2025-01-22

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Henry Investments – 73-83 Ste-Cecil St.
Traffic Noise Impact Study R1

Dear Denis,

We are pleased to present the following traffic noise study for a new proposed residential development of a four storey apartment building at 73-83 Ste.-Cecile St. in Ottawa, Ontario. As part of the Site Plan Application (SPA), the City of Ottawa has requested a noise study to be completed. The planned development is for a new apartment building with a total of 41 residential units, which is in proximity to Marier Avenue. As per City of Ottawa requirements, noise from traffic must be considered.

This study considers traffic noise from Marier Avenue (~88m from the south-west façade of the building). This noise source is the only traffic noise source considered in this study. All other noise sources, such as other main or arterial roads, principal rail lines and airport influence zone are outside of limits as per the City of Ottawa ENCG and Schedule G of the City of Ottawa Official Plan.

It was found that noise levels at the plane of window (POW) at each of the PORs analyzed are below 55 dBA and a detailed building component analysis was not required. Therefore, noise mitigation measures are not required and warning clauses are not required for lease agreements. Our full traffic nose analysis is provided in Section 4.0.

1.0 Introduction

State of the Art Acoustik Inc. was commissioned by Henry Investments to complete a noise impact study as requested by the City of Ottawa for the site plan application of a proposed apartment building consisting of 41 units over four storeys to be located at 73-83 Ste. Cecile Street in Ottawa, Ontario. We have followed the 2016 City of Ottawa Environmental Noise Control Guidelines (ENCG), which are compliant with the Ministry of Environment, Conservation and Parks (MECP) NPC-300.

In Section 2.0, the site plan of the building is shown, and surrounding area is analyzed for possible noise sources which would impact the proposed development. This section also shows angles and distances from the sources to receptor points. This study includes only noise from road sources and there are no other nearby sources.

In Section 3.0, the noise impact calculation procedure is described and in Section 4.0, the predicted noise impact from Marier Avenue has been analyzed.

2.0 Site Plan Evaluation

2.1 Project Description

The proposed development consists of a new four storey apartment building located at 73-83 Ste. Cecile Street in Ottawa, Ontario. The area surrounding the development consists primarily of low-rise residential buildings, which are mainly single-family homes. We have considered traffic noise from Marier Avenue as the only traffic noise source for this location, as per the City of Ottawa requirements, and all other potential road noise sources are outside of the distances outlined in Section 2.2.1 of the City of Ottawa Environmental Noise Control Guidelines.

2.2 Site Plan Review

The following Figure 2.1 shows the site plan of the proposed building. Figure 2.2 shows the proposed site with the distance and angles to Marier Ave, which is located approximately 88m from the closest facade of the building. Marier Avenue is indicated as a collector road, as per City of Ottawa Schedule G.

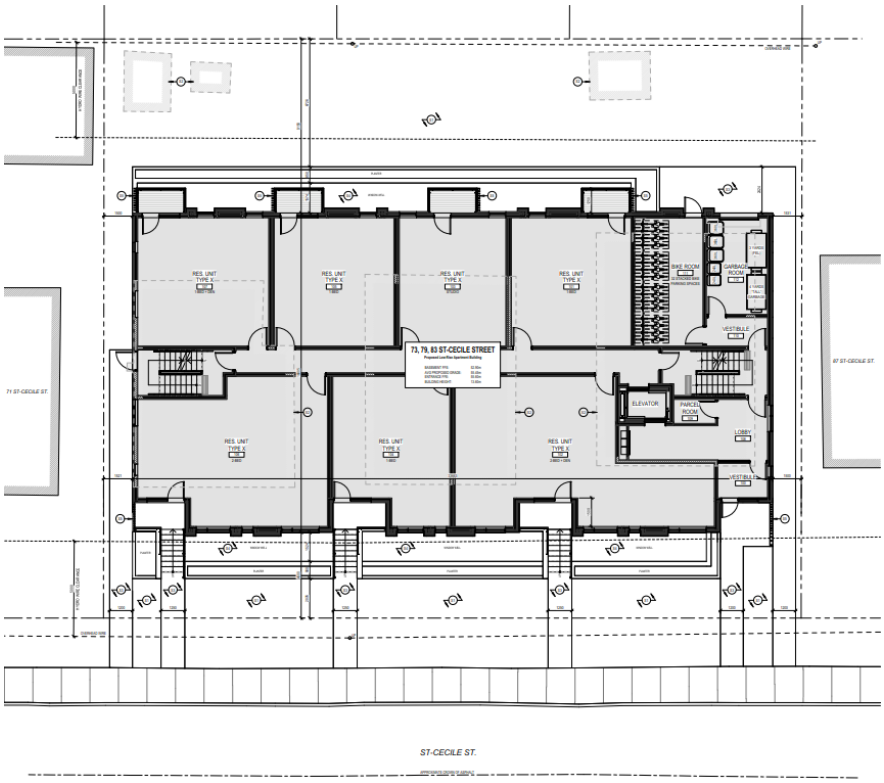

Figure 2.1 – Site plan of 73-83 Ste. Cecile Street.

Figure 2.2 – Surrounding area of 73-83 Ste. Cecile St. with locations, distances and angles of relevant noise sources.

3.0 Noise Impact Procedure

3.1 Procedure Used to Assess Noise Impacts

This assessment uses the City of Ottawa Environmental Noise Control Guidelines (ENCG), dated January 2016, to assess and mitigate noise from roads, transit ways, railways and aircraft. The maximum road noise levels for indoor areas that apply to this building are taken from Table 2.2b of the ENCG and summarized in Table 3.1 below with outdoor level limits shown in Table 3.2.

Time	**Indoor Leq Levels (dBA) Class 1, 2 & 3 Areas**
	Road Traffic Noise Level Limit (dBA)
07:00 – 23:00	**45** for living/dining areas of residences and sleeping quarters
07:00 – 23:00	**50** for general offices, reception areas, retail stores, etc.
23:00 - 07:00	**40** for sleeping quarters

Table 3.1 – Criteria for Indoor Area Road Noise Levels

	Outdoor Leq Levels (dBA) Class 1, 2 & 3 Areas
	Road/Rail Traffic Noise Level Limit (dBA)
07:00 – 23:00	**55** for Outdoor Living Areas

Table 3.2 – Criteria for Outdoor Living Area Road/Rail Noise Levels

The ENCG states that noise control studies are to be prepared when the indoor area is within the following setback distances from the road, highway and railway noise sources:

- 100m from an arterial road or a major collector, light rail corridor or bus rapid transitway
- 250m from an existing or proposed highway
- 300m from a proposed or existing rail corridor or secondary main railway line
- 500m from a 400-series provincial highway or principle main railway line

Marier Avenue is within 100m of the planned development and therefore an analysis of the impact of traffic noise is required.

3.2 Noise Attenuation Requirements

This section outlines the required noise control measures and warning clauses and when to apply them, as stipulated by the ENCG and Ministry of Environment, Conservation and Parks (MOECP) for placement within purchase agreements.

If sound levels are predicted to be less than the specified criteria, no attenuation measures are required on the part of the proponent. If the predicted noise exceeds the criteria, the City of Ottawa recommends several attenuation measures.

These attenuation measures may include any or all of the following:

- construction of a noise barrier wall and/or berm;

- installation of a forced air ventilation system with provision for central air;
- installation of central air;
- acoustically selected building façade components

Where excessive noise levels may adversely affect the property or its use, the ENCG requires notices in the form of a Warning Clause to be placed on title in order to alert the buyer or renter of a possible environmental noise condition or a limitation on his/her property rights. The notices on title must be included in the Development Agreement(s) and in the Agreement(s) or Offer(s) of Purchase and Sale.

The City of Ottawa, via MOECP NPC-300, requires a Warning Clause whenever noise could meet or exceed 55 dBA 16 hour L_{eq} at the Outdoor Living Area or Plane of Window of any living area or 50 dBA at the Plane of Window of any sleeping area prior to any noise mitigation. Table 3.3 provides the types of warning clauses which are taken from Section C8.1 Transportation Sources of the MOECP NPC-300 which also states:

"The use of warning clauses or easements in respect of noise are recommended when circumstances warrant. Noise warning clauses may be used to warn of potential annoyance due to an existing source of noise and/or to warn of excesses above the sound level limits. Direction on the use of warning clauses should be included in agreements that are registered on title to the lands in question. The warning clauses would be included in agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations."

In addition, Section Section C8 also notes: "*A warning clause is not considered a form of noise mitigation. It is not acceptable therefore to use warning clauses in place of physical noise control measures to identify an excess over the MOE or City noise limits*."

TYPE	Warning Clause Text
Type A	Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transit way traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.
Type B	Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road/rail/Light Rail/transitway traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.
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 condition 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 City and the Ministry of Environment.

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

Table 3.3 - Warning Clause Types (from MOECP NPC-300 Section C8.1)

3.3 Building Component Assessment (AIF Analysis)

According to the ENCG, when noise levels could exceed 65 dBA at the Plane of Windows (POW) of a living area (day) or sleeping quarters (night) the exterior cladding system of the building envelope must be acoustically designed to ensure the indoor noise criteria is achieved. The City of Ottawa recognizes the Acoustic Insulation Factor (AIF[1]) method as an appropriate analysis technique.

To comply with the City of Ottawa policies, the building envelope will require a minimum AIF rating to provide the indoor noise level required for living, dining and bedrooms of residential dwellings as described below.

The City of Ottawa's ENCG outlines the following maximum indoor L_{eq} limits:

- maximum daytime indoor L_{eq} for living spaces should be 45 dBA
- maximum nighttime indoor L_{eq} for bedrooms should be 40 dBA

For the overall exterior wall of any room, the required AIF for road and rail transportation noise is:

Required AIF = Outside L_{eq} - Indoor L_{eq} (Req) + 2dB **(1)**

When the exterior is comprised of components, then the AIF required of each component is determined by the following equation[1]:

Required AIF = Outside L_{eq} - Indoor L_{eq} (Req) + 10 $\log_{10}$ (Number of Components) + 2dB (2)

The required AIF is based on the Outside L_{eq}, Indoor L_{eq} required and the total number of exterior façade components. The AIF method allows for the number of components to be reduced if any component significantly exceeds the required AIF[1]:

"If the AIF of any component exceeds the required AIF by 10 or more, the calculation should be repeated for the other components with the 'total number of components' reduced by one. This reduction in the number of components lowers the required AIF for the others."

[1] J.D. Quirt, Building Research Note: Acoustic Insulation Factor: A Rating for the Insulation of Buildings against Outdoor Noise, National Rearch Council [Revised June 1980]

4.0 Surface Transportation Noise Study

The following section describes our analysis of the road noise impact on the new proposed building at 73-83 Ste-Cecile St.

4.1 Road Traffic Information

For this study, the only surface transportation noise sources considered was traffic from Marier Avenue, which is located to the east of the front façade of the new building. The new proposed buildings are farther than 100m from any other collector or arterial road and are not near any rail lines or within the zone of influence of the airport therefore no other surface noise sources are considered.

Table 4.1 below summarizes the roadway's parameters obtained from Table B1 on p. 75 of The City of Ottawa Environmental Noise Control Guidelines 2016, "Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions" for the respective roadway class.

Roadway	Implied Roadway Class	Annual Average Daily Traffic (AADT) Veh/Day	Posted Speed	Day/Night Split (%)	Medium Trucks (%)	Heavy Trucks (%)
Marier Ave	2 Lane Urban Collector	8,000	40 km/h	92/8	7	5

Table 4.1 – Summary of Major Roadway Noise Sources.

4.2 Procedure Used for Roadway Noise Analysis

In order to calculate the road noise impact at the proposed development, we utilized the Ministry of Environment's STAMSON modeling software version 5.04. This program allows us to input variables of a road such as traffic volume, types of vehicles, speed, barrier locations and topography to determine the environmental noise impact at a point of reception.

4.3 Points of Reception

To determine the worst case noise impact on the façade of the building, we have chosen three points of reception (POR); two at the south west corner on the 1st floor and the 3rd floor, and the Outdoor Amenity Area at the back of the building, which is also at ground level. Figure 4.1 and 4.2 below show the plan view of point of reception locations and Figure 4.3 shows the elevation view of POR1 and POR2. POR1 is located at a height of 3.0m, as the basement floor extends 1.5m above ground because there are also units in the basement. There will be little to no difference in traffic noise levels for basement units and 1st floor units. POR2 is located at a height of 9.0m on the 3rd floor. POR3 is located at 1.5m from ground level at the rear of the building. POR1 and POR2 are located at the plane of window (POW) and POR3 is located at approximately the centre of the amenity area. Table 4.2 below summarizes receiver heights and distances.

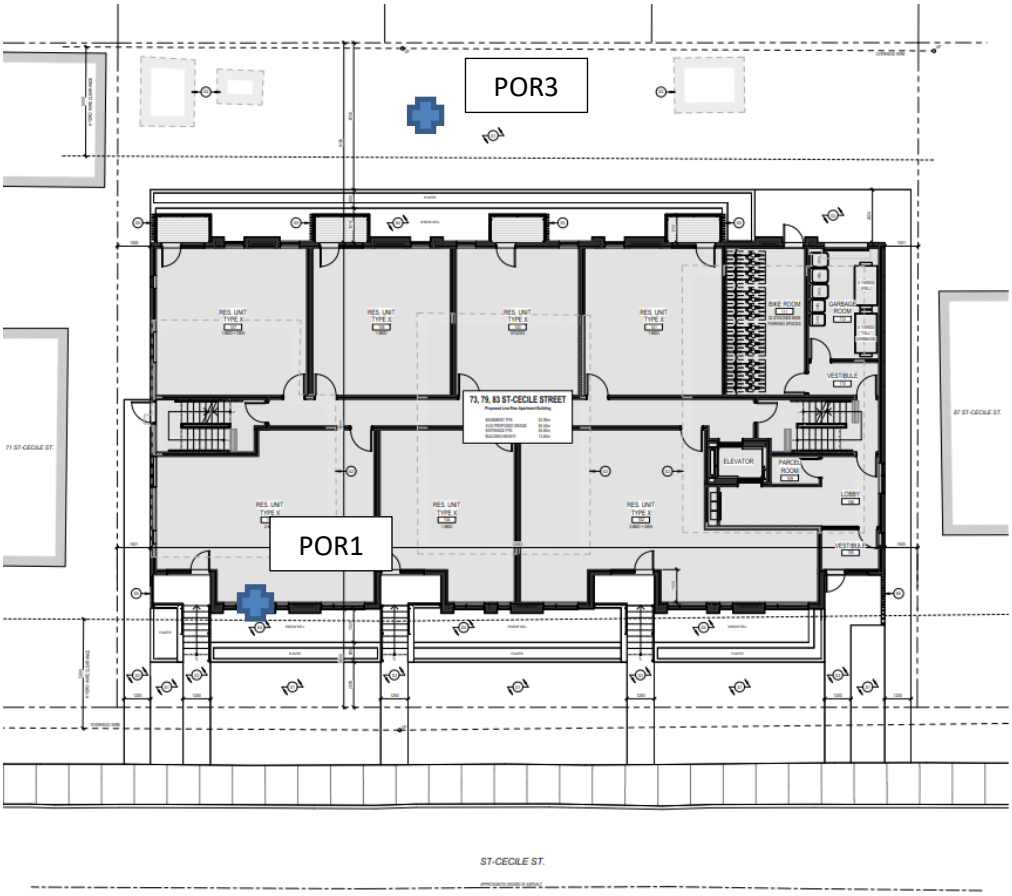

Figure 4.1 – 1st floor plan view showing POR1 and POR3 (Amenity Area).

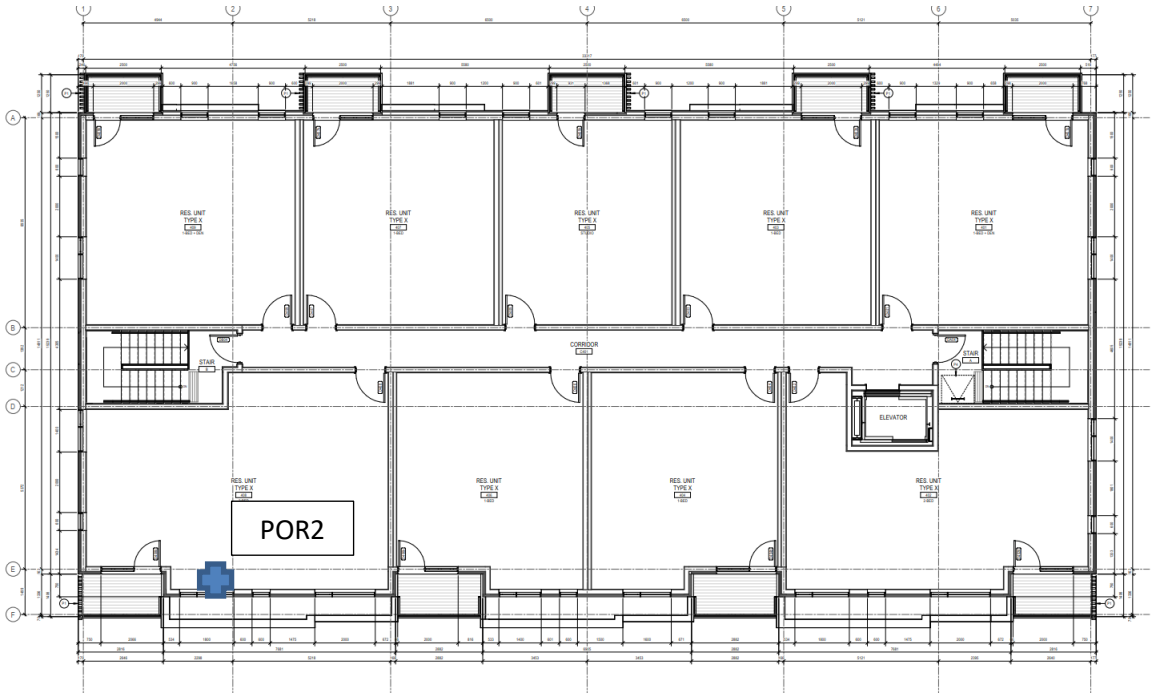

Figure 4.2 – 2nd/3rd floor plan view showing POR2.

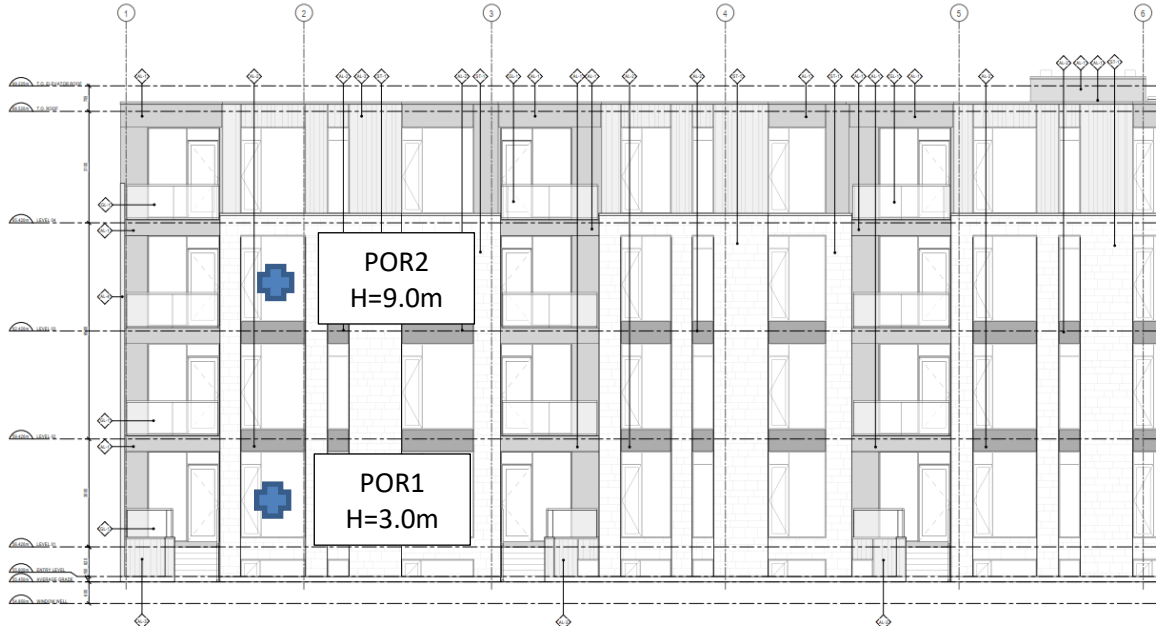

Figure 4.3 – Front elevation view showing POR1 and POR2.

Receiver	Height (m)	Distance from Closest Source	Angle to source segment from POR (left)	Angle to source segment from POR (right)
POR1	3.0	~88m (Marier Ave.)	90°	90°
POR2	9.0	~88m (Marier Ave.)	90°	90°
POR3	1.5	~127m (Marier Ave.)	90°	90°

Table 4.2 – Table of receiver height and distance from noise source.

4.4 Parameters Used for Analysis

The parameters used in STAMSON to assess the noise impact at POR1 are shown below in Table 4.3:

Parameter	Values Used
Noise Source:	**Marier Ave.**
Time Period	16h/8h
Topography	Flat/gentle slope no barrier
Rows of Houses	2
Density of First Row%	50
Intermediate Surface	Reflective
Receiver Height (m)	3.0
Source Receiver Distance (m)*	88

Table 4.3 – Parameters used in STAMSON model at POR1 (1st floor south-west unit)

The parameters used in STAMSON to assess the noise impact at POR2 are shown below in Table 4.4:

Parameter	Values Used
Noise Source:	**Marier Ave.**
Time Period	16h/8h
Topography	Flat/gentle slope no barrier
Rows of Houses	2
Density of First Row%	50
Intermediate Surface	Reflective
Receiver Height (m)	9.0
Source Receiver Distance* (m)	88

Table 4.4 – Parameters used in STAMSON model at POR 2 (3rd floor south-west unit)

The parameters used in STAMSON to assess the noise impact at POR3 are shown below in Table 4.5:

Parameter	Values Used
Noise Source:	**Marier Ave.**
Time Period	16h/8h
Topography	Flat/gentle slope no barrier
Rows of Houses	3
Density of First Row%	50
Intermediate Surface	Reflective
Receiver Height (m)	1.5
Source Receiver Distance (m)*	127

Table 4.5 – Parameters used in STAMSON model at POR3 (Outdoor Amenity Area)

We have assessed both daytime and nighttime levels for POR1 and POR2 and only daytime levels for POR3, which is the Outdoor Amenity Area at the rear of the building.

4.5 Surface Transportation Noise Levels

Table 4.7 below summarizes the predicted sound pressure levels at the points of reception from the results of the STAMSON environmental noise software calculation (Appendix A) for Marier Avenue.

	POR 1 (dBA)		POR 2 (dBA)		POR 3 (dBA)
	Day	**Night**	**Day**	**Night**	**Day**
Marier Ave.	46.0	38.4	47.7	40.1	41.5
Total	**46.0**	**38.4**	**47.7**	**40.1**	**41.5**

Table 4.6 – Predicted Road Noise at each Point of Reception

4.6 Roadway Noise Summary and Analysis

We have calculated the predicted noise level caused by traffic using STAMSON and have shown a 16h L_{eq} for daytime hours is **46.0 dBA**, at POR1, **47.7 dBA** at POR2 and **41.5 dBA** at POR3. The 8h L_{eq} for nighttime hours is **38.4 dBA** at POR1 and **40.1 dBA.** Nighttime levels for POR3 were not calculated as this is the Outdoor Amenity Area at the rear of the building. As the levels during the day and at night are below 65 dBA, an evaluation of exterior building components (AIF analysis) is not required and as they are also below 55 dBA at the Plane of Window, there are no warning clauses required. Therefore, no changes or recommendations are required for the exterior assemblies and windows and no changes to the lease agreement are required for warning clauses.

5.0 Conclusion

We have analyzed the traffic noise impact for road sources for the new proposed development to be located at 73-83 Ste. Cecile Street. A detailed building component analysis and implementation of warning clauses were found to be not required as noise levels from the traffic noise sources (Marier Avenue) were less than 55 dBA at the Plane of Window (POW) at each of the PORs and at the Outdoor Amenity Area.

If you have any questions or concerns regarding this report, please let us know.

Sincerely,

Patrick Richard, M.Sc.E.
Acoustic Consultant

Approved By:

Donald Buchan, P.Eng
Principal
Buchan Lawton Parent Ltd.

Appendix A
STAMSON Calculations

STAMSON 5.0 NORMAL REPORT Date: 01-12-2022 21:51:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: stcecil1.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Marier (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)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Marier (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 3.00 / 3.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Marier (day)

Source height = 1.50 m

ROAD (0.00 + 46.01 + 0.00) = 46.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.62 63.96 0.00 -12.41 -1.38 0.00 -4.15 0.00 46.01

Segment Leq : 46.01 dBA

Total Leq All Segments: 46.01 dBA

Results segment # 1: Marier (night)

Source height = 1.50 m

ROAD (0.00 + 38.42 + 0.00) = 38.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.62	56.36	0.00	-12.41	-1.38	0.00	-4.15	0.00	38.42

Segment Leq : 38.42 dBA

Total Leq All Segments: 38.42 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 46.01
(NIGHT): 38.42

STAMSON 5.0 NORMAL REPORT Date: 01-12-2022 21:50:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: stcecil2.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Marier (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)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Marier (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 9.00 / 9.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Marier (day)

Source height = 1.50 m

ROAD (0.00 + 47.72 + 0.00) = 47.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.44	63.96	0.00	-11.03	-1.05	0.00	-4.15	0.00	47.72

Segment Leq : 47.72 dBA

Total Leq All Segments: 47.72 dBA

Results segment # 1: Marier (night)

Source height = 1.50 m

ROAD (0.00 + 40.13 + 0.00) = 40.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.44	56.36	0.00	-11.03	-1.05	0.00	-4.15	0.00	40.13

Segment Leq : 40.13 dBA

Total Leq All Segments: 40.13 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 47.72
(NIGHT): 40.13

STAMSON 5.0 NORMAL REPORT Date: 01-12-2022 21:49:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: stcecil3.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Marier (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)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Marier (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 3
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 127.00 / 127.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Marier (day)

Source height = 1.50 m

ROAD (0.00 + 41.50 + 0.00) = 41.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---

-90 90 0.66 63.96 0.00 -15.40 -1.46 0.00 -5.59 0.00 41.50

Segment Leq : 41.50 dBA

Total Leq All Segments: 41.50 dBA

Results segment # 1: Marier (night)

Source height = 1.50 m

ROAD (0.00 + 33.91 + 0.00) = 33.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.66 56.36 0.00 -15.40 -1.46 0.00 -5.59 0.00 33.91

Segment Leq : 33.91 dBA

Total Leq All Segments: 33.91 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 41.50
(NIGHT): 33.91