DCR/PHOENIX GROUP OF COMPANIES

REPORT
109575-5.2.2.1

ENVIRONMENTAL NOISE IMPACT ASSESSMENT
1208 OLD MONTREAL ROAD

CITY OF OTTAWA

IBI

Prepared for DCR/PHOENIX HOMES
by IBI Group
February 12, 2021

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1 INTRODUCTION

This report has been prepared to determine the impact of roadway traffic on the residential lands of 1200 Old Montreal Road property developed by DCR/Phoenix. The report deals with the expected noise levels in the development and any required noise control measures.

1.1 Location

The subject properties are located in the City of Ottawa, within the former Cumberland Township and within the Cardinal Creek Village (CCV) CDP. It is bound to the north by Old Montreal Road, to the east by vacant agricultural/future development lands, to the south by a tributary branch of the Cardinal Creek, and to the west by existing rural development lands. The site is located opposite of de la Famille-Laporte Avenue, constructed by Tamarack Homes as part of the CCV development. Refer to **Figure 1.1** below for key map.

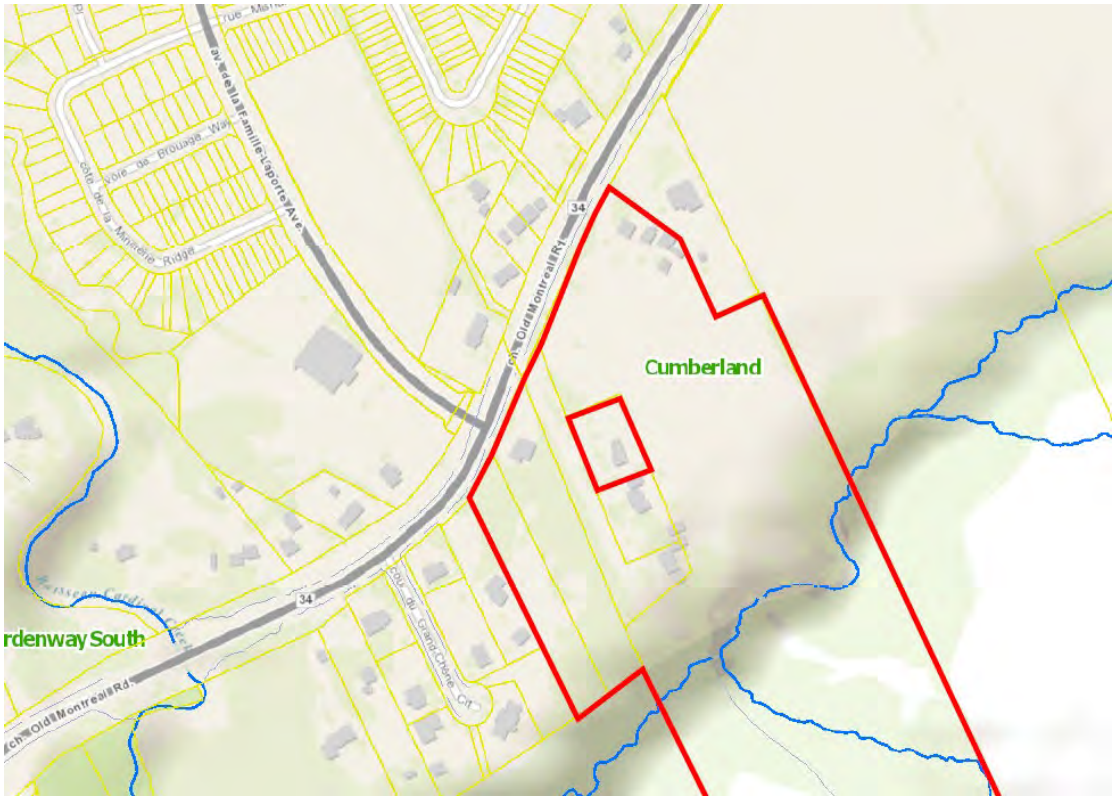

Figure 1.1 – Key Map of Subject Lands

The subject lands are inclusive in the Cardinal Creek Village Master Servicing Study.

2 BACKGROUND

2.1 Noise Sources

The study area is primarily subject to roadway noise from Old Montreal Road. Existing Trim Road and Regional Road 174 are both in excess of 900 meters from the study area and will not impact the site. Aircraft noise from the Ottawa International Airport is not a factor as the airport is not in close proximity to the study area; there are no rail lines within 500 meters of the site.

As per the guidelines, a Noise Feasibility Study is required if an existing stationary noise source is located within 100 meters of a new noise sensitive development. An existing dairy plant is located approximately 500 meters west of the site and an aggregate stockpile site is located approximately 230 meters east of the site.

2.2 Sound Level Limits for Road Traffic

Sound level criteria for road traffic is taken from the City of Ottawa Environmental Noise Control Guidelines hereafter referred to as the guidelines and from the Ministry of the Environment Environmental Noise Guideline Publication NPC-300. Noise levels are expressed in the form Leq (T) which refers to a weighted level of a steady sound carrying the same total energy in the time period T (in hours) as the observed fluctuation sound.

2.2.1 Outdoor sound level criterion

As per Table 2.2a of the guidelines the sound level criteria for the outdoor living area (OLA) for the daytime period between 07:00 and 23:00 hours is 55 dBA Leq (16). Sound levels for the OLA are calculated 3 metres from the building face at the centre of the unit or within the center of the OLA at a height of 1.5 meters above the ground.

If the Leq sound level is less than or equal to the above criteria then no further action is required by the developer. If the sound level exceeds the criteria by less than 5 dBA then the developer may, with City approval, either provide a warning clause to prospective purchasers or install physical attenuation. For sound levels greater than 5 dBA above the criteria control measures are required to reduce the noise levels as close to 55 dBA as technically, economically and administratively possible. Should the sound levels with the barrier in place exceed 55 dBA a warning clause is also required.

2.2.2 Indoor sound level criterion – ventilation and warning clause requirements

Similar to outdoor noise levels, the recommended indoor sound, the sound level criteria from Table 2.2b of the guidelines are:

- Bedrooms – 23:00 to 07:00 – 40 dBA Leq 98)
- Other areas – 07:00 to 23:00 – 45 dBA Leq (16)

The sound levels are based on the windows and doors to an indoor space being closed.

For the purpose of assessing indoor sound levels, the outdoor sound levels are observed at the plane of the living room window at 2.5 meters above the ground for daytime noise and at the plane of the bedroom window 4.5 meters above the ground for nighttime noise.

As per NPC-300 C7.1.2.1 and C7.1.2.2 when the outdoor noise levels at the living room are greater than 55 dBA and less than or equal to 65 dBA and/or greater than 50 dBA and less than or equal to 60 dBA at the bedroom window then a warning clause is required and forced air heating with provision for central air conditioning is required.

Should the outdoor noise levels exceed 65 dBA at the living room and/or exceed 60 dBA at the bedroom then central air conditioning is mandatory and a warning clause is required.

2.2.3 Indoor Sound Level Criterion – Building Components

As per NPC-300 C7.1.3 when the outdoor sound levels are less than or equal to 65 dBA at the living room window and/or less than or equal to 60 dBA at the bedroom level then the building must be compliant with the Ontario Building Code. Should the outdoor sound levels exceed this criteria then the building component (walls, windows etc.) must be designed to achieve indoor sound level criteria.

3 ROADWAY NOISE

3.1 Road Traffic Data

The major source of road noise impacting the study area is the traffic moving along Old Montreal Road.

Old Montreal Road is currently a two-lane rural arterial road with a posted speed limit of 80 km/hr; it is assumed that the roadway will be widened to a four-lane divided arterial roadway (4-UAD per Appendix B Table B1 of the guidelines) with a posted speed of 60 km/hr through the urbanized study area. Table 3.1 summarizes the traffic and road parameters used to assess the noise; traffic volume parameters are taken from Appendix B Table B1 of the guidelines.

TABLE 3.1
TRAFFIC AND ROAD DATA SUMMARY

	OLD MONTREAL ROAD
Annual Average Daily Traffic (AADT)	35,000
Posted Speed Limit (km/hr)	60
% Medium Trucks	7%
% Heavy Trucks	5%
% Daytime Traffic	92%

3.2 Calculation Methods

Roadway noise is calculated using the STAMSON 5.04 computer program from the Ontario Ministry of the Environment.

This study will identify the noise contours generated by the traffic for various scenarios. To determine the requirement for an indoor noise warning clause, the contours for the 55 dBA daytime and 50 dBA nighttime levels are determined. For the requirement to evaluate building components, the 65 dBA daytime and 60 dBA night time contours are used. To determine the requirements for noise barriers, the 55 dBA and 60 dBA daytime noise contours are used. The following table provides the offset from centerline of the roadway to the noise contours. For the divided roads, the noise levels are calculated for the divided lanes separately and then combined; the noise contour offset is measured from the center of the right of way.

TABLE 3.2
NOISE CONTOUR OFFSETS

	DISTANCE FROM CENTERLINE (M)
	OLD MONTREAL ROAD
Indoor Daytime 65 dBA	43.1
55 dBA	172.3
Indoor Nighttime 60 dBA	31.8
55 dBA	131.4
Outdoor Living Area 60 dBA	82.4
55 dBA	163.8

Based on the above table, for indoor noise evaluation, the daytime contours are further from centerline than the nighttime levels for each criterion; therefore, only the daytime levels will be used in the evaluation. Noise contours for indoor noise and outdoor living area noise evaluation are shown on **Figure 2.1**. The noise contours have not been adjusted to reflect screening from proposed buildings.

J:\109575_OldMontrealRd\5.9 Drawings\59civil\current\Serviceability-Rev17\Layout\FIG 2.2 NOISE CONTOURS.dwg Layout Name: FIG 2.2 NOISE CONTOURS Last Saved By: ddore Last Saved At: Feb. 8, 21

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	DCR / PHOENIX 1208 OLD MONTREAL ROAD	NOISE CONTOURS	FIG 2.2

4 RESULTS

4.1 Indoor Sound Levels

The 65 dBA daytime noise contour shown on **Figure 2.1** represents the limit in which central air conditioning and an acoustical review/design of building components is required along with a Type 'D' warning clause to be included in an Agreement of Purchase and Sale. All the residential units that front onto Old Montreal Road meet this requirement. Between the 65 dBA and 55 dBA contour, a forced air heating system with provision for central air conditioning is required along with a Type 'C' warning clause to be included in the Agreement of Purchase and Sale. While the 55 dBA covers the majority of the site the first row of the buildings adjacent to Old Montreal Road will screen the traffic noise for the units behind. The exact location of the units requiring the Type 'C' warning clause will be determined during detailed design.

Warning clauses for indoor noise from NPC-300 are as follows:

Type 'C'

"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property."

Type 'D'

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

4.2 Outdoor Sound Levels

The 60 dBA outdoor noise contour shown on **Figure 2.1** represents the limit in which physical attenuation is required while the 55 dBA represents the limits in which no action is required for noise at the outdoor living areas. For areas above 60 dBA where a noise barrier reduces the noise below 60 dBA but remains above 55 dBA, a Type 'B' warning clause is required in the Agreement of Purchase and Sale. For areas that fall between the 60 dBA and 55 dBA contours a Type 'A' warning clause could be used in lieu of a noise barrier. The apartment buildings adjacent to Old Montreal Road do not have outdoor living areas as defined in the guidelines and are not evaluated for outdoor noise. The terrace back to back townhouses do not have outdoor living areas and the street towns have the outdoor living areas facing away from Old Montreal Road. There is a community space located east of Block 5 however it is expected that the apartment buildings will screen the noise levels below 55 dBA. This will be confirmed during detailed design.

Warning clauses for outdoor noise from NPC-300 are as follows:

Type 'A'

"Purchasers/tenants are advised that sound levels due to increasing Old Montreal Road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria."

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 Old Montreal Road traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria."

5 CONCLUSIONS

This report outlines the impact of roadway noise on the 1208 Old Montreal Road development. The exact location of residential units requiring noise warning clauses, ventilation, air conditioning requirements, acoustical review/design of building components, and the potential location and size of noise barriers will be determined during the detailed design phase when site plans and grading plans are finalized.

Prepared by:

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Appendix

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 10:02:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: IN65.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 65 dBA Indoor

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 49.35 / 49.35	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 36.85 / 36.85	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 60.83 + 0.00) = 60.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-8.43	-1.41	0.00	0.00	0.00	60.83

Segment Leq : 60.83 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 62.90 + 0.00) = 62.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-6.36	-1.41	0.00	0.00	0.00	62.90

Segment Leq : 62.90 dBA

Total Leq All Segments: 65.00 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 53.65 + 0.00) = 53.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-8.12	-1.30	0.00	0.00	0.00	53.65

Segment Leq : 53.65 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 55.64 + 0.00) = 55.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-6.13	-1.30	0.00	0.00	0.00	55.64

Segment Leq : 55.64 dBA

Total Leq All Segments: 57.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 57.77

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 10:05:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: IN55.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 55 dBA Indoor

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 166.05 / 166.05	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 178.55 / 178.55 m	
Receiver height	: 2.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 52.24 + 0.00) = 52.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-17.02	-1.41	0.00	0.00	0.00	52.24

Segment Leq : 52.24 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 51.72 + 0.00) = 51.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-17.53	-1.41	0.00	0.00	0.00	51.72

Segment Leq : 51.72 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 45.37 + 0.00) = 45.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-16.39	-1.30	0.00	0.00	0.00	45.37

Segment Leq : 45.37 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 44.88 + 0.00) = 44.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-16.89	-1.30	0.00	0.00	0.00	44.88

Segment Leq : 44.88 dBA

Total Leq All Segments: 48.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 48.14

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 10:07:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: IN60.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 60 dBA Indoor night

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 25.55 / 25.54	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 38.05 / 38.04	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 65.49 + 0.00) = 65.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-3.77	-1.41	0.00	0.00	0.00	65.49

Segment Leq : 65.49 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 62.67 + 0.00) = 62.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-6.59	-1.41	0.00	0.00	0.00	62.67

Segment Leq : 62.67 dBA

Total Leq All Segments: 67.32 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 58.14 + 0.00) = 58.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-3.63	-1.30	0.00	0.00	0.00	58.14

Segment Leq : 58.14 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 55.42 + 0.00) = 55.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-6.35	-1.30	0.00	0.00	0.00	55.42

Segment Leq : 55.42 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.32
(NIGHT): 60.00

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 10:09:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: IN50.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 50 dBA Indoor night

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 125.15 / 125.15	m
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 137.65 / 137.65 m	
Receiver height	: 2.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 54.24 + 0.00) = 54.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-15.02	-1.41	0.00	0.00	0.00	54.24

Segment Leq : 54.24 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 53.57 + 0.00) = 53.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.63	70.67	0.00	-15.69	-1.41	0.00	0.00	0.00	53.57

Segment Leq : 53.57 dBA

Total Leq All Segments: 56.93 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 47.30 + 0.00) = 47.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-14.47	-1.30	0.00	0.00	0.00	47.30

Segment Leq : 47.30 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 46.65 + 0.00) = 46.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-15.12	-1.30	0.00	0.00	0.00	46.65

Segment Leq : 46.65 dBA

Total Leq All Segments: 50.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.93
(NIGHT): 50.00

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 09:56:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: OLA60.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 60 dBA Outdoor

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 76.15 / 301.00	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 88.65 / 313.50 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 57.50 + 0.00) = 57.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-11.71	-1.46	0.00	0.00	0.00	57.50

Segment Leq : 57.50 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 56.40 + 0.00) = 56.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-12.81	-1.46	0.00	0.00	0.00	56.40

Segment Leq : 56.40 dBA

Total Leq All Segments: 60.00 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 41.32 + 0.00) = 41.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-20.45	-1.30	0.00	0.00	0.00	41.32

Segment Leq : 41.32 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 41.04 + 0.00) = 41.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-20.73	-1.30	0.00	0.00	0.00	41.04

Segment Leq : 41.04 dBA

Total Leq All Segments: 44.19 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 44.19

STAMSON 5.0 NORMAL REPORT Date: 09-02-2018 09:59:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: OLA55.te Time Period: Day/Night 16/8 hours
Description: Old Montreal Road 55 dBA Outdoor

Road data, segment # 1: Old Mont WB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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: Old Mont WB (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	: 157.55 / 301.00	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Road data, segment # 2: Old Mont EB (day/night)

Car traffic volume	: 14168/1232	veh/TimePeriod *
Medium truck volume	: 1127/98	veh/TimePeriod *
Heavy truck volume	: 805/70	veh/TimePeriod *
Posted speed limit	: 60	km/h
Road gradient	: 1	%
Road pavement	: 1	(Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT)	:	17500
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
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 # 2: Old Mont EB (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	: 170.05 / 313.50 m	
Receiver height	: 1.50 / 4.50 m	
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Old Mont WB (day)

Source height = 1.50 m

ROAD (0.00 + 52.26 + 0.00) = 52.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-16.95	-1.46	0.00	0.00	0.00	52.26

Segment Leq : 52.26 dBA

Results segment # 2: Old Mont EB (day)

Source height = 1.50 m

ROAD (0.00 + 51.70 + 0.00) = 51.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-17.50	-1.46	0.00	0.00	0.00	51.70

Segment Leq : 51.70 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: Old Mont WB (night)

Source height = 1.50 m

ROAD (0.00 + 41.32 + 0.00) = 41.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-20.45	-1.30	0.00	0.00	0.00	41.32

Segment Leq : 41.32 dBA

Results segment # 2: Old Mont EB (night)

Source height = 1.50 m

ROAD (0.00 + 41.04 + 0.00) = 41.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-20.73	-1.30	0.00	0.00	0.00	41.04

Segment Leq : 41.04 dBA

Total Leq All Segments: 44.19 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 44.19