Traffic Noise Assessment

541-545 Rideau Street

Ottawa, Ontario

REPORT: GWE17-142 – Noise

Prepared For:

10311197 Canada Inc.
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EXECUTIVE SUMMARY

This document describes a traffic noise assessment performed for a proposed mixed-use development to be located at 541-545 Rideau in Ottawa, Ontario. The development will be 9-stories high, with the first floor intended for commercial and amenity use, and the remaining floors above for residential use. Amenity space is provided in the main floor, private terraces on the 4th floor and a potential terrace on the rooftop. The private balconies are not considered Outdoor Living Areas (OLA) since they are less than 4-metres in depth. The major sources of vehicle transportation noise are from Rideau Street, Charlotte Street, Tormey Street, and Cobourg Street. Figure 1 shows the site plan and surrounding context.

The assessment is based on: (i) theoretical noise prediction methods that conform to the Ministry of the Environment and Climate Change (MOECC) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) architectural drawings received from Barry Padolsky Associates Inc. Architects.

The results of the current study indicate that noise levels due to roadway traffic over the site will range from 46 to 73 dBA during the daytime period (07:00-23:00) and from 39 to 66 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 73 dBA) occurs on the south façade (Receptors 2 and 6), which is nearest and most exposed to Rideau Street and Cobourg Street. Noise levels predicted due to vehicle sources exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components are required where noise levels exceed 65 dBA as shown in Figures 3-4. The OLA noise level does not exceed 55 dBA during the daytime period, therefore, no mitigation measures are required.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Chenier Development Corp. to undertake a traffic noise assessment for a proposed mixed-use development to be located at 541-545 Rideau Street in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to a roadway traffic noise assessment. GWE's scope of work involved assessing exterior and interior noise levels generated by local roadway traffic. The assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa[1] and the Ministry of the Environment and Climate Change (MOECC)[2] guidelines. Noise calculations were based on concept drawings received from Barry Padolsky Associates Inc. Architects with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this traffic noise assessment is the proposed mixed-use development to be located at 541-545 Rideau Street in Ottawa, Ontario. The proposed development is a nine-storey building with commercial units at grade, residential dwelling in above floors, 46 underground parking spaces and 7 main level parking spaces. Amenity space is provided in the main floor, private terraces on the 4th floor, and a potential terrace on the rooftop. The private balconies are not considered a noise-sensitive OLA, being less than 4 metres in depth. The major sources of roadway noise are vehicle traffic on Rideau Street, Charlotte Street, Tormey Street and Cobourg Street. The site is surrounded by mixed-use land, mainly commercial developments and residential space. Figure 1 illustrates a complete site plan with the surrounding context.

3. OBJECTIVES

The main objective of this work is to calculate the future noise levels on the study building produced by local transportation traffic, and to ensure that interior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG), as outlined in Section 4.2 of this report.

[1] City of Ottawa Environmental Noise Control Guidelines, SS Wilson Associates, May 10, 2006
[2] Ministry of the Environment – Publication NPC-300

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 Criteria for Roadway Traffic Noise

For vehicle traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, 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 ENCG specifies that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for retail space, living rooms and sleeping quarters respectively, as listed in Table 1. To account for deficiencies in building construction, theses levels should be targeted toward 47, 42 and 37 dBA.

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

Type of Space	Time Period	L_{eq} (dBA)
		Road
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]. 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 normally triggers the need for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, building components will require higher levels of sound attenuation[5].

For designated Outdoor Living Areas, the sound level limit is 55 dBA during the daytime period. Only in cases were the required noise control measures are not feasible for technical, economic, or administrative reasons should an excess above the limit be acceptable.

4.3 Roadway Noise Assessment

4.3.1 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MOECC computerized noise assessment program, STAMSON 5.04, for road analysis. Noise receptors were strategically identified at 10 locations around the study area, as illustrated in Figure 2. Roadway noise calculations were performed by treating each road segment as separate line sources of noise, and by using existing building locations as noise barriers. In

[3] Adapted from ENCG 2016 – Part 1, Table 2.2c
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[5] MOECC, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

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 of 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions
- The day/night split was taken to be 92% / 8%, respectively, for all streets
- Reflective intermediate ground surfaces used
- Distance adjustment used for some receivers where source-receiver distances is less than 15 m.
- Surrounding buildings and homes on Rideau Street, Charlotte, and Tormey Street are in some cases used as barrier when the line of sight between the source and receiver is broken by the buildings
- Proposed heritage element building north-west of development used as a barrier with an assumed height of 7-metres (3-metres per story + 1-metre for the roof) based on concept plans

In some cases, source-receiver distances were less than 15 m, which is the minimum distance required for entry in STAMSON. A distance adjustment calculation shown in equation 1 from ORNAMENT was used to calculate the adjustment value, which was added to the calculated noise level from STAMSON[6]. The equation is as follows:

$$Distance\ Adjustment\ Value = 10\ (1+\propto) \log(\frac{D_{ref}}{D}) \qquad \textbf{(1)}$$

Where the parameters are:

- D_{ref}= Distance used in STAMSON, 15 metres
- D= Actual distance of source-receiver
- α= Ground Absorption Factor (Hard Ground = 0, Soft Ground =1)

4.3.2 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

[6] ORNAMENT Technical Document, October 1989, Section 4
[7] City of Ottawa Transportation Master Plan, November 2013

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

Source	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Rideau Street	4-Lane Urban Arterial Undivided (4-UAU)	50	**30,000**
Charlotte Street (South of Rideau)	4-Lane Major Collector (4-UMCU)	50	**24,000**
Charlotte Street (North of Rideau)	2-Lane Urban Collector (2-UCU)	40	**8,000**
Tormey Street	2-Lane Urban Collector (2-UCU)	40	**8,000**
Cobourg Street	2-Lane Urban Collector (2-UCU)	40	**8,000**

4.4 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, concrete and masonry walls can achieve STC 50 or more. Curtain wall systems typically provide around STC 35, depending on the glazing elements. 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.

According to Section 4.2, when daytime noise levels (from road) 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:

[8] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

- 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 site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

5. RESULTS AND DISCUSSION

5.1 Roadway Noise Levels

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

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC

Receptor Number	Plane of Window Receptor Location	Roadway Noise Level (dBA)*	
		Day	Night
1	West Façade – 2nd floor	69*	62*
2	South Façade – 9th floor	73*	66*
3	East Façade – 2nd floor	70*	62*
4	North Façade – 9th floor	46	39
5	West Façade – 2nd floor	70*	62*
6	South Façade – 9th floor	73*	66*
7	East Façade – 2nd floor	70*	62*

*Distance Adjustment Applied to Receptors as per equation 1

[9] CMHC, Road & Rail Noise: Effects on Housing

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

Receptor Number	Plane of Window Receptor Location	Roadway Noise Level (dBA)*	
		Day	Night
8	North Façade – 9th floor	59	52
9	OLA – Terrace – Roof of Building	52	45

*Distance Adjustment Applied to Receptors as per equation 1

The results of the current study indicate that noise levels due to roadway traffic over the site will range from 46 to 73 dBA during the daytime period (07:00-23:00) and from 39 to 66 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 73 dBA) occurs on the south façade (Receptors 2 and 6), which is nearest and most exposed to Rideau Street and Cobourg Street. A distance adjustment of 0.6 dBA was applied to Receptors 1 and 5, 1.76 dBA for Receptors 2 and 6, and 0.97 dBA for Receptors 3 and 7. The OLA noise level does not exceed 55 dBA during the daytime period, therefore, no mitigation measures are required.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.4 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). It is recommended detailed STC calculations be performed 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 Figures 3-4):

- **Retail Windows**

(i) Retail windows facing east and west will require a minimum STC of 23

(ii) Retail windows facing south will require a minimum STC of 26

(iii) All other retail windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Living Room Windows**

(i) Living room windows facing east and west will require a minimum STC of 28

(ii) Living room windows facing south will require a minimum STC of 31

(iii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Bedroom Windows**

(i) Bedroom windows facing east and west will require a minimum STC of 33

(ii) Bedroom windows facing south will require a minimum STC of 36

(iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements

- **Exterior Walls**

(i) Exterior wall components on the east, south, and west façade require a minimum STC of 45 which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[10]

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

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 below.

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

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current study indicate that noise levels due to roadway traffic over the site will range from 46 to 73 dBA during the daytime period (07:00-23:00) and from 39 to 66 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 73 dBA) occurs on the south façade (Receptors 2 and 6), which is nearest and most exposed to Rideau Street and Cobourg Street. Noise levels predicted due to vehicle sources exceed the criteria listed in Section 4.2 for building components. Therefore, upgraded building components are required where noise levels exceed 65 dBA as shown in Figure 3-4. The OLA noise level does not exceed 55 dBA during the daytime period, therefore, no mitigation measures are required.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses in all Lease, Purchase and Sale Agreements will be required as summarized below:

> *"Purchasers are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing roadway traffic may, on occasion, interfere with some activities of the occupants as the sound levels exceed the sound level limits of the City of Ottawa and Ministry of the Environment and Climate Change. To help address the need for sound attenuation, this development includes:*

- *STC multi-pane glass glazing elements*
  - *West and east façade retail: STC 23*
  - *West and east façade living room: STC 28*
  - *West and east façade bedroom: STC 33*
  - *South façade retail: STC 26*
  - *South façade living room: STC 31*
  - *South façade bedroom: STC 36*
- *STC rated exterior walls*
  - *East, south, and west facade: STC 45*

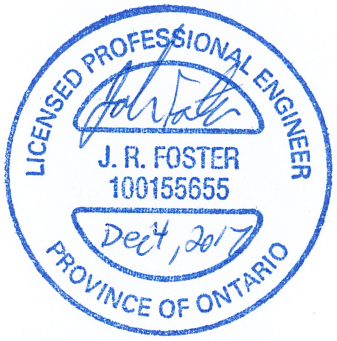
To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.

This development has also been designed with central air conditioning for all units. Installation of air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment and Climate Change."

This concludes our 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.

Yours truly,

Gradient Wind Engineering Inc.



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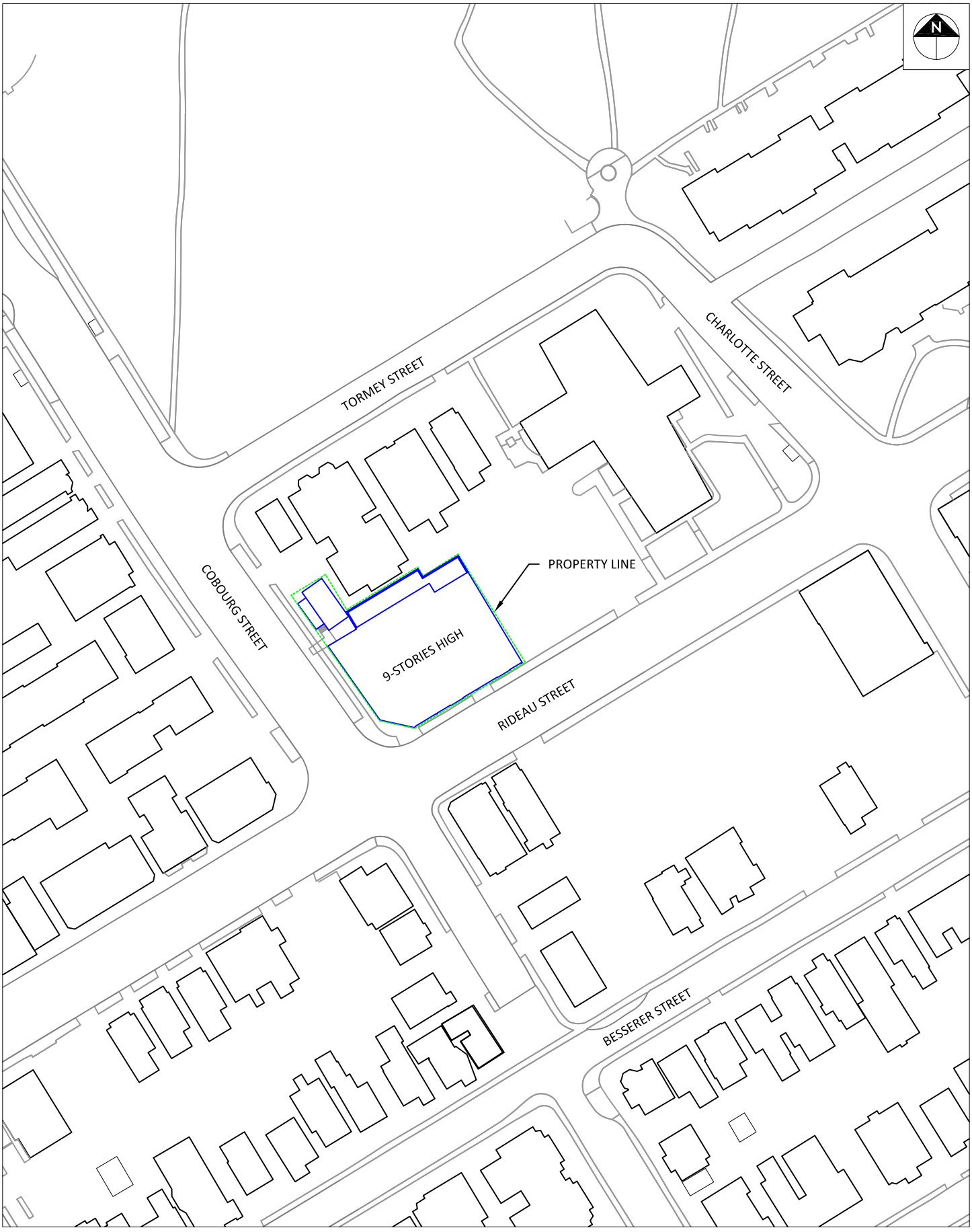

127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	541-545 RIDEAU STREET - TRAFFIC NOISE ASSESSMENT
SCALE	1:1250 (APPROX.)
DRAWING NO.	GWE17-142-1
DATE	DECEMBER 4, 2017
DRAWN BY	O.D.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT

127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	541-545 RIDEAU STREET - TRAFFIC NOISE ASSESSMENT		
SCALE	1:500 (APPROX.)	DRAWING NO.	GWE17-142-2
DATE	DECEMBER 4, 2017	DRAWN BY	O.D.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS

127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	541-545 RIDEAU STREET - TRAFFIC NOISE ASSESSMENT
SCALE	1:500 (APPROX.)
DRAWING NO.	GWE17-142-3
DATE	DECEMBER 4, 2017
DRAWN BY	O.D.

DESCRIPTION

FIGURE 3:
RETAIL WINDOW STC REQUIREMENTS

127 Walgreen Road
Ottawa, Ontario
(613) 836 0934
GRADIENT WIND ENGINEERING INC

PROJECT	541-545 RIDEAU STREET - TRAFFIC NOISE ASSESSMENT
SCALE	1:500 (APPROX.)
DRAWING NO.	GWE17-142-4
DATE	DECEMBER 4, 2017
DRAWN BY	O.D.

DESCRIPTION

FIGURE 4:
BEDROOM AND LIVING ROOM WINDOW STC REQUIREMENTS

APPENDIX A

STAMSON 5.04 - INPUT AND OUTPUT DATA

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:27:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
-----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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  :  18.00 / 18.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  78.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 m
Barrier receiver distance :   7.00 / 7.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Cobourg (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           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Rideau (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.33	3.33

ROAD (67.07 + 51.11 + 0.00) = 67.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	78	0.00	71.49	0.00	-0.79	-3.63	0.00	0.00	0.00	67.07
78	90	0.00	71.49	0.00	-0.79	-11.76	0.00	0.00	-7.83	51.11

Segment Leq : 67.18 dBA

Results segment # 2: Cobourg (day)

Source height = 1.50 m

ROAD (0.00 + 63.96 + 0.00) = 63.96 dBA

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

Segment Leq : 63.96 dBA

Total Leq All Segments: 68.87 dBA

```
Results segment # 1: Rideau (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 !        4.50 !        3.33 !         3.33

ROAD (59.47 + 43.51 + 0.00) = 59.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     78   0.00  63.89   0.00  -0.79  -3.63   0.00   0.00   0.00  59.47
-------------------------------------------------------------------------------
    78     90   0.00  63.89   0.00  -0.79 -11.76   0.00   0.00  -7.83  43.51
-------------------------------------------------------------------------------

Segment Leq : 59.58 dBA


Results segment # 2: Cobourg (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.36 + 0.00) = 56.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  56.36   0.00   0.00   0.00   0.00   0.00   0.00  56.36
-------------------------------------------------------------------------------

Segment Leq : 56.36 dBA

Total Leq All Segments: 61.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.87
                           (NIGHT): 61.27
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:27:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Cobourg (day/night)
-----------------------------------------
Angle1   Angle2           : -12.00 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           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Rideau (day)

Source height = 1.50 m

ROAD (0.00 + 71.49 + 0.00) = 71.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.49	0.00	0.00	0.00	0.00	0.00	0.00	71.49

Segment Leq : 71.49 dBA

Results segment # 2: Cobourg (day)

Source height = 1.50 m

ROAD (0.00 + 50.73 + 0.00) = 50.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-12	0	0.00	63.96	0.00	-1.46	-11.76	0.00	0.00	0.00	50.73

Segment Leq : 50.73 dBA

Total Leq All Segments: 71.53 dBA

```
Results segment # 1: Rideau (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.89 + 0.00) = 63.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.89   0.00   0.00   0.00   0.00   0.00   0.00  63.89
-------------------------------------------------------------------------------

Segment Leq : 63.89 dBA


Results segment # 2: Cobourg (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 43.14 + 0.00) = 43.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -12      0   0.00  56.36   0.00  -1.46 -11.76   0.00   0.00   0.00  43.14
-------------------------------------------------------------------------------

Segment Leq : 43.14 dBA

Total Leq All Segments: 63.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.53
                           (NIGHT): 63.93
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:30:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
-----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Tormey 1 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Tormey 1 (day/night)
-----------------------------------------
Angle1   Angle2           :   0.00 deg   32.00 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           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 18.00 deg
Barrier height            :   9.00 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
```

```
Road data, segment # 3: Tormey 2 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Tormey 2 (day/night)
-----------------------------------------
Angle1   Angle2           :  32.00 deg   44.00 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           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  32.00 deg   Angle2 : 44.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  62.00 / 62.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Charlotte (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Charlotte (day/night)
-----------------------------------------------
Angle1   Angle2           : -44.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  93.00 / 93.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -44.00 deg   Angle2 : 6.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  63.00 / 63.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: Charlotte MC (day/night)
------------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1546/134   veh/TimePeriod  *
Heavy truck volume  :  1104/96    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):  24000
    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 # 5: Charlotte MC (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  97.00 / 97.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  14.00 deg   Angle2 : 31.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  88.00 / 88.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Rideau (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      0   0.00  71.49   0.00   0.00  -3.01   0.00   0.00   0.00  68.48
-------------------------------------------------------------------------------

Segment Leq : 68.48 dBA
```

```
Results segment # 2: Tormey 1 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        4.50 !        2.06 !         2.06

ROAD (0.00 + 27.02 + 45.93) = 45.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     18   0.00  63.96   0.00  -6.93 -10.00   0.00   0.00 -20.00  27.02
-------------------------------------------------------------------------------
    18     32   0.00  63.96   0.00  -6.93 -11.09   0.00   0.00   0.00  45.93
-------------------------------------------------------------------------------

Segment Leq : 45.99 dBA


Results segment # 3: Tormey 2 (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 !        4.50 !        1.98 !         1.98

ROAD (0.00 + 25.26 + 0.00) = 25.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    32     44   0.00  63.96   0.00  -6.93 -11.76   0.00   0.00 -20.00  25.26
-------------------------------------------------------------------------------

Segment Leq : 25.26 dBA
```

```
Results segment # 4: Charlotte (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 !        4.50 !        2.46 !         2.46

ROAD (0.00 + 30.47 + 44.94) = 45.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -44      6   0.00  63.96   0.00  -7.92  -5.56   0.00   0.00 -20.00  30.47
-------------------------------------------------------------------------------
     6     20   0.00  63.96   0.00  -7.92 -11.09   0.00   0.00   0.00  44.94
-------------------------------------------------------------------------------

Segment Leq : 45.09 dBA


Results segment # 5: Charlotte MC (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 !        4.50 !        1.77 !         1.77

ROAD (51.32 + 32.17 + 51.32) = 54.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     14   0.00  70.52   0.00  -8.11 -11.09   0.00   0.00   0.00  51.32
-------------------------------------------------------------------------------
    14     31   0.00  70.52   0.00  -8.11 -10.25   0.00   0.00 -20.00  32.17
-------------------------------------------------------------------------------
    31     45   0.00  70.52   0.00  -8.11 -11.09   0.00   0.00   0.00  51.32
-------------------------------------------------------------------------------

Segment Leq : 54.36 dBA

Total Leq All Segments: 68.69 dBA
```

```
Results segment # 1: Rideau (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      0   0.00  63.89   0.00   0.00  -3.01   0.00   0.00   0.00  60.88
-------------------------------------------------------------------------------

Segment Leq : 60.88 dBA


Results segment # 2: Tormey 1 (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 !        4.50 !        2.06 !         2.06

ROAD (0.00 + 19.43 + 38.34) = 38.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     18   0.00  56.36   0.00  -6.93 -10.00   0.00   0.00 -20.00  19.43
-------------------------------------------------------------------------------
    18     32   0.00  56.36   0.00  -6.93 -11.09   0.00   0.00   0.00  38.34
-------------------------------------------------------------------------------

Segment Leq : 38.39 dBA
```

```
Results segment # 3: Tormey 2 (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 !        4.50 !        1.98 !         1.98

ROAD (0.00 + 17.67 + 0.00) = 17.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    32     44   0.00  56.36   0.00  -6.93 -11.76   0.00   0.00 -20.00  17.67
-------------------------------------------------------------------------------

Segment Leq : 17.67 dBA


Results segment # 4: Charlotte (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 !        4.50 !        2.46 !         2.46

ROAD (0.00 + 22.88 + 37.35) = 37.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -44      6   0.00  56.36   0.00  -7.92  -5.56   0.00   0.00 -20.00  22.88
-------------------------------------------------------------------------------
     6     20   0.00  56.36   0.00  -7.92 -11.09   0.00   0.00   0.00  37.35
-------------------------------------------------------------------------------

Segment Leq : 37.50 dBA
```

```
Results segment # 5: Charlotte MC (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 !        4.50 !        1.77 !         1.77

ROAD (43.72 + 24.57 + 43.72) = 46.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     14   0.00  62.92   0.00  -8.11 -11.09   0.00   0.00   0.00  43.72
-------------------------------------------------------------------------------
    14     31   0.00  62.92   0.00  -8.11 -10.25   0.00   0.00 -20.00  24.57
-------------------------------------------------------------------------------
    31     45   0.00  62.92   0.00  -8.11 -11.09   0.00   0.00   0.00  43.72
-------------------------------------------------------------------------------

Segment Leq : 46.76 dBA

Total Leq All Segments: 61.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.69
                           (NIGHT): 61.09
```

```
STAMSON 5.0        NORMAL REPORT        Date: 02-10-2017 10:15:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Tormey 1 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Tormey 1 (day/night)
------------------------------------------
Angle1   Angle2           : -19.00 deg   66.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 66.00 deg
Barrier height            :   9.00 m
Barrier receiver distance :  31.00 / 31.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Tormey 2 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Tormey 2 (day/night)
-----------------------------------------
Angle1   Angle2           :  66.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  66.00 deg   Angle2 : 90.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  31.00 / 31.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Cobourg (day/night)
----------------------------------------
Angle1   Angle2           :   0.00 deg   70.00 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           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 70.00 deg
Barrier height            :   7.00 m
Barrier receiver distance :  12.00 / 12.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Cobourg 2 (day/night)
-----------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Cobourg 2 (day/night)
-----------------------------------------
Angle1   Angle2           :  70.00 deg   90.00 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           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  70.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 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: Tormey 1 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        4.50 !        2.33 !         2.33

ROAD (0.00 + 36.46 + 0.00) = 36.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -19     66   0.00  63.96   0.00  -4.57  -3.26   0.00   0.00 -19.66  36.46
-------------------------------------------------------------------------------

Segment Leq : 36.46 dBA


Results segment # 2: Tormey 2 (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 !        4.50 !        2.33 !         2.33

ROAD (0.00 + 31.59 + 0.00) = 31.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    66     90   0.00  63.96   0.00  -4.57  -8.75   0.00   0.00 -19.04  31.59
-------------------------------------------------------------------------------

Segment Leq : 31.59 dBA
```

```
Results segment # 3: Cobourg (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 !        4.50 !        3.11 !         3.11

ROAD (0.00 + 40.82 + 0.00) = 40.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     70   0.00  63.96   0.00  -2.39  -4.10   0.00   0.00 -16.65  40.82
-------------------------------------------------------------------------------

Segment Leq : 40.82 dBA


Results segment # 4: Cobourg 2 (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 !        4.50 !        3.58 !         3.58

ROAD (0.00 + 44.03 + 0.00) = 44.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    70     90   0.00  63.96   0.00  -2.39  -9.54   0.00   0.00  -7.99  44.03
-------------------------------------------------------------------------------

Segment Leq : 44.03 dBA

Total Leq All Segments: 46.36 dBA
```

```
Results segment # 1: Tormey 1 (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 !        4.50 !        2.33 !         2.33

ROAD (0.00 + 28.87 + 0.00) = 28.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -19     66   0.00  56.36   0.00  -4.57  -3.26   0.00   0.00 -19.66  28.87
-------------------------------------------------------------------------------

Segment Leq : 28.87 dBA


Results segment # 2: Tormey 2 (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 !        4.50 !        2.33 !         2.33

ROAD (0.00 + 24.00 + 0.00) = 24.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    66     90   0.00  56.36   0.00  -4.57  -8.75   0.00   0.00 -19.04  24.00
-------------------------------------------------------------------------------

Segment Leq : 24.00 dBA
```

```
Results segment # 3: Cobourg (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 !        4.50 !        3.11 !         3.11

ROAD (0.00 + 33.23 + 0.00) = 33.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     70   0.00  56.36   0.00  -2.39  -4.10   0.00   0.00 -16.65  33.23
-------------------------------------------------------------------------------

Segment Leq : 33.23 dBA


Results segment # 4: Cobourg 2 (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 !        4.50 !        3.58 !         3.58

ROAD (0.00 + 36.44 + 0.00) = 36.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    70     90   0.00  56.36   0.00  -2.39  -9.54   0.00   0.00  -7.99  36.44
-------------------------------------------------------------------------------

Segment Leq : 36.44 dBA

Total Leq All Segments: 38.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 46.36
                           (NIGHT): 38.77
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:27:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
-----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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  :  18.00 / 18.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  78.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 m
Barrier receiver distance :   7.00 / 7.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Cobourg (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           :  25.50 / 25.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Rideau (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	25.50	16.16	16.16

ROAD (67.07 + 58.94 + 0.00) = 67.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	78	0.00	71.49	0.00	-0.79	-3.63	0.00	0.00	0.00	67.07
78	90	0.00	71.49	0.00	-0.79	-11.76	0.00	0.00	-0.24	58.70*
78	90	0.00	71.49	0.00	-0.79	-11.76	0.00	0.00	0.00	58.94

* Bright Zone !

Segment Leq : 67.69 dBA

Results segment # 2: Cobourg (day)

Source height = 1.50 m

ROAD (0.00 + 63.96 + 0.00) = 63.96 dBA

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

Segment Leq : 63.96 dBA

Total Leq All Segments: 69.22 dBA

```
Results segment # 1: Rideau (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 !       25.50 !       16.16 !        16.16

ROAD (59.47 + 51.34 + 0.00) = 60.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     78   0.00  63.89   0.00  -0.79  -3.63   0.00   0.00   0.00  59.47
-------------------------------------------------------------------------------
    78     90   0.00  63.89   0.00  -0.79 -11.76   0.00   0.00  -0.24  51.10*
    78     90   0.00  63.89   0.00  -0.79 -11.76   0.00   0.00   0.00  51.34
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 60.09 dBA


Results segment # 2: Cobourg (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.36 + 0.00) = 56.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  56.36   0.00   0.00   0.00   0.00   0.00   0.00  56.36
-------------------------------------------------------------------------------

Segment Leq : 56.36 dBA

Total Leq All Segments: 61.62 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.22
                           (NIGHT): 61.62
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:28:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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           :  25.50 / 25.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Cobourg (day/night)
-----------------------------------------
Angle1   Angle2           : -12.00 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           :  25.50 / 25.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Rideau (day)

Source height = 1.50 m

ROAD (0.00 + 71.49 + 0.00) = 71.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.49	0.00	0.00	0.00	0.00	0.00	0.00	71.49

Segment Leq : 71.49 dBA

Results segment # 2: Cobourg (day)

Source height = 1.50 m

ROAD (0.00 + 50.73 + 0.00) = 50.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-12	0	0.00	63.96	0.00	-1.46	-11.76	0.00	0.00	0.00	50.73

Segment Leq : 50.73 dBA

Total Leq All Segments: 71.53 dBA

```
Results segment # 1: Rideau (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.89 + 0.00) = 63.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.89   0.00   0.00   0.00   0.00   0.00   0.00  63.89
-------------------------------------------------------------------------------

Segment Leq : 63.89 dBA

Results segment # 2: Cobourg (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 43.14 + 0.00) = 43.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -12      0   0.00  56.36   0.00  -1.46 -11.76   0.00   0.00   0.00  43.14
-------------------------------------------------------------------------------

Segment Leq : 43.14 dBA

Total Leq All Segments: 63.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.53
                           (NIGHT): 63.93
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2017 15:30:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
-----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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  :  15.00 / 15.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Tormey 1 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Tormey 1 (day/night)
------------------------------------------
Angle1   Angle2           :   0.00 deg   32.00 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           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 18.00 deg
Barrier height            :   9.00 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
```

```
Road data, segment # 3: Tormey 2 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Tormey 2 (day/night)
------------------------------------------
Angle1   Angle2           :  32.00 deg   44.00 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           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  32.00 deg   Angle2 : 44.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  62.00 / 62.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Charlotte (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Charlotte (day/night)
-----------------------------------------------
Angle1   Angle2           : -44.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  93.00 / 93.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -44.00 deg   Angle2 : 6.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  63.00 / 63.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: Charlotte MC (day/night)
------------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1546/134   veh/TimePeriod  *
Heavy truck volume  :  1104/96    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):  24000
    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 # 5: Charlotte MC (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  97.00 / 97.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  14.00 deg   Angle2 : 31.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  88.00 / 88.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Rideau (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      0   0.00  71.49   0.00   0.00  -3.01   0.00   0.00   0.00  68.48
-------------------------------------------------------------------------------

Segment Leq : 68.48 dBA


Results segment # 2: Tormey 1 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !        6.04 !         6.04

ROAD (0.00 + 34.33 + 45.93) = 46.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     18   0.00  63.96   0.00  -6.93 -10.00   0.00   0.00 -12.70  34.33
-------------------------------------------------------------------------------
    18     32   0.00  63.96   0.00  -6.93 -11.09   0.00   0.00   0.00  45.93
-------------------------------------------------------------------------------

Segment Leq : 46.22 dBA
```

Results segment # 3: Tormey 2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	25.50	5.39	5.39

ROAD (0.00 + 25.26 + 0.00) = 25.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
32	44	0.00	63.96	0.00	-6.93	-11.76	0.00	0.00	-20.00	25.26

Segment Leq : 25.26 dBA

Results segment # 4: Charlotte (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	25.50	9.24	9.24

ROAD (0.00 + 30.47 + 44.94) = 45.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-44	6	0.00	63.96	0.00	-7.92	-5.56	0.00	0.00	-20.00	30.47
6	20	0.00	63.96	0.00	-7.92	-11.09	0.00	0.00	0.00	44.94

Segment Leq : 45.09 dBA

```
Results segment # 5: Charlotte MC (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 !       25.50 !        3.72 !         3.72

ROAD (51.32 + 32.17 + 51.32) = 54.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     14   0.00  70.52   0.00  -8.11 -11.09   0.00   0.00   0.00  51.32
-------------------------------------------------------------------------------
    14     31   0.00  70.52   0.00  -8.11 -10.25   0.00   0.00 -20.00  32.17
-------------------------------------------------------------------------------
    31     45   0.00  70.52   0.00  -8.11 -11.09   0.00   0.00   0.00  51.32
-------------------------------------------------------------------------------

Segment Leq : 54.36 dBA

Total Leq All Segments: 68.69 dBA

Results segment # 1: Rideau (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      0   0.00  63.89   0.00   0.00  -3.01   0.00   0.00   0.00  60.88
-------------------------------------------------------------------------------

Segment Leq : 60.88 dBA
```

```
Results segment # 2: Tormey 1 (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 !       25.50 !        6.04 !         6.04

ROAD (0.00 + 26.73 + 38.34) = 38.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     18   0.00  56.36   0.00  -6.93 -10.00   0.00   0.00 -12.70  26.73
-------------------------------------------------------------------------------
    18     32   0.00  56.36   0.00  -6.93 -11.09   0.00   0.00   0.00  38.34
-------------------------------------------------------------------------------

Segment Leq : 38.63 dBA

Results segment # 3: Tormey 2 (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 !       25.50 !        5.39 !         5.39

ROAD (0.00 + 17.67 + 0.00) = 17.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    32     44   0.00  56.36   0.00  -6.93 -11.76   0.00   0.00 -20.00  17.67
-------------------------------------------------------------------------------

Segment Leq : 17.67 dBA
```

```
Results segment # 4: Charlotte (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 !       25.50 !        9.24 !         9.24

ROAD (0.00 + 22.88 + 37.35) = 37.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -44      6   0.00  56.36   0.00  -7.92  -5.56   0.00   0.00 -20.00  22.88
-------------------------------------------------------------------------------
     6     20   0.00  56.36   0.00  -7.92 -11.09   0.00   0.00   0.00  37.35
-------------------------------------------------------------------------------

Segment Leq : 37.50 dBA

Results segment # 5: Charlotte MC (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 !       25.50 !        3.72 !         3.72

ROAD (43.72 + 24.57 + 43.72) = 46.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     14   0.00  62.92   0.00  -8.11 -11.09   0.00   0.00   0.00  43.72
-------------------------------------------------------------------------------
    14     31   0.00  62.92   0.00  -8.11 -10.25   0.00   0.00 -20.00  24.57
-------------------------------------------------------------------------------
    31     45   0.00  62.92   0.00  -8.11 -11.09   0.00   0.00   0.00  43.72
-------------------------------------------------------------------------------

Segment Leq : 46.76 dBA

Total Leq All Segments: 61.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.69
                           (NIGHT): 61.09
```

```
STAMSON 5.0        NORMAL REPORT        Date: 02-10-2017 10:21:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Tormey 1 (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Tormey 1 (day/night)
----------------------------------------------
Angle1   Angle2           : -19.00 deg   66.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 66.00 deg
Barrier height            :   9.00 m
Barrier receiver distance :  31.00 / 31.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Tormey 2 (day/night)
-------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Tormey 2 (day/night)
-----------------------------------------
Angle1   Angle2           :  66.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  66.00 deg   Angle2 : 90.00 deg
Barrier height            :  42.00 m
Barrier receiver distance :  31.00 / 31.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Cobourg (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  :  26.00 / 26.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Tormey 1 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !        8.19 !         8.19

ROAD (0.00 + 50.13 + 0.00) = 50.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -19     66   0.00  63.96   0.00  -4.57  -3.26   0.00   0.00  -5.99  50.13
-------------------------------------------------------------------------------

Segment Leq : 50.13 dBA


Results segment # 2: Tormey 2 (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 !       25.50 !        8.19 !         8.19

ROAD (0.00 + 32.16 + 0.00) = 32.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    66     90   0.00  63.96   0.00  -4.57  -8.75   0.00   0.00 -18.48  32.16
-------------------------------------------------------------------------------

Segment Leq : 32.16 dBA
```

```
Results segment # 3: Cobourg (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.56 + 0.00) = 58.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  63.96   0.00  -2.39  -3.01   0.00   0.00   0.00  58.56
-------------------------------------------------------------------------------

Segment Leq : 58.56 dBA

Total Leq All Segments: 59.15 dBA


Results segment # 1: Tormey 1 (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 !       25.50 !        8.19 !         8.19

ROAD (0.00 + 42.54 + 0.00) = 42.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -19     66   0.00  56.36   0.00  -4.57  -3.26   0.00   0.00  -5.99  42.54
-------------------------------------------------------------------------------

Segment Leq : 42.54 dBA
```

```
Results segment # 2: Tormey 2 (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 !       25.50 !        8.19 !         8.19

ROAD (0.00 + 24.56 + 0.00) = 24.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    66     90   0.00  56.36   0.00  -4.57  -8.75   0.00   0.00 -18.48  24.56
-------------------------------------------------------------------------------

Segment Leq : 24.56 dBA


Results segment # 3: Cobourg (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.96 + 0.00) = 50.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  56.36   0.00  -2.39  -3.01   0.00   0.00   0.00  50.96
-------------------------------------------------------------------------------

Segment Leq : 50.96 dBA

Total Leq All Segments: 51.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.15
                           (NIGHT): 51.55
```

```
STAMSON 5.0        NORMAL REPORT        Date: 29-09-2017 13:24:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Rideau (day/night)
-----------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   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):  30000
    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: Rideau (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           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  27.00 m
Barrier receiver distance :  13.00 / 13.00  m
Source elevation          :   0.00 m
Receiver elevation        :  27.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Cobourg (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Cobourg (day/night)
-----------------------------------------
Angle1   Angle2           : -37.00 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           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -37.00 deg   Angle2 : 90.00 deg
Barrier height            :  27.00 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :  27.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Rideau (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 !       13.24 !        13.24

ROAD (0.00 + 51.76 + 0.00) = 51.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  71.49   0.00  -1.86   0.00   0.00   0.00 -17.87  51.76
-------------------------------------------------------------------------------

Segment Leq : 51.76 dBA


Results segment # 2: Cobourg (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 !       17.45 !        17.45

ROAD (0.00 + 43.27 + 0.00) = 43.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -37     90   0.00  63.96   0.00  -1.66  -1.51   0.00   0.00 -17.51  43.27
-------------------------------------------------------------------------------

Segment Leq : 43.27 dBA

Total Leq All Segments: 52.34 dBA
```

```
Results segment # 1: Rideau (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 !       13.24 !        13.24

ROAD (0.00 + 44.16 + 0.00) = 44.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.89   0.00  -1.86   0.00   0.00   0.00 -17.87  44.16
-------------------------------------------------------------------------------

Segment Leq : 44.16 dBA


Results segment # 2: Cobourg (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 !       17.45 !        17.45

ROAD (0.00 + 35.67 + 0.00) = 35.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -37     90   0.00  56.36   0.00  -1.66  -1.51   0.00   0.00 -17.51  35.67
-------------------------------------------------------------------------------

Segment Leq : 35.67 dBA

Total Leq All Segments: 44.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.34
                           (NIGHT): 44.74
```