

**ROADWAY TRAFFIC
NOISE ASSESSMENT**

138 Forward Avenue
Ottawa, Ontario

Report: 21-359-Traffic Noise



December 17, 2021

PREPARED FOR

Vika Land Development Group Inc.

2727 Grand Vista Circle
Ottawa, ON K2J 0W5

PREPARED BY

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EXECUTIVE SUMMARY

This report describes a detailed roadway traffic noise assessment performed for the proposed residential development located at 138 Forward Avenue in Ottawa, Ontario, in support of a Site Plan Control (SPA) application.

The proposed development consists of a 4-storey residential building located on a block that is bordered by Burnside Avenue to the north, Forward Avenue to the east, Lyndale Avenue to the south, and Parkdale Avenue to the west. The study site is surrounded by low to mid-rise residential/commercial buildings from north to south clockwise. The Jean Talon Building is located to the west of the study site across Parkdale Avenue. The major source of roadway traffic noise is Parkdale Avenue which runs in the north-south direction to the west side of the study site. Figure 1 illustrates the site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) drawings prepared by Architect Susan D. Smith, dated September 2021.

The results of the current analysis indicate that noise levels will range between 43 and 55 dBA during the daytime period (07:00-23:00) and between 35 and 48 dBA during the nighttime period (23:00-07:00). The highest noise level (55 dBA) occurs at the west façade, which is nearest and most exposed to Parkdale Avenue. Upgraded building components will not be required since noise levels predicted due to roadway traffic do not exceed 65 dBA during daytime or 60 dBA during nighttime at any façade.

Since noise levels do not exceed 55 dBA at any Plane of Window (POW) receptor, no warning clauses or other noise mitigation measures will be required. Additionally, noise levels at the OLA receptor in the backyard do not exceed ENCG requirements, therefore no mitigation measures are required.



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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Vika Land Development Group Inc to undertake a detailed roadway traffic noise study for the proposed development located at 138 Forward Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

This assessment is based on theoretical noise calculation methods conforming to the City of Ottawa¹ and the Ministry of the Environment, Conservation and Parks (MECP)² guidelines. Noise calculations were based on architectural drawings prepared by Architect Susan D. Smith, dated November 2021, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The proposed development consists of a 4-storey apartment building on a rectangular-shaped parcel of land. The basement level comprises of 3 residential units and a bicycle storage area, the ground floor comprises 3 residential units and a shared amenity space serving as a living room, and the remaining upper floors consist of residential units.

The study site is surrounded by low to mid-rise residential/commercial buildings from north to south clockwise. The Jean Talon Building is located to the west of the study site across Parkdale Avenue. The major source of roadway traffic noise is Parkdale Avenue which runs in the north-south direction to the west of the study site. Figure 1 illustrates the site plan with the surrounding context.

Given the small size of the development, no major pieces of HVAC equipment are anticipated to be located around the building. Only small internal fan coil or heat pumps are expected for this development. Any equipment supplied shall comply with the Ministry of Environment's NPC-116 - Environmental Noise Guidelines for Installation of Residential Air Conditioners.

¹ City of Ottawa Environmental Noise Control Guidelines, January 2016

² Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013



3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa’s Environmental Noise Control Guidelines (ENCG) as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure level at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard sound pressure level (2×10^{-5} Pascals). The ‘A’ suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicular traffic, the equivalent sound energy level, L_{eq} , provides a measure of the time-varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time-varying noise level over a period of time. For roadways and LRT, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa’s Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms and sleeping quarters respectively for roadway, as listed in Table 1. Based on Gradient Wind’s experience, more comfortable indoor noise levels should be targeted, towards 42 and 37, respectively, to control peak noise and deficiencies in building envelope construction.



TABLE 1: INDOOR SOUND LEVEL CRITERIA

Type of Space	Time Period	L _{eq} (dBA)
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50
Living/dining/den areas of residences , hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45
Sleeping quarters of hotels/motels	23:00 – 07:00	45
Sleeping quarters of residences , hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction³. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment⁴. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation⁵.

The sound level criterion for outdoor living areas (OLA) is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA but are less than 60 dBA, mitigation is recommended to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. If these measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause. If noise levels at OLAs exceed 60 dBA, mitigation must be provided.

³ Burberry, P.B. (2014). Mitchell’s Environment and Services. Routledge, Page 125

⁴ MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

⁵ MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Theoretical Roadway Noise Predictions

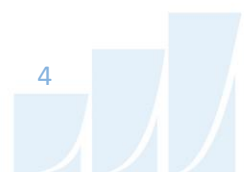
Noise predictions were performed with the aid of the MOECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data. Roadway traffic noise calculations were performed by treating each roadway segment as a separate line source of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Four (4) receptor locations were chosen at the façades of the study building as Plane of Window (POW) receptors and one (1) receptor location was chosen as Outdoor Living Area (OLA) receptor (see Figure 2).
- Receptor heights were taken to be 9.5 metres at Level 3 for the centre of the window and 1.5 m for the backyard outdoor living area (OLA) receptor.
- Surrounding buildings were considered as barriers blocking line of sight with surrounding roadway sources where applicable.
- For select sources, where appropriate, the proposed building was considered as a barrier, partially or fully obstructing exposure to the source.
- Receptor distances and exposure angles are illustrated in Figures 3-7.

4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan⁶ which

⁶ City of Ottawa Transportation Master Plan, November 2013



provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Parkdale Avenue	2-Lane Urban Arterial (2-UAU)	40	15,000

5. ROADWAY TRAFFIC NOISE RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	9.5	POW – 3 rd Floor – East Façade	43	35
2	9.5	POW – 3 rd Floor – South Façade	50	42
3	9.5	POW – 3 rd Floor – West Façade	55	48
4	9.5	POW – 3 rd Floor – North Façade	52	44
5	1.5	OLA – Backyard	55	N/A*

*OLA noise levels during the nighttime period are not considered as per ENCG.

The results of the current analysis indicate that noise levels will range between 43 and 55 dBA during the daytime period (07:00-23:00) and between 35 and 48 dBA during the nighttime period (23:00-07:00). The highest noise level (55 dBA) occurs at the west façade, which is nearest and most exposed to Parkdale Avenue.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic do not exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components will not be required. Since noise levels do not exceed 55 dBA, no noise mitigation measures are required.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 43 and 55 dBA during the daytime period (07:00-23:00) and between 35 and 48 dBA during the nighttime period (23:00-07:00). The highest noise level (55 dBA) occurs at the west façade, which is nearest and most exposed to Parkdale Avenue. Upgraded building components will not be required since noise levels predicted due to roadway traffic do not exceed 65 dBA during daytime or 60 dBA during nighttime at any façade.

Since noise levels do not exceed 55 dBA at any Plane of Window (POW) receptor, no warning clauses or other noise mitigation measures will be required. Additionally, noise levels at the OLA receptor in the backyard do not exceed ENCG requirements, therefore no mitigation measures are required. It is also worth noting that the same builders of the subject site will be erecting a building at 139 Parkdale Avenue which will provide further shielding from the roadway traffic noise.

This concludes our traffic noise assessment and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

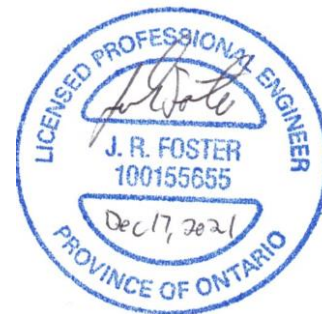
Sincerely,

Gradient Wind Engineering Inc.

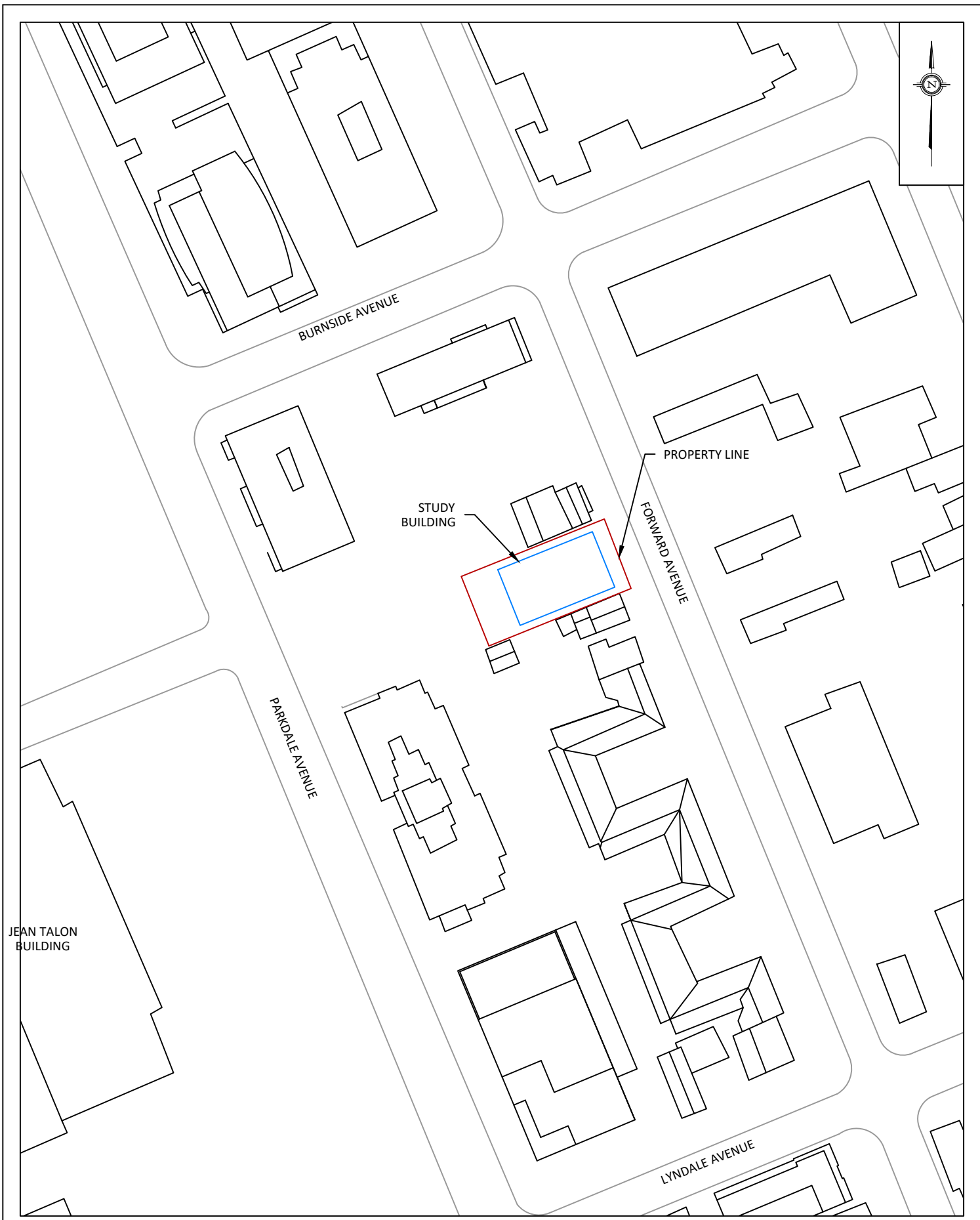


Caleb Alexander, B.Eng.,
Junior Environmental Scientist

Gradient Wind File 21-359-Traffic Noise



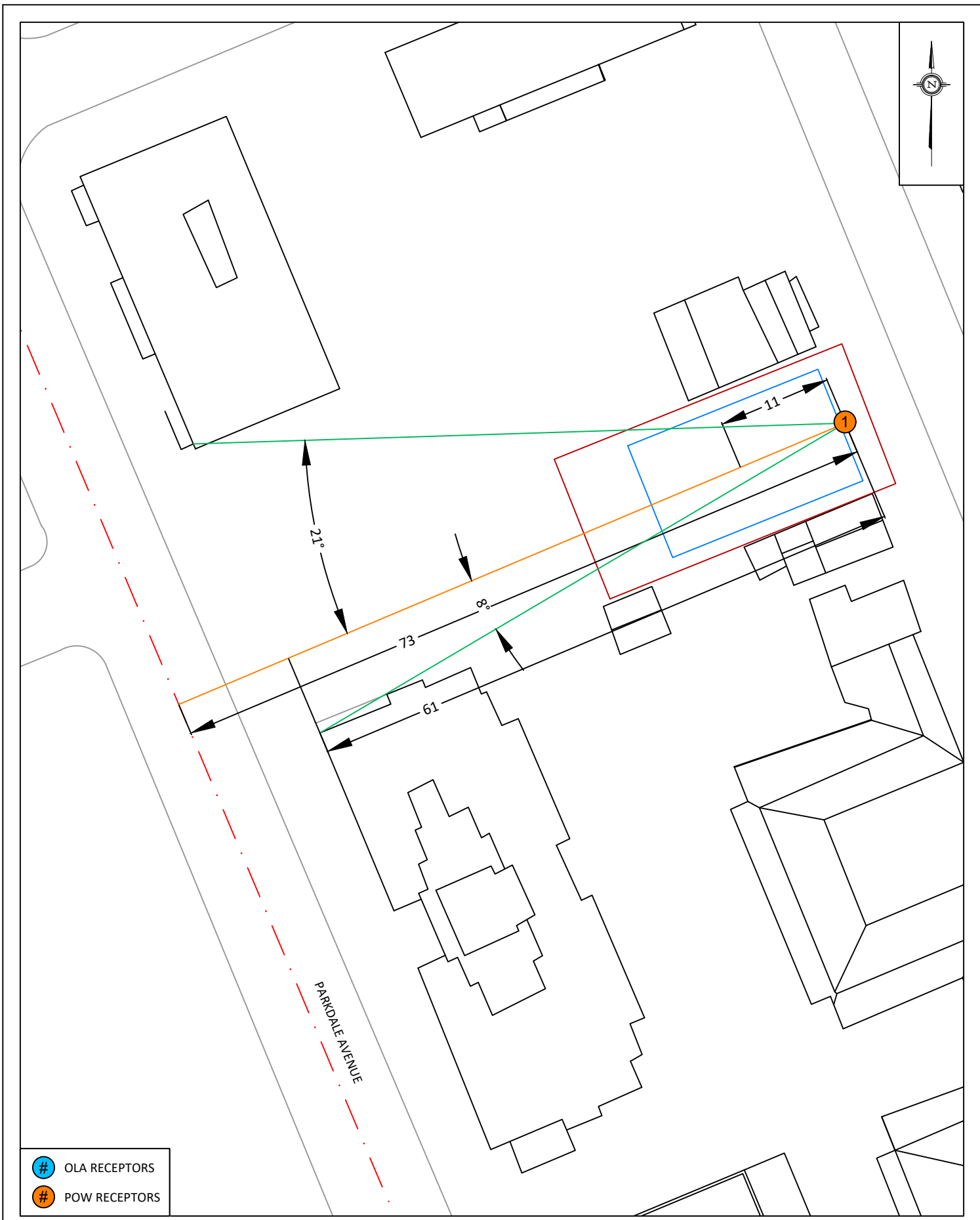
Joshua Foster, P.Eng.
Principal



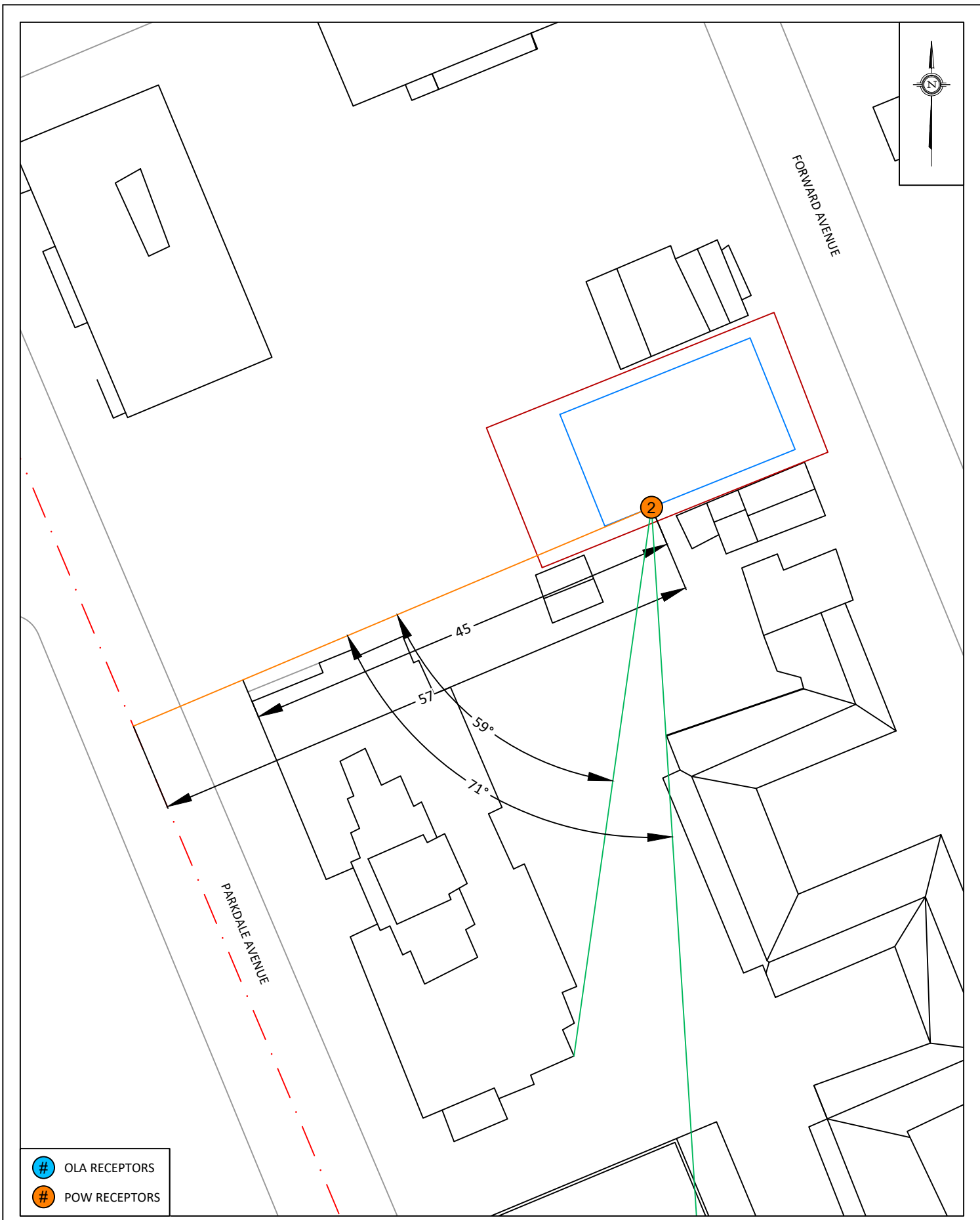
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SCALE	1:1000 (APPROX.)	DRAWING NO. 21-359- 1
DATE	DECEMBER 10, 2021	DRAWN BY C.A.



PROJECT	138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
SCALE	1:500 (APPROX.)	DRAWING NO. 21-359- 1
DATE	DECEMBER 10, 2021	DRAWN BY C.A.

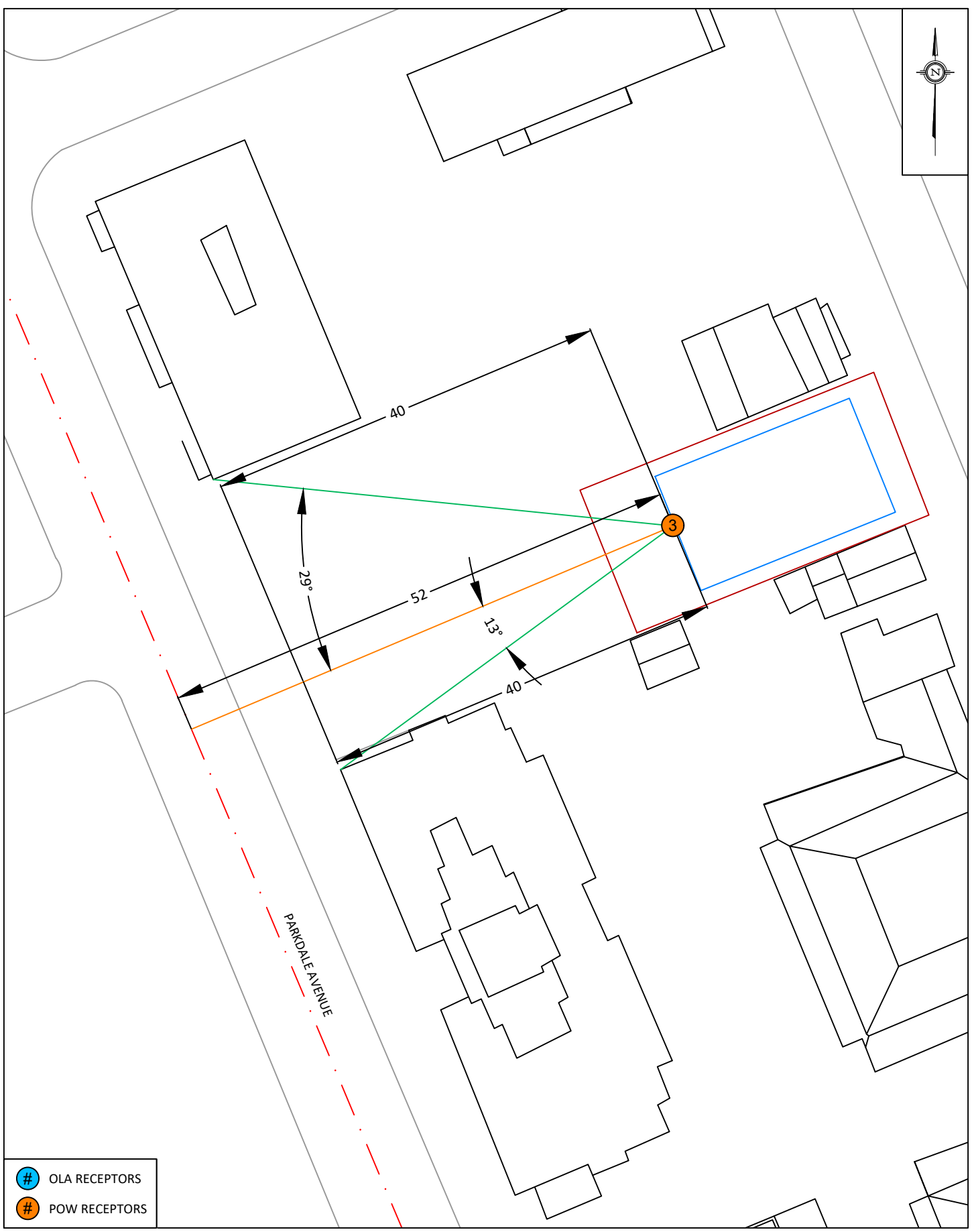


PROJECT	138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
SCALE	1:500 (APPROX.)	DRAWING NO. 21-359- 3
DATE	DECEMBER 10, 2021	DRAWN BY C.A.



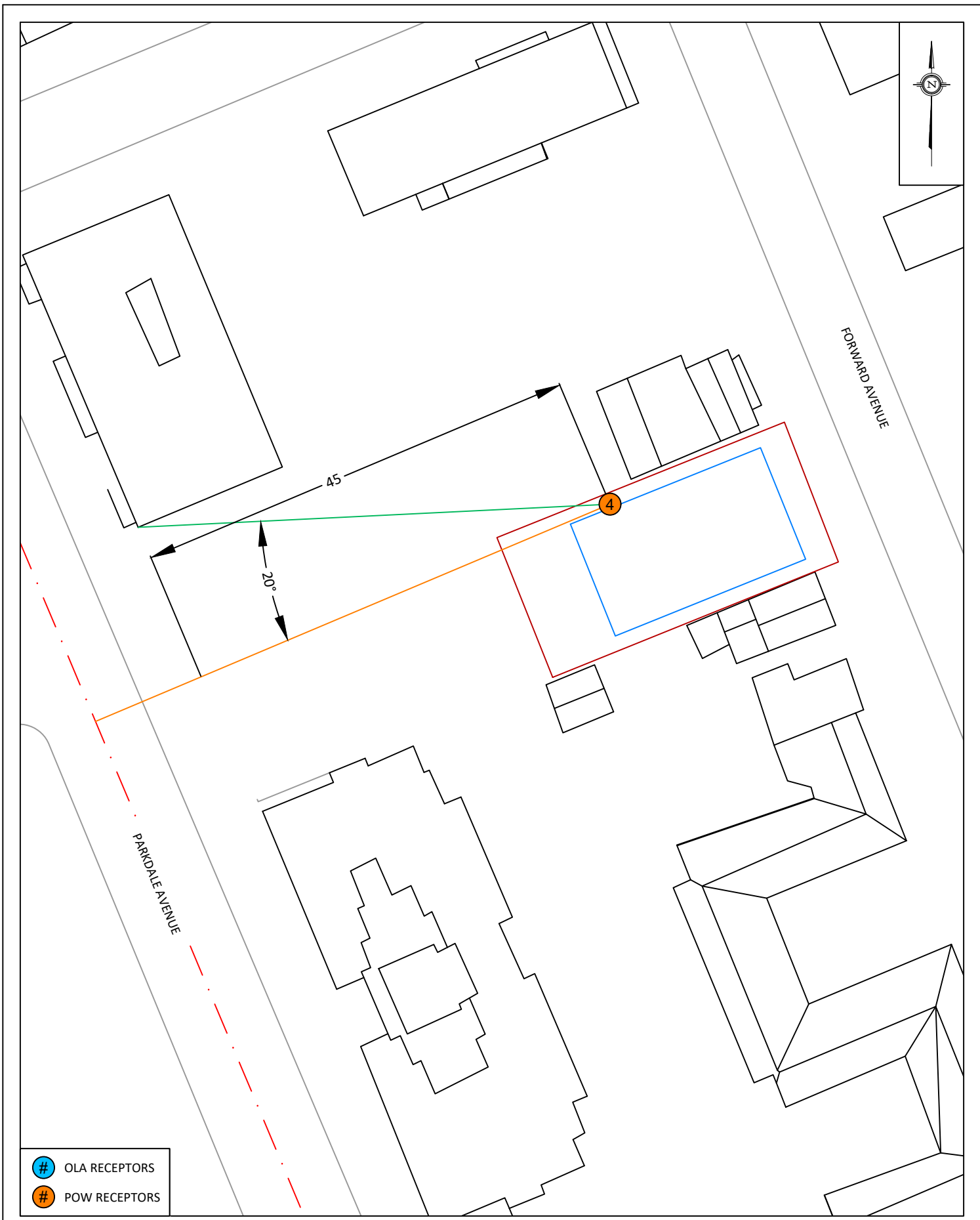
- # OLA RECEPTORS
- # POW RECEPTORS

<p>GRADIENTWIND ENGINEERS & SCIENTISTS</p> <p>127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM</p>	PROJECT	138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	DESCRIPTION
	SCALE	1:500 (APPROX.)	DRAWING NO.
	DATE	DECEMBER 10, 2021	DRAWN BY
			<p>FIGURE 4: STAMSON INPUT DATA FOR RECEPTORS 2</p>



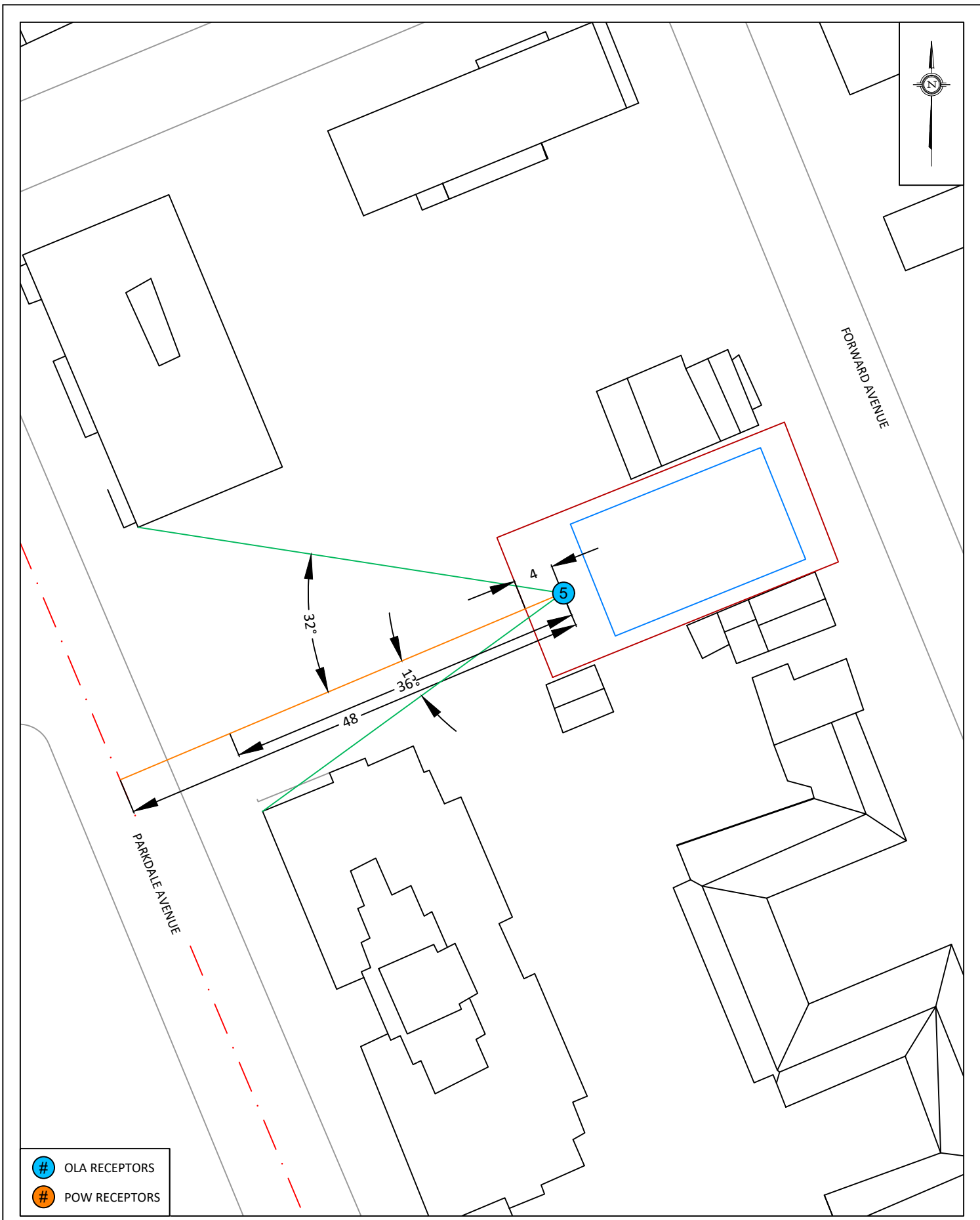
- # OLA RECEPTORS
- # POW RECEPTORS

<p>GRADIENTWIND ENGINEERS & SCIENTISTS</p> <p>127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM</p>	PROJECT	138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION	<p>FIGURE 5: STAMSON INPUT DATA FOR RECEPTORS 3</p>
	SCALE	1:500 (APPROX.)	DRAWING NO.	21-359- 5	
	DATE	DECEMBER 10, 2021	DRAWN BY	C.A.	



- # OLA RECEPTORS
- # POW RECEPTORS

GRADIENTWIND ENGINEERS & SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT 138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION FIGURE 6: STAMSON INPUT DATA FOR RECEPTOR 4
	SCALE 1:500 (APPROX.)	DRAWING NO. 21-359- 6	
	DATE DECEMBER 10, 2021	DRAWN BY C.A.	



- # OLA RECEPTORS
- # POW RECEPTORS

GRADIENTWIND ENGINEERS & SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT 138 FORWARD AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION FIGURE 7: STAMSON INPUT DATA FOR RECEPTOR 5
	SCALE 1:500 (APPROX.)	DRAWING NO. 21-359-7	
	DATE DECEMBER 10, 2021	DRAWN BY C.A.	

GRADIENTWIND

ENGINEERS & SCIENTISTS



APPENDIX A

STAMSON INPUT-OUTPUT DATA

STAMSON 5.0 NORMAL REPORT Date: 10-12-2021 17:01:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Parkdale 1 (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 : 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): 15000
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: Parkdale 1 (day/night)

Angle1 Angle2 : -90.00 deg -8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 73.00 / 73.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -8.00 deg
Barrier height : 18.00 m
Barrier receiver distance : 61.00 / 61.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Parkdale 2 (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 : 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): 15000
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: Parkdale 2 (day/night)

Angle1 Angle2 : -8.00 deg 21.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 73.00 / 73.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -8.00 deg Angle2 : 21.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 11.00 / 11.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Parkdale 3 (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 : 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): 15000
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 # 3: Parkdale 3 (day/night)

Angle1 Angle2 : 21.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 73.00 / 73.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 21.00 deg Angle2 : 90.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 61.00 / 61.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Parkdale 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	2.81	2.81

ROAD (0.00 + 37.88 + 0.00) = 37.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-8	0.00	66.69	0.00	-6.87	-3.41	0.00	0.00	-18.52	37.88

Segment Leq : 37.88 dBA



Results segment # 2: Parkdale 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

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

-----+-----+-----+-----
1.50 ! 9.50 ! 8.29 ! 8.29

ROAD (0.00 + 38.35 + 0.00) = 38.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

-8 21 0.00 66.69 0.00 -6.87 -7.93 0.00 0.00 -13.53 38.35

Segment Leq : 38.35 dBA

Results segment # 3: Parkdale 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

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

-----+-----+-----+-----
1.50 ! 9.50 ! 2.81 ! 2.81

ROAD (0.00 + 37.96 + 0.00) = 37.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

21 90 0.00 66.69 0.00 -6.87 -4.16 0.00 0.00 -17.69 37.96

Segment Leq : 37.96 dBA

Total Leq All Segments: 42.84 dBA

Results segment # 1: Parkdale 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	9.50 !	2.81 !	2.81

ROAD (0.00 + 30.28 + 0.00) = 30.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-8	0.00	59.09	0.00	-6.87	-3.41	0.00	0.00	-18.52	30.28

Segment Leq : 30.28 dBA

Results segment # 2: Parkdale 2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	9.50 !	8.29 !	8.29

ROAD (0.00 + 30.75 + 0.00) = 30.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	21	0.00	59.09	0.00	-6.87	-7.93	0.00	0.00	-13.53	30.75

Segment Leq : 30.75 dBA

Results segment # 3: Parkdale 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	2.81	2.81

ROAD (0.00 + 30.36 + 0.00) = 30.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
21	90	0.00	59.09	0.00	-6.87	-4.16	0.00	0.00	-17.69	30.36

Segment Leq : 30.36 dBA

Total Leq All Segments: 35.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 42.84
(NIGHT): 35.24



STAMSON 5.0 NORMAL REPORT Date: 10-12-2021 17:02:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Parkdale3 (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 : 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): 15000
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: Parkdale3 (day/night)

Angle1 Angle2 : -90.00 deg -71.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -71.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 45.00 / 45.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: PARKDALE 2 (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 : 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): 15000
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: PARKDALE 2 (day/night)

Angle1 Angle2 : -71.00 deg -59.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 9.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: PARKDALE 1 (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 : 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): 15000
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 # 3: PARKDALE 1 (day/night)

Angle1 Angle2 : -59.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.00 / 57.00 m
Receiver height : 9.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -59.00 deg Angle2 : 0.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 45.00 / 45.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Parkdale3 (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 ! 9.50 ! 3.18 ! 3.18

ROAD (0.00 + 34.68 + 0.00) = 34.68 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -71 0.00 66.69 0.00 -5.80 -9.77 0.00 0.00 -16.44 34.68

Segment Leq : 34.68 dBA

Results segment # 2: PARKDALE 2 (day)

Source height = 1.50 m

ROAD (0.00 + 49.13 + 0.00) = 49.13 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-71 -59 0.00 66.69 0.00 -5.80 -11.76 0.00 0.00 0.00 49.13

Segment Leq : 49.13 dBA



Results segment # 3: PARKDALE 1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.18	3.18

ROAD (0.00 + 36.04 + 0.00) = 36.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	0	0.00	66.69	0.00	-5.80	-4.84	0.00	0.00	-20.00	36.04

-59 0 0.00 66.69 0.00 -5.80 -4.84 0.00 0.00 -20.00 36.04

Segment Leq : 36.04 dBA

Total Leq All Segments: 49.48 dBA

Results segment # 1: Parkdale3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.18	3.18

ROAD (0.00 + 27.08 + 0.00) = 27.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-71	0.00	59.09	0.00	-5.80	-9.77	0.00	0.00	-16.44	27.08

-90 -71 0.00 59.09 0.00 -5.80 -9.77 0.00 0.00 -16.44 27.08

Segment Leq : 27.08 dBA

Results segment # 2: PARKDALE 2 (night)

Source height = 1.50 m

ROAD (0.00 + 41.53 + 0.00) = 41.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-71	-59	0.00	59.09	0.00	-5.80	-11.76	0.00	0.00	0.00	41.53

Segment Leq : 41.53 dBA

Results segment # 3: PARKDALE 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	2.13	2.13

ROAD (0.00 + 28.45 + 0.00) = 28.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-59	0	0.00	59.09	0.00	-5.80	-4.84	0.00	0.00	-20.00	28.45

Segment Leq : 28.45 dBA

Total Leq All Segments: 41.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.48
(NIGHT): 41.88

STAMSON 5.0 NORMAL REPORT Date: 10-12-2021 17:01:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Parkdale 1 (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 : 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): 15000
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: Parkdale 1 (day/night)

Angle1 Angle2 : -90.00 deg -13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -13.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Parkdale 2 (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 : 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): 15000
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: Parkdale 2 (day/night)

Angle1 Angle2 : -13.00 deg 29.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 9.50 / 9.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Parkdale 3 (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 : 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): 15000
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 # 3: Parkdale 3 (day/night)

Angle1 Angle2 : 29.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 29.00 deg Angle2 : 90.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Parkdale 1 (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)

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1.50 ! 9.50 ! 3.34 ! 3.34

ROAD (0.00 + 38.77 + 0.00) = 38.77 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -13 0.00 66.69 0.00 -5.40 -3.69 0.00 0.00 -18.83 38.77

Segment Leq : 38.77 dBA

Results segment # 2: Parkdale 2 (day)

Source height = 1.50 m

ROAD (0.00 + 54.97 + 0.00) = 54.97 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-13 29 0.00 66.69 0.00 -5.40 -6.32 0.00 0.00 0.00 54.97

Segment Leq : 54.97 dBA



Results segment # 3: Parkdale 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.34	3.34

ROAD (0.00 + 39.14 + 0.00) = 39.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
29	90	0.00	66.69	0.00	-5.40	-4.70	0.00	0.00	-17.45	39.14

Segment Leq : 39.14 dBA

Total Leq All Segments: 55.18 dBA

Results segment # 1: Parkdale 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.34	3.34

ROAD (0.00 + 31.17 + 0.00) = 31.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-13	0.00	59.09	0.00	-5.40	-3.69	0.00	0.00	-18.83	31.17

Segment Leq : 31.17 dBA

Results segment # 2: Parkdale 2 (night)

Source height = 1.50 m

ROAD (0.00 + 47.37 + 0.00) = 47.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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-13	29	0.00	59.09	0.00	-5.40	-6.32	0.00	0.00	0.00	47.37
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Segment Leq : 47.37 dBA

Results segment # 3: Parkdale 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
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1.50	9.50	3.34	3.34
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ROAD (0.00 + 31.54 + 0.00) = 31.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
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29	90	0.00	59.09	0.00	-5.40	-4.70	0.00	0.00	-17.45	31.54
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Segment Leq : 31.54 dBA

Total Leq All Segments: 47.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.18
(NIGHT): 47.58

STAMSON 5.0 NORMAL REPORT Date: 10-12-2021 17:07:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 960/1056 veh/TimePeriod
Medium truck volume : 0/84 veh/TimePeriod
Heavy truck volume : 0/60 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -90.00 deg -13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 1.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -13.00 deg
Barrier height : 500.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Parkdale 2 (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 : 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): 15000
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: Parkdale 2 (day/night)

Angle1 Angle2 : 0.00 deg 20.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 9.50 / 9.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Parkdale 3 (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 : 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): 15000
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 # 3: Parkdale 3 (day/night)

Angle1 Angle2 : 20.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 52.00 / 52.00 m
Receiver height : 9.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 20.00 deg Angle2 : 90.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 40.00 / 40.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Parkdale 1 (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

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0.50 ! 1.50 ! 1.42 ! 1.42

ROAD (0.00 + 8.27 + 0.00) = 8.27 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -13 0.00 47.16 0.00 -15.23 -3.69 0.00 0.00 -19.98 8.27

Segment Leq : 8.27 dBA

Results segment # 2: Parkdale 2 (day)

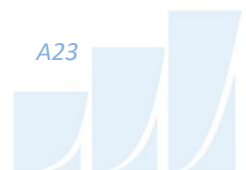
Source height = 1.50 m

ROAD (0.00 + 51.74 + 0.00) = 51.74 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

0 20 0.00 66.69 0.00 -5.40 -9.54 0.00 0.00 0.00 51.74

Segment Leq : 51.74 dBA



Results segment # 3: Parkdale 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.34	3.34

ROAD (0.00 + 39.48 + 0.00) = 39.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.00	66.69	0.00	-5.40	-4.10	0.00	0.00	-17.70	39.48

Segment Leq : 39.48 dBA

Total Leq All Segments: 51.99 dBA

Results segment # 1: Parkdale 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	8.86	8.86

ROAD (0.00 + 20.20 + 0.00) = 20.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-13	0.00	59.09	0.00	-15.23	-3.69	0.00	0.00	-19.98	20.20

Segment Leq : 20.20 dBA

Results segment # 2: Parkdale 2 (night)

Source height = 1.50 m

ROAD (0.00 + 44.15 + 0.00) = 44.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	20	0.00	59.09	0.00	-5.40	-9.54	0.00	0.00	0.00	44.15

0	20	0.00	59.09	0.00	-5.40	-9.54	0.00	0.00	0.00	44.15
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Segment Leq : 44.15 dBA

Results segment # 3: Parkdale 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.34	3.34

1.50	9.50	3.34	3.34
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ROAD (0.00 + 31.89 + 0.00) = 31.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
20	90	0.00	59.09	0.00	-5.40	-4.10	0.00	0.00	-17.70	31.89

20	90	0.00	59.09	0.00	-5.40	-4.10	0.00	0.00	-17.70	31.89
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Segment Leq : 31.89 dBA

Total Leq All Segments: 44.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.99
(NIGHT): 44.42

STAMSON 5.0 NORMAL REPORT Date: 10-12-2021 17:09:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Parkdale 1 (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 : 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): 15000
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: Parkdale 1 (day/night)

Angle1 Angle2 : -90.00 deg -13.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height : 1.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -13.00 deg
Barrier height : 25.00 m
Barrier receiver distance : 36.00 / 36.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Parkdale 2 (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 : 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): 15000
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: Parkdale 2 (day/night)

Angle1 Angle2 : -13.00 deg 32.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height : 1.50 / 9.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Parkdale 3 (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 : 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): 15000
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 # 3: Parkdale 3 (day/night)

Angle1 Angle2 : 32.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 48.00 / 48.00 m
Receiver height : 1.50 / 9.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 32.00 deg Angle2 : 90.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 36.00 / 36.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Parkdale 1 (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 + 38.64 + 0.00) = 38.64 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -13 0.00 66.69 0.00 -5.05 -3.69 0.00 0.00 -19.31 38.64

Segment Leq : 38.64 dBA

Results segment # 2: Parkdale 2 (day)

Source height = 1.50 m

ROAD (0.00 + 55.61 + 0.00) = 55.61 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-13 32 0.00 66.69 0.00 -5.05 -6.02 0.00 0.00 0.00 55.61

Segment Leq : 55.61 dBA



Results segment # 3: Parkdale 3 (day)

Source height = 1.50 m

Barrier height for grazing incidence

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

ROAD (0.00 + 37.98 + 0.00) = 37.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
32	90	0.00	66.69	0.00	-5.05	-4.92	0.00	0.00	-18.74	37.98

32 90 0.00 66.69 0.00 -5.05 -4.92 0.00 0.00 -18.74 37.98

Segment Leq : 37.98 dBA

Total Leq All Segments: 55.77 dBA

Results segment # 1: Parkdale 1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

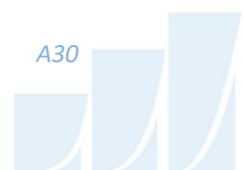
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.50	3.50

ROAD (0.00 + 31.21 + 0.00) = 31.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-13	0.00	59.09	0.00	-5.05	-3.69	0.00	0.00	-19.14	31.21

-90 -13 0.00 59.09 0.00 -5.05 -3.69 0.00 0.00 -19.14 31.21

Segment Leq : 31.21 dBA



Results segment # 2: Parkdale 2 (night)

Source height = 1.50 m

ROAD (0.00 + 48.02 + 0.00) = 48.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-13	32	0.00	59.09	0.00	-5.05	-6.02	0.00	0.00	0.00	48.02

Segment Leq : 48.02 dBA

Results segment # 3: Parkdale 3 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	9.50	3.50	3.50

ROAD (0.00 + 30.73 + 0.00) = 30.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
32	90	0.00	59.09	0.00	-5.05	-4.92	0.00	0.00	-18.39	30.73

Segment Leq : 30.73 dBA

Total Leq All Segments: 48.19 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.77
(NIGHT): 48.19