Roadway Traffic Noise Assessment

Kent Street & McLeod Street
Ottawa, Ontario

REPORT: GWE17-141 – Traffic Noise R2

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EXECUTIVE SUMMARY

This document describes a roadway traffic noise assessment performed for a proposed residential development located at the northeast corner of the Kent Street & McLeod Street intersection in Ottawa, Ontario. The development comprises a new four-storey residential building of nearly rectangular planform, with the long axis oriented along Kent Street. Balconies are provided for select units; balconies less than 4 m in depth are not considered as outdoor living areas, as per the ENCG. The major source of transportation noise is Gladstone Avenue, Kent Street and Highway 417. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on: (i) theoretical noise prediction methods that conform to the Ministry of the Environment 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 Roderick Lahey Architect Inc.

The results of the current analysis indicate that noise levels will range between 55 and 69 dBA during the daytime period (07:00-23:00) and between 48 and 62 dBA during the nighttime period (23:00-07:00). The highest noise levels (i.e. 69 dBA) occurs along the development's west façade, which is nearest and most exposed to Kent Street. Noise levels are the rooftop terrace cannot be feasibly mitigated to 60 dBA, and as such the ground level green space is considered as a protected outdoor living area. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated on Figure 3.

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

Noise levels at the ground level green space (Receptor 7) are expected to fall under 55 dBA; therefore, no mitigation is required for this outdoor living area. Noise levels at the rooftop terrace (Receptor 6) are expected to approach 68 dBA during the daytime period. According to the ENCG, if this area is to be used as an outdoor living area, noise control measures should be considered to reduce the L_{eq} to 55 dBA, where

technically and administratively feasible. Investigation into the application of a sound barrier surround the terrace found that a height of 4 m would be needed to reduce noise levels below 60 dBA, and a barrier height of 9 m would be needed to reduce noise levels below 55 dBA. The use of barriers as noise control for the space would be impractical given the required height exceeds the City of Ottawa's preferred height for noise barriers. Furthermore, barriers are counterintuitive to the programed function of the space as a rooftop terrace where views are desired. Although the resultant noise levels on the rooftop terrace are elevated, other outdoor living areas within the development comply with the ENCG and offer an alternative for residences to seek a quite outdoor environment.

With regards to stationary noise impacts from the proposed building on surrounding noise-sensitive buildings, once the mechanical plans for the proposed building become available, a stationary noise study will be performed. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels at the surrounding noise-sensitive buildings due to mechanical equipment on the roof of the proposed building are below the City of Ottawa's Noise Guidelines.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Roca Homes to undertake a roadway traffic noise assessment of a proposed residential development located at the northeast corner of the Kent Street & McLeod Street intersection 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 Ministry of the Environment and Climate Change (MOECC)[2] guidelines. Noise calculations were based on architectural drawings received from Roderick Lahey Architect Inc., with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this roadway traffic noise assessment is a four-storey residential building of nearly rectangular planform, with the long axis oriented along Kent Street. A basement level and the upper floors provide 31 total residential units. Balconies are provided for select units. A sheltered driveway at the southwest corner at grade provides access to rear parking. Balconies less than 4 m in depth are not considered as outdoor living areas, as per the ENCG. The major source of transportation noise is Gladstone Avenue, Kent Street and Highway 417. Figure 1 illustrates a complete site plan with surrounding context.

Additionally, once mechanical drawings and information is available, the stationary noise impacts of the proposed development on the surrounding noise-sensitive developments will be performed to ensure compliance with the ENCG.

3. OBJECTIVES

The main goals of this work are to: (i) calculate the future noise levels on the study building produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4 of this report.

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016

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

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For 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 City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for residence living rooms and sleeping quarters respectively, as listed in Table 1. To account for deficiencies in building construction, theses levels should be targeted toward 42 and 37 dBA.

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

Type of Space	Time Period	L_{eq} (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50	45
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	40
Sleeping quarters of hotels/motels	23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40	35

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].

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

4.2.1 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[6] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes

[3] Adapted from ENCG 2016 – Tables 2.2b and 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
[6] 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

Segment	Roadway / Transit Class	Speed Limit (km/h)	Traffic Volumes
Gladstone Avenue	2-UMCU	50	**12,000**
Kent Street	2-UAU	50	**15,000**
Highway 417 WB	8-Freeway	100	**73,333**
Highway 417 EB			**73,333**

4.2.2 Theoretical Transportation Noise Predictions

Noise predictions were performed with the aid of the MOECC computerized noise assessment program, STAMSON 5.04, for road and rail analysis. Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions
- The day/night split was taken to be 92% / 8% respectively for all streets
- Reflective intermediate ground surfaces used, pavement
- Topography considered in height parameters
- Surrounding buildings used as noise barriers for some receptors
- Highway 417 considered as two segments as it is a divided highway more than 4 lanes wide

Noise receptors were strategically identified at seven locations around the study area (see Figure 2).

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard vinyl or wood sided exterior "2X6" walls have around STC 35. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels (from road and rail sources) at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[7] considers:

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

Based on published research[8], 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).

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

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

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A and Figure 4 to 10. Please note that due to minor changes in building massing, some variability in figure annotations is expected.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC SOURCES

Receptor Number	Receptor Height (m)	Plane of Window Receptor Location	Noise Level (dBA)	
			Day	Night
1	11.5	4th Floor – North Façade	66	59
2	11.5	4th Floor – East Façade	64	57
3	5.5	2nd Floor – South Façade	68	61
4	11.5	4th Floor – South Façade	68	61
5	11.5	4th Floor – West Façade	69	62
6	15.5	Rooftop Terrace (Roof of 4th Floor)	68	61
7	1.5	Ground Level – Green Space	55	48

The results of the current analysis indicate that noise levels will range between 55 and 69 dBA during the daytime period (07:00-23:00) and between 48 and 62 dBA during the nighttime period (23:00-07:00). The highest noise levels (i.e. 69 dBA) occurs along the development's west façade, which is nearest and most exposed to Kent Street.

5.2 Noise Control Measures

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

- **Bedroom Windows**

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

(ii) Bedroom windows on the east facade are to satisfy Ontario Building Code (OBC 2012) requirements

- **Living Room Windows**

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

(ii) Living room windows on the east façade are to satisfy Ontario Building Code (OBC 2012) requirements

- **Exterior Walls**

(i) Exterior wall components on the north, south and west façades will require a minimum STC of 45 which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[9]

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

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 be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

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

5.2.1 Noise Barrier Calculation

Noise levels at the ground level green space (Receptor 7) are expected to fall under 55 dBA; therefore, no mitigation is required for this outdoor living area. Noise levels at the rooftop terrace (Receptor 6) are expected to approach 68 dBA during the daytime period. According to the ENCG, if this area is to be used as an outdoor living area, noise control measures should be considered to reduce the L_{eq} to 55 dBA, where technically and administratively feasible. Investigation into the application of a sound barrier surround the terrace found that a height of 4 m would be needed to reduce noise levels below 60 dBA, and a barrier height of 9 m would be needed to reduce noise levels below 55 dBA. The use of barriers as noise control for the space would be impractical given the required height exceeds the City of Ottawa's preferred height for noise barriers. Furthermore, barriers are counterintuitive to the programed function of the space as a rooftop terrace where views are desired. Although the resultant noise levels on the rooftop terrace are elevated, other outdoor living areas within the development comply with the ENCG and offer an alternative for residences to seek a quite outdoor environment. Table 4 summarizes the results of the barrier investigation.

TABLE 4: RESULTS OF BARRIER INVESTIGATION

Location	Reference Receptors	Barrier Height (m)	Daytime L_{eq} Noise Levels (dBA)	
			Without Barrier	With Barrier
Rooftop Terrace (Roof of 4th Floor)	6	4	68	59
		9		55

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 55 and 69 dBA during the daytime period (07:00-23:00) and between 48 and 62 dBA during the nighttime period (23:00-07:00). The highest noise levels (i.e. 69 dBA) occurs along the development's west façade, which is nearest and most exposed to Kent Street. Noise levels are the rooftop terrace cannot be feasibly mitigated to 60 dBA, and as such the ground level green space is considered as a protected outdoor living area. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated on Figure 3.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The following Warning Clause[10] will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized below:

> *"Purchasers/tenants 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 dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment and Climate Change. To help address the need for sound attenuation, this development includes:*
>
> - *STC rated multi-pane glazing elements and spandrel panels*
> - *North, south and west façade bedroom/living room: STC 32/27*
> - *STC rated exterior walls*
> - *North, south and west façade: STC 45*
>
> *This dwelling unit has also been designed with air conditioning (or similar mechanical system). Air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment and Climate Change.*
>
> *To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features."*

Noise levels at the ground level green space (Receptor 7) are expected to fall under 55 dBA; therefore, no mitigation is required for this outdoor living area. Noise levels at the rooftop terrace (Receptor 6) are expected to approach 68 dBA during the daytime period. According to the ENCG, if this area is to be used as an outdoor living area, noise control measures should be considered to reduce the L_{eq} to 55 dBA, where technically and administratively feasible. Investigation into the application of a sound barrier surround the terrace found that a height of 4 m would be needed to reduce noise levels below 60 dBA, and a barrier height of 9 m would be needed to reduce noise levels below 55 dBA. The use of barriers as noise control

[10] City of Ottawa Environmental Noise Control Guidelines, January 2016

for the space would be impractical given the required height exceeds the City of Ottawa's preferred height for noise barriers. Furthermore, barriers are counterintuitive to the programed function of the space as a rooftop terrace where views are desired. Although the resultant noise levels on the rooftop terrace are elevated, other outdoor living areas within the development comply with the ENCG and offer an alternative for residences to seek a quite outdoor environment.

With regards to stationary noise impacts from the proposed building on surrounding noise-sensitive buildings, once the mechanical plans for the proposed building become available, a stationary noise study will be performed. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels at the surrounding noise-sensitive buildings due to mechanical equipment on the roof of the proposed building are below the City of Ottawa's Noise Guidelines.

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.

Michael Lafortune
Environmental Scientist
GWE17-141 – Traffic Noise R2

Joshua Foster, P.Eng.
Principal

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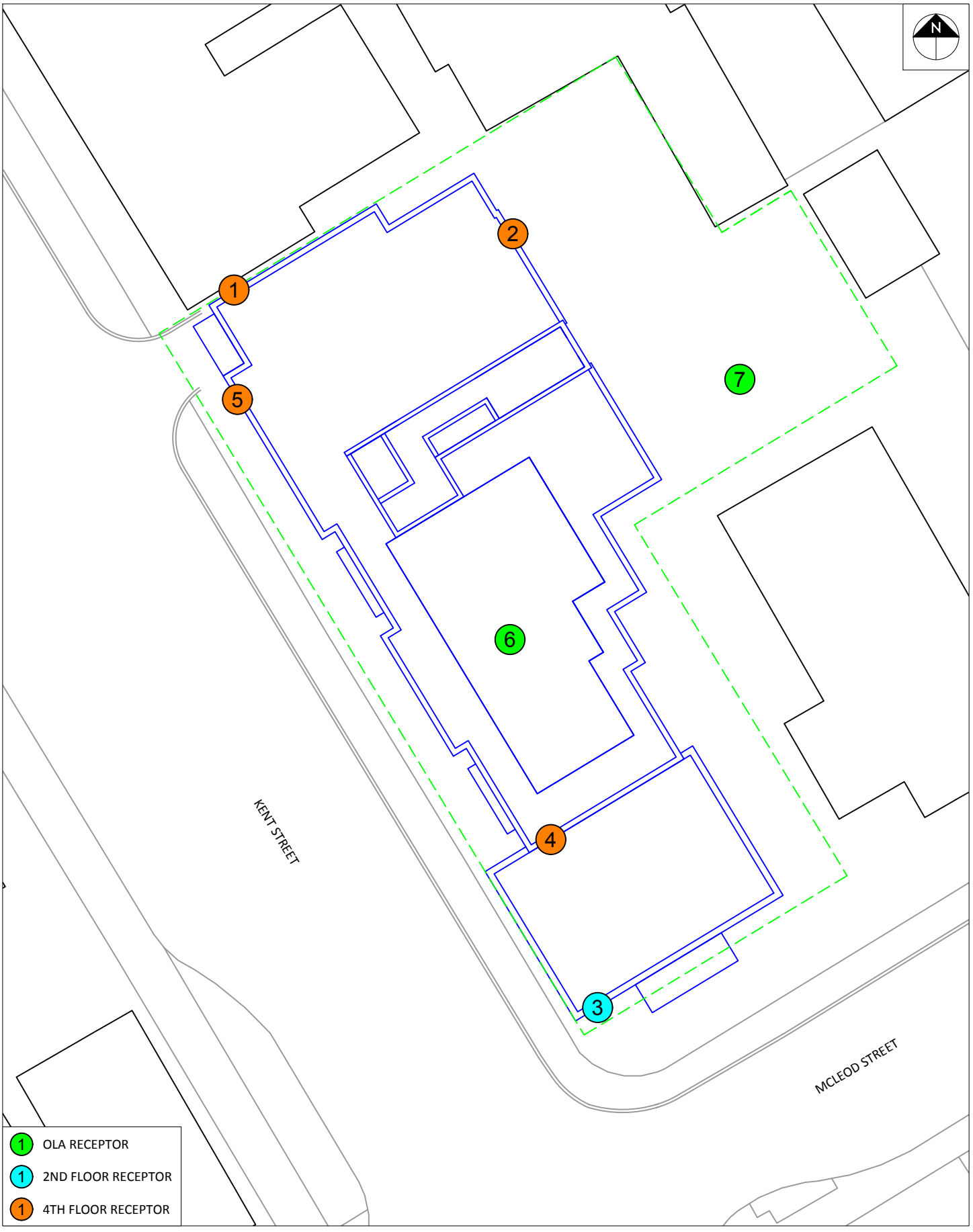
PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-1
DATE	JULY 20, 2018
DRAWN BY	M.L.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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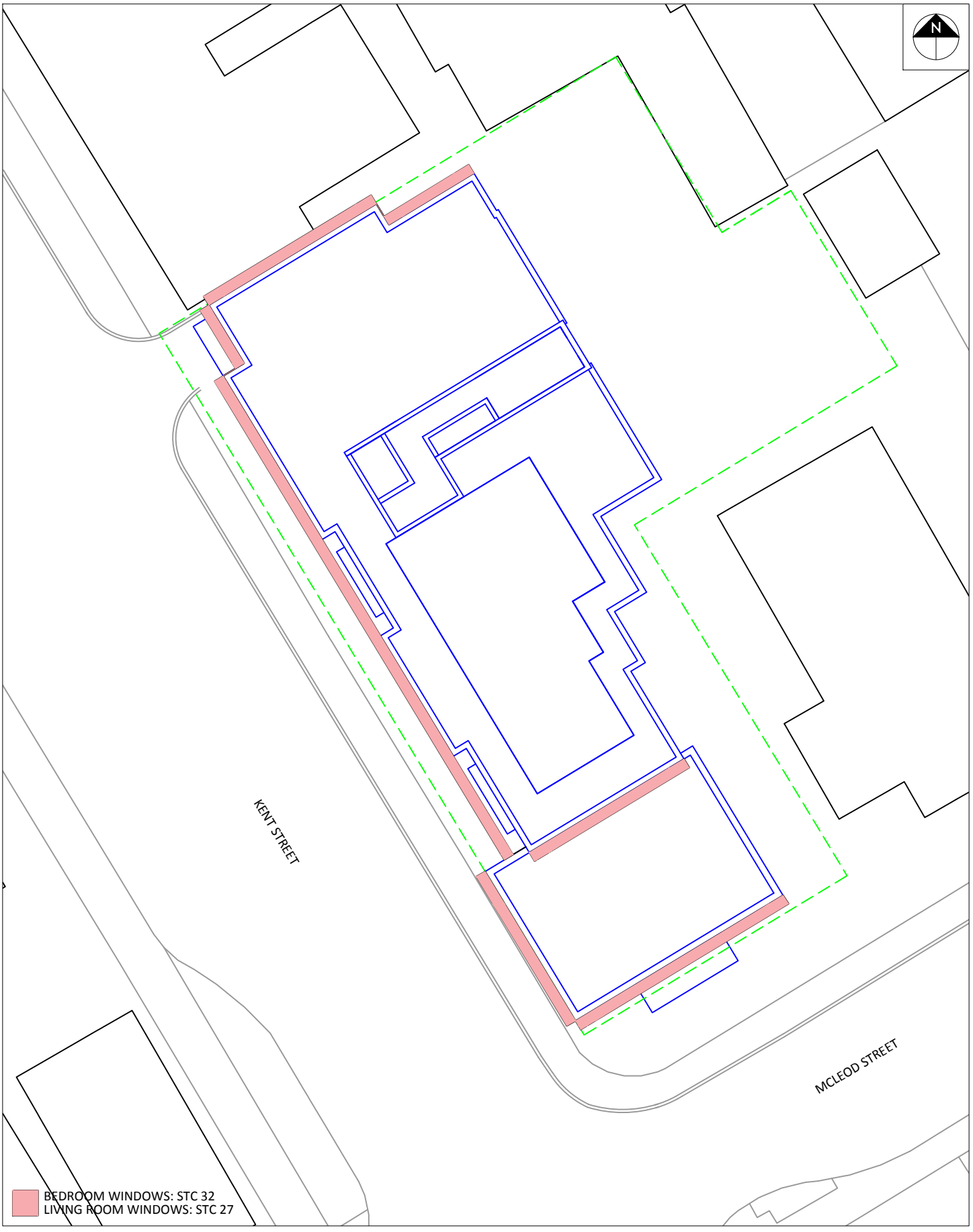
PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:250 (APPROX.)
DRAWING NO.	GWE17-141-2
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 2: RECEPTOR LOCATIONS



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PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:250 (APPROX.)
DRAWING NO.	GWE17-141-3
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 3: WINDOW STC REQUIREMENTS

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SCALE	1:1000 (APPROX.)	DRAWING NO. GWE17-141-4	FIGURE 4: STAMSON INPUT - RECEPTOR 1
DATE	JULY 20, 2018	DRAWN BY M.L.	

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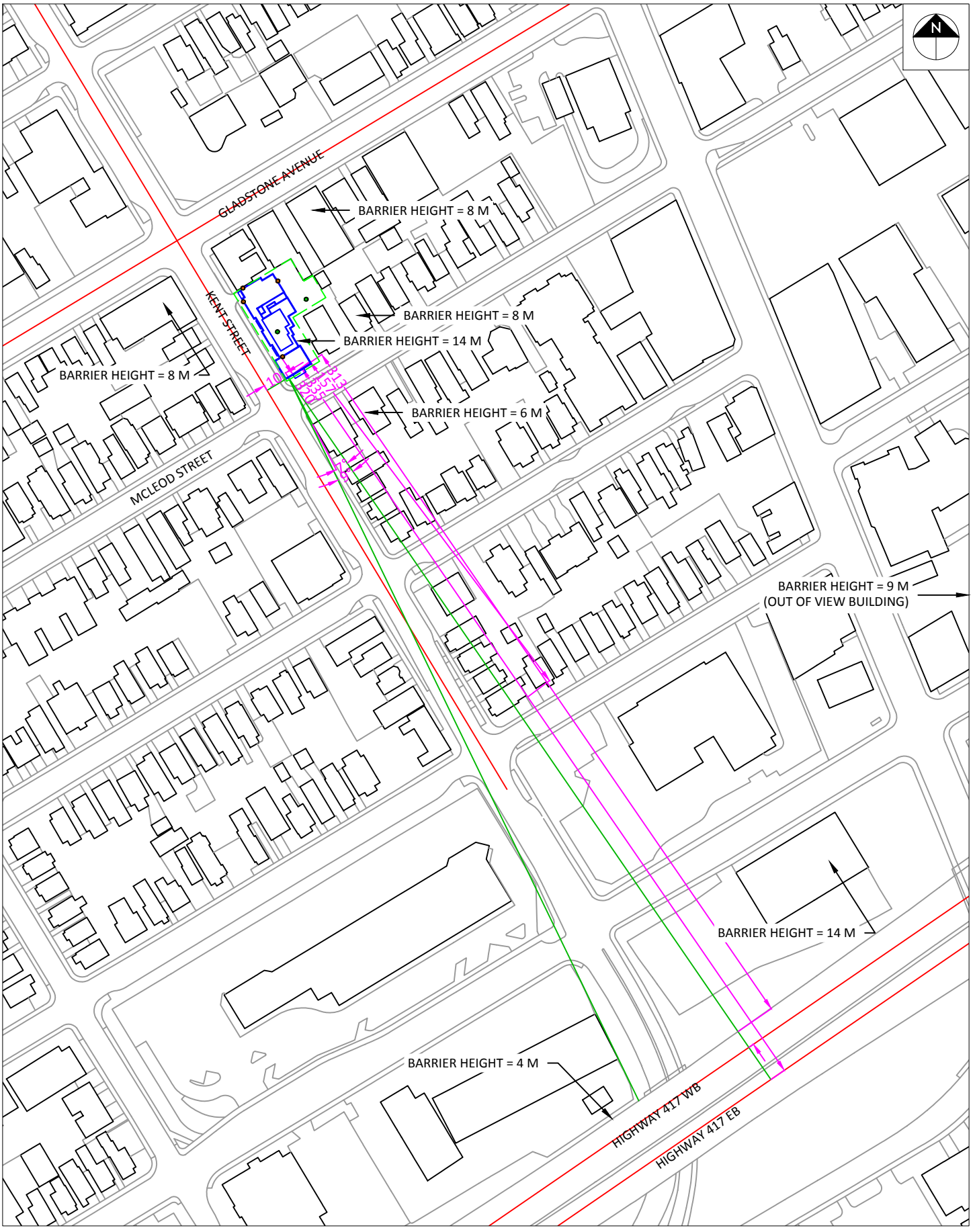
PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-5
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 5: STAMSON INPUT - RECEPTOR 2



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PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GWE17-141-6
DATE	JULY 20, 2018	DRAWN BY	M.L.

DESCRIPTION

FIGURE 6:
STAMSON INPUT - RECEPTOR 3

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SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-7
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 7: STAMSON INPUT - RECEPTOR 4

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SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-8
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 8: STAMSON INPUT - RECEPTOR 5

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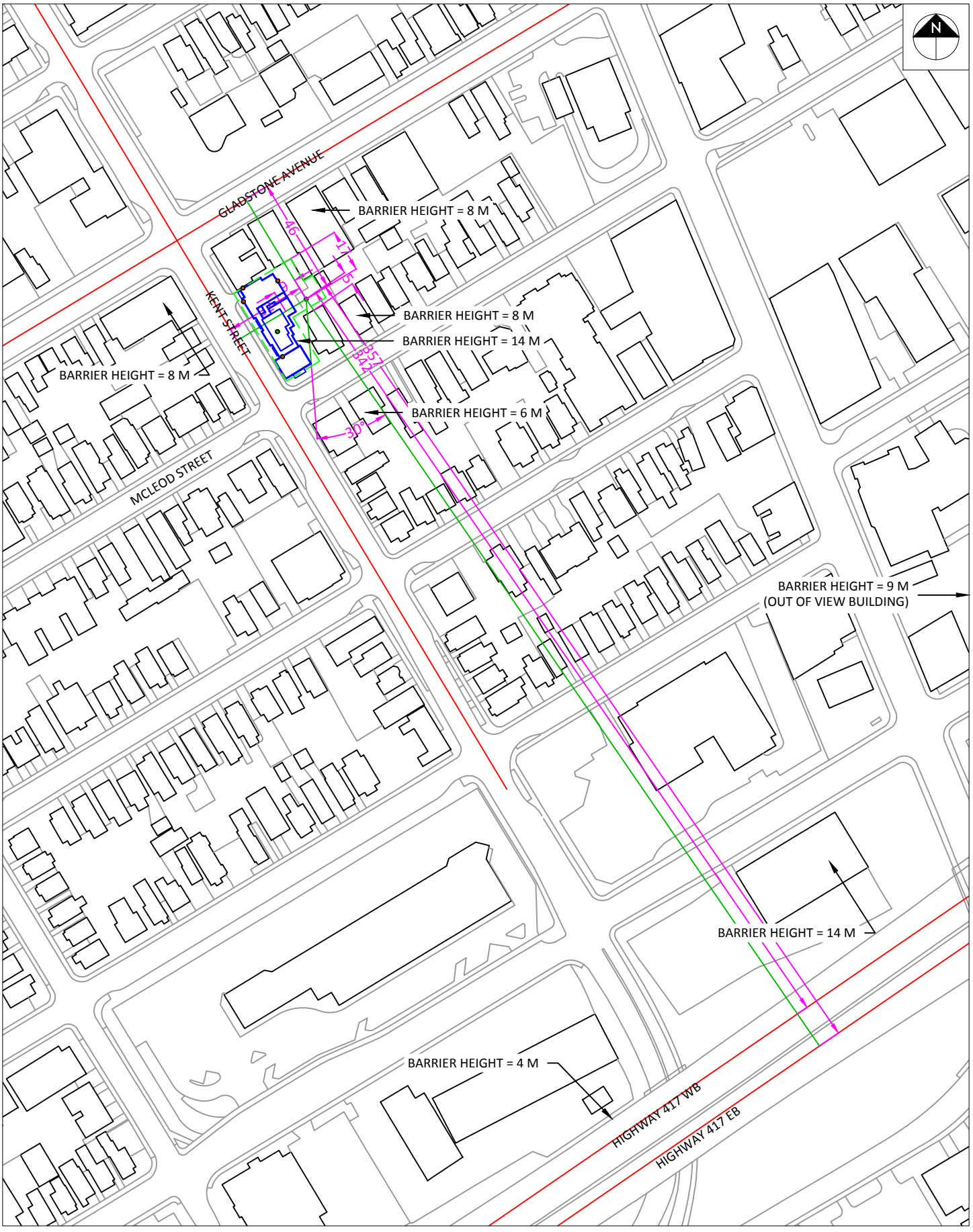
SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-9
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 9: STAMSON INPUT - RECEPTOR 6



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GRADIENT WIND ENGINEERING INC

PROJECT	KENT & MCLEOD ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GWE17-141-10
DATE	JULY 20, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 10: STAMSON INPUT - RECEPTOR 7

APPENDIX A

STAMSON 5.04 - INPUT AND OUTPUT DATA

```
STAMSON 5.0        NORMAL REPORT        Date: 15-12-2017 12:57:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: GladstoneL (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: GladstoneL (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  33.00 / 33.00  m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -41.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  22.00 / 22.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: GladstoneR (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: GladstoneR (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  33.00 / 33.00  m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Kent (day/night)
----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: Kent (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  :  15.00 / 15.00  m
Receiver height           :  11.50 / 11.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: GladstoneL (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 !       11.50 !        4.83 !         4.83

ROAD (0.00 + 48.17 + 57.66) = 58.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -41   0.00  67.51   0.00  -3.42  -5.65   0.00   0.00 -10.26
48.17
-------------------------------------------------------------------------------
--
   -41      0   0.00  67.51   0.00  -3.42  -6.42   0.00   0.00   0.00
57.66
-------------------------------------------------------------------------------
--

Segment Leq : 58.12 dBA


Results segment # 2: GladstoneR (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 !       11.50 !        4.53 !         4.53

ROAD (0.00 + 48.61 + 0.00) = 48.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  67.51   0.00  -3.42  -3.01   0.00   0.00 -12.46
48.61
-------------------------------------------------------------------------------
--

Segment Leq : 48.61 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 65.47 + 0.00) = 65.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00   0.00  -3.01   0.00   0.00   0.00
65.47
-------------------------------------------------------------------------
--

Segment Leq : 65.47 dBA

Total Leq All Segments: 66.28 dBA


Results segment # 1: GladstoneL (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 !       11.50 !        4.83 !         4.83

ROAD (0.00 + 40.57 + 50.06) = 50.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -41   0.00  59.91   0.00  -3.42  -5.65   0.00   0.00 -10.26
40.57
-------------------------------------------------------------------------
--
   -41      0   0.00  59.91   0.00  -3.42  -6.42   0.00   0.00   0.00
50.06
-------------------------------------------------------------------------
--

Segment Leq : 50.53 dBA
```

```
Results segment # 2: GladstoneR (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 !       11.50 !        4.53 !         4.53

ROAD (0.00 + 41.02 + 0.00) = 41.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  59.91   0.00  -3.42  -3.01   0.00   0.00 -12.46
41.02
-------------------------------------------------------------------------------
--

Segment Leq : 41.02 dBA


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

Source height = 1.50 m

ROAD (0.00 + 57.87 + 0.00) = 57.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00   0.00  -3.01   0.00   0.00   0.00
57.87
-------------------------------------------------------------------------------
--

Segment Leq : 57.87 dBA

Total Leq All Segments: 58.68 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 66.28
                           (NIGHT): 58.68
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-12-2017 12:57:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  24.00 / 24.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -12.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 354.00 / 354.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -24.00 deg
Barrier height            :   9.00 m
Barrier receiver distance : 251.00 / 251.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           : -12.00 deg   3.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 354.00 / 354.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -12.00 deg   Angle2 : -3.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 320.00 / 320.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -12.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 370.00 / 370.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -24.00 deg
Barrier height            :   9.00 m
Barrier receiver distance : 251.00 / 251.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           : -12.00 deg   3.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 370.00 / 370.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -12.00 deg   Angle2 : -3.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 320.00 / 320.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Gladstone (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 !       11.50 !        4.44 !         4.44

ROAD (0.00 + 48.35 + 0.00) = 48.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  67.51   0.00  -3.55  -3.01   0.00   0.00 -12.60
48.35
-------------------------------------------------------------------------------
--

Segment Leq : 48.35 dBA


Results segment # 2: 417WB1 (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 !       11.50 !        6.53 !         6.53

ROAD (0.00 + 57.32 + 55.91) = 59.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -24   0.00  81.40   0.00 -13.73  -4.36   0.00   0.00  -5.99
57.32
-------------------------------------------------------------------------------
--
   -24    -12   0.00  81.40   0.00 -13.73 -11.76   0.00   0.00   0.00
55.91
-------------------------------------------------------------------------------
--

Segment Leq : 59.68 dBA
```

```
Results segment # 3: 417WB2 (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 !       11.50 !        5.17 !         5.17

ROAD (0.00 + 36.12 + 52.90) = 52.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -12     -3   0.00  81.40   0.00 -13.73 -13.01   0.00   0.00 -18.54
36.12
-------------------------------------------------------------------------------
--
    -3      3   0.00  81.40   0.00 -13.73 -14.77   0.00   0.00   0.00
52.90
-------------------------------------------------------------------------------
--

Segment Leq : 52.99 dBA
```

```
Results segment # 4: 417EB1 (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 !       11.50 !        6.75 !         6.75

ROAD (0.00 + 57.35 + 55.71) = 59.62 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -24   0.00  81.40   0.00 -13.92  -4.36   0.00   0.00  -5.77
57.35
-------------------------------------------------------------------------------
--
   -24    -12   0.00  81.40   0.00 -13.92 -11.76   0.00   0.00   0.00
55.71
-------------------------------------------------------------------------------
--

Segment Leq : 59.62 dBA
```

```
Results segment # 5: 417EB2 (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 !       11.50 !        5.44 !         5.44

ROAD (0.00 + 37.64 + 52.70) = 52.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -12     -3   0.00  81.40   0.00 -13.92 -13.01   0.00   0.00 -16.83
37.64
-------------------------------------------------------------------------------
--
    -3      3   0.00  81.40   0.00 -13.92 -14.77   0.00   0.00   0.00
52.70
-------------------------------------------------------------------------------
--

Segment Leq : 52.84 dBA

Total Leq All Segments: 63.63 dBA
```

```
Results segment # 1: Gladstone (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 !       11.50 !        4.44 !         4.44

ROAD (0.00 + 40.75 + 0.00) = 40.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  59.91   0.00  -3.55  -3.01   0.00   0.00 -12.60
40.75
-------------------------------------------------------------------------------
--

Segment Leq : 40.75 dBA
```

```
Results segment # 2: 417WB1 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.53 !         6.53

ROAD (0.00 + 49.72 + 48.31) = 52.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -24    0.00  73.80   0.00 -13.73  -4.36   0.00   0.00  -5.99
49.72
-------------------------------------------------------------------------------
--
   -24    -12    0.00  73.80   0.00 -13.73 -11.76   0.00   0.00   0.00
48.31
-------------------------------------------------------------------------------
--

Segment Leq : 52.08 dBA
```

```
Results segment # 3: 417WB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        5.17 !         5.17

ROAD (0.00 + 28.52 + 45.30) = 45.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -12     -3   0.00  73.80   0.00 -13.73 -13.01   0.00   0.00 -18.54
28.52
-------------------------------------------------------------------------------
--
    -3      3   0.00  73.80   0.00 -13.73 -14.77   0.00   0.00   0.00
45.30
-------------------------------------------------------------------------------
--

Segment Leq : 45.39 dBA
```

```
Results segment # 4: 417EB1 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.75 !         6.75

ROAD (0.00 + 49.75 + 48.12) = 52.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -24   0.00  73.80   0.00 -13.92  -4.36   0.00   0.00  -5.77
49.75
-------------------------------------------------------------------------------
--
   -24    -12   0.00  73.80   0.00 -13.92 -11.76   0.00   0.00   0.00
48.12
-------------------------------------------------------------------------------
--

Segment Leq : 52.02 dBA
```

```
Results segment # 5: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        5.44 !         5.44

ROAD (0.00 + 30.04 + 45.11) = 45.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -12     -3   0.00  73.80   0.00 -13.92 -13.01   0.00   0.00 -16.83
30.04
-------------------------------------------------------------------------------
--
    -3      3   0.00  73.80   0.00 -13.92 -14.77   0.00   0.00   0.00
45.11
-------------------------------------------------------------------------------
--

Segment Leq : 45.24 dBA

Total Leq All Segments: 56.03 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 63.63
                           (NIGHT): 56.03
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-12-2017 12:57:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Kent (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           :   5.50 / 5.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 320.00 / 320.00 m
Receiver height           :   5.50 / 5.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 7.00 deg
Barrier height            :   6.00 m
Barrier receiver distance : 157.00 / 157.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 320.00 / 320.00 m
Receiver height           :   5.50 / 5.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 313.00 / 313.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 335.00 / 335.00 m
Receiver height           :   5.50 / 5.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 7.00 deg
Barrier height            :   6.00 m
Barrier receiver distance : 157.00 / 157.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 335.00 / 335.00 m
Receiver height           :   5.50 / 5.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 313.00 / 313.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 65.47 + 0.00) = 65.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  68.48   0.00   0.00  -3.01   0.00   0.00   0.00
65.47
-------------------------------------------------------------------------
--

Segment Leq : 65.47 dBA


Results segment # 2: 417WB1 (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 !        5.50 !        5.01 !         5.01

ROAD (0.00 + 60.21 + 48.56) = 60.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      7   0.00  81.40   0.00 -13.29  -2.69   0.00   0.00  -5.21
60.21
-------------------------------------------------------------------------
--
     7      9   0.00  81.40   0.00 -13.29 -19.54   0.00   0.00   0.00
48.56
-------------------------------------------------------------------------
--

Segment Leq : 60.50 dBA
```

```
Results segment # 3: 417WB2 (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 !        5.50 !        1.52 !         4.52

ROAD (0.00 + 53.90 + 0.00) = 53.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  81.40   0.00 -13.29  -3.47   0.00   0.00 -10.74
53.90
-------------------------------------------------------------------------------
--

Segment Leq : 53.90 dBA
```

```
Results segment # 4: 417EB1 (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 !        5.50 !        5.03 !         5.03

ROAD (0.00 + 60.03 + 48.36) = 60.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      7   0.00  81.40   0.00 -13.49  -2.69   0.00   0.00  -5.19
60.03
-------------------------------------------------------------------------------
--
     7      9   0.00  81.40   0.00 -13.49 -19.54   0.00   0.00   0.00
48.36
-------------------------------------------------------------------------------
--

Segment Leq : 60.31 dBA
```

```
Results segment # 5: 417EB2 (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 !        5.50 !        1.56 !         4.56

ROAD (0.00 + 56.45 + 0.00) = 56.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  81.40   0.00 -13.49  -3.47   0.00   0.00  -7.99
56.45
-------------------------------------------------------------------------------
--

Segment Leq : 56.45 dBA

Total Leq All Segments: 68.07 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 57.87 + 0.00) = 57.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  60.88   0.00   0.00  -3.01   0.00   0.00   0.00
57.87
-------------------------------------------------------------------------
--

Segment Leq : 57.87 dBA


Results segment # 2: 417WB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        5.50 !        5.01 !         5.01

ROAD (0.00 + 52.61 + 40.97) = 52.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      7   0.00  73.80   0.00 -13.29  -2.69   0.00   0.00  -5.21
52.61
-------------------------------------------------------------------------
--
     7      9   0.00  73.80   0.00 -13.29 -19.54   0.00   0.00   0.00
40.97
-------------------------------------------------------------------------
--

Segment Leq : 52.90 dBA
```

```
Results segment # 3: 417WB2 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        5.50 !        1.52 !         4.52

ROAD (0.00 + 46.30 + 0.00) = 46.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  73.80   0.00 -13.29  -3.47   0.00   0.00 -10.74
46.30
-------------------------------------------------------------------------------
--

Segment Leq : 46.30 dBA
```

```
Results segment # 4: 417EB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        5.50 !        5.03 !         5.03

ROAD (0.00 + 52.43 + 40.77) = 52.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      7   0.00  73.80   0.00 -13.49  -2.69   0.00   0.00  -5.19
52.43
-------------------------------------------------------------------------------
--
     7      9   0.00  73.80   0.00 -13.49 -19.54   0.00   0.00   0.00
40.77
-------------------------------------------------------------------------------
--

Segment Leq : 52.72 dBA
```

```
Results segment # 5: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        5.50 !        1.56 !         4.56

ROAD (0.00 + 48.85 + 0.00) = 48.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  73.80   0.00 -13.49  -3.47   0.00   0.00  -7.99
48.85
-------------------------------------------------------------------------------
--

Segment Leq : 48.85 dBA

Total Leq All Segments: 60.47 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.07
                           (NIGHT): 60.47
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-12-2017 12:58:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Kent (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           :  11.50 / 11.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 329.00 / 329.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -28.00 deg
Barrier height            :   9.00 m
Barrier receiver distance : 236.00 / 236.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           : -19.00 deg   15.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 329.00 / 329.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 6.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 236.00 / 236.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB3 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB3 (day/night)
----------------------------------------
Angle1   Angle2           :  15.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 329.00 / 329.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  15.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 321.00 / 321.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 344.00 / 344.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -28.00 deg
Barrier height            :   9.00 m
Barrier receiver distance : 236.00 / 236.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 6: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           : -19.00 deg   15.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 344.00 / 344.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 6.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 236.00 / 236.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 7: 417EB3 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 7: 417EB3 (day/night)
----------------------------------------
Angle1   Angle2           :  15.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 344.00 / 344.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  15.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 321.00 / 321.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 65.47 + 0.00) = 65.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  68.48   0.00   0.00  -3.01   0.00   0.00   0.00
65.47
-------------------------------------------------------------------------
--

Segment Leq : 65.47 dBA


Results segment # 2: 417WB1 (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 !       11.50 !        6.48 !         6.48

ROAD (0.00 + 57.29 + 54.98) = 59.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -28   0.00  81.40   0.00 -13.41  -4.63   0.00   0.00  -6.07
57.29
-------------------------------------------------------------------------
--
   -28    -19   0.00  81.40   0.00 -13.41 -13.01   0.00   0.00   0.00
54.98
-------------------------------------------------------------------------
--

Segment Leq : 59.29 dBA
```

```
Results segment # 3: 417WB2 (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 !       11.50 !        6.48 !         6.48

ROAD (0.00 + 45.51 + 54.98) = 55.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -19      6   0.00  81.40   0.00 -13.41  -8.57   0.00   0.00 -13.90
45.51
-------------------------------------------------------------------------------
--
     6     15   0.00  81.40   0.00 -13.41 -13.01   0.00   0.00   0.00
54.98
-------------------------------------------------------------------------------
--

Segment Leq : 55.44 dBA
```

```
Results segment # 4: 417WB3 (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 !       11.50 !        1.67 !         4.67

ROAD (0.00 + 54.31 + 0.00) = 54.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    15     90   0.00  81.40   0.00 -13.41  -3.80   0.00   0.00  -9.88
54.31
-------------------------------------------------------------------------------
--

Segment Leq : 54.31 dBA


Results segment # 5: 417EB1 (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 !       11.50 !        6.69 !         6.69

ROAD (0.00 + 57.33 + 54.78) = 59.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -28   0.00  81.40   0.00 -13.60  -4.63   0.00   0.00  -5.83
57.33
-------------------------------------------------------------------------------
--
   -28    -19   0.00  81.40   0.00 -13.60 -13.01   0.00   0.00   0.00
54.78
-------------------------------------------------------------------------------
--

Segment Leq : 59.25 dBA
```

```
Results segment # 6: 417EB2 (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 !       11.50 !        6.69 !         6.69

ROAD (0.00 + 45.99 + 54.78) = 55.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -19      6   0.00  81.40   0.00 -13.60  -8.57   0.00   0.00 -13.23
45.99
-------------------------------------------------------------------------------
--
     6     15   0.00  81.40   0.00 -13.60 -13.01   0.00   0.00   0.00
54.78
-------------------------------------------------------------------------------
--

Segment Leq : 55.32 dBA
```

```
Results segment # 7: 417EB3 (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 !       11.50 !        1.96 !         4.96

ROAD (0.00 + 56.85 + 0.00) = 56.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    15     90   0.00  81.40   0.00 -13.60  -3.80   0.00   0.00  -7.14
56.85
-------------------------------------------------------------------------------
--

Segment Leq : 56.85 dBA

Total Leq All Segments: 68.23 dBA


Results segment # 1: Kent (night)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.87 + 0.00) = 57.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  60.88   0.00   0.00  -3.01   0.00   0.00   0.00
57.87
-------------------------------------------------------------------------------
--

Segment Leq : 57.87 dBA
```

```
Results segment # 2: 417WB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.48 !         6.48

ROAD (0.00 + 49.69 + 47.38) = 51.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -28   0.00  73.80   0.00 -13.41  -4.63   0.00   0.00  -6.07
49.69
-------------------------------------------------------------------------------
--
   -28    -19   0.00  73.80   0.00 -13.41 -13.01   0.00   0.00   0.00
47.38
-------------------------------------------------------------------------------
--

Segment Leq : 51.70 dBA
```

```
Results segment # 3: 417WB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.48 !         6.48

ROAD (0.00 + 37.92 + 47.38) = 47.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -19      6   0.00  73.80   0.00 -13.41  -8.57   0.00   0.00 -13.90
37.92
-------------------------------------------------------------------------------
--
     6     15   0.00  73.80   0.00 -13.41 -13.01   0.00   0.00   0.00
47.38
-------------------------------------------------------------------------------
--

Segment Leq : 47.84 dBA
```

```
Results segment # 4: 417WB3 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        1.67 !         4.67

ROAD (0.00 + 46.71 + 0.00) = 46.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    15     90   0.00  73.80   0.00 -13.41  -3.80   0.00   0.00  -9.88
46.71
-------------------------------------------------------------------------------
--

Segment Leq : 46.71 dBA


Results segment # 5: 417EB1 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.69 !         6.69

ROAD (0.00 + 49.74 + 47.18) = 51.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -28   0.00  73.80   0.00 -13.60  -4.63   0.00   0.00  -5.83
49.74
-------------------------------------------------------------------------------
--
   -28    -19   0.00  73.80   0.00 -13.60 -13.01   0.00   0.00   0.00
47.18
-------------------------------------------------------------------------------
--

Segment Leq : 51.65 dBA
```

```
Results segment # 6: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        6.69 !         6.69

ROAD (0.00 + 38.39 + 47.18) = 47.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -19      6   0.00  73.80   0.00 -13.60  -8.57   0.00   0.00 -13.23
38.39
-------------------------------------------------------------------------------
--
     6     15   0.00  73.80   0.00 -13.60 -13.01   0.00   0.00   0.00
47.18
-------------------------------------------------------------------------------
--

Segment Leq : 47.72 dBA
```

```
Results segment # 7: 417EB3 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        1.96 !         4.96

ROAD (0.00 + 49.25 + 0.00) = 49.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    15     90   0.00  73.80   0.00 -13.60  -3.80   0.00   0.00  -7.14
49.25
-------------------------------------------------------------------------------
--

Segment Leq : 49.25 dBA

Total Leq All Segments: 60.64 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.23
                           (NIGHT): 60.64
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-12-2017 12:58:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (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  :  34.00 / 34.00  m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -37.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Kent (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           :  11.50 / 11.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB (day/night)
---------------------------------------
Angle1   Angle2           :   4.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 355.00 / 355.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   8.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 347.00 / 347.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417EB (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB (day/night)
---------------------------------------
Angle1   Angle2           :   4.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 370.00 / 370.00 m
Receiver height           :  11.50 / 11.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   8.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 347.00 / 347.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Gladstone (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 !       11.50 !        4.73 !         4.73

ROAD (0.00 + 48.04 + 57.09) = 57.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -37   0.00  67.51   0.00  -3.55  -5.31   0.00   0.00 -10.60
48.04
-------------------------------------------------------------------------------
--
   -37      0   0.00  67.51   0.00  -3.55  -6.87   0.00   0.00   0.00
57.09
-------------------------------------------------------------------------------
--

Segment Leq : 57.60 dBA
```

```
Results segment # 2: Kent (day)
-------------------------------

Source height = 1.50 m

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

Segment Leq : 68.48 dBA


Results segment # 3: 417WB (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 !       11.50 !        1.65 !         4.65

ROAD (51.12 + 54.15 + 0.00) = 55.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     4      8   0.00  81.40   0.00 -13.74 -16.53   0.00   0.00   0.00
51.12
-------------------------------------------------------------------------
--
     8     90   0.00  81.40   0.00 -13.74  -3.41   0.00   0.00 -10.09
54.15
-------------------------------------------------------------------------
--

Segment Leq : 55.90 dBA
```

```
Results segment # 4: 417EB (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 !       11.50 !        1.93 !         4.93

ROAD (50.94 + 56.77 + 0.00) = 57.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     4      8   0.00  81.40   0.00 -13.92 -16.53   0.00   0.00   0.00
50.94
-------------------------------------------------------------------------------
--
     8     90   0.00  81.40   0.00 -13.92  -3.41   0.00   0.00  -7.29
56.77
-------------------------------------------------------------------------------
--

Segment Leq : 57.78 dBA

Total Leq All Segments: 69.35 dBA
```

```
Results segment # 1: Gladstone (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 !       11.50 !        4.73 !         4.73

ROAD (0.00 + 40.44 + 49.49) = 50.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -37   0.00  59.91   0.00  -3.55  -5.31   0.00   0.00 -10.60
40.44
-------------------------------------------------------------------------------
--
   -37      0   0.00  59.91   0.00  -3.55  -6.87   0.00   0.00   0.00
49.49
-------------------------------------------------------------------------------
--

Segment Leq : 50.00 dBA
```

```
Results segment # 2: Kent (night)
---------------------------------

Source height = 1.50 m

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

Segment Leq : 60.88 dBA


Results segment # 3: 417WB (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        1.65 !         4.65

ROAD (43.53 + 46.55 + 0.00) = 48.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     4       8   0.00  73.80   0.00 -13.74 -16.53   0.00   0.00   0.00
43.53
-------------------------------------------------------------------------
--
     8      90   0.00  73.80   0.00 -13.74  -3.41   0.00   0.00 -10.09
46.55
-------------------------------------------------------------------------
--

Segment Leq : 48.31 dBA
```

```
Results segment # 4: 417EB (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       11.50 !        1.93 !         4.93

ROAD (43.35 + 49.17 + 0.00) = 50.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     4      8   0.00  73.80   0.00 -13.92 -16.53   0.00   0.00   0.00
43.35
-------------------------------------------------------------------------------
--
     8     90   0.00  73.80   0.00 -13.92  -3.41   0.00   0.00  -7.29
49.17
-------------------------------------------------------------------------------
--

Segment Leq : 50.18 dBA

Total Leq All Segments: 61.75 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 69.35
                           (NIGHT): 61.75
```

```
STAMSON 5.0        NORMAL REPORT        Date: 20-03-2018 66:09:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (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  :  51.00 / 51.00  m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :  18.00 / 18.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Kent (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           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 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 # 3: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -17.00 deg   Angle2 : -5.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 255.00 / 255.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 331.00 / 331.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -17.00 deg   Angle2 : -5.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 255.00 / 255.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 6: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 331.00 / 331.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !        10.56

ROAD (0.00 + 51.03 + 0.00) = 51.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  67.51   0.00  -5.31   0.00   0.00   0.00 -11.16
51.03
-------------------------------------------------------------------------------
--

Segment Leq : 51.03 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00 -14.95
53.53
-------------------------------------------------------------------------------
--

Segment Leq : 53.53 dBA
```

```
Results segment # 3: 417WB1 (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 !       15.50 !        7.20 !         7.20

ROAD (63.95 + 42.81 + 56.78) = 64.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -17   0.00  81.40   0.00 -13.53  -3.92   0.00   0.00   0.00
63.95
-------------------------------------------------------------------------------
--
   -17     -5   0.00  81.40   0.00 -13.53 -11.76   0.00   0.00 -13.30
42.81
-------------------------------------------------------------------------------
--
    -5      9   0.00  81.40   0.00 -13.53 -11.09   0.00   0.00   0.00
56.78
-------------------------------------------------------------------------------
--

Segment Leq : 64.74 dBA
```

```
Results segment # 4: 417WB2 (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 !       15.50 !        1.72 !         4.72

ROAD (0.00 + 54.17 + 0.00) = 54.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  81.40   0.00 -13.53  -3.47   0.00   0.00 -10.24
54.17
-------------------------------------------------------------------------------
--

Segment Leq : 54.17 dBA
```

```
Results segment # 5: 417EB1 (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 !       15.50 !        7.55 !         7.55

ROAD (63.76 + 43.54 + 56.59) = 64.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -17   0.00  81.40   0.00 -13.72  -3.92   0.00   0.00   0.00
63.76
-------------------------------------------------------------------------------
--
   -17     -5   0.00  81.40   0.00 -13.72 -11.76   0.00   0.00 -12.38
43.54
-------------------------------------------------------------------------------
--
    -5      9   0.00  81.40   0.00 -13.72 -11.09   0.00   0.00   0.00
56.59
-------------------------------------------------------------------------------
--

Segment Leq : 64.56 dBA
```

```
Results segment # 6: 417EB2 (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 !       15.50 !        2.18 !         5.18

ROAD (0.00 + 57.28 + 0.00) = 57.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  81.40   0.00 -13.72  -3.47   0.00   0.00  -6.93
57.28
-------------------------------------------------------------------------------
--

Segment Leq : 57.28 dBA

Total Leq All Segments: 68.44 dBA
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !        10.56

ROAD (0.00 + 43.43 + 0.00) = 43.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  59.91   0.00  -5.31   0.00   0.00   0.00 -11.16
43.43
-------------------------------------------------------------------------------
--

Segment Leq : 43.43 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 45.93 + 0.00) = 45.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00 -14.95
45.93
-------------------------------------------------------------------------------
--

Segment Leq : 45.93 dBA
```

```
Results segment # 3: 417WB1 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        7.20 !         7.20

ROAD (56.35 + 35.21 + 49.18) = 57.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -17   0.00  73.80   0.00 -13.53  -3.92   0.00   0.00   0.00
56.35
-------------------------------------------------------------------------------
--
   -17     -5   0.00  73.80   0.00 -13.53 -11.76   0.00   0.00 -13.30
35.21
-------------------------------------------------------------------------------
--
    -5      9   0.00  73.80   0.00 -13.53 -11.09   0.00   0.00   0.00
49.18
-------------------------------------------------------------------------------
--

Segment Leq : 57.14 dBA
```

```
Results segment # 4: 417WB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        1.72 !         4.72

ROAD (0.00 + 46.57 + 0.00) = 46.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  73.80   0.00 -13.53  -3.47   0.00   0.00 -10.24
46.57
-------------------------------------------------------------------------------
--

Segment Leq : 46.57 dBA
```

```
Results segment # 5: 417EB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        7.55 !         7.55

ROAD (56.16 + 35.94 + 48.99) = 56.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -17   0.00  73.80   0.00 -13.72  -3.92   0.00   0.00   0.00
56.16
-------------------------------------------------------------------------------
--
   -17     -5   0.00  73.80   0.00 -13.72 -11.76   0.00   0.00 -12.38
35.94
-------------------------------------------------------------------------------
--
    -5      9   0.00  73.80   0.00 -13.72 -11.09   0.00   0.00   0.00
48.99
-------------------------------------------------------------------------------
--

Segment Leq : 56.96 dBA
```

```
Results segment # 6: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        2.18 !         5.18

ROAD (0.00 + 49.68 + 0.00) = 49.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     9     90   0.00  73.80   0.00 -13.72  -3.47   0.00   0.00  -6.93
49.68
-------------------------------------------------------------------------------
--

Segment Leq : 49.68 dBA

Total Leq All Segments: 60.84 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.44
                           (NIGHT): 60.84
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-04-2018 107:58:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (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  :  51.00 / 51.00  m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :  18.00 / 18.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Kent (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           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 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 # 3: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -17.00 deg   Angle2 : -5.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 255.00 / 255.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 331.00 / 331.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -17.00 deg   Angle2 : -5.00 deg
Barrier height            :  14.00 m
Barrier receiver distance : 255.00 / 255.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 6: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.00 m
Barrier receiver distance : 331.00 / 331.00 m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !        10.56

ROAD (0.00 + 51.03 + 0.00) = 51.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  67.51   0.00  -5.31   0.00   0.00   0.00 -11.16
51.03
-------------------------------------------------------------------------
------

Segment Leq : 51.03 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00 -14.95
53.53
-------------------------------------------------------------------------
------

Segment Leq : 53.53 dBA
```

```
Results segment # 3: 417WB1 (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 !       15.50 !        7.20 !         7.20

ROAD (63.95 + 42.81 + 56.78) = 64.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90    -17   0.00  81.40   0.00 -13.53  -3.92   0.00   0.00   0.00
63.95
-------------------------------------------------------------------------
------
   -17     -5   0.00  81.40   0.00 -13.53 -11.76   0.00   0.00 -13.30
42.81
-------------------------------------------------------------------------
------
    -5      9   0.00  81.40   0.00 -13.53 -11.09   0.00   0.00   0.00
56.78
-------------------------------------------------------------------------
------

Segment Leq : 64.74 dBA
```

```
Results segment # 4: 417WB2 (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 !       15.50 !        1.72 !         4.72

ROAD (0.00 + 54.17 + 0.00) = 54.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  81.40   0.00 -13.53  -3.47   0.00   0.00 -10.24
54.17
-------------------------------------------------------------------------
------

Segment Leq : 54.17 dBA
```

```
Results segment # 5: 417EB1 (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 !       15.50 !        7.55 !         7.55

ROAD (63.76 + 43.54 + 56.59) = 64.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90    -17   0.00  81.40   0.00 -13.72  -3.92   0.00   0.00   0.00
63.76
-------------------------------------------------------------------------
------
   -17     -5   0.00  81.40   0.00 -13.72 -11.76   0.00   0.00 -12.38
43.54
-------------------------------------------------------------------------
------
    -5      9   0.00  81.40   0.00 -13.72 -11.09   0.00   0.00   0.00
56.59
-------------------------------------------------------------------------
------

Segment Leq : 64.56 dBA
```

```
Results segment # 6: 417EB2 (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 !       15.50 !        2.18 !         5.18

ROAD (0.00 + 57.28 + 0.00) = 57.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  81.40   0.00 -13.72  -3.47   0.00   0.00  -6.93
57.28
-------------------------------------------------------------------------
------

Segment Leq : 57.28 dBA

Total Leq All Segments: 68.44 dBA
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !        10.56

ROAD (0.00 + 43.43 + 0.00) = 43.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  59.91   0.00  -5.31   0.00   0.00   0.00 -11.16
43.43
-------------------------------------------------------------------------
------

Segment Leq : 43.43 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 45.93 + 0.00) = 45.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00 -14.95
45.93
-------------------------------------------------------------------------
------

Segment Leq : 45.93 dBA
```

```
Results segment # 3: 417WB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        7.20 !         7.20

ROAD (56.35 + 35.21 + 49.18) = 57.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90    -17   0.00  73.80   0.00 -13.53  -3.92   0.00   0.00   0.00
56.35
-------------------------------------------------------------------------
------
   -17     -5   0.00  73.80   0.00 -13.53 -11.76   0.00   0.00 -13.30
35.21
-------------------------------------------------------------------------
------
    -5      9   0.00  73.80   0.00 -13.53 -11.09   0.00   0.00   0.00
49.18
-------------------------------------------------------------------------
------

Segment Leq : 57.14 dBA
```

```
Results segment # 4: 417WB2 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        1.72 !         4.72

ROAD (0.00 + 46.57 + 0.00) = 46.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  73.80   0.00 -13.53  -3.47   0.00   0.00 -10.24
46.57
-------------------------------------------------------------------------
------

Segment Leq : 46.57 dBA
```

```
Results segment # 5: 417EB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        7.55 !         7.55

ROAD (56.16 + 35.94 + 48.99) = 56.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90    -17   0.00  73.80   0.00 -13.72  -3.92   0.00   0.00   0.00
56.16
-------------------------------------------------------------------------
------
   -17     -5   0.00  73.80   0.00 -13.72 -11.76   0.00   0.00 -12.38
35.94
-------------------------------------------------------------------------
------
    -5      9   0.00  73.80   0.00 -13.72 -11.09   0.00   0.00   0.00
48.99
-------------------------------------------------------------------------
------

Segment Leq : 56.96 dBA
```

```
Results segment # 6: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !        2.18 !         5.18

ROAD (0.00 + 49.68 + 0.00) = 49.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  73.80   0.00 -13.72  -3.47   0.00   0.00  -6.93
49.68
-------------------------------------------------------------------------
------

Segment Leq : 49.68 dBA

Total Leq All Segments: 60.84 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.44
                           (NIGHT): 60.84
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-04-2018 107:58:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6b2.te              Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (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  :  51.00 / 51.00  m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  23.00 m
Barrier receiver distance :  18.00 / 18.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Kent (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           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  23.00 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 # 3: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 9.00 deg
Barrier height            :  23.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 338.00 / 338.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :  23.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            : -90.00 deg   Angle2 : 9.00 deg
Barrier height            :  23.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 6: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 353.00 / 353.00 m
Receiver height           :  15.50 / 15.50  m
Topography                :      2       (Flat/gentle slope; with
barrier)
Barrier angle1            :   9.00 deg   Angle2 : 90.00 deg
Barrier height            :  23.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   3.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !         10.56

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
-------------------------------------------------------------------------
------
   -90     90   0.00  67.51   0.00  -5.31   0.00   0.00   0.00 -18.16
44.03
-------------------------------------------------------------------------
------

Segment Leq : 44.03 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 49.44 + 0.00) = 49.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00 -19.04
49.44
-------------------------------------------------------------------------
------

Segment Leq : 49.44 dBA
```

```
Results segment # 3: 417WB1 (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 !       15.50 !       15.17 !        15.17

ROAD (0.00 + 48.32 + 0.00) = 48.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90      9   0.00  81.40   0.00 -13.53  -2.60   0.00   0.00 -16.95
48.32
-------------------------------------------------------------------------
------

Segment Leq : 48.32 dBA
```

```
Results segment # 4: 417WB2 (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 !       15.50 !       12.17 !         15.17

ROAD (0.00 + 46.70 + 0.00) = 46.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  81.40   0.00 -13.53  -3.47   0.00   0.00 -17.70
46.70
-------------------------------------------------------------------------
------

Segment Leq : 46.70 dBA
```

```
Results segment # 5: 417EB1 (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 !       15.50 !       15.19 !        15.19

ROAD (0.00 + 48.15 + 0.00) = 48.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90      9   0.00  81.40   0.00 -13.72  -2.60   0.00   0.00 -16.94
48.15
-------------------------------------------------------------------------
------

Segment Leq : 48.15 dBA
```

```
Results segment # 6: 417EB2 (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 !       15.50 !       12.19 !        15.19

ROAD (0.00 + 46.52 + 0.00) = 46.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  81.40   0.00 -13.72  -3.47   0.00   0.00 -17.69
46.52
-------------------------------------------------------------------------
------

Segment Leq : 46.52 dBA

Total Leq All Segments: 55.29 dBA
```

```
Results segment # 1: Gladstone (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 !       15.50 !       10.56 !         10.56

ROAD (0.00 + 36.43 + 0.00) = 36.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  59.91   0.00  -5.31   0.00   0.00   0.00 -18.16
36.43
-------------------------------------------------------------------------
------

Segment Leq : 36.43 dBA
```

```
Results segment # 2: Kent (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 !       15.50 !        8.96 !         8.96

ROAD (0.00 + 41.85 + 0.00) = 41.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00 -19.04
41.85
-------------------------------------------------------------------------
------

Segment Leq : 41.85 dBA
```

```
Results segment # 3: 417WB1 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !       15.17 !        15.17

ROAD (0.00 + 40.73 + 0.00) = 40.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90      9   0.00  73.80   0.00 -13.53  -2.60   0.00   0.00 -16.95
40.73
-------------------------------------------------------------------------
------

Segment Leq : 40.73 dBA
```

```
Results segment # 4: 417WB2 (night)
----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !       12.17 !        15.17

ROAD (0.00 + 39.11 + 0.00) = 39.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  73.80   0.00 -13.53  -3.47   0.00   0.00 -17.70
39.11
-------------------------------------------------------------------------
------

Segment Leq : 39.11 dBA
```

```
Results segment # 5: 417EB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !       15.19 !        15.19

ROAD (0.00 + 40.55 + 0.00) = 40.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
   -90      9   0.00  73.80   0.00 -13.72  -2.60   0.00   0.00 -16.94
40.55
-------------------------------------------------------------------------
------

Segment Leq : 40.55 dBA
```

```
Results segment # 6: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !       15.50 !       12.19 !        15.19

ROAD (0.00 + 38.93 + 0.00) = 38.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
------
     9     90   0.00  73.80   0.00 -13.72  -3.47   0.00   0.00 -17.69
38.93
-------------------------------------------------------------------------
------

Segment Leq : 38.93 dBA

Total Leq All Segments: 47.70 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 55.29
                           (NIGHT): 47.70
```

```
STAMSON 5.0        NORMAL REPORT        Date: 20-03-2018 66:09:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Gladstone (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    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):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Gladstone (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  :  46.00 / 46.00  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            :   8.00 m
Barrier receiver distance :  17.00 / 17.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Kent (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  :  32.00 / 32.00  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            :  14.00 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 342.00 / 342.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 30.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           :  30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 342.00 / 342.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 357.00 / 357.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 30.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 59370/5163  veh/TimePeriod  *
Medium truck volume :  4723/411   veh/TimePeriod  *
Heavy truck volume  :  3373/293   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  73333
    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 # 6: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           :  30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 357.00 / 357.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

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

ROAD (0.00 + 47.94 + 0.00) = 47.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  67.51   0.00  -4.87   0.00   0.00   0.00 -14.71
47.94
-------------------------------------------------------------------------------
--

Segment Leq : 47.94 dBA
```

```
Results segment # 2: Kent (day)
-------------------------------

Source height = 1.50 m

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

ROAD (0.00 + 46.43 + 0.00) = 46.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00  -3.29   0.00   0.00   0.00 -18.76
46.43
-------------------------------------------------------------------------------
--

Segment Leq : 46.43 dBA
```

```
Results segment # 3: 417WB1 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 49.04 + 0.00) = 49.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     30   0.00  81.40   0.00 -13.58  -1.76   0.00   0.00 -17.01
49.04
-------------------------------------------------------------------------------
--

Segment Leq : 49.04 dBA
```

```
Results segment # 4: 417WB2 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 44.95 + 0.00) = 44.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  81.40   0.00 -13.58  -4.77   0.00   0.00 -18.09
44.95
-------------------------------------------------------------------------------
--

Segment Leq : 44.95 dBA
```

```
Results segment # 5: 417EB1 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 48.86 + 0.00) = 48.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     30   0.00  81.40   0.00 -13.77  -1.76   0.00   0.00 -17.01
48.86
-------------------------------------------------------------------------------
--

Segment Leq : 48.86 dBA
```

```
Results segment # 6: 417EB2 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 44.77 + 0.00) = 44.77 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  81.40   0.00 -13.77  -4.77   0.00   0.00 -18.09
44.77
-------------------------------------------------------------------------------
--

Segment Leq : 44.77 dBA

Total Leq All Segments: 55.11 dBA
```

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

Source height = 1.50 m

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

ROAD (0.00 + 40.34 + 0.00) = 40.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  59.91   0.00  -4.87   0.00   0.00   0.00 -14.71
40.34
-------------------------------------------------------------------------------
--

Segment Leq : 40.34 dBA
```

```
Results segment # 2: Kent (night)
---------------------------------

Source height = 1.50 m

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

ROAD (0.00 + 38.83 + 0.00) = 38.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00  -3.29   0.00   0.00   0.00 -18.76
38.83
-------------------------------------------------------------------------------
--

Segment Leq : 38.83 dBA
```

```
Results segment # 3: 417WB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 41.45 + 0.00) = 41.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     30    0.00  73.80   0.00 -13.58  -1.76   0.00   0.00 -17.01
41.45
-------------------------------------------------------------------------------
--

Segment Leq : 41.45 dBA
```

```
Results segment # 4: 417WB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 37.36 + 0.00) = 37.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  73.80   0.00 -13.58  -4.77   0.00   0.00 -18.09
37.36
-------------------------------------------------------------------------------
--

Segment Leq : 37.36 dBA
```

```
Results segment # 5: 417EB1 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 41.26 + 0.00) = 41.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     30   0.00  73.80   0.00 -13.77  -1.76   0.00   0.00 -17.01
41.26
-------------------------------------------------------------------------------
--

Segment Leq : 41.26 dBA
```

```
Results segment # 6: 417EB2 (night)
-----------------------------------

Source height = 1.49 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.49 !        1.50 !        1.54 !         1.54

ROAD (0.00 + 37.17 + 0.00) = 37.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  73.80   0.00 -13.77  -4.77   0.00   0.00 -18.09
37.17
-------------------------------------------------------------------------------
--

Segment Leq : 37.17 dBA

Total Leq All Segments: 47.52 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.11
                           (NIGHT): 47.52
```