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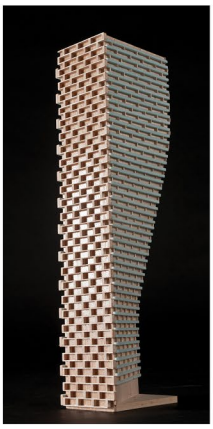
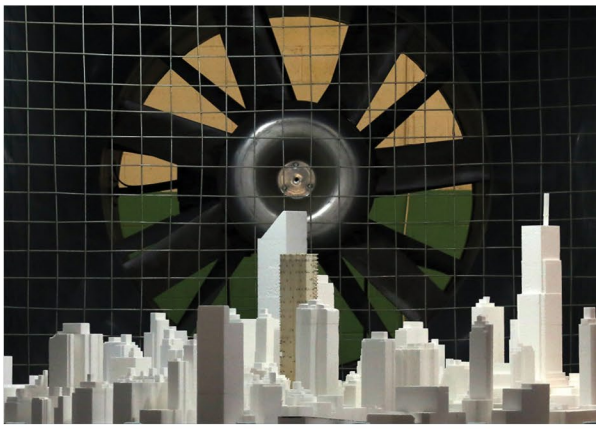
ENVIRONMENTAL NOISE ASSESSMENT

112 Montreal Road
Ottawa, Ontario

GRADIENT WIND REPORT: 20-018- Environmental Noise





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EXECUTIVE SUMMARY

This report describes an environmental noise assessment undertaken to satisfy Site Plan Control application requirements for the proposed Phase 1 multi-building development located at 112 Montreal Road in Ottawa, Ontario. The development consists of four buildings of a rectangular planform identified as: Building A, Tower B1, Tower B2, and Tower B3. The primary sources of roadway traffic noise include Montreal Road and Vanier Parkway. This report also incudes a stationary noise assessment investigating the impacts from existing stationary noise sources onto the proposed development, primarily the existing gas station car wash located at 114 Montreal Road. 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; (iv) stationary noise level criteria as specified by NPC-300; and (v) architectural drawings provided by Roderick Lahey Architect Inc. in August 2022.

The results of the current analysis indicate that noise levels will range between 53 and 72 dBA during the daytime period (07:00-23:00) and between 45 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs at the east façades of Tower B1 and Tower B2, which are nearest and most exposed to Vanier Parkway. 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 Tower B1, Tower B2, and Building A will require central air conditioning, or similar mechanical system, which will allow occupants to keep windows closed and maintain a comfortable indoor living environment. Similarly, noise levels for Tower B3 are expected to be between 55 dBA and 65 dBA during the daytime. Therefore, Tower B3 will require forced air heating with provisions for central air conditioning, or similar mechanical system, which will allow occupants to keep windows closed and maintain a comfortable indoor 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. Noise levels during the daytime period at the outdoor amenity areas are

expected to meet the 55 dBA OLA noise criterion as stipulated in the ENCG. Therefore, noise mitigation is not required.

With regard to existing stationary nose sources, the predicted noise levels due to the car wash exceeds the criteria listed in NPC-300 for Plane of Window receptors. In order for the proposed development to be compatible with the existing car wash, noise mitigation is required. Gradient Wind advises that the car wash blower fans be fitted with a silencer to reduce the noise levels onto the proposed development. The car wash owner will need to agree to the addition/modifications of the car wash mechanical equipment as well. Specific insertion loss values can be determined during the Detailed Design stage as the project progresses. At this stage, stationary noise impacts from the development onto the surroundings will also be investigated when mechanical equipment becomes available.

Gradient Wind outlines that upgraded building components and central air conditioning are required for Building A and Tower B1 to address noise generated from local transportation sources. Comparing the results depicted in Table 6 and Table 7, traffic noise levels along the east façade of Building A and the north façade of Tower B1 are expected to have a similar loudness as the noise generated by the car wash. As such, the implementation of upgraded building components and central air conditioning for the proposed buildings will also bring interior noise levels, generated by the gas station car wash, to an appropriate level. This approach could be considered should the implementation of silencers at the car wash is not feasible due to administrative or economic limitations. It is advised that a Warning Clause be included on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

In addition, stationary noise impacts from the proposed development onto the surroundings and itself would be addressed at a future phase once the mechanical equipment design has progressed and information becomes available. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Noise from these sources can be controlled to acceptable limits established by MECP by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by 2705460 Ontario Inc. to undertake an environmental noise assessment to satisfy Site Plan Control application requirements for Phase 1 of the proposed multi-building development located at 112 Montréal Road in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic and existing stationary noise sources.

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

2. TERMS OF REFERENCE

The focus of this environmental noise assessment is a proposed residential development located at 112 Montreal Road in Ottawa, Ontario. The study site is situated on a parcel of land bordered by Montreal Road and an existing gas station to the north, Vanier Parkway to the east, and existing developments to the south and west.

Architectural Rendering, South Perspective (Courtesy of Roderick Lahey Architect Inc)

Phase 1 comprises a nominally rectangular eight-storey mixed-use residential building (Building A) and a near rectangular 37-storey residential building (Tower B1), inclusive of a six-storey podium. Building A is situated at the northwest corner of the subject site and Tower B1 is situated at the northeast corner of the subject site. The Phase 1 buildings share four below-grade parking levels and are topped with a mechanical penthouse level (MPH).

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016
[2] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

The future Phase 2 comprises a 28-storey residential building (Tower B2) with a six-storey podium, and a 16-storey residential building (Tower B3) with a four-storey podium. Towers B2 and B3 are situated at the southeast corner and at the southwest corner of the subject site, respectively. A parkland is situated to the south of Tower B2, and laneways extend along the south and west sides of the subject site. The present study is focused on the influence of Phase 1. The massing details of Phase 2 are not final and are subject to change.

Above below-grade parking, the ground floor of Building A includes a residential main entrance to the south, a mail and parcel room at the southwest corner, an indoor amenity to the west, commercial space to the north, an elevator core to the east, and garbage and move-in spaces at the southeast corner. An outdoor multi-purpose space is provided along the west elevation, and surface parking spaces are situated to the south of Building A. Levels 2-8 are reserved for residential use. On Levels 2 to 4, inset balconies are provided along the west elevation and at the northeast and southeast corners. At Level 5, the building sets back from the south, west, and north elevations. Balconies are provided on the south, west, and north elevations at Levels 5 to 8.

Above below-grade parking, ground floor of Tower B1 includes a visitor lobby and admin space to the south, a main entrance at the southwest corner, a mail and parcel room to the west, garbage space at the northwest corner, townhouse units to the north and at the northeast corner, indoor amenity space at the southeast corner, and central elevator cores. An outdoor event space/plaza is situated to the southwest and surface parking spaces are situated to the west of Tower B1. Access to below-grade parking is provided by a ramp at the northwest corner of Tower B1 via a laneway from Palace Street. Floorplate setbacks are situated to the east and west at Level 7 and to the west and north at Level 35. Level 7 includes indoor amenity space to the south and residential units throughout the remainder of the level. This level is also served by an amenity terrace to the south. An additional amenity terrace is provided at Level 35 on the west elevation. The remaining space from Levels 2 through 37 is reserved for residential occupancy. Inset balconies are provided along the north and south elevations at Levels 2 through 6. Balconies are situated in all compass directions at Levels 8 through 34. Figure 1 illustrates a complete site plan with surrounding context.

This report also incudes a stationary noise assessment investigating the potential impacts from existing stationary noise sources onto the proposed development, primarily the existing gas station car wash

located at 114 Montreal Road. The equipment investigated are considered the primary sources of interest given their location relative to the proposed development, typical noise level, and operation frequency. In addition, stationary noise impacts from the proposed development onto the surroundings and itself would be addressed at a future phase once the mechanical equipment design has progressed and information becomes available. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Noise from these sources can be controlled to acceptable limits established by MECP by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

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 existing stationary noise sources, 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 (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For 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 50, 45 and 40 dBA for amenity/reception areas, living rooms, and sleeping quarters respectively for roadway as listed in Table 1. Based on Gradient Wind's experience, more comfortable indoor noise levels should be targeted, towards 47, 42 and 37 dBA, respectively, to control peak noise and deficiencies in building envelope construction.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) [3]

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor

[3] Adapted from ENCG 2016 – Tables 2.2b and 2.2c
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

environment[5]. 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[6].

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 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, with the exception of the landscaped courtyard which was modelled as absorptive ground due the presence of soft (lawn) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- For select sources where appropriate, receptors considered the proposed and existing buildings as a barrier, partially or fully obstructing exposure to the source as illustrated by exposure angles in Figures 5-7.

[5] MOECC, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MOECC, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

- Screening effects of proposed parapets and perimeter guards were conservatively omitted in the report.
- Noise receptors were strategically placed at 23 locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 5-7.

4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[7] 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
Vanier Parkway	4-Lane Urban Arterial Divided (4-UAD)	60	**35,000**
Montreal Road	2-Lane Urban Arterial (2-UAU)	50	**15,000**

4.2.4 Indoor Noise Calculations

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

[7] City of Ottawa Transportation Master Plan, November 2013

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[8] 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[9], 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 OPA 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).

4.3 Stationary Noise

Stationary sources are defined in NPC-300 as: "a source of sound or combination of sources of sound that are included and normally operated within the property lines of a facility and includes the premises of a person as one stationary source, unless the dominant source of sound on those premises is construction"[10]. Common stationary sources of noise include HVAC equipment, emergency generators, cooling towers and exhaust fans, which are often found on industrial and commercial facilities. As stationary noise can cause an adverse effect, it is important to examine the impact of existing stationary sources on the development. The impact of study building sources onto the surrounding residences will be determined at a future stage once mechanical information becomes available.

[8] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985
[9] CMHC, Road & Rail Noise: Effects on Housing
[10] NPC – 300, page 16

4.3.1 Stationary Noise Criteria

The equivalent sound energy level, L_{eq}, provides a weighted 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 selected period of time. For stationary sources, the L_{eq} is commonly calculated on an hourly interval, while for roadways, the L_{eq} is calculated on the basis of a 16-hour daytime/8-hour nighttime split.

Noise criteria taken from NPC-300 apply to points of reception (POR). A POR is defined as "any location on a noise sensitive land use where noise from a stationary source is received". A POR can be located on an existing or zoned for future use premises of permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds, and noise sensitive buildings such as schools and places of worship. The recommended maximum noise levels for a Class 1 area in a suburban environment adjacent to arterial roadways at a POR are outlined in Table 3 below. The study site is considered to be in a Class 1 area because it is located at the intersection of two arterial roadways. These conditions indicate that the sound field is dominated by manmade sources.

TABLE 3: EXCLUSIONARY LIMITS FOR CLASS 1 AREA

Time of Day	Outdoor Points of Reception	Plane of Window
07:00 – 19:00	50	50
19:00 – 23:00	50	50
23:00 – 07:00	N/A	45

4.3.1 Determination of Noise Source Power Levels

A review of satellite imagery identified the gas station car wash located at 114 Montreal Road as the primary source of existing stationary noise influencing the development area. This was based on the location relative to the proposed development, typical noise levels produced, and operation frequency of the car wash. The investigated sources primarily impact Building A and Tower B1 (Phase 1) at the north boundary line of the site.

Gradient Wind determined sound power data for the relevant equipment based on experience on past projects with similar equipment. Table 4 summarizes the sound power of each stationary noise source used in the analysis. Figure 8 illustrate the stationary noise source locations.

TABLE 4: EQUIPMENT SOUND POWER LEVELS (114 MONTREAL ROAD)

Source ID	Description	Height Above Grade (m)	Frequency (Hz)								
			63	125	250	500	1000	2000	4000	8000	Total (dBA)
S1-2	Car Wash – Idling Cars	0.75	55	65	57	65	66	63	62	54	**72**
S3	Car Wash – Entrance	3x3*	60	68	73	89	90	90	88	85	**96**
S4	Car Wash – Exit	3x3*	65	77	81	96	97	96	91	82	**102**

* - Emitting façade (Length x Height)

4.3.1 Stationary Source Noise Predictions

The impact of stationary noise sources was determined by computer modelling using the software program Predictor-Lima. This program was developed from the International Standards Organization (ISO) standard 9613 Parts 1 and 2 and is capable of representing three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing. The methodology has been used on numerous assignments and has been accepted by the Ministry of the Environment, Conservation and Parks (MECP) as part of Environmental Compliance Approval applications.

A total of 8 receptor locations were chosen around the site to measure the noise impact at points of reception (POR) during the daytime/evening period (07:00 – 23:00), as well as during the nighttime period (23:00 – 07:00). POR locations include outdoor points of reception (OPOR) and the plane of windows (POW) of the proposed development. Sensor locations are illustrated in Figure 8. All units were represented as point sources in the Predictor model with the exclusion of source 3 and 4 which were modelled as emitting facades. Table 5 below contains Predictor-Lima calculation settings. These are typical settings that have been based on ISO 9613 standards and guidance from the MECP.

Ground absorption over the study area was determined based on topographical features (such as water, concrete, grassland, etc.). An absorption value of 0 is representative of hard ground, while a value of 1

represents grass and similar soft surface conditions. Existing and proposed buildings were added to the model to account for screening and reflection effects from building façades, where necessary.

TABLE 5: CALCULATION SETTINGS

Parameter	Setting
Meteorological correction method	Single value for C0
Value C0	2.0
Ground attenuation factor for lawn areas	1
Ground attenuation factor for roadways and paved areas	0
Temperature (K)	283.15
Pressure (kPa)	101.33
Air humidity (%)	70

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise

5.1.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 6 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

The results of the current analysis indicate that noise levels will range between 53 and 72 dBA during the daytime period (07:00-23:00) and between 45 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs at the east façades of Tower B1 and Tower B2, which are nearest and most exposed to Vanier Parkway.

TABLE 6: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
Tower B1				
1	55.5	POW – 19th Floor – North Façade	69	61
2	89.8	POW – 30th Floor – North Façade	69	61
3	55.5	POW – 19th Floor – East Façade	72	64
4	89.8	POW – 30th Floor – East Façade	72	64
5	55.5	POW – 19th Floor – South Façade	69	61
6	89.8	POW – 30th Floor – South Façade	69	61
7	89.8	POW – 30th Floor – West Façade	53	45
Tower B2				
8	17.8	POW – 6th Floor – North Façade	69	62
9	55.5	POW – 19th Floor – East Façade	72	64
10	82	POW – 28th Floor – East Façade	72	64
11	55.5	POW – 19th Floor – North Façade	69	61
12	82	POW – 28th Floor – North Façade	69	61
13	55.5	POW – 19th Floor – South Façade	69	61
14	82	POW – 28th Floor – South Façade	69	61
Building A				
15	24.8	POW – 8th Floor – West Façade	65	57
16	24.8	POW – 8th Floor – North Façade	70	62
17	24.8	POW – 8th Floor – East Façade	68	60
Tower B3				
18	31	POW – 16th Floor – North Façade	60	52
19	31	POW – 16th Floor – East Façade	59	51
20	31	POW – 16th Floor – South Façade	63	55
Outdoor Living Areas				
21	21.4	OLA – Tower B1 – 7th Floor – Terrace	55	N/A*
22	21.4	OLA – Tower B2 – 7th Floor – Terrace	54	N/A*
23	1.5	OLA – Landscaped Courtyard	55	N/A*

*Nighttime noise levels at the OLAs are not considered as per ENCG.

5.1.2 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 below for various units within the development (see Figure 3):

Towers B1 and B2

- **Bedroom Windows**

(i) Bedroom windows facing north, and south will require a minimum STC of 32.

(ii) Bedroom windows facing east will require a minimum STC of 35.

(iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Living Room Windows**

(i) Living room windows facing north and south will require a minimum STC of 27.

(ii) Living room windows facing east will require a minimum STC of 30.

(iii) All other living room windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Reception and Amenity Windows**

(i) Reception and amenity windows facing north and south will require a minimum STC of 22.

(ii) Reception and amenity windows facing east will require a minimum STC of 25.

(iii) All other reception and amenity windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Exterior Walls**

(i) Exterior wall components on the north, south, and east façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[11].

Building A

- **Bedroom Windows**

(i) Bedroom windows facing north and east will require a minimum STC of 32.

(ii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Living Room Windows**

(i) Living room windows facing north and east will require a minimum STC of 27.

(ii) All other living room windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Reception and Amenity Windows**

(i) Reception and amenity windows facing north and east will require a minimum STC of 22.

(ii) All other reception and amenity windows are to satisfy Ontario Building Code (OBC 2020) requirements.

- **Exterior Walls**

(i) Exterior wall components on the north and east façade will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[12].

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 punch window and 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

[11] J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.
[12] J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

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 Tower B1, Tower B2, and Building A will require central air conditioning, or similar mechanical system, which will allow occupants to keep windows closed and maintain a comfortable indoor living environment. Similarly, noise levels for Tower B3 are expected to be between 55 dBA and 65 dBA during the daytime. Therefore, Tower B3 will require forced air heating with provisions for central air conditioning, or similar mechanical system, which will allow occupants to keep windows closed and maintain a comfortable indoor living environment (see Figure 4). In addition to ventilation requirements, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

Noise levels during the daytime period at the outdoor amenity areas are expected to meet the 55 dBA OLA noise criterion as stipulated in the ENCG. Therefore, noise mitigation is not required.

5.2 Stationary Noise

5.2.1 Stationary Noise Levels Due to Existing Properties

Noise levels at the study site are expected to exceed NPC-300 criteria for stationary noise at Building A and Tower B1, as summarized in Tables 7. The results of the current analysis indicate that noise levels will range between 44 and 69 dBA during the daytime period (07:00-23:00) and 37 and 62 dBA during the nighttime period (23:00-07:00). The highest noise level (69 dBA) occurs at the north façade of Tower B1, which is directly exposed to noise generated by the car wash facility. Noise contours covering Phase 1 are shown in Figures 9 and 10 for daytime and nighttime conditions, respectively.

TABLE 7: EXTERIOR NOISE LEVELS DUE TO CAR WASH NOISE SOURCE

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	Predictor-Lima Noise Level (dBA)		Meets NPC-300 Class 1 Criteria	
			Day	Night	Day	Night
R1_A	10	POW - Building A - East Facade	66	59	**No**	**No**
R1_B	25	POW - Building A - East Facade	66	59	**No**	**No**
R2_A	10	POW - Tower B1 - North Facade	69	62	**No**	**No**
R2_B	18	POW - Tower B1 - North Facade	66	59	**No**	**No**
R3_A	50	POW - Tower B1 - North Facade	59	52	**No**	**No**
R4_A	10	POW - Tower B1 - North Facade	62	55	**No**	**No**
R4_B	18	POW - Tower B1 - North Facade	60	53	**No**	**No**
R5_A	50	POW - Tower B1 - North Facade	53	47	**No**	**No**
R6_A	10	POW - Tower B3 - North Facade	50	43	Yes	Yes
R7_A	30	POW - Tower B3 - North Facade	45	38	Yes	Yes
R8_A	1.5	OPOR - Tower B1 - Terrace	44	37	Yes	Yes

5.2.2 Stationary Noise Discussion

The predicted noise levels due to the existing car wash exceeds the criteria listed in NPC-300 for Plane of Window receptors. In order for the proposed development to be compatible with the existing car wash, noise mitigation is required. Gradient Wind advises that the car wash blower fans be fitted with a silencer to reduce the noise levels onto the proposed development. The car wash owner will need to agree to the addition/modifications of the car wash mechanical equipment as well. Specific insertion loss values can be determined during the Detailed Design stage as the project progresses. At this stage, stationary noise impacts from the development onto the surroundings will also be investigated when mechanical equipment becomes available.

As summarized in Section 5.1.2, Gradient Wind outlines that upgraded building components and central air conditioning are required for Building A and Tower B1 to address noise generated from local transportation sources. Comparing the results depicted in Table 6 and Table 7, traffic noise levels along the east façade of Building A and the north façade of Tower B1 are expected to have a similar loudness as the noise generated by the car wash. As such, the implementation of upgraded building components and central air conditioning for the proposed buildings will also bring interior noise levels, generated by the gas station car wash, to an appropriate level. This approach could be considered should the implementation of silencers at the car wash is not feasible due to administrative or economic limitations.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 53 and 72 dBA during the daytime period (07:00-23:00) and between 45 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (72 dBA) occurs at the east façades of Tower B1 and Tower B2, which are nearest and most exposed to Vanier Parkway. 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 Tower B1, Tower B2, and Building A will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. For Tower B1, Tower B2, and Building A, a Type D Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized below:

Type D

> *"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."*

For Tower B3, a Type C Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized below:

Type C

> *"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."*

Noise levels during the daytime period at the outdoor amenity areas are expected to meet the 55 dBA OLA noise criterion as stipulated in the ENCG. Therefore, noise mitigation is not required.

With regard to existing stationary nose sources, the predicted noise levels due to the car wash exceeds the criteria listed in NPC-300 for Plane of Window receptors. In order for the proposed development to be compatible with the existing car wash, noise mitigation is required. Gradient Wind advises that the car wash blower fans be fitted with a silencer to reduce the noise levels onto the proposed development. The car wash owner will need to agree to the addition/modifications of the car wash mechanical equipment as well. Specific insertion loss values can be determined during the Detailed Design stage as the project progresses. At this stage, stationary noise impacts from the development onto the surroundings will also be investigated when mechanical equipment becomes available.

As summarized in Section 5.1.2, Gradient Wind outlines that upgraded building components and central air conditioning are required for Building A and Tower B1 to address noise generated from local

transportation sources. Comparing the results depicted in Table 6 and Table 7, traffic noise levels along the east façade of Building A and the north façade of Tower B1 are expected to have a similar loudness as the noise generated by the car wash. As such, the implementation of upgraded building components and central air conditioning for the proposed buildings will also bring interior noise levels, generated by the gas station car wash, to an appropriate level. This approach could be considered should the implementation of silencers at the car wash is not feasible due to administrative or economic limitations.

It is advised that a Type E Warning Clause also be included on all Lease, Purchase and Sale Agreements, as summarized below:

Type E

> *"Purchasers/tenants are advised that due to the proximity of the adjacent gas station car wash, noise from the car wash may at times be audible."*

In addition, stationary noise impacts from the proposed development onto the surroundings and itself would be addressed at a future phase once the mechanical equipment design has progressed and information becomes available. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Noise from these sources can be controlled to acceptable limits established by MECP by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

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

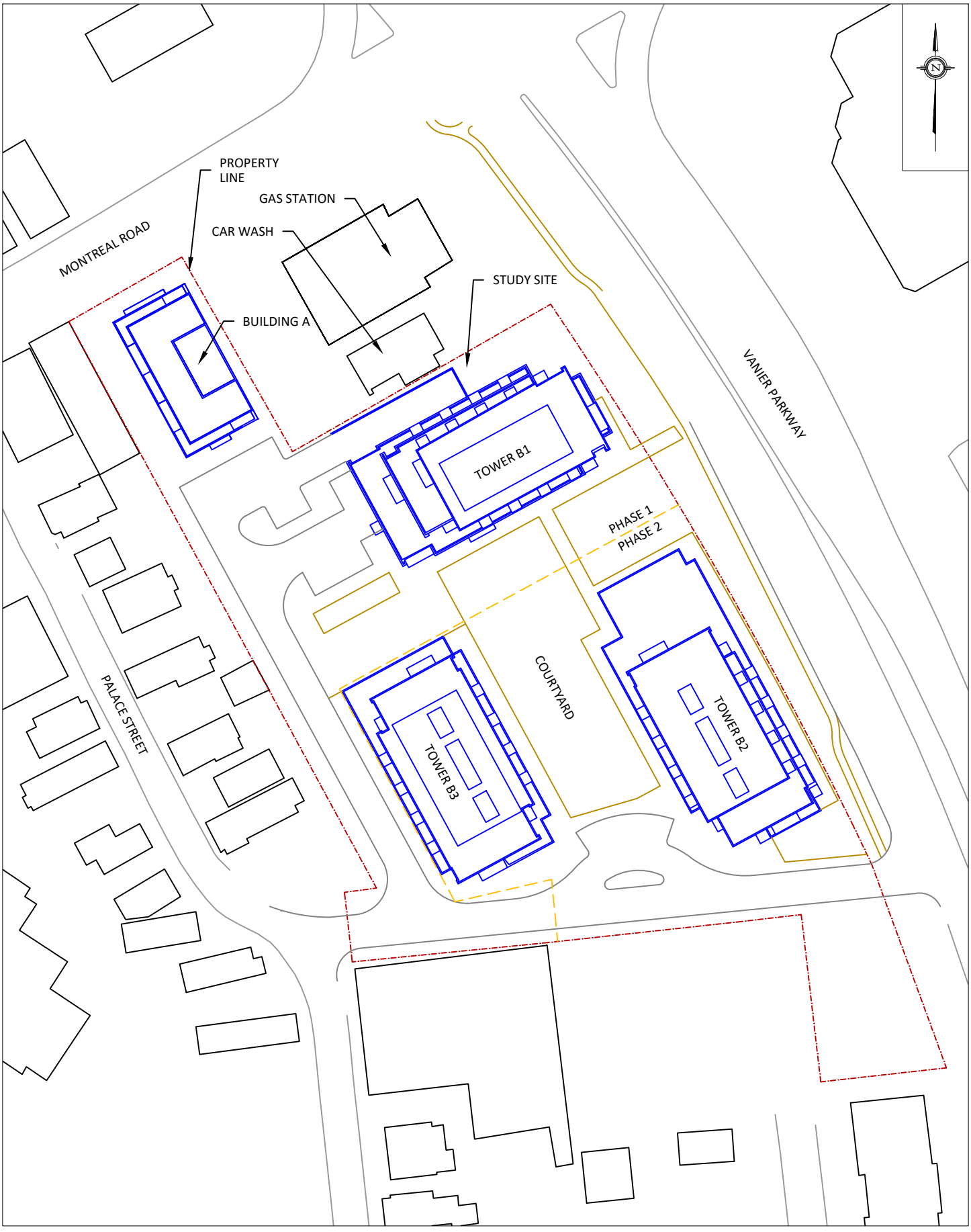
Sincerely,

Gradient Wind Engineering Inc.

Giuseppe Garro, MASc.
Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #20-018



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PROJECT	112 MONTREAL ROAD, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-018-1
DATE	SEPTEMBER 9, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT

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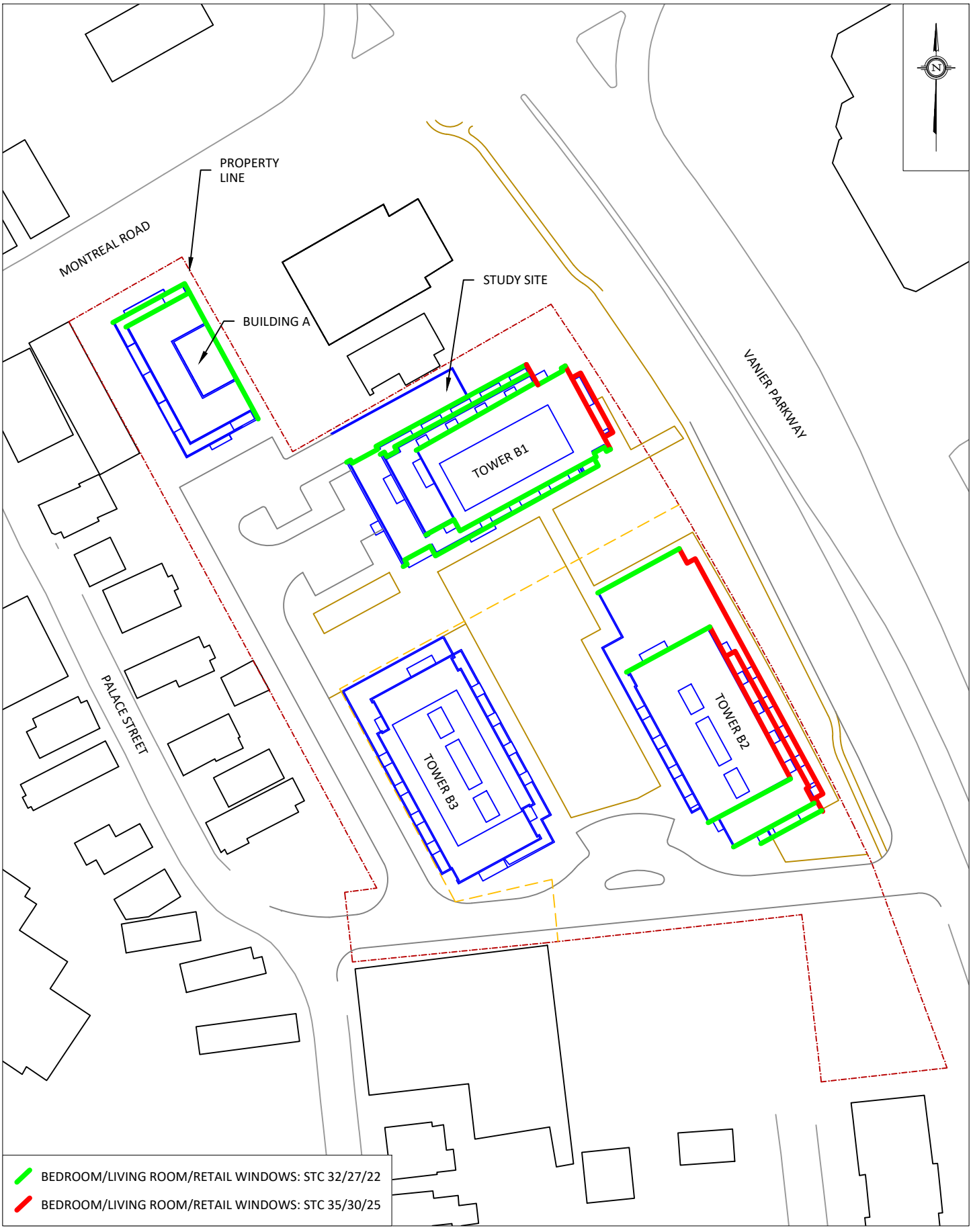
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-018-2
DATE	SEPTEMBER 9, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 2:
TRAFFIC NOISE RECEPTOR LOCATIONS



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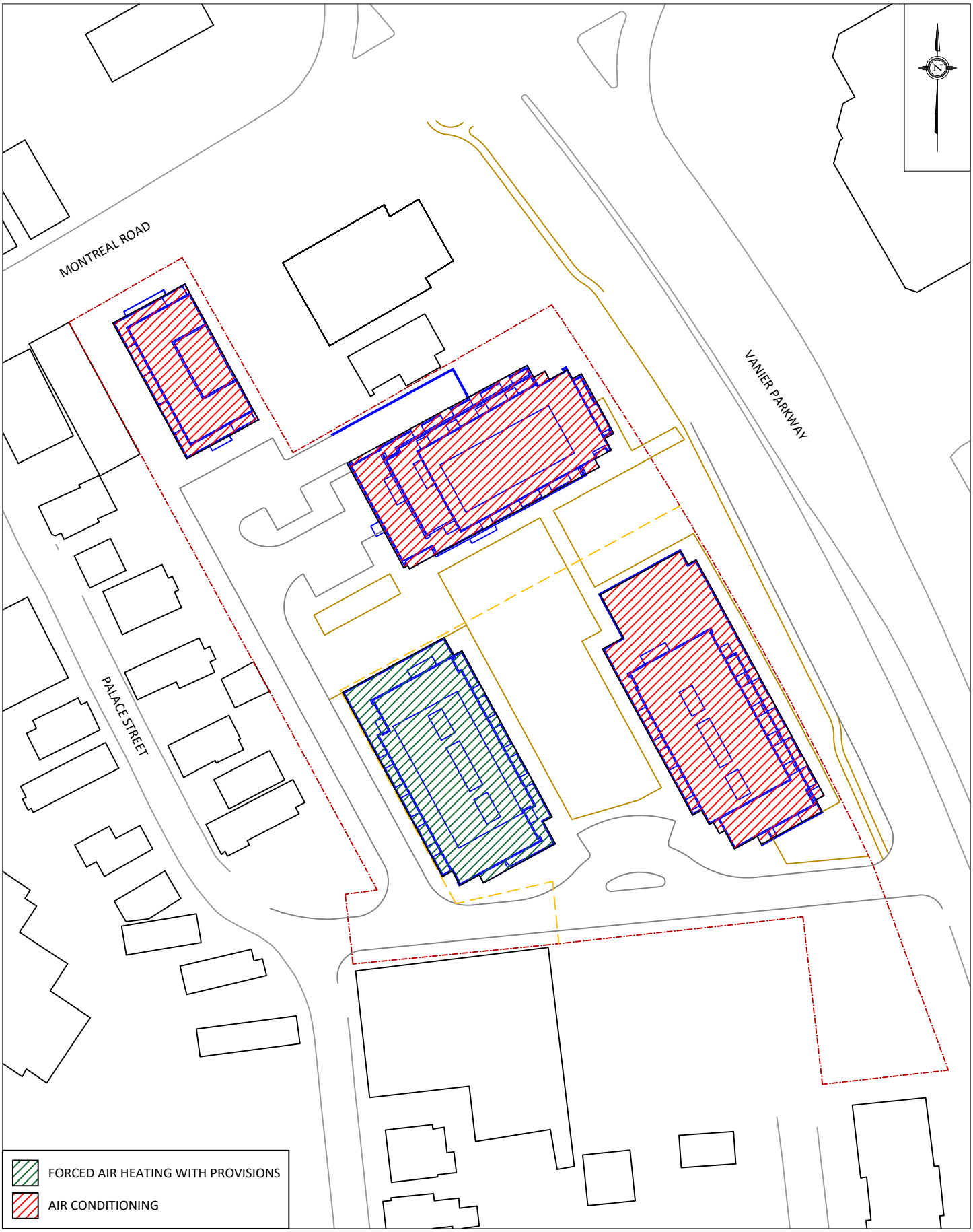
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-018-3
DATE	SEPTEMBER 9, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 3:
WINDOW STC REQUIREMENTS



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PROJECT	112 MONTREAL ROAD, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-018-4
DATE	SEPTEMBER 9, 2022	DRAWN BY	G.G.

FIGURE 4:
VENTILATION REQUIREMENTS

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SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-018-5
DATE	SEPTEMBER 9, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 5:
STAMSON INPUT PARAMETERS

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SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-018-6
DATE	SEPTEMBER 9, 2022	DRAWN BY	G.G.

FIGURE 6:
STAMSON INPUT PARAMETERS

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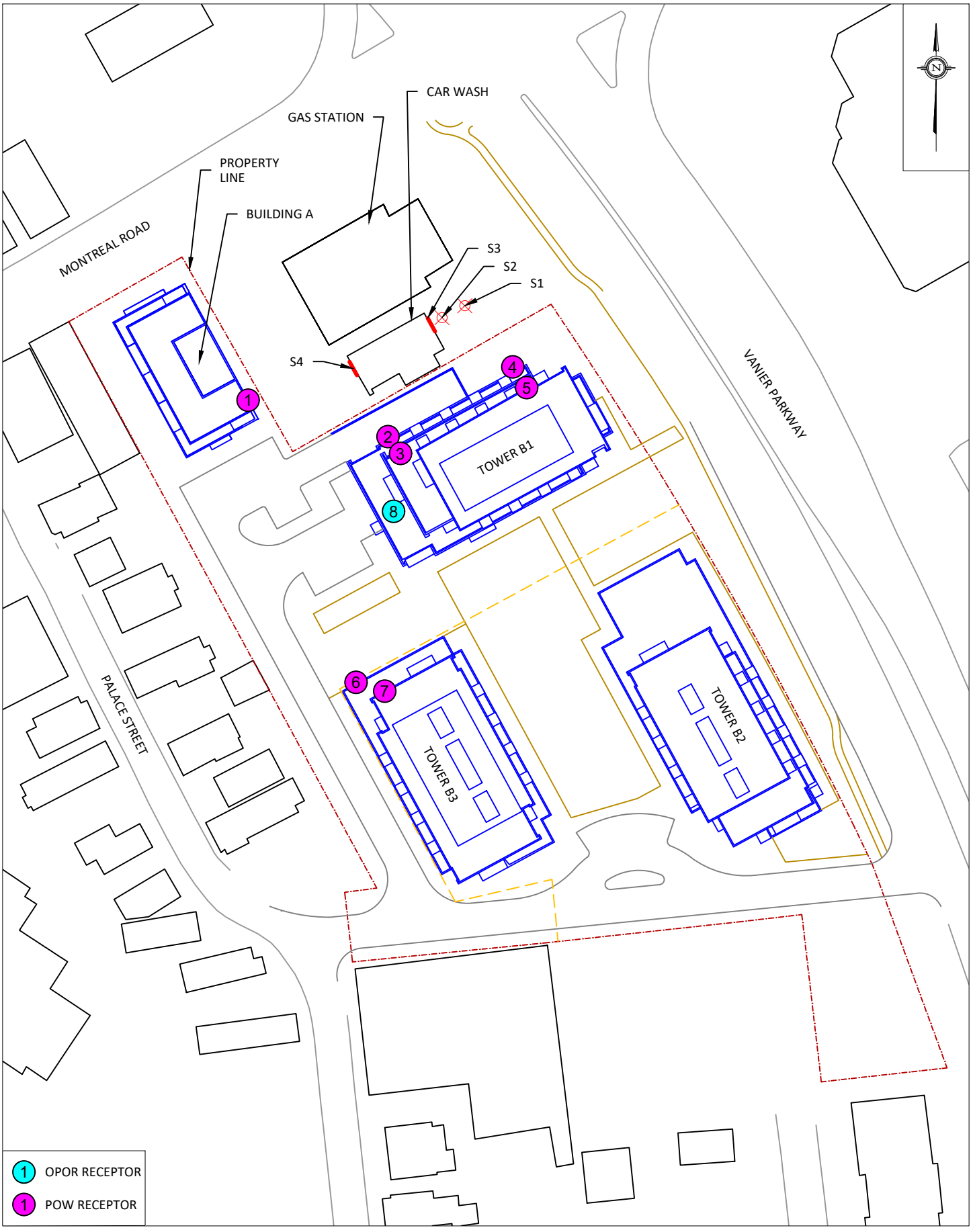
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-018-7
DATE	SEPTEMBER 9, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 7:
STAMSON INPUT PARAMETERS



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PROJECT	112 MONTREAL ROAD, OTTAWA ENVIRONMENTAL NOISE ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-018-8
DATE	SEPTEMBER 9, 2022	DRAWN BY	G.G.

DESCRIPTION

FIGURE 8:
STATIONARY NOISE RECEPTOR AND SOURCE LOCATIONS

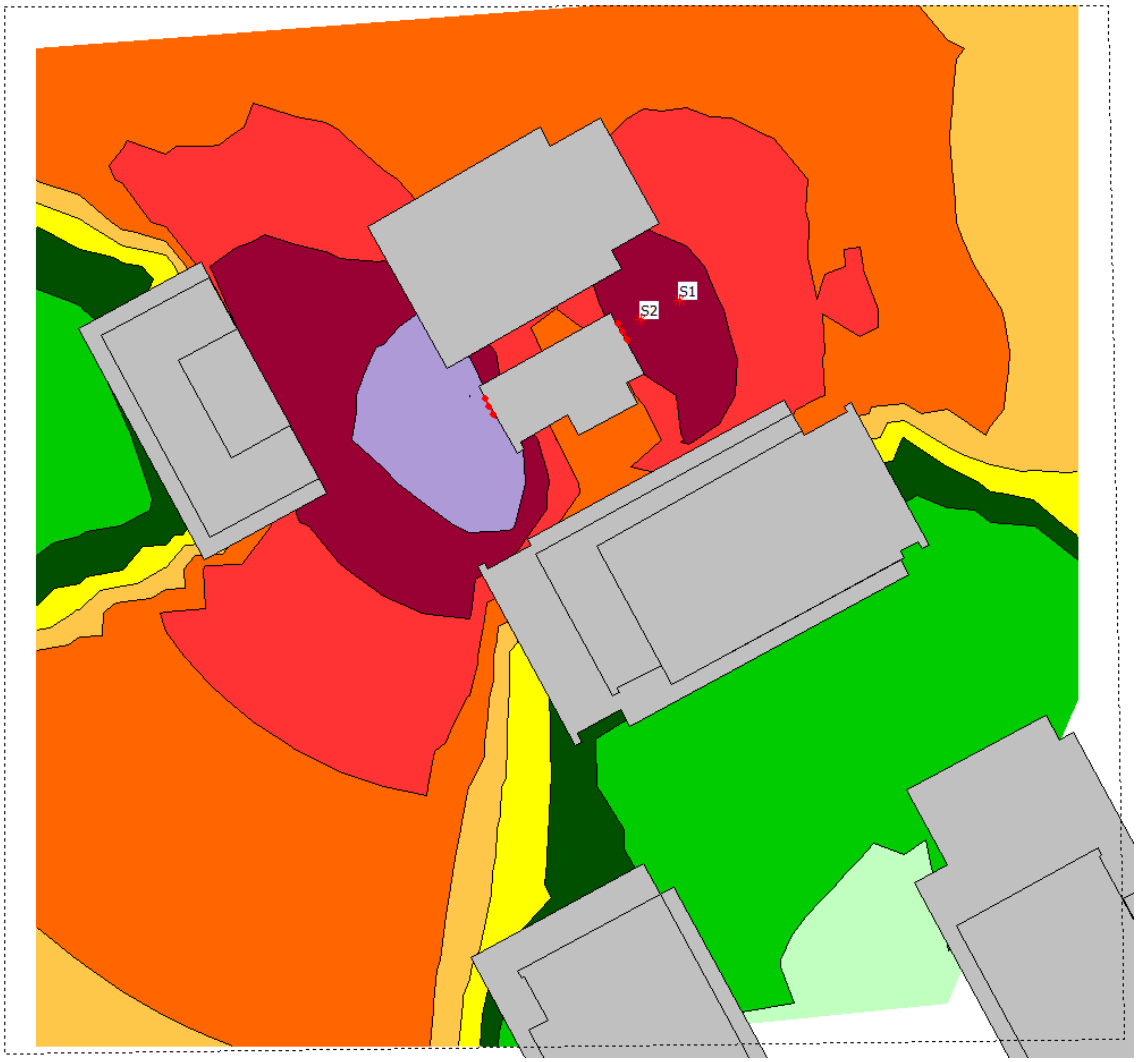


FIGURE 9: DAYTIME STATIONARY NOISE CONTOURS (10 M ABOVE GRADE)

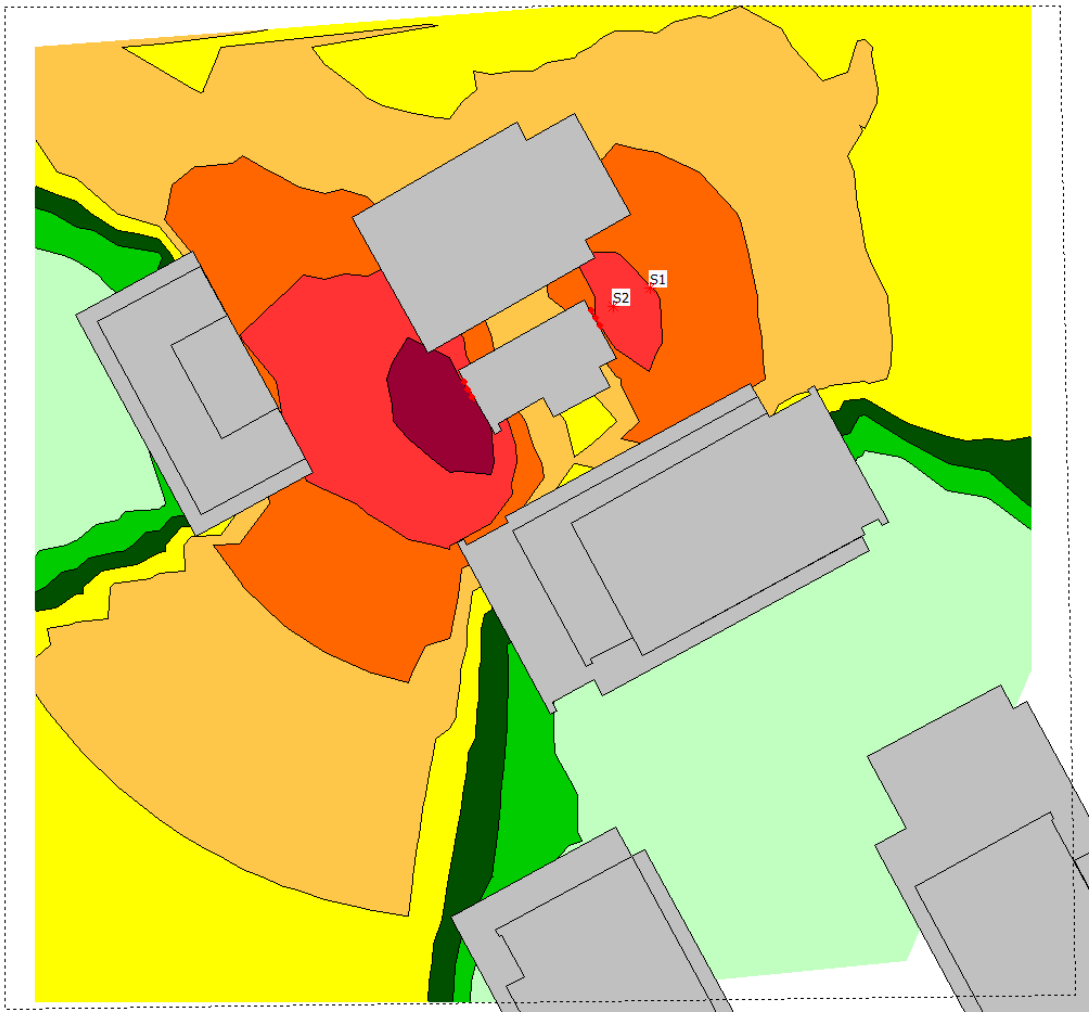
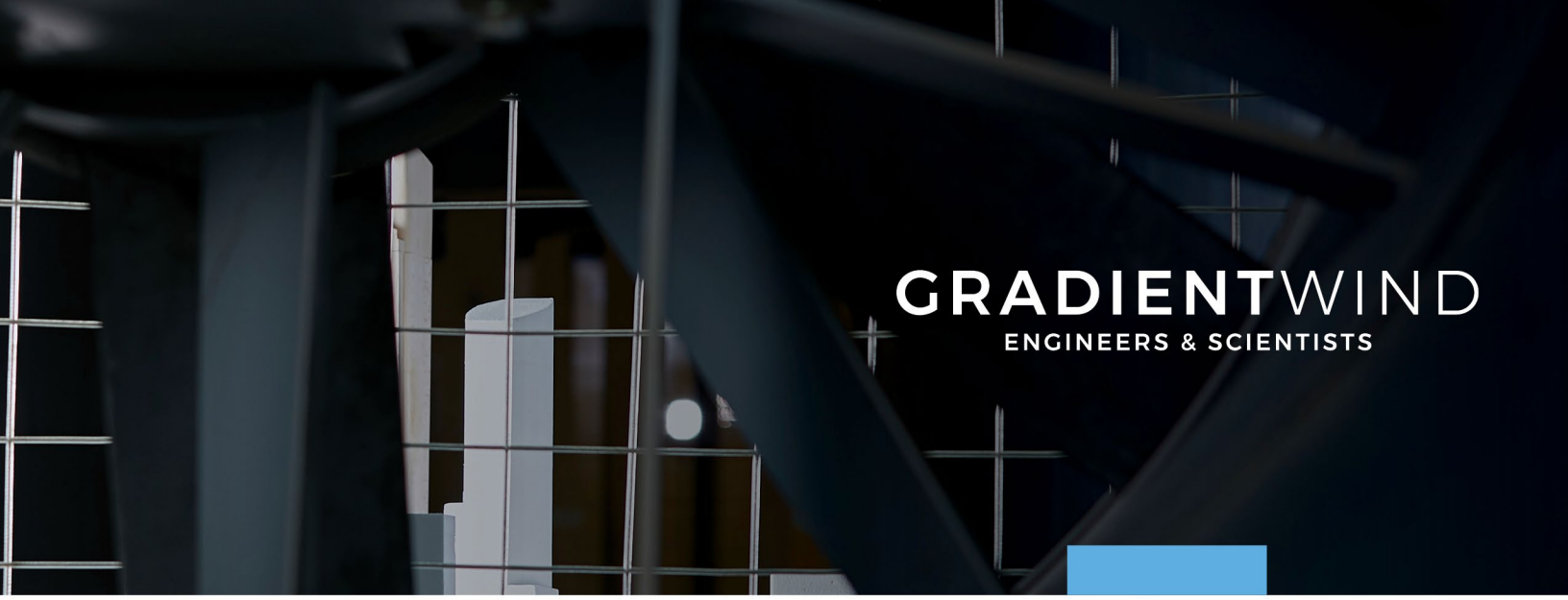


FIGURE 10: NIGHTTIME STATIONARY NOISE CONTOURS (10 M ABOVE GRADE)



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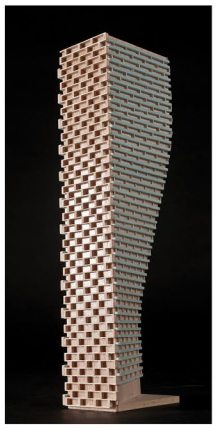

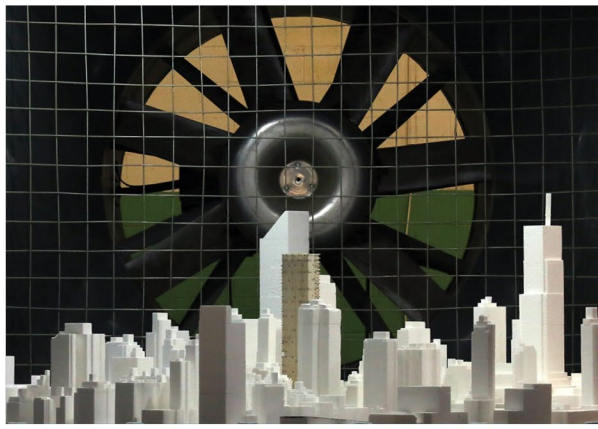

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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GRADIENTWIND.COM

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:57:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  :  65.00 / 65.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -46.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  52.00 / 52.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: Vanier PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Vanier PKWY (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  :  26.00 / 26.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Montreal Rd (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       55.50 !       12.30 !        12.30

ROAD (0.00 + 39.73 + 60.89) = 60.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -46   0.00  68.48   0.00  -6.37  -6.12   0.00   0.00 -16.26
39.73
-------------------------------------------------------------------------
--
   -46     90   0.00  68.48   0.00  -6.37  -1.22   0.00   0.00   0.00
60.89
-------------------------------------------------------------------------
--

Segment Leq : 60.93 dBA
```

```
Results segment # 2: Vanier PKWY (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.28 + 0.00) = 68.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  73.68   0.00  -2.39  -3.01   0.00   0.00   0.00
68.28
-------------------------------------------------------------------------
--

Segment Leq : 68.28 dBA

Total Leq All Segments: 69.01 dBA

Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       55.50 !       12.30 !        12.30

ROAD (0.00 + 32.14 + 53.30) = 53.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -46   0.00  60.88   0.00  -6.37  -6.12   0.00   0.00 -16.26
32.14
-------------------------------------------------------------------------
--
   -46     90   0.00  60.88   0.00  -6.37  -1.22   0.00   0.00   0.00
53.30
-------------------------------------------------------------------------
--

Segment Leq : 53.33 dBA

Results segment # 2: Vanier PKWY (night)
----------------------------------------

Source height = 1.50 m
```

```
ROAD (0.00 + 60.68 + 0.00) = 60.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  66.08   0.00  -2.39  -3.01   0.00   0.00   0.00
60.68
-------------------------------------------------------------------------
--

Segment Leq : 60.68 dBA

Total Leq All Segments: 61.41 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.01
                           (NIGHT): 61.41
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:57:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  :  65.00 / 65.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -46.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  52.00 / 52.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: Vanier PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Vanier PKWY (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  :  26.00 / 26.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Montreal Rd (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       89.80 !       19.16 !        19.16

ROAD (0.00 + 44.66 + 60.89) = 61.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -46   0.00  68.48   0.00  -6.37  -6.12   0.00   0.00 -11.33
44.66
-------------------------------------------------------------------------------
--
   -46     90   0.00  68.48   0.00  -6.37  -1.22   0.00   0.00   0.00
60.89
-------------------------------------------------------------------------------
--

Segment Leq : 61.00 dBA
```

```
Results segment # 2: Vanier PKWY (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.28 + 0.00) = 68.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  73.68   0.00  -2.39  -3.01   0.00   0.00   0.00
68.28
-------------------------------------------------------------------------
--

Segment Leq : 68.28 dBA

Total Leq All Segments: 69.02 dBA


Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       89.80 !       19.16 !        19.16

ROAD (0.00 + 37.06 + 53.30) = 53.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -46   0.00  60.88   0.00  -6.37  -6.12   0.00   0.00 -11.33
37.06
-------------------------------------------------------------------------
--
   -46     90   0.00  60.88   0.00  -6.37  -1.22   0.00   0.00   0.00
53.30
-------------------------------------------------------------------------
--

Segment Leq : 53.40 dBA


Results segment # 2: Vanier PKWY (night)
----------------------------------------
```

```
Source height = 1.50 m

ROAD (0.00 + 60.68 + 0.00) = 60.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  66.08   0.00  -2.39  -3.01   0.00   0.00   0.00
60.68
-------------------------------------------------------------------------
--

Segment Leq : 60.68 dBA

Total Leq All Segments: 61.42 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.02
                           (NIGHT): 61.42
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:57:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  :  67.00 / 67.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Vanier PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Vanier PKWY (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  :  23.00 / 23.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Montreal Rd (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.97 + 0.00) = 58.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00  -6.50  -3.01   0.00   0.00   0.00
58.97
-------------------------------------------------------------------------------
--

Segment Leq : 58.97 dBA

Results segment # 2: Vanier PKWY (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 71.82 + 0.00) = 71.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  73.68   0.00  -1.86   0.00   0.00   0.00   0.00
71.82
-------------------------------------------------------------------------------
--

Segment Leq : 71.82 dBA

Total Leq All Segments: 72.04 dBA
```

```
Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.37 + 0.00) = 51.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00  -6.50  -3.01   0.00   0.00   0.00
51.37
-------------------------------------------------------------------------
--

Segment Leq : 51.37 dBA

Results segment # 2: Vanier PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.22 + 0.00) = 64.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  66.08   0.00  -1.86   0.00   0.00   0.00   0.00
64.22
-------------------------------------------------------------------------
--

Segment Leq : 64.22 dBA

Total Leq All Segments: 64.44 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 72.04
                           (NIGHT): 64.44
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:57:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  :  67.00 / 67.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Vanier PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Vanier PKWY (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  :  23.00 / 23.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Montreal Rd (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.97 + 0.00) = 58.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00  -6.50  -3.01   0.00   0.00   0.00
58.97
-------------------------------------------------------------------------------
--

Segment Leq : 58.97 dBA

Results segment # 2: Vanier PKWY (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 71.82 + 0.00) = 71.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  73.68   0.00  -1.86   0.00   0.00   0.00   0.00
71.82
-------------------------------------------------------------------------------
--

Segment Leq : 71.82 dBA

Total Leq All Segments: 72.04 dBA
```

```
Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.37 + 0.00) = 51.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00  -6.50  -3.01   0.00   0.00   0.00
51.37
-------------------------------------------------------------------------
--

Segment Leq : 51.37 dBA

Results segment # 2: Vanier PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.22 + 0.00) = 64.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  66.08   0.00  -1.86   0.00   0.00   0.00   0.00
64.22
-------------------------------------------------------------------------
--

Segment Leq : 64.22 dBA

Total Leq All Segments: 64.44 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 72.04
                           (NIGHT): 64.44
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:57:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:58:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:58:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  :  67.00 / 67.00  m
Receiver height           :  89.80 / 89.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -18.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  54.00 / 54.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Montreal Rd (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
```

```
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       89.80 !       18.63 !        18.63

ROAD (0.00 + 44.88 + 51.98) = 52.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -18   0.00  68.48   0.00  -6.50  -3.98   0.00   0.00 -13.12
44.88
-------------------------------------------------------------------------
--
   -18      0   0.00  68.48   0.00  -6.50 -10.00   0.00   0.00   0.00
51.98
-------------------------------------------------------------------------
--

Segment Leq : 52.75 dBA

Total Leq All Segments: 52.75 dBA

Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       89.80 !       18.63 !        18.63

ROAD (0.00 + 37.28 + 44.38) = 45.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -18   0.00  60.88   0.00  -6.50  -3.98   0.00   0.00 -13.12
37.28
-------------------------------------------------------------------------
   -18      0   0.00  60.88   0.00  -6.50 -10.00   0.00   0.00   0.00
44.38
-------------------------------------------------------------------------
Segment Leq : 45.16 dBA

Total Leq All Segments: 45.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.75
                           (NIGHT): 45.16
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:58:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Montreal Rd (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Montreal Rd (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  : 107.00 / 107.00 m
Receiver height           :  17.75 / 17.75  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  47.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :  73.00 / 73.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: Vanier PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Vanier PKWY (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  :  21.00 / 21.00  m
Receiver height           :  17.75 / 17.75  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Montreal Rd (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       17.75 !        6.66 !         6.66

ROAD (54.12 + 41.97 + 0.00) = 54.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     47   0.00  68.48   0.00  -8.53  -5.83   0.00   0.00   0.00
54.12
-------------------------------------------------------------------------
--
    47     90   0.00  68.48   0.00  -8.53  -6.22   0.00   0.00 -11.76
41.97
-------------------------------------------------------------------------
--

Segment Leq : 54.37 dBA

Results segment # 2: Vanier PKWY (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  73.68   0.00  -1.46  -3.01   0.00   0.00   0.00
69.20
-------------------------------------------------------------------------
--

Segment Leq : 69.20 dBA

Total Leq All Segments: 69.34 dBA

Results segment # 1: Montreal Rd (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       17.75 !        6.66 !         6.66

ROAD (46.52 + 34.38 + 0.00) = 46.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     47   0.00  60.88   0.00  -8.53  -5.83   0.00   0.00   0.00
46.52
-------------------------------------------------------------------------
--
    47     90   0.00  60.88   0.00  -8.53  -6.22   0.00   0.00 -11.76
34.38
-------------------------------------------------------------------------
--

Segment Leq : 46.78 dBA

Results segment # 2: Vanier PKWY (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  66.08   0.00  -1.46  -3.01   0.00   0.00   0.00
61.61
-------------------------------------------------------------------------
--

Segment Leq : 61.61 dBA

Total Leq All Segments: 61.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.34
                           (NIGHT): 61.75
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:58:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  22.00 / 22.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 72.01 + 0.00) = 72.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90    0.00  73.68   0.00  -1.66   0.00   0.00   0.00   0.00
72.01
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 72.01 dBA

Total Leq All Segments: 72.01 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.42 + 0.00) = 64.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  66.08   0.00  -1.66   0.00   0.00   0.00   0.00
64.42
-------------------------------------------------------------------------
--

Segment Leq : 64.42 dBA

Total Leq All Segments: 64.42 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 72.01
                           (NIGHT): 64.42
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:09:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  22.00 / 22.00  m
Receiver height           :  82.00 / 82.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 72.01 + 0.00) = 72.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90    0.00  73.68   0.00  -1.66   0.00   0.00   0.00   0.00
72.01
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 72.01 dBA

Total Leq All Segments: 72.01 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.42 + 0.00) = 64.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  66.08   0.00  -1.66   0.00   0.00   0.00   0.00
64.42
-------------------------------------------------------------------------------
--

Segment Leq : 64.42 dBA

Total Leq All Segments: 64.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.01
                           (NIGHT): 64.42
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:58:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:10:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  82.00 / 82.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:59:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  55.50 / 55.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:10:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  23.00 / 23.00  m
Receiver height           :  82.00 / 82.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.81 + 0.00) = 68.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90    0.00  73.68   0.00  -1.86  -3.01   0.00   0.00   0.00
68.81
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 68.81 dBA

Total Leq All Segments: 68.81 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.21 + 0.00) = 61.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  66.08   0.00  -1.86  -3.01   0.00   0.00   0.00
61.21
-------------------------------------------------------------------------
--

Segment Leq : 61.21 dBA

Total Leq All Segments: 61.21 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.21
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 15:59:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: MONTREAL RD (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: MONTREAL RD (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  :  17.00 / 17.00  m
Receiver height           :  24.75 / 24.75  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: MONTREAL RD (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.93 + 0.00) = 64.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  68.48   0.00  -0.54  -3.01   0.00   0.00   0.00
64.93
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 64.93 dBA

Total Leq All Segments: 64.93 dBA

Results segment # 1: MONTREAL RD (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.33 + 0.00) = 57.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  60.88   0.00  -0.54  -3.01   0.00   0.00   0.00
57.33
-------------------------------------------------------------------------
--

Segment Leq : 57.33 dBA

Total Leq All Segments: 57.33 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.93
                           (NIGHT): 57.33
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 16:00:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: MONTREAL RD (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: MONTREAL RD (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  :  15.00 / 15.00  m
Receiver height           :  24.75 / 24.75  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: VANIER PKWY (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: VANIER PKWY (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  :  85.00 / 85.00  m
Receiver height           :  24.75 / 24.75  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: MONTREAL RD (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Results segment # 2: VANIER PKWY (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.13 + 0.00) = 63.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  73.68   0.00  -7.53  -3.01   0.00   0.00   0.00
63.13
-------------------------------------------------------------------------------
--

Segment Leq : 63.13 dBA

Total Leq All Segments: 69.59 dBA
```

```
Results segment # 1: MONTREAL RD (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Results segment # 2: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.54 + 0.00) = 55.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  66.08   0.00  -7.53  -3.01   0.00   0.00   0.00
55.54
-------------------------------------------------------------------------
--

Segment Leq : 55.54 dBA

Total Leq All Segments: 61.99 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.59
                           (NIGHT): 61.99
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 16:00:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: MONTREAL RD (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: MONTREAL RD (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  :  17.00 / 17.00  m
Receiver height           :  24.75 / 24.75  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: VANIER PKWY (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  :  83.00 / 83.00  m
Receiver height           :  24.75 / 24.75  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  35.00 deg   Angle2 : 90.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  60.00 / 60.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: MONTREAL RD (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.93 + 0.00) = 64.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00  -0.54  -3.01   0.00   0.00   0.00
64.93
-------------------------------------------------------------------------
--

Segment Leq : 64.93 dBA

Results segment # 2: VANIER PKWY (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       24.75 !        7.94 !         7.94

ROAD (64.66 + 41.29 + 0.00) = 64.68 dBA
```

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     35   0.00  73.68   0.00  -7.43  -1.58   0.00   0.00   0.00
64.66
-------------------------------------------------------------------------
--
    35     90   0.00  73.68   0.00  -7.43  -5.15   0.00   0.00 -19.80
41.29
-------------------------------------------------------------------------
--

Segment Leq : 64.68 dBA

Total Leq All Segments: 67.82 dBA

Results segment # 1: MONTREAL RD (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.33 + 0.00) = 57.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00  -0.54  -3.01   0.00   0.00   0.00
57.33
-------------------------------------------------------------------------
--

Segment Leq : 57.33 dBA

Results segment # 2: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       24.75 !        7.94 !         7.94

ROAD (57.07 + 33.70 + 0.00) = 57.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
```

```
   -90     35   0.00  66.08   0.00  -7.43  -1.58   0.00   0.00   0.00
57.07
-------------------------------------------------------------------------
--
    35     90   0.00  66.08   0.00  -7.43  -5.15   0.00   0.00 -19.80
33.70
-------------------------------------------------------------------------
--

Segment Leq : 57.09 dBA

Total Leq All Segments: 60.22 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 67.82
                           (NIGHT): 60.22
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:10:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: MONTREAL RD1 (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: MONTREAL RD1 (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  : 102.00 / 102.00 m
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -28.00 deg   Angle2 : -2.00 deg
Barrier height            :   5.00 m
Barrier receiver distance :  94.00 / 94.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: MONTREAL RD2 (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: MONTREAL RD2 (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  : 102.00 / 102.00 m
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  40.00 / 40.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 3: VANIER PKWY (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 3: VANIER PKWY (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  :  76.00 / 76.00  m
```

```
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  55.00 / 55.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: MONTREAL RD1 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !        3.81 !         3.81

ROAD (55.53 + 43.60 + 40.61) = 55.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -28   0.00  68.48   0.00  -8.33  -4.63   0.00   0.00   0.00
55.53
-------------------------------------------------------------------------
--
   -28     -2   0.00  68.48   0.00  -8.33  -8.40   0.00   0.00  -8.16
43.60
-------------------------------------------------------------------------
--
    -2      0   0.00  68.48   0.00  -8.33 -19.54   0.00   0.00   0.00
40.61
-------------------------------------------------------------------------
--

Segment Leq : 55.93 dBA

Results segment # 2: MONTREAL RD2 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       1.50 !       31.00 !       19.43 !        19.43

ROAD (47.14 + 36.85 + 0.00) = 47.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0      9   0.00  68.48   0.00  -8.33 -13.01   0.00   0.00   0.00
47.14
-------------------------------------------------------------------------
--
     9     90   0.00  68.48   0.00  -8.33  -3.47   0.00   0.00 -19.83
36.85
-------------------------------------------------------------------------
--

Segment Leq : 47.53 dBA

Results segment # 3: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !        9.65 !         9.65

ROAD (0.00 + 42.63 + 57.30) = 57.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  73.68   0.00  -7.05  -4.16   0.00   0.00 -19.84
42.63
-------------------------------------------------------------------------
--
   -21      0   0.00  73.68   0.00  -7.05  -9.33   0.00   0.00   0.00
57.30
-------------------------------------------------------------------------
--

Segment Leq : 57.44 dBA

Total Leq All Segments: 60.01 dBA
```

```
Results segment # 1: MONTREAL RD1 (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !        3.81 !         3.81

ROAD (47.93 + 36.00 + 33.02) = 48.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -28   0.00  60.88   0.00  -8.33  -4.63   0.00   0.00   0.00
47.93
-------------------------------------------------------------------------------
--
   -28     -2   0.00  60.88   0.00  -8.33  -8.40   0.00   0.00  -8.16
36.00
-------------------------------------------------------------------------------
--
    -2      0   0.00  60.88   0.00  -8.33 -19.54   0.00   0.00   0.00
33.02
-------------------------------------------------------------------------------
--

Segment Leq : 48.33 dBA

Results segment # 2: MONTREAL RD2 (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !       19.43 !        19.43

ROAD (39.55 + 29.26 + 0.00) = 39.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0      9   0.00  60.88   0.00  -8.33 -13.01   0.00   0.00   0.00
39.55
```

```
-------------------------------------------------------------------------
--
     9     90   0.00  60.88   0.00  -8.33  -3.47   0.00   0.00 -19.83
29.26
-------------------------------------------------------------------------
--

Segment Leq : 39.94 dBA

Results segment # 3: VANIER PKWY (night)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !        9.65 !         9.65

ROAD (0.00 + 35.03 + 49.70) = 49.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  66.08   0.00  -7.05  -4.16   0.00   0.00 -19.84
35.03
-------------------------------------------------------------------------
--
   -21      0   0.00  66.08   0.00  -7.05  -9.33   0.00   0.00   0.00
49.70
-------------------------------------------------------------------------
--

Segment Leq : 49.85 dBA

Total Leq All Segments: 52.42 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 60.01
                           (NIGHT): 52.42
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:11:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY1 (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY1 (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  :  72.00 / 72.00  m
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -25.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  51.00 / 51.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: VANIER PKWY2 (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: VANIER PKWY2 (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  :  72.00 / 72.00  m
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  51.00 / 51.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: VANIER PKWY1 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !       10.10 !        10.10

ROAD (0.00 + 42.61 + 58.29) = 58.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -25   0.00  73.68   0.00  -6.81  -4.42   0.00   0.00 -19.83
42.61
-------------------------------------------------------------------------------
--
   -25      0   0.00  73.68   0.00  -6.81  -8.57   0.00   0.00   0.00
58.29
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 58.41 dBA

Results segment # 2: VANIER PKWY2 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !       10.10 !        10.10

ROAD (0.00 + 43.98 + 0.00) = 43.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  73.68   0.00  -6.81  -3.01   0.00   0.00 -19.88
43.98
-------------------------------------------------------------------------------
--

Segment Leq : 43.98 dBA

Total Leq All Segments: 58.56 dBA

Results segment # 1: VANIER PKWY1 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !       10.10 !        10.10

ROAD (0.00 + 35.01 + 50.69) = 50.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -25   0.00  66.08   0.00  -6.81  -4.42   0.00   0.00 -19.83
35.01
-------------------------------------------------------------------------------
--
```

```
   -25      0   0.00  66.08   0.00  -6.81  -8.57   0.00   0.00   0.00
50.69
-------------------------------------------------------------------------
--

Segment Leq : 50.81 dBA

Results segment # 2: VANIER PKWY2 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !       10.10 !        10.10

ROAD (0.00 + 36.38 + 0.00) = 36.38 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  66.08   0.00  -6.81  -3.01   0.00   0.00 -19.88
36.38
-------------------------------------------------------------------------
--

Segment Leq : 36.38 dBA

Total Leq All Segments: 50.96 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 58.56
                           (NIGHT): 50.96
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:11:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: VANIER PKWY (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (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  :  74.00 / 74.00  m
Receiver height           :  31.00 / 31.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 22.00 deg
Barrier height            : 100.00 m
Barrier receiver distance :  57.00 / 57.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       1.50 !       31.00 !        8.27 !         8.27

ROAD (0.00 + 37.62 + 62.52) = 62.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     22   0.00  73.68   0.00  -6.93  -9.13   0.00   0.00 -20.00
37.62
-------------------------------------------------------------------------
--
    22     90   0.00  73.68   0.00  -6.93  -4.23   0.00   0.00   0.00
62.52
-------------------------------------------------------------------------
--

Segment Leq : 62.53 dBA

Total Leq All Segments: 62.53 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       31.00 !        8.27 !         8.27

ROAD (0.00 + 30.02 + 54.92) = 54.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
     0     22   0.00  66.08   0.00  -6.93  -9.13   0.00   0.00 -20.00
30.02
-------------------------------------------------------------------------
    22     90   0.00  66.08   0.00  -6.93  -4.23   0.00   0.00   0.00
54.92
-------------------------------------------------------------------------

Segment Leq : 54.93 dBA

Total Leq All Segments: 54.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.53
                           (NIGHT): 54.93
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 16:01:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r21.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: MONTREAL RD1 (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: MONTREAL RD1 (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  :  73.00 / 73.00  m
Receiver height           :  21.35 / 21.35  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -13.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  59.00 / 59.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: MONTREAL RD2 (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: MONTREAL RD2 (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   24.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  73.00 / 73.00  m
Receiver height           :  21.35 / 21.35  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   5.00 deg   Angle2 : 24.00 deg
Barrier height            :   5.00 m
Barrier receiver distance :  54.00 / 54.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: MONTREAL RD1 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       21.35 !        5.30 !         5.30

ROAD (0.00 + 38.83 + 50.19) = 50.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -13   0.00  68.48   0.00  -6.87  -3.69   0.00   0.00 -19.09
38.83
-------------------------------------------------------------------------------
--
   -13      0   0.00  68.48   0.00  -6.87 -11.41   0.00   0.00   0.00
50.19
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 50.50 dBA

Results segment # 2: MONTREAL RD2 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       21.35 !        6.66 !         6.66

ROAD (46.04 + 51.84 + 0.00) = 52.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0      5   0.00  68.48   0.00  -6.87 -15.56   0.00   0.00   0.00
46.04
-------------------------------------------------------------------------------
--
     5     24   0.00  68.48   0.00  -6.87  -9.77   0.00   0.00   0.00
51.84*
     5     24   0.00  68.48   0.00  -6.87  -9.77   0.00   0.00   0.00
51.84
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 52.86 dBA

Total Leq All Segments: 54.85 dBA

Results segment # 1: MONTREAL RD1 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       21.35 !        5.30 !         5.30

ROAD (0.00 + 31.24 + 42.60) = 42.90 dBA
```

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -13   0.00  60.88   0.00  -6.87  -3.69   0.00   0.00 -19.09
31.24
-------------------------------------------------------------------------
--
   -13      0   0.00  60.88   0.00  -6.87 -11.41   0.00   0.00   0.00
42.60
-------------------------------------------------------------------------
--

Segment Leq : 42.90 dBA

Results segment # 2: MONTREAL RD2 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       21.35 !        6.66 !         6.66

ROAD (38.45 + 44.25 + 0.00) = 45.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0      5   0.00  60.88   0.00  -6.87 -15.56   0.00   0.00   0.00
38.45
-------------------------------------------------------------------------
--
     5     24   0.00  60.88   0.00  -6.87  -9.77   0.00   0.00   0.00
44.25*
     5     24   0.00  60.88   0.00  -6.87  -9.77   0.00   0.00   0.00
44.25
-------------------------------------------------------------------------
 * Bright Zone !

Segment Leq : 45.26 dBA

Total Leq All Segments: 47.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.85
                           (NIGHT): 47.25
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-03-2021 16:01:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r22.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: VANIER PKWY (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (day/night)
---------------------------------------------
Angle1   Angle2           : -80.00 deg   68.00 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           :  21.35 / 21.35  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -80.00 deg   Angle2 : 68.00 deg
Barrier height            :  19.85 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       1.50 !       21.35 !       15.24 !        15.24

ROAD (0.00 + 54.20 + 0.00) = 54.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80     68   0.00  73.68   0.00  -2.39  -0.85   0.00   0.00 -16.24
54.20
-------------------------------------------------------------------------
--

Segment Leq : 54.20 dBA

Total Leq All Segments: 54.20 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       21.35 !       15.24 !        15.24

ROAD (0.00 + 46.60 + 0.00) = 46.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80     68   0.00  66.08   0.00  -2.39  -0.85   0.00   0.00 -16.24
46.60
-------------------------------------------------------------------------
--

Segment Leq : 46.60 dBA

Total Leq All Segments: 46.60 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 54.20
                           (NIGHT): 46.60
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-09-2022 09:12:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r23.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: VANIER PKWY (day/night)
-----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    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):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: VANIER PKWY (day/night)
---------------------------------------------
Angle1   Angle2           : -44.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  56.00 / 56.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -21.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.00 m
Barrier receiver distance :  38.00 / 38.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: VANIER PKWY (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.50 !         1.50

ROAD (54.73 + 45.95 + 0.00) = 55.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -44    -21   0.66  73.68   0.00  -9.50  -9.45   0.00   0.00   0.00
54.73
-------------------------------------------------------------------------
--
   -21     90   0.00  73.68   0.00  -5.72  -2.10   0.00   0.00 -19.91
45.95
-------------------------------------------------------------------------
--

Segment Leq : 55.27 dBA

Total Leq All Segments: 55.27 dBA

Results segment # 1: VANIER PKWY (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.50 !         1.50

ROAD (47.14 + 38.35 + 0.00) = 47.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
   -44    -21   0.66  66.08   0.00  -9.50  -9.45   0.00   0.00   0.00
47.14
-------------------------------------------------------------------------
   -21     90   0.00  66.08   0.00  -5.72  -2.10   0.00   0.00 -19.91
38.35
-------------------------------------------------------------------------

Segment Leq : 47.68 dBA

Total Leq All Segments: 47.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.27
                           (NIGHT): 47.68
```