Transportation Noise Feasibility Assessment

100 Argyle Avenue

Ottawa, Ontario

REPORT: GWE18-108 – Traffic Noise

Prepared For:

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EXECUTIVE SUMMARY

This document describes a roadway traffic noise feasibility assessment performed for a proposed residential-use development located at 100 Argyle Avenue in Ottawa, Ontario. The proposed development comprises a 21-storey residential building with a three-storey podium. The planned building would comprise residential units with commercial space at grade. Outdoor amenity space is provided at the 4th Floor terrace, atop the podium. Major sources of noise are roadway traffic along Metcalfe Road, Argyle Avenue, Elgin 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, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); and (iii) architectural drawings received from RLA Architecture, dated July 12, 2018.

The results of the current analysis indicate that noise levels will range between 67 and 74 dBA during the daytime period (07:00-23:00) and between 59 and 66 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 74 dBA) occurs along the building's south facing façade, which is nearest and most exposed to Highway 417.

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. Upgraded building components, including STC rated glazing elements and exterior walls, will be required where noise levels exceed 65 dBA, as discussed in Section 4.2.1. Results of the calculations also indicate that the development will require air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment.

Noise levels at the 4th floor terrace (Receptor 5) are expected to approach 71 dBA during the daytime period. If this area is to be used as an outdoor living area, noise control measures are required to reduce the L_{eq} to 55 dBA, where feasible. Consideration of a 4.5 m noise barrier surrounding the south edge of the terrace, with a 1.5 m noise barrier surrounding the north edge of the terrace, proved that noise levels could only be reduced to 60 dBA, as illustrated in Figure 3. Any barrier greater than 2.5 m is generally considered not feasible, as it would require City approval, and block the natural views from the rooftop

terrace. To limit noise barrier heights, the orientation of the building should provide sheltered areas for outdoor livings areas. The details of the outdoor noise mitigation, however, can be refined during the site plan control state of the project.

In addition to these requirements, Warning Clauses will also be required be placed on all Lease, Purchase and Sale Agreements. Specific noise control measures can be developed once the design of the building has progressed sufficiently, these are typically identified at the time of site plan control.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Colonade BridgePort to undertake a roadway traffic feasibility assessment for a proposed residential-use development located at 100 Argyle Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to a roadway traffic noise feasibility assessment, prepared in consideration of a rezoning application. GWE's scope of work involved assessing exterior noise and vibration levels generated by local roadway traffic. The assessment was performed based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings received from RLA Architecture, dated July 12, 2018, with future roadway traffic volumes based on the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this roadway traffic noise feasibility assessment is the proposed residential development located at 100 Argyle Avenue in Ottawa, Ontario. The study site is situated on a parcel of land just south of the Argyle Avenue where Metcalfe Road jogs around the Museum of Nature. Major sources of noise are roadway traffic along Metcalfe Road, Argyle Avenue, Elgin Street and Highway 417. Figure 1 illustrates a site plan with surrounding context.

The proposed development comprises a 21-storey building with a three-storey podium. The planned building would comprise residential units with, a lobby, administration offices, utility room and a gym at grade. An indoor amenity space is located on the second floor. Outdoor amenity space is provided at the 4th Floor terrace, atop the podium. Private balconies are not considered to be noise sensitive unless they are greater than 4 metres in depth according to city's Environmental Noise Control Guidelines (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) determine whether noise levels exceed the allowable limits specified by the ENCG, as outlined in Section 4 of this report.

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

[2] Ontario Ministry of the Environment, Conservation and Parks– 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 NPC-300 guidelines specify that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for retail space, residence living rooms and residence sleeping quarters respectively, as listed in Table 1. To account for deficiencies in building construction, theses levels should be targeted toward 47, 42 and 37 dBA.

TABLE 1: INDOOR SOUND LEVEL CRITERIA[3]

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[5]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which 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[6].

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

[3] Adapted from Table C-2, Part C, Section 3.2.3 of NPC-300
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[5] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[7] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes 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 Class	Speed Limit (km/h)	ENCG AADT Count
Metcalfe Road	2-UAU	50	**15,000**
Argyle Avenue	2-UAU	50	**15,000**
Elgin Street	4-UAU	50	**30,000**
Highway 417 Westbound	6-Freeway	100	**55,000**
Highway 417 Eastbound		100	**55,000**

4.2.3 Theoretical Roadway Traffic Noise Predictions

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road and rail analysis. Roadway noise calculations were performed by treating each road segment as separate line sources of noise, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 2 below, 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.
- Reflective intermediate ground surfaces used for POW receptors.
- Absorptive intermediate ground surfaces used for OLA receptor.
- Receptor heights placed at 1.5 and 48.5 m for ground floor and 16th Floor receptors respectively.
- Surrounding buildings used as noise barriers.

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

- The study site was treated as having flat/gently slopping topography, with Highway 417 being elevated 3 m.
- Noise receptors were strategically placed at five locations around the study area as illustrated in Figure 2.

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 STAMSON 5.04 input data is illustrated in Figure 3 to 7.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor Number	Receptor Location	Roadway Noise Levels (dBA)	
		Day	Night
1	16th Floor – North Façade	67	59
2	16th Floor – East Façade	71	63
3	16th Floor – South Façade	74	66
4	16th Floor – West Façade	71	64
5	4th Floor Terrace	71	64

The results of the current analysis indicate that noise levels will range between 67 and 74 dBA during the daytime period (07:00-23:00) and between 59 and 66 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 74 dBA) occurs along the building's south facing façade, which is nearest and most exposed to Highway 417.

5.2 Noise Barrier Calculation

Noise levels at the 4th floor terrace (Receptor 5) are expected to approach 71 dBA during the daytime period. If this area is to be used as an outdoor living area, noise control measures are required to reduce the L_{eq} to 55 dBA, where feasible. Consideration of a 4.5 m noise barrier surrounding the south edge of the terrace, with a 1.5 m noise barrier surrounding the north edge of the terrace, proved that noise levels can only be reduced to 60 dBA, as illustrated in Figure 3. Any barrier greater than 2.5 m is generally

considered not feasible, as it would require City approval, and block the natural views from the rooftop terrace. To limit noise barrier heights, the orientation of the building should provide sheltered areas for outdoor livings areas. The details of the outdoor noise mitigation, however, can be refined during the site plan control state of the project.

TABLE 4: RESULTS OF BARRIER INVESTIGATION

Location	Reference Receptors	Barrier Height (m)	Daytime L_{EQ} Noise Levels (dBA)	
			Without Barrier	With Barrier
4th Floor Terrace	5	1.5	71	66
		4.5		60

6. CONCLUSIONS AND RECOMMENDATIONS

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. Upgraded building components, including STC rated glazing elements and exterior walls, will be required where noise levels exceed 65 dBA, as discussed in Section 4.2.1. Results of the calculations also indicate that the development will require air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment.

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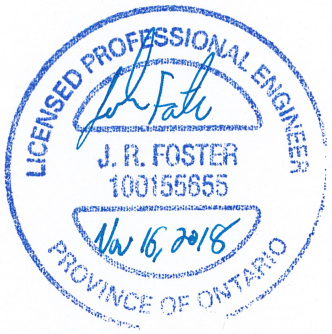
In addition to these requirements, Warning Clauses will also be required be placed on all Lease, Purchase and Sale Agreements. Specific noise control measures can be developed once the design of the building has progressed sufficiently, these are typically identified at the time of site plan control.

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.

Sincerely,

Gradient Wind Engineering Inc.



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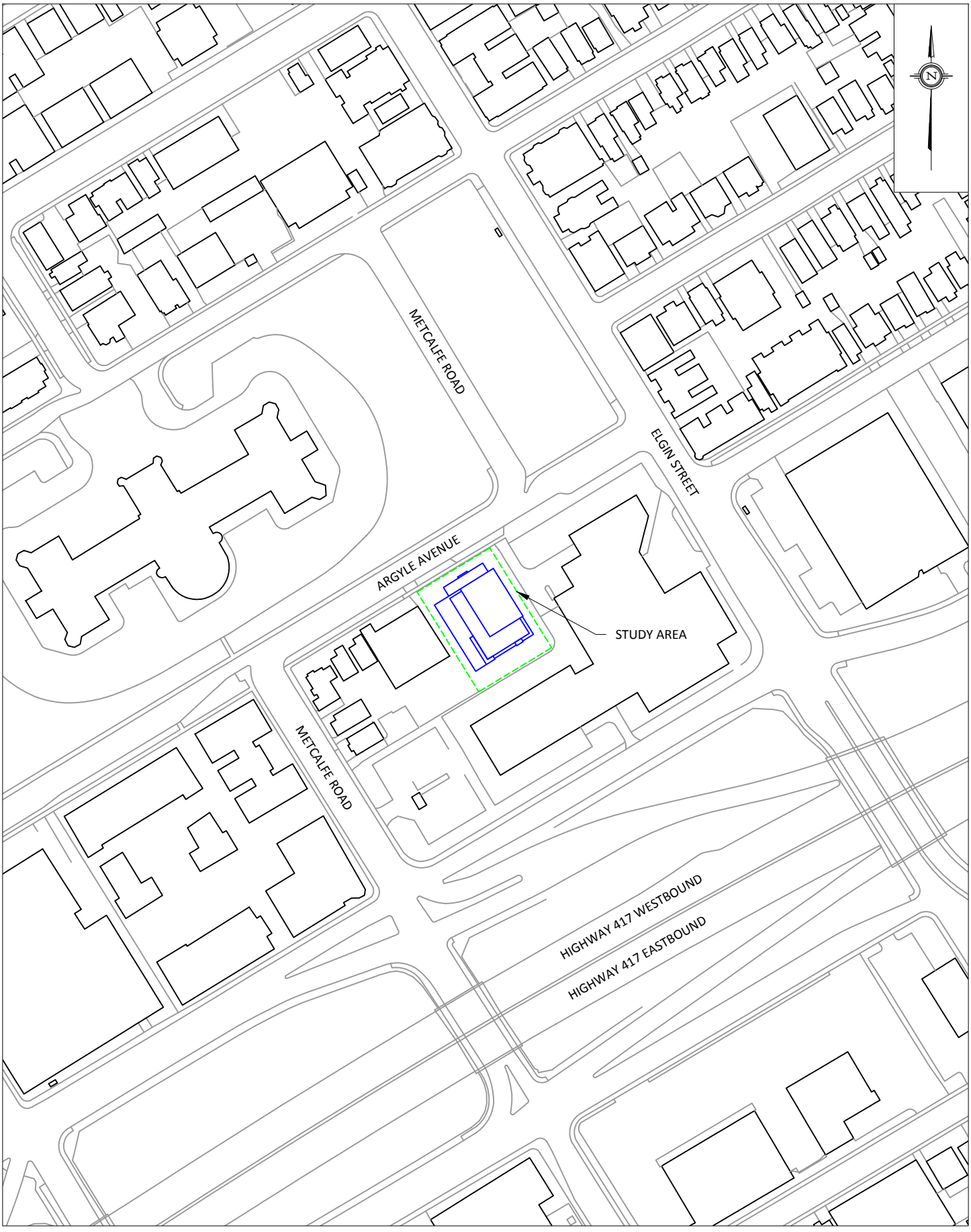

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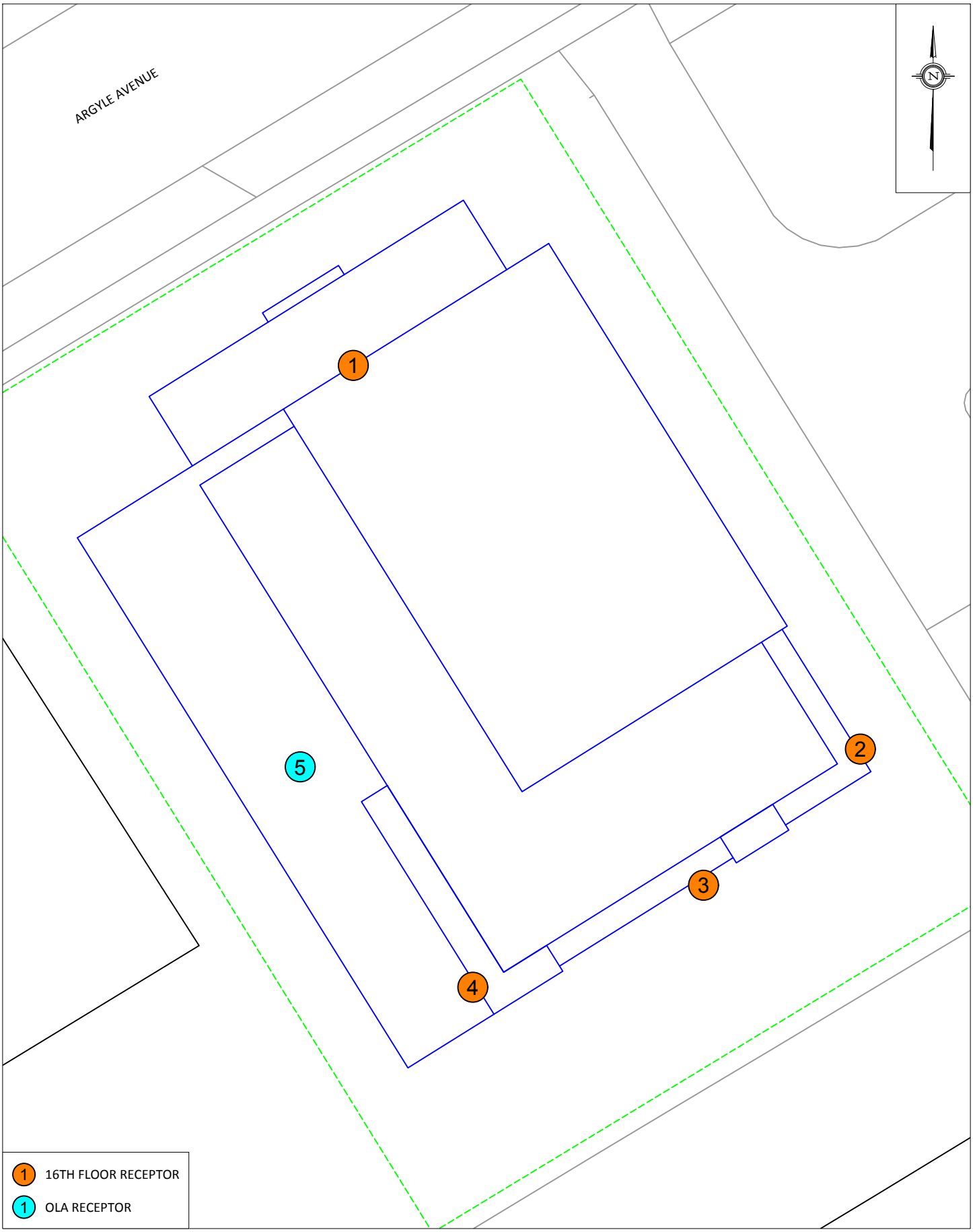
GRADIENT WIND ENGINEERING INC

PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GWE18-108-1
DATE	NOVEMBER 8, 2018
DRAWN BY	M.L.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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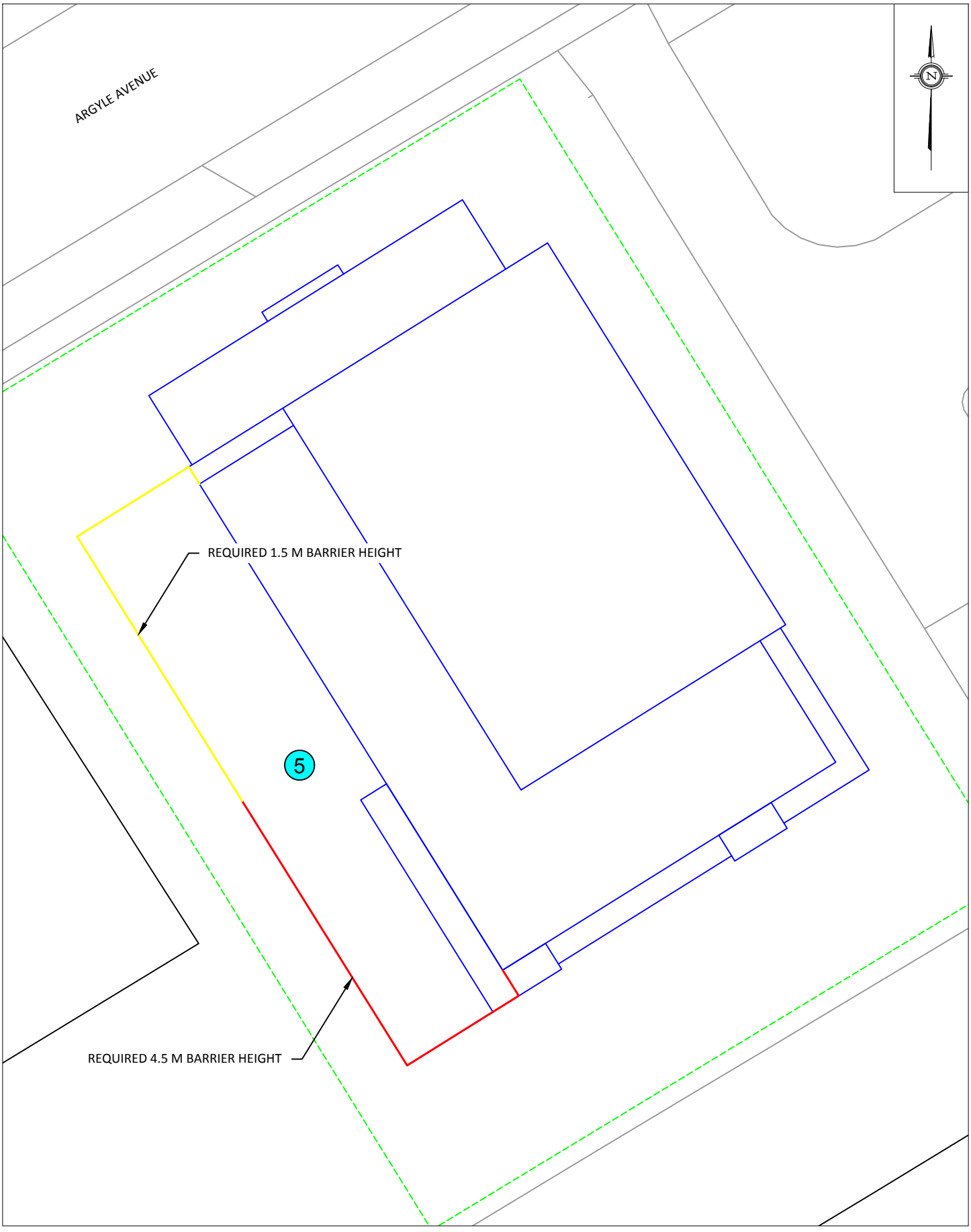
PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT
SCALE	1:250 (APPROX.)
DRAWING NO.	GWE18-108-2
DATE	AUGUST 8, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 2: RECEPTOR LOCATIONS



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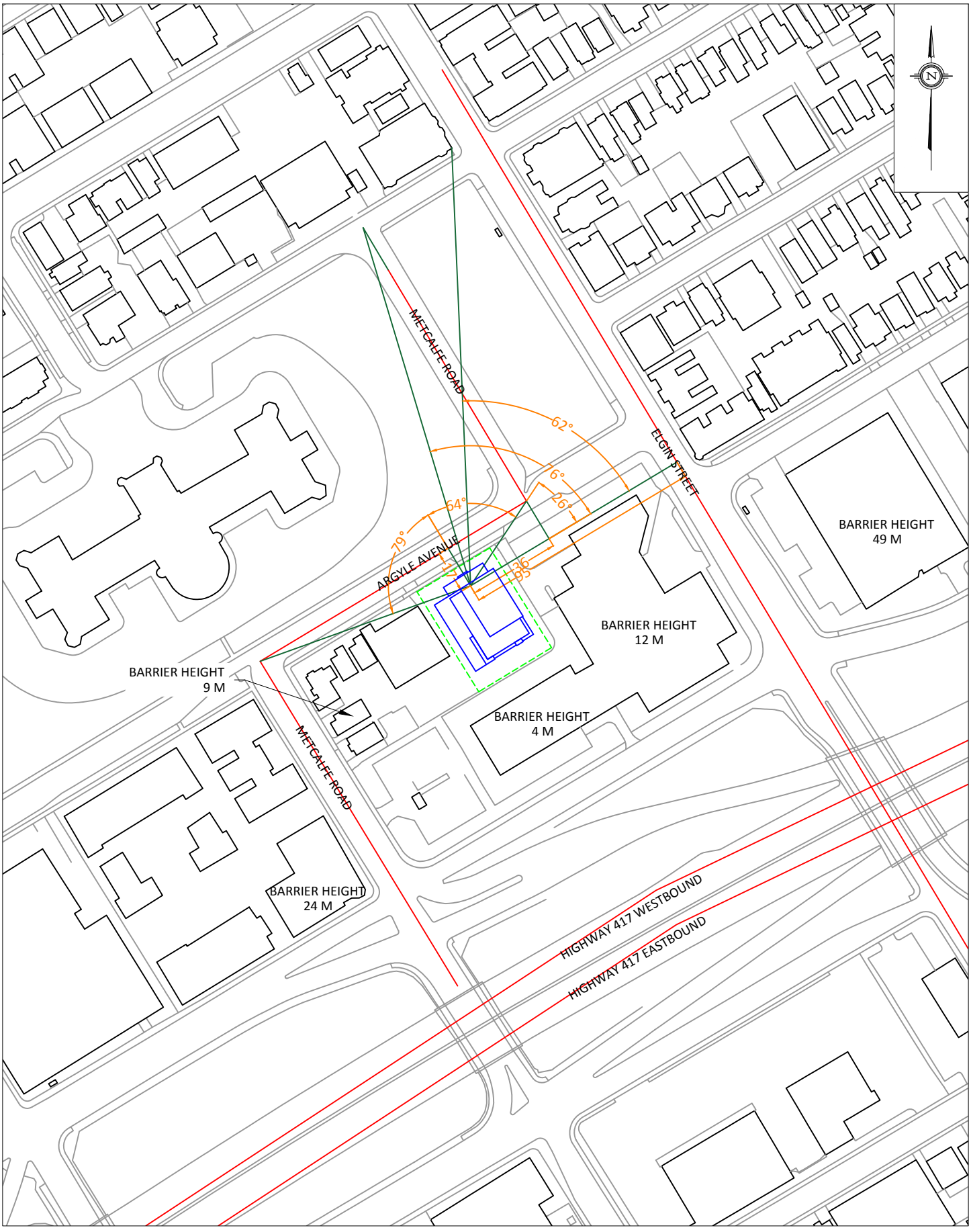
GRADIENT WIND ENGINEERING INC

PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:250 (APPROX.)	DRAWING NO.	GWE18-108-3
DATE	NOVEMBER 8, 2018	DRAWN BY	M.L.

FIGURE 3:
NOISE BARRIER LOCATIONS



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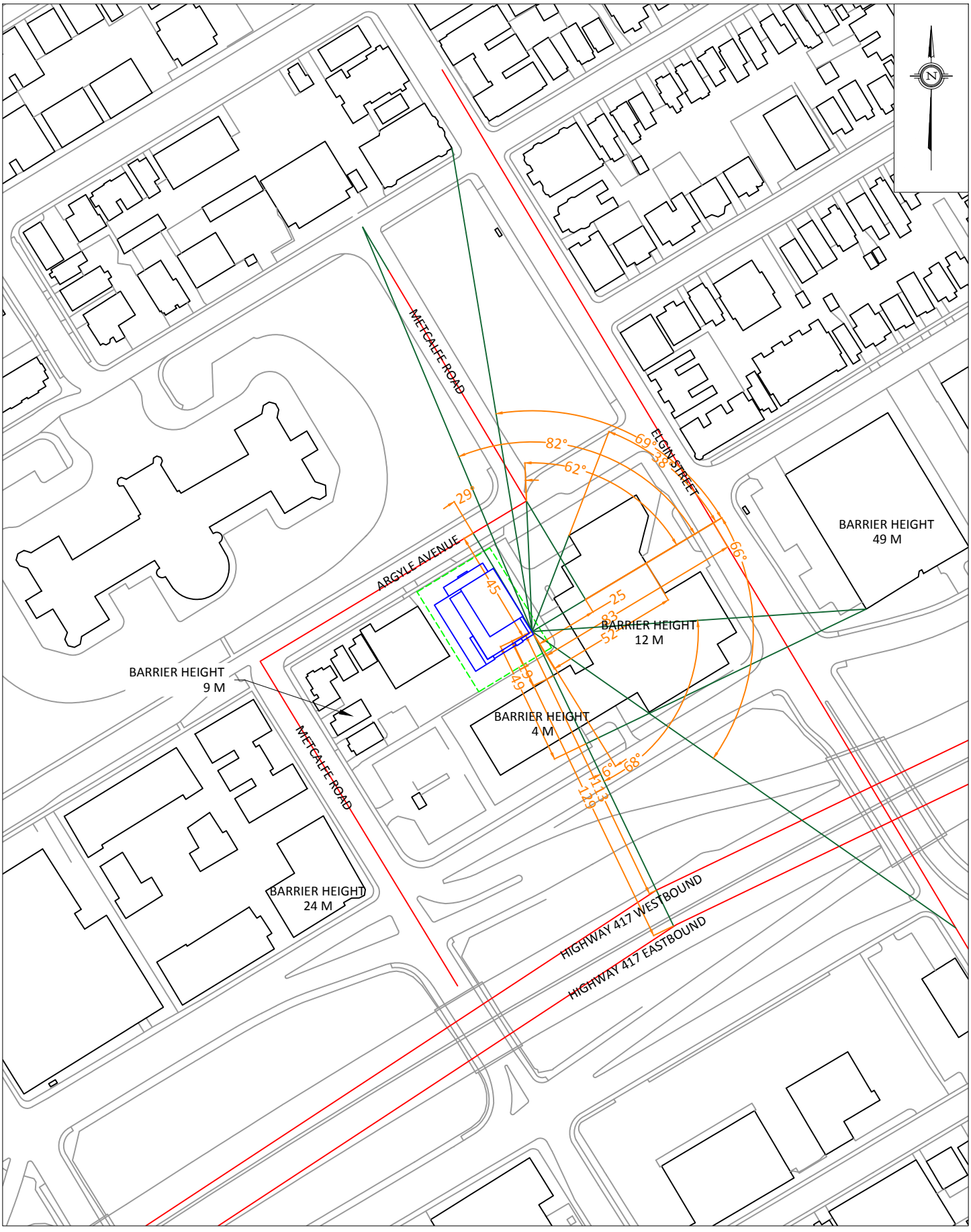
GRADIENT WIND ENGINEERING INC

PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE18-108-4
DATE	NOVEMBER 8, 2018	DRAWN BY	M.L.

FIGURE 4:
STAMSON INPUT DATA - RECEPTOR 1



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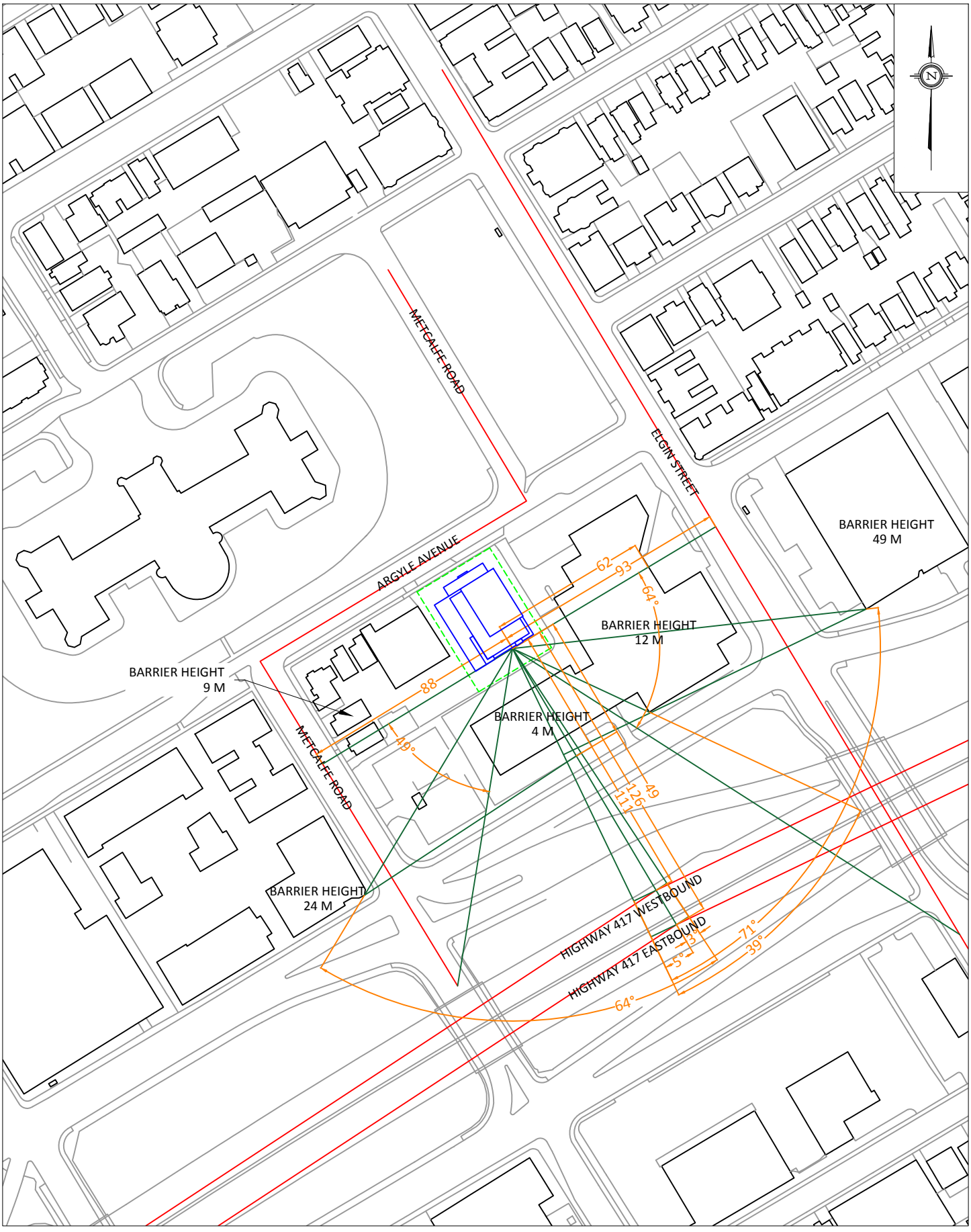
PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GWE18-108-5
DATE	NOVEMBER 8, 2018
DRAWN BY	M.L.
DESCRIPTION	FIGURE 5: STAMSON INPUT DATA - RECEPTOR 2



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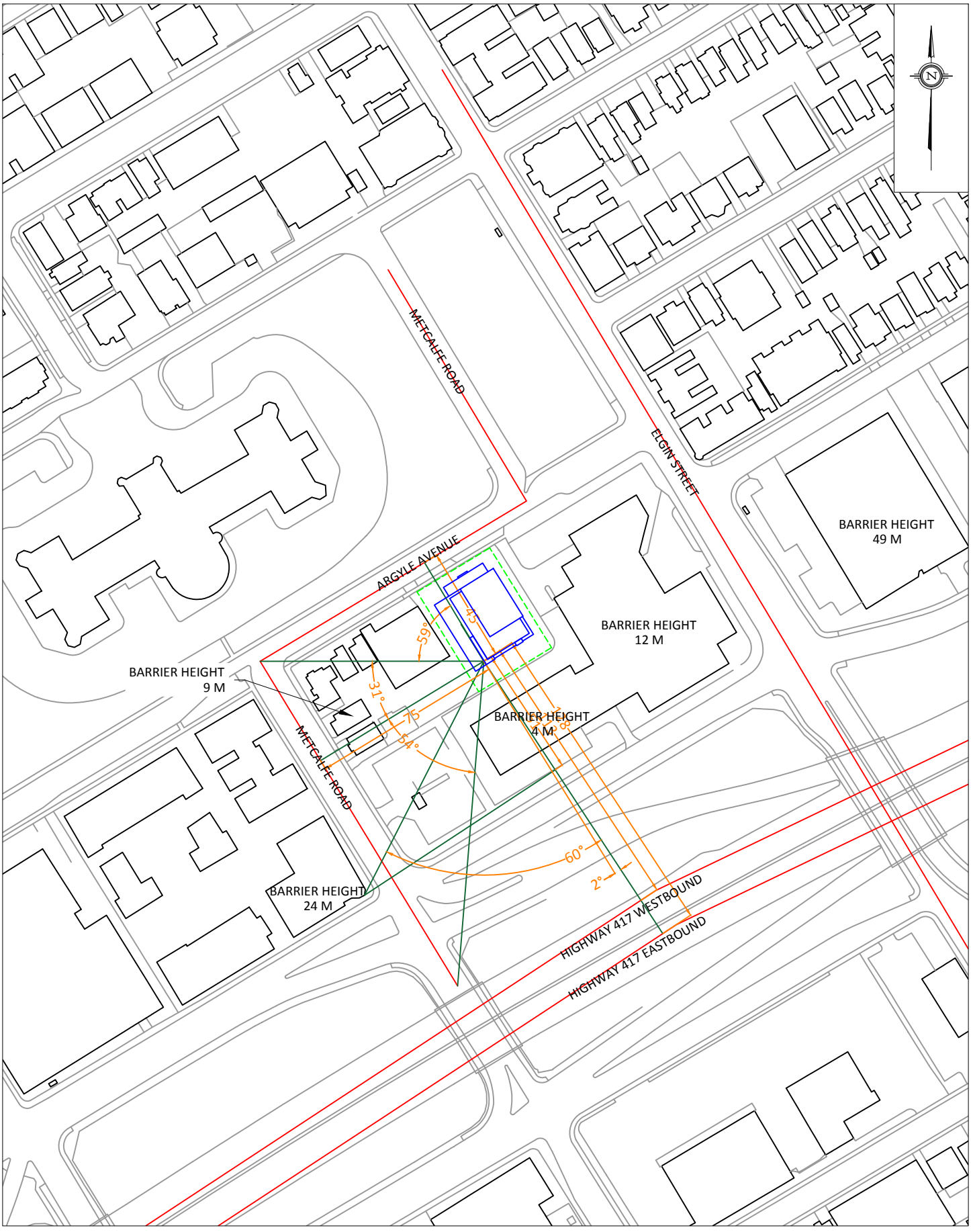
PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE18-108-6
DATE	NOVEMBER 8, 2018	DRAWN BY	M.L.

FIGURE 6:
STAMSON INPUT DATA - RECEPTOR 3



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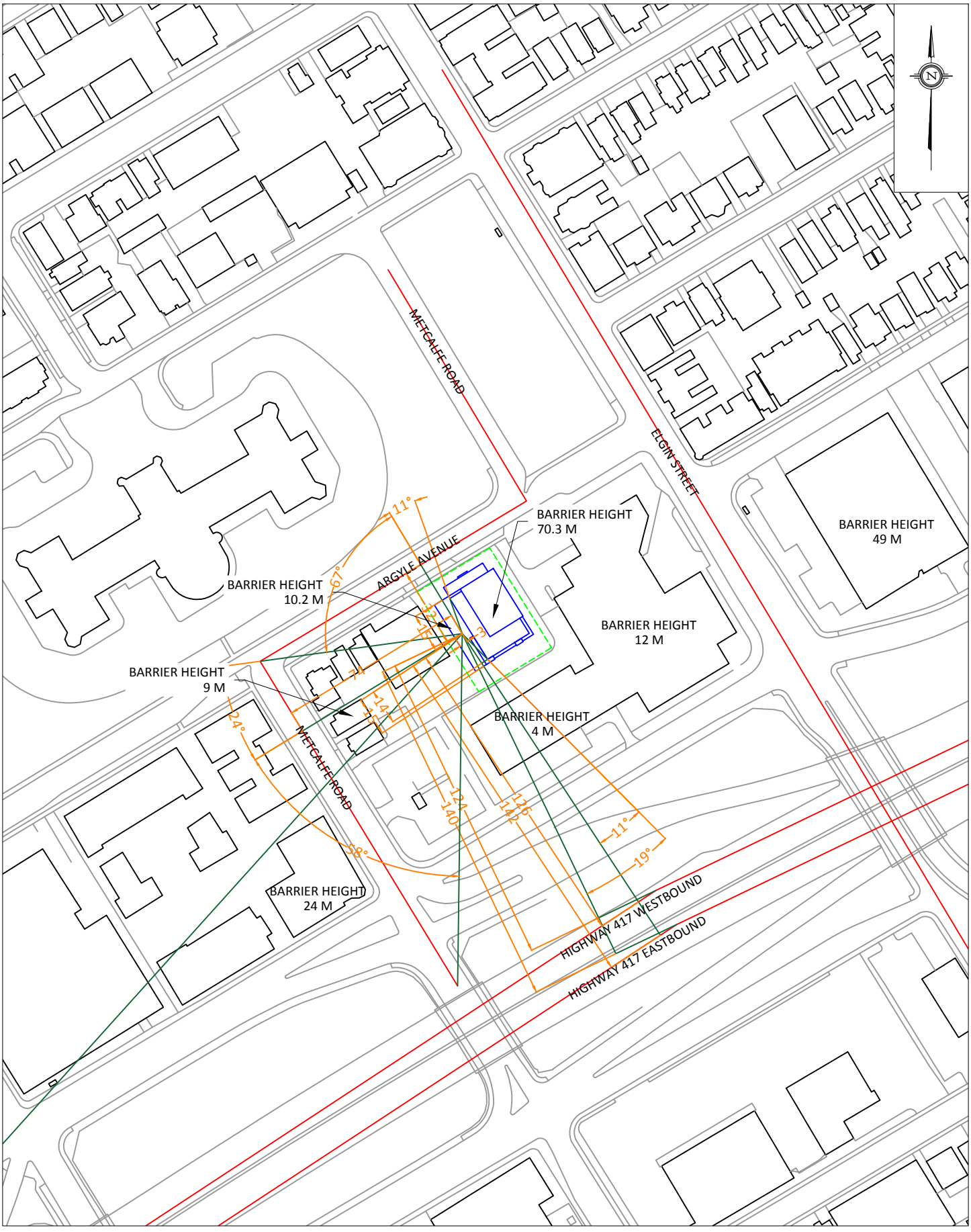
PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE18-108-7
DATE	NOVEMBER 8, 2018	DRAWN BY	M.L.

FIGURE 7:
STAMSON INPUT DATA - RECEPTOR 4



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GRADIENT WIND ENGINEERING INC

PROJECT	100 ARGYLE AVENUE ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO. GWE18-108-8	FIGURE 8: STAMSON INPUT DATA - RECEPTOR 5
DATE	NOVEMBER 8, 2018	DRAWN BY M.L.	

APPENDIX A

STAMSON 5.04 INPUT AND OUTPUT DATA

```
STAMSON 5.0        NORMAL REPORT        Date: 07-08-2018 15:23:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Argyle (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: Argyle (day/night)
-----------------------------------------
Angle1   Angle2           : -79.00 deg   64.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  17.00 / 17.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Metcalfe (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: Metcalfe (day/night)
------------------------------------------
Angle1   Angle2           : -76.00 deg   -26.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  36.00 / 36.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Elgin (day/night)
------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 3: Elgin (day/night)
---------------------------------------
Angle1   Angle2           : -62.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  95.00 / 95.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 66.94 + 0.00) = 66.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -79     64   0.00  68.48   0.00  -0.54  -1.00   0.00   0.00   0.00
66.94
-------------------------------------------------------------------------
--

Segment Leq : 66.94 dBA


Results segment # 2: Metcalfe (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.11 + 0.00) = 59.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -76    -26   0.00  68.48   0.00  -3.80  -5.56   0.00   0.00   0.00
59.11
-------------------------------------------------------------------------
--

Segment Leq : 59.11 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 58.85 + 0.00) = 58.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -62      0   0.00  71.49   0.00  -8.02  -4.63   0.00   0.00   0.00
58.85
-------------------------------------------------------------------------
--

Segment Leq : 58.85 dBA

Total Leq All Segments: 68.15 dBA


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

Source height = 1.50 m

ROAD (0.00 + 59.34 + 0.00) = 59.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -79     64   0.00  60.88   0.00  -0.54  -1.00   0.00   0.00   0.00
59.34
-------------------------------------------------------------------------
--

Segment Leq : 59.34 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 51.52 + 0.00) = 51.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -76    -26   0.00  60.88   0.00  -3.80  -5.56   0.00   0.00   0.00
51.52
-------------------------------------------------------------------------
--

Segment Leq : 51.52 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.25 + 0.00) = 51.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -62      0   0.00  63.89   0.00  -8.02  -4.63   0.00   0.00   0.00
51.25
-------------------------------------------------------------------------
--

Segment Leq : 51.25 dBA

Total Leq All Segments: 60.55 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 68.15
                           (NIGHT): 60.55
```

```
STAMSON 5.0        NORMAL REPORT        Date: 07-08-2018 16:15:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Argyle (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: Argyle (day/night)
----------------------------------------
Angle1   Angle2           :   0.00 deg   29.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Metcalfe (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: Metcalfe (day/night)
------------------------------------------
Angle1   Angle2           : -82.00 deg   -62.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Elgin (day/night)
------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Elgin (day/night)
---------------------------------------
Angle1   Angle2           : -69.00 deg   66.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  83.00 / 83.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -38.00 deg   Angle2 : 66.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  53.00 / 53.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -68.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 113.00 / 113.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -68.00 deg
Barrier height            :  49.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB2 (day/night)
----------------------------------------
Angle1   Angle2           : -68.00 deg   -6.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 113.00 / 113.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -68.00 deg   Angle2 : -6.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -68.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 129.00 / 129.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -68.00 deg
Barrier height            :  49.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 7: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           : -68.00 deg   -6.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 129.00 / 129.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -68.00 deg   Angle2 : -6.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 55.78 + 0.00) = 55.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     29   0.00  68.48   0.00  -4.77  -7.93   0.00   0.00   0.00
55.78
-------------------------------------------------------------------------
--

Segment Leq : 55.78 dBA


Results segment # 2: Metcalfe (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.72 + 0.00) = 56.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -82    -62   0.00  68.48   0.00  -2.22  -9.54   0.00   0.00   0.00
56.72
-------------------------------------------------------------------------
--

Segment Leq : 56.72 dBA
```

```
Results segment # 3: Elgin (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 !       48.50 !       18.48 !        18.48

ROAD (56.42 + 61.68 + 0.00) = 62.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -69    -38   0.00  71.49   0.00  -7.43  -7.64   0.00   0.00   0.00
56.42
-------------------------------------------------------------------------------
--
   -38     66   0.00  71.49   0.00  -7.43  -2.38   0.00   0.00   0.00
61.68*
   -38     66   0.00  71.49   0.00  -7.43  -2.38   0.00   0.00   0.00
61.68
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 62.81 dBA
```

```
Results segment # 4: 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 !       48.50 !       29.42 !        29.42

ROAD (0.00 + 47.40 + 0.00) = 47.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -68   0.00  80.15   0.00  -8.77  -9.13   0.00   0.00 -14.85
47.40
-------------------------------------------------------------------------------
--

Segment Leq : 47.40 dBA
```

```
Results segment # 5: 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 !       48.50 !       29.42 !        29.42

ROAD (0.00 + 66.75 + 0.00) = 66.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -68     -6   0.00  80.15   0.00  -8.77  -4.63   0.00   0.00   0.00
66.75*
   -68     -6   0.00  80.15   0.00  -8.77  -4.63   0.00   0.00   0.00
66.75
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.75 dBA
```

```
Results segment # 6: 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 !       48.50 !       31.79 !        31.79

ROAD (0.00 + 47.75 + 0.00) = 47.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -68   0.00  80.15   0.00  -9.34  -9.13   0.00   0.00 -13.93
47.75
-------------------------------------------------------------------------------
--

Segment Leq : 47.75 dBA
```

```
Results segment # 7: 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 !       48.50 !       31.79 !        31.79

ROAD (0.00 + 66.17 + 0.00) = 66.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -68     -6   0.00  80.15   0.00  -9.34  -4.63   0.00   0.00   0.00
66.17*
   -68     -6   0.00  80.15   0.00  -9.34  -4.63   0.00   0.00   0.00
66.17
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.17 dBA

Total Leq All Segments: 70.70 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 48.18 + 0.00) = 48.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     29   0.00  60.88   0.00  -4.77  -7.93   0.00   0.00   0.00
48.18
-------------------------------------------------------------------------
--

Segment Leq : 48.18 dBA


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

Source height = 1.50 m

ROAD (0.00 + 49.12 + 0.00) = 49.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -82    -62   0.00  60.88   0.00  -2.22  -9.54   0.00   0.00   0.00
49.12
-------------------------------------------------------------------------
--

Segment Leq : 49.12 dBA
```

```
Results segment # 3: Elgin (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 !       48.50 !       18.48 !        18.48

ROAD (48.82 + 54.08 + 0.00) = 55.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -69    -38   0.00  63.89   0.00  -7.43  -7.64   0.00   0.00   0.00
48.82
-------------------------------------------------------------------------------
--
   -38     66   0.00  63.89   0.00  -7.43  -2.38   0.00   0.00   0.00
54.08*
   -38     66   0.00  63.89   0.00  -7.43  -2.38   0.00   0.00   0.00
54.08
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 55.21 dBA
```

```
Results segment # 4: 417WB1 (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 !       48.50 !       29.42 !        29.42

ROAD (0.00 + 39.80 + 0.00) = 39.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -68   0.00  72.55   0.00  -8.77  -9.13   0.00   0.00 -14.85
39.80
-------------------------------------------------------------------------------
--

Segment Leq : 39.80 dBA


Results segment # 5: 417WB2 (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 !       48.50 !       29.42 !        29.42

ROAD (0.00 + 59.15 + 0.00) = 59.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -68     -6   0.00  72.55   0.00  -8.77  -4.63   0.00   0.00   0.00
59.15*
   -68     -6   0.00  72.55   0.00  -8.77  -4.63   0.00   0.00   0.00
59.15
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 59.15 dBA
```

```
Results segment # 6: 417EB1 (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 !       48.50 !       31.79 !        31.79

ROAD (0.00 + 40.15 + 0.00) = 40.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -68   0.00  72.55   0.00  -9.34  -9.13   0.00   0.00 -13.93
40.15
-------------------------------------------------------------------------------
--

Segment Leq : 40.15 dBA
```

```
Results segment # 7: 417EB2 (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 !       48.50 !       31.79 !        31.79

ROAD (0.00 + 58.58 + 0.00) = 58.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -68     -6   0.00  72.55   0.00  -9.34  -4.63   0.00   0.00   0.00
58.58*
   -68     -6   0.00  72.55   0.00  -9.34  -4.63   0.00   0.00   0.00
58.58
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.58 dBA

Total Leq All Segments: 63.10 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 70.70
                           (NIGHT): 63.10
```

```
STAMSON 5.0        NORMAL REPORT        Date: 07-08-2018 16:15:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (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: Metcalfe (day/night)
-------------------------------------------
Angle1   Angle2           : -49.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  88.00 / 88.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Elgin (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: Elgin (day/night)
---------------------------------------
Angle1   Angle2           :   0.00 deg   64.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  93.00 / 93.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 64.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  62.00 / 62.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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   -71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -71.00 deg
Barrier height            :  49.00 m
Barrier receiver distance :  49.00 / 49.00  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  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           : -71.00 deg   -5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -71.00 deg   Angle2 : -39.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417WB3 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB3 (day/night)
----------------------------------------
Angle1   Angle2           :   3.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  64.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -71.00 deg
Barrier height            :  49.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 7: 417EB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB2 (day/night)
----------------------------------------
Angle1   Angle2           : -71.00 deg   -5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -71.00 deg   Angle2 : -39.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 8: 417EB3 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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 # 8: 417EB3 (day/night)
----------------------------------------
Angle1   Angle2           :   3.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  64.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 55.15 + 0.00) = 55.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -49      0   0.00  68.48   0.00  -7.68  -5.65   0.00   0.00   0.00
55.15
-------------------------------------------------------------------------
--

Segment Leq : 55.15 dBA


Results segment # 2: Elgin (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 !       48.50 !       17.16 !        17.16

ROAD (0.00 + 56.07 + 0.00) = 56.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     64   0.00  68.48   0.00  -7.92  -4.49   0.00   0.00   0.00
56.07*
     0     64   0.00  68.48   0.00  -7.92  -4.49   0.00   0.00   0.00
56.07
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 56.07 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 !       48.50 !       29.07 !        29.07

ROAD (0.00 + 47.17 + 0.00) = 47.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -71   0.00  80.15   0.00  -8.69  -9.77   0.00   0.00 -14.52
47.17
-------------------------------------------------------------------------------
--

Segment Leq : 47.17 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 !       48.50 !       29.07 !        29.07

ROAD (0.00 + 63.95 + 64.22) = 67.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -71    -39   0.00  80.15   0.00  -8.69  -7.50   0.00   0.00   0.00
63.95*
   -71    -39   0.00  80.15   0.00  -8.69  -7.50   0.00   0.00   0.00
63.95
-------------------------------------------------------------------------------
--
   -39     -5   0.00  80.15   0.00  -8.69  -7.24   0.00   0.00   0.00
64.22
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 67.10 dBA
```

```
Results segment # 5: 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 !       48.50 !       29.07 !        29.07

ROAD (66.76 + 63.05 + 0.00) = 68.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     3     64   0.00  80.15   0.00  -8.69  -4.70   0.00   0.00   0.00
66.76
-------------------------------------------------------------------------------
--
    64     90   0.00  80.15   0.00  -8.69  -8.40   0.00   0.00  -0.83
62.23*
    64     90   0.00  80.15   0.00  -8.69  -8.40   0.00   0.00   0.00
63.05
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.30 dBA
```

```
Results segment # 6: 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 !       48.50 !       31.39 !        31.39

ROAD (0.00 + 47.51 + 0.00) = 47.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -71   0.00  80.15   0.00  -9.24  -9.77   0.00   0.00 -13.63
47.51
-------------------------------------------------------------------------------
--

Segment Leq : 47.51 dBA
```

```
Results segment # 7: 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 !       48.50 !       31.39 !        31.39

ROAD (0.00 + 63.40 + 63.67) = 66.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -71    -39   0.00  80.15   0.00  -9.24  -7.50   0.00   0.00   0.00
63.40*
   -71    -39   0.00  80.15   0.00  -9.24  -7.50   0.00   0.00   0.00
63.40
-------------------------------------------------------------------------------
--
   -39     -5   0.00  80.15   0.00  -9.24  -7.24   0.00   0.00   0.00
63.67
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.55 dBA
```

```
Results segment # 8: 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 !       48.50 !       31.39 !        31.39

ROAD (66.21 + 62.50 + 0.00) = 67.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     3     64    0.00  80.15   0.00  -9.24  -4.70   0.00   0.00   0.00
66.21
-------------------------------------------------------------------------------
--
    64     90    0.00  80.15   0.00  -9.24  -8.40   0.00   0.00  -0.39
62.11*
    64     90    0.00  80.15   0.00  -9.24  -8.40   0.00   0.00   0.00
62.50
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 67.75 dBA

Total Leq All Segments: 73.66 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 47.55 + 0.00) = 47.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -49      0   0.00  60.88   0.00  -7.68  -5.65   0.00   0.00   0.00
47.55
-------------------------------------------------------------------------------
--

Segment Leq : 47.55 dBA


Results segment # 2: Elgin (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 !       48.50 !       17.16 !        17.16

ROAD (0.00 + 48.47 + 0.00) = 48.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     64   0.00  60.88   0.00  -7.92  -4.49   0.00   0.00   0.00
48.47*
     0     64   0.00  60.88   0.00  -7.92  -4.49   0.00   0.00   0.00
48.47
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 48.47 dBA
```

```
Results segment # 3: 417WB1 (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 !       48.50 !       29.07 !        29.07

ROAD (0.00 + 39.57 + 0.00) = 39.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -71   0.00  72.55   0.00  -8.69  -9.77   0.00   0.00 -14.52
39.57
-------------------------------------------------------------------------------
--

Segment Leq : 39.57 dBA
```

```
Results segment # 4: 417WB2 (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 !       48.50 !       29.07 !        29.07

ROAD (0.00 + 56.36 + 56.62) = 59.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -71    -39   0.00  72.55   0.00  -8.69  -7.50   0.00   0.00   0.00
56.36*
   -71    -39   0.00  72.55   0.00  -8.69  -7.50   0.00   0.00   0.00
56.36
-------------------------------------------------------------------------------
--
   -39     -5   0.00  72.55   0.00  -8.69  -7.24   0.00   0.00   0.00
56.62
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 59.50 dBA
```

```
Results segment # 5: 417WB3 (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 !       48.50 !       29.07 !        29.07

ROAD (59.16 + 55.46 + 0.00) = 60.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     3     64    0.00  72.55   0.00  -8.69  -4.70   0.00   0.00   0.00
59.16
-------------------------------------------------------------------------------
--
    64     90    0.00  72.55   0.00  -8.69  -8.40   0.00   0.00  -0.83
54.63*
    64     90    0.00  72.55   0.00  -8.69  -8.40   0.00   0.00   0.00
55.46
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.70 dBA
```

```
Results segment # 6: 417EB1 (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 !       48.50 !       31.39 !        31.39

ROAD (0.00 + 39.92 + 0.00) = 39.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -71   0.00  72.55   0.00  -9.24  -9.77   0.00   0.00 -13.63
39.92
-------------------------------------------------------------------------------
--

Segment Leq : 39.92 dBA
```

```
Results segment # 7: 417EB2 (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 !       48.50 !       31.39 !        31.39

ROAD (0.00 + 55.81 + 56.07) = 58.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -71    -39   0.00  72.55   0.00  -9.24  -7.50   0.00   0.00   0.00
55.81*
   -71    -39   0.00  72.55   0.00  -9.24  -7.50   0.00   0.00   0.00
55.81
-------------------------------------------------------------------------------
--
   -39     -5   0.00  72.55   0.00  -9.24  -7.24   0.00   0.00   0.00
56.07
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.95 dBA
```

```
Results segment # 8: 417EB3 (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 !       48.50 !       31.39 !        31.39

ROAD (58.61 + 54.90 + 0.00) = 60.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     3     64    0.00  72.55   0.00  -9.24  -4.70   0.00   0.00   0.00
58.61
-------------------------------------------------------------------------------
--
    64     90    0.00  72.55   0.00  -9.24  -8.40   0.00   0.00  -0.39
54.51*
    64     90    0.00  72.55   0.00  -9.24  -8.40   0.00   0.00   0.00
54.90
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.15 dBA

Total Leq All Segments: 66.06 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 73.66
                           (NIGHT): 66.06
```

```
STAMSON 5.0        NORMAL REPORT        Date: 07-08-2018 16:16:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (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: Metcalfe (day/night)
-------------------------------------------
Angle1   Angle2           : -54.00 deg   31.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  75.00 / 75.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Argyle (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: Argyle (day/night)
----------------------------------------
Angle1   Angle2           : -59.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  48.50 / 48.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: 417WB (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           :   2.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 113.00 / 113.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  60.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :  51.00 / 51.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417EB (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           :   2.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 128.00 / 128.00 m
Receiver height           :  48.50 / 48.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  60.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :  51.00 / 51.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 58.23 + 0.00) = 58.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -54     31   0.00  68.48   0.00  -6.99  -3.26   0.00   0.00   0.00
58.23
-------------------------------------------------------------------------
--

Segment Leq : 58.23 dBA


Results segment # 2: Argyle (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.86 + 0.00) = 58.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -59      0   0.00  68.48   0.00  -4.77  -4.84   0.00   0.00   0.00
58.86
-------------------------------------------------------------------------
--

Segment Leq : 58.86 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 !       48.50 !       28.64 !        28.64

ROAD (66.46 + 63.60 + 0.00) = 68.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     2     60   0.00  80.15   0.00  -8.77  -4.92   0.00   0.00   0.00
66.46
-------------------------------------------------------------------------------
--
    60     90   0.00  80.15   0.00  -8.77  -7.78   0.00   0.00  -0.87
62.72*
    60     90   0.00  80.15   0.00  -8.77  -7.78   0.00   0.00   0.00
63.60
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.27 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 !       48.50 !       30.97 !        30.97

ROAD (65.92 + 63.05 + 0.00) = 67.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     2     60   0.00  80.15   0.00  -9.31  -4.92   0.00   0.00   0.00
65.92
-------------------------------------------------------------------------------
--
    60     90   0.00  80.15   0.00  -9.31  -7.78   0.00   0.00  -0.39
62.67*
    60     90   0.00  80.15   0.00  -9.31  -7.78   0.00   0.00   0.00
63.05
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 67.73 dBA

Total Leq All Segments: 71.49 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 50.64 + 0.00) = 50.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -54     31   0.00  60.88   0.00  -6.99  -3.26   0.00   0.00   0.00
50.64
-------------------------------------------------------------------------------
--

Segment Leq : 50.64 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.27 + 0.00) = 51.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -59      0   0.00  60.88   0.00  -4.77  -4.84   0.00   0.00   0.00
51.27
-------------------------------------------------------------------------------
--

Segment Leq : 51.27 dBA
```

```
Results segment # 3: 417WB (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 !       48.50 !       28.64 !        28.64

ROAD (58.86 + 56.00 + 0.00) = 60.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     2     60   0.00  72.55   0.00  -8.77  -4.92   0.00   0.00   0.00
58.86
-------------------------------------------------------------------------------
--
    60     90   0.00  72.55   0.00  -8.77  -7.78   0.00   0.00  -0.87
55.13*
    60     90   0.00  72.55   0.00  -8.77  -7.78   0.00   0.00   0.00
56.00
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.67 dBA
```

```
Results segment # 4: 417EB (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 !       48.50 !       30.97 !        30.97

ROAD (58.32 + 55.46 + 0.00) = 60.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     2     60   0.00  72.55   0.00  -9.31  -4.92   0.00   0.00   0.00
58.32
-------------------------------------------------------------------------------
--
    60     90   0.00  72.55   0.00  -9.31  -7.78   0.00   0.00  -0.39
55.07*
    60     90   0.00  72.55   0.00  -9.31  -7.78   0.00   0.00   0.00
55.46
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.13 dBA

Total Leq All Segments: 63.89 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 71.49
                           (NIGHT): 63.89
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-11-2018 11:03:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5n.te               Time Period: Day/Night 16/8 hours
Description: No Barrier


Road data, segment # 1: Metcalfe1 (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: Metcalfe1 (day/night)
--------------------------------------------
Angle1   Angle2           : -58.00 deg   24.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  74.00 / 74.00  m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -58.00 deg   Angle2 : 24.00 deg
Barrier height            :  10.20 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Metcalfe2 (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: Metcalfe2 (day/night)
-------------------------------------------
Angle1   Angle2           : -67.00 deg   11.00 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           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -67.00 deg   Angle2 : 11.00 deg
Barrier height            :  10.20 m
Barrier receiver distance :  15.00 / 15.00  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  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 124.00 / 124.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  10.20 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417WB3 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB3 (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  : 140.00 / 140.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 142.00 / 142.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  10.20 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 58.13 + 0.00) = 58.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  68.48   0.00  -6.93  -3.41   0.00   0.00   0.00
58.13*
   -58     24   0.00  68.48   0.00  -6.93  -3.41   0.00   0.00   0.00
58.13
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.13 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 47.34 + 0.00) = 47.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  68.48   0.00  -3.29  -3.63   0.00   0.00 -14.21
47.34
-------------------------------------------------------------------------------
--

Segment Leq : 47.34 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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 47.20 + 0.00) = 47.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.17  -4.04   0.00   0.00 -19.74
47.20
-------------------------------------------------------------------------------
--

Segment Leq : 47.20 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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 68.40 + 0.00) = 68.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.24  -2.51   0.00   0.00  -4.40
63.99*
   -11     90   0.00  80.15   0.00  -9.24  -2.51   0.00   0.00   0.00
68.40
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.40 dBA
```

```
Results segment # 5: 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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 46.68 + 0.00) = 46.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.70  -4.04   0.00   0.00 -19.73
46.68
-------------------------------------------------------------------------------
--

Segment Leq : 46.68 dBA

Results segment # 6: 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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 67.88 + 0.00) = 67.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.76  -2.51   0.00   0.00  -4.20
63.67*
   -11     90   0.00  80.15   0.00  -9.76  -2.51   0.00   0.00   0.00
67.88
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 67.88 dBA

Total Leq All Segments: 71.42 dBA
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 50.54 + 0.00) = 50.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  60.88   0.00  -6.93  -3.41   0.00   0.00   0.00
50.54*
   -58     24   0.00  60.88   0.00  -6.93  -3.41   0.00   0.00   0.00
50.54
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 50.54 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 39.75 + 0.00) = 39.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  60.88   0.00  -3.29  -3.63   0.00   0.00 -14.21
39.75
-------------------------------------------------------------------------------
--

Segment Leq : 39.75 dBA
```

```
Results segment # 3: 417WB1 (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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 39.60 + 0.00) = 39.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.17  -4.04   0.00   0.00 -19.74
39.60
-------------------------------------------------------------------------------
--

Segment Leq : 39.60 dBA


Results segment # 4: 417WB2 (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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 60.80 + 0.00) = 60.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.24  -2.51   0.00   0.00  -4.40
56.39*
   -11     90   0.00  72.55   0.00  -9.24  -2.51   0.00   0.00   0.00
60.80
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.80 dBA
```

```
Results segment # 5: 417WB3 (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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 39.08 + 0.00) = 39.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.70  -4.04   0.00   0.00 -19.73
39.08
-------------------------------------------------------------------------------
--

Segment Leq : 39.08 dBA
```

```
Results segment # 6: 417EB1 (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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 60.28 + 0.00) = 60.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.76  -2.51   0.00   0.00  -4.20
56.08*
   -11     90   0.00  72.55   0.00  -9.76  -2.51   0.00   0.00   0.00
60.28
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.28 dBA

Total Leq All Segments: 63.82 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 71.42
                           (NIGHT): 63.82
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-11-2018 11:03:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5nb1.te             Time Period: Day/Night 16/8 hours
Description: 1.5 m Barrier (all terrace edges)


Road data, segment # 1: Metcalfe1 (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: Metcalfe1 (day/night)
--------------------------------------------
Angle1   Angle2           : -58.00 deg   24.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  74.00 / 74.00  m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -58.00 deg   Angle2 : 24.00 deg
Barrier height            :  11.70 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Metcalfe2 (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: Metcalfe2 (day/night)
-------------------------------------------
Angle1   Angle2           : -67.00 deg   11.00 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           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -67.00 deg   Angle2 : 11.00 deg
Barrier height            :  11.70 m
Barrier receiver distance :  15.00 / 15.00  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  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 124.00 / 124.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  11.70 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417WB3 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB3 (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  : 140.00 / 140.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 142.00 / 142.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  11.70 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 51.91 + 0.00) = 51.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  68.48   0.00  -6.93  -3.41   0.00   0.00  -6.22
51.91
-------------------------------------------------------------------------------
--

Segment Leq : 51.91 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 44.16 + 0.00) = 44.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  68.48   0.00  -3.29  -3.63   0.00   0.00 -17.39
44.16
-------------------------------------------------------------------------------
--

Segment Leq : 44.16 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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 47.20 + 0.00) = 47.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.17  -4.04   0.00   0.00 -19.74
47.20
-------------------------------------------------------------------------------
--

Segment Leq : 47.20 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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 62.51 + 0.00) = 62.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.24  -2.51   0.00   0.00  -5.89
62.51
-------------------------------------------------------------------------------
--

Segment Leq : 62.51 dBA
```

```
Results segment # 5: 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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 46.68 + 0.00) = 46.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.70  -4.04   0.00   0.00 -19.73
46.68
-------------------------------------------------------------------------------
--

Segment Leq : 46.68 dBA


Results segment # 6: 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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 62.17 + 0.00) = 62.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.76  -2.51   0.00   0.00  -5.71
62.17
-------------------------------------------------------------------------------
--

Segment Leq : 62.17 dBA

Total Leq All Segments: 65.69 dBA
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 44.31 + 0.00) = 44.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  60.88   0.00  -6.93  -3.41   0.00   0.00  -6.22
44.31
-------------------------------------------------------------------------------
--

Segment Leq : 44.31 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 36.57 + 0.00) = 36.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  60.88   0.00  -3.29  -3.63   0.00   0.00 -17.39
36.57
-------------------------------------------------------------------------------
--

Segment Leq : 36.57 dBA
```

```
Results segment # 3: 417WB1 (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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 39.60 + 0.00) = 39.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.17  -4.04   0.00   0.00 -19.74
39.60
-------------------------------------------------------------------------------
--

Segment Leq : 39.60 dBA


Results segment # 4: 417WB2 (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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 54.91 + 0.00) = 54.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.24  -2.51   0.00   0.00  -5.89
54.91
-------------------------------------------------------------------------------
--

Segment Leq : 54.91 dBA
```

```
Results segment # 5: 417WB3 (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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 39.08 + 0.00) = 39.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.70  -4.04   0.00   0.00 -19.73
39.08
-------------------------------------------------------------------------------
--

Segment Leq : 39.08 dBA
```

```
Results segment # 6: 417EB1 (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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 54.57 + 0.00) = 54.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.76  -2.51   0.00   0.00  -5.71
54.57
-------------------------------------------------------------------------------
--

Segment Leq : 54.57 dBA

Total Leq All Segments: 58.09 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 65.69
                           (NIGHT): 58.09
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-11-2018 11:03:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5nb2.te             Time Period: Day/Night 16/8 hours
Description: 4.5 m Barrier (south terrace edge)


Road data, segment # 1: Metcalfe1 (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: Metcalfe1 (day/night)
--------------------------------------------
Angle1   Angle2           : -58.00 deg   24.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  74.00 / 74.00  m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -58.00 deg   Angle2 : 24.00 deg
Barrier height            :  11.70 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Metcalfe2 (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: Metcalfe2 (day/night)
-------------------------------------------
Angle1   Angle2           : -67.00 deg   11.00 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           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -67.00 deg   Angle2 : 11.00 deg
Barrier height            :  14.70 m
Barrier receiver distance :  15.00 / 15.00  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  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 124.00 / 124.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: 417WB2 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 126.00 / 126.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.70 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: 417WB3 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417WB3 (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  : 140.00 / 140.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  70.30 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 6: 417EB1 (day/night)
------------------------------------------
Car traffic volume  : 44528/3872  veh/TimePeriod  *
Medium truck volume :  3542/308   veh/TimePeriod  *
Heavy truck volume  :  2530/220   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):  55000
    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: 417EB1 (day/night)
----------------------------------------
Angle1   Angle2           : -11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 142.00 / 142.00 m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.70 m
Barrier receiver distance :  15.00 / 15.00  m
Source elevation          :   3.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 51.91 + 0.00) = 51.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  68.48   0.00  -6.93  -3.41   0.00   0.00  -6.22
51.91
-------------------------------------------------------------------------------
--

Segment Leq : 51.91 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 41.64 + 0.00) = 41.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  68.48   0.00  -3.29  -3.63   0.00   0.00 -19.92
41.64
-------------------------------------------------------------------------------
--

Segment Leq : 41.64 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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 47.20 + 0.00) = 47.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.17  -4.04   0.00   0.00 -19.74
47.20
-------------------------------------------------------------------------------
--

Segment Leq : 47.20 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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 56.41 + 0.00) = 56.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.24  -2.51   0.00   0.00 -11.98
56.41
-------------------------------------------------------------------------------
--

Segment Leq : 56.41 dBA
```

```
Results segment # 5: 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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 46.68 + 0.00) = 46.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  80.15   0.00  -9.70  -4.04   0.00   0.00 -19.73
46.68
-------------------------------------------------------------------------------
--

Segment Leq : 46.68 dBA


Results segment # 6: 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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 56.10 + 0.00) = 56.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  80.15   0.00  -9.76  -2.51   0.00   0.00 -11.78
56.10
-------------------------------------------------------------------------------
--

Segment Leq : 56.10 dBA

Total Leq All Segments: 60.47 dBA
```

```
Results segment # 1: Metcalfe1 (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 !       11.70 !       11.29 !        11.29

ROAD (0.00 + 44.31 + 0.00) = 44.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -58     24   0.00  60.88   0.00  -6.93  -3.41   0.00   0.00  -6.22
44.31
-------------------------------------------------------------------------------
--

Segment Leq : 44.31 dBA


Results segment # 2: Metcalfe2 (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 !       11.70 !        6.92 !         6.92

ROAD (0.00 + 34.04 + 0.00) = 34.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -67     11   0.00  60.88   0.00  -3.29  -3.63   0.00   0.00 -19.92
34.04
-------------------------------------------------------------------------------
--

Segment Leq : 34.04 dBA
```

```
Results segment # 3: 417WB1 (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 !       11.70 !       10.89 !        10.89

ROAD (0.00 + 39.60 + 0.00) = 39.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.17  -4.04   0.00   0.00 -19.74
39.60
-------------------------------------------------------------------------------
--

Segment Leq : 39.60 dBA


Results segment # 4: 417WB2 (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 !       11.70 !       10.84 !        10.84

ROAD (0.00 + 48.81 + 0.00) = 48.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.24  -2.51   0.00   0.00 -11.98
48.81
-------------------------------------------------------------------------------
--

Segment Leq : 48.81 dBA
```

```
Results segment # 5: 417WB3 (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 !       11.70 !       10.98 !        10.98

ROAD (0.00 + 39.08 + 0.00) = 39.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -19   0.00  72.55   0.00  -9.70  -4.04   0.00   0.00 -19.73
39.08
-------------------------------------------------------------------------------
--

Segment Leq : 39.08 dBA
```

```
Results segment # 6: 417EB1 (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 !       11.70 !       10.94 !        10.94

ROAD (0.00 + 48.50 + 0.00) = 48.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -11     90   0.00  72.55   0.00  -9.76  -2.51   0.00   0.00 -11.78
48.50
-------------------------------------------------------------------------------
--

Segment Leq : 48.50 dBA

Total Leq All Segments: 52.87 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 60.47
                           (NIGHT): 52.87
```