

**TRANSPORTATION NOISE  
ASSESSMENT**

1209 St. Laurent Boulevard  
Ottawa, Ontario

REPORT: GW22-130-Traffic Noise



May 20, 2022

PREPARED FOR  
Canderel

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PREPARED BY

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## EXECUTIVE SUMMARY

This report describes a transportation noise assessment in support of concurrent Zoning By-law Amendment and Site Plan Control application requirements for the proposed residential development located at 1209 St. Laurent Boulevard in Ottawa, Ontario. The proposed development comprises two nominally rectangular 30-storey towers, referred to as “Tower A” and “Tower B”, situated to the northwest and to the east, respectively, above a shared seven-storey podium comprising a nominally ‘U’-shaped planform, with its long axis-oriented parallel with the bridge situated to the south of the subject site. The major sources of transportation noise are roadway traffic along St. Laurent Boulevard, Lemieux Street and Highway 417, as well as LRT noise produced by the Confederation Line LRT. Figure 1 illustrates a complete site plan with 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 prepared by Roderick Lahey Architect Inc., in May 2022.

The results of the current analysis indicate that noise levels will range between 63 and 75 dBA during the daytime period (07:00-23:00) and between 57 and 67 dBA during the nighttime period (23:00-07:00). The highest noise level (75 dBA) occurs at the south façade of Tower A, which is nearest and most exposed to Highway 417. 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 the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. A Type D Warning Clause will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

Noise levels at terrace amenities are expected to approach 63, 74 and 69 dBA during the daytime period at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. If these areas are to be used as outdoor living areas, noise control measures are required to reduce the  $L_{eq}$  to 60 dBA, and as close



to 55 dBA as feasibly possible. Further analysis investigated the noise mitigating impact of noise mitigating guardrails surrounding the terraces and extending the proposed landscape wall surrounding the ground level amenity (see Figure 4). Results of the investigation proved that noise levels can only be reduced to 58, 67 and 65 dBA at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. Reducing noise levels to 55 dBA would require excessive barrier heights that would not be feasible. Gradient Wind recommends a 1.1 m noise mitigating guardrail for the 2<sup>nd</sup> Floor terrace, a 1.8 m noise mitigating guardrail for the 8<sup>th</sup> Floor terrace, and a minimum 1.5 m landscape wall for the ground level amenity. The 8<sup>th</sup> Floor terrace and ground level amenity should not be programmed as OLAs, as mitigating noise levels to 60 dBA would require excessive barrier heights. The guardrails must be constructed from materials having a minimum surface density of 20 kg/m<sup>2</sup> (STC rating of 30) and contain no gaps. Design of the guardrail will conform to the requirements outlined in Part 5 of the ENCG. The following information will be required by the City for review prior to installation of the barrier:

1. Shop drawings, signed and sealed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing the details of the acoustic barrier systems components, including material specifications.
2. Structural drawing(s), signed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing foundation details and specifying design criteria, climatic design loads, as well as applicable geotechnical data used in the design.
3. Layout plan, and wall elevations, showing proposed colours and patterns.

Regarding stationary noise, impacts from the surroundings on the study building are expected to be minimal. Sources associated with the surrounding commercial buildings are at a sufficient setback distance and will be significantly buffered by elevated background noise levels generated by Highway 417. Impacts from the development on the surroundings can be minimized by judicious placement mechanical equipment such as its placement on a roof or in a mechanical penthouse, or the incorporation of silencers and noise screens as necessary. It is recommended that any large pieces of HVAC equipment be placed in the middle of the roof, avoiding line of site with the surrounding residential dwellings.

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## 1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Canderel to undertake a transportation noise assessment in support of concurrent Zoning By-law Amendment and Site Plan Control application requirements for the proposed residential development located at 1209 St. Laurent Boulevard in Ottawa, Ontario (hereinafter referred to as “subject site” or “proposed development”). This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway and LRT traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa<sup>1</sup> and Ministry of the Environment, Conservation and Parks (MECP)<sup>2</sup> guidelines. Noise calculations were based on architectural drawings prepared by Roderick Lahey Architect Inc., in May 2022, with future traffic volumes corresponding to the City of Ottawa’s Official Plan (OP) roadway classifications.

## 2. TERMS OF REFERENCE

The subject site is located at 1209 St. Laurent Boulevard in Ottawa; situated on a parcel of land bounded by St. Laurent Boulevard to the west, R. Lemieux Street to the north and east, and a bridge to the south which extends above St. Laurent Boulevard, connecting St. Laurent Shopping Centre to the intersection of R. Lemieux Street and Labelle Street.

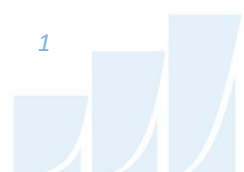
The proposed development comprises two nominally rectangular 30-storey towers, referred to as “Tower A” and “Tower B”, situated to the northwest and to the east, respectively, above a shared seven-storey podium comprising a nominally ‘U’-shaped planform, with its long axis-oriented parallel with the bridge situated to the south of the subject site. The proposed development includes five levels of below-grade parking, while the towers are served by mechanical penthouse levels.

The ground floor includes a main entrance and elevator core to the west, indoor amenity to the northwest, central shared building support spaces and bike storage, a main entrance to the north, residential units and elevator core to the east, a rental office and indoor amenities to the south, and a lounge at the

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<sup>1</sup> City of Ottawa Environmental Noise Control Guidelines, January 2016

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



southwest corner. Surface parking spaces are located centrally to the subject site and outdoor amenity is situated to the south of the proposed development. Access to below-grade parking is provided by a ramp to the north via a laneway from R. Lemieux Street. Levels 2-30 include residential use. Level 2 is served by central indoor and outdoor amenities and includes residential units throughout the remainder of the level. At Level 8, Tower A and Tower B begin and include residential units with indoor amenities at the southwest and southeast corners, respectively. This level is also served by an amenity terrace to the south and private terraces to the west and north of Tower A and to the east and south of Tower B.

The near-field surroundings, defined as an area within 200 metres (m) of the subject site, include low-rise commercial buildings to the north, a mid-rise hotel building to the northeast, a low-rise commercial building and a mid-rise hotel building to the east, and a mid-rise commercial building to the southeast. Notably, St. Laurent Shopping Centre is situated to the immediate west of the subject site. In addition, St. Laurent Station is situated approximately 160 m to the southwest, and the Light Rail Transit Confederation Line extends from the southeast to the southwest. The major sources of transportation noise are roadway traffic along St. Laurent Boulevard, Lemieux Street and Highway 417, as well as LRT noise produced by the Confederation Line LRT. Figure 1 illustrates a complete site plan with surrounding context.

### **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 Transportation Noise

### 4.2.1 Criteria for Roadway and LRT 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 for roadway as listed in Table 1.

**TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD AND LRT)<sup>3</sup>**

Type of Space	Time Period	Leq (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, <b>individual or semi-private offices</b> , 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

<sup>3</sup> Adapted from ENCG 2016 – Tables 2.2b and 2.2c

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>4</sup>. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment<sup>5</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>6</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.

#### **4.2.2 Theoretical Roadway and LRT 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 due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building. Highway 417 is elevated approximately 4 m above local grade and the Confederation Line is sunken approximately 6 m below local grade.

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<sup>4</sup> Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

<sup>5</sup> MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

<sup>6</sup> MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3



- Noise receptors were strategically placed at 11 locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 5-8.

### 4.2.3 Roadway and LRT 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>7</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. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

**TABLE 2: ROADWAY TRAFFIC DATA**

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
St. Laurent Boulevard	6-UAD	60	<b>50,000</b>
Lemieux Street	2-MCU	40	<b>12,000</b>
Highway 417	8-Lane Freeway	100	<b>146,664</b>
Confederation Line	LRT	70	<b>540/60*</b>

\* - Daytime/nighttime 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 (2020) 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.

<sup>7</sup> City of Ottawa Transportation Master Plan, November 2013

As per Section 4.2, when daytime noise levels (from road and rail 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>8</sup> considers:

- Window type and total area as a percentage of total room floor area
- 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>9</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, which was prepared for site plan approval, 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).

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<sup>8</sup> Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

<sup>9</sup> CMHC, Road & Rail Noise: Effects on Housing

## 5. RESULTS AND DISCUSSION

### 5.1 Transportation Noise Levels

The results of the transportation 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/Roof (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	75	POW – Tower A – North Façade	70	62
2	75	POW – Tower A – East Façade	68	61
3	75	POW – Tower A – South Façade	75	67
4	75	POW – Tower A – West Façade	74	67
5	75	POW – Tower B – North Façade	65	57
6	75	POW – Tower B – East Façade	71	63
7	75	POW – Tower B – South Façade	74	67
8	75	POW – Tower B – West Façade	71	64
9	1.5	OLA – 2 <sup>nd</sup> Floor Terrace	63	N/A
10	1.5	OLA – 8 <sup>th</sup> Floor Terrace	74	N/A
11	1.5	OLA – Ground Level Amenity	69	N/A

The results of the current analysis indicate that noise levels will range between 63 and 75 dBA during the daytime period (07:00-23:00) and between 57 and 67 dBA during the nighttime period (23:00-07:00). The highest noise level (75 dBA) occurs at the south façade of Tower A, which is nearest and most exposed to Highway 417.

### 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: NOISE CONTROL REQUIREMENTS**

Location	Façade	Window STC (Bedroom/Living Room & Office)	Exterior Wall STC	Warning Clauses	A/C
Podium	West	38/33	45	Yes	Yes
	South	38/33	45	Yes	Yes
Tower A	North	34/29	45	Yes	Yes
	East	31/26	45	Yes	Yes
	South	38/33	45	Yes	Yes
	West	38/33	45	Yes	Yes
Tower B	East	34/29	45	Yes	Yes
	South	38/33	45	Yes	Yes
	West	34/29	45	Yes	Yes

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. We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, 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 the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

### 5.3 Noise Barrier Calculation

Noise levels at terrace amenities are expected to approach 63, 74 and 69 dBA during the daytime period at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. If these areas are to be used as outdoor living areas, noise control measures are required to reduce the  $L_{eq}$  to 60 dBA, and as close to 55 dBA as feasibly possible. Further analysis investigated the noise mitigating impact of noise mitigating guardrails surrounding the terraces and extending the proposed landscape wall surrounding the ground level amenity (see Figure 4). Results of the investigation proved that noise levels can only be reduced to 58, 67 and 65 dBA at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. Reducing noise levels to 55 dBA would require excessive barrier heights that would not be feasible. Gradient Wind recommends a 1.1 m noise mitigating guardrail for the 2<sup>nd</sup> Floor terrace, a 1.8 m noise mitigating guardrail for the 8<sup>th</sup> Floor terrace, and a minimum 1.5 m landscape wall for the ground level amenity. The 8<sup>th</sup> Floor terrace and ground level amenity should not be programmed as OLAs, as mitigating noise levels to 60 dBA would require excessive barrier heights. Table 5 summarizes the results of the barrier investigation.

**TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION**

Location	Reference Receptor	Barrier Height (m)	Daytime Leq Noise Levels (dBA)
2 <sup>nd</sup> Floor Terrace	9	No Barrier	63
		1.1	58
		2.5	55
8 <sup>th</sup> Floor Terrace	10	No Barrier	74
		1.8	67
		3	63
Ground Level Amenity	11	1.5 (Landscape Wall)	69
		3	65



## 6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 63 and 75 dBA during the daytime period (07:00-23:00) and between 57 and 67 dBA during the nighttime period (23:00-07:00). The highest noise level (75 dBA) occurs at the south façade of Tower A, which is nearest and most exposed to Highway 417. 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.

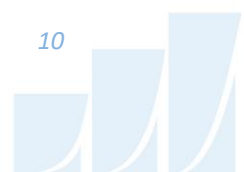
Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The following Type D Warning Clause<sup>10</sup> will also be required be placed on all Lease, Purchase and Sale Agreements, 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, Conservation and Parks."*

Noise levels at terrace amenities are expected to approach 63, 74 and 69 dBA during the daytime period at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. If these areas are to be used as outdoor living areas, noise control measures are required to reduce the  $L_{eq}$  to 60 dBA, and as close to 55 dBA as feasibly possible. Further analysis investigated the noise mitigating impact of noise mitigating guardrails surrounding the terraces and extending the proposed landscape wall surrounding the ground level amenity (see Figure 4). Results of the investigation proved that noise levels can only be reduced to 58, 67 and 65 dBA at the 2<sup>nd</sup> Floor terrace, 8<sup>th</sup> Floor terrace and ground level amenity, respectively. Reducing noise levels to 55 dBA would require excessive barrier heights that would not be feasible. Gradient Wind recommends a 1.1 m noise mitigating guardrail for the 2<sup>nd</sup> Floor terrace, a 1.8 m noise mitigating guardrail for the 8<sup>th</sup> Floor terrace, and a minimum 1.5 m landscape wall for the ground level amenity. The 8<sup>th</sup> Floor terrace and ground level amenity should not be programmed as OLAs, as mitigating noise levels to 60 dBA would require excessive barrier heights.

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<sup>10</sup> City of Ottawa Environmental Noise Control Guidelines, January 2016



Regarding stationary noise, impacts from the surroundings on the study building are expected to be minimal. Sources associated with the surrounding commercial buildings are at a sufficient setback distance and will be significantly buffered by elevated background noise levels generated by Highway 417. Impacts from the development on the surroundings can be minimized by judicious placement mechanical equipment such as its placement on a roof or in a mechanical penthouse, or the incorporation of silencers and noise screens as necessary. It is recommended that any large pieces of HVAC equipment be placed in the middle of the roof, avoiding line of site with the surrounding residential dwellings.

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.

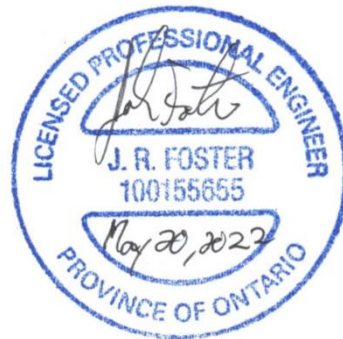
Sincerely,

**Gradient Wind Engineering Inc.**

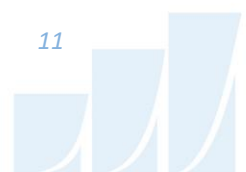


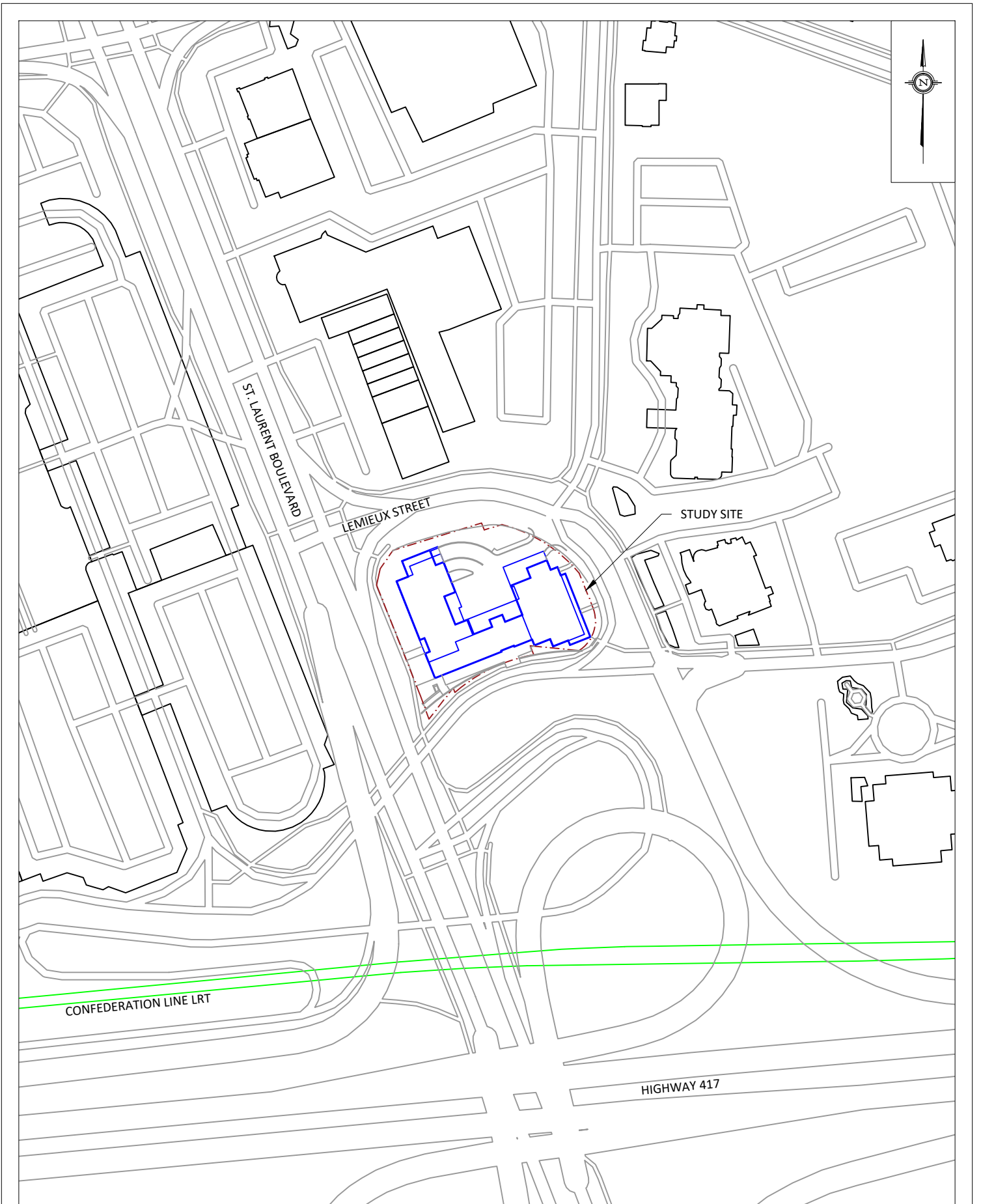
Michael Lafortune, C.E.T.  
Environmental Scientist

*Gradient Wind File #22-130-Traffic Noise*



Joshua Foster, P.Eng.  
Lead Engineer

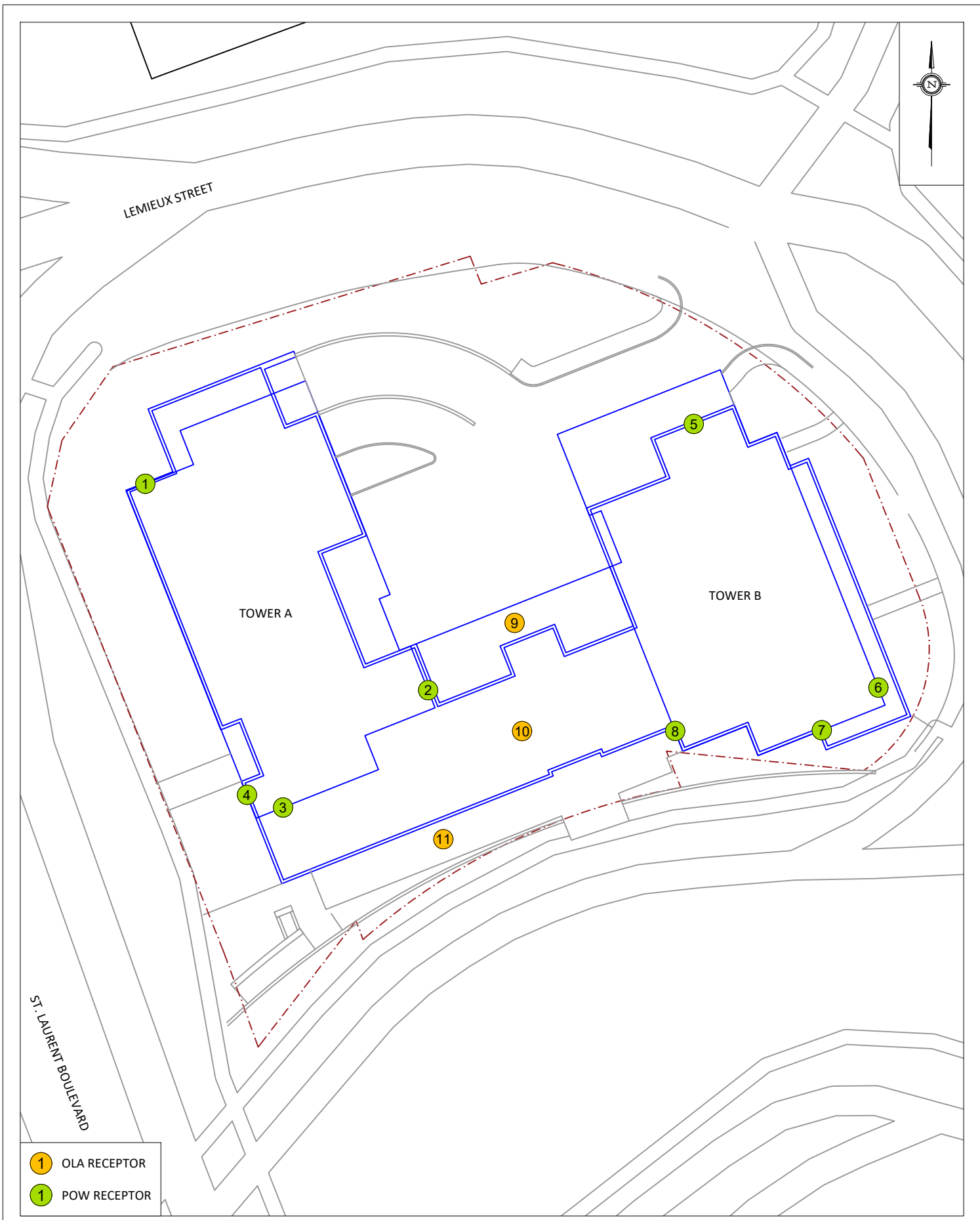




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SCALE	1:2000 (APPROX.)	DRAWING NO. GW22-130-1
DATE	MAY 13, 2022	DRAWN BY M.L.

DESCRIPTION	FIGURE 1: SITE PLAN AND SURROUNDING CONTEXT
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- 1 OLA RECEPTOR
- 1 POW RECEPTOR

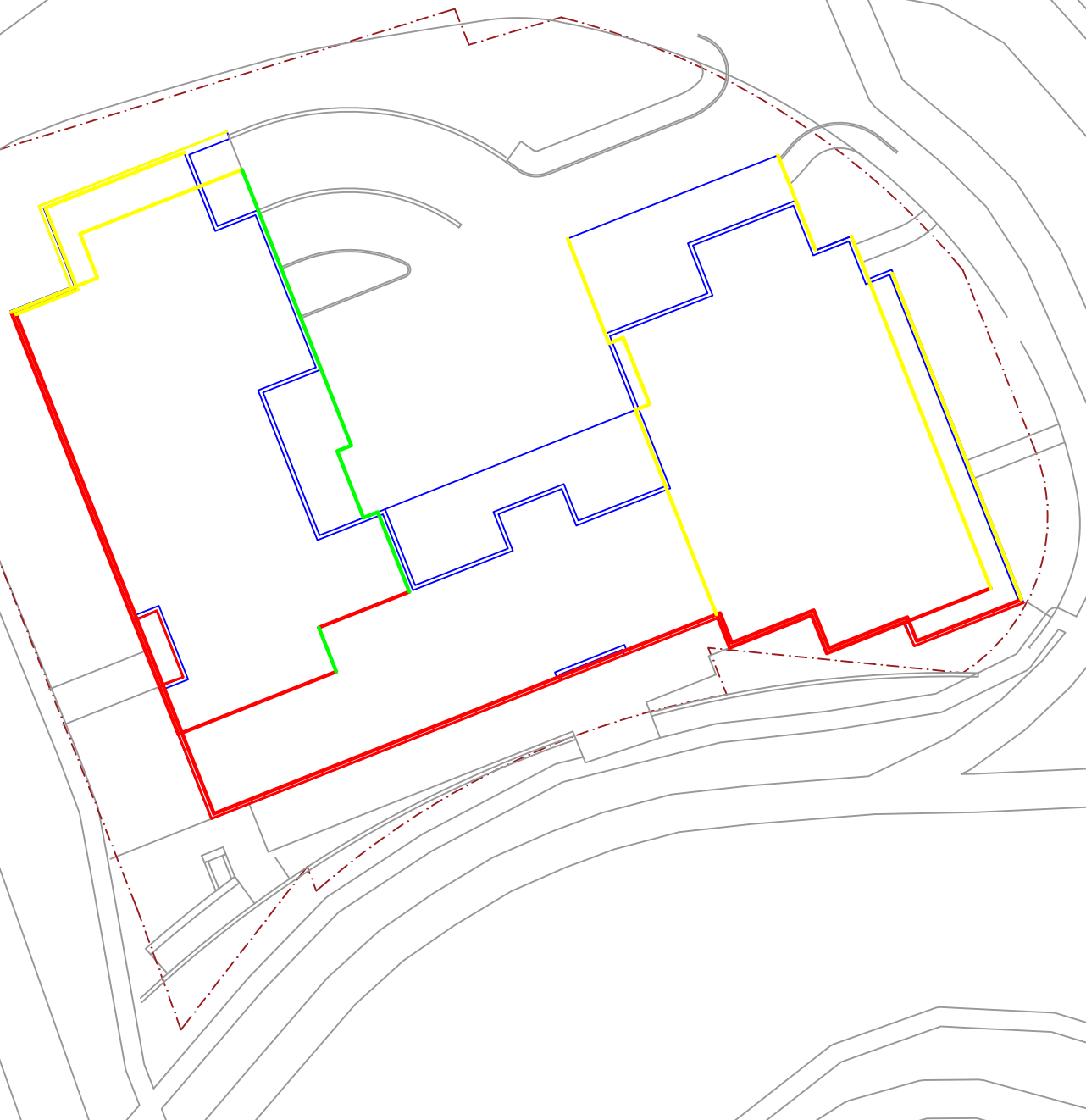
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	SCALE	1:500 (APPROX.)	DRAWING NO. GW22-130-2
	DATE	MAY 13, 2022	DRAWN BY M.L.




FIGURE 2:  
RECEPTOR LOCATIONS



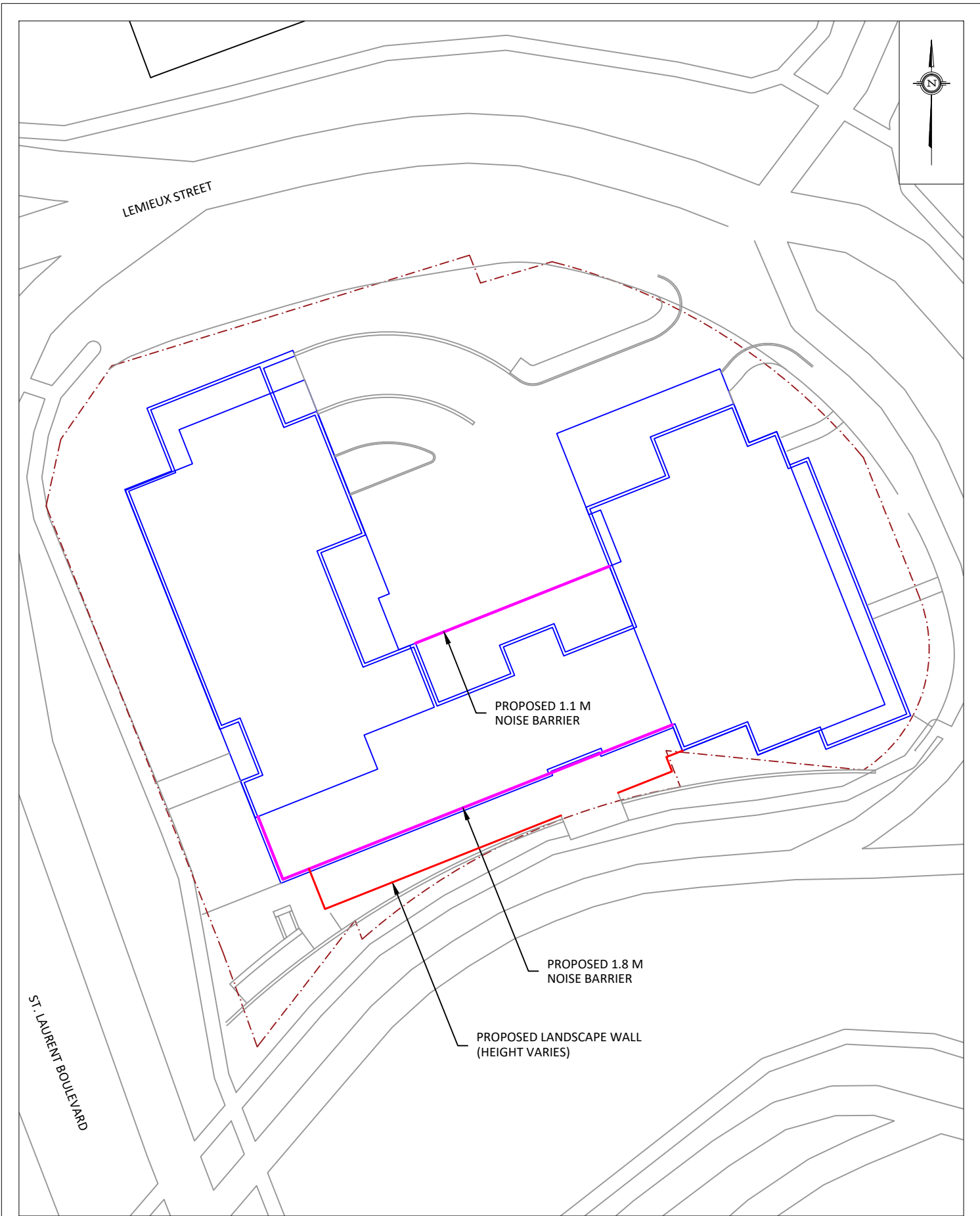
LEMIEUX STREET

ST. LAURENT BOULEVARD

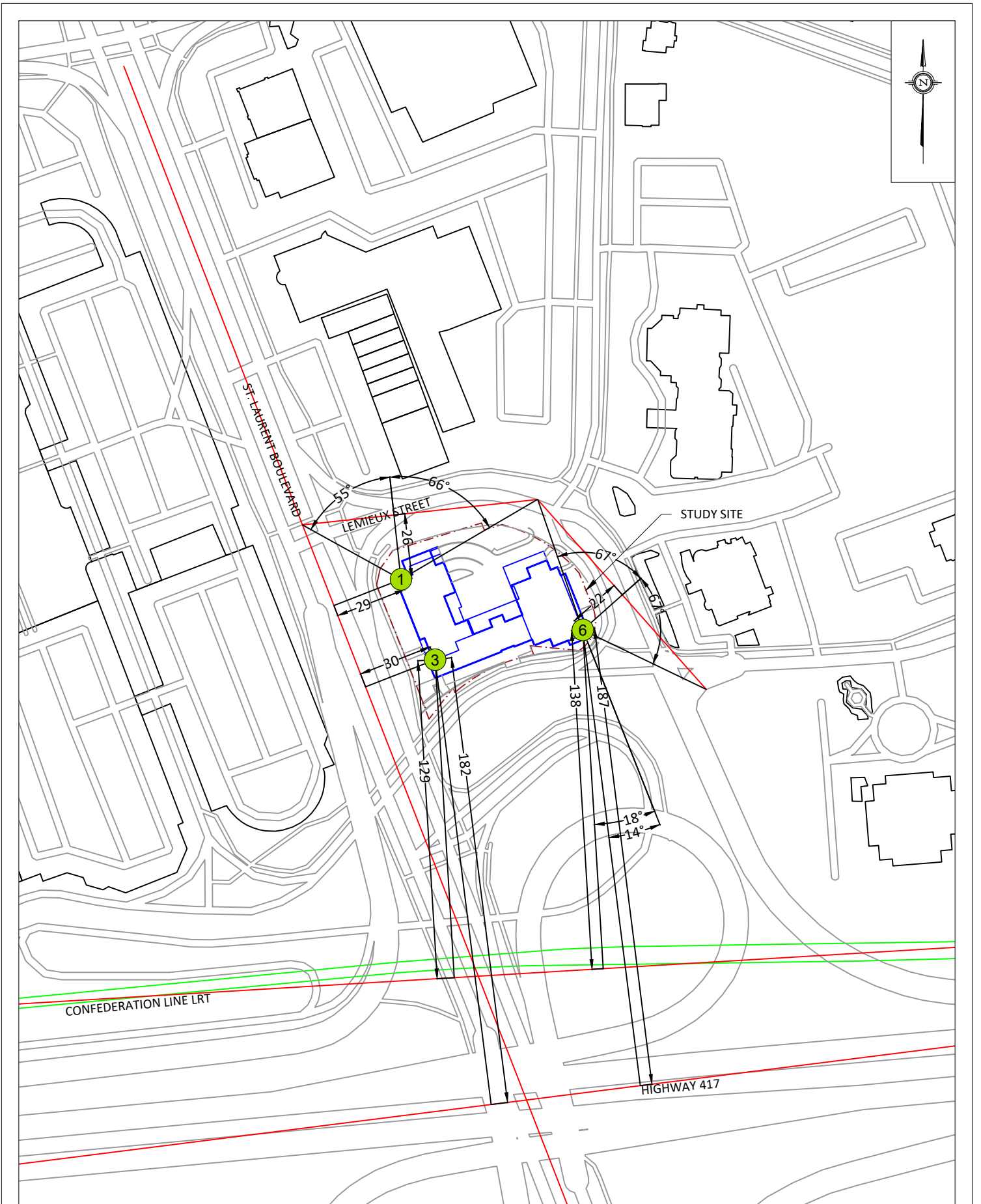


-  BEDROOM/LIVING ROOM WINDOWS: STC 38/33
-  BEDROOM/LIVING ROOM WINDOWS: STC 34/29
-  BEDROOM/LIVING ROOM WINDOWS: STC 31/26

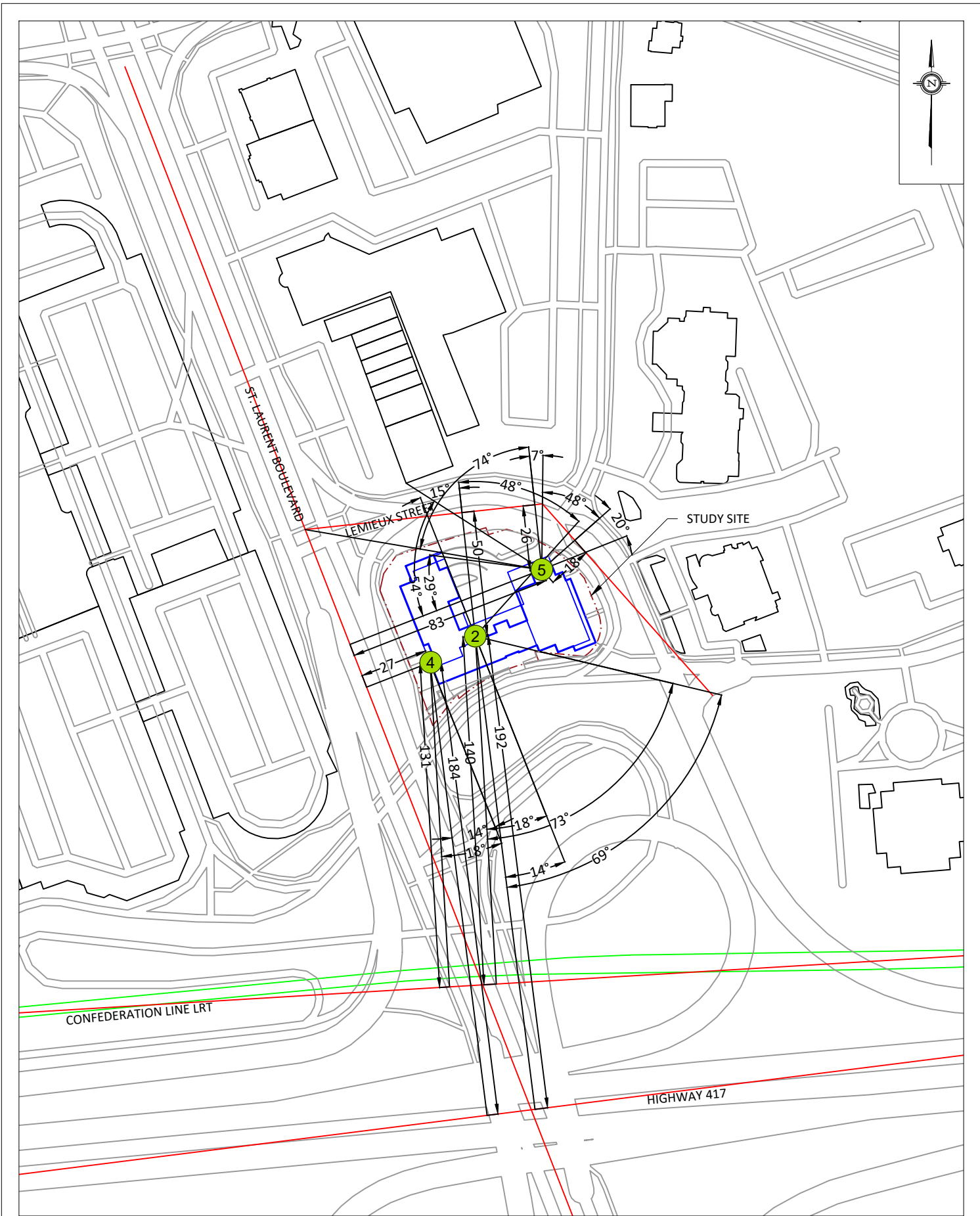
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DATE	MAY 13, 2022	DRAWN BY M.L.



PROJECT	1209 ST. LAURENT BOULEVARD, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
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DATE	MAY 13, 2022	DRAWN BY M.L.

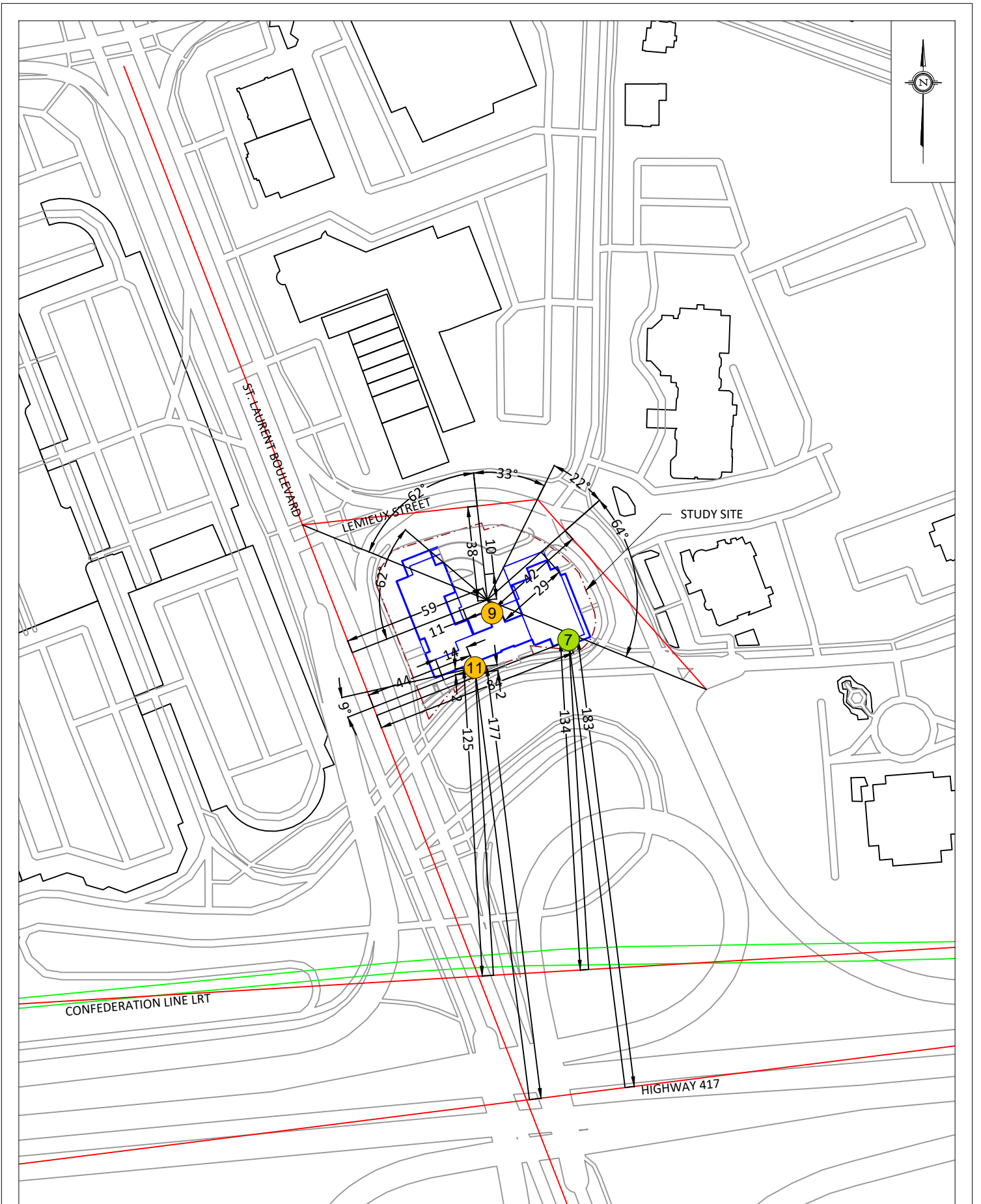


<b>GRADIENTWIND</b> ENGINEERS & SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT	1209 ST. LAURENT BOULEVARD, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	DESCRIPTION
	SCALE	1:2000 (APPROX.)	DRAWING NO. GW22-130-5
	DATE	MAY 13, 2022	DRAWN BY M.L.
			FIGURE 5: STAMSON INPUT PARAMETERS - RECEPTOR 1,3,6

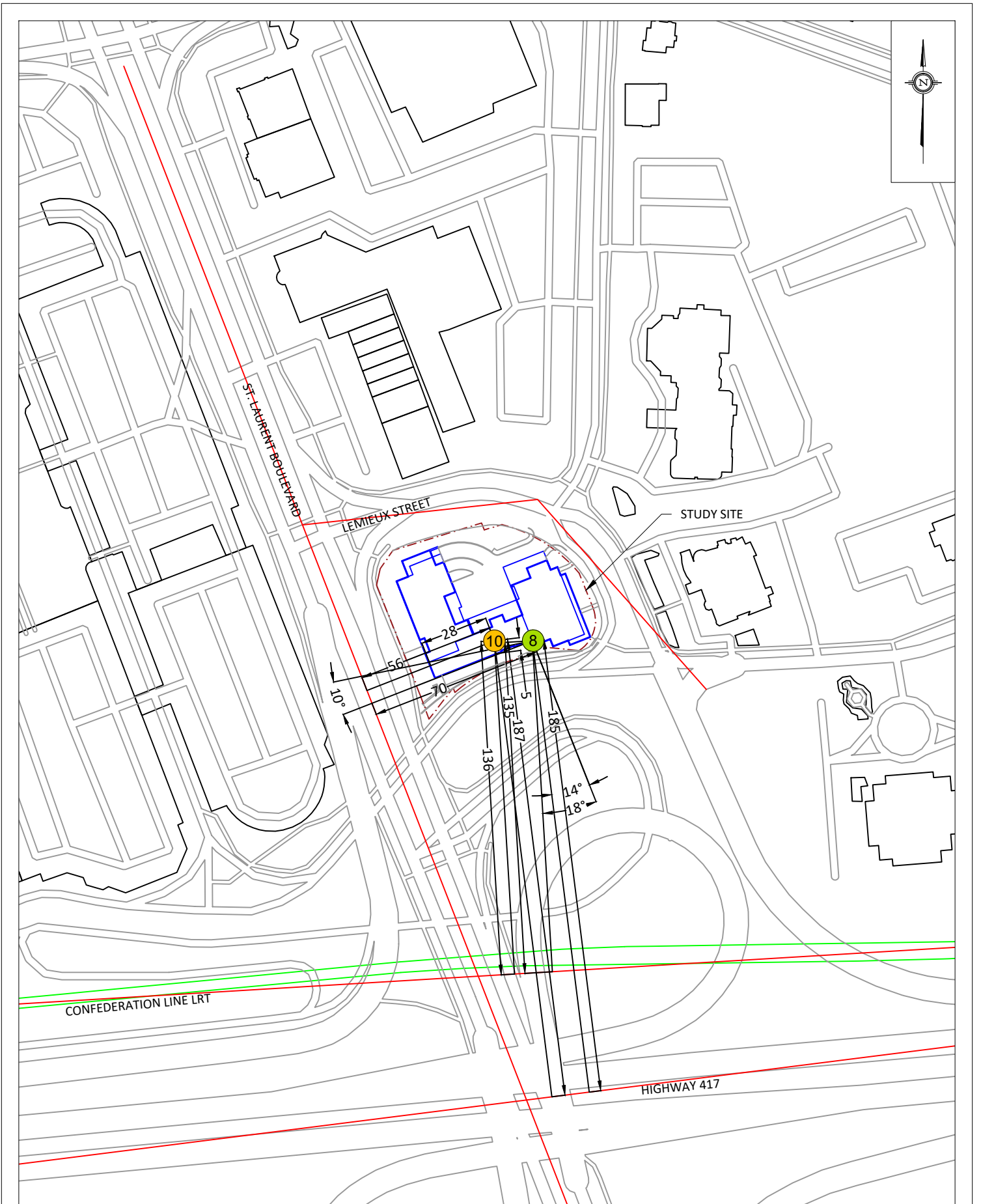


PROJECT	1209 ST. LAURENT BOULEVARD, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT	
SCALE	1:2000 (APPROX.)	DRAWING NO. GW22-130-6
DATE	MAY 13, 2022	DRAWN BY M.L.

DESCRIPTION	FIGURE 6: STAMSON INPUT PARAMETERS - RECEPTOR 2,4,5
-------------	--



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	SCALE	1:2000 (APPROX.)	DRAWING NO.		GW22-130-7
	DATE	MAY 13, 2022	DRAWN BY		M.L.



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	SCALE	1:2000 (APPROX.)	FIGURE 8: STAMSON INPUT PARAMETERS - RECEPTOR 8,10
	DATE	MAY 13, 2022	DRAWING NO. GW22-130-8
		DRAWN BY	M.L.

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## APPENDIX A

### STAMSON 5.04 – INPUT AND OUTPUT DATA



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STAMSON 5.0                      NORMAL REPORT                      Date: 12-05-2022 15:02:30  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----  
Angle1 Angle2 : -55.00 deg 66.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 26.00 / 26.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (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 : 29.00 / 29.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Lemieux (day)

Source height = 1.50 m

ROAD (0.00 + 61.60 + 0.00) = 61.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	66	0.00	65.72	0.00	-2.39	-1.72	0.00	0.00	0.00	61.60

Segment Leq : 61.60 dBA

Results segment # 2: Laurent (day)

Source height = 1.50 m

ROAD (0.00 + 69.35 + 0.00) = 69.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	75.22	0.00	-2.86	-3.01	0.00	0.00	0.00	69.35

Segment Leq : 69.35 dBA

Total Leq All Segments: 70.02 dBA

Results segment # 1: Lemieux (night)

Source height = 1.50 m

ROAD (0.00 + 54.00 + 0.00) = 54.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	66	0.00	58.12	0.00	-2.39	-1.72	0.00	0.00	0.00	54.00

Segment Leq : 54.00 dBA

Results segment # 2: Laurent (night)

Source height = 1.50 m

ROAD (0.00 + 61.75 + 0.00) = 61.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	67.63	0.00	-2.86	-3.01	0.00	0.00	0.00	61.75

Segment Leq : 61.75 dBA

Total Leq All Segments: 62.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.02  
(NIGHT): 62.42



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STAMSON 5.0            NORMAL REPORT            Date: 12-05-2022 15:02:53  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----  
Angle1    Angle2            : -15.00 deg    48.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 2                    (Reflective ground surface)  
Receiver source distance : 50.00 / 50.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (day/night)

-----  
Angle1 Angle2 : -69.00 deg -14.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 192.00 / 192.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -69.00 deg Angle2 : -14.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Lemieux (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 55.93 + 0.00) = 55.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	48	0.00	65.72	0.00	-5.23	-4.56	0.00	0.00	0.00	55.93

-----  
 Segment Leq : 55.93 dBA

Results segment # 2: 417 (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	75.00	71.38	71.38

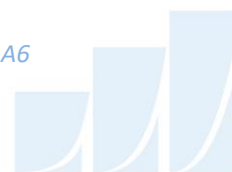
ROAD (0.00 + 68.19 + 0.00) = 68.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	-14	0.00	84.41	0.00	-11.07	-5.15	0.00	0.00	0.00	68.19*
-69	-14	0.00	84.41	0.00	-11.07	-5.15	0.00	0.00	0.00	68.19

-----  
 \* Bright Zone !

Segment Leq : 68.19 dBA

Total Leq All Segments: 68.44 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 48.33 + 0.00) = 48.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-15	48	0.00	58.12	0.00	-5.23	-4.56	0.00	0.00	0.00	48.33

-----  
 Segment Leq : 48.33 dBA

Results segment # 2: 417 (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	75.00	71.38	71.38

ROAD (0.00 + 60.59 + 0.00) = 60.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-69	-14	0.00	76.81	0.00	-11.07	-5.15	0.00	0.00	0.00	60.59*
-69	-14	0.00	76.81	0.00	-11.07	-5.15	0.00	0.00	0.00	60.59

-----  
 \* Bright Zone !

Segment Leq : 60.59 dBA

Total Leq All Segments: 60.84 dBA



# GRADIENTWIND

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

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

-----  
Angle1 Angle2 : -73.00 deg -18.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 140.00 / 140.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -73.00 deg Angle2 : -18.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00





Results segment # 1: LRT (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	75.00	69.25	69.25

RT/Custom (0.00 + 48.59 + 0.00) = 48.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-18	0.00	63.44	-9.70	-5.15	0.00	0.00	0.00	48.59*
-73	-18	0.00	63.44	-9.70	-5.15	0.00	0.00	0.00	48.59

\* Bright Zone !

Segment Leq : 48.59 dBA

Total Leq All Segments: 48.59 dBA

Results segment # 1: LRT (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	75.00	69.25	69.25

RT/Custom (0.00 + 42.06 + 0.00) = 42.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-73	-18	0.00	56.91	-9.70	-5.15	0.00	0.00	0.00	42.06*
-73	-18	0.00	56.91	-9.70	-5.15	0.00	0.00	0.00	42.06

\* Bright Zone !

Segment Leq : 42.06 dBA

Total Leq All Segments: 42.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.49  
(NIGHT): 60.90



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0            NORMAL REPORT            Date: 12-05-2022 15:02:58  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----  
Car traffic volume    : 40480/3520    veh/TimePeriod    \*  
Medium truck volume  : 3220/280     veh/TimePeriod    \*  
Heavy truck volume   : 2300/200     veh/TimePeriod    \*  
Posted speed limit   :     60 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): 50000  
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: Laurent (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   : 30.00 / 30.00 m  
Receiver height            : 75.00 / 75.00 m  
Topography                 :     1         (Flat/gentle slope; no barrier)  
Reference angle            :     0.00



# GRADIENTWIND

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Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 182.00 / 182.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



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Results segment # 1: Laurent (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 69.20 + 0.00) = 69.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.22	0.00	-3.01	-3.01	0.00	0.00	0.00	69.20

-----  
 Segment Leq : 69.20 dBA

Results segment # 2: 417 (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	75.00	71.18	71.18

ROAD (0.00 + 73.57 + 0.00) = 73.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.84	0.00	0.00	0.00	-0.00	73.57*
-90	90	0.00	84.41	0.00	-10.84	0.00	0.00	0.00	0.00	73.57

-----  
 \* Bright Zone !

Segment Leq : 73.57 dBA

Total Leq All Segments: 74.92 dBA



# GRADIENTWIND

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Results segment # 1: Laurent (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 61.61 + 0.00) = 61.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.63	0.00	-3.01	-3.01	0.00	0.00	0.00	61.61

-----  
 Segment Leq : 61.61 dBA

Results segment # 2: 417 (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	75.00	71.18	71.18

ROAD (0.00 + 65.97 + 0.00) = 65.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.84	0.00	0.00	0.00	-0.00	65.97*
-90	90	0.00	76.81	0.00	-10.84	0.00	0.00	0.00	0.00	65.97

-----  
 \* Bright Zone !

Segment Leq : 65.97 dBA

Total Leq All Segments: 67.33 dBA



# GRADIENTWIND

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 129.00 / 129.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	75.00	68.76	68.76

RT/Custom (0.00 + 54.09 + 0.00) = 54.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.34	0.00	0.00	0.00	-0.00	54.09*
-90	90	0.00	63.44	-9.34	0.00	0.00	0.00	0.00	54.09

\* Bright Zone !

Segment Leq : 54.09 dBA

Total Leq All Segments: 54.09 dBA

Results segment # 1: LRT (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	75.00	68.76	68.76

RT/Custom (0.00 + 47.56 + 0.00) = 47.56 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.34	0.00	0.00	0.00	-0.00	47.56*
-90	90	0.00	56.91	-9.34	0.00	0.00	0.00	0.00	47.56

\* Bright Zone !

Segment Leq : 47.56 dBA

Total Leq All Segments: 47.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 74.96  
(NIGHT): 67.37







# GRADIENTWIND

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Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (day/night)

-----  
Angle1 Angle2 : 14.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 184.00 / 184.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 14.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

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Results segment # 1: Laurent (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 72.67 + 0.00) = 72.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.22	0.00	-2.55	0.00	0.00	0.00	0.00	72.67

-----  
 Segment Leq : 72.67 dBA

Results segment # 2: 417 (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	75.00	71.22	71.22

ROAD (0.00 + 69.78 + 0.00) = 69.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
14	90	0.00	84.41	0.00	-10.89	-3.74	0.00	0.00	-0.00	69.77*
14	90	0.00	84.41	0.00	-10.89	-3.74	0.00	0.00	0.00	69.78

-----  
 \* Bright Zone !

Segment Leq : 69.78 dBA

Total Leq All Segments: 74.47 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (night)

Source height = 1.50 m

ROAD (0.00 + 65.08 + 0.00) = 65.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.63	0.00	-2.55	0.00	0.00	0.00	0.00	65.08

Segment Leq : 65.08 dBA

Results segment # 2: 417 (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	75.00	71.22	71.22

ROAD (0.00 + 62.18 + 0.00) = 62.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
14	90	0.00	76.81	0.00	-10.89	-3.74	0.00	0.00	-0.00	62.18*
14	90	0.00	76.81	0.00	-10.89	-3.74	0.00	0.00	0.00	62.18

\* Bright Zone !

Segment Leq : 62.18 dBA

Total Leq All Segments: 66.88 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

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

-----  
Angle1 Angle2 : 18.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 131.00 / 131.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 18.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	75.00	68.85	68.85

RT/Custom (0.00 + 50.05 + 0.00) = 50.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
18	90	0.00	63.44	-9.41	-3.98	0.00	0.00	-0.00	50.04*
18	90	0.00	63.44	-9.41	-3.98	0.00	0.00	0.00	50.05

\* Bright Zone !

Segment Leq : 50.05 dBA

Total Leq All Segments: 50.05 dBA

Results segment # 1: LRT (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	75.00	68.85	68.85

RT/Custom (0.00 + 43.51 + 0.00) = 43.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
18	90	0.00	56.91	-9.41	-3.98	0.00	0.00	-0.00	43.51*
18	90	0.00	56.91	-9.41	-3.98	0.00	0.00	0.00	43.51

\* Bright Zone !

Segment Leq : 43.51 dBA

Total Leq All Segments: 43.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 74.49  
(NIGHT): 66.90





# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (day/night)

-----  
Angle1 Angle2 : 29.00 deg 54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 83.00 / 83.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 3: Lemieux2 (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 # 3: Lemieux2 (day/night)

-----  
Angle1 Angle2 : -48.00 deg 20.00 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 : 75.00 / 75.00 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux1 (day)

Source height = 1.50 m

ROAD (0.00 + 59.86 + 0.00) = 59.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	7	0.00	65.72	0.00	-2.39	-3.47	0.00	0.00	0.00	59.86

Segment Leq : 59.86 dBA

Results segment # 2: Laurent (day)

Source height = 1.50 m

ROAD (0.00 + 59.22 + 0.00) = 59.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
29	54	0.00	75.22	0.00	-7.43	-8.57	0.00	0.00	0.00	59.22

Segment Leq : 59.22 dBA

Results segment # 3: Lemieux2 (day)

Source height = 1.50 m

ROAD (0.00 + 60.70 + 0.00) = 60.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	20	0.00	65.72	0.00	-0.79	-4.23	0.00	0.00	0.00	60.70

Segment Leq : 60.70 dBA

Total Leq All Segments: 64.74 dBA

Results segment # 1: Lemieux1 (night)

Source height = 1.50 m

ROAD (0.00 + 52.26 + 0.00) = 52.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-74	7	0.00	58.12	0.00	-2.39	-3.47	0.00	0.00	0.00	52.26

Segment Leq : 52.26 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 2: Laurent (night)

Source height = 1.50 m

ROAD (0.00 + 51.63 + 0.00) = 51.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
29	54	0.00	67.63	0.00	-7.43	-8.57	0.00	0.00	0.00	51.63

Segment Leq : 51.63 dBA

Results segment # 3: Lemieux2 (night)

Source height = 1.50 m

ROAD (0.00 + 53.10 + 0.00) = 53.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	20	0.00	58.12	0.00	-0.79	-4.23	0.00	0.00	0.00	53.10

Segment Leq : 53.10 dBA

Total Leq All Segments: 57.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.74  
(NIGHT): 57.14





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (day/night)

-----  
Angle1 Angle2 : -90.00 deg -14.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 187.00 / 187.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -14.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 62.77 + 0.00) = 62.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	67	0.00	65.72	0.00	-1.66	-1.28	0.00	0.00	0.00	62.77

-----  
 Segment Leq : 62.77 dBA

Results segment # 2: 417 (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	75.00	71.28	71.28

ROAD (0.00 + 69.71 + 0.00) = 69.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-14	0.00	84.41	0.00	-10.96	-3.74	0.00	0.00	-0.00	69.70*
-90	-14	0.00	84.41	0.00	-10.96	-3.74	0.00	0.00	0.00	69.71

-----  
 \* Bright Zone !

Segment Leq : 69.71 dBA

Total Leq All Segments: 70.51 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 55.17 + 0.00) = 55.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	67	0.00	58.12	0.00	-1.66	-1.28	0.00	0.00	0.00	55.17

-----  
 Segment Leq : 55.17 dBA

Results segment # 2: 417 (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	75.00	71.28	71.28

ROAD (0.00 + 62.11 + 0.00) = 62.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-14	0.00	76.81	0.00	-10.96	-3.74	0.00	0.00	-0.00	62.11*
-90	-14	0.00	76.81	0.00	-10.96	-3.74	0.00	0.00	0.00	62.11

-----  
 \* Bright Zone !

Segment Leq : 62.11 dBA

Total Leq All Segments: 62.91 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

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

-----  
Angle1 Angle2 : -90.00 deg -18.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 138.00 / 138.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -18.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	75.00	69.17	69.17

RT/Custom (0.00 + 49.82 + 0.00) = 49.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-18	0.00	63.44	-9.64	-3.98	0.00	0.00	-0.00	49.82*
-90	-18	0.00	63.44	-9.64	-3.98	0.00	0.00	0.00	49.82

\* Bright Zone !

Segment Leq : 49.82 dBA

Total Leq All Segments: 49.82 dBA

Results segment # 1: LRT (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	75.00	69.17	69.17

RT/Custom (0.00 + 43.29 + 0.00) = 43.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-18	0.00	56.91	-9.64	-3.98	0.00	0.00	-0.00	43.29*
-90	-18	0.00	56.91	-9.64	-3.98	0.00	0.00	0.00	43.29

\* Bright Zone !

Segment Leq : 43.29 dBA

Total Leq All Segments: 43.29 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.55  
(NIGHT): 62.96







# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 183.00 / 183.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 64.73 + 0.00) = 64.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.22	0.00	-7.48	-3.01	0.00	0.00	0.00	64.73

-----  
 Segment Leq : 64.73 dBA

Results segment # 2: 417 (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	75.00	71.20	71.20

ROAD (0.00 + 73.54 + 0.00) = 73.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.86	0.00	0.00	0.00	-0.00	73.54*
-90	90	0.00	84.41	0.00	-10.86	0.00	0.00	0.00	0.00	73.54

-----  
 \* Bright Zone !

Segment Leq : 73.54 dBA

Total Leq All Segments: 74.08 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 57.14 + 0.00) = 57.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.63	0.00	-7.48	-3.01	0.00	0.00	0.00	57.14

-----  
 Segment Leq : 57.14 dBA

Results segment # 2: 417 (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	75.00	71.20	71.20

ROAD (0.00 + 65.95 + 0.00) = 65.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.86	0.00	0.00	0.00	-0.00	65.95*
-90	90	0.00	76.81	0.00	-10.86	0.00	0.00	0.00	0.00	65.95

-----  
 \* Bright Zone !

Segment Leq : 65.95 dBA

Total Leq All Segments: 66.49 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 134.00 / 134.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	75.00	68.99	68.99

RT/Custom (0.00 + 53.93 + 0.00) = 53.93 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.51	0.00	0.00	0.00	-0.00	53.93*
-90	90	0.00	63.44	-9.51	0.00	0.00	0.00	0.00	53.93

\* Bright Zone !

Segment Leq : 53.93 dBA

Total Leq All Segments: 53.93 dBA

Results segment # 1: LRT (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	75.00	68.99	68.99

RT/Custom (0.00 + 47.40 + 0.00) = 47.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.51	0.00	0.00	0.00	-0.00	47.39*
-90	90	0.00	56.91	-9.51	0.00	0.00	0.00	0.00	47.40

\* Bright Zone !

Segment Leq : 47.40 dBA

Total Leq All Segments: 47.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 74.12  
(NIGHT): 66.54





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (day/night)

-----  
Angle1 Angle2 : 14.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 185.00 / 185.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 14.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 65.98 + 0.00) = 65.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	10	0.00	75.22	0.00	-6.69	-2.55	0.00	0.00	0.00	65.98

-----  
 Segment Leq : 65.98 dBA

Results segment # 2: 417 (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	75.00	71.24	71.24

ROAD (0.00 + 69.75 + 0.00) = 69.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
14	90	0.00	84.41	0.00	-10.91	-3.74	0.00	0.00	-0.00	69.75*
14	90	0.00	84.41	0.00	-10.91	-3.74	0.00	0.00	0.00	69.75

-----  
 \* Bright Zone !

Segment Leq : 69.75 dBA

Total Leq All Segments: 71.27 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (night)

-----  
 Source height = 1.50 m

ROAD (0.00 + 58.39 + 0.00) = 58.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	10	0.00	67.63	0.00	-6.69	-2.55	0.00	0.00	0.00	58.39

-----  
 Segment Leq : 58.39 dBA

Results segment # 2: 417 (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	75.00	71.24	71.24

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
14	90	0.00	76.81	0.00	-10.91	-3.74	0.00	0.00	-0.00	62.15*
14	90	0.00	76.81	0.00	-10.91	-3.74	0.00	0.00	0.00	62.16

-----  
 \* Bright Zone !

Segment Leq : 62.16 dBA

Total Leq All Segments: 63.68 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

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

-----  
Angle1 Angle2 : 18.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 135.00 / 135.00 m  
Receiver height : 75.00 / 75.00 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 18.00 deg Angle2 : 90.00 deg  
Barrier height : 0.00 m  
Barrier receiver distance : 10.00 / 10.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	75.00	69.04	69.04

RT/Custom (0.00 + 49.92 + 0.00) = 49.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
18	90	0.00	63.44	-9.54	-3.98	0.00	0.00	-0.00	49.91*
18	90	0.00	63.44	-9.54	-3.98	0.00	0.00	0.00	49.92

\* Bright Zone !

Segment Leq : 49.92 dBA

Total Leq All Segments: 49.92 dBA

Results segment # 1: LRT (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	75.00	69.04	69.04

RT/Custom (0.00 + 43.38 + 0.00) = 43.38 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
18	90	0.00	56.91	-9.54	-3.98	0.00	0.00	-0.00	43.38*
18	90	0.00	56.91	-9.54	-3.98	0.00	0.00	0.00	43.38

\* Bright Zone !

Segment Leq : 43.38 dBA

Total Leq All Segments: 43.38 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.30  
(NIGHT): 63.72





# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (day/night)

-----  
Angle1 Angle2 : 62.00 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 : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 62.00 deg Angle2 : 90.00 deg  
Barrier height : 5.00 m  
Barrier receiver distance : 11.00 / 11.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 3: Lemieux2 (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 # 3: Lemieux2 (day/night)

-----  
Angle1 Angle2 : -22.00 deg 64.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 42.00 / 42.00 m  
Receiver height : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -22.00 deg Angle2 : 64.00 deg  
Barrier height : 5.00 m  
Barrier receiver distance : 29.00 / 29.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux1 (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	6.50	5.18	5.18

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
-62	33	0.00	65.72	0.00	-4.04	-2.78	0.00	0.00	-4.90	54.01*
-62	33	0.00	65.72	0.00	-4.04	-2.78	0.00	0.00	0.00	58.90

\* Bright Zone !

Segment Leq : 58.90 dBA

Results segment # 2: Laurent (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	6.50	5.57	5.57

ROAD (0.00 + 61.20 + 0.00) = 61.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	75.22	0.00	-5.95	-8.08	0.00	0.00	-4.77	56.43*
62	90	0.00	75.22	0.00	-5.95	-8.08	0.00	0.00	0.00	61.20

\* Bright Zone !

Segment Leq : 61.20 dBA





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	65.72	0.00	-4.47	-3.21	0.00	0.00	-10.42	47.62

Segment Leq : 47.62 dBA

Total Leq All Segments: 63.33 dBA

Results segment # 1: Lemieux1 (night)

Source height = 1.50 m

Barrier height for grazing incidence

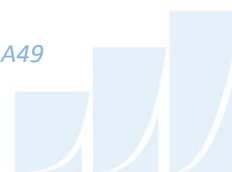
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	6.50	5.18	5.18

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
-62	33	0.00	58.12	0.00	-4.04	-2.78	0.00	0.00	-4.90	46.41*
-62	33	0.00	58.12	0.00	-4.04	-2.78	0.00	0.00	0.00	51.31

\* Bright Zone !

Segment Leq : 51.31 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 2: Laurent (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	6.50	5.57	5.57

ROAD (0.00 + 53.60 + 0.00) = 53.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	67.63	0.00	-5.95	-8.08	0.00	0.00	-4.77	48.83*
62	90	0.00	67.63	0.00	-5.95	-8.08	0.00	0.00	0.00	53.60

\* Bright Zone !

Segment Leq : 53.60 dBA

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 40.02 + 0.00) = 40.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	58.12	0.00	-4.47	-3.21	0.00	0.00	-10.42	40.02

Segment Leq : 40.02 dBA

Total Leq All Segments: 55.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.33  
(NIGHT): 55.73





# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (day/night)

-----  
Angle1 Angle2 : 62.00 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 : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 62.00 deg Angle2 : 90.00 deg  
Barrier height : 6.10 m  
Barrier receiver distance : 11.00 / 11.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 3: Lemieux2 (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 # 3: Lemieux2 (day/night)

-----  
Angle1 Angle2 : -22.00 deg 64.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 42.00 / 42.00 m  
Receiver height : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -22.00 deg Angle2 : 64.00 deg  
Barrier height : 6.10 m  
Barrier receiver distance : 29.00 / 29.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux1 (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	6.50	5.18	5.18

ROAD (0.00 + 51.79 + 0.00) = 51.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-62	33	0.00	65.72	0.00	-4.04	-2.78	0.00	0.00	-7.11	51.79

Segment Leq : 51.79 dBA

Results segment # 2: Laurent (day)

Source height = 1.50 m

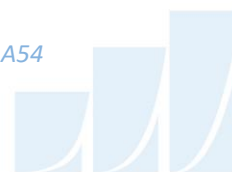
Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	6.50	5.57	5.57

ROAD (0.00 + 56.00 + 0.00) = 56.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	75.22	0.00	-5.95	-8.08	0.00	0.00	-5.19	56.00

Segment Leq : 56.00 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 44.28 + 0.00) = 44.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	65.72	0.00	-4.47	-3.21	0.00	0.00	-13.76	44.28

Segment Leq : 44.28 dBA

Total Leq All Segments: 57.60 dBA

Results segment # 1: Lemieux1 (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	6.50	5.18	5.18

ROAD (0.00 + 44.19 + 0.00) = 44.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-62	33	0.00	58.12	0.00	-4.04	-2.78	0.00	0.00	-7.11	44.19

Segment Leq : 44.19 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 2: Laurent (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	6.50	5.57	5.57

ROAD (0.00 + 48.41 + 0.00) = 48.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	67.63	0.00	-5.95	-8.08	0.00	0.00	-5.19	48.41

Segment Leq : 48.41 dBA

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 36.68 + 0.00) = 36.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	58.12	0.00	-4.47	-3.21	0.00	0.00	-13.76	36.68

Segment Leq : 36.68 dBA

Total Leq All Segments: 50.01 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.60  
(NIGHT): 50.01





# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                    NORMAL REPORT                    Date: 12-05-2022 15:03:43  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9b2.te                    Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: Lemieux1 (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: Lemieux1 (day/night)

-----  
Angle1    Angle2                : -62.00 deg    33.00 deg  
Wood depth                    : 0             (No woods.)  
No of house rows              : 0 / 0  
Surface                        : 2             (Reflective ground surface)  
Receiver source distance      : 38.00 / 38.00 m  
Receiver height                : 6.50 / 6.50 m  
Topography                    : 2             (Flat/gentle slope; with barrier)  
Barrier angle                 : -62.00 deg    Angle2 : 33.00 deg  
Barrier height                 : 7.50 m  
Barrier receiver distance     : 10.00 / 10.00 m  
Source elevation               : 0.00 m  
Receiver elevation             : 0.00 m  
Barrier elevation              : 0.00 m  
Reference angle                : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (day/night)

-----  
Angle1 Angle2 : 62.00 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 : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 62.00 deg Angle2 : 90.00 deg  
Barrier height : 7.50 m  
Barrier receiver distance : 11.00 / 11.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 3: Lemieux2 (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 # 3: Lemieux2 (day/night)

-----  
Angle1 Angle2 : -22.00 deg 64.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 42.00 / 42.00 m  
Receiver height : 6.50 / 6.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -22.00 deg Angle2 : 64.00 deg  
Barrier height : 7.50 m  
Barrier receiver distance : 29.00 / 29.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Lemieux1 (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	6.50	5.18	5.18

ROAD (0.00 + 46.36 + 0.00) = 46.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-62	33	0.00	65.72	0.00	-4.04	-2.78	0.00	0.00	-12.55	46.36

Segment Leq : 46.36 dBA

Results segment # 2: Laurent (day)

Source height = 1.50 m

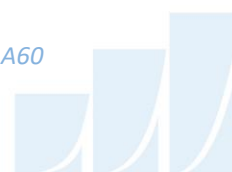
Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	6.50	5.57	5.57

ROAD (0.00 + 54.24 + 0.00) = 54.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	75.22	0.00	-5.95	-8.08	0.00	0.00	-6.96	54.24

Segment Leq : 54.24 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 41.16 + 0.00) = 41.16 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	65.72	0.00	-4.47	-3.21	0.00	0.00	-16.88	41.16

Segment Leq : 41.16 dBA

Total Leq All Segments: 55.08 dBA

Results segment # 1: Lemieux1 (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	6.50	5.18	5.18

ROAD (0.00 + 38.76 + 0.00) = 38.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-62	33	0.00	58.12	0.00	-4.04	-2.78	0.00	0.00	-12.55	38.76

Segment Leq : 38.76 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 2: Laurent (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	6.50	5.57	5.57

ROAD (0.00 + 46.64 + 0.00) = 46.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
62	90	0.00	67.63	0.00	-5.95	-8.08	0.00	0.00	-6.96	46.64

Segment Leq : 46.64 dBA

Results segment # 3: Lemieux2 (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	6.50	3.04	3.04

ROAD (0.00 + 33.56 + 0.00) = 33.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-22	64	0.00	58.12	0.00	-4.47	-3.21	0.00	0.00	-16.88	33.56

Segment Leq : 33.56 dBA

Total Leq All Segments: 47.48 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.08  
(NIGHT): 47.48





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 187.00 / 187.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 26.00 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 51.86 + 0.00) = 51.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.22	0.00	-5.72	-3.01	0.00	0.00	-14.63	51.86

Segment Leq : 51.86 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 73.45 + 0.00) = 73.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.96	0.00	0.00	0.00	-1.25	72.20*
-90	90	0.00	84.41	0.00	-10.96	0.00	0.00	0.00	0.00	73.45

\* Bright Zone !

Segment Leq : 73.45 dBA

Total Leq All Segments: 73.48 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 44.27 + 0.00) = 44.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.63	0.00	-5.72	-3.01	0.00	0.00	-14.63	44.27

Segment Leq : 44.27 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 65.85 + 0.00) = 65.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.96	0.00	0.00	0.00	-1.25	64.60*
-90	90	0.00	76.81	0.00	-10.96	0.00	0.00	0.00	0.00	65.85

\* Bright Zone !

Segment Leq : 65.85 dBA

Total Leq All Segments: 65.88 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 136.00 / 136.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 26.00 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 53.86 + 0.00) = 53.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.57	0.00	0.00	0.00	-4.73	49.13*
-90	90	0.00	63.44	-9.57	0.00	0.00	0.00	0.00	53.86

\* Bright Zone !

Segment Leq : 53.86 dBA

Total Leq All Segments: 53.86 dBA

Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 47.33 + 0.00) = 47.33 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.57	0.00	0.00	0.00	-4.73	42.60*
-90	90	0.00	56.91	-9.57	0.00	0.00	0.00	0.00	47.33

\* Bright Zone !

Segment Leq : 47.33 dBA

Total Leq All Segments: 47.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 73.53  
(NIGHT): 65.94



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                    NORMAL REPORT                    Date: 20-05-2022 10:36:37  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10b.te                    Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume    : 40480/3520    veh/TimePeriod    \*  
Medium truck volume : 3220/280    veh/TimePeriod    \*  
Heavy truck volume  : 2300/200    veh/TimePeriod    \*  
Posted speed limit   :     60 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): 50000  
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: Laurent (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 : 56.00 / 56.00 m  
Receiver height          : 27.50 / 27.50 m  
Topography               :     2        (Flat/gentle slope; with barrier)  
Barrier angle             : -90.00 deg    Angle2 : 0.00 deg  
Barrier height            : 27.80 m  
Barrier receiver distance : 17.00 / 17.00 m  
Source elevation         : 0.00 m  
Receiver elevation       : 0.00 m  
Barrier elevation         : 0.00 m  
Reference angle          : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 187.00 / 187.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 27.80 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 50.29 + 0.00) = 50.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.22	0.00	-5.72	-3.01	0.00	0.00	-16.21	50.29

Segment Leq : 50.29 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 66.39 + 0.00) = 66.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.96	0.00	0.00	0.00	-7.06	66.39

Segment Leq : 66.39 dBA

Total Leq All Segments: 66.50 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 42.69 + 0.00) = 42.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.63	0.00	-5.72	-3.01	0.00	0.00	-16.21	42.69

Segment Leq : 42.69 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 58.80 + 0.00) = 58.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.96	0.00	0.00	0.00	-7.06	58.80

Segment Leq : 58.80 dBA

Total Leq All Segments: 58.91 dBA





# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 136.00 / 136.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 27.80 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 44.65 + 0.00) = 44.65 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.57	0.00	0.00	0.00	-9.22	44.65

Segment Leq : 44.65 dBA

Total Leq All Segments: 44.65 dBA

Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 38.12 + 0.00) = 38.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.57	0.00	0.00	0.00	-9.22	38.12

Segment Leq : 38.12 dBA

Total Leq All Segments: 38.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.52  
(NIGHT): 58.94



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                    NORMAL REPORT                    Date: 20-05-2022 10:37:06  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10b2.te                    Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 40480/3520 veh/TimePeriod \*  
Medium truck volume : 3220/280 veh/TimePeriod \*  
Heavy truck volume : 2300/200 veh/TimePeriod \*  
Posted speed limit : 60 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): 50000  
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: Laurent (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 : 56.00 / 56.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle : -90.00 deg Angle2 : 0.00 deg  
Barrier height : 29.00 m  
Barrier receiver distance : 17.00 / 17.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 187.00 / 187.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 29.00 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : 4.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 49.60 + 0.00) = 49.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	75.22	0.00	-5.72	-3.01	0.00	0.00	-16.89	49.60

Segment Leq : 49.60 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 62.44 + 0.00) = 62.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.96	0.00	0.00	0.00	-11.01	62.44

Segment Leq : 62.44 dBA

Total Leq All Segments: 62.66 dBA



Results segment # 1: Laurent (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	27.50	19.61	19.61

ROAD (0.00 + 42.00 + 0.00) = 42.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.63	0.00	-5.72	-3.01	0.00	0.00	-16.89	42.00

Segment Leq : 42.00 dBA

Results segment # 2: 417 (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	27.50	26.91	26.91

ROAD (0.00 + 54.84 + 0.00) = 54.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.96	0.00	0.00	0.00	-11.01	54.84

Segment Leq : 54.84 dBA

Total Leq All Segments: 55.06 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 136.00 / 136.00 m  
Receiver height : 27.50 / 27.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 29.00 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : -6.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 41.26 + 0.00) = 41.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.57	0.00	0.00	0.00	-12.60	41.26

Segment Leq : 41.26 dBA

Total Leq All Segments: 41.26 dBA

Results segment # 1: LRT (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	27.50	26.29	26.29

RT/Custom (0.00 + 34.73 + 0.00) = 34.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.57	0.00	0.00	0.00	-12.60	34.73

Segment Leq : 34.73 dBA

Total Leq All Segments: 34.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.69  
(NIGHT): 55.10





# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                  NORMAL REPORT                  Date: 13-05-2022 13:08:55  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

-----  
Car traffic volume    : 40480/3520    veh/TimePeriod    \*  
Medium truck volume : 3220/280    veh/TimePeriod    \*  
Heavy truck volume  : 2300/200    veh/TimePeriod    \*  
Posted speed limit  :     60 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): 50000  
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: Laurent (day/night)

-----  
Angle1    Angle2                : -90.00 deg    9.00 deg  
Wood depth                        :     0            (No woods.)  
No of house rows                  :     0 / 0  
Surface                            :     2            (Reflective ground surface)  
Receiver source distance         : 44.00 / 44.00    m  
Receiver height                    : 1.50 / 1.50     m  
Topography                        :     2            (Flat/gentle slope; with barrier)  
Barrier angle                      : -90.00 deg    Angle2 : 9.00 deg  
Barrier height                     : 1.50 m  
Barrier receiver distance         : 14.00 / 14.00    m  
Source elevation                  : -3.00 m  
Receiver elevation                 : 0.00 m  
Barrier elevation                  : 0.00 m  
Reference angle                    : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 177.00 / 177.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 1.50 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: Laurent (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	0.54	0.54

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	9	0.00	75.22	0.00	-4.67	-2.60	0.00	0.00	-6.41	61.55

Segment Leq : 61.55 dBA

Results segment # 2: 417 (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 + 68.69 + 0.00) = 68.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.72	0.00	0.00	0.00	-5.00	68.69

Segment Leq : 68.69 dBA

Total Leq All Segments: 69.46 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	0.54	0.54

ROAD (0.00 + 53.95 + 0.00) = 53.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.00	67.63	0.00	-4.67	-2.60	0.00	0.00	-6.41	53.95

Segment Leq : 53.95 dBA

Results segment # 2: 417 (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 + 61.09 + 0.00) = 61.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.72	0.00	0.00	0.00	-5.00	61.09

Segment Leq : 61.09 dBA

Total Leq All Segments: 61.86 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 125.00 / 125.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 1.50 m  
Barrier receiver distance : 2.00 / 2.00 m  
Source elevation : -10.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	1.50	1.32	1.32

RT/Custom (0.00 + 48.97 + 0.00) = 48.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.21	0.00	0.00	0.00	-5.26	48.97

Segment Leq : 48.97 dBA

Total Leq All Segments: 48.97 dBA

Results segment # 1: LRT (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	1.50	1.32	1.32

RT/Custom (0.00 + 42.44 + 0.00) = 42.44 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.21	0.00	0.00	0.00	-5.26	42.44

Segment Leq : 42.44 dBA

Total Leq All Segments: 42.44 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.50  
(NIGHT): 61.91



# GRADIENTWIND

ENGINEERS & SCIENTISTS

STAMSON 5.0                    NORMAL REPORT                    Date: 13-05-2022 13:09:00  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11b.te                    Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume    : 40480/3520    veh/TimePeriod    \*  
Medium truck volume : 3220/280    veh/TimePeriod    \*  
Heavy truck volume  : 2300/200    veh/TimePeriod    \*  
Posted speed limit  :     60 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): 50000  
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: Laurent (day/night)

-----  
Angle1    Angle2            : -90.00 deg    9.00 deg  
Wood depth                :     0        (No woods.)  
No of house rows         :     0 / 0  
Surface                    :     2        (Reflective ground surface)  
Receiver source distance : 44.00 / 44.00 m  
Receiver height          : 1.50 / 1.50 m  
Topography                :     2        (Flat/gentle slope; with barrier)  
Barrier angle             : -90.00 deg    Angle2 : 9.00 deg  
Barrier height            : 3.00 m  
Barrier receiver distance : 14.00 / 14.00 m  
Source elevation         : -3.00 m  
Receiver elevation        : 0.00 m  
Barrier elevation         : 0.00 m  
Reference angle          : 0.00



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Road data, segment # 2: 417 (day/night)

-----  
Car traffic volume : 118739/10325 veh/TimePeriod \*  
Medium truck volume : 9445/821 veh/TimePeriod \*  
Heavy truck volume : 6747/587 veh/TimePeriod \*  
Posted speed limit : 100 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): 146664  
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: 417 (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 : 177.00 / 177.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 3.00 m  
Barrier receiver distance : 5.00 / 5.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00





# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	0.54	0.54

ROAD (0.00 + 57.72 + 0.00) = 57.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.00	75.22	0.00	-4.67	-2.60	0.00	0.00	-10.23	57.72

Segment Leq : 57.72 dBA

Results segment # 2: 417 (day)

Source height = 1.50 m

Barrier height for grazing incidence

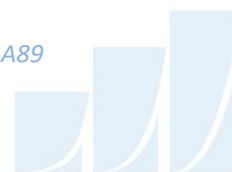
Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 64.50 + 0.00) = 64.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	84.41	0.00	-10.72	0.00	0.00	0.00	-9.19	64.50

Segment Leq : 64.50 dBA

Total Leq All Segments: 65.33 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

Results segment # 1: Laurent (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	0.54	0.54

ROAD (0.00 + 50.13 + 0.00) = 50.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.00	67.63	0.00	-4.67	-2.60	0.00	0.00	-10.23	50.13

Segment Leq : 50.13 dBA

Results segment # 2: 417 (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 + 56.90 + 0.00) = 56.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.81	0.00	-10.72	0.00	0.00	0.00	-9.19	56.90

Segment Leq : 56.90 dBA

Total Leq All Segments: 57.73 dBA



# GRADIENTWIND

ENGINEERS & SCIENTISTS

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

-----  
1 - 4-car SRT:  
Traffic volume : 540/60 veh/TimePeriod  
Speed : 70 km/h

Data for Segment # 1: LRT (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 : 125.00 / 125.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg  
Barrier height : 3.00 m  
Barrier receiver distance : 2.00 / 2.00 m  
Source elevation : -10.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



Results segment # 1: LRT (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	1.50	1.32	1.32

RT/Custom (0.00 + 42.04 + 0.00) = 42.04 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.44	-9.21	0.00	0.00	0.00	-12.19	42.04

Segment Leq : 42.04 dBA

Total Leq All Segments: 42.04 dBA

Results segment # 1: LRT (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	1.50	1.32	1.32

RT/Custom (0.00 + 35.50 + 0.00) = 35.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.91	-9.21	0.00	0.00	0.00	-12.19	35.50

Segment Leq : 35.50 dBA

Total Leq All Segments: 35.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.35  
(NIGHT): 57.76

