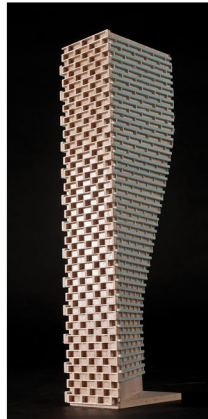


## ROADWAY TRAFFIC NOISE ASSESSMENT

Barrhaven Town Centre  
Ottawa, Ontario

REPORT: GW21-289 – Traffic Noise



May 31, 2023

PREPARED FOR

**Minto Communities**

200-180 Kent St  
Ottawa, ON K1P 0B6

PREPARED BY

Giuseppe Garro, MAsc., Environmental Scientist  
Joshua Foster, P.Eng., Lead Engineer

## EXECUTIVE SUMMARY

This report describes a traffic noise assessment undertaken in support of Zoning By-law Amendment and Draft Plan of Subdivision applications for a proposed residential development comprised of 25 stacked townhome blocks located at Barrhaven Town Centre in Ottawa, Ontario. For the purposes of this study, the elevations facing Longfields Drive will be referred to as the east elevations. The major sources of traffic noise are Longfields Drive, Chapman Mills Drive and the associated Bus Rapid Transit (BRT) line, Riocan Avenue, and Glenroy Gilbert Drive. Figure 1 illustrates a complete 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) architectural drawings provided by Minto Communities in March 2023.

The results of the current analysis indicate that noise levels will range between 50 and 70 dBA at the Plane of Window during the daytime period (07:00-23:00) and between 43 and 62 dBA during the nighttime period (23:00-07:00). The highest noise level (70 dBA) occurs at the east façades of Blocks 6 and 16, which are nearest and most exposed to Longfields Drive. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 3.

Results of the calculations also indicate that Blocks 6 and 16 within the development will require central air conditioning which will allow occupants to keep windows closed and maintain a comfortable living environment. All remaining Blocks within the development will require forced air heating with provision for the installation of central air conditioning at the occupant's discretion. A Warning Clause will also be required to be placed on all Lease, Purchase and Sale Agreements for dwelling units within the development as summarized in Section 6. The ventilation requirements and associated Warning Clauses are identified in Figure 4 for each Block of townhouses in the development.

The stationary noise impacts of the proposed townhome development onto the surroundings was determined to be insignificant as no major mechanical equipment is planned for this subdivision. The only anticipated mechanical systems are residential air conditioners which, according to MECP noise



guidelines, are not considered stationary noise sources. The location and installation of these systems are expected to comply with the noise regulations stipulated in *NPC-216: Residential and Air Conditioning Devices*<sup>1</sup>, or local noise by-laws. As a result, noise from these units onto the surrounding area is anticipated to be minimal.

With respect to impacts of surrounding stationary noise sources on the development, the impacts are expected to be minimal. Sources of stationary noise were identified at the rooftop of the cinema and strip mall located at 131 and 129 Riocan Avenue respectively. The associated Rooftop Air Handling Units (RTUs) are located to the northwest of the proposed development. The setback distance to the RTUs atop the cinema at 131 Riocan Avenue is approximately 35 metres, while the setback to the RTUs atop the strip mall at 129 Riocan Avenue is approximately 25 metres. Based on the setback distances, the size of the RTUs, and the tall parapet surrounding the RTUs at 129 Riocan Avenue, received noise levels at the nearest Block of townhouses are expected to be within the ENCG limits for stationary noise.

Results indicate that noise levels at the ground-level amenity areas are expected to fall below 55 dBA, which complies to the limits for Outdoor Living Areas specified in the ENCG. Therefore, mitigation will not be required.

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<sup>1</sup> Ontario Ministry of the Environment and Energy – Residential Air Conditioning Devices, Publication NPC-216, Toronto Municipal Code, Toronto, 1993

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## 1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Minto Communities to undertake a traffic noise assessment in support of Zoning By-law Amendment and Draft Plan of Subdivision applications for a proposed residential development located at Barrhaven Town Centre in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa<sup>2</sup> and Ministry of the Environment, Conservation and Parks (MECP)<sup>3</sup> guidelines. Noise calculations were based on architectural drawings provided by Minto Communities in March 2023, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

## 2. TERMS OF REFERENCE

The focus of this traffic noise assessment is the proposed residential development comprised of 25 back-to-back stacked townhome blocks located at Barrhaven Town Centre in Ottawa, Ontario. For the purposes of this study, the elevations facing Longfields Drive will be referred to as the east elevations. The study site is located on a nearly rectangular shaped parcel of land bound by Longfields Drive to the east, Chapman Mills Drive to the south, Riocan Avenue to the west, and Glenroy Gilbert Drive to the north.

The proposed development comprises 25 stacked townhome blocks, with underground parking accessible via four access ramps in the above-ground parking near the center and the east of the site. The units will be 3.5-storeys tall. Outdoor amenity space is located centrally between townhomes on the east and west sides of the site. The site is surrounded by low-rise residential neighbourhoods to the northwest clockwise to the west, and a variety of low-rise commercial buildings to the northwest.

The major sources of traffic noise are Longfields Drive, Chapman Mills Drive and the associated Bus Rapid Transit (BRT) line, Riocan Avenue, and Glenroy Gilbert Drive. Arterial or collector roadways beyond 100 meters from the study site are not included as sources influencing the study site as per ENCG Section 2.1.

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<sup>2</sup> City of Ottawa Environmental Noise Control Guidelines, January 2016

<sup>3</sup> Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

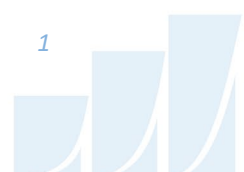


Figure 1 illustrates a complete site plan with the surrounding context. Individual blocks of townhouses within the proposed development are labelled numerically for ease of reference, as illustrated in Figure 1.

### **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 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 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 noise level ( $2 \times 10^{-5}$  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 surface roadway traffic noise, 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, 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, as listed in Table 1. However, to account for deficiencies in building construction and to control peak noise, these levels should be targeted toward 42 and 37 dBA.

**TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) <sup>4</sup>**

Type of Space	Time Period	L <sub>eq</sub> (dBA)
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50
Living/dining/den areas of <b>residences</b> , 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 <b>residences</b> , 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 reduction<sup>5</sup>. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment<sup>6</sup>. 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 attenuation<sup>7</sup>.

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion.

<sup>4</sup> Adapted from ENCG 2016 – Tables 2.2b and 2.2c

<sup>5</sup> Burberry, P.B. (2014). Mitchell’s Environment and Services. Routledge, Page 125

<sup>6</sup> MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

<sup>7</sup> 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 MECP 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 separate line sources 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 or absorptive depending on specific source-receiver pathways.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Noise receptors were strategically placed at 20 locations around the study area (see Figure 2).
- Receptor height was taken to be 9.5 metres at Level 3 for the centre of the window (height to the 3<sup>rd</sup> floor slab + 1.5 metres) for POW Receptors 1-18; and 1.5 metres for OLA Receptors 19 and 20.
- Receptor distances and exposure angles are illustrated in Appendix A.

### 4.2.1 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 Plan<sup>8</sup> which 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. BRT volumes are based on Gradient Wind's experience with previous projects. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

---

<sup>8</sup> City of Ottawa Transportation Master Plan, November 2013



**TABLE 2: ROADWAY TRAFFIC DATA**

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Longfields Drive	4-Lane Urban Arterial Divided	50	<b>35,000</b>
Chapman Mills Drive	2-Lane Major Collector	40	<b>12,000</b>
BRT (Chapman Mills Drive)	Bus	40	<b>191/67*</b>
Riocan Avenue	2-Lane Urban Collector	40	<b>8,000</b>
Glenro Gilbert Drive	2-Lane Urban Collector	40	<b>8,000</b>

\*Day/Night volumes

### 4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially-sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels (from road sources) at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure<sup>9</sup> considers:

- Window type and total area as a percentage of total room floor area

<sup>9</sup> Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research<sup>10</sup>, exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

## 5. 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	Block 11 - North Façade	64	58
2	9.5	Block 11 - West Façade	64	57
3	9.5	Block 19 - East Façade	59	52
4	9.5	Block 11 - South Façade	59	52
5	9.5	Block 13 - South Façade	50	43
6	9.5	Block 1 - West Façade	64	57

<sup>10</sup> CMHC, Road & Rail Noise: Effects on Housing

**TABLE 3 (CONTINUED): EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC**

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
7	9.5	Block 1 - South Façade	64	56
8	9.5	Block 16 - North Façade	68	60
9	9.5	Block 16 - East Façade	70	62
10	9.5	Block 15 - South Façade	51	44
11	9.5	Block 16 - East Façade	69	62
12	9.5	Block 16 - South Façade	65	57
13	9.5	Block 6 - East Façade	70	62
14	9.5	Block 6 - South Façade	68	60
15	9.5	Block 4 - West Façade	59	52
16	9.5	Block 4 - South Façade	63	57
17	9.5	Block 22 - West Façade	59	52
18	9.5	Block 22 - South Façade	64	56
19	1.5	Amenity - West Side	40	N/A*
20	1.5	Amenity - East Side	47	N/A*

\*Nighttime noise levels are not considered at OLA receptors, as per ENCG

The results of the current analysis indicate that noise levels will range between 50 and 70 dBA at the Plane of Window during the daytime period (07:00-23:00) and between 43 and 62 dBA during the nighttime period (23:00-07:00). The highest noise level (70 dBA) occurs at the east façades of Blocks 6 and 16, which are nearest and most exposed to Longfields Drive.

## 5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). As per city of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application for each unit type. The STC requirements for the windows are summarized in Table 4 below for various units within the development (see Figure 3):

**TABLE 4: WINDOW STC REQUIREMENTS**

Block	Façade	Bedroom Window STC	Living Room Window STC	Exterior Wall STC
16	North	31	26	45
	East	33	28	
6	East	33	28	45
	South	31	26	

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a window/wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. Several manufacturers and various combinations of window components will offer the necessary sound attenuation rating. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

Results of the calculations also indicate that Blocks 6 and 16 within the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. All other blocks within the development will require forced air heating with provision for

the installation of central air conditioning. In addition to ventilation requirements, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

Results indicate that noise levels at the ground-level amenity areas are expected to fall below 55 dBA, which complies to the limits for Outdoor Living Areas specified in the ENCG. Therefore, mitigation will not be required.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

The results of the current analysis indicate that noise levels will range between 50 and 70 dBA at the Plane of Window during the daytime period (07:00-23:00) and between 43 and 62 dBA during the nighttime period (23:00-07:00). The highest noise level (70 dBA) occurs at the east façades of Blocks 6 and 16, which are nearest and most exposed to Longfields Drive. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 3.

Results of the calculations also indicate that Blocks 6 and 16 within the development will require central air conditioning which will allow occupants to keep windows closed and maintain a comfortable living environment. The following 'Type D' Warning Clause<sup>11</sup> will also be required to be placed on all Lease, Purchase and Sale Agreements for dwelling units within Blocks 6 and 16, as summarized below:

*"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 sound level limits of the Municipality and the Ministry of the Environment."*

All remaining Blocks within the development will require forced air heating with provision for the installation of central air conditioning at the occupant's discretion. The following 'Type C' Warning Clause<sup>11</sup> will also be required to be placed on all Lease, Purchase and Sale Agreements for dwelling units within the remaining Blocks in the development as summarized below:

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<sup>11</sup> Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013



*“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning 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 the Environment”*

The ventilation requirements and associated Warning Clauses are identified in Figure 4 for each Block of townhouses in the development.

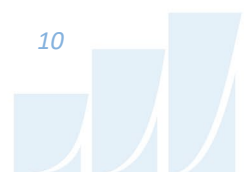
The stationary noise impacts of the proposed townhome development onto the surroundings was determined to be insignificant as no major mechanical equipment is planned for this subdivision. The only anticipated mechanical systems are residential air conditioners which, according to MECP noise guidelines, are not considered stationary noise sources. The location and installation of these systems are expected to comply with the noise regulations stipulated in *NPC-216: Residential and Air Conditioning Devices*<sup>12</sup>, or local noise by-laws. As a result, noise from these units onto the surrounding area is anticipated to be minimal.

With respect to impacts of surrounding stationary noise sources on the development, the impacts are expected to be minimal. Sources of stationary noise were identified at the rooftop of the cinema and strip mall located at 131 and 129 Riocan Avenue respectively. The associated Rooftop Air Handling Units (RTUs) are located to the northwest of the proposed development. The setback distance to the RTUs atop the cinema at 131 Riocan Avenue is approximately 35 metres, while the setback to the RTUs atop the strip mall at 129 Riocan Avenue is approximately 25 metres. Based on the setback distances, the size of the RTUs, and the tall parapet surrounding the RTUs at 129 Riocan Avenue, received noise levels at the nearest Block of townhouses are expected to be within the ENCG limits for stationary noise.

Results indicate that noise levels at the ground-level amenity areas are expected to fall below 55 dBA, which complies to the limits for Outdoor Living Areas specified in the ENCG. Therefore, mitigation will not be required.

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<sup>12</sup> Ontario Ministry of the Environment and Energy – Residential Air Conditioning Devices, Publication NPC-216, Toronto Municipal Code, Toronto, 1993



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.***



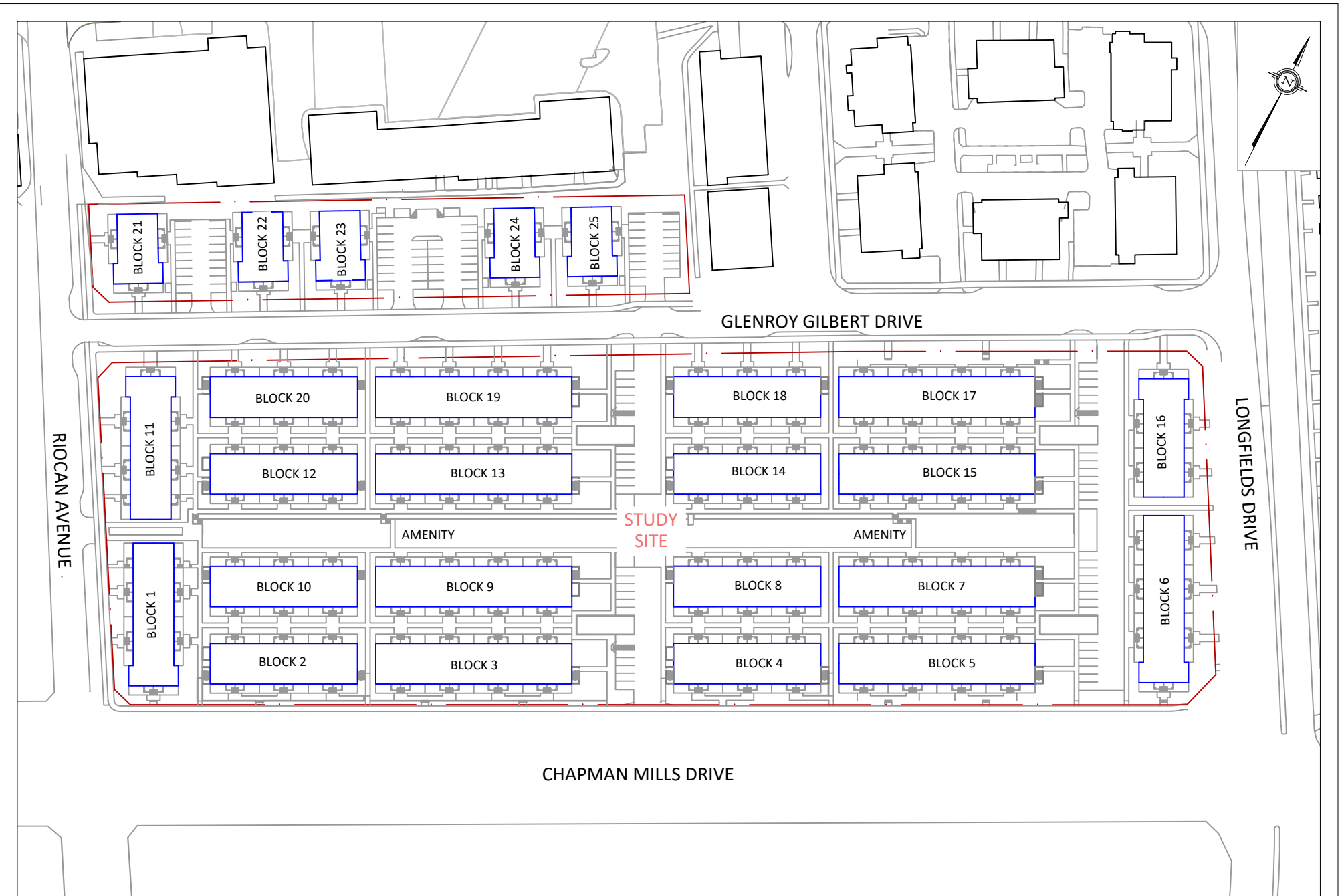
Giuseppe Garro, M.A.Sc.  
Environmental Scientist

*Gradient Wind File #21-289 - Traffic Noise*



Joshua Foster, P.Eng.  
Lead Engineer





PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
SCALE	1:1700 (APPROX.)	DRAWING NO. GW21-289-1
DATE	MAY 31, 2023	DRAWN BY G.G.

DESCRIPTION

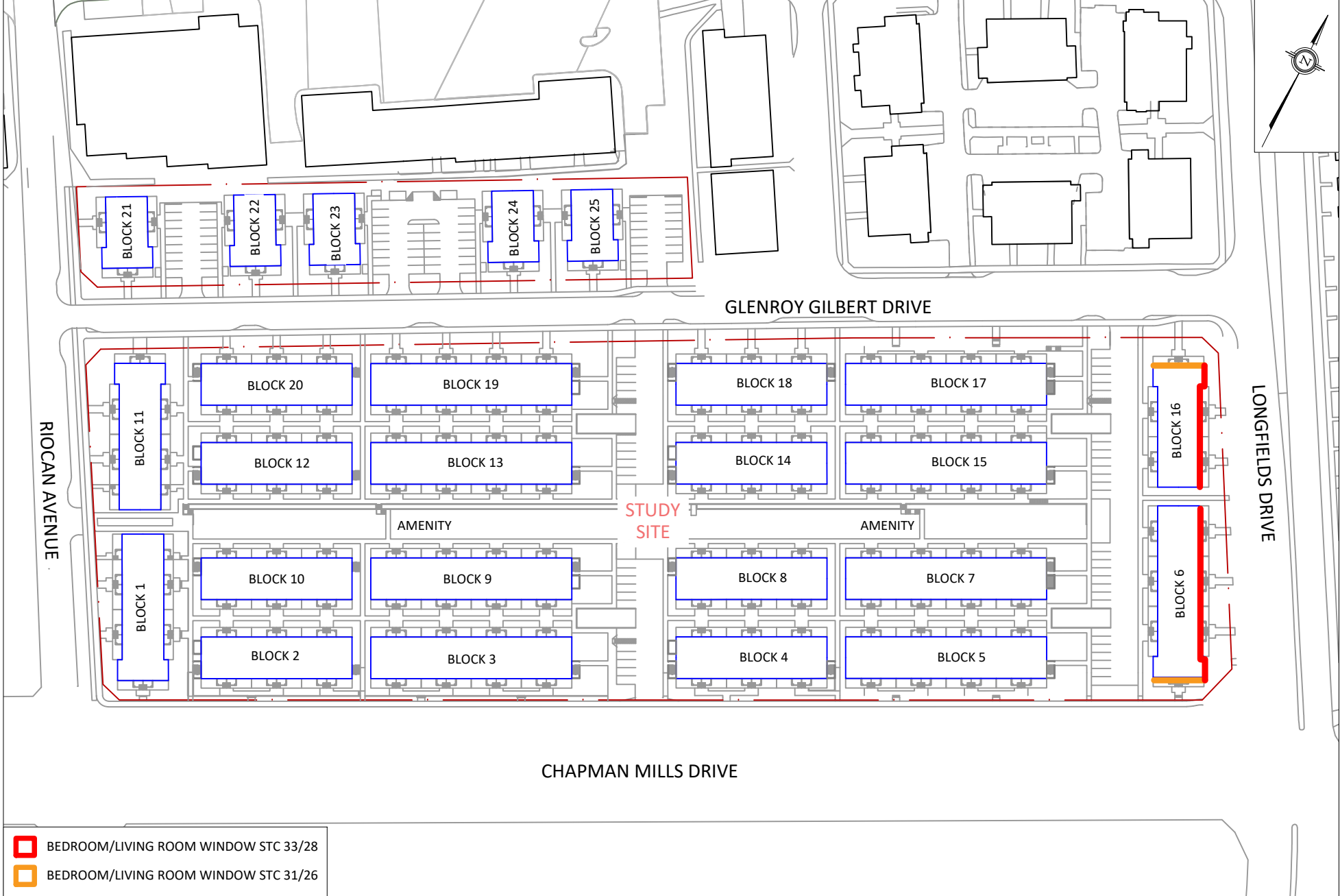
**FIGURE 1:**  
SITE PLAN AND SURROUNDING CONTEXT





FIGURE 2:  
RECEPTOR LOCATIONS

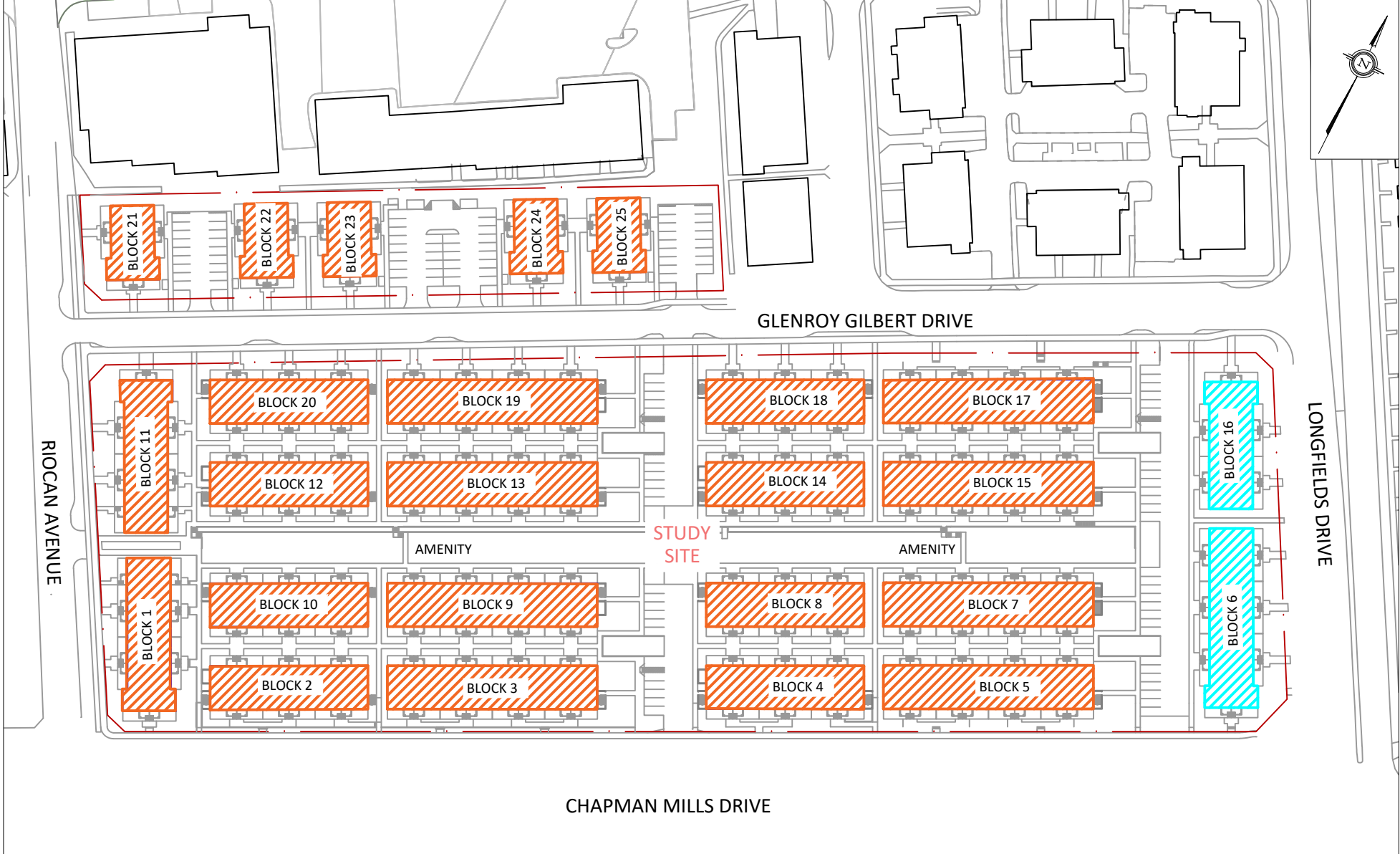
PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX.)	DRAWING NO.	GW21-289-2
DATE	MAY 31, 2023	DRAWN BY	G.G.





- BEDROOM/LIVING ROOM WINDOW STC 33/28
- BEDROOM/LIVING ROOM WINDOW STC 31/26

PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX)	DRAWING NO.	GW21-289-3
DATE	MAY 31, 2023	DRAWN BY	G.G.

FIGURE 3:  
UPGRADED BUILDING COMPONENTS



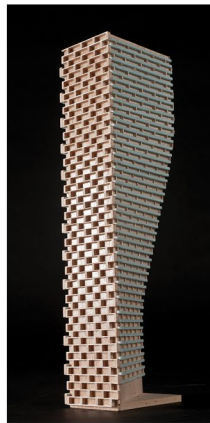
-  TYPE D / AIR CONDITIONING
-  TYPE C / FORCED AIR HEATING WITH PROVISION FOR AIR CONDITIONING

PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX.)	DRAWING NO.	GW21-289-4
DATE	MAY 31, 2023	DRAWN BY	G.G.

FIGURE 4:  
VENTILATION REQUIREMENTS

# GRADIENTWIND

ENGINEERS & SCIENTISTS



## APPENDIX A

### STAMSON 5.04 – INPUT AND OUTPUT DATA

# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 22-09-2021 17:56:43  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----

Angle1    Angle2                   : -61.00 deg    90.00 deg  
Wood depth                        : 0            (No woods.)  
No of house rows                   : 0 / 0  
Surface                             : 2            (Reflective ground surface)  
Receiver source distance           : 15.00 / 15.00 m  
Receiver height                    : 9.50 / 9.50 m  
Topography                         : 1            (Flat/gentle slope; no barrier)  
Reference angle                     : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 24.00 / 24.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Glenroy (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 63.19 + 0.00) = 63.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-61	90	0.00	63.96	0.00	0.00	-0.76	0.00	0.00	0.00	63.19

-----  
Segment Leq : 63.19 dBA

Results segment # 2: Riocan (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 58.90 + 0.00) = 58.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.96	0.00	-2.04	-3.01	0.00	0.00	0.00	58.90

-----  
Segment Leq : 58.90 dBA

Total Leq All Segments: 64.56 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Glenroy (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.60 + 0.00) = 55.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-61	90	0.00	56.36	0.00	0.00	-0.76	0.00	0.00	0.00	55.60

-----  
Segment Leq : 55.60 dBA

Results segment # 2: Riocan (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 51.31 + 0.00) = 51.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	56.36	0.00	-2.04	-3.01	0.00	0.00	0.00	51.31

-----  
Segment Leq : 51.31 dBA

Total Leq All Segments: 56.97 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.56  
(NIGHT): 56.97





# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 26-11-2021 16:34:48  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----

Angle1    Angle2                    : -50.00 deg    0.00 deg  
Wood depth                        : 0              (No woods.)  
No of house rows                  : 0 / 0  
Surface                             : 2              (Reflective ground surface)  
Receiver source distance         : 18.00 / 18.00 m  
Receiver height                    : 9.50 / 9.50 m  
Topography                         : 1              (Flat/gentle slope; no barrier)  
Reference angle                    : 0.00



# GRADIENTWIND

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

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 20.00 / 24.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Glenroy (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 57.60 + 0.00) = 57.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	0	0.00	63.96	0.00	-0.79	-5.56	0.00	0.00	0.00	57.60

-----

Segment Leq : 57.60 dBA

Results segment # 2: Riocan (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 62.71 + 0.00) = 62.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-1.25	0.00	0.00	0.00	0.00	62.71

-----

Segment Leq : 62.71 dBA

Total Leq All Segments: 63.88 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Glenroy (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 50.01 + 0.00) = 50.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	0	0.00	56.36	0.00	-0.79	-5.56	0.00	0.00	0.00	50.01

-----  
Segment Leq : 50.01 dBA

Results segment # 2: Riocan (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 54.32 + 0.00) = 54.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-2.04	0.00	0.00	0.00	0.00	54.32

-----  
Segment Leq : 54.32 dBA

Total Leq All Segments: 55.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.88  
(NIGHT): 55.69



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 22-09-2021 18:03:16  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

---

Angle1    Angle2                      : 0.00 deg    90.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                      (Reflective ground surface)  
Receiver source distance : 21.00 / 21.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Glenroy (day)

Source height = 1.50 m

ROAD (0.00 + 59.48 + 0.00) = 59.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	63.96	0.00	-1.46	-3.01	0.00	0.00	0.00	59.48

Segment Leq : 59.48 dBA

Total Leq All Segments: 59.48 dBA

Results segment # 1: Glenroy (night)

Source height = 1.50 m

ROAD (0.00 + 51.89 + 0.00) = 51.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	56.36	0.00	-1.46	-3.01	0.00	0.00	0.00	51.89

Segment Leq : 51.89 dBA

Total Leq All Segments: 51.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.48  
(NIGHT): 51.89



# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:45  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----

Angle1    Angle2                      : -90.00 deg    0.00 deg  
Wood depth                      : 0                      (No woods.)  
No of house rows                : 0 / 0  
Surface                            : 2                      (Reflective ground surface)  
Receiver source distance        : 20.00 / 20.00 m  
Receiver height                 : 9.50 / 9.50 m  
Topography                       : 2                      (Flat/gentle slope; with barrier)  
Barrier angle1                   : -90.00 deg    Angle2 : -84.00 deg  
Barrier height                   : 12.50 m  
Barrier receiver distance       : 1.00 / 1.00 m  
Source elevation                : 0.00 m  
Receiver elevation               : 0.00 m  
Barrier elevation                : 0.00 m  
Reference angle                 : 0.00



# GRADIENTWIND

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Results segment # 1: RCA (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	9.10	9.10

ROAD (0.00 + 38.29 + 59.40) = 59.43 dBA

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

-90	-84	0.00	63.96	0.00	-1.25	-14.77	0.00	0.00	-9.65
38.29									

-84	0	0.00	63.96	0.00	-1.25	-3.31	0.00	0.00	0.00
59.40									

Segment Leq : 59.43 dBA

Total Leq All Segments: 59.43 dBA

Results segment # 1: RCA (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	9.10	9.10

ROAD (0.00 + 30.69 + 51.80) = 51.84 dBA

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

-90	-84	0.00	56.36	0.00	-1.25	-14.77	0.00	0.00	-9.65
30.69									





# GRADIENTWIND

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---

--										
	-84	0	0.00	56.36	0.00	-1.25	-3.31	0.00	0.00	0.00
	51.80									

---

Segment Leq : 51.84 dBA

Total Leq All Segments: 51.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.43  
(NIGHT): 51.84

# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:55  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

## Road data, segment # 1: CMD1 (day/night)

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    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:

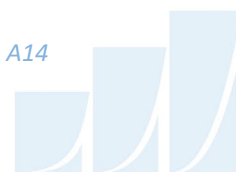
24 hr Traffic Volume (AADT or SADT): 12000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

## Data for Segment # 1: CMD1 (day/night)

-----  
Angle1    Angle2                      : -90.00 deg    -5.00 deg  
Wood depth                      : 0                      (No woods.)  
No of house rows                : 0 / 0  
Surface                          : 2                      (Reflective ground surface)  
Receiver source distance : 95.00 / 95.00 m  
Receiver height                 : 9.50 / 9.50 m  
Topography                      : 2                      (Flat/gentle slope; with barrier)  
Barrier angle1                 : -90.00 deg    Angle2 : -29.00 deg  
Barrier height                  : 12.50 m  
Barrier receiver distance : 67.00 / 67.00 m  
Source elevation                : 0.00 m  
Receiver elevation              : 0.00 m  
Barrier elevation               : 0.00 m  
Reference angle                : 0.00

## Road data, segment # 2: CMD2 (day/night)

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 40 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)



# GRADIENTWIND

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

```

24 hr Traffic Volume (AADT or SADT): 12000
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: CMD2 (day/night)

```

-----
Angle1   Angle2           : -5.00 deg   90.00 deg
Wood depth           : 0           (No woods.)
No of house rows    : 0 / 0
Surface             : 2           (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height      : 9.50 / 9.50 m
Topography          : 2           (Flat/gentle slope; with barrier)
Barrier angle1      : -5.00 deg   Angle2 : 90.00 deg
Barrier height       : 12.50 m
Barrier receiver distance : 67.00 / 67.00 m
Source elevation     : 0.00 m
Receiver elevation   : 0.00 m
Barrier elevation    : 0.00 m
Reference angle      : 0.00
    
```

Results segment # 1: CMD1 (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 !          3.85 !          3.85
    
```

ROAD (0.00 + 38.62 + 48.95) = 49.33 dBA

```

Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----
--
-90    -29    0.00  65.72  0.00  -8.02  -4.70  0.00  0.00 -14.38
38.62
-----
--
-29    -5     0.00  65.72  0.00  -8.02  -8.75  0.00  0.00  0.00
48.95
    
```



-----  
--  
Segment Leq : 49.33 dBA

Results segment # 2: CMD2 (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	3.85	3.85

ROAD (0.00 + 39.24 + 0.00) = 39.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-5	90	0.00	65.72	0.00	-8.02	-2.78	0.00	0.00	-15.69

SubLeq

-----  
--  
39.24  
-----  
--

Segment Leq : 39.24 dBA

Total Leq All Segments: 49.74 dBA

Results segment # 1: CMD1 (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	3.85	3.85

ROAD (0.00 + 31.02 + 41.35) = 41.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
-5	90	0.00	65.72	0.00	-8.02	-2.78	0.00	0.00	-15.69

SubLeq

-----  
--



# GRADIENTWIND

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```

-90   -29   0.00  58.12   0.00  -8.02  -4.70   0.00   0.00  -14.38
31.02
-----

```

```

--
-29   -5   0.00  58.12   0.00  -8.02  -8.75   0.00   0.00   0.00
41.35
-----

```

Segment Leq : 41.74 dBA

Results segment # 2: CMD2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          9.50 !          3.85 !          3.85

```

ROAD (0.00 + 31.64 + 0.00) = 31.64 dBA

```

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

```

```

--
-5     90   0.00  58.12   0.00  -8.02  -2.78   0.00   0.00  -15.69
31.64
-----

```

Segment Leq : 31.64 dBA

Total Leq All Segments: 42.14 dBA

RT/Custom data, segment # 1: BRT1 (day/night)

```

1 - Bus:
Traffic volume   :   191/67   veh/TimePeriod
Speed            :    40 km/h

```

Data for Segment # 1: BRT1 (day/night)

```

-----
Angle1  Angle2      :  -90.00 deg  -5.00 deg
Wood depth      :           0   (No woods.)
No of house rows :           0 / 0
Surface         :           2   (Reflective ground surface)

```



# GRADIENTWIND

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```

Receiver source distance : 95.00 / 95.00 m
Receiver height          : 9.50 / 9.50 m
Topography               : 2          (Flat/gentle slope; with barrier)
Barrier angle1           : -90.00 deg  Angle2 : -29.00 deg
Barrier height           : 12.50 m
Barrier receiver distance : 67.00 / 67.00 m
Source elevation         : 0.00 m
Receiver elevation       : 0.00 m
Barrier elevation        : 0.00 m
Reference angle          : 0.00
  
```

RT/Custom data, segment # 2: BRT2 (day/night)

```

-----
1 - Bus:
Traffic volume   : 191/67   veh/TimePeriod
Speed            : 40 km/h
  
```

Data for Segment # 2: BRT2 (day/night)

```

-----
Angle1  Angle2      : -5.00 deg  90.00 deg
Wood depth      : 0          (No woods.)
No of house rows : 0 / 0
Surface         : 2          (Reflective ground surface)
Receiver source distance : 95.00 / 95.00 m
Receiver height  : 9.50 / 9.50 m
Topography      : 2          (Flat/gentle slope; with barrier)
Barrier angle1  : -5.00 deg  Angle2 : 90.00 deg
Barrier height   : 12.50 m
Barrier receiver distance : 67.00 / 67.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

Results segment # 1: BRT1 (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)
-----+-----+-----+-----
          0.50 !          9.50 !          3.15 !          3.15
  
```

RT/Custom (0.00 + 24.63 + 35.45) = 35.80 dBA

```

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



# GRADIENTWIND

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-90	-29	0.00	52.22	-8.02	-4.70	0.00	0.00	-14.87	24.63
-29	-5	0.00	52.22	-8.02	-8.75	0.00	0.00	0.00	35.45

Segment Leq : 35.80 dBA

Results segment # 2: BRT2 (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
0.50	!	9.50	!
		3.15	!
			3.15

RT/Custom (0.00 + 25.32 + 0.00) = 25.32 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.00	52.22	-8.02	-2.78	0.00	0.00	-16.11	25.32

Segment Leq : 25.32 dBA

Total Leq All Segments: 36.17 dBA

Results segment # 1: BRT1 (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
0.50	!	9.50	!
		3.15	!
			3.15

RT/Custom (0.00 + 23.10 + 33.91) = 34.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-29	0.00	50.68	-8.02	-4.70	0.00	0.00	-14.87	23.10
-29	-5	0.00	50.68	-8.02	-8.75	0.00	0.00	0.00	33.91



# GRADIENTWIND

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Segment Leq : 34.26 dBA

Results segment # 2: BRT2 (night)

-----  
 Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
0.50	!	9.50	!
		3.15	!
			3.15

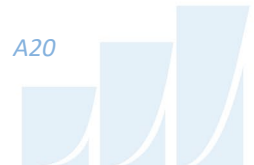
RT/Custom (0.00 + 23.78 + 0.00) = 23.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-5	90	0.00	50.68	-8.02	-2.78	0.00	0.00	-16.11	23.78

-----  
 Segment Leq : 23.78 dBA

Total Leq All Segments: 34.63 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.92  
 (NIGHT): 42.85





# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:23:14  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te    Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1    Angle2                      : -63.00 deg    90.00 deg  
Wood depth                            : 0              (No woods.)  
No of house rows                      : 0 / 0  
Surface                                : 2              (Reflective ground surface)  
Receiver source distance : 18.00 / 18.00 m  
Receiver height                        : 9.50 / 9.50 m  
Topography                             : 1              (Flat/gentle slope; no barrier)  
Reference angle                        : 0.00



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

```

-----
Car traffic volume   : 9715/845   veh/TimePeriod  *
Medium truck volume : 773/67    veh/TimePeriod  *
Heavy truck volume  : 552/48    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): 12000
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: Chapman (day/night)

```

-----
Angle1  Angle2      : 0.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 2          (Reflective ground surface)
Receiver source distance : 36.00 / 36.00 m
Receiver height     : 9.50 / 9.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
  
```

Results segment # 1: Riocan (day)

Source height = 1.50 m

ROAD (0.00 + 62.46 + 0.00) = 62.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-63	90	0.00	63.96	0.00	-0.79	-0.71	0.00	0.00	0.00	62.46

Segment Leq : 62.46 dBA



Results segment # 2: Chapman (day)

-----

Source height = 1.50 m

ROAD (0.00 + 58.90 + 0.00) = 58.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.72	0.00	-3.80	-3.01	0.00	0.00	0.00	58.90

-----

Segment Leq : 58.90 dBA

Total Leq All Segments: 64.05 dBA

Results segment # 1: Riocan (night)

-----

Source height = 1.50 m

ROAD (0.00 + 54.86 + 0.00) = 54.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-63	90	0.00	56.36	0.00	-0.79	-0.71	0.00	0.00	0.00	54.86

-----

Segment Leq : 54.86 dBA



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Results segment # 2: Chapman (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 51.31 + 0.00) = 51.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	58.12	0.00	-3.80	-3.01	0.00	0.00	0.00	51.31

-----

Segment Leq : 51.31 dBA

Total Leq All Segments: 56.45 dBA

RT/Custom data, segment # 1: BRT (day/night)

-----  
1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 36.00 / 36.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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Results segment # 1: BRT (day)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 45.41 + 0.00) = 45.41 dBA

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

0	90	0.00	52.22	-3.80	-3.01	0.00	0.00	0.00	45.41
---	----	------	-------	-------	-------	------	------	------	-------

-----  
Segment Leq : 45.41 dBA

Total Leq All Segments: 45.41 dBA

Results segment # 1: BRT (night)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 43.87 + 0.00) = 43.87 dBA

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

0	90	0.00	50.68	-3.80	-3.01	0.00	0.00	0.00	43.87
---	----	------	-------	-------	-------	------	------	------	-------

-----  
Segment Leq : 43.87 dBA

Total Leq All Segments: 43.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.10  
(NIGHT): 56.68



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STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:24:54  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te    Time Period: Day/Night 16/8 hours  
Description:

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

---

Angle1    Angle2                      : -60.00 deg    0.00 deg  
Wood depth : 0                                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                                      (Reflective ground surface)  
Receiver source distance : 22.00 / 22.00    m  
Receiver height : 9.50 / 9.50    m  
Topography : 1                                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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

-----  
Car traffic volume : 9715/845 veh/TimePeriod \*  
Medium truck volume : 773/67 veh/TimePeriod \*  
Heavy truck volume : 552/48 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): 12000  
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: Chapman (day/night)

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 34.00 / 34.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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Results segment # 1: Riocan (day)

Source height = 1.50 m

ROAD (0.00 + 57.52 + 0.00) = 57.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	0	0.00	63.96	0.00	-1.66	-4.77	0.00	0.00	0.00	57.52

Segment Leq : 57.52 dBA

Results segment # 2: Chapman (day)

Source height = 1.50 m

ROAD (0.00 + 62.16 + 0.00) = 62.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.72	0.00	-3.55	0.00	0.00	0.00	0.00	62.16

Segment Leq : 62.16 dBA

Total Leq All Segments: 63.44 dBA





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Results segment # 1: Riocan (night)

Source height = 1.50 m

ROAD (0.00 + 49.93 + 0.00) = 49.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	0	0.00	56.36	0.00	-1.66	-4.77	0.00	0.00	0.00	49.93

Segment Leq : 49.93 dBA

Results segment # 2: Chapman (night)

Source height = 1.50 m

ROAD (0.00 + 54.56 + 0.00) = 54.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.12	0.00	-3.55	0.00	0.00	0.00	0.00	54.56

Segment Leq : 54.56 dBA

Total Leq All Segments: 55.85 dBA



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RT/Custom data, segment # 1: BRT (day/night)

1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 34.00 / 34.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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Results segment # 1: BRT (day)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 48.67 + 0.00) = 48.67 dBA

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

-90	90	0.00	52.22	-3.55	0.00	0.00	0.00	0.00	48.67
-----	----	------	-------	-------	------	------	------	------	-------

-----  
Segment Leq : 48.67 dBA

Total Leq All Segments: 48.67 dBA

Results segment # 1: BRT (night)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 47.13 + 0.00) = 47.13 dBA

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

-90	90	0.00	50.68	-3.55	0.00	0.00	0.00	0.00	47.13
-----	----	------	-------	-------	------	------	------	------	-------

-----  
Segment Leq : 47.13 dBA

Total Leq All Segments: 47.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.58  
(NIGHT): 56.39



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STAMSON 5.0                      NORMAL REPORT                      Date: 29-11-2021 17:27:47  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8.te    Time Period: Day/Night 16/8 hours  
Description:

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

-----

Angle1    Angle2                      : -90.00 deg    56.00 deg  
Wood depth : 0                                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                                      (Reflective ground surface)  
Receiver source distance : 19.00 / 19.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1                                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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

-----  
Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: Longfields (day/night)

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 29.00 / 29.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: Glenroy (day)

-----

Source height = 1.50 m

ROAD (0.00 + 62.02 + 0.00) = 62.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	56	0.00	63.96	0.00	-1.03	-0.91	0.00	0.00	0.00	62.02

-----

Segment Leq : 62.02 dBA

Results segment # 2: Longfields (day)

-----

Source height = 1.50 m

ROAD (0.00 + 66.29 + 0.00) = 66.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	72.16	0.00	-2.86	-3.01	0.00	0.00	0.00	66.29

-----

Segment Leq : 66.29 dBA

Total Leq All Segments: 67.67 dBA



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Results segment # 1: Glenroy (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 54.43 + 0.00) = 54.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	56	0.00	56.36	0.00	-1.03	-0.91	0.00	0.00	0.00	54.43

-----  
Segment Leq : 54.43 dBA

Results segment # 2: Longfields (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 58.69 + 0.00) = 58.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	64.56	0.00	-2.86	-3.01	0.00	0.00	0.00	58.69

-----  
Segment Leq : 58.69 dBA

Total Leq All Segments: 60.07 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.67  
(NIGHT): 60.07



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STAMSON 5.0                      NORMAL REPORT                      Date: 29-11-2021 17:30:53  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te    Time Period: Day/Night 16/8 hours  
Description:

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

---

Angle1    Angle2                      : 0.00 deg    50.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                      (Reflective ground surface)  
Receiver source distance : 23.00 / 23.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00





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

-----  
Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: Longfields (day/night)

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 25.00 / 27.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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Results segment # 1: Glenroy (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 56.54 + 0.00) = 56.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	63.96	0.00	-1.86	-5.56	0.00	0.00	0.00	56.54

-----  
Segment Leq : 56.54 dBA

Results segment # 2: Longfields (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 69.94 + 0.00) = 69.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.16	0.00	-2.22	0.00	0.00	0.00	0.00	69.94

-----  
Segment Leq : 69.94 dBA

Total Leq All Segments: 70.13 dBA



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Results segment # 1: Glenroy (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 48.94 + 0.00) = 48.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	56.36	0.00	-1.86	-5.56	0.00	0.00	0.00	48.94

-----  
Segment Leq : 48.94 dBA

Results segment # 2: Longfields (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 62.01 + 0.00) = 62.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.56	0.00	-2.55	0.00	0.00	0.00	0.00	62.01

-----  
Segment Leq : 62.01 dBA

Total Leq All Segments: 62.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.13  
(NIGHT): 62.22



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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:33:53  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----

Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: LD (day/night)

-----

Angle1    Angle2                      : 0.00 deg    90.00 deg  
Wood depth                      : 0            (No woods.)  
No of house rows                : 0 / 0  
Surface                            : 2            (Reflective ground surface)  
Receiver source distance        : 93.00 / 93.00 m  
Receiver height                  : 9.50 / 9.50 m  
Topography                        : 2            (Flat/gentle slope; with barrier)  
Barrier angle1                    : 7.00 deg    Angle2 : 90.00 deg  
Barrier height                    : 12.50 m  
Barrier receiver distance        : 66.00 / 66.00 m  
Source elevation                  : 0.00 m  
Receiver elevation                : 0.00 m  
Barrier elevation                 : 0.00 m  
Reference angle                   : 0.00



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Results segment # 1: LD (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	!
		3.82	!
			3.82

ROAD (50.13 + 45.46 + 0.00) = 51.41 dBA

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

-----

--	0	7	0.00	72.16	0.00	-7.92	-14.10	0.00	0.00	0.00
	50.13									

-----

--	7	90	0.00	72.16	0.00	-7.92	-3.36	0.00	0.00	-15.42
	45.46									

-----

Segment Leq : 51.41 dBA

Total Leq All Segments: 51.41 dBA

Results segment # 1: LD (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	!
		3.82	!
			3.82

ROAD (42.54 + 37.86 + 0.00) = 43.81 dBA

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

-----

--	0	7	0.00	64.56	0.00	-7.92	-14.10	0.00	0.00	0.00
	42.54									



# GRADIENTWIND

ENGINEERS & SCIENTISTS

---

--											
	7	90	0.00	64.56	0.00	-7.92	-3.36	0.00	0.00	-15.42	
37.86											

---

--

Segment Leq : 43.81 dBA

Total Leq All Segments: 43.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.41  
(NIGHT): 43.81

# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 29-11-2021 17:41:46  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te                      Time Period: Day/Night 16/8 hours  
Description:

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

---

Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: Longfields (day/night)

---

Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 30.00 / 30.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: Longfields (day)

-----

Source height = 1.50 m

ROAD (0.00 + 69.15 + 0.00) = 69.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.16	0.00	-3.01	0.00	0.00	0.00	0.00	69.15

-----

Segment Leq : 69.15 dBA

Total Leq All Segments: 69.15 dBA

Results segment # 1: Longfields (night)

-----

Source height = 1.50 m

ROAD (0.00 + 61.55 + 0.00) = 61.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.56	0.00	-3.01	0.00	0.00	0.00	0.00	61.55

-----

Segment Leq : 61.55 dBA

Total Leq All Segments: 61.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.15  
(NIGHT): 61.55





# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:02  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: LD (day/night)

-----  
Angle1    Angle2                      :    0.00 deg    90.00 deg  
Wood depth                            :            0            (No woods.)  
No of house rows                      :            0 / 0  
Surface                                :            2            (Reflective ground surface)  
Receiver source distance               :    30.00 / 30.00 m  
Receiver height                        :            9.50 / 9.50 m  
Topography                            :            2            (Flat/gentle slope; with barrier)  
Barrier angle1                         :    62.00 deg    Angle2 : 90.00 deg  
Barrier height                         :            12.50 m  
Barrier receiver distance               :    3.00 / 3.00 m  
Source elevation                       :            0.00 m  
Receiver elevation                      :            0.00 m  
Barrier elevation                       :            0.00 m  
Reference angle                        :            0.00



# GRADIENTWIND

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Results segment # 1: LD (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	!
		8.70	!
			8.70

ROAD (64.52 + 48.26 + 0.00) = 64.62 dBA

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

-----

--	0	62	0.00	72.16	0.00	-3.01	-4.63	0.00	0.00	0.00
	64.52									

-----

-----

--	62	90	0.00	72.16	0.00	-3.01	-8.08	0.00	0.00	-12.81
	48.26									

-----

Segment Leq : 64.62 dBA

Total Leq All Segments: 64.62 dBA

Results segment # 1: LD (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	!
		8.70	!
			8.70

ROAD (56.92 + 40.66 + 0.00) = 57.03 dBA

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

-----

--	0	62	0.00	64.56	0.00	-3.01	-4.63	0.00	0.00	0.00
	56.92									



# GRADIENTWIND

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---

--											
	62	90	0.00	64.56	0.00	-3.01	-8.08	0.00	0.00	-12.81	
40.66											

---

--

Segment Leq : 57.03 dBA

Total Leq All Segments: 57.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.62  
(NIGHT): 57.03

# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:27:49  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: Longfields (day/night)

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 29.00 / 29.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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

```

-----
Car traffic volume   : 9715/845   veh/TimePeriod  *
Medium truck volume : 773/67    veh/TimePeriod  *
Heavy truck volume  : 552/48    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): 12000
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: Chapman (day/night)

```

-----
Angle1  Angle2      : -90.00 deg  0.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 2          (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height     : 9.50 / 9.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
  
```

Results segment # 1: Longfields (day)

Source height = 1.50 m

ROAD (0.00 + 69.30 + 0.00) = 69.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	72.16	0.00	-2.86	0.00	0.00	0.00	0.00	69.30

Segment Leq : 69.30 dBA



Results segment # 2: Chapman (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 59.28 + 0.00) = 59.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	65.72	0.00	-3.42	-3.01	0.00	0.00	0.00	59.28

-----  
Segment Leq : 59.28 dBA

Total Leq All Segments: 69.71 dBA

Results segment # 1: Longfields (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 61.70 + 0.00) = 61.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	64.56	0.00	-2.86	0.00	0.00	0.00	0.00	61.70

-----  
Segment Leq : 61.70 dBA



# GRADIENTWIND

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Results segment # 2: Chapman (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 51.68 + 0.00) = 51.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	58.12	0.00	-3.42	-3.01	0.00	0.00	0.00	51.68

-----

Segment Leq : 51.68 dBA

Total Leq All Segments: 62.11 dBA

RT/Custom data, segment # 1: BRT (day/night)

-----  
1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 33.00 / 33.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: BRT (day)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 45.78 + 0.00) = 45.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	52.22	-3.42	-3.01	0.00	0.00	0.00	45.78

-----  
Segment Leq : 45.78 dBA

Total Leq All Segments: 45.78 dBA

Results segment # 1: BRT (night)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 44.25 + 0.00) = 44.25 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	50.68	-3.42	-3.01	0.00	0.00	0.00	44.25

-----  
Segment Leq : 44.25 dBA

Total Leq All Segments: 44.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.73  
(NIGHT): 62.18





# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:29:33  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te                      Time Period: Day/Night 16/8 hours  
Description:

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

---

Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: Longfields (day/night)

---

Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 33.00 / 33.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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

```
-----
Car traffic volume   : 9715/845   veh/TimePeriod  *
Medium truck volume : 773/67    veh/TimePeriod  *
Heavy truck volume  : 552/48    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): 12000
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: Chapman (day/night)

```
-----
Angle1  Angle2      : -90.00 deg  90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 9.50 / 9.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: Longfields (day)

Source height = 1.50 m

ROAD (0.00 + 65.73 + 0.00) = 65.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	72.16	0.00	-3.42	-3.01	0.00	0.00	0.00	65.73

Segment Leq : 65.73 dBA



# GRADIENTWIND

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Results segment # 2: Chapman (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 62.71 + 0.00) = 62.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.72	0.00	-3.01	0.00	0.00	0.00	0.00	62.71

-----

Segment Leq : 62.71 dBA

Total Leq All Segments: 67.49 dBA

Results segment # 1: Longfields (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 58.13 + 0.00) = 58.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	64.56	0.00	-3.42	-3.01	0.00	0.00	0.00	58.13

-----

Segment Leq : 58.13 dBA



# GRADIENTWIND

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Results segment # 2: Chapman (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.11 + 0.00) = 55.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.12	0.00	-3.01	0.00	0.00	0.00	0.00	55.11

-----

Segment Leq : 55.11 dBA

Total Leq All Segments: 59.89 dBA

RT/Custom data, segment # 1: BRT (day/night)

-----  
1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 30.00 / 30.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: BRT (day)

-----  
 Source height = 0.50 m

RT/Custom (0.00 + 49.21 + 0.00) = 49.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	52.22	-3.01	0.00	0.00	0.00	0.00	49.21

-----  
 Segment Leq : 49.21 dBA

Total Leq All Segments: 49.21 dBA

Results segment # 1: BRT (night)

-----  
 Source height = 0.50 m

RT/Custom (0.00 + 47.67 + 0.00) = 47.67 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	50.68	-3.01	0.00	0.00	0.00	0.00	47.67

-----  
 Segment Leq : 47.67 dBA

Total Leq All Segments: 47.67 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.55  
 (NIGHT): 60.14



# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:31:22  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te                      Time Period: Day/Night 16/8 hours  
Description:

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

---

Car traffic volume : 9715/845    veh/TimePeriod    \*  
Medium truck volume : 773/67    veh/TimePeriod    \*  
Heavy truck volume : 552/48    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): 12000  
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: Chapman (day/night)

---

Angle1    Angle2                      : 0.00 deg    90.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                      (Reflective ground surface)  
Receiver source distance : 34.00 / 34.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Chapman (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 59.15 + 0.00) = 59.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.72	0.00	-3.55	-3.01	0.00	0.00	0.00	59.15

-----

Segment Leq : 59.15 dBA

Total Leq All Segments: 59.15 dBA



# GRADIENTWIND

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Results segment # 1: Chapman (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 51.55 + 0.00) = 51.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	58.12	0.00	-3.55	-3.01	0.00	0.00	0.00	51.55

-----

Segment Leq : 51.55 dBA

Total Leq All Segments: 51.55 dBA

RT/Custom data, segment # 1: BRT (day/night)

-----  
1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 34.00 / 34.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00





# GRADIENTWIND

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Results segment # 1: BRT (day)

Source height = 0.50 m

RT/Custom (0.00 + 45.66 + 0.00) = 45.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	52.22	-3.55	-3.01	0.00	0.00	0.00	45.66

Segment Leq : 45.66 dBA

Total Leq All Segments: 45.66 dBA

Results segment # 1: BRT (night)

Source height = 0.50 m

RT/Custom (0.00 + 44.12 + 0.00) = 44.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	50.68	-3.55	-3.01	0.00	0.00	0.00	44.12

Segment Leq : 44.12 dBA

Total Leq All Segments: 44.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.34  
(NIGHT): 52.27



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                      NORMAL REPORT                      Date: 02-12-2021 10:33:47  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r16.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----

Car traffic volume : 9715/845    veh/TimePeriod    \*  
Medium truck volume : 773/67    veh/TimePeriod    \*  
Heavy truck volume : 552/48    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): 12000  
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: Chapman (day/night)

-----

Angle1    Angle2                      : -90.00 deg    90.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                      (Reflective ground surface)  
Receiver source distance : 31.00 / 31.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1                      (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Results segment # 1: Chapman (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 62.56 + 0.00) = 62.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.72	0.00	-3.15	0.00	0.00	0.00	0.00	62.56

-----

Segment Leq : 62.56 dBA

Total Leq All Segments: 62.56 dBA



# GRADIENTWIND

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Results segment # 1: Chapman (night)

-----  
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
-90	90	0.00	58.12	0.00	-3.15	0.00	0.00	0.00	0.00	54.97

-----

Segment Leq : 54.97 dBA

Total Leq All Segments: 54.97 dBA

RT/Custom data, segment # 1: BRT (day/night)

-----  
1 - Bus:

Traffic volume : 191/67 veh/TimePeriod  
Speed : 40 km/h

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

-----  
Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 31.00 / 31.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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Results segment # 1: BRT (day)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 49.07 + 0.00) = 49.07 dBA

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

-90	90	0.00	52.22	-3.15	0.00	0.00	0.00	0.00	49.07
-----	----	------	-------	-------	------	------	------	------	-------

-----  
Segment Leq : 49.07 dBA

Total Leq All Segments: 49.07 dBA

Results segment # 1: BRT (night)

-----  
Source height = 0.50 m

RT/Custom (0.00 + 47.53 + 0.00) = 47.53 dBA

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

-90	90	0.00	50.68	-3.15	0.00	0.00	0.00	0.00	47.53
-----	----	------	-------	-------	------	------	------	------	-------

-----  
Segment Leq : 47.53 dBA

Total Leq All Segments: 47.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.75  
(NIGHT): 55.69



# GRADIENTWIND

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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:14  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r17.te                      Time Period: Day/Night 16/8 hours  
Description:

## Road data, segment # 1: RCA1 (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 : 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: RCA1 (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 : 59.00 / 59.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 2                      (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -40.00 deg  
Barrier height : 12.50 m  
Barrier receiver distance : 39.00 / 39.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

## Road data, segment # 2: RCA2 (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)



# GRADIENTWIND

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\* 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 : 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: RCA2 (day/night)

-----  
Angle1 Angle2 : -8.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 59.00 / 59.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -8.00 deg Angle2 : 90.00 deg  
Barrier height : 12.50 m  
Barrier receiver distance : 39.00 / 39.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

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

-----  
Angle1 Angle2 : 0.00 deg 71.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0



# GRADIENTWIND

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```

Surface                :      2          (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height        :   9.50 / 9.50 m
Topography             :      1          (Flat/gentle slope; no barrier)
Reference angle        :   0.00
  
```

Results segment # 1: RCA1 (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	!
4.21	!	4.21	!

ROAD (0.00 + 37.76 + 50.51) = 50.73 dBA

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

-----

--	-90	-40	0.00	63.96	0.00	-5.95	-5.56	0.00	0.00	-14.68
	37.76									

-----

--	-40	-8	0.00	63.96	0.00	-5.95	-7.50	0.00	0.00	0.00
	50.51									

-----

Segment Leq : 50.73 dBA

Results segment # 2: RCA2 (day)

-----

Source height = 1.50 m

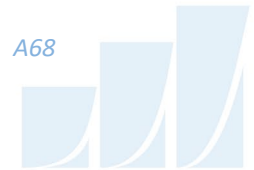
Barrier height for grazing incidence

-----

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50	!	9.50	!
4.21	!	4.21	!

ROAD (0.00 + 38.84 + 0.00) = 38.84 dBA

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





# GRADIENTWIND

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```

-----
--
-8      90      0.00  63.96   0.00  -5.95  -2.64   0.00   0.00  -16.53
38.84
-----

```

Segment Leq : 38.84 dBA

Results segment # 3: GGD (day)

Source height = 1.50 m

ROAD (0.00 + 58.67 + 0.00) = 58.67 dBA

```

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

```

```

--
      0      71      0.00  63.96   0.00  -1.25  -4.04   0.00   0.00   0.00
58.67
-----

```

Segment Leq : 58.67 dBA

Total Leq All Segments: 59.36 dBA

Results segment # 1: RCA1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          9.50 !          4.21 !          4.21
-----

```

ROAD (0.00 + 30.17 + 42.91) = 43.14 dBA

```

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

```

```

--
     -90     -40     0.00  56.36   0.00  -5.95  -5.56   0.00   0.00  -14.68
30.17
-----

```



# GRADIENTWIND

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```

-40    -8    0.00  56.36   0.00  -5.95  -7.50   0.00   0.00   0.00
42.91
-----
--

```

Segment Leq : 43.14 dBA

Results segment # 2: RCA2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height      (m) ! Height      (m) ! Height      (m) ! Barrier Top   (m)
-----+-----+-----+-----
          1.50 !          9.50 !          4.21 !          4.21

```

ROAD (0.00 + 31.25 + 0.00) = 31.25 dBA

```

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

```

```

--
-8     90    0.00  56.36   0.00  -5.95  -2.64   0.00   0.00 -16.53
31.25
-----
--

```

Segment Leq : 31.25 dBA

Results segment # 3: GGD (night)

Source height = 1.50 m

ROAD (0.00 + 51.07 + 0.00) = 51.07 dBA

```

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

```

```

--
0     71    0.00  56.36   0.00  -1.25  -4.04   0.00   0.00   0.00
51.07
-----

```

Segment Leq : 51.07 dBA

Total Leq All Segments: 51.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.36  
(NIGHT): 51.76



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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:23  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r18.te                      Time Period: Day/Night 16/8 hours  
Description:

## Road data, segment # 1: RCA1 (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 : 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: RCA1 (day/night)

-----

Angle1    Angle2                      : -90.00 deg    0.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 2                      (Reflective ground surface)  
Receiver source distance : 63.00 / 63.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 2                      (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -35.00 deg  
Barrier height : 12.50 m  
Barrier receiver distance : 44.00 / 44.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

## Road data, segment # 2: RCA2 (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 %



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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 : 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: RCA2 (day/night)

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 63.00 / 63.00 m  
Receiver height : 9.50 / 9.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg  
Barrier height : 12.50 m  
Barrier receiver distance : 44.00 / 44.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

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

-----  
Angle1 Angle2 : -90.00 deg 76.00 deg  
Wood depth : 0 (No woods.)



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```

No of house rows      :      0 / 0
Surface               :      2      (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height       :      9.50 / 9.50 m
Topography            :      1      (Flat/gentle slope; no barrier)
Reference angle       :      0.00
  
```

Results segment # 1: RCA1 (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	3.91	3.91

ROAD (0.00 + 37.42 + 50.61) = 50.81 dBA

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

-90	-35	0.00	63.96	0.00	-6.23	-5.15	0.00	0.00	-15.16
37.42									

-35	0	0.00	63.96	0.00	-6.23	-7.11	0.00	0.00	0.00
50.61									

Segment Leq : 50.81 dBA

Results segment # 2: RCA2 (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	3.91	3.91

ROAD (0.00 + 38.24 + 0.00) = 38.24 dBA



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```

Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----
--
      0      90    0.00  63.96   0.00  -6.23  -3.01   0.00   0.00 -16.47
38.24
-----
--

```

Segment Leq : 38.24 dBA

Results segment # 3: GGD (day)

Source height = 1.50 m

ROAD (0.00 + 63.60 + 0.00) = 63.60 dBA

```

Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----
--
     -90      76    0.00  63.96   0.00   0.00  -0.35   0.00   0.00   0.00
63.60
-----
--

```

Segment Leq : 63.60 dBA

Total Leq All Segments: 63.83 dBA

Results segment # 1: RCA1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          9.50 !          3.91 !          3.91

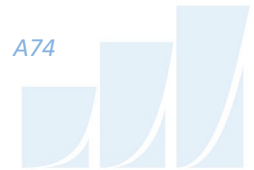
```

ROAD (0.00 + 29.82 + 43.02) = 43.22 dBA

```

Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----
--
     -90     -35    0.00  56.36   0.00  -6.23  -5.15   0.00   0.00 -15.16
29.82
-----
--

```



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```

-----
--
-35      0    0.00  56.36   0.00  -6.23  -7.11   0.00   0.00   0.00
43.02
-----
--

```

Segment Leq : 43.22 dBA

Results segment # 2: RCA2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.50 !          9.50 !          3.91 !          3.91

```

ROAD (0.00 + 30.65 + 0.00) = 30.65 dBA

```

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

```

```

--
  0      90    0.00  56.36   0.00  -6.23  -3.01   0.00   0.00 -16.47
30.65
-----
--

```

Segment Leq : 30.65 dBA

Results segment # 3: GGD (night)

Source height = 1.50 m

ROAD (0.00 + 56.01 + 0.00) = 56.01 dBA

```

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

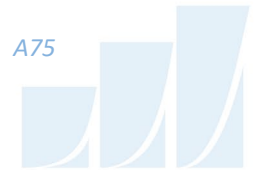
```

```

--
 -90     76    0.00  56.36   0.00   0.00  -0.35   0.00   0.00   0.00
56.01
-----
--

```

Segment Leq : 56.01 dBA



Total Leq All Segments: 56.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.83  
(NIGHT): 56.24





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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:30  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r19.te                      Time Period: Day/Night 16/8 hours  
Description:

## Road data, segment # 1: RCA1 (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 : 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: RCA1 (day/night)

-----

Angle1    Angle2                      : -90.00 deg    0.00 deg  
Wood depth                      : 0                      (No woods.)  
No of house rows                : 0 / 0  
Surface                          : 1                      (Absorptive ground surface)  
Receiver source distance        : 109.00 / 109.00 m  
Receiver height                 : 1.50 / 1.50    m  
Topography                      : 2                      (Flat/gentle slope; with barrier)  
Barrier angle1                  : -90.00 deg    Angle2 : 0.00 deg  
Barrier height                  : 12.50 m  
Barrier receiver distance       : 90.00 / 90.00 m  
Source elevation                : 0.00 m  
Receiver elevation               : 0.00 m  
Barrier elevation                : 0.00 m  
Reference angle                 : 0.00

## Road data, segment # 2: RCA2 (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)



# GRADIENTWIND

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\* 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       : 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: RCA2 (day/night)

```

-----
Angle1   Angle2      : 0.00 deg   90.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface        : 1           (Absorptive ground surface)
Receiver source distance : 109.00 / 109.00 m
Receiver height  : 1.50 / 1.50 m
Topography     : 2           (Flat/gentle slope; with barrier)
Barrier angle1  : 9.00 deg   Angle2 : 90.00 deg
Barrier height  : 12.50 m
Barrier receiver distance : 90.00 / 90.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
    
```

Results segment # 1: RCA1 (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 + 35.06 + 0.00) = 35.06 dBA

```

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

```

-----
--
-90      0      0.00  63.96  0.00  -8.61  -3.01  0.00  0.00 -17.27
35.06
-----
--
    
```

Segment Leq : 35.06 dBA



# GRADIENTWIND

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Results segment # 2: RCA2 (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 (36.64 + 34.82 + 0.00) = 38.83 dBA

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

0	9	0.66	63.96	0.00	-14.30	-13.02	0.00	0.00	0.00
36.64									

9	90	0.00	63.96	0.00	-8.61	-3.47	0.00	0.00	-17.05
34.82									

Segment Leq : 38.83 dBA

Total Leq All Segments: 40.35 dBA

Results segment # 1: RCA1 (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	1.50	1.50	1.50

ROAD (0.00 + 27.47 + 0.00) = 27.47 dBA

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

-90	0	0.00	56.36	0.00	-8.61	-3.01	0.00	0.00	-17.27
27.47									



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-----  
 --

Segment Leq : 27.47 dBA

Results segment # 2: RCA2 (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	1.50	1.50	1.50

ROAD (29.04 + 27.23 + 0.00) = 31.24 dBA

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

-----  
 --

0	9	0.66	56.36	0.00	-14.30	-13.02	0.00	0.00	0.00
29.04									

-----  
 --

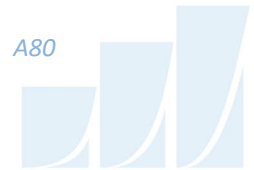
9	90	0.00	56.36	0.00	-8.61	-3.47	0.00	0.00	-17.05
27.23									

-----  
 --

Segment Leq : 31.24 dBA

Total Leq All Segments: 32.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 40.35  
 (NIGHT): 32.76



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STAMSON 5.0                      NORMAL REPORT                      Date: 21-04-2023 14:34:37  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r20.te                      Time Period: Day/Night 16/8 hours  
Description:

## Road data, segment # 1: LD1 (day/night)

-----

Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 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): 35000  
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: LD1 (day/night)

-----

Angle1 Angle2 : -90.00 deg 0.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 123.00 / 123.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -4.00 deg  
Barrier height : 12.50 m  
Barrier receiver distance : 95.00 / 95.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

## Road data, segment # 2: LD2 (day/night)

-----

Car traffic volume : 28336/2464 veh/TimePeriod \*  
Medium truck volume : 2254/196 veh/TimePeriod \*  
Heavy truck volume : 1610/140 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)



# GRADIENTWIND

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

```

24 hr Traffic Volume (AADT or SADT): 35000
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: LD2 (day/night)

```

-----
Angle1   Angle2       : 0.00 deg   90.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface        : 1           (Absorptive ground surface)
Receiver source distance : 123.00 / 123.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 2           (Flat/gentle slope; with barrier)
Barrier angle1   : 0.00 deg   Angle2 : 90.00 deg
Barrier height   : 12.50 m
Barrier receiver distance : 95.00 / 95.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
    
```

Results segment # 1: LD1 (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

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

ROAD (0.00 + 43.29 + 40.46) = 45.11 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq
-----
--
-90    -4    0.00  72.16  0.00  -9.14  -3.21  0.00  0.00 -16.52
43.29
-----
--
-4     0    0.66  72.16  0.00 -15.17 -16.53  0.00  0.00  0.00
40.46
    
```



-----  
--  
Segment Leq : 45.11 dBA

Results segment # 2: LD2 (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 + 43.38 + 0.00) = 43.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
0	90	0.00	72.16	0.00	-9.14	-3.01	0.00	0.00	-16.63

SubLeq  
-----  
--  
43.38  
-----  
--

Segment Leq : 43.38 dBA

Total Leq All Segments: 47.34 dBA

Results segment # 1: LD1 (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	1.50	1.50	1.50

ROAD (0.00 + 35.70 + 32.86) = 37.52 dBA

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

SubLeq  
-----  
--



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```

-90   -4   0.00  64.56   0.00  -9.14  -3.21   0.00   0.00  -16.52
35.70
-----

```

```

--
-4     0   0.66  64.56   0.00 -15.17 -16.53   0.00   0.00   0.00
32.86
-----

```

Segment Leq : 37.52 dBA

Results segment # 2: LD2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

```

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

```

ROAD (0.00 + 35.79 + 0.00) = 35.79 dBA

```

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

```

```

--
0     90   0.00  64.56   0.00  -9.14  -3.01   0.00   0.00  -16.63
35.79
-----

```

Segment Leq : 35.79 dBA

Total Leq All Segments: 39.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 47.34  
(NIGHT): 39.75







PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX.)	DRAWING NO.	GW21-289-A1
DATE	MAY 31, 2023	DRAWN BY	G.G.

FIGURE A1:  
STAMSON INPUT PARAMETERS



- 1 OLA RECEPTOR
- 1 POW RECEPTOR

PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
SCALE	1:1700 (APPROX.)	DRAWING NO. GW21-289-A2
DATE	MAY 31, 2023	DRAWN BY G.G.

DESCRIPTION

FIGURE A2:  
STAMSON INPUT PARAMETERS



- 1 OLA RECEPTOR
- 1 POW RECEPTOR

PROJECT	BARRHAVEN TOWN CENTRE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1700 (APPROX)	DRAWING NO.	GW21-289-A3
DATE	MAY 31, 2023	DRAWN BY	G.G.

FIGURE A3:  
STAMSON INPUT PARAMETERS