MONTGOMERY SISAM ARCHITECTS INC.

Noise Assessment

1161 Old Montreal Road, Ottawa, Ontario

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1.0 Introduction

1.1 Purpose and Objectives

Dillon Consulting Limited (Dillon) was retained by Montgomery Sisam Architects Inc. to complete a noise control detailed assessment as requested by the City of Ottawa for a proposed long term care facility located at 1161 Old Montreal Road, in Ottawa, Ontario. This study has been completed in support of a Zoning By-law Amendment (ZBA) application for the proposed development.

The noise control detailed assessment presented herein was prepared in accordance with the requirements of the City of Ottawa Guidelines and the Ontario Ministry of Environment, Conservation and Parks (MECP) Noise Guidelines (*NPC-300*). The assessment focuses on noise impacts from the surrounding transportation corridors, as well as stationary noise sources from the proposed development on itself and the existing surrounding noise sensitive receptors.

1.2 The Project and Surrounding Areas

The proposed development is located at 1161 Old Montreal Road, in Ottawa, Ontario. The proposed development is located adjacent to existing residences and a place of worship.

The subject site and the surrounding areas are shown in **Figure 1**.

Currently, the subject lands of the proposed development are vacant. The proposed development consists of a 4-storey (Building A) and 5-storey (Building B) long term care facility. The concept plan of the proposed development is presented in **Appendix A**.

2.0 Impacts from the Environment on the Proposed Development

This technical report investigates noise impacts from nearby transportation sources on the proposed development, as well as impacts from the proposed development's stationary noise sources on itself and existing surrounding noise sensitive receptors.

2.1 Transportation Noise Assessment

The transportation sources with the potential to impact the proposed development include road traffic along Old Montreal Road and Famille-Laporte Avenue. Impacts from road traffic were predicted and compared against the applicable criteria as stipulated in the Ontario Ministry of Environment, Conservation and Parks (MECP) noise guideline publication, *NPC 300 – Environmental Noise Guideline – Stationary and Transportation Sources – Approvals and Planning* (2013). NPC-300 outlines noise level criteria for sensitive land uses, which assist in determining requirements for façade construction, ventilation requirements, warning clauses, and potential noise barriers for the proposed development.

2.1.1 Noise Criteria

The applicable transportation noise criteria, as outlined in Part C of NPC-300, is summarized below and presented in **Tables 1** through **4**. **Table 1** summarizes the indoor sound level limits based on the type of space assessed, Time of day, and the maximum allowable equivalent sound levels from road sources. The indoor noise levels are based on the assumption of closed windows and doors.

Table 1: Indoor Sound Level Limits for Road

Type of Space	Time Period	Equivalent Sound Level - L_{eq} [dBA]
		Road
Living/dining areas of residences, hospitals, nursing homes, schools, daycares, etc.	Daytime (07:00 - 23:00)	50
Living/dining areas of residences, hospitals, nursing homes, etc. (except schools and daycares)	Nighttime (23:00 - 07:00)	45
Sleeping quarters of residences	Daytime (07:00 - 23:00)	45
	Nighttime (23:00 - 07:00)	40
Sleeping quarters of hotels	Nighttime (23:00 - 07:00)	45

Table 2 outlines the maximum equivalent sound levels, from road sources, where if exceeded a detailed building component design assessment is required to ensure the indoor sound level limits (see **Table 1**) are achieved.

Table 2: Requirements for Building Component Assessment

Assessment Location	Time Period	Equivalent Sound Level - L_{eq} [dBA]
		Road
Plane Window for Living area or sleeping quarters	Daytime (07:00 - 23:00)	65
	Nighttime (23:00 - 7:00)	60

Table 3 summarizes ventilation requirements and potential noise warning clauses that should be used to warn of potential annoyance due to existing noise sources related to transportation.

Table 3: Ventilation and Warning Clause Requirement

Assessment Location	Time Period	Equivalent Sound Level - L_{eq}	Ventilation and Warning Clause Requirements
Plane of window for living area or sleeping quarters	Daytime (07:00 - 23:00)	≤ 55 dBA	No Requirement
		> 55 dBA and ≤ 65 dBA	Provision for the installation of central air conditioning with a Type C warning clause
		> 65 dBA	Installation of central air conditioning with a Type D warning clause
Plane of window for living area or sleeping quarters	Nighttime (23:00 - 7:00)	≤ 50 dBA	No Requirement
		> 50 dBA and ≤ 60 dBA	Provision for the installation of central air conditioning with a Type C warning clause
		> 60 dBA	Installation of central air conditioning with a Type D warning clause

The applicable noise criteria for Outdoor Living Areas (OLAs), specific to surface transportation are presented in **Table 4**. If the 16-Hour Equivalent Sound Level (Leq 16h) at an OLA is greater than 55 dBA and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. Otherwise, prospective purchasers or tenants should be informed of potential elevated noise levels by way of warning clause. For Leq 16h of greater than 60 dBA, noise mitigation measures are required to reduce the noise levels to 55 dBA or less.

Table 4: OLA Level Limits for Road Noise

Assessment Location	Equivalent Sound Level - L_{eq} 16hr	Noise Control Measures and Warning Clause Requirements
Outdoor Living Area	≤ 55 dBA	No requirement
	> 55 dBA and ≤ 60 dBA	Installation of noise control measure OR a Type A warning clause [1]
	> 60 dBA	Installation of noise control measure with a Type B warning clause

2.1.2 Transportation Sources

In assessing potential transportation noise impacts on the proposed development, Chemin Old Montreal Road and Famille-Laporte Avenue was analyzed as a surface transportation source.

Road Noise Sources

The proposed development is located directly adjacent to Chemin Old Montreal Road and Famille-Laporte Avenue. The mature state of development traffic data for Chemin Old Montreal road and Famille-Laporte Avenue was referenced from the Appendix B of the City of Ottawa Environmental Noise Control Guidelines Part 4 based on the implied roadway class and posted speed limit. The road traffic data is presented in **Table 5**. Appendix B of the City of Ottawa Environmental Noise Control Guidelines Part 4 has been included in **Appendix B** of this report.

Table 5: Road Traffic Data

Roadway	Implied Roadway Class	AADT Vehicles/Day	Posted Speed (km/hr)	Day/Night Split (%)	Medium Trucks (%)	Heavy Trucks (%)
Chemin Old Montreal Road	2-Lane Rural Arterial	15,000	60	92/8	7	5
Famille-Laporte Avenue	2-Lane Urban Collector	8,000	40	92/8	7	5

2.1.3 Predicted Sound Level

The transportation noise analysis was completed using Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) developed by the Environmental Assessment and Approvals Branch of the MECP, and implemented through STAMSON Version 5.04 noise propagation software. The model inputs used in the ORNAMENT algorithm are outlined in **Section 2.1.2**.

Sensitive Receptor Locations

Facades of the proposed development were assessed for impacts on the plane of windows. Additionally, an Outdoor Living Area sensitive receptor was identified as the outdoor courtyard space in the centre of the proposed development. As per NPC-300, the elevated terraces of the proposed development were not considered to be Outdoor Living Areas because they do not have a minimum depth of 4 metres.

Transportation Noise Impacts

Table 6 summarizes the predicted building façade noise levels from transportation noise sources at the representative sensitive receptors within the proposed development.

Table 6: Transportation Noise Impact Summary Table

Assessment Location		Equivalent Sound Level- L_{eq}[1,2] [dBA]	
		Roadway Impacts	
		Daytime/Evening	Nighttime
Building A	North Façade	**57**	49
	East Façade	55	47
	South Façade	**63**	**54**
	West Façade	**62**	**54**
	Courtyard Outdoor Living Area	45	-
Building B	North Facade	**59**	**51**
	East Façade	53	46
	South Facade	**60**	**52**
	West Façade	**62**	**55**

[1] L_{eq} represents maximum predicted impacts along façade.
[2] Predicted noise levels that exceed the applicable limits are presented in **bold**.

The STAMSON model output is provided in **Appendix C.**

2.1.4 Noise Control Measures

Façade Construction Recommendations

Based on the predicted façade sound levels shown in **Table 6,** and the threshold criteria outlined in **Table 2**, a detailed building component design analysis is not required for the proposed development.

Windows conforming to the Ontario Building Code (OBC) are anticipated to be sufficient to ensure the indoor sound level criteria is met (as outlined in **Table 1**). Windows which meet the structural and energy saving requirements of the OBC typically have STC29 / STC30 ratings.

Ventilation Requirements and Warning Clauses

Due to proximity and exposure, the units of Buildings A and B with north, south, and west facing façades requires the provision for the installation of central air conditioning with a **'Type C'** warning clause.

The list of applicable warning clause requirements is provided in **Appendix D**.

2.2 Stationary Noise Assessment

A review of the site and surrounding area has been conducted to identify potential stationary sources (e.g., industrial / commercials) that have the potential to impact the proposed sensitive use. Additionally, stationary sources associated with the proposed development which have the potential to

impact the surrounding sensitive uses, and the sensitive uses with the proposed development, were reviewed.

2.2.1 MECP Guideline D-6 Compatibility between Industrial Facilities

The MECP's land-use compatibility guidelines (D-series) are intended to prevent or minimize the encroachment of sensitive land uses upon industrial/commercial land uses and vice versa, as these two types of land uses are normally incompatible, due to possible adverse effects (e.g., noise) on the sensitive land use. As per the guideline, potential noise impact from commercial / industrial establishments within the specified area of influence and/or recommended minimum separation distance, as outlined in D-6 (see **Table 7**), should be assessed.

Table 7: Guideline D-6 Potential Influence Area and Recommended Minimum Separation Distance

Industrial Classification [1]	Potential Influence Area	Recommended Minimum Separation Distance
Class I	70 m	20 m
Class II	300 m	70 m
Class III	1000 m	300 m

[1] Industrial classification are outlined in Guideline D-6, and presented in **Appendix E**.

2.2.2 Facilities

The land use planning guide, *D-6 Compatibility between Industrial Facilities*, was utilized for the classification of the surrounding establishments (stationary noise sources) and the compatible proximities for the proposed sensitive land use. The criteria for classification of industrial categories are presented in **Appendix E**.

A site visit was conducted on December 1st, 2021 to identify any industrial / commercial establishments within the area of influence of the proposed development. No industrial / commercial establishments were identified with the potential to impact the noise environment at the proposed development.

At the time of this assessment, mechanical site plans were only available for Building A. The mechanical site plans of Building A were reviewed for potential stationary noise sources. The stationary noise sources of Building B were assumed based on a comparison of floor area between Buildings A and B. The following stationary noise sources with the potential to impact the proposed development and existing surrounding noise sensitive land uses have been identified:

Building A

- Seven HVAC rooftop units (RTU1 - RTU7) located on the roof of Building A;
- Two make-up air units (MAU1 and MAU2) located on the roof of Building A;
- Two exhaust fans (EF1 and EF2) located on the roof of Building A; and
- One emergency generator (GEN1) located on the ground floor adjacent to the east façade of Building A.

Building B

- Five HVAC rooftop units (RTU8 - RTU12) located on the roof of Building B;
- One make-up air unit (MAU3) located on the roof of Building B; and
- One exhaust fan (EF3) located on the roof of Building B.

This assessment should be updated by an Acoustic Consultant as the design of the building services for the proposed development progress and are finalized.

NPC-300 has defined that the occasional movement of vehicles on the property such as delivery of goods to and the removal of goods/refuse from convenience stores, fast food restaurants and similar commercial facilities, etc. are not considered as stationary as stationary sources. Through this classification, the movement of trucks to service the operations of the proposed long term care facility were not considered as stationary noise sources.

2.2.3 Stationary Noise Criteria and Area Classification

MECP Publication NPC-300 outlines applicable noise criteria for the proposed development associated with surrounding industrial and commercial stationary noise sources. The noise criteria are defined using area classifications (not to be confused with the D-6 industrial classifications), which are based on the receptor's existing acoustical environment. NPC-300 classification is as follows:

- Class 1 – Urban Area
- Class 2 – Semi-Urban / Semi – Rural
- Class 3 – Rural Area
- Class 4 – Areas of Redevelopment and Infill

Different sound level limits apply to each area classification. **Table 8** shows the sound level limits for routine operation of equipment.

Table 8: Exclusionary Limits for Stationary Noise Sources - Continuous

Assessment Location	Time Period	Exclusionary Sound Level Limit - L_{eq} 1hr			
		Class 1	Class 2	Class 3	Class 4
Plane of window for living area or sleeping quarters	Daytime (07:00 - 19:00)	50 dBA	50 dBA	45 dBA	60 dBA
	Evening (19:00 - 23:00)	50 dBA	50 dBA	40 dBA	60 dBA
	Nighttime (23:00 - 07:00)	45 dBA	45 dBA	40 dBA	55 dBA
Outdoor points of reception	Daytime (07:00 - 19:00)	50 dBA	50 dBA	45 dBA	55 dBA
	Evening (19:00 - 23:00)	50 dBA	45 dBA	40 dBA	55 dBA

The acoustic environment surrounding the proposed development is dominated by transportation noise and general urban hum during daytime, evening, and nighttime periods. Based on the nature of the area, the Class 1 urban sound level limits would apply.

The noise emitted from emergency equipment in non-emergency situations, such as routine testing, is assessed independently from all other stationary noise sources. The sound level limits under these conditions are 5 dB greater than the sound level limits shown in **Table 8**. Sound level limits do not apply to emergency equipment operating in emergency situations.

2.2.4 Stationary Sources

As detailed in **Section 2.2.2**, stationary noise sources with the potential to impact the proposed development were considered to be the mechanical equipment and the emergency generator servicing the proposed development.

Sound levels for the above-mentioned sources were obtained through manufacturer's data, Dillon's in-house noise database, and publically accessible noise data. Sound level data for the stationary sources used in this assessment are presented in **Table 9**.

Table 9: Stationary Noise Source Sound Power Spectrum

Source	Source Location	Octave Spectrum (dB)									Sound Power Level (dBA)	Information Source
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
RTU1 (Discharge)	Building A Rooftop	-	94.0	92.0	93.0	95.0	92.0	90.0	88.0	84.0	97.6	Man. Data
RTU1 (Supply Fan Inlet)	Building A Rooftop	-	92.0	90.0	88.0	87.0	86.0	87.0	87.0	86.0	95.0[1]	Man. Data
RTU2 (Discharge)	Building A Rooftop	-	95.0	92.0	93.0	98.0	96.0	92.0	88.0	83.0	100.2	Man. Data
RTU2 (Supply Fan Inlet)	Building A Rooftop	-	93.0	82.0	81.0	81.0	89.0	88.0	86.0	84.0	96.0[1]	Man. Data
RTU3 (Discharge)	Building A Rooftop	-	94.0	93.0	95.0	93.0	89.0	89.0	89.0	85.0	94.7[1]	Man. Data
RTU3 (Supply Fan Inlet)	Building A Rooftop	-	91.0	89.0	87.0	86.0	85.0	86.0	85.0	84.0	94.0[1]	Man. Data
RTU4 (Discharge)	Building A Rooftop	-	92.0	90.0	91.0	97.0	93.0	90.0	85.0	80.0	98.1	Man. Data
RTU4 (Supply Fan Inlet)	Building A Rooftop	-	91.0	90.0	89.0	89.0	87.0	86.0	84.0	81.0	94.0[1]	Man. Data
RTU5 (Discharge)	Building A Rooftop	-	97.0	96.0	96.0	102.0	99.0	97.0	93.0	86.0	104.1	Man. Data
RTU5 (Supply Fan Inlet)	Building A Rooftop	-	91.0	95.0	94.0	95.0	92.0	90.0	88.0	84.0	99.0[1]	Man. Data
RTU6 (Discharge)	Building A Rooftop	-	92.0	90.0	91.0	97.0	93.0	90.0	85.0	80.0	98.1	Man. Data
RTU6 (Supply Fan Inlet)	Building A Rooftop	-	91.0	90.0	89.0	89.0	87.0	86.0	84.0	81.0	94.0[1]	Man. Data
RTU7 (Discharge)	Building A Rooftop	-	97.0	96.0	96.0	101.0	99.0	97.0	93.0	88.0	103.8[1]	Man. Data
RTU7 (Supply Fan Inlet)	Building A Rooftop	-	97.0	96.0	94.0	96.0	92.0	91.0	90.0	87.0	100.0[1]	Man. Data
MAU1 / MAU2	Building A Rooftop	-	94.0	93.0	95.0	93.0	89.0	89.0	89.0	85.0	94.7[1]	Dillon Library
EF2 / EF3	Building A Rooftop	-	92.0	90.0	88.0	87.0	86.0	87.0	87.0	86.0	95.0[1]	Dillon Library
GEN1	Building A Ground Level	-	-	84.1	86.4	92.2	88.1	86.3	79.5	77.0	97.8[1]	Man. Data

Source	Source Location	Octave Spectrum (dB)									Sound Power Level (dBA)	Information Source
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
RTU8 - RTU12 (Discharge)	Building B Rooftop	-	94.0	92.0	93.0	95.0	92.0	90.0	88.0	84.0	97.6	Dillon Library
RTU8 - RTU12 (Supply Fan Outlet)	Building B Rooftop	-	92.0	90.0	88.0	87.0	86.0	87.0	87.0	86.0	95.0[1]	Dillon Library
EF4	Building B Rooftop	-	92.0	90.0	88.0	87.0	86.0	87.0	87.0	86.0	95.0[1]	Dillon Library
MAU3	Building B Rooftop	-	94.0	93.0	95.0	93.0	89.0	89.0	89.0	85.0	94.7[1]	Dillon Library

[1] Sound power level normalized to match manufacturer's data.

It is assumed that all rooftop mechanical services will operate continuously and simultaneously during the daytime (07:00-19:00) and evening (19:00-23:00) period, and RTU1 - RTU12 and EF2 – EF4 were assumed to operate with a 50% duty cycle during the nighttime (23:00-07:00) period. Additionally, it is assumed that the testing of the emergency generator will only occur during the daytime and evening periods (07:00-23:00).

2.2.5 Noise Sensitive Points of Reception

As per the MECP noise guidelines NPC-300, a Point of Reception (POR), as it applies to impact assessments of stationary sources, means any location on a noise sensitive land use where noise from a stationary source is received. Noise sensitive land uses include the following lands:

- Permanent, seasonal, or rental residences;
- Hotels, motels, and campgrounds;
- Schools, universities, libraries, and daycare centres;
- Hospitals and clinics, nursing / retirement homes; and
- Places of worship.

The proposed development and surrounding existing residential and institutional land uses are noise sensitive points of reception which require the assessment of potential stationary noise impacts from the proposed development's operations.

The most impacted noise sensitive receptors in each cardinal direction from the proposed development were selected for assessment of stationary noise impacts. A description of each receptor is provided below and summarized in **Table 10.**

Table 10: Stationary Noise Impact Assessment – Points of Reception

Receptor ID	Description	Location
Pr-POR-A	Building A: Proposed four storey long term care facility.	Proposed development at 1161 Old Montreal Road
Pr-POR-B	Building B: Proposed five storey long term care facility.	Proposed development at 1161 Old Montreal Road
Ex-POR-1	Existing two storey residential dwelling.	100 m north of the proposed development at 322 Mishawashkode Street.
Ex-POR-2	Existing two storey residential dwelling.	50 m north of the proposed development at 681 Cartographe Street.
Ex-POR-3	Existing one storey residential dwelling.	50 m east of the proposed development at 1171 Old Montreal Road.
Ex-POR-4	Place of worship.	50 m southwest of the proposed development at 1123 Old Montreal Road.
Ex-POR-5	Existing two storey residential dwelling.	50 m west of the proposed development at 101 Minoterie Ridge.

2.2.6 Predicted Sound Levels

The noise analysis was completed using CADNA/A, an outdoor noise propagation model, based on ISO Standard 9613, Part 1: Calculation of the absorption of sound by the atmosphere, 1993 and Part 2: General method of calculation (ISO-9613-2:1996). The model is capable of incorporating various site specific features, such as elevation, berms, absorptive grounds, and barriers to accurately predict noise levels at specific receptors, pertaining to noise emissions from a particular source / sources. The ISO based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures and topography. The model is considered conservative since as it represents atmospheric conditions that promote propagation of sound from the source to the receiver.

The following assumptions were incorporated in the noise propagation modelling:

- A global ground absorption coefficient of 0.50, representing a mix of absorptive and reflective grounds between sources and receptors, was incorporated in the noise model.
- A second order reflection was incorporated in the noise model.
- The ground within the study area is considered to be generally flat. As such, land topography was not incorporated in the noise model.

For the purposes of the stationary assessment, the Building Evaluation feature in Cadna/A was used to determine building facades with the worst-case noise impacts.

Impacts from the stationary noise sources were predicted through noise propagation modelling. The predicted receptor noise levels (at the proposed residential development site) were compared against the applicable criteria, as specified in NPC-300 (see **Table 8**).

Stationary Noise Impacts – Continuous

Table 11 summarizes the predicted noise levels from stationary noise sources of the building on the proposed development and surrounding noise sensitive receptors.

Table 11: Stationary Noise Impact Summary Table - Continuous

Assessment Location	Continuous Predicted Noise Impacts - L_{eq} 1 hr (dBA)			Meets Class 1 Limits? (Yes/No)
	Plane of Window		Outdoor Point of Reception	
	Daytime/Evening	Nighttime	Daytime/Evening	
Pr-POR-A	**67**	**65**	**59**	No
Pr-POR-B	**64**	**61**	NA	No
Ex-POR-1	**53**	**50**	**54**	No
Ex-POR-2	**59**	**56**	**59**	No
Ex-POR-3	**55**	**53**	**54**	No
Ex-POR-4	**52**	NA	NA	No
Ex-POR-5	**56**	**54**	**54**	No

[1] Predicted noise levels that exceed the applicable limits are presented in **bold**.

The predicted continuous stationary noise impacts on the proposed development and the surrounding existing sensitive receptors are shown graphically in **Figures 3** and **4** for daytime/evening and nighttime, respectively.

Stationary Noise Impacts – Emergency

Table 12 summarizes the predicted noise levels from the testing of the emergency generator on the proposed development and surrounding noise sensitive receptors.

Table 12: Stationary Noise Impact Summary Table – Emergency Generator Testing

Assessment Location	Emergency Testing Predicted Noise Impacts - L_{eq} 1 hr (dBA)			Meets Class 1 Limits? (Yes/No)
	Plane of Window		Outdoor Point of Reception	
	Daytime/Evening	Nighttime	Daytime/Evening	
Pr-POR-A	**70**	NA	32	No
Pr-POR-B	47	NA	NA	Yes
Ex-POR-1	42	NA	44	Yes
Ex-POR-2	52	NA	55	Yes

Assessment Location	Emergency Testing Predicted Noise Impacts - L_{eq} 1 hr (dBA)			Meets Class 1 Limits? (Yes/No)
	Plane of Window		Outdoor Point of Reception	
	Daytime/Evening	Nighttime	Daytime/Evening	
Ex-POR-3	50	NA	47	Yes
Ex-POR-4	35	NA	NA	Yes
Ex-POR-5	22	NA	23	Yes

[1] Predicted noise levels that exceed the applicable limits are presented in **bold**.

The predicted emergency equipment testing noise impacts on the proposed development and the surrounding existing sensitive receptors are shown graphically in **Figure 5** for daytime/evening.

The results indicate that the MECP Class 1 exclusionary limits for continuous noise impacts and emergency equipment testing are exceeded at multiple facades throughout the proposed development and the surrounding existing sensitive receptors. As such, noise mitigation measures are required.

2.2.7 Noise Mitigation Measures

The modelling results indicate that noise levels from the operations of the proposed development are predicted to exceed the NPC-300 Class 1 exclusionary limits for many of the assessed noise sensitive receptors. Through noise modelling iterations, it was determined that mitigation in the form of acoustic barriers and reductions in the sound power level of stationary noise sources will be required to achieve compliance with NPC-300.

Two conceptual mitigation options (Option 1 and Option 2) have been assessed to achieve compliance with NPC-300 Class 1 exclusionary limits. Through increasing the required sound power level reductions, Option 1 has decreased acoustic barrier requirements when compared to Option 2. While Option 2 provides more acoustic barrier requirements to minimize the required sound power level reductions. The barrier and required sound power level reductions of Option 1 and Option 2 are summarized below.

The noise barriers detailed below should have a minimum surface density (face weight) of 20 kg/m^2 and should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without any surface gaps. Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained.

2.2.7.1 Stationary Noise Mitigation Option 1

Barriers

The following rooftop barriers are recommended for the proposed development:

- An L-shaped acoustic barrier with a length of 10 m and height of 2.5 m located around RTU2;
- An L-shaped acoustic barrier with a length of 10 m and height of 2.5 m located around RTU3;

- An L-shaped acoustic barrier with a length of 9 m and height of 2.5 m located around RTU6;
- An L-shaped acoustic barrier with a length of 9 m and height of 2.5 m located around RTU7; and
- An L-shaped acoustic barrier with a length of 7 m and height of 2.5 m located around MAU1 and MAU2.

The noise barrier locations for Option 1 are shown in **Figure 6**.

Stationary Noise Source Power Level Reductions

Table 13 summarizes the maximum allowable sound levels of the proposed development's stationary noise sources.

Table 13: Option 1 - Stationary Noise Sources Maximum Allowable Sound Levels

Source	Source Location	Maximum Allowable Sound Power Level (dBA)
RTU1 (Discharge)	Building A Rooftop	80
RTU1 (Supply Fan Inlet)	Building A Rooftop	81
RTU2 (Discharge)	Building A Rooftop	80
RTU2 (Supply Fan Inlet)	Building A Rooftop	79
RTU3 (Discharge)	Building A Rooftop	79
RTU3 (Supply Fan Inlet)	Building A Rooftop	84
RTU4 (Discharge)	Building A Rooftop	83
RTU4 (Supply Fan Inlet)	Building A Rooftop	84
RTU5 (Discharge)	Building A Rooftop	79
RTU5 (Supply Fan Inlet)	Building A Rooftop	81
RTU6 (Discharge)	Building A Rooftop	76
RTU6 (Supply Fan Inlet)	Building A Rooftop	79
RTU7 (Discharge)	Building A Rooftop	79
RTU7 (Supply Fan Inlet)	Building A Rooftop	85
MAU1	Building A Rooftop	75
MAU2	Building A Rooftop	79
EF2 / EF3	Building A Rooftop	77
GEN1	Building A Ground Level	81
RTU8 - RTU12 (Discharge)	Building B Rooftop	85
RTU8 - RTU12 (Supply Fan Outlet)	Building B Rooftop	85
EF4	Building B Rooftop	85
MAU3	Building B Rooftop	85

2.2.7.2 Stationary Noise Mitigation Option 2

Barriers

The following rooftop barriers are recommended for the proposed development:

- An L-shaped acoustic barrier with a length of 14 m and height of 2.5 m located around RTU2;
- An L-shaped acoustic barrier with a length of 10 m and height of 2.5 m located around RTU3;
- An L-shaped acoustic barrier with a length of 16 m and height of 2.5 m located around RTU6;
- An L-shaped acoustic barrier with a length of 9 m and height of 2.5 m located around RTU7;
- An L-shaped acoustic barrier with a length of 8 m and height of 2.5 m located around MAU1 and MAU2; and
- acoustic barriers with a length of 4 m and height of 2.5 m located around RTU8, RTU9, RTU10, RTU11, and RTU12.

The noise barrier locations for Option 2 are shown in **Figure 7**.

Stationary Noise Source Power Level Reductions

Table 14 summarizes the maximum allowable sound levels of the proposed development's stationary noise sources.

Table 14: Option 2 - Stationary Noise Sources Maximum Allowable Sound Levels

Source	Source Location	Maximum Allowable Sound Power Level (dBA)
RTU1 (Discharge)	Building A Rooftop	82
RTU1 (Supply Fan Inlet)	Building A Rooftop	85
RTU2 (Discharge)	Building A Rooftop	80
RTU2 (Supply Fan Inlet)	Building A Rooftop	86
RTU3 (Discharge)	Building A Rooftop	79
RTU3 (Supply Fan Inlet)	Building A Rooftop	84
RTU4 (Discharge)	Building A Rooftop	83
RTU4 (Supply Fan Inlet)	Building A Rooftop	84
RTU5 (Discharge)	Building A Rooftop	83
RTU5 (Supply Fan Inlet)	Building A Rooftop	84
RTU6 (Discharge)	Building A Rooftop	76
RTU6 (Supply Fan Inlet)	Building A Rooftop	79
RTU7 (Discharge)	Building A Rooftop	82
RTU7 (Supply Fan Inlet)	Building A Rooftop	85
MAU1 / MAU2	Building A Rooftop	79
EF2 / EF3	Building A Rooftop	80
GEN1	Building A Ground Level	81
RTU8 - RTU12 (Discharge)	Building B Rooftop	87
RTU8 - RTU12 (Supply Fan Outlet)	Building B Rooftop	85
EF4	Building B Rooftop	85
MAU3	Building B Rooftop	85

2.2.8 Mitigated Predicted Sound Levels

Stationary Noise Impacts – Option 1 Mitigated Continuous

Table 15 summarizes the mitigation Option 1 predicted noise levels from stationary noise sources of the building on the proposed development and surrounding noise sensitive receptors. Mitigation Option 2 is also able to achieve compliance with NPC-300 Class 1 exclusionary criteria.

Table 14: Stationary Noise Impact Summary Table – Continuous Mitigation Option 1

Assessment Location	Continuous Predicted Noise Impacts - L_{eq} 1 hr (dBA)			Meets Class 1 Limits? (Yes/No)
	Plane of Window		Outdoor Point of Reception	
	Daytime/Evening	Nighttime	Daytime/Evening	
Pr-POR-A	48	45	41	Yes
Pr-POR-B	46	43	NA	Yes
Ex-POR-1	40	37	41	Yes
Ex-POR-2	41	38	41	Yes
Ex-POR-3	37	35	37	Yes
Ex-POR-4	37	NA	NA	Yes
Ex-POR-5	42	39	40	Yes

The predicted mitigated continuous stationary noise impacts on the proposed development and the surrounding existing sensitive receptors are shown graphically in **Figures 8** and **9** for daytime/evening and nighttime, respectively.

Stationary Noise Impacts – Mitigated Emergency Generator Testing

Table 16 summarizes the mitigated predicted noise levels from the testing of the emergency generator on the proposed development and surrounding noise sensitive receptors.

Table 15: Stationary Noise Impact Summary Table - Emergency Mitigated

Assessment Location	Emergency Testing Predicted Noise Impacts - L_{eq} 1 hr (dBA)			Meets Class 1 Limits? (Yes/No)
	Plane of Window		Outdoor Point of Reception	
	Daytime/Evening	Nighttime	Daytime/Evening	
Pr-POR-A	54	NA	16	Yes
Pr-POR-B	31	NA	NA	Yes
Ex-POR-1	26	NA	27	Yes
Ex-POR-2	36	NA	38	Yes
Ex-POR-3	34	NA	30	Yes
Ex-POR-4	18	NA	NA	Yes
Ex-POR-5	6	NA	7	Yes

The predicted emergency equipment testing noise impacts on the proposed development and the surrounding existing sensitive receptors are shown graphically in **Figure 10** for daytime/evening.

The conceptual mitigation options (Option 1 and Option 2) are based on multiple assumptions (source heights, source data, design, etc.). Mitigation Option 1 and Option 2 are conceptual solutions that demonstrate that compatibility can be achieved with the introduction of the proposed development. As

the mechanical and building designs progress, the stationary noise assessment should be updated by an Acoustic Consultant, in consultation with the mechanical design and architectural teams.

3.0 Conclusions

Dillon Consulting Limited (Dillon) was retained Montgomery Sisam Architects Inc. to complete a noise control detailed assessment as requested by the City of Ottawa for a proposal long term care facility located at 1161 Old Montreal Road, in Ottawa, Ontario. This study has been completed in support of a Zoning By-law Amendment (ZBA) application for the proposed development.

The noise assessment presented herein focused on the noise impacts of transportation sources on the proposed use, as well as stationary noise sources of the proposed development on itself and surrounding noise sensitive receptors.

The assessment demonstrates noise impacts from transportation sources as well as stationary noise sources associated with the proposed development result in noise exceedances above the applicable criteria at the proposed development and surrounding noise sensitive receptors. As such, noise mitigation measures are required. This report specifies conceptual noise mitigation options in the form of a warning clause, acoustic barriers, and maximum allowable sound levels for rooftop mechanical equipment and the emergency generator. With the implementation of noise mitigation, the proposed development is predicted to be able to achieve compliance with all applicable criteria for transportation and stationary noise sources.

As the recommended mitigation measures for the proposed development may not be aligned with the design of the long term care centre (i.e., mechanical design needs), alternative mitigation measures may be feasible to ensure compatibility. Such as mechanical equipment selection (quieter and/or smaller units), equipment location, enclosed roof-top mechanical rooms, etc.). This assessment should be updated by an Acoustic Consultant as the design of the building services for the proposed development progress and are finalized.

4.0 Closure

This noise control detailed assessment has been prepared based on the information provided and/or approved by Montgomery Sisam Architects Inc. This report is intended to provide a reasonable review of available information within an agreed work scope, schedule, and budget. This report was prepared by Dillon for the sole benefit of Montgomery Sisam Architects Inc. The material in the report reflects Dillon's judgement in light of the information available to Dillon at the time of this report preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

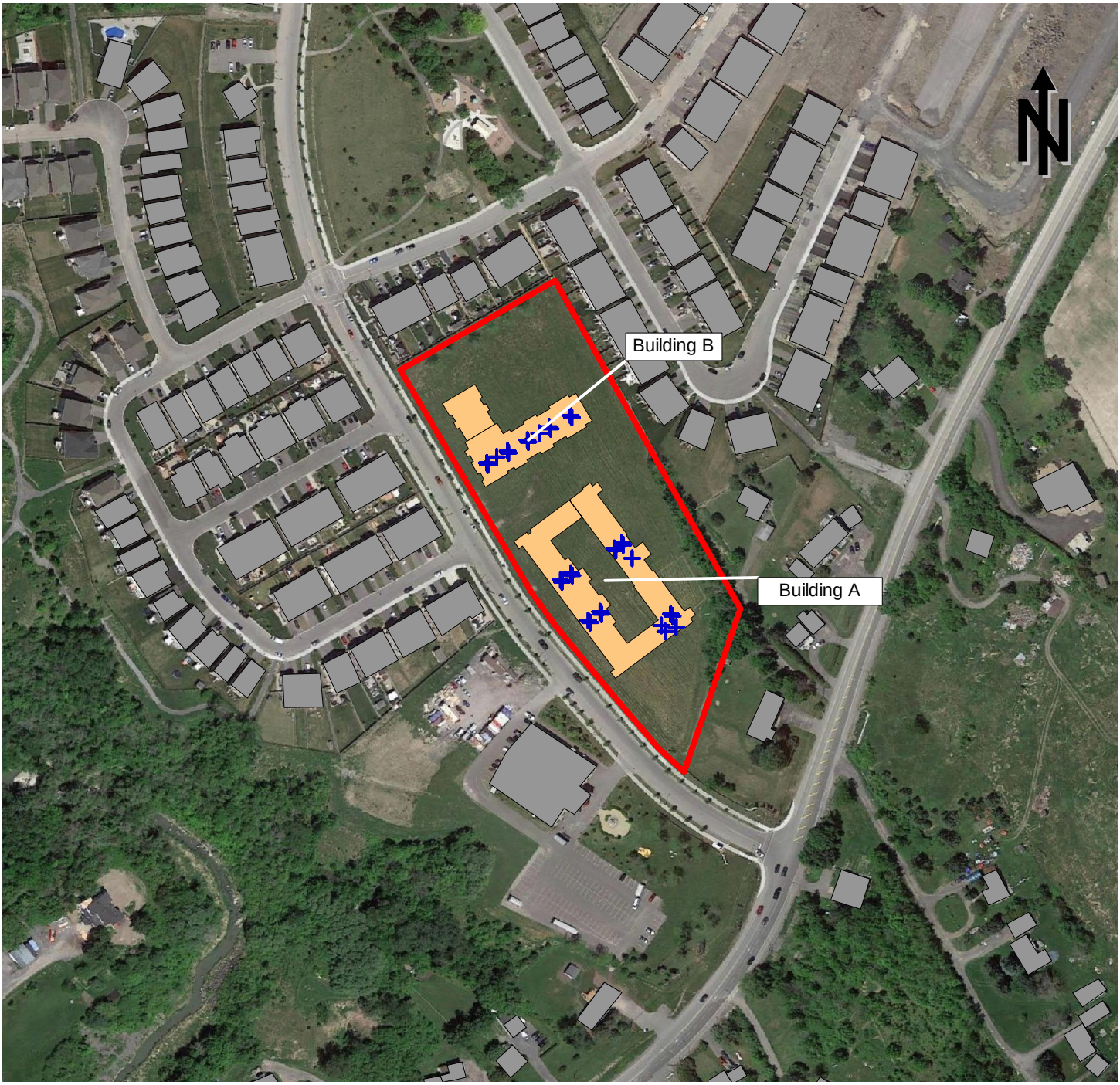
We trust that the report is to your satisfaction. Please do not hesitate to contact the undersigned if you have any further questions on this report.

Respectfully Submitted:
DILLON CONSULTING LIMITED

Lucas Arnold, P.Eng.
Associate

Callum Heggart, EIT

Figures



Scale 1: 3,000

Figure 1

Subject Site and Surrounding Area

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING

Scale 1: 1,000

Figure 2

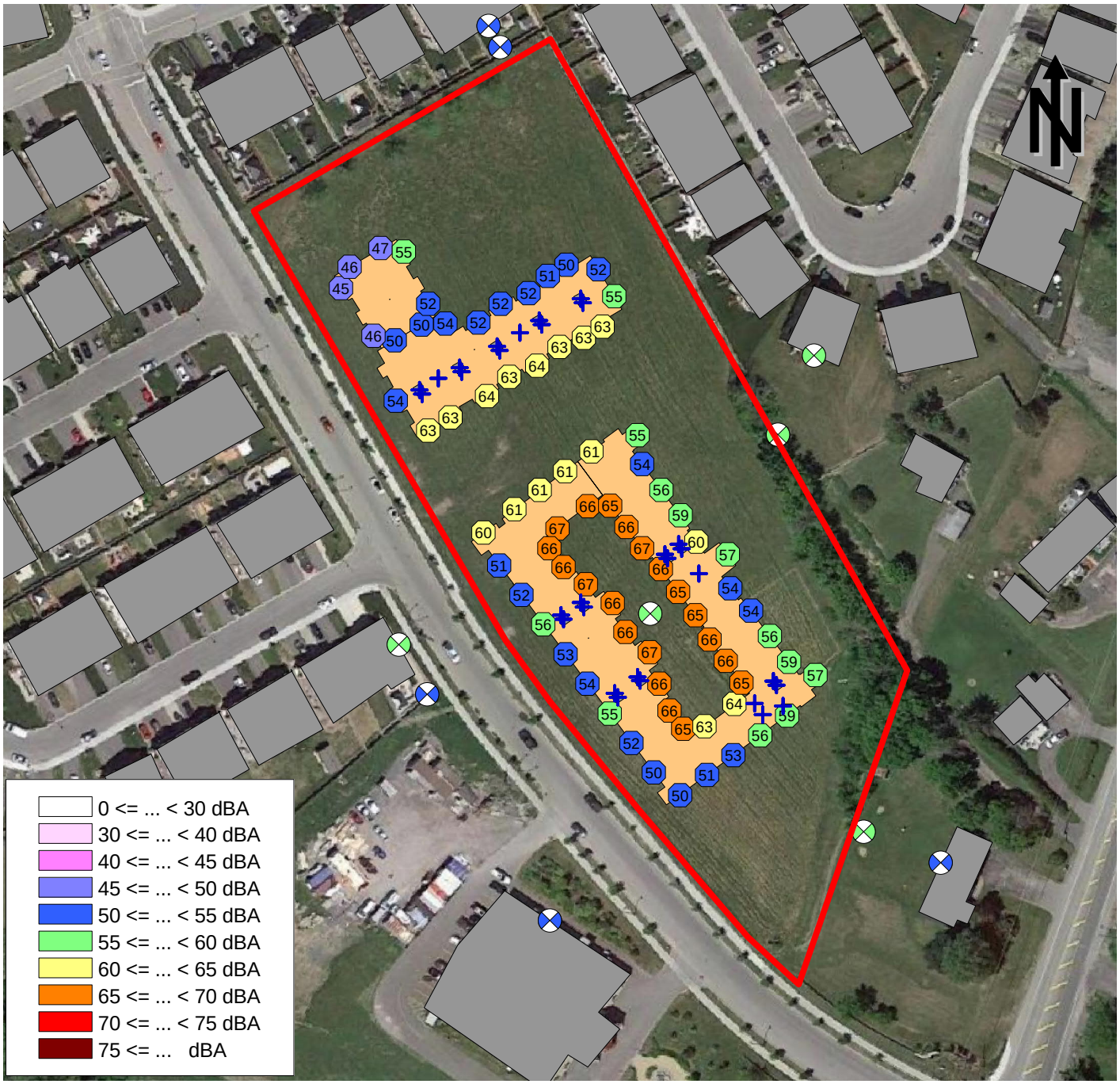
Stationary Noise Source Locations

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 3

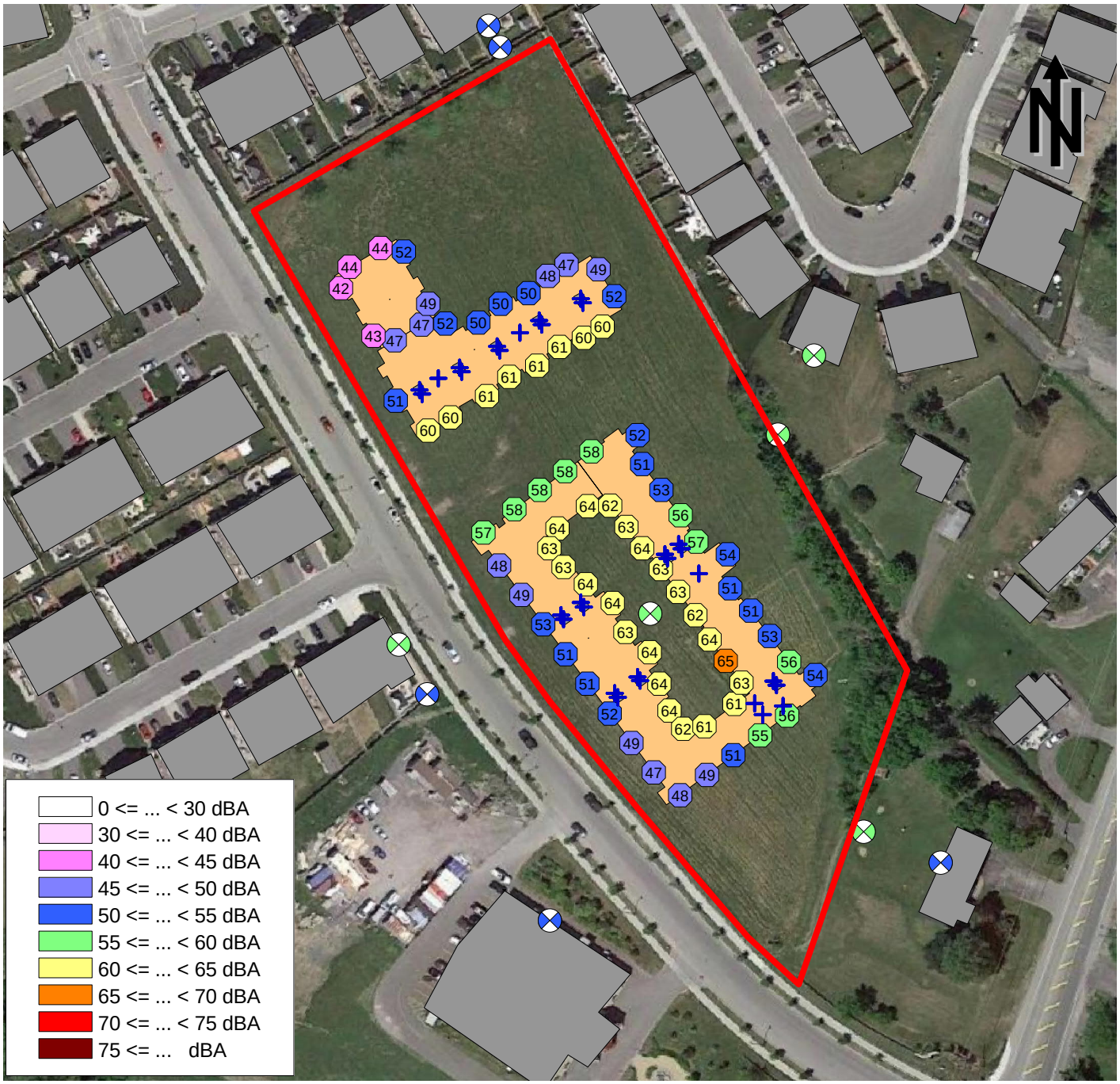
Stationary Noise Impacts - Continuous Daytime/Evening

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 4

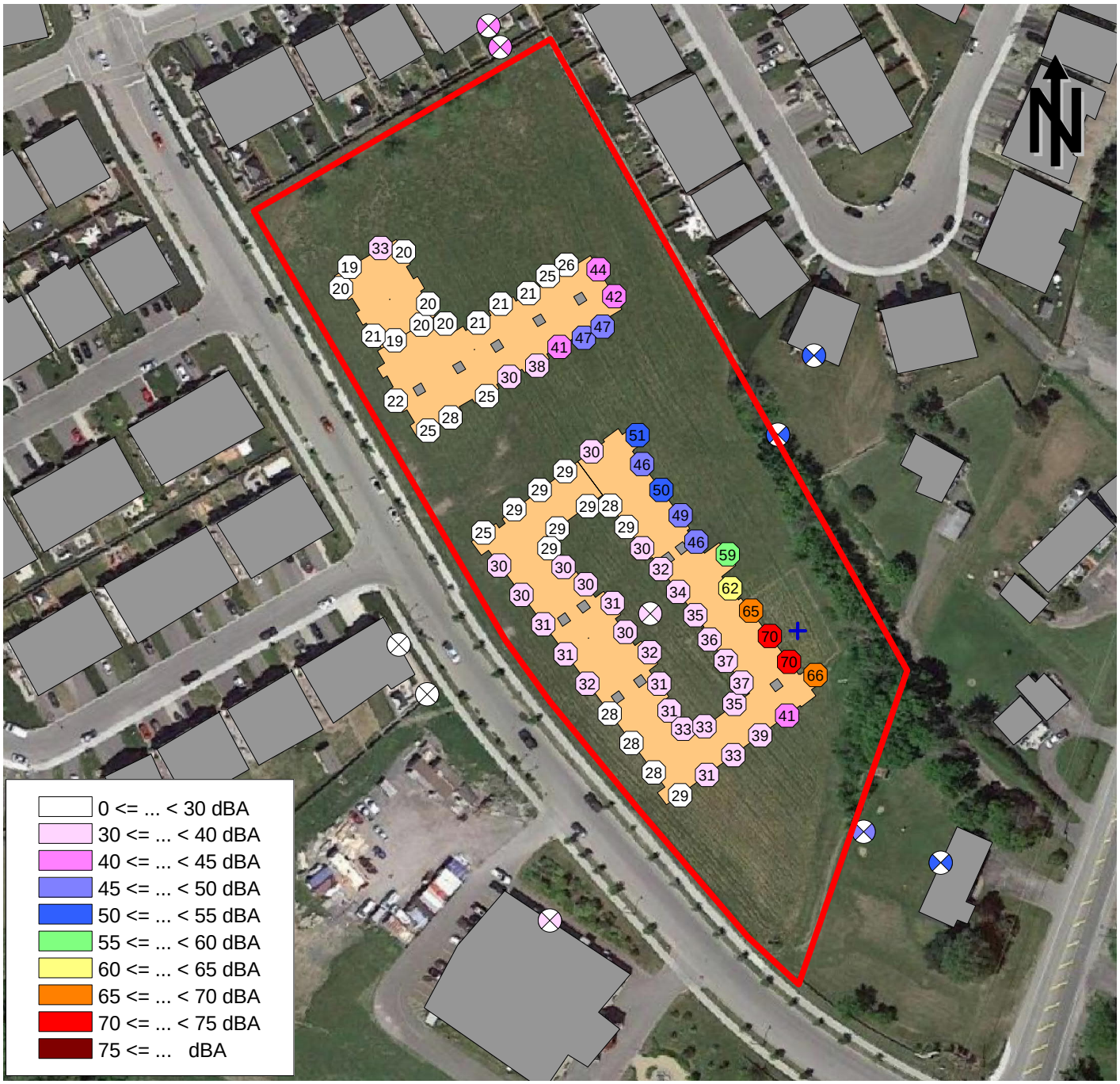
Stationary Noise Impacts - Continuous Nighttime

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 5

Stationary Noise Impacts - Emergency Daytime/Evening

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

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Scale 1: 2,200

Figure 6

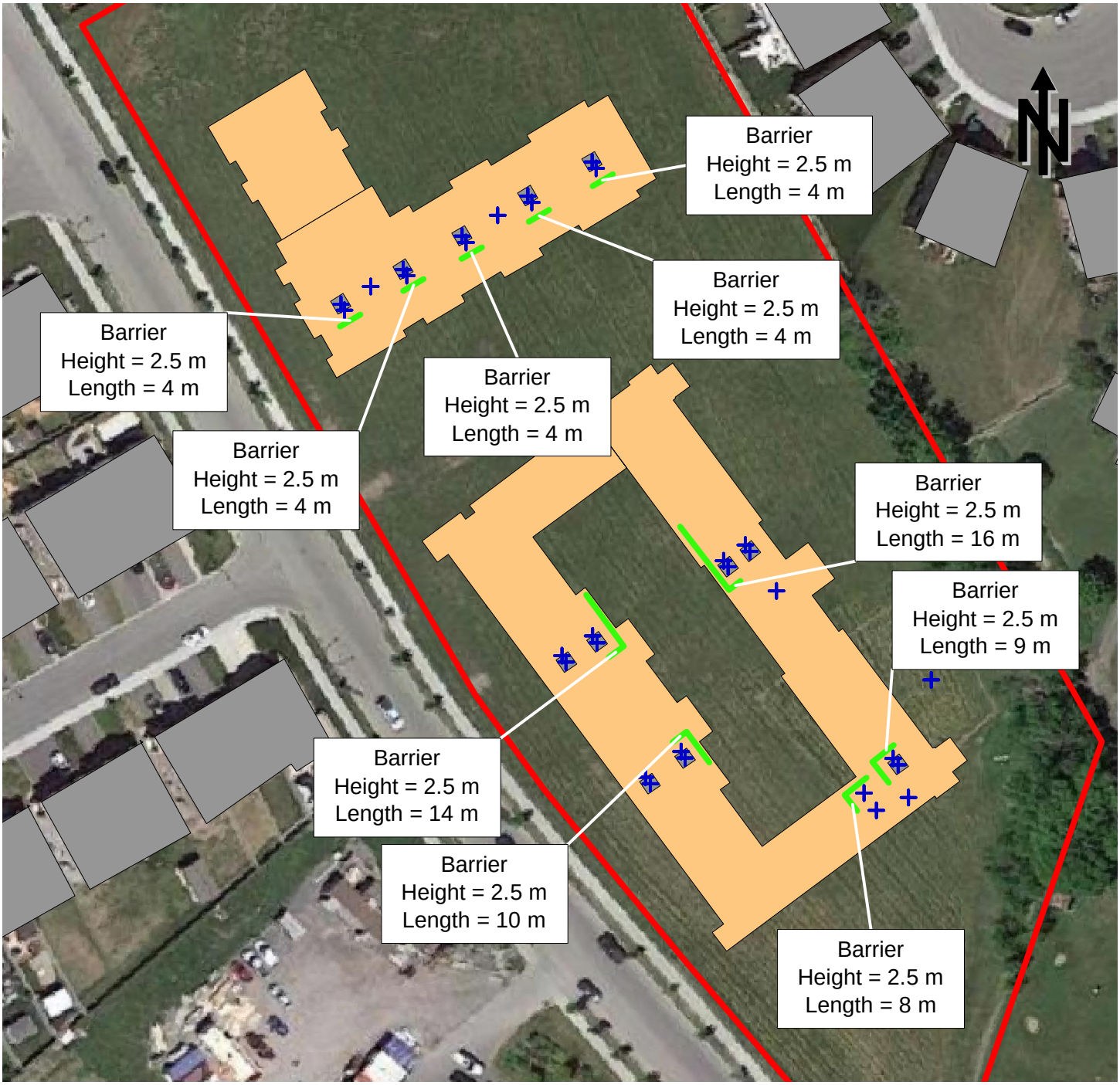
Proposed Acoustic Barriers
Mitigation Option 1

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 2,200

Figure 7

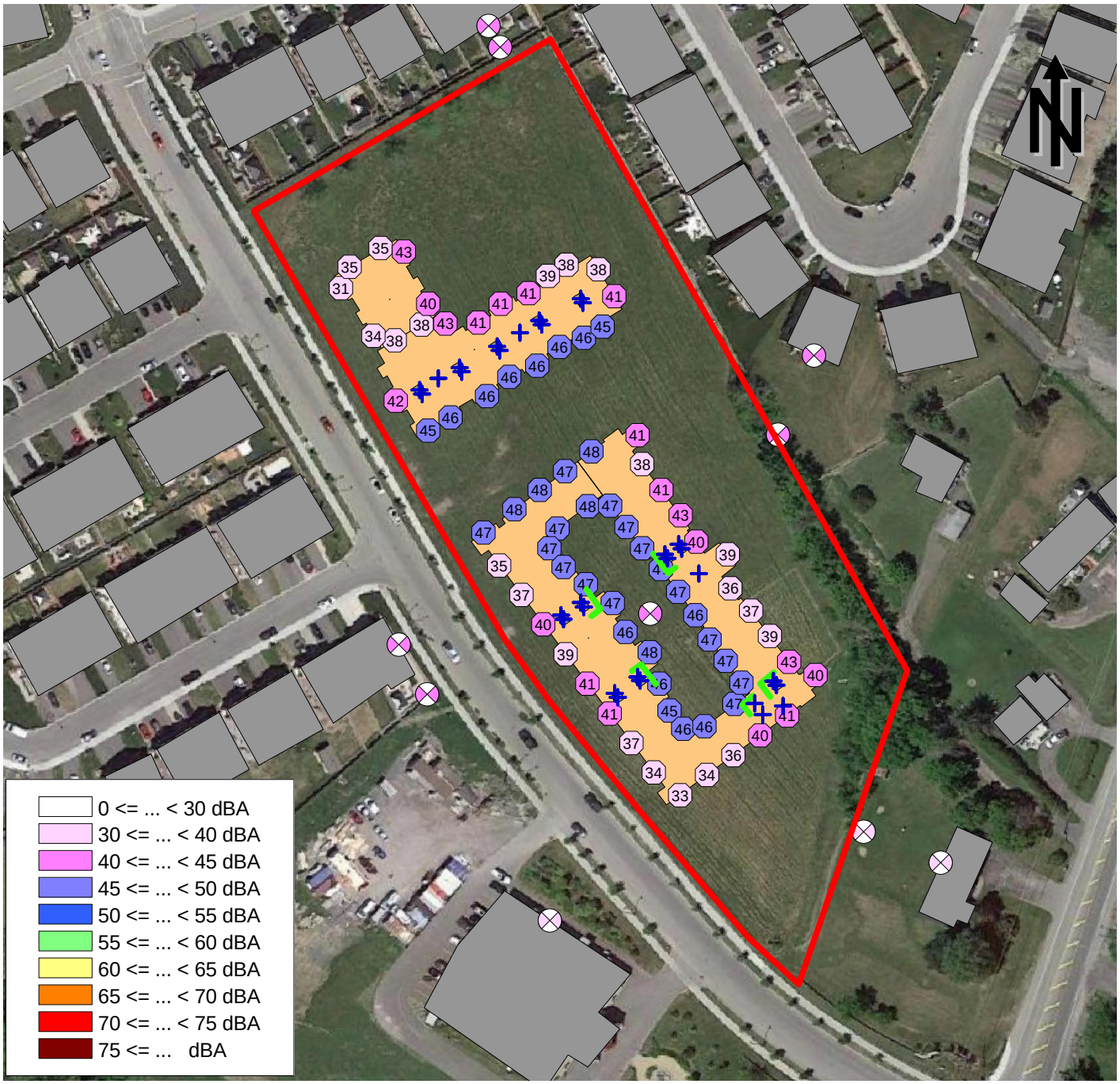
Proposed Acoustic Barriers
Mitigation Option 2

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 8

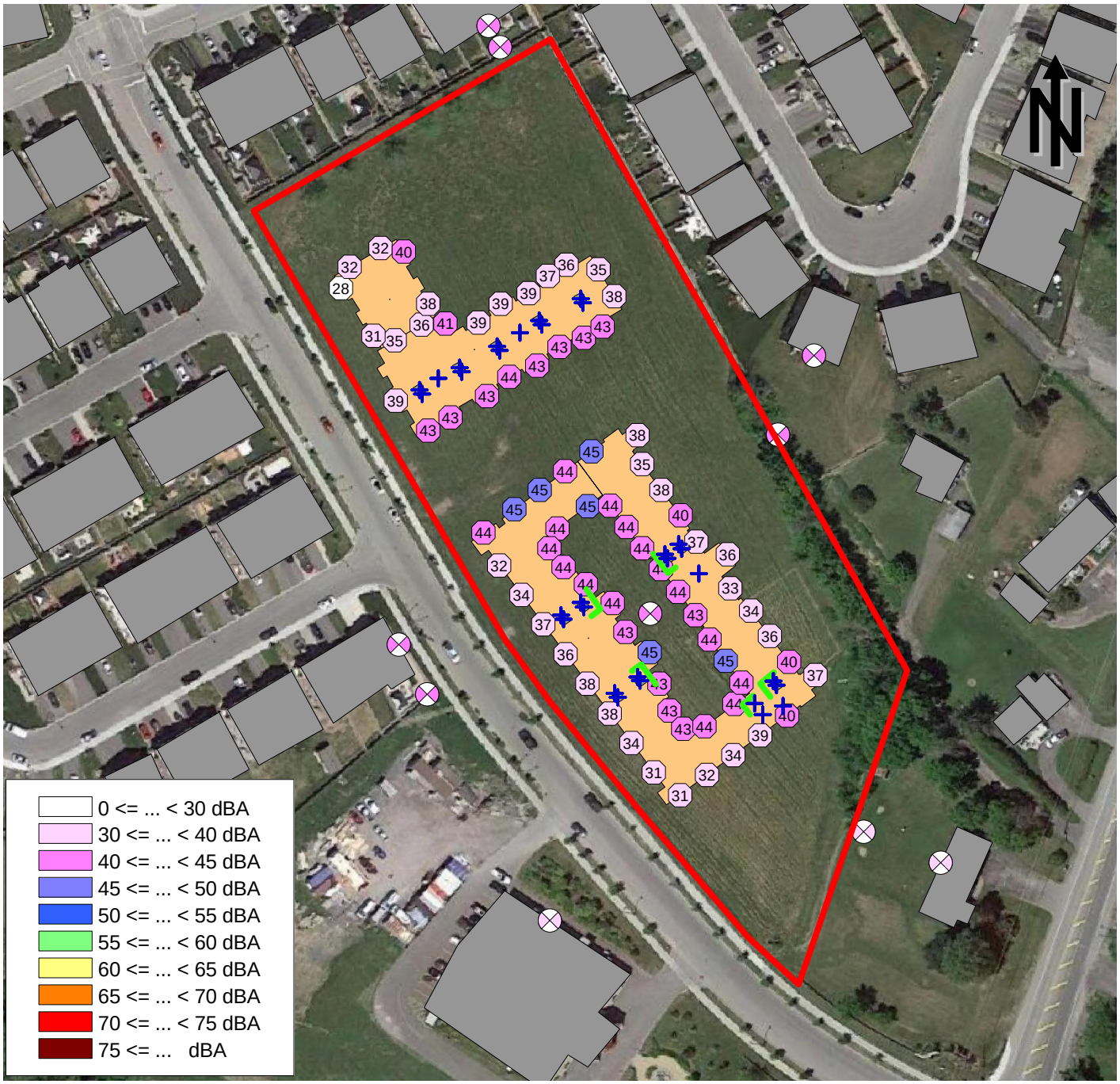
Stationary Noise Impacts - Continuous Daytime/Evening - Mitigation Option 1

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 9

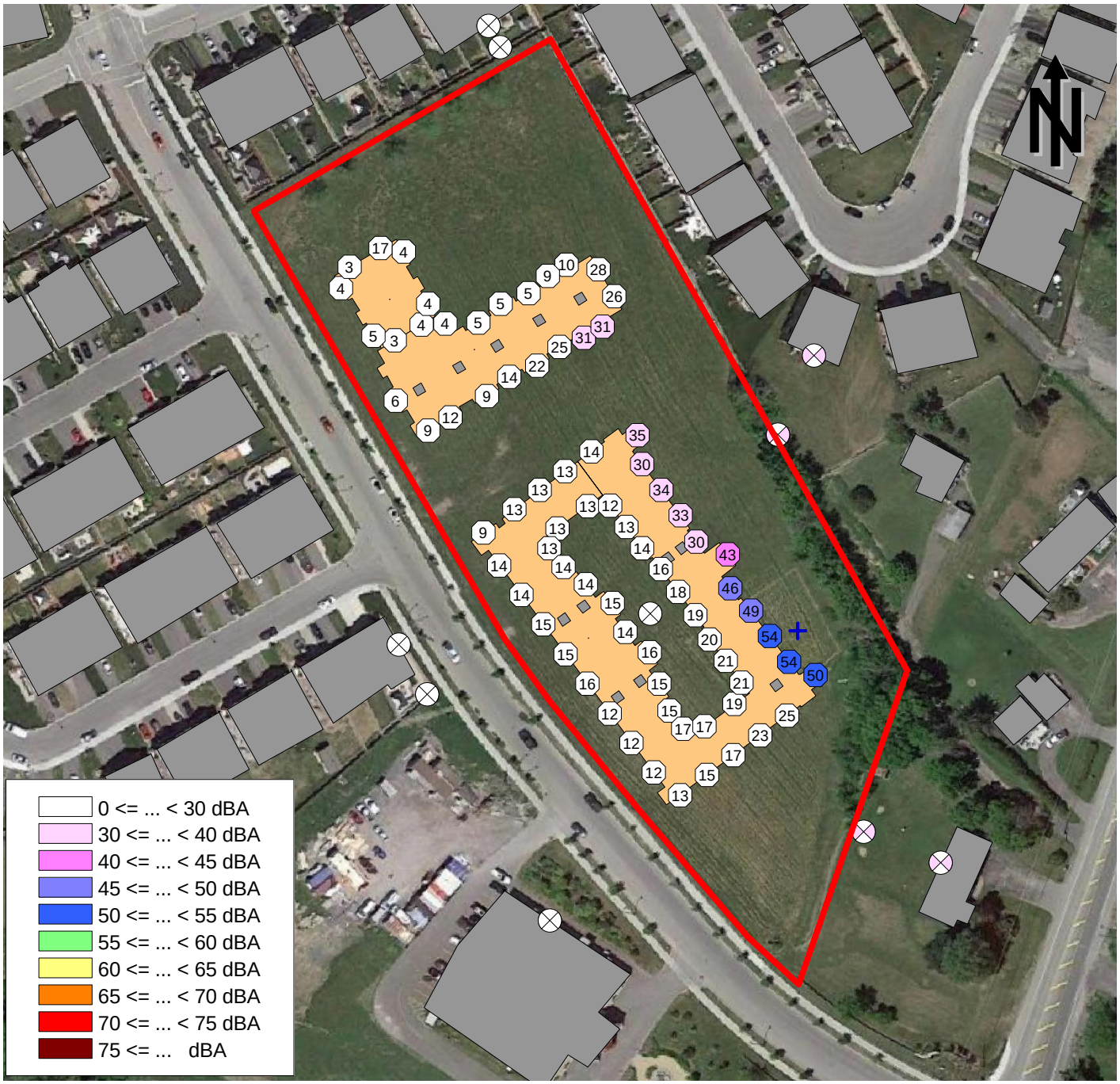
Stationary Noise Impacts - Continuous Nighttime - Mitigation Option 1

Project # 21-2647

Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING



Scale 1: 1,600

Figure 10

Stationary Noise Impacts - Emergency Daytime/Evening - Mitigated

Project # 21-2647

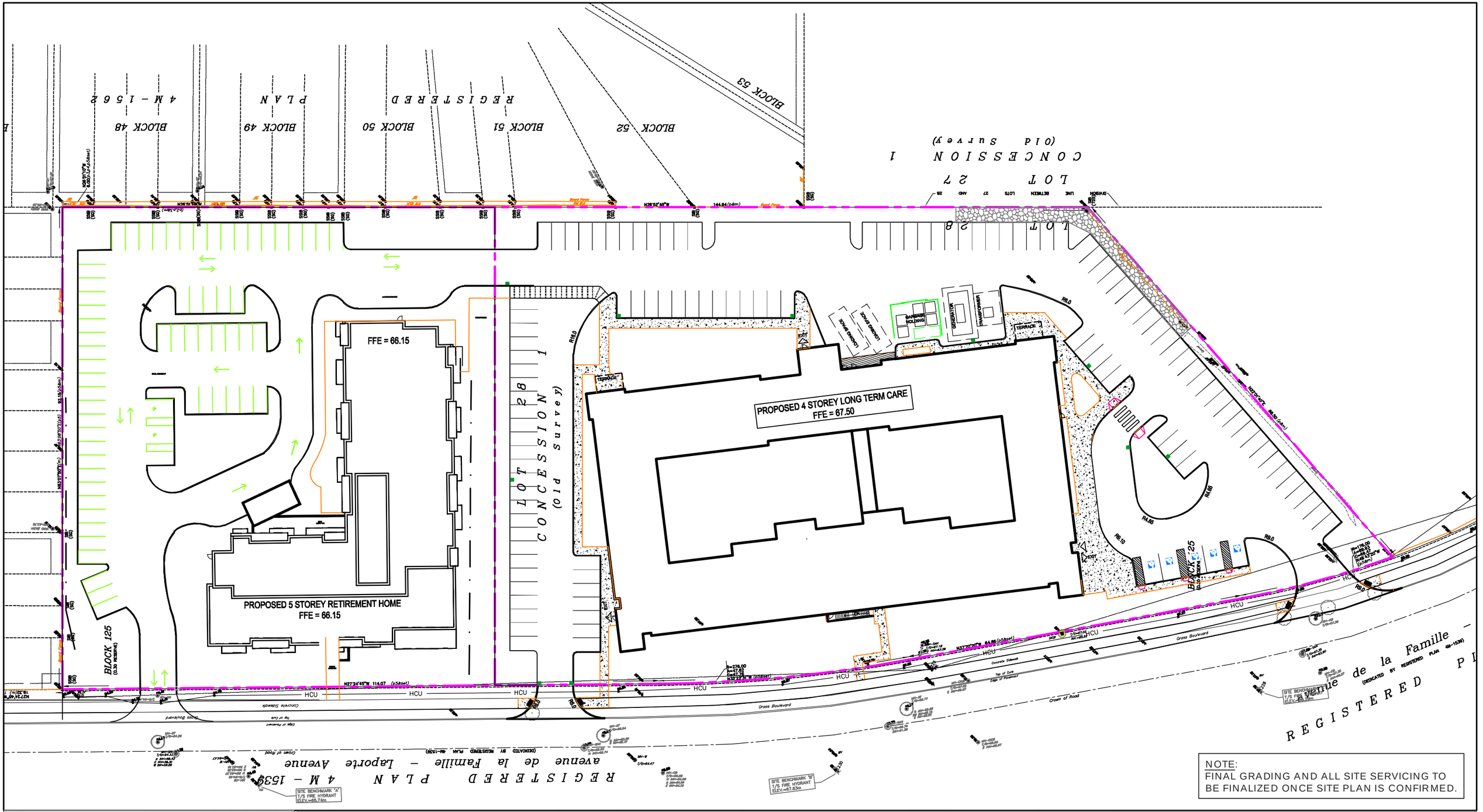
Jul 2022

1161 Old Montreal Road, Ottawa, Ontario

DILLON CONSULTING

Appendix A

Development Site Plan and Drawings



NOTE:
FINAL GRADING AND ALL SITE SERVICING TO BE FINALIZED ONCE SITE PLAN IS CONFIRMED.

ARCH CORP ORLEANS
1161 Old Montreal Road, Ottawa, ON

SITE SERVICING PLAN
FIGURE 1.0

SUBJECT SITE
(±1.99 Ha)

FUTURE BUILDING

File Location:
c:\pw working directory\projects
2021\32cdp\dms62260\archcorp_orleans_fsr_overall.dwg
February, 23, 2022 3:56 PM

MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.
CREATED BY: KRK
CHECKED BY: CDP
DESIGNED BY: KRK

SCALE: 1:1500

PROJECT: 21-2647
STATUS: PRELIMINARY
DATE: 02/22/2022

Appendix B

Traffic Data

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

[2] The number of lanes is determined by the future mature state of the roadway.

Appendix C

STAMSON Modelling

STAMSON 5.0 NORMAL REPORT Date: 11-07-2022 09:38:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_1n.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -10.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 165.00 /
165.00 m Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille-L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille-L (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 24.00 /
24.00 m
Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 43.46 + 0.00) = 43.46 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -10 0
0.34 70.00 0.00 -13.98 -12.56 0.00 0.00 0.00 43.46 ----------

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

Segment Leq : 43.46 dBA


Results segment # 2: Famille-L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.34 + 0.00) = 57.34 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.34 63.96 0.00 -2.74 -3.87 0.00 0.00 0.00 57.34 ---------------------------
------------------------------------------------

Segment Leq : 57.34 dBA
 Total Leq All Segments: 57.51 dBA


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

Source height = 1.50 m

ROAD (0.00 + 35.86 + 0.00) = 35.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -10 0
0.34 62.40 0.00 -13.98 -12.56 0.00 0.00 0.00 35.86 -------------------------
------------------------------------------------

Segment Leq : 35.86 dBA


Results segment # 2: Famille-L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.75 + 0.00) = 49.75 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.34 56.36 0.00 -2.74 -3.87 0.00 0.00 0.00 49.75 ---------------------------
------------------------------------------------

Segment Leq : 49.75 dBA
 Total Leq All Segments: 49.92 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 57.51
 (NIGHT): 49.92
```

STAMSON 5.0 NORMAL REPORT Date: 08-07-2022 11:49:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_1e.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 100.00 /
100.00 m Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 55.07 + 0.00) = 55.07 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 0
0.34 70.00 0.00 -11.06 -3.87 0.00 0.00 0.00 55.07 ----------

Segment Leq : 55.07 dBA

Total Leq All Segments: 55.07 dBA

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

Source height = 1.50 m

ROAD (0.00 + 47.47 + 0.00) = 47.47 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 0
0.34 62.40 0.00 -11.06 -3.87 0.00 0.00 0.00 47.47 ----------

Segment Leq : 47.47 dBA

Total Leq All Segments: 47.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.07
 (NIGHT): 47.47

STAMSON 5.0 NORMAL REPORT Date: 08-07-2022 10:29:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_1s.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 86.00 /
86.00 m Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 21.00 /
21.00 m
Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 58.96 + 0.00) = 58.96 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 90
0.34 70.00 0.00 -10.18 -0.86 0.00 0.00 0.00 58.96 ----------

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

Segment Leq : 58.96 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.12 + 0.00) = 58.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
-----------------------------------------------------------------  -90 0
0.34 63.96 0.00 -1.96 -3.87 0.00 0.00 0.00 58.12 ---------------------------
------------------------------------------------

Segment Leq : 58.12 dBA
 Total Leq All Segments: 61.57 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.36 + 0.00) = 51.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
-----------------------------------------------------------------  -90 90
0.34 62.40 0.00 -10.18 -0.86 0.00 0.00 0.00 51.36 ---------------------------
------------------------------------------------

Segment Leq : 51.36 dBA


Results segment # 2: Famille_L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.53 + 0.00) = 50.53 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
-----------------------------------------------------------------  -90 0
0.34 56.36 0.00 -1.96 -3.87 0.00 0.00 0.00 50.53 ---------------------------
------------------------------------------------

Segment Leq : 50.53 dBA
 Total Leq All Segments: 53.98 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 61.57
 (NIGHT): 53.98
```

STAMSON 5.0 NORMAL REPORT Date: 08-07-2022 11:14:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_1w.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : 0.00 deg 52.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 100.00 /
100.00 m Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 22.00 /
22.00 m
Receiver height : 12.10 / 12.10 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 53.33 + 0.00) = 53.33 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- 0 52
0.34 70.00 0.00 -11.06 -5.61 0.00 0.00 0.00 53.33 ----------

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

Segment Leq : 53.33 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.86 + 0.00) = 60.86 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 90
0.34 63.96 0.00 -2.23 -0.86 0.00 0.00 0.00 60.86 ---------------------------
------------------------------------------------

Segment Leq : 60.86 dBA
 Total Leq All Segments: 61.57 dBA


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

Source height = 1.50 m

ROAD (0.00 + 45.73 + 0.00) = 45.73 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  0 52
0.34 62.40 0.00 -11.06 -5.61 0.00 0.00 0.00 45.73 --------------------------
------------------------------------------------

Segment Leq : 45.73 dBA


Results segment # 2: Famille_L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.27 + 0.00) = 53.27 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 90
0.34 56.36 0.00 -2.23 -0.86 0.00 0.00 0.00 53.27 ---------------------------
------------------------------------------------

Segment Leq : 53.27 dBA
 Total Leq All Segments: 53.97 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 61.57
 (NIGHT): 53.97
```

STAMSON 5.0 NORMAL REPORT Date: 11-07-2022 09:41:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_1o.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------
Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 135.00 / 135.00 m Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier) Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 14.40 m
Barrier receiver distance : 30.00 / 30.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------
Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.) No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 45.00 / 45.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier) Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 14.40 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m

```
Barrier elevation : 0.00 m
Reference angle : 0.00


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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m) ------------+---------
----+-------------+--------------
 1.50 ! 1.50 ! 1.50 ! 1.50
 ROAD (0.00 + 43.29 + 0.00) = 43.29 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
-------------------------------------------------------------------------  -90 90
0.00 70.00 0.00 -9.54 0.00 0.00 0.00 -17.16 43.29  -------------------------
-----------------------------------------------

Segment Leq : 43.29 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

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

ROAD (0.00 + 40.40 + 0.00) = 40.40 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
-------------------------------------------------------------------------  -90 90
0.00 63.96 0.00 -4.77 0.00 0.00 0.00 -18.79 40.40  -------------------------
-----------------------------------------------

Segment Leq : 40.40 dBA

Total Leq All Segments: 45.09 dBA


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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
```

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m) ------------+---------
----+-------------+--------------
 1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 35.69 + 0.00) = 35.69 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 90
0.00 62.40 0.00 -9.54 0.00 0.00 0.00 -17.16 35.69 -------------------------
----

Segment Leq : 35.69 dBA

Results segment # 2: Famille_L (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m) ------------+---------
----+-------------+--------------
 1.50 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 32.80 + 0.00) = 32.80 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 90
0.00 56.36 0.00 -4.77 0.00 0.00 0.00 -18.79 32.80 -------------------------
----

Segment Leq : 32.80 dBA

Total Leq All Segments: 37.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 45.09
 (NIGHT): 37.49

STAMSON 5.0 NORMAL REPORT Date: 11-07-2022 09:45:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_2n.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -10.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 170.00 /
170.00 m Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 21.00 /
21.00 m
Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 44.36 + 0.00) = 44.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
---------- -10 0
0.24 70.00 0.00 -13.08 -12.56 0.00 0.00 0.00 44.36 ----------

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

Segment Leq : 44.36 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.50 + 0.00) = 58.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.24 63.96 0.00 -1.81 -3.64 0.00 0.00 0.00 58.50 ---------------------------
------------------------------------------------

Segment Leq : 58.50 dBA
 Total Leq All Segments: 58.66 dBA


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

Source height = 1.50 m

ROAD (0.00 + 36.77 + 0.00) = 36.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -10 0
0.24 62.40 0.00 -13.08 -12.56 0.00 0.00 0.00 36.77 -------------------------
------------------------------------------------

Segment Leq : 36.77 dBA


Results segment # 2: Famille_L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.91 + 0.00) = 50.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.24 56.36 0.00 -1.81 -3.64 0.00 0.00 0.00 50.91 ---------------------------
------------------------------------------------

Segment Leq : 50.91 dBA
 Total Leq All Segments: 51.07 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 58.66
 (NIGHT): 51.07
```

STAMSON 5.0 NORMAL REPORT Date: 08-07-2022 11:45:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_2e.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 170.00 /
170.00 m Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 53.28 + 0.00) = 53.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 0
0.24 70.00 0.00 -13.08 -3.64 0.00 0.00 0.00 53.28 ----------

Segment Leq : 53.28 dBA

Total Leq All Segments: 53.28 dBA

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

Source height = 1.50 m

ROAD (0.00 + 45.68 + 0.00) = 45.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
--- -90 0
0.24 62.40 0.00 -13.08 -3.64 0.00 0.00 0.00 45.68 ----------

Segment Leq : 45.68 dBA

Total Leq All Segments: 45.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.28
 (NIGHT): 45.68

STAMSON 5.0 NORMAL REPORT Date: 11-07-2022 09:46:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_2s.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 170.00 /
170.00 m Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 21.00 /
21.00 m
Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 53.28 + 0.00) = 53.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
---------- -90 0
0.24 70.00 0.00 -13.08 -3.64 0.00 0.00 0.00 53.28 ----------

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

Segment Leq : 53.28 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.50 + 0.00) = 58.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  0 90
0.24 63.96 0.00 -1.81 -3.64 0.00 0.00 0.00 58.50 ---------------------------
------------------------------------------------

Segment Leq : 58.50 dBA
 Total Leq All Segments: 59.64 dBA


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

Source height = 1.50 m

ROAD (0.00 + 45.68 + 0.00) = 45.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.24 62.40 0.00 -13.08 -3.64 0.00 0.00 0.00 45.68 ---------------------------
------------------------------------------------

Segment Leq : 45.68 dBA


Results segment # 2: Famille_L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.91 + 0.00) = 50.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  0 90
0.24 56.36 0.00 -1.81 -3.64 0.00 0.00 0.00 50.91 ---------------------------
------------------------------------------------

Segment Leq : 50.91 dBA
 Total Leq All Segments: 52.05 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 59.64
 (NIGHT): 52.05
```

STAMSON 5.0 NORMAL REPORT Date: 11-07-2022 09:46:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ltc_2w.te Time Period: Day/Night 16/8 hours Description:

Road data, segment # 1: Montreal_R (day/night) ----------

Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Montreal_R (day/night) ----------

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 170.00 /
170.00 m Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Road data, segment # 2: Famille_L (day/night) ----------

Car traffic volume : 6477/563 veh/TimePeriod
Medium truck volume : 515/45 veh/TimePeriod
Heavy truck volume : 368/32 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Famille_L (day/night) ----------

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface) Receiver source distance : 21.00 /
21.00 m
Receiver height : 15.50 / 15.50 m
Topography : 1 (Flat/gentle slope; no barrier) Reference angle : 0.00

Results segment # 1: Montreal_R (day)

Source height = 1.50 m

ROAD (0.00 + 53.28 + 0.00) = 53.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
---------- -90 0
0.24 70.00 0.00 -13.08 -3.64 0.00 0.00 0.00 53.28 ----------

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

Segment Leq : 53.28 dBA


Results segment # 2: Famille_L (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.51 + 0.00) = 61.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 90
0.24 63.96 0.00 -1.81 -0.63 0.00 0.00 0.00 61.51 ---------------------------
------------------------------------------------

Segment Leq : 61.51 dBA
 Total Leq All Segments: 62.12 dBA


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

Source height = 1.50 m

ROAD (0.00 + 45.68 + 0.00) = 45.68 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 0
0.24 62.40 0.00 -13.08 -3.64 0.00 0.00 0.00 45.68 ---------------------------
------------------------------------------------

Segment Leq : 45.68 dBA


Results segment # 2: Famille_L (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.92 + 0.00) = 53.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq -------
------------------------------------------------------------------  -90 90
0.24 56.36 0.00 -1.81 -0.63 0.00 0.00 0.00 53.92 ---------------------------
------------------------------------------------

Segment Leq : 53.92 dBA
 Total Leq All Segments: 54.53 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 62.12
 (NIGHT): 54.53
```

Appendix D

Warning Clause Requirement

Warning Clauses

All warning clauses should be included in agreements that are registered on title for all Offers of Purchase and Sale, lease/rental agreements, and condominium declarations.

NPC 300 Type C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

Appendix E

Guideline D-6-1 Industrial Classification Criteria

Category	Outputs	Scale	Process	Operations/Intensity	Possible Examples
Class I	• Noise: Sound not audible off property • Dust and/or Odour: Infrequent and not intense • Vibration: No ground borne vibration on plant property	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria for this Class	• Self-contained plant or building which produces/stores a packaged product. Low probability of fugitive emissions	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Electronics manufacturing and repair • Furniture repair and refinishing • Beverages bottling • Auto parts supply • Packaging and crafting services • Distribution of dairy products • Laundry and linen supply
Class II	• Noise: Sound occasionally audible off property • Dust and/or Odour: Frequent and occasionally intense • Vibration: Possible groundborne vibration, but cannot be perceived off property	• Outside storage permitted • Medium level of production allowed	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Shift operations permitted • Frequent movement of products and/or heavy trucks with the majority of movements during daytime hours	• Magazine printing • Paint spray booths • Metal command • Electrical production manufacturing • Manufacturing of dairy products • Dry cleaning services • Feed packing plant
Class III	• Noise: sound frequently audible off property • Dust and/or Odour: Persistent and/or intense • Vibration: Ground-borne vibration can frequently be perceived off property	• Outside storage of raw and finished products • Large production levels	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions	• Continuous movement of products and employees • Daily shift operations permitted	• Manufacturing of paint and varnish • Organic chemicals manufacturing • Breweries • Solvent recovery plants • Soaps and detergent manufacturing • Manufacturing of resins and costing • Metal manufacturing

References

D-6 Compatibility between Industrial Facilities, Ontario Ministry of Environment Conservation and Parks, July 2021.

Environmental Noise Control Guidelines Part 4 Appendix B, City of Ottawa, January 2016.

Ontario Ministry of Environment Publication NPC-300, Environmental Noise Guideline, Stationary and Transportation Sources- Approval and Planning, October 2013.

Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), V. Schroter, C. Chiu, Ontario Ministry of Environment, October 1989.