to convert the private noise attenuation walls to Regional noise attenuation walls will be one hundred per cent (100%) funded by the Region through a tax-supported capital replacement reserve. Ongoing maintenance and any future replacements of the noise attenuation walls will be the responsibility of the Region.

c) Until the Region reconstructs the private noise attenuation walls which will be situated, whenever possible, on the property line, the repair of deteriorating noise attenuation walls on private property will remain the sole responsibility of the property owner. The Region of Peel is not responsible for any kind of liability, suit, claim, demand or proceeding of any kind or for any damage incurred or injury suffered by any individual or property owner as a result of the private noise attenuation wall. The Property Standards By-law for each local municipality, Brampton, Mississauga, and Caledon, establishes the requirements of property owners with respect to the maintenance of their property.

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

Each local municipality will ensure that noise attenuation barriers situated on private property are maintained to an acceptable level through enforcement of the Property Standards By-law.

d) In situations where there is a capital works project planned to widen a Regional Road and construct Regional noise attenuation walls, any affected private noise attenuation walls will be removed as part of the capital works regardless of the condition of the walls.

e) To initiate start-up of the conversion program, a full inventory of private noise attenuation walls will be gathered followed by detailed condition assessments. This information will be used in combination with the Prioritization Criteria, in order to establish the priority in which the private noise attenuation walls will be converted.

f) While efforts will be made to meet the related project timelines for inventory collection, condition assessment and construction, the Region makes no representation that the private noise attenuation walls will be converted in any given timeframe.

g) Generally, the noise attenuation wall conversion undertaken by the Region will be to replace entire blocks where condition warrants replacement.

2. INVENTORY COLLECTION

a) Prior to undertaking condition assessment and prioritization of conversion construction projects, a comprehensive inventory of all private noise attenuation walls on properties that abut or side Regional Roads will be undertaken to collect the spatial data for all private noise attenuation walls within the Region of Peel.

b) Following the initial inventory collection and confirmation, at least once every ten years a review of all the private noise attenuation walls within Region of Peel will be undertaken for ongoing verification of inventory accuracy.

3. CONDITION ASSESSMENT

a) Noise attenuation walls condition assessment is important to order to identify defects and deterioration, identify the functional ability to deliver the service and prioritize the replacement of private noise attenuation walls.

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

b) The condition rating program for private noise attenuation walls involves site inspection of each private noise attenuation wall following an inspection process with standard criteria to identify defects and to determine an overall rating on each noise attenuation wall based on a review of the panels, foundations and posts.

c) Conditions are rated using a visual performance rating of the components of Poor, Fair, Good and Excellent.

d) Upon completion of the initial inventory collection, a detailed visual condition assessment will be undertaken. Going forward, on a regular basis, there will be a visual condition assessment inspection for the inventoried private noise attenuation walls. The inventory collection and inspection work will be undertaken internally.

4. PRIORITIZATION CRITERIA

a) Several criteria have been established to assist in prioritizing the conversion of private walls. Criteria to determine and prioritize locations include:

1. Public safety and urgency of replacement of observable distresses;
2. Structural integrity and performance of private noise attenuation walls;
3. The estimated service life and level of deterioration; and
4. Consistency in the materials and aesthetics of private noise attenuation walls.

b) Condition of the noise attenuation walls, public safety, estimated service life and level of deterioration will carry a higher weighting as these are most predominate and quantifiable measures.

5. PRIORITIZATION MODEL

a) The data gathered for each of the Prioritization Criteria will be assessed to establish the priority of converting the private noise attenuation walls inventory to Regional noise attenuation walls.

b) Based on the prioritization criteria, a priority listing of all private noise attenuation walls will be developed. Prioritization will be reviewed and updated based on updated condition assessment data.

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

c) The model will prioritize noise attenuation walls into four categories: Excellent, Good, Fair and Poor. Private noise attenuation walls will be scheduled for replacement based on the wall nearing the end of its useful life – progressing to the poor and/or fair categories. An assessment by the Region of Peel or the related results of the assessment is not an assumption of risk of the condition of the wall, and the risk and liability remains solely with the property owner until the Conversion is completed.

6. LONG TERM FINANCIAL SUSTAINABILITY CONSIDERATIONS

a) A typical construction of a noise attenuation wall is anticipated to span over the course of two (2) years.

b) During the first year, a detailed design will commence that will take into consideration the most current Regional road noise attenuation wall design standards. Reasonable notice will be provided by the Region of Peel to all affected property owners prior to the year in which a design for converting a private noise attenuation wall is planned to commence.

c) The Region of Peel will consult with affected property owners during the detailed design phase and permission to enter will be requested.

d) Wherever possible, the private noise attenuation wall will be relocated on the property line. Where exceptions due to the nature of the design are required, such as land availability, the wall may be reconstructed on private property and the Region will secure adequate property rights, if necessary.

e) The location of the noise attenuation wall and related land requirements will be identified during detailed design. The timing of physical construction will be dependent upon securing the relevant property rights, as required, and the permission to enter onto private lands.

f) During the second year, construction will be undertaken based upon the approved detailed design for the noise attenuation wall. The approval of the local Municipality, as to the height and type of wall proposed, will be required prior to construction.

g) Noise attenuation walls abutting Regional Property shall be constructed of either masonry, wood or approved composite materials with due consideration to streetscape, and future maintenance requirements at the discretion of the Region of Peel.

CATEGORY: **WORKS**

SUBCATEGORY: **ROADS**

SUBJECT: **PRIVATE NOISE ATTENUATION WALLS CONVERSION POLICY**

7. COMMUNICATION PLAN

a) Ongoing communication throughout the program will be undertaken to ensure updates on inventory, prioritization, and upcoming design and construction work are readily available to keep the public, Regional Councillors, and Region of Peel staff up to date.

b) Communication will include, but not limited to: regular updating of the Region's external website to provide information on the conversion program; providing written notice to affected property owners of upcoming capital works (design and construction); consulting with affected property owners throughout the capital work; and regularly advising Regional Councillors of the status of inventory collection, prioritization, and construction.

E. GUIDELINES

1. Region of Peel, Standard Specification for Concrete Noise Barrier Walls
2. City of Mississauga, Corporate Policy and Procedure for Noise Attenuation Barriers on Major Roadways
3. Peel, Mississauga, Brampton - Harmonization of Noise Wall Standards and Specifications
4. Region of Peel, Corporate Policy for Asset Management, F10-06
5. Region of Peel Website for Roads Serviced by the Region of Peel

APPROVAL SOURCE:	Council Resolution 2015-663
ORIGINAL DATE:	September 10, 2015
LAST REVIEW DATE:	October 13, 2016
LAST UPDATE:	October 13, 2016
EFFECTIVE DATE:	October 13, 2016
RESPONSIBILITY:	Public Works, Transportation

Region of Peel

Corporate Policy

Policy No: W30-04
Page: 1 of 6
Effective Date: June 13, 1996

TAB: WORKS

SECTION: ROADS

SUBJECT: NOISE ATTENUATION BARRIERS

General

1. (1) Noise walls abutting railways and freeways under Ministry of Transportation (MTO) jurisdiction shall be constructed using only precast concrete or brick, concrete block or approved composite materials.

(2) Local improvements or retrofit noise walls abutting arterial and collector roads shall be constructed of either masonry, wood or approved composite materials with due consideration to streetscape, and future maintenance requirements at the discretion of the municipality.

(3) Noise walls built on private property abutting arterial and collector roads as a condition of development shall be constructed of either wood or approved composite materials.

(4) Only existing residential sites with reversed frontage and experiencing a daytime noise level equivalent (leq. daytime from 7:00 a.m. to 11:00 p.m.) or 60dBA or higher shall be considered for retrofit noise attenuation barriers.

(5) Retrofit noise walls shall be constructed with the centreline a minimum of 300mm on the public side of the streetline and only where rear yards or side yards abut a municipal road.

(6) Noise walls constructed as a condition of development shall be constructed with the centreline a minimum of 300mm on the private side of the streetline and become the maintenance responsibility of the homeowner through appropriate clauses registered on the title of the lot.

(7) A petition must be signed by owners representing a minimum of 2/3 of the properties in the benefitting area representing a minimum of 50% of the assessed value in order to be considered for a retrofit noise wall under the *Local Improvement Act.*

(8) The resident's special assessment for local improvement noise walls shall be based on 50% of actual final project costs with the remaining 50% to be paid by the municipality.

Guidelines for Installation

2. The following guidelines are to initiate special assessment rolls for charges to be levied as a result of noise barrier construction under the *Local Improvement Act.* This policy is intended to supplement, and not replace, the Noise Barrier Policy, as adopted by Council in April, 1983 under Resolution 83-173-5.

1. In general, projects will be initiated by rate-payers submitting petitions to Regional staff. In cases where the work is considered to be essential, Council may be approached to initiate same. Projects may also be advanced for Council initiative in cases where works should be coordinated with road projects.

2. The Region will participate only in noise barriers designed in accordance with current technology to give a minimum anticipated noise attenuation of 5 dBA.

3. Wall height generally will be determined as per the sketch approved by Regional Council.

4. In order to achieve the required minimum attenuation the barrier wall should meet or intercept the line of sight between the assumed locations of noise source and receiver.

5. Also the Region will participate only if the road in question is at least four (4) lanes wide and the residential reverse frontage is continuous between intersecting streets. If, as can be the case, the corner lot has direct frontage on the Region road the wall may be terminated with a return, if feasible, along the side lot line prior to the frontage of the corner lot.

6. Mid-block pedestrian right-of-ways may be accommodated by staggering the noise barrier as shown in the sketch approved by Regional Council.

7. The approval of the local Municipality, as to the height and type of wall proposed, will be mandatory, prior to construction, bearing in mind the general aesthetics and the probable contravention of local by-laws, regarding the permissible height of fence.

8. Assessments will be prepared on Special Assessment Rolls on a form to be approved by the Commissioner of Public Works.

9. The total chargeable cost will be the construction cost, i.e. final contract cost including pre-engineering, design, supervision, administration but excluding future maintenance for the total length of the wall including end returns.

10. The portion of the total chargeable cost to be paid by each owner will be based on a modified frontage measurement, (to the nearest one hundredth of a metre) which will be the property width at mid lot in order to compensate for inequities arising from irregularly shaped lots.

11. The homeowner will be assessed 50% of the cost of the barrier under the *Local Improvement Act* with the remaining 50% being paid by the Municipality.

Local Improvement Procedures

3. The following procedure for the construction and maintenance of noise abatement works on petition under the *Local Improvement Act* is adopted:

1. Petition signed by at least two-thirds of owners representing at least one-half of the lots liable to be specially assessed. (Section 11)

Region of Peel

Corporate Policy

Policy No: W30-04
Page: 3 of 6
Effective Date: June 13, 1996

TAB: WORKS

SECTION: ROADS

SUBJECT: NOISE ATTENUATION BARRIERS

2. Petition lodged with the Clerk and is deemed to be presented to the Council when lodged. (Section 16)

3. Clerk determines sufficiency of petition and endorses certificate to that effect (attached to petition). (Section 15)

4. By-law authorizing engineer's report. (May be general or specific and combined with step 11.) (Section 42)

5. Council receives engineer's report outlining lifetime of the work, reductions for special lot frontages, estimate of the cost of work, statement of the share or proportion of the cost to be borne by the land and by the municipal corporation respectively and the number of instalments by which the special assessment should be made payable. (Section 40)

6. By-law is passed for undertaking the work as a local improvement. (Section 7)

7. By-law is passed with a minimum vote of three-quarters of all members of council (17) assuming a portion of the cost of the works to be paid by the municipal corporation. (May be combined with by-law authorizing the undertaking under Section 7, step 6.) (Section 27)

8. By-law passed authorizing temporary loans or advances to meet the cost of the work pending completion of it. (May be combined with previous steps 6 and 7.) (Section 53(1))

9. By-law awards tender for the construction of the work and firm contract is entered into whereby the cost of completing the undertaking is established and construction of the work has commenced.

10. By-law authorizing borrowing on credit of corporation to repay temporary loans and to defray the cost of the work and issuing debentures if required. Can only be passed after firm contract for carrying out work has been entered into whereby the cost of completing the undertaking is established and construction has commenced. (May also impose special or general rate for repayment of municipal portion of debenture.) (Sections 53(2) to 57)

11. By-law authorizing preparation of the special assessment roll. (May be general or specific and combined with step 4.) (Section 42)

12. By-law establishing Court of Revision. (May be combined with step 4.) (Section 43)

13. Special assessment roll is prepared and kept open for inspection at the Office of the Clerk for ten days before the day appointed for sittings of the Court of Revision. (Section 45)

14. A statement showing under the appropriate heads the actual cost of the work verified by the Clerk or the Treasurer is delivered to the Chair of the Court of Revision. (May show an

amount not to exceed 25 per cent of the total estimated cost for unfinished work and outstanding claims for land or injurious affection.) Actual cost includes:

- construction cost
- engineering expenses
- cost of advertising and service of notices
- interest on temporary loans
- compensation for land taken and injuriously affected and expenses incurred in connection with determining compensation
- estimated cost of the issue and sale of debentures and discounts allowed to the purchasers of them (Sections 46, 47, 20)

15. Court of Revision holds hearing and adjudicates upon:

- the actual cost of the work
- names of the owners
- frontage or other measurements
- reduction for irregular lots
- amounts assessed on exempt lots
- the lifetime of the work
- the frontage charge as a rate per metre (Court of Revision cannot alter the proportion of the cost to be borne by special assessment and the municipal corporation respectively) (Section 48)

16. Clerk makes correction to special assessment roll and certifies corrected roll. (Section 51)

17. Council or owner may appeal to the Ontario Municipal Board the decision of the Court of Revision within twenty-one days of mailing of decision. (OMB has same powers as Court of Revision.) (Section 52)

18. By-law enacted imposing special assessment payable in annual instalments as Council shall prescribe not to extend beyond the life time of the work. In fixing the amount of annual instalments, a sum sufficient to cover the interest on borrowed funds may be added. Council may also permit commutation of the payment in cash. (Section 65)

19. Each annual instalment becomes due and payable on date defined by by-law under Section 56. Where the payment is not made, the provisions of the *Municipal Act* with respect to penalties and interest on the collection and recovery of taxes apply. (Section 58)

4. Petitioners shall be advised of the estimated cost of the work and their estimated cost share by both notification on the petition form and through a public meeting to be held within one month following verification by the Regional Clerk that the petition meets requirements for sufficiency.

Region of Peel

Corporate Policy

Policy No: W30-04
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Effective Date: June 13, 1996

TAB: WORKS

SECTION: ROADS

SUBJECT: NOISE ATTENUATION BARRIERS

5. The calculation of frontage lengths for noise abatement works constructed pursuant to the *Local Improvement Act* shall be based on the actual length of wall abutting the property owner's property boundary.

Technical Committee

6. A staff technical committee with members from the Region of Peel, City of Mississauga and City of Brampton appointed by their respective Commissioners shall meet as required with the following mandate:

(a) to review, update and maintain a harmonized set of noise wall standards and specifications for applications in the Region of Peel, City of Mississauga and City of Brampton;

(b) to review new products and to maintain and update a list of approved suppliers and products;

(c) to liaise with suppliers in determining methods of reducing manufacturing costs or improving overall product quality;

(d) to ensure a consistent application of the *Local Improvement Act* with respect to petition requirements, noise level standards, frontage measurements and special assessment allocation.

SOURCE: Resolutions 88-352-26, 94-55-21, 94-266-12, and 96-598.

Region of Peel
Working for you

GENERAL GUIDELINES FOR THE PREPARATION OF ACOUSTICAL REPORTS IN THE REGION OF PEEL

November 2012

GENERAL GUIDELINES FOR THE PREPARATION OF ACOUSTICAL REPORTS IN THE REGION OF PEEL

1.0 The Ministry of the Environment discontinued its review and clearance functions relating to acoustical reports of Regional and local roads within Peel in 1987 and this function has been delegated directly to the Region of Peel and to the pertinent Area Municipality.

In 1996, the Ministry of the Environment further discontinued its review and clearance functions concerning acoustical reports relating to provincial highways, railways, aircraft and major industrial noise sources, and also delegated this responsibility to the Region of Peel and the pertinent Area Municipality.

The Region of Peel and its constituent Area Municipalities require the applicants of all residential plans of subdivision, rezoning and site plans adjacent to major noise sources in the Region to engage the services of a qualified acoustical specialist (hereafter referred to as the Acoustical consultant) to prepare an acoustical report to be signed and submitted by a professional engineer which will recommend noise control measures to meet the sound level objectives of the Region of Peel, the Area Municipality and the Ministry of the Environment.

1.2 Generally, an acoustical report for a plan of subdivision is required only prior to final approval of the plan to clear the conditions of draft approval. However, when it is anticipated that projected noise levels between 7 am and 11 pm will exceed 65 dBA, an acoustical feasibility report will be required prior to draft approval to determine whether the design proposed and layout of the lots will allow the required sound level objectives to be achieved.

1.3 Notwithstanding policy 1.2 above, an acoustical feasibility report will be required prior to draft approval for any residential subdivision plan abutting a Provincial or Regional road except in cases whether a master acoustical feasibility study has been approved for the area.

1.4 The acoustical report must describe the plan of subdivision or the site and its relationship to the major roads and all other major noise sources including industrial, aircraft and rail noise, which may affect future occupants of the subdivision. The report must also identify all future noise sources in consultation with the area municipality and the Region of Peel.

1.5 Aircraft and freeway noise shall be considered in accordance with Regional and Municipal Official Plan Policies and the Ministry of Municipal Affairs and Housing's aircraft and freeway noise guidelines.

1.6 All other noise sources including industrial activity shall be considered in accordance with the Ministry of Environment criteria and procedures.

1.7 The report shall give details of prediction techniques used to determine noise levels (road, rail, aircraft) including all adjustments.

2.0 NOISE PREDICTION AND DESIGN CRITERIA

2.1 Sound Level Limits

2.1.1 The road traffic noise study will be based on the following criteria for sound level limits adopted by the Region of Peel, its constituent municipalities, and the Ministry of the Environment.

2.1.2 Outdoor Living Area
(7am-11pm) Leq (16 hr) = 55dBA

2.1.3 Outside Bedroom Window
(11pm-7am) Leq (8 hr) = 50 dBA

2.1.4 Indoor (bedrooms, hospitals)
(11pm-7am) Leq (8 hr) =40 dBA

2.1.5 Indoor (living rooms, hotels, private offices, reading rooms)
(7am-11pm) Leq (16 hr) =45 dBA

2.1.6 Indoor (general offices, shops)
(7am-11pm) Leq (16 hr) =50 dBA

2.2 Traffic Noise Predictions

2.2.1 With respect to road traffic predictions, only analytical techniques of current methods as approved by the Ministry of the Environment are accepted.

2.2.2 Traffic Volumes on arterial roads in the Urban Area (used in predicting noise level calculations) must be based on ultimate lane configuration and posted speed limit with level of service “D” unless otherwise directed, as set out in the table below:

Lanes	Future Traffic Volume	Medium Truck %	Heavy Truck %
2	16,200	Truck percentages are determined from actual counts, where available.	
4	32,400		
6	48,100		

2.2.3. Requests for traffic data must be provided to the Region of Peel in writing.

2.2.4. All traffic data sources must be identified in the report.

2.2.5. Predicted noise level calculations must be included in the report for both daytime (7am-11pm) and night time (11pm-7am) periods.

2.2.6. If manual calculations are used, the report must contain the fully completed MOE Traffic Noise Prediction Work Sheet for all sections calculated. If an acceptable computer model is utilized, sample copies of all sections calculated must be included.

2.2.7. The report must detail information on all adjustments, where applicable.

2.2.8. Where there is more than one source impacting the site, the calculations for each source and the combined noise level calculations must be included.

2.2.9. For industrial, aircraft and rail sound predictions, the Ministry of the Environment standard procedures should be employed with the report detailing the method of calculation or measurement.

2.3 Noise Barrier Calculations

2.3.1 In addition to noise level calculations, acoustical barrier calculations must also be included in the report and accompanied by a table of comparative barrier heights and barrier cross section drawings, which must comply with the following criteria:

a) The comparative barrier heights table must demonstrate attenuation under alternative heights including the sound level objective and the report's recommended level

b) Typical and/or worst case cross sections (and additional cross sections as may be necessary) at a vertical and horizontal scale of 1 to 1000 must be provided to clearly illustrate the proposed berm and wall configuration in trelation to the future grade at the house based on the proposed Lot Grading Plan. (Existing and proposed future grades at the site must be indicated).

c) Height of receiver to be used is 1.5 metres above the ground at a point located 3.0 metres from the real wall of the dwelling unit.

d) Barrier wall (i.e., fence) shall generally not exceed 2.0 metres in height unless approved by the area municipality in consultation with the appropriate road authority. Consideration maybe given to fence heights up to a maximum of 2.4 metres.

e) A minimum of 6.0 metres depth of rear yard as measured from rear face of the building which contains no slope in excess of 2% will be required by the Region of Peel unless otherwise specified as follows:
   a. In Brampton, any sloped portion in excess of 2% shall not occupy more than 1/3 of the overall depth of the rear yard.

f) A maximum berm slope of 4:1 on the right of way side will be required on all local and Regional roads within the Region of Peel unless otherwise specified below. Slopes steeper than 3:1 may be tolerated on the lot side of the earthwork (berm) by the use of retaining walls, etc provided that the Area Municipality is satisfied from a drainage and landscaping standpoint. Back to front drainage should be provided for wherever possible.
   a. In Mississauga, 3:1 berm slopes on the street side will be permitted.
   b. In Brampton, 3:1 berm slopes on the street side will be permitted as an option if the developer agrees to full planting with low maintenance cover.

g) In cases where the attenuation facility is interrupted, barrier returns or parallel screens are required and the detailed design of the treatment in cases will have to be incorporated into the acoustical report.

h) Barrier walls should generally be located no further than 0.3 metres from the rear lot line or as specified by the Area Municipality. Barrier walls will be located on the private homeowner's side of the lot line.

i) Boulevard slopes (between berms and the edge of the pavement) will preferably be 2%-4%.

j) The combined height of berm and barrier over 4 metres will be considered in very exceptional situations. 4 metre barrier height will generally be calculated (in standard situations) fro the centre line of the pavement. In non-standard or extreme the barrier heights will be considered on an individual basis. The area municipality shall be consulted on local height restrictions. (The maximum barrier height is generally to be measured from a line joining the centre line of the pavement to the ground level at the rear of the dwelling unit, except in non-standard situations.)

2.3.2. Information on acoustical barriers, berms, berm/wall combinations must include location and height of barriers relative to a fixed point, usually the centreline of the road. Unless otherwise agreed to, no portion of a berm may extend onto a municipal road right of way.

2.3.3. Type and surface density (minimum of 4lbs/sqft) of barrier fence should be specified.

2.3.4. The report shall be required to prove to the satisfaction of the Region of Peel, the Area Municipality and the Ministry of the Environment that the noise level in outdoor living areas after applying attenuation measures is the lowest level aesthetically, technically, administratively practical. To this end, the reports shall continue to provide a table of comparative barrier heights and show the height required to attenuate sounds to the Ministry of the Environment standards. The sound level objective is 55 dBA.

The report must show that the analysis has been done to meet the planning objectives of the municipality and that every effort has been made to achieve the 55 dBA sound level at a minimum, line of sight from receiver to source must be broken in all cases.

The report will provide an explanation in circumstances where the recommended barrier heights and other attenuation measures will result in the Ministry of Environment guidelines not being met.

(Note: It is preferable, that where possible, residential developments be designed such that the need for barrier type attenuation features, to control outdoor noise levels, is minimized.)

2.4 Other Noise Control Measures for Outdoor Living Areas

2.4.1 Alternative measures (site planning, service road, special type or location of acoustical barriers, etc) should be discussed with the Region and the Areas municipality in advance to receive their acceptance in principle.

2.4.2 Front yard attenuation (i.e., outdoor living areas in the front yard) area not an acceptable form of noise attenuation for reversed frontage lots.

2.5 Noise Attenuation for Indoor Living Areas

2.5.1 Central air conditioning is required when the night time noise level is 60 dBA or greater at a bedroom window or when the day time noise level exceeds 65 dBA at the exterior face of a living room. A warning clause note to this effect is to be included in the reports and in the Subdivision Agreement for registration on title.

2.5.2 For central air conditions requirements, traffic volumes may be based on a 10 year projection from the estimated date of occupancy of the affected dwellings.

2.5.3 If central air conditioning is required, a noise insensitive location or other appropriate means of noise attenuation of the air collected condenser unit should be stipulated in the report and specified in the Subdivision Agreement. If a heat pump is installed, the location of the outdoor unit should be specified as well. In all cases the condenser unit should have a maximum ARI rating of 7.6 Bels for 3.5 tons or less.

2.5.4 If the night time outdoor noise level is above 50 dBA and below 60 dBA forced air heating is to be installed with provision for central air conditioning. A warning clause note to this effect is to be included in the report and in the Subdivision Agreement for registration on title. (See wording in 2.6).

2.5.5 When the night time outdoor noise level at the bedroom window is 60 dBA or greater, door specifications, outer wall specifications and required window glazing shall be provided. All recommendations shall be based on ultimate traffic volumes and the report shall distinguish between those dwellings where the standard requirements of the Ontario building Code will provide adequate indoor attenuation and those locations where additional measures are required.

2.5.6 Noise reports will not be required for industrial/commercial/office developments. In lieu of requiring a noise report the following building component requirements will be imposed as a condition to development:

"Prior to the issuance of building permits for Blocks (___), an acoustical consultant shall certify on the building plans submitted for application approval to the Building Department that the building design for the office and retail areas include double glaze noon-opening windows, brick veneer or its acoustical equivalent, and air conditioning system and a suspended acoustical type ceiling.

2.6 Warning Clauses

2.6.1 The following minimum wording is to be used in the Subdivision Agreement and in all Offers of Purchase and Sale for the specific lots when noise levels are not being attenuated and the levels exceed the Municipality's and the Ministry of the Environment's noise criteria, but not by more than 5 dBA:

"Purchasers are advised that noise levels due to increasing road (rail) (air) traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants."

2.6.2 When noise attenuation measures have been instituted on the site, and resultant noise levels still exceed the Municipality's and the Ministry of Environment's noise criteria by 5 dBA or less, the

following wording is to be used in the Subdivision Agreement and in all Offers of Purchase and Sale for the specific lots:

"Purchasers are advised that despite the inclusion of noise control features in this development area and within the building units, noise levels from increasing road (rail) (air) traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the noise level exceeds the Municipality's and the Ministry of the Environment's noise criteria."

2.6.3 If the Municipality accepts a noise attenuation solution where the resultant noise level exceeds the Municipality's and the Ministry of Environment's criteria by more than 5dBA, the warning clause in paragraphs 2.6.1 and 2.6.2 must be reworded by replacing the word "may" with "will" or as directed by the Area Municipality.

2.6.4 When forced air heating with provision for central air conditioning is to be installed the following additional paragraph is to be added to the warning clause in 2.6.2:
"This dwelling unit was fitted with a forced air heating system and the ducting, etc sized to accommodate a central air conditioning unit. Air conditioning may be installed at the owner's option and cost.

2.6.5 Where mandatory air conditioning is to be installed, the following additional paragraph is to be added to the warning clause in 2.6.2:
"This dwelling unit was fitted with a central air conditioning system in order to permit closing of the windows for noise control, (Note: locate air cooled condenser unit in a noise insensitive area and ensure that unit has a maximum ARI rating of 7.6 Bels for 3.5 tons or less.)"

2.6.6 Where berms and/or barriers are being installed on the site the following additional paragraph is to be added to the warning clause in 2.6.2:

"That the acoustical berm and/or barrier as installed, shall be maintained, repaired 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."

3.0 REPORT FORMAT AND SUBMISSION REQUIREMENTS

3.1 While the technique or techniques used, the data, calculations, and resulting recommendations are the sole responsibility of the consultant,

it is appropriate that a reasonable standard report format be utilized to minimize processing delay and facilitate the formulation of requirements to be incorporated within the development agreement.

3.1.1 In order to expedite processing and approval, the following format should be used for submission within the Region of Peel:

a) cover page to clearly identify the Regional and local municipality's file number, the applicant's name and the name of the development if known.
b) Introduction to identify noise sources and sources of data utilized. This should include a brief description of on site conditions together with analytical techniques used. Listing of criteria for sound level limits would be appropriate as well as alternative methods considered for noise mitigation.
c) Analysis procedures for on site conditions before barrier to include sample calculations and work sheets for typical and worst case situations. Summary table to include all predicted noise levels with locations identified.
d) Analysis procedures for on site conditions after barrier to utilize the same typical and worst case situations together with a table of alternative barrier heights. Cross sections of berm barrier configuration to be included for typical and worst case samples.
e) A table illustrating all recommended attenuation measures including building component specifications to be provided with a sketch illustrating affected lots.
f) A plan of the affected lots which clearly depicts all information including existing and/or proposed:
    a. Property boundaries
    b. Building and/or building envelopes
    c. Noise walls, berms and sidewalks
    d. Sample receiver locations with cross sections keyed in
    e. Other relevant site features

OFFICE CONSOLIDATION

This is a consolidation of the Town's by-law to control noise being By-law 86-110 as amended by By-law 95-66, 2010-117 and 2012-016. This is prepared for reference and information purposes only. The following consolidation is an electronic reproduction made available for information only. It is not an official version of the by-law. Official versions of all by-laws can be obtained from the Legislative Services section by calling (905) 584-2272. If there are any discrepancies between this consolidation and By-laws 86-110, 95-66, 2010-117 and 2012-016 the By-laws shall prevail.

THE CORPORATION OF THE TOWN OF CALEDON

BY-LAW NO. 86-110

A by-law to control noise

WHEREAS it is expedient to exercise the power conferred upon the Council by the *Environmental Protection Act* and other statutory authority; and

WHEREAS a recognized body of scientific and technological knowledge exists by which sound and vibration may be substantially reduced; and

WHEREAS the people have a right to and should be ensured an environment free from unusual, unnecessary or excessive sound or vibration which may degrade the quality and tranquility of their life or cause nuisance; and

WHEREAS it is the policy of the Council to reduce and control such sound or vibration;

NOW THEREFORE**,** the council of The Corporation of the Town of Caledon enacts as follows:

1. Interpretation

(1) In this by-law,

(a) Construction

"construction" includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith;

(b) Construction Equipment

"construction equipment" means any equipment or device designed and intended for use in construction or material handling, including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment;

(c) Conveyance

"conveyance" includes a vehicle and any other device employed to transport a person or persons

or goods from place to place but does not include any such device or vehicle if operated only within the premises of a person;

(d) Council

"Council" means the Council of The Corporation of the Town of Caledon;

[By-law 2012-016 effective Feb 14/12]

(dd) dB(A)

"dB(A)" means the sound pressure measured in decibels using "A" weighted scale of a sound level meter set to slow response;

[By-law 2012-016 effective Feb 14/12]

(ddd) Decibel

"Decibel" means a unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to approximately 130 for the average pain level;

(e) Highway

"highway" includes a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle designed and intended for, or used by, the general public for the passage of vehicles;

(f) Motor Vehicle

"motor vehicle" includes an automobile, motorcycle and any other vehicle propelled or driven otherwise than by muscular power, but does not include the cars of electric or steam railways or other motor vehicles running only upon rails, or a motorized snow vehicle, traction engine, farm tractor, self-propelled implement of husbandry or road-building machine within the meaning of the *Highway Traffic Act*;

(g) Motorized Conveyance

"motorized conveyance" means a conveyance propelled or driven otherwise than by muscular, gravitational or wind power;

(h) Municipality

"municipality" means the land within the geographic limit of the Town of Caledon;

[By-law 2012-016 effective Feb 14/12]

(i) Noise

"noise" means unwanted sound;

[By-law 2012-016 effective Feb 14/12]

(ii) Officer

"Officer" means a person appointed by The Corporation of the Town of Caledon for the enforcement of its by-laws and also includes a member of the Ontario Provincial Police Force;

(j) Point of Reception

"point of reception" means any point on the premises of a person where sound or vibration

originating from other than those premises is received and

[By-law 2012-016 effective Feb 14/12]

(k) RPM

"RPM" means revolutions per minute;

[By-law 2012-016 effective Feb 14/12]

(l) Sound Level Meter

"Sound Level Meter" means a device used to measure sound pressure which meets the American National Standards Institute S1.4-1983(R2006), or the International Electro-Technical Council Standard No. 123, or the British Standard no. 3539 Part 1, or the U.S.A. Standard S1.4-196, as amended.

(2) Residential Area

In this by-law "Residential Area" means those areas of the municipality designated in the Official Plan of the Town of Caledon Planning Area as "Settlement Area".

2. General Prohibitions

No person shall emit or cause or permit the emission of sound resulting from an act listed herein, and which sound is clearly audible at a point of reception:

1. Racing of any motorized conveyance other than in a racing event regulated by law.

2. The operation of a motor vehicle in such a way that the tires squeal.

3. The operation of any combustion engine or pneumatic device without an effective exhaust or intake muffling device in good working order and in constant operation.

4. The operation of a vehicle or a vehicle with a trailer resulting in banging, clanking, squealing or other like sounds due to improperly secured load or equipment, or inadequate maintenance.

5. The operation of an engine or motor in, or on, any motor vehicle or item of attached auxiliary equipment for a continuous period exceeding five minutes, while such vehicle is stationary in a Residential Area unless:

   (i) the original equipment manufacturer specifically recommends a longer idling period for normal and efficient operation of the motor vehicle in which case such recommended period shall not be exceeded; or,

   (ii) operation of such engine or motor is essential to a basic function of the vehicle or equipment, including but not limited to, operation of ready-mixed concrete trucks, lift platforms and refuse compactors; or,

   (iii) weather conditions justify the use of heating or refrigerating systems powered by the motor or engine for the safety and welfare of the operator, passengers or animals, or the preservation of perishable cargo, and the vehicle is stationary for purposes of delivery or loading; or,

(iv) prevailing low temperatures make longer idling periods necessary immediately after starting the motor or engine; or,

(v) the idling is for the purpose of cleaning and flushing the radiator and associated circulation system for seasonal change of antifreeze, cleaning of the fuel system, carburetor the like, when such work is performed other than for profit.

6. The operation of a motor vehicle horn or other warning device except where required or authorized by law or in accordance with good safety practices.

7. The operation of any item of construction equipment in a Residential Area without effective muffling devices in good working order and in constant operation.

[By-law 2012-016 effective Feb 14/12]

2A. (1) No person shall operate a motorcycle on any highway if the motorcycle:

1. emits any sound exceeding 92 dB(A) from the exhaust outlet as measure at 50 centimeters by means of a Sound Level Meter set to slow response while the engine of the motorcycle is at idel; or

2. is a one, two, five or six cylinder motocycle and emits any sound exceeding 96 dB(A) from the exhaust outlet as measured at 50 centimetres by means of a Sound Level Meter set to slow response when the engine is at 2000 RPM; or

3. is a three or four cyclinder motorcycle and emits any sound exceeding 100 dB(A) from the exhaust outlet as measured at 50 centimetres by means of a Sound Level Meter set to slow response when the engine is at 5000 RPM.

(2) No person shall hinder or obstruct the Sound Level Meter testing procedure carried out by an Officer pursuant to the provisions of this by-law.

3. Prohibitions by Time and Place

No person shall emit or cause or permit the emission of sound resulting from any act listed in Table 3-1 if clearly audible at a point of reception located in a Residential Area within a prohibited time shown in Table 3-1.

TABLE 3-1

PROHIBITIONS BY TIME AND PLACE

Act	Prohibited Period of Time
1. The detonation of fireworks or explosive devices not used in construction	At all times
2. The discharge of firearms	At all times
3. The operation of a combustion engine which, (i) is, or (ii) is used in, or (iii) is intended for use in a toy, or a model or replica of any device, which model or replica has no function other than amusement and which is not a conveyance.	At all times

4. The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction or amplification of sound.	11:00 p.m. one day to 7:00 a.m. the next day
5. The operation of any auditory signaling device, including but not limited to the ringing of bells or gongs and the blowing of horns or sirens or whistles, or the production, reproduction or amplification of any similar sounds by electronic means, except where required or authorized by law or in accordance with good safety practices.	11:00 p.m. one day to 7:00 a.m. the next day
6. The operation of any powered rail car, including but not limited to refrigeration cars, locomotives or self-propelled passenger cars, while stationary on property not owned or controlled by a railway governed by the *Canada Railway Act.*	11:00 p.m. one day to 7:00 a.m. the next day
7. The operation of any motorized conveyance other than on a highway or other place intended for its operation.	11:00 p.m. one day to 7:00 a.m. the next day
8. The venting, release or pressure relief of air, steam or other gaseous material, product or compound from any autoclave, boiler, pressure vessel, pipe, valve, machine, device or system.	11:00 p.m. one day to 7:00 a.m. the next day
9. Persistent barking, calling or whining or other similar persistent noise making by any domestic pet or any other animal kept or used for any purpose other than agriculture.	11:00 p.m. one day to 7:00 a.m. the next day
10. The operation of a commercial car wash with air drying equipment.	11:00 p.m. one day to 7:00 a.m. the next day
11. Yelling, shouting, hooting, whistling or singing	11:00 p.m. one day to 7:00 a.m. the next day
12. The operation of a power assisted hand glider or parafoil.	11:00 p.m. one day to 7:00 a.m. the next day
13. All selling or advertising by shouting or outcry or amplified sound.	11:00 p.m. one day to 7:00 a.m. the next day
14. Loading, unloading, delivering, packing, unpacking, or otherwise handling any containers, products, materials, or refuse, whatsoever, unless necessary for the maintenance of essential services or the moving of private household effects.	11:00 p.m. one day to 7:00 a.m. the next day
15. The operation of any equipment in connection with construction	11:00 p.m. one day to 6:00 a.m. the next day
16. The operation or use of any tool for domestic purposes other than snow removal.	11:00 p.m. one day to 7:00 a.m. the next day
17. The operation of solid waste bulk lift or refuse compacting equipment.	11:00 p.m. one day to 7:00 a.m. the next day
18. The operation of a commercial car wash of a type other than mentioned in item 10.	11:00 p.m. one day to 7:00 a.m. the next day

4. Exemption for Public Safety

Notwithstanding any other provision of this by-law, it shall be lawful to emit or cause or permit the emission of sound or vibration in connection with emergency measures undertaken:

(a) for the immediate health, safety or welfare of the inhabitants or any of them; or,

(b) for the preservation or restoration of property;

unless such sound or vibration is clearly of a longer duration, or nature more disturbing, than is reasonably necessary for the accomplishment of such emergency purpose.

[By-law 2012-016 effective Feb 14/12] 4A This by-law may be enforced by the Officers of the Ontario Provincial Police and Town of Caledon By-law Enforcement Officers.

5. Severability

If a court of competent jurisdiction should declare any section or part of a section of this by-law to be invalid, such section or part of a section shall not be construed as having persuaded or influenced Council to pass the remainder of the by-law and it is hereby declared that the remainder of the by-law shall be valid and shall remain in force.

[By-law 95-66 effective Jun 26/95] 6. Penalty

Every person who contravenes any of the provisions of this by-law is guilty of an offence.

[By-law 95-66 effective Jun 26/95] 7. Exemptions

The Council, upon application of any person who proposes to emit, or cause or permit the emission of sound not in conformity with the provisions of this by-law, may authorize an exemption from the provisions of this by-law provided that, in the opinion of the Council, the general intent and purpose of this by-law are maintained.

[By-law 95-66 effective Jun 26/95] 8. A person seeking an exemption shall

(1) submit an application to the chief by-law enforcement officer who shall prepare a report in respect of the application,

(2) pay a non-refundable application fee of $50.00, at the time of submitting the application, and

(3) be heard by the Council, or such committee of Council as designated by Council, which committee shall recommend to Council whether or not to grant the exemption requested.

9. Effective Date

This by-law shall come into force and take effect from the date it is approved by the Minister of the Environment.

By-law read a first time
This 23rd day of June 1986

_____
Mayor

_____
Clerk

By-law read a second and third time and
finally Passed in Open Council
This 7th day of July 1986

_____
Mayor

_____
Clerk

This By-law is approved pursuant to the
Provisions of the Environmental Protection
Act at Toronto, This 19th day of
August, 1986.

"Jim Bradley"

MINISTER OF THE ENVIRONMENT

APPENDIX B

Traffic Data

1665649 - Coleraine Drive Grade Separation Noise Impact Study - Prediction Modelling Inputs

Client Data
Assumption

			EXISTING DATA							FUTURE DATA WITHOUT GRADE SEPARATION							FUTURE DATA WITH GRADE SEPARATION						
ALIGNMENT	ROAD SEGMENT ID	SPEED	AADT	YEAR	DAYTIME %	NIGHTTIME %	% TRUCKS (COMMERCIAL)	% MEDIUM TRUCKS	% HEAVY TRUCKS	AADT	YEAR	DAYTIME %	NIGHTTIME %	% TRUCKS (COMMERCIAL)	% MEDIUM TRUCKS	% HEAVY TRUCKS	AADT	YEAR	DAYTIME %	NIGHTTIME %	% TRUCKS (COMMERCIAL)	% MEDIUM TRUCKS	% HEAVY TRUCKS
Coleratine Drive SB	S01	60	6511	2017	90%	10%	19.1%	12.4%	6.7%	16893	2041	90%	10%	19.1%	12.4%	0.8%	17649	2041	90%	10%	19.1%	12.4%	0.8%
Coleraine Drive NB	S02	60	7054	2017	90%	10%	18.6%	12.4%	6.5%	8320	2041	90%	10%	18.6%	12.1%	0.9%	7564	2041	90%	10%	18.6%	12.1%	0.9%
Old Ellwood Drive	S03	50	-	-	-	-	-	-	-	10830	2041	90%	10%	3%	2.7%	0.3%	-	-	-	-	-	-	-

Note: Daytime (16 Hours) – 07:00 to 23:00. Nighttime (8 Hours) – 23:00 to 07:00

APPENDIX C

CadnaA Sample Calculation

Report (1665649 - Coleraine Rd Caledon - June2022_TNM.cna)

CALCULATION CONFIGURATION

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	0.00
DTM	
Standard Height (m)	234.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

NOISE SOURCES

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height		
			left	right		horz.	vert.	Begin		End
					(m)	(m)	(m)	(m)		(m)
Existing Barrier								2.00	r	
Existing Barrier								2.00	r	
Existing Barrier								2.00	r	
Existing Barrier								2.00	r	
Existing Barrier								2.00	r	
Curb	~	!04*BAR1						0.80	r	
Curb	~	!04*BAR2						0.80	r	
Jersey Barrier	~	!04*BAR2						1.20	r	

Building(s)

Name	M.	ID	RB	Residents	Absorption	Reflection		Height	
						Left	Right	Begin	
						dB	dB	(m)	
House1		B001	x	0				6.00	r
House2		B002	x	0				6.00	r
House3		B003	x	0				6.00	r
House5		B005	x	0				6.00	r
House6		B006	x	0				6.00	r
House4		B004	x	0				6.00	r

Road(s)

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
Coleraine Northbound		!02*COLNB	61.6	0.0	55.0			606.0	0.0	135.0	9.5	0.0	9.5	60		5	0.0	1	0.0	0.0		
Coleraine Southbound		!02*COLSB	63.4	0.0	56.9			813.0	0.0	181.0	12.4	0.0	12.4	60		5	0.0	1	0.0	0.0		
Old Ellwood Drive		!02*OLDELWD	57.1	0.0	50.5			340.0	0.0	76.0	3.0	0.0	3.0	60		7	0.0	1	0.0	0.0		
Coleraine Northbound	~	!01*COLNB	61.5	0.0	54.9			592.0	0.0	131.0	9.5	0.0	9.5	60		5	0.0	1	0.0	0.0		
Coleraine Southbound	~	!01*COLSB	63.5	0.0	57.0			827.0	0.0	184.0	12.4	0.0	12.4	60		5	0.0	1	0.0	0.0		
Coleraine Northbound	~	!00*COLNB	61.5	0.0	54.9			592.0	0.0	131.0	9.5	0.0	9.5	60		5	0.0	1	0.0	0.0		
Coleraine Southbound	~	!00*COLSB	63.5	0.0	57.0			827.0	0.0	184.0	12.4	0.0	12.4	60		5	0.0	1	0.0	0.0		

Receptor Noise Impact Level(s)

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Evening	Night	Day	Evening	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Outdoor Living Area 1		OLA001	53.6	-73.2	47.0	0.0	0.0	0.0	0	x	Total	1.50	r	600553.67	4858147.42	260.37
Outdoor Living Area 2		OLA002	58.8	-69.7	52.3	0.0	0.0	0.0	0	x	Total	1.50	r	600607.84	4858179.85	258.72
Outdoor Living Area 3		OLA003	58.8	-69.7	52.3	0.0	0.0	0.0	0	x	Total	1.50	r	600594.81	4858195.36	258.50
Outdoor Living Area 4		OLA004	58.6	-69.5	52.1	0.0	0.0	0.0	0	x	Total	1.50	r	600548.40	4858233.30	258.50
Outdoor Living Area 5		OLA005	55.9	-72.0	49.4	0.0	0.0	0.0	0	x	Total	1.50	r	600485.89	4858217.74	258.32
Outdoor Living Area 6		OLA006	59.2	-68.7	52.7	0.0	0.0	0.0	0	x	Total	1.50	r	600510.94	4858272.23	258.50

APPENDIX D

STAMSON Sample Calculation

STAMSON 5.0 NORMAL REPORT Date: 24-03-2021 14:49:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Time Period: 1 hours
Description: Coleraine Dr SB - Sample Calculation

Road data, segment # 1: Coleraine

Car traffic volume : 813 veh/TimePeriod
Medium truck volume : 101 veh/TimePeriod
Heavy truck volume : 0 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Coleraine

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 28.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -70.00 deg Angle2 : 90.00 deg
Barrier height : 2.00 m
Barrier receiver distance : 6.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Coleraine

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.29	1.29

ROAD (48.44 + 55.29 + 0.00) = 56.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-70	0.66	67.72	0.00	-4.50	-14.79	0.00	0.00	0.00	48.44

```
-------------------------------------------------------------------------------
   -70     90   0.57  67.72   0.00  -4.26  -1.54   0.00   0.00  -6.64  55.29
-------------------------------------------------------------------------------

Segment Leq : 56.10 dBA

Total Leq All Segments: 56.10 dBA

↑



TOTAL Leq FROM ALL SOURCES:       56.10
↑
↑
```

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