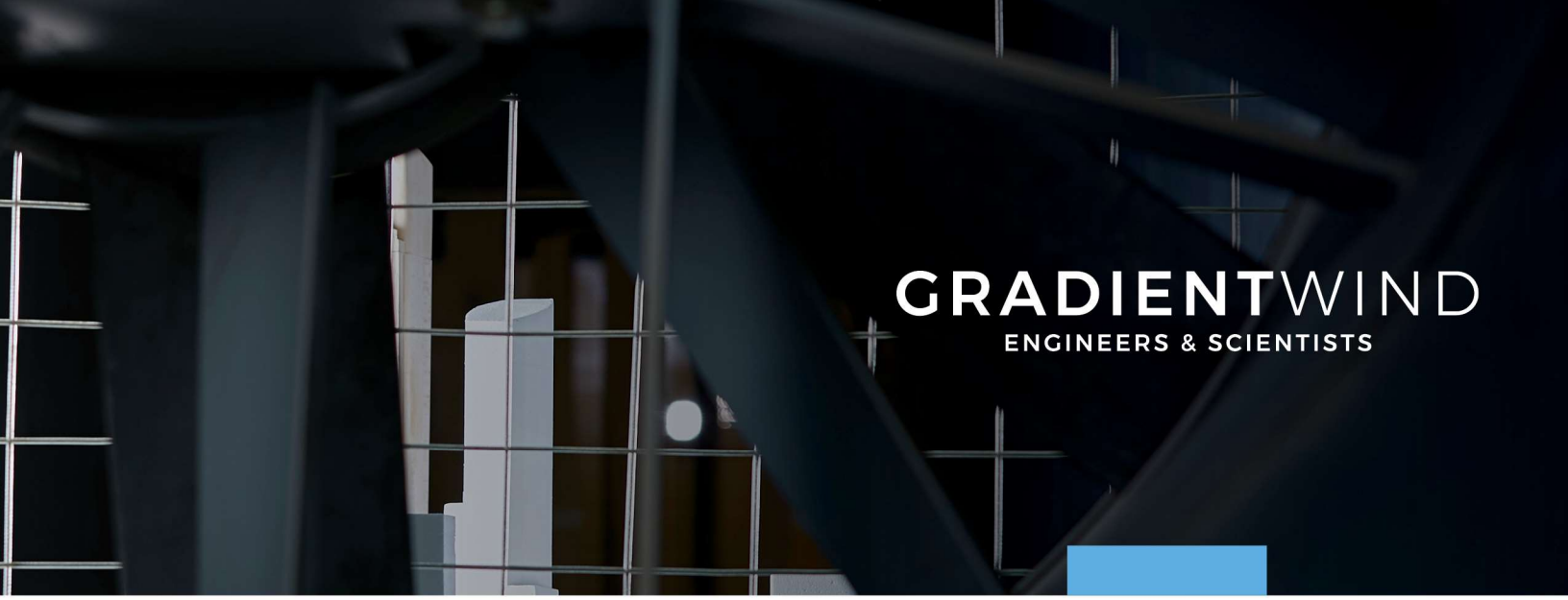

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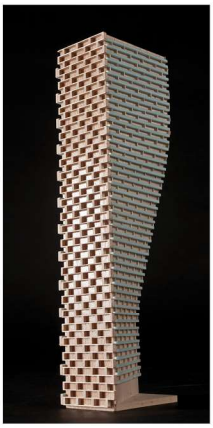
ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT

3-33 Selkirk Street
Ottawa, Ontario

Report: 20-077–Traffic Noise



June 15, 2020

PREPARED FOR
Selkirk & Main Developments Inc.
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PREPARED BY
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127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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EXECUTIVE SUMMARY

This report describes a roadway traffic noise feasibility assessment undertaken in support of a joint Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) application submission for a proposed development located at 3-33 Selkirk Street in Ottawa, Ontario. The development comprises three residential towers: Building A (28 storeys), Building B (22 storeys) and Building C (32 storeys), including shared podium levels. The major sources of traffic noise are Montreal Road and North River Road. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) preliminary drawings prepared by HOK Architects in June 2020.

The results of the current analysis indicate that noise levels will range between 50 and 71 dBA during the daytime period (07:00-23:00) and between 52 and 63 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the northwest façade of the podium, which is nearest and most exposed to Montreal Road. The results indicate that upgraded building components and air conditioning will be required for the podium, Building A and C and Building B will require forced air heating with provision for central air conditioning, as noise levels predicted due to roadway traffic exceed the criteria specified in Ottawa's ENCG. Upgraded building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA to ensure the indoor sound levels meet the ENCG criteria. Installation of air conditioning will allow occupants to keep windows closed and maintain a comfortable living environment. Additionally, Warning Clauses will also be required be placed on all Lease, Purchase and Sale Agreements.

The noise levels at the large rooftop terrace between Building A and C are expected to fall within the limits, however, the noise levels at the two smaller rooftop terraces to the south of Building A and north of Building B are expected to slightly exceed the criteria. Therefore, noise control measures will be required at the smaller terraces. A detailed roadway traffic noise study will be required at the time of site plan approval to determine specific noise control measures for the development.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Selkirk & Main Developments Inc. to undertake a roadway traffic noise feasibility assessment in support of a joint Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) application submission for a proposed development at 3-33 Selkirk Street in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on preliminary drawings provided by HOK Architects in June 2020, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The planned multi-building mixed-use development is located on an irregular parcel of land at 3-33 Selkirk Street in Ontario, Ontario. The subject site is bounded by Montreal Road to the north, Montgomery Street to the east, Selkirk Street to the south, and North River Road to the west.

Architectural Rendering, North Perspective
(Courtesy of HOK Architects)

The subject site comprises three buildings with rectangular planforms at grade connected by a 1-storey podium. Building 'A', of 28 storeys, is located at the north of the site, with the long axis oriented along Montgomery Street. Building 'B', of 22 storeys, is located at the east of the site with the long axis oriented perpendicular to Building A. Building 'C', of 32 storeys, is located at the south of the site with the long axis oriented parallel to Montgomery Street. The ground floor comprises various retail spaces, lobby

[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

space, and parking space. The mezzanine level comprises a continuation of the retail space and parking space. Level 2 comprises residential units and parking space. Levels 3 and above comprise residential units. Main building entrances are located within the courtyard in the centre of the subject site, near the centre of the southeast elevation of Building A, near the centre of the northwest elevation of Building B, and near the centre of the northeast elevation of Building C. Within the courtyard there is a roundabout accessed from Montgomery Street and North River Road. At the centre of the roundabout is an entrance that gives access to the parking structures at the southeast and northeast corners of the site, which feature one below-grade and two above-grade parking levels. Dedicated parkland is located at the northwest, southwest, and southeast corners of the site. A bus stop is integrated within the dedicated parkland on North River Road, near Selkirk Street, which will include a bus shelter. Existing bus stops are also located on the north side of Montreal Road and on the west side of North River Road. The latter bus stop includes a bus shelter. Above the northwest section of the parking structure is a large rooftop terrace between Buildings A and C overlooking the dedicated parkland. Rooftop terraces are also located at Level 2 north of Building B and south of Building A.

The site is surrounded by low-rise buildings from the north clockwise to the south, the Rideau River to the west, and mid-rise buildings to the south immediately beyond Selkirk Street as well as to the east and southeast along the east side of Vanier Parkway.

The major sources of traffic noise are Montreal Road to the north and North River Road to the west. Although McArthur Street and Vanier Parkway located south and east of the site, respectively, are nearby arterial roadways, they are located beyond 100 metres of the study site and therefore are not anticipated to be a significant source of noise. Figure 1 illustrates a complete site plan with surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10^{-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 surface roadway traffic noise, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for retail stores, living rooms and sleeping quarters respectively for roadway as listed in Table 1.

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

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[5]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[6].

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

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

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- The mid-rise building at 333 North River Road to the south were considered as a noise barrier with a height of 57 m.
- For select sources where appropriate, the receptors considered the proposed buildings and podium as barriers, partially or fully obstructing exposure to the source as illustrated by exposure angles in Figures 3-6.
- A 0.9 m tall guard rail around the terraces was considered.
- Noise receptors were strategically placed at twelve (12) locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 3-6.

4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[7] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. Table 2 (below) summarizes the AADT values used for each roadway included in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Montreal Road	4-Lane Urban Arterial Undivided (4-UAU)	50	**30,000**
North River Road (South of Montreal Road)	2-Lane Urban Arterial (2-UAU)	50	**15,000**

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

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.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	1.5	POW – Podium, Level 1 Northwest Façade	71	63
2	88.5	POW – Building A, Level 28 Northeast Façade	68	61
3	88.5	POW – Building A, Level 28 Northwest Façade	69	62
4	88.5	POW – Building A, Level 28 Southwest Façade	63	56
5	100.5	POW – Building C, Level 32 Northeast Façade	62	54
6	100.5	POW – Building C, Level 32 Northwest Façade	67	60
7	100.5	POW – Building C, Level 32 Southwest Façade	67	60
8	70.5	POW – Building B, Level 22 Northeast Façade	61	54
9	70.5	POW – Building B, Level 22 Northwest Façade	60	52
10	8.5	OLA – Rooftop Terrace, Between Building A and C	50	N/A
11	8.5	OLA – Rooftop Terrace, South of Building A	56	N/A
12	8.5	OLA – Rooftop Terrace, North of Building B	56	N/A

The results of the current analysis indicate that noise levels will range between 50 and 71 dBA during the daytime period (07:00-23:00) and between 52 and 63 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the northwest façade of the podium, which is nearest and most exposed to Montreal Road. The noise levels at the large rooftop terrace between Building A and C are expected to fall within the limits, however, the noise levels at the two smaller rooftop terraces to the south of Building A and north of Building B are expected to slightly exceed the criteria.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 50 and 71 dBA during the daytime period (07:00-23:00) and between 52 and 63 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the northwest façade of the podium, which is nearest and most exposed to Montreal Road.

The results indicate that upgraded building components and air conditioning will be required for the podium, Building A and C and Building B will require forced air heating with provision for central air conditioning, as noise levels predicted due to roadway traffic exceed the criteria specified in Ottawa's ENCG. Upgraded building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA to ensure the indoor sound levels meet the ENCG criteria. Installation of air conditioning will allow occupants to keep windows closed and maintain a comfortable living environment. Additionally, Warning Clauses will also be required be placed on all Lease, Purchase and Sale Agreements.

The noise levels at the large rooftop terrace between Building A and C are expected to fall within the limits, however, the noise levels at the two smaller rooftop terraces to the south of Building A and north of Building B are expected to slightly exceed the outdoor living area criteria. Therefore, noise control measures will be required at the smaller terraces. A detailed roadway traffic noise study will be required at the time of site plan approval to determine specific noise control measures for the development.

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

Sincerely,

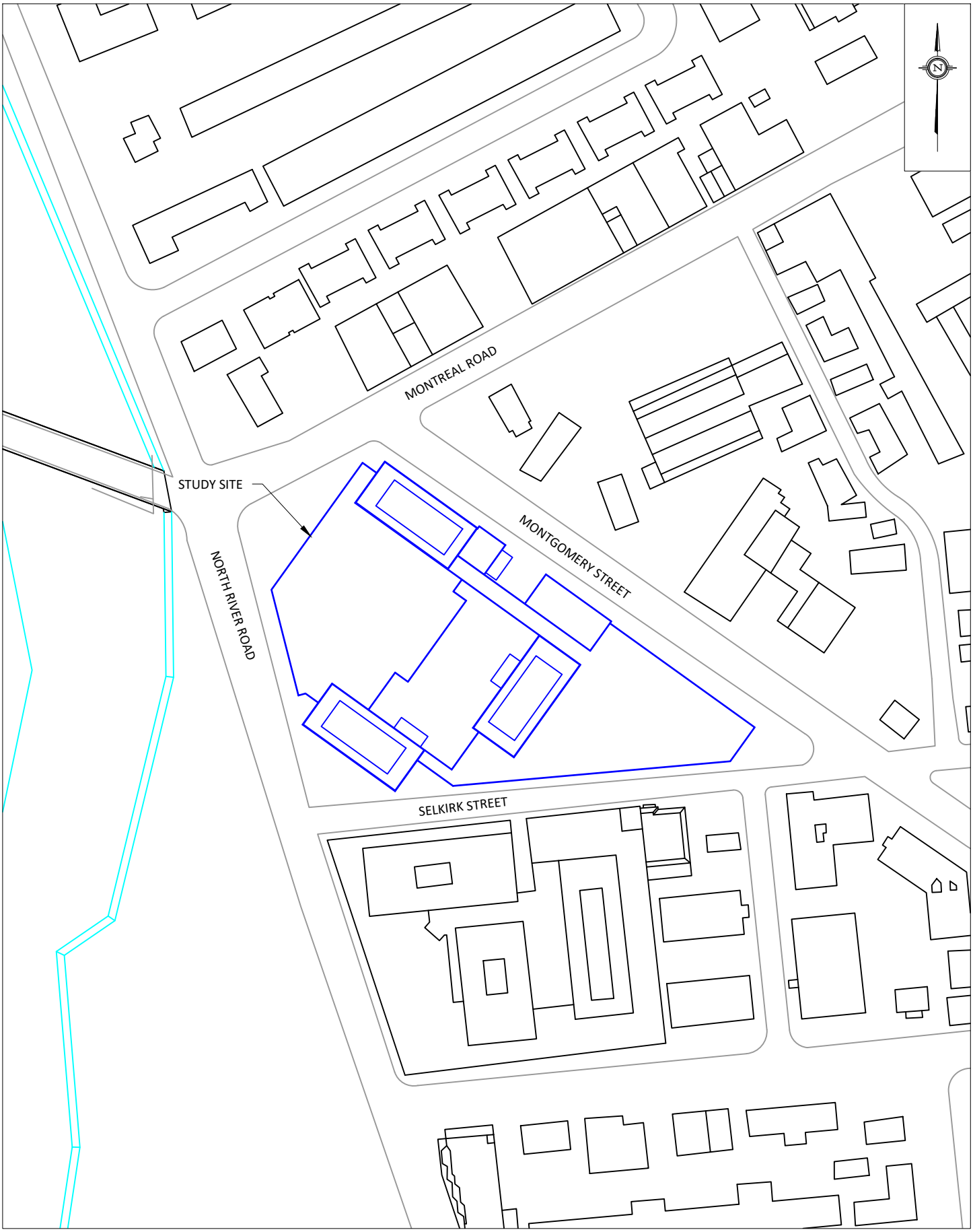
Gradient Wind Engineering Inc.

LICENSED PROFESSIONAL ENGINEER
J. R. FOSTER
100155655
June 15, 2020
PROVINCE OF ONTARIO

Samantha Phillips, B.Eng.
Environmental Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File #20-077-T.Noise



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PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	20-077-1
DATE	JUNE 15, 2020
DRAWN BY	S.P.
DESCRIPTION	FIGURE 1: SITE PLAN AND SURROUNDING CONTEXT

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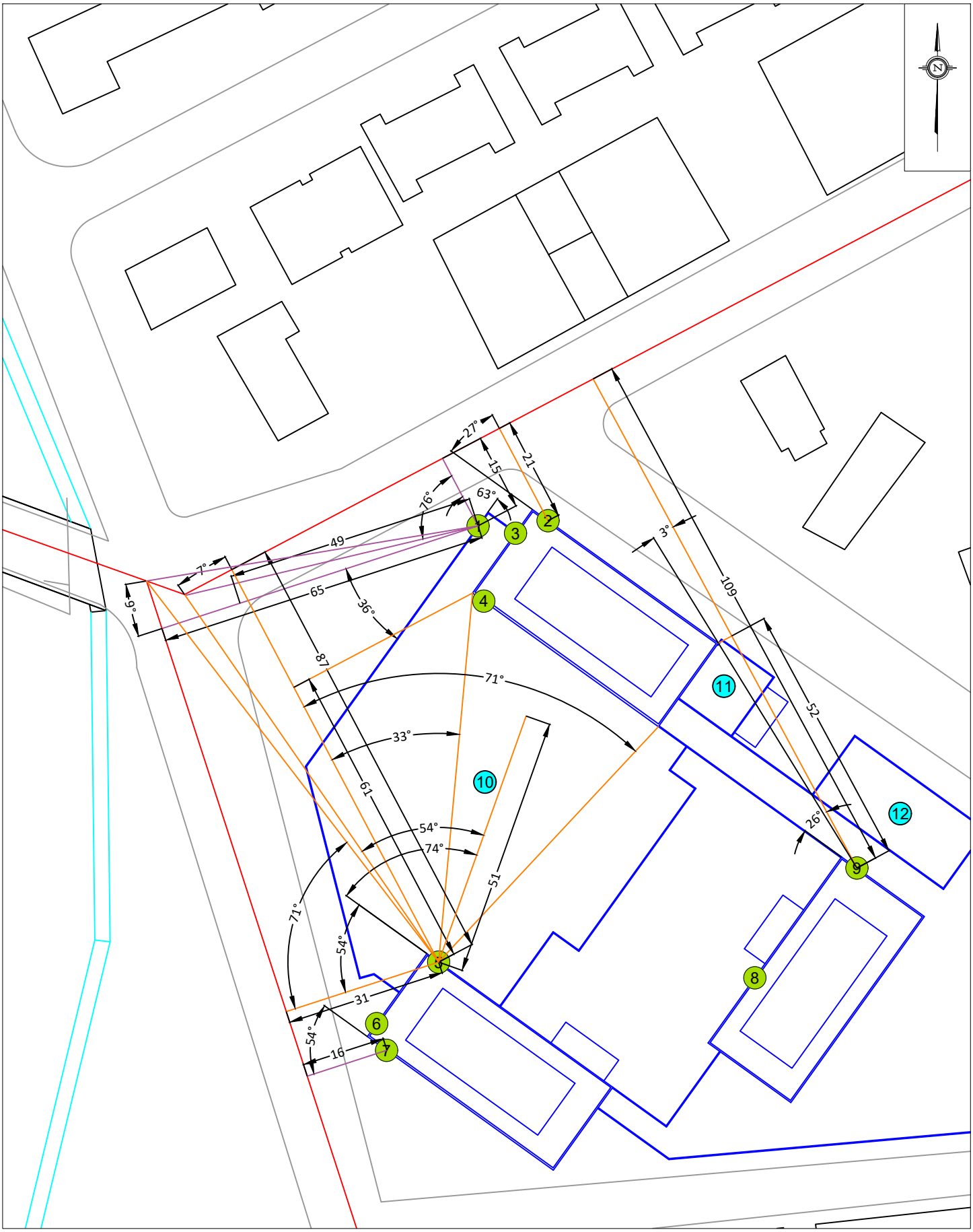
PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 20-077-2	FIGURE 2: RECEPTOR LOCATIONS
DATE	JUNE 15, 2020	DRAWN BY S.P.	



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PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 20-077-3	FIGURE 3: STAMSON INPUT PARAMETERS RECEPTORS 1, 2, 5, 7 & 9
DATE	JUNE 15, 2020	DRAWN BY S.P.	

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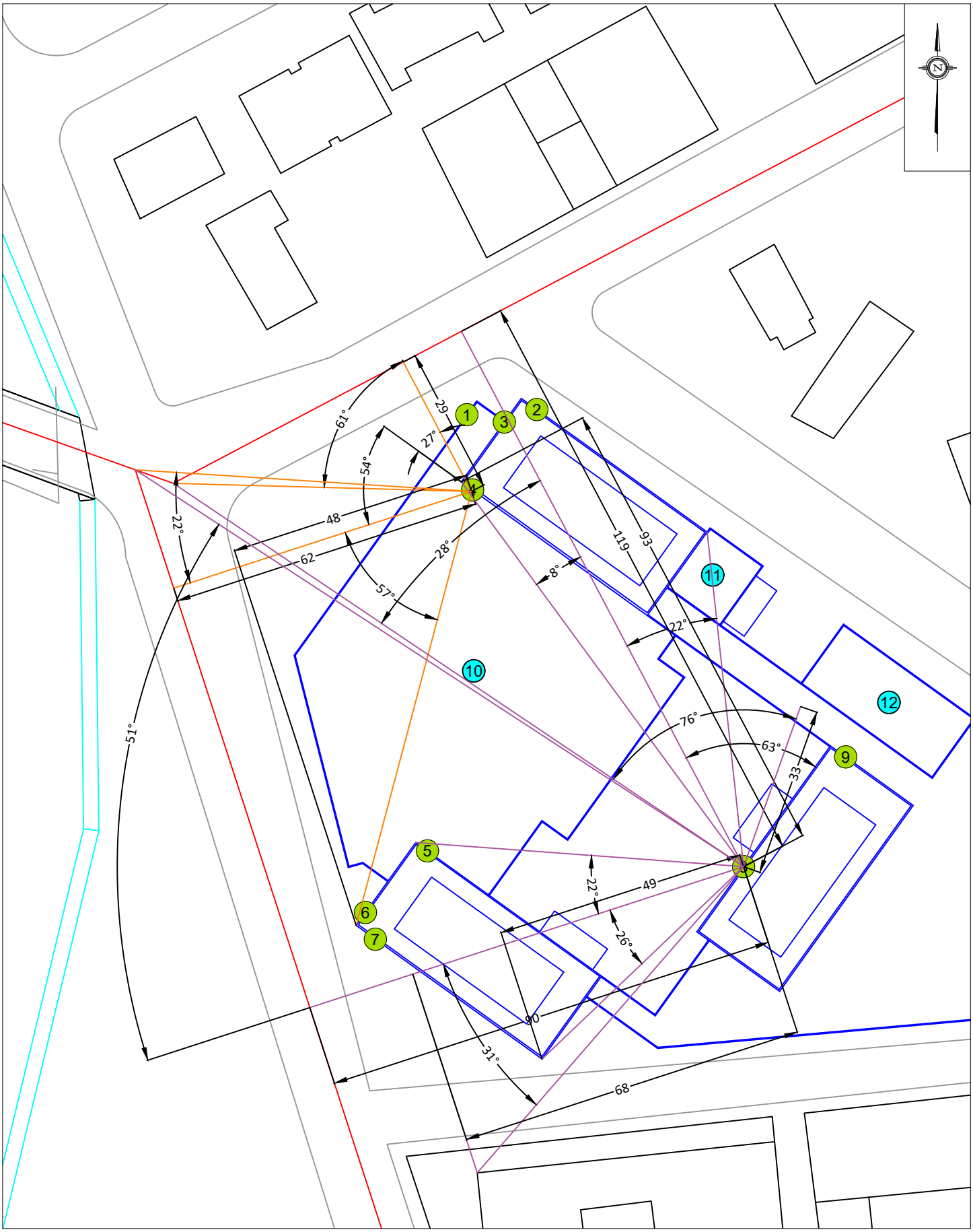
PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 20-077-4	FIGURE 4: STAMSON INPUT PARAMETERS RECEPTORS 3, 6 & 11
DATE	JUNE 15, 2020	DRAWN BY S.P.	



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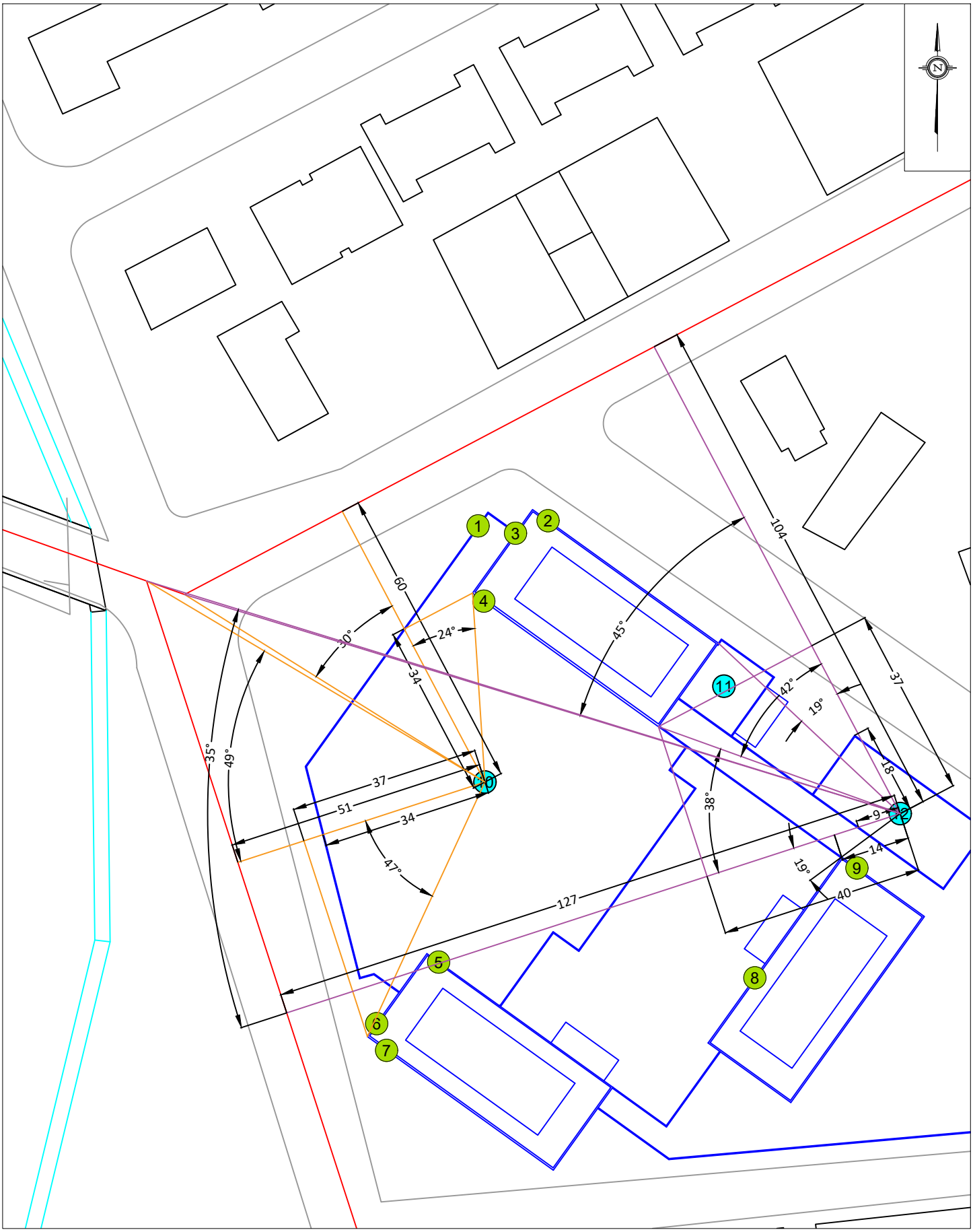
PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 20-077-5	FIGURE 5: STAMSON INPUT PARAMETERS RECEPTORS 4 & 8
DATE	JUNE 15, 2020	DRAWN BY S.P.	



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PROJECT	3-33 SELKIRK STREET, OTTAWA ROADWAY TRAFFIC NOISE FEASIBILITY ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 20-077-6	FIGURE 6: STAMSON INPUT PARAMETERS RECEPTORS 10 & 12
DATE	JUNE 15, 2020	DRAWN BY S.P.	

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 07:49:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -76.00 deg   63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: River (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: River (day/night)
---------------------------------------
Angle1   Angle2           : -36.00 deg   9.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 70.37 + 0.00) = 70.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -76     63   0.00  71.49   0.00   0.00  -1.12   0.00   0.00   0.00
70.37
--------------------------------------------------------------------------
--

Segment Leq : 70.37 dBA


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

Source height = 1.50 m

ROAD (0.00 + 56.09 + 0.00) = 56.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36      9   0.00  68.48   0.00  -6.37  -6.02   0.00   0.00   0.00
56.09
--------------------------------------------------------------------------
--

Segment Leq : 56.09 dBA

Total Leq All Segments: 70.53 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 62.77 + 0.00) = 62.77 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -76     63   0.00  63.89   0.00   0.00  -1.12   0.00   0.00   0.00
62.77
--------------------------------------------------------------------------
--

Segment Leq : 62.77 dBA


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

Source height = 1.50 m

ROAD (0.00 + 48.49 + 0.00) = 48.49 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36      9   0.00  60.88   0.00  -6.37  -6.02   0.00   0.00   0.00
48.49
--------------------------------------------------------------------------
--

Segment Leq : 48.49 dBA

Total Leq All Segments: 62.93 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 70.53
                         (NIGHT): 62.93
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-06-2020 15:08:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R2.te                Time Period: Day/Night 16/8 hours
Description:


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -27.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  21.00 / 21.00  m
Receiver height           :  88.50 / 88.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 68.16 + 0.00) = 68.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -27     90   0.00  71.49   0.00  -1.46  -1.87   0.00   0.00   0.00
68.16
--------------------------------------------------------------------------
--

Segment Leq : 68.16 dBA

Total Leq All Segments: 68.16 dBA


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

Source height = 1.50 m

ROAD (0.00 + 60.56 + 0.00) = 60.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -27     90   0.00  63.89   0.00  -1.46  -1.87   0.00   0.00   0.00
60.56
--------------------------------------------------------------------------
--

Segment Leq : 60.56 dBA

Total Leq All Segments: 60.56 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 68.16
                         (NIGHT): 60.56
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 07:51:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -73.00 deg   63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :  88.50 / 88.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: River (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: River (day/night)
---------------------------------------
Angle1   Angle2           : -36.00 deg   11.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  72.00 / 72.00  m
Receiver height           :  88.50 / 88.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 69.02 + 0.00) = 69.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -73     63   0.00  71.49   0.00  -1.25  -1.22   0.00   0.00   0.00
69.02
--------------------------------------------------------------------------
--

Segment Leq : 69.02 dBA


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

Source height = 1.50 m

ROAD (0.00 + 55.84 + 0.00) = 55.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36     11   0.00  68.48   0.00  -6.81  -5.83   0.00   0.00   0.00
55.84
--------------------------------------------------------------------------
--

Segment Leq : 55.84 dBA

Total Leq All Segments: 69.22 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 61.43 + 0.00) = 61.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -73     63   0.00  63.89   0.00  -1.25  -1.22   0.00   0.00   0.00
61.43
--------------------------------------------------------------------------
--

Segment Leq : 61.43 dBA


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

Source height = 1.50 m

ROAD (0.00 + 48.24 + 0.00) = 48.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36     11   0.00  60.88   0.00  -6.81  -5.83   0.00   0.00   0.00
48.24
--------------------------------------------------------------------------
--

Segment Leq : 48.24 dBA

Total Leq All Segments: 61.63 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 69.22
                          (NIGHT): 61.63
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 07:52:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -61.00 deg   -27.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  29.00 / 29.00  m
Receiver height           :  88.50 / 88.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: River (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: River (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   22.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  62.00 / 62.00  m
Receiver height           :  88.50 / 88.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -57.00 deg
Barrier height            : 102.90 m
Barrier receiver distance :  48.00 / 48.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 61.39 + 0.00) = 61.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -61    -27   0.00  71.49   0.00  -2.86  -7.24   0.00   0.00   0.00
61.39
--------------------------------------------------------------------------
--

Segment Leq : 61.39 dBA


Results segment # 2: River (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 !       88.50 !       21.14 !        21.14

ROAD (0.00 + 35.70 + 58.74) = 58.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -57   0.00  68.48   0.00  -6.16  -7.37   0.00   0.00 -19.25
35.70
--------------------------------------------------------------------------
--
   -57     22   0.00  68.48   0.00  -6.16  -3.58   0.00   0.00   0.00
58.74
--------------------------------------------------------------------------
--

Segment Leq : 58.76 dBA

Total Leq All Segments: 63.28 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 53.79 + 0.00) = 53.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -61    -27   0.00  63.89   0.00  -2.86  -7.24   0.00   0.00   0.00
53.79
--------------------------------------------------------------------------
--

Segment Leq : 53.79 dBA


Results segment # 2: River (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 !       88.50 !       21.14 !        21.14

ROAD (0.00 + 28.10 + 51.14) = 51.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -57   0.00  60.88   0.00  -6.16  -7.37   0.00   0.00 -19.25
28.10
--------------------------------------------------------------------------
--
   -57     22   0.00  60.88   0.00  -6.16  -3.58   0.00   0.00   0.00
51.14
--------------------------------------------------------------------------
--

Segment Leq : 51.17 dBA

Total Leq All Segments: 55.68 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.28
                         (NIGHT): 55.68
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 07:54:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           :  -7.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  87.00 / 87.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  33.00 deg   Angle2 : 71.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  61.00 / 61.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal2 (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 # 2: Montreal2 (day/night)
-------------------------------------------
Angle1   Angle2           : -74.00 deg   -54.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 / 51.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: River (day/night)
---------------------------------------
Angle1   Angle2           :  54.00 deg   71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Montreal (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 !      100.50 !       31.08 !        31.08

ROAD (57.32 + 37.10 + 54.09) = 59.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    -7     33   0.00  71.49   0.00  -7.63  -6.53   0.00   0.00   0.00
57.32
-------------------------------------------------------------------------
--
    33     71   0.00  71.49   0.00  -7.63  -6.75   0.00   0.00 -20.00
37.10
-------------------------------------------------------------------------
--
    71     90   0.00  71.49   0.00  -7.63  -9.77   0.00   0.00   0.00
54.09
-------------------------------------------------------------------------
--

Segment Leq : 59.04 dBA


Results segment # 2: Montreal2 (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.63 + 0.00) = 56.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -74    -54   0.00  71.49   0.00  -5.31  -9.54   0.00   0.00   0.00
56.63
-------------------------------------------------------------------------
--

Segment Leq : 56.63 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    54     71   0.00  68.48   0.00  -3.15 -10.25   0.00   0.00   0.00
55.08
--------------------------------------------------------------------------
--

Segment Leq : 55.08 dBA

Total Leq All Segments: 62.00 dBA

Results segment # 1: Montreal (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 !      100.50 !       31.08 !        31.08

ROAD (49.73 + 29.50 + 46.49) = 51.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    -7     33   0.00  63.89   0.00  -7.63  -6.53   0.00   0.00   0.00
49.73
--------------------------------------------------------------------------
--
    33     71   0.00  63.89   0.00  -7.63  -6.75   0.00   0.00 -20.00
29.50
--------------------------------------------------------------------------
--
    71     90   0.00  63.89   0.00  -7.63  -9.77   0.00   0.00   0.00
46.49
--------------------------------------------------------------------------
--

Segment Leq : 51.44 dBA
```

```
Results segment # 2: Montreal2 (night)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.04 + 0.00) = 49.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -74    -54   0.00  63.89   0.00  -5.31  -9.54   0.00   0.00   0.00
49.04
--------------------------------------------------------------------------
--

Segment Leq : 49.04 dBA


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

Source height = 1.50 m

ROAD (0.00 + 47.48 + 0.00) = 47.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    54     71   0.00  60.88   0.00  -3.15 -10.25   0.00   0.00   0.00
47.48
--------------------------------------------------------------------------
--

Segment Leq : 47.48 dBA

Total Leq All Segments: 54.40 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 62.00
                         (NIGHT): 54.40
```

```
STAMSON 5.0        COMPREHENSIVE REPORT        Date: 15-06-2020 09:16:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           :   4.00 deg   63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  92.00 / 92.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  40.00 deg   Angle2 : 63.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  66.00 / 66.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal (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 # 2: Montreal (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -44.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  67.00 / 67.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: River (day/night)
---------------------------------------
Angle1   Angle2           : -36.00 deg   81.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  16.00 / 16.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Segment # 1: Montreal (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 !      100.50 !       29.47 !        29.47

ROAD (56.62 + 34.68 + 0.00) = 56.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
     4     40   0.00  71.49   0.00  -7.88  -6.99   0.00   0.00   0.00
56.62
--------------------------------------------------------------------------
--
    40     63   0.00  71.49   0.00  -7.88  -8.94   0.00   0.00 -20.00
34.68
--------------------------------------------------------------------------
--

Segment Leq : 56.65 dBA


Segment # 2: Montreal (day)
---------------------------

Source height = 1.50 m

ROAD (0.00 + 59.07 + 0.00) = 59.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -44   0.00  71.49   0.00  -6.50  -5.93   0.00   0.00   0.00
59.07
--------------------------------------------------------------------------
--

Segment Leq : 59.07 dBA
```

```
Segment # 3: River (day)
------------------------

Source height = 1.50 m

ROAD (0.00 + 66.33 + 0.00) = 66.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36     81   0.00  68.48   0.00  -0.28  -1.87   0.00   0.00   0.00
66.33
--------------------------------------------------------------------------
--

Segment Leq : 66.33 dBA

Total Leq All Segments: 67.45 dBA


Segment # 1: Montreal (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 !      100.50 !       29.47 !        29.47

ROAD (49.03 + 27.08 + 0.00) = 49.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
     4     40   0.00  63.89   0.00  -7.88  -6.99   0.00   0.00   0.00
49.03
--------------------------------------------------------------------------
--
    40     63   0.00  63.89   0.00  -7.88  -8.94   0.00   0.00 -20.00
27.08
--------------------------------------------------------------------------
--

Segment Leq : 49.05 dBA
```

```
Segment # 2: Montreal (night)
-----------------------------

Source height = 1.50 m

ROAD (0.00 + 51.47 + 0.00) = 51.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -44   0.00  63.89   0.00  -6.50  -5.93   0.00   0.00   0.00
51.47
--------------------------------------------------------------------------
--

Segment Leq : 51.47 dBA


Segment # 3: River (night)
--------------------------

Source height = 1.50 m

ROAD (0.00 + 58.73 + 0.00) = 58.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -36     81   0.00  60.88   0.00  -0.28  -1.87   0.00   0.00   0.00
58.73
--------------------------------------------------------------------------
--

Segment Leq : 58.73 dBA

Total Leq All Segments: 59.85 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.45
                         (NIGHT): 59.85
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-06-2020 15:58:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: River (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: River (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   54.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  16.00 / 16.00  m
Receiver height           : 100.50 / 100.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 67.23 + 0.00) = 67.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90     54   0.00  68.48   0.00  -0.28  -0.97   0.00   0.00   0.00
67.23
--------------------------------------------------------------------------
--

Segment Leq : 67.23 dBA

Total Leq All Segments: 67.23 dBA


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

Source height = 1.50 m

ROAD (0.00 + 59.63 + 0.00) = 59.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90     54   0.00  60.88   0.00  -0.28  -0.97   0.00   0.00   0.00
59.63
--------------------------------------------------------------------------
--

Segment Leq : 59.63 dBA

Total Leq All Segments: 59.63 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 67.23
                         (NIGHT): 59.63
```

```
STAMSON 5.0        COMPREHENSIVE REPORT        Date: 15-06-2020 09:19:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -28.00 deg   63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 119.00 / 119.00 m
Receiver height           :  70.50 / 70.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  -8.00 deg   Angle2 : 22.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  93.00 / 93.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal2 (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 # 2: Montreal2 (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -76.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  33.00 / 33.00  m
Receiver height           :  70.50 / 70.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: River (day/night)
---------------------------------------
Angle1   Angle2           : -26.00 deg   51.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  90.00 / 90.00  m
Receiver height           :  70.50 / 70.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -26.00 deg   Angle2 : 22.00 deg
Barrier height            : 102.90 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: River2 (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 # 4: River2 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -26.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  90.00 / 90.00  m
Receiver height           :  70.50 / 70.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -31.00 deg
Barrier height            :  57.00 m
Barrier receiver distance :  68.00 / 68.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Segment # 1: Montreal (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 !       70.50 !       16.57 !        16.57

ROAD (52.95 + 34.71 + 56.07) = 57.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -28     -8   0.00  71.49   0.00  -8.99  -9.54   0.00   0.00   0.00
52.95
-------------------------------------------------------------------------
--
    -8     22   0.00  71.49   0.00  -8.99  -7.78   0.00   0.00 -20.00
34.71
-------------------------------------------------------------------------
--
    22     63   0.00  71.49   0.00  -8.99  -6.42   0.00   0.00   0.00
56.07
-------------------------------------------------------------------------
--

Segment Leq : 57.82 dBA
```

```
Segment # 2: Montreal2 (day)
----------------------------

Source height = 1.50 m

ROAD (0.00 + 56.97 + 0.00) = 56.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -76   0.00  71.49   0.00  -3.42 -11.09   0.00   0.00   0.00
56.97
--------------------------------------------------------------------------
--

Segment Leq : 56.97 dBA


Segment # 3: River (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 !       70.50 !       32.93 !        32.93

ROAD (0.00 + 34.96 + 52.77) = 52.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -26     22   0.00  68.48   0.00  -7.78  -5.74   0.00   0.00 -20.00
34.96
--------------------------------------------------------------------------
--
    22     51   0.00  68.48   0.00  -7.78  -7.93   0.00   0.00   0.00
52.77
--------------------------------------------------------------------------
--

Segment Leq : 52.84 dBA
```

```
Segment # 4: River2 (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 !       70.50 !       18.36 !        18.36

ROAD (0.00 + 37.02 + 45.14) = 45.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -31   0.00  68.48   0.00  -7.78  -4.84   0.00   0.00 -18.83
37.02
-------------------------------------------------------------------------
--
   -31    -26   0.00  68.48   0.00  -7.78 -15.56   0.00   0.00   0.00
45.14
-------------------------------------------------------------------------
--

Segment Leq : 45.76 dBA

Total Leq All Segments: 61.25 dBA
```

```
Segment # 1: Montreal (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 !       70.50 !       16.57 !        16.57

ROAD (45.36 + 27.12 + 48.47) = 50.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -28     -8   0.00  63.89   0.00  -8.99  -9.54   0.00   0.00   0.00
45.36
-------------------------------------------------------------------------
--
    -8     22   0.00  63.89   0.00  -8.99  -7.78   0.00   0.00 -20.00
27.12
-------------------------------------------------------------------------
--
    22     63   0.00  63.89   0.00  -8.99  -6.42   0.00   0.00   0.00
48.47
-------------------------------------------------------------------------
--

Segment Leq : 50.22 dBA
```

```
Segment # 2: Montreal2 (night)
------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.38 + 0.00) = 49.38 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -76   0.00  63.89   0.00  -3.42 -11.09   0.00   0.00   0.00
49.38
--------------------------------------------------------------------------
--

Segment Leq : 49.38 dBA


Segment # 3: River (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 !       70.50 !       32.93 !        32.93

ROAD (0.00 + 27.36 + 45.17) = 45.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -26     22   0.00  60.88   0.00  -7.78  -5.74   0.00   0.00 -20.00
27.36
--------------------------------------------------------------------------
--
    22     51   0.00  60.88   0.00  -7.78  -7.93   0.00   0.00   0.00
45.17
--------------------------------------------------------------------------
--

Segment Leq : 45.24 dBA
```

```
Segment # 4: River2 (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 !       70.50 !       18.36 !        18.36

ROAD (0.00 + 29.42 + 37.54) = 38.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -31   0.00  60.88   0.00  -7.78  -4.84   0.00   0.00 -18.83
29.42
-------------------------------------------------------------------------
--
   -31    -26   0.00  60.88   0.00  -7.78 -15.56   0.00   0.00   0.00
37.54
-------------------------------------------------------------------------
--

Segment Leq : 38.16 dBA

Total Leq All Segments: 53.65 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 61.25
                         (NIGHT): 53.65
```

```
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -26.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 109.00 / 109.00 m
Receiver height           :  70.50 / 70.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -26.00 deg   Angle2 : -3.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  52.00 / 52.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Montreal (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 !       70.50 !       37.58 !        37.58

ROAD (0.00 + 33.94 + 60.01) = 60.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -26     -3   0.00  71.49   0.00  -8.61  -8.94   0.00   0.00 -20.00
33.94
-------------------------------------------------------------------------
--
    -3     90   0.00  71.49   0.00  -8.61  -2.87   0.00   0.00   0.00
60.01
-------------------------------------------------------------------------
--

Segment Leq : 60.02 dBA

Total Leq All Segments: 60.02 dBA
```

```
Results segment # 1: Montreal (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 !       70.50 !       37.58 !        37.58

ROAD (0.00 + 26.34 + 52.41) = 52.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----------------------------------------------------------------------
--
   -26     -3   0.00  63.89   0.00  -8.61  -8.94   0.00   0.00 -20.00
26.34
-----------------------------------------------------------------------
--
    -3     90   0.00  63.89   0.00  -8.61  -2.87   0.00   0.00   0.00
52.41
-----------------------------------------------------------------------
--

Segment Leq : 52.42 dBA

Total Leq All Segments: 52.42 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 60.02
                         (NIGHT): 52.42
```

```
STAMSON 5.0        COMPREHENSIVE REPORT        Date: 15-06-2020 09:20:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -30.00 deg   24.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  60.00 / 60.00  m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -30.00 deg   Angle2 : 24.00 deg
Barrier height            :   7.90 m
Barrier receiver distance :  34.00 / 34.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal2 (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 # 2: Montreal2 (day/night)
-------------------------------------------
Angle1   Angle2           :  24.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  60.00 / 60.00  m
Receiver height           :   8.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  24.00 deg   Angle2 : 90.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  34.00 / 34.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: River (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   -47.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 / 51.00  m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -47.00 deg
Barrier height            : 102.90 m
Barrier receiver distance :  37.00 / 37.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: River2 (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 # 4: River2 (day/night)
----------------------------------------
Angle1   Angle2           : -47.00 deg   49.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 / 51.00  m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -47.00 deg   Angle2 : 49.00 deg
Barrier height            :   7.90 m
Barrier receiver distance :  34.00 / 34.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Segment # 1: Montreal (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 !        8.50 !        4.53 !         4.53

ROAD (0.00 + 46.94 + 0.00) = 46.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -30     24   0.00  71.49   0.00  -6.02  -5.23   0.00   0.00 -13.30
46.94
--------------------------------------------------------------------------
--

Segment Leq : 46.94 dBA
```

```
Segment # 2: Montreal2 (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 !        8.50 !        4.53 !         4.53

ROAD (0.00 + 41.26 + 0.00) = 41.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    24     90   0.00  71.49   0.00  -6.02  -4.36   0.00   0.00 -19.85
41.26
--------------------------------------------------------------------------
--

Segment Leq : 41.26 dBA


Segment # 3: River (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 !        8.50 !        3.42 !         3.42

ROAD (0.00 + 37.13 + 0.00) = 37.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -47   0.00  68.48   0.00  -5.31  -6.22   0.00   0.00 -19.82
37.13
--------------------------------------------------------------------------
--

Segment Leq : 37.13 dBA
```

```
Segment # 4: River2 (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 !        8.50 !        3.83 !         3.83

ROAD (0.00 + 44.96 + 0.00) = 44.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -47     49   0.00  68.48   0.00  -5.31  -2.73   0.00   0.00 -15.48
44.96
--------------------------------------------------------------------------
--

Segment Leq : 44.96 dBA

Total Leq All Segments: 49.97 dBA


Segment # 1: Montreal (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 !        8.50 !        4.53 !         4.53

ROAD (0.00 + 39.35 + 0.00) = 39.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -30     24   0.00  63.89   0.00  -6.02  -5.23   0.00   0.00 -13.30
39.35
--------------------------------------------------------------------------
--

Segment Leq : 39.35 dBA
```

```
Segment # 2: Montreal2 (night)
------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        4.50 !        2.80 !         2.80

ROAD (0.00 + 33.66 + 0.00) = 33.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    24     90   0.00  63.89   0.00  -6.02  -4.36   0.00   0.00 -19.85
33.66
--------------------------------------------------------------------------
--

Segment Leq : 33.66 dBA


Segment # 3: River (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 !        8.50 !        3.42 !         3.42

ROAD (0.00 + 29.53 + 0.00) = 29.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -47   0.00  60.88   0.00  -5.31  -6.22   0.00   0.00 -19.82
29.53
--------------------------------------------------------------------------
--

Segment Leq : 29.53 dBA
```

```
Segment # 4: River2 (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 !        8.50 !        3.83 !         3.83

ROAD (0.00 + 37.36 + 0.00) = 37.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -47     49   0.00  60.88   0.00  -5.31  -2.73   0.00   0.00 -15.48
37.36
--------------------------------------------------------------------------
--

Segment Leq : 37.36 dBA

Total Leq All Segments: 42.37 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 49.97
                         (NIGHT): 42.37
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 09:38:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -53.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -53.00 deg   Angle2 : 20.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal2 (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 # 2: Montreal2 (day/night)
-------------------------------------------
Angle1   Angle2           :  20.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  20.00 deg   Angle2 : 90.00 deg
Barrier height            :   7.90 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: River (day/night)
---------------------------------------
Angle1   Angle2           : -14.00 deg   28.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 102.00 / 102.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -14.00 deg   Angle2 : 28.00 deg
Barrier height            :  90.90 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 # 4: River2 (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 # 4: River2 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -14.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 102.00 / 102.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -14.00 deg
Barrier height            :  12.90 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Montreal (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 !        8.50 !        7.64 !         7.64

ROAD (0.00 + 41.20 + 0.00) = 41.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----------------------------------------------------------------------------
--
   -53     20   0.00  71.49   0.00  -6.37  -3.92   0.00   0.00 -20.00
41.20
-----------------------------------------------------------------------------
--

Segment Leq : 41.20 dBA
```

```
Results segment # 2: Montreal2 (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 !        8.50 !        7.64 !         7.64

ROAD (0.00 + 55.89 + 0.00) = 55.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    20     90   0.00  71.49   0.00  -6.37  -4.10   0.00   0.00  -5.14
55.89
--------------------------------------------------------------------------
--

Segment Leq : 55.89 dBA
```

```
Results segment # 3: River (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 !        8.50 !        7.47 !         7.47

ROAD (0.00 + 33.83 + 0.00) = 33.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -14     28   0.00  68.48   0.00  -8.33  -6.32   0.00   0.00 -20.00
33.83
--------------------------------------------------------------------------
--

Segment Leq : 33.83 dBA
```

```
Results segment # 4: River2 (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 !        8.50 !        7.88 !         7.88

ROAD (0.00 + 42.05 + 0.00) = 42.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----------------------------------------------------------------------------
--
   -90    -14   0.00  68.48   0.00  -8.33  -3.74   0.00   0.00 -14.36
42.05
-----------------------------------------------------------------------------
--

Segment Leq : 42.05 dBA

Total Leq All Segments: 56.23 dBA
```

```
Results segment # 1: Montreal (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 !        8.50 !        7.64 !         7.64

ROAD (0.00 + 33.61 + 0.00) = 33.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -53     20   0.00  63.89   0.00  -6.37  -3.92   0.00   0.00 -20.00
33.61
--------------------------------------------------------------------------
--

Segment Leq : 33.61 dBA

Results segment # 2: Montreal2 (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 !        8.50 !        7.64 !         7.64

ROAD (0.00 + 48.29 + 0.00) = 48.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
    20     90   0.00  63.89   0.00  -6.37  -4.10   0.00   0.00  -5.14
48.29
--------------------------------------------------------------------------
--

Segment Leq : 48.29 dBA
```

```
Results segment # 3: River (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 !        8.50 !        7.47 !         7.47

ROAD (0.00 + 26.24 + 0.00) = 26.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -14     28   0.00  60.88   0.00  -8.33  -6.32   0.00   0.00 -20.00
26.24
--------------------------------------------------------------------------
--

Segment Leq : 26.24 dBA

Results segment # 4: River2 (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 !        8.50 !        7.88 !         7.88

ROAD (0.00 + 34.46 + 0.00) = 34.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -14   0.00  60.88   0.00  -8.33  -3.74   0.00   0.00 -14.36
34.46
--------------------------------------------------------------------------
--
Segment Leq : 34.46 dBA

Total Leq All Segments: 48.63 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 56.23
                         (NIGHT): 48.63
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-06-2020 09:39:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Montreal (day/night)
------------------------------------------
Angle1   Angle2           : -45.00 deg   -42.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 104.00 / 104.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -45.00 deg   Angle2 : -42.00 deg
Barrier height            :  12.90 m
Barrier receiver distance :  37.00 / 37.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Montreal2 (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 # 2: Montreal2 (day/night)
-------------------------------------------
Angle1   Angle2           : -42.00 deg   -19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 104.00 / 104.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -42.00 deg   Angle2 : -19.00 deg
Barrier height            :  90.90 m
Barrier receiver distance :  37.00 / 37.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Montreal3 (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: Montreal3 (day/night)
-------------------------------------------
Angle1   Angle2           : -19.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 104.00 / 104.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 90.00 deg
Barrier height            :   7.90 m
Barrier receiver distance :  18.00 / 18.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: River (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 # 4: River (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  : 127.00 / 127.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -19.00 deg
Barrier height            :  72.90 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: River2 (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 # 5: River2 (day/night)
----------------------------------------
Angle1   Angle2           : -19.00 deg   35.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 127.00 / 127.00 m
Receiver height           :   8.50 / 8.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -19.00 deg   Angle2 : 35.00 deg
Barrier height            :  12.90 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Montreal (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 !        8.50 !        6.01 !         6.01

ROAD (0.00 + 29.10 + 0.00) = 29.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----------------------------------------------------------------------------
--
   -45    -42   0.00  71.49   0.00  -8.41 -17.78   0.00   0.00 -16.20
29.10
-----------------------------------------------------------------------------
--

Segment Leq : 29.10 dBA
```

```
Results segment # 2: Montreal2 (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 !        8.50 !        6.01 !         6.01

ROAD (0.00 + 34.15 + 0.00) = 34.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -42    -19   0.00  71.49   0.00  -8.41  -8.94   0.00   0.00 -20.00
34.15
--------------------------------------------------------------------------
--

Segment Leq : 34.15 dBA

Results segment # 3: Montreal3 (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 !        8.50 !        7.29 !         7.29

ROAD (0.00 + 55.46 + 0.00) = 55.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -19     90   0.00  71.49   0.00  -8.41  -2.18   0.00   0.00  -5.44
55.46
--------------------------------------------------------------------------
--

Segment Leq : 55.46 dBA
```

```
Results segment # 4: River (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 !        8.50 !        7.73 !         7.73

ROAD (0.00 + 35.40 + 0.00) = 35.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -19   0.00  68.48   0.00  -9.28  -4.04   0.00   0.00 -19.77
35.40
--------------------------------------------------------------------------
--

Segment Leq : 35.40 dBA

Results segment # 5: River2 (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 !        8.50 !        8.00 !         8.00

ROAD (0.00 + 35.18 + 0.00) = 35.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -19     35   0.00  68.48   0.00  -9.28  -5.23   0.00   0.00 -18.79
35.18
--------------------------------------------------------------------------
--

Segment Leq : 35.18 dBA

Total Leq All Segments: 55.58 dBA
```

```
Results segment # 1: Montreal (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 !        8.50 !        6.01 !         6.01

ROAD (0.00 + 21.51 + 0.00) = 21.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -45    -42   0.00  63.89   0.00  -8.41 -17.78   0.00   0.00 -16.20
21.51
--------------------------------------------------------------------------
--

Segment Leq : 21.51 dBA

Results segment # 2: Montreal2 (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 !        8.50 !        6.01 !         6.01

ROAD (0.00 + 26.55 + 0.00) = 26.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -42    -19   0.00  63.89   0.00  -8.41  -8.94   0.00   0.00 -20.00
26.55
--------------------------------------------------------------------------
--

Segment Leq : 26.55 dBA
```

```
Results segment # 3: Montreal3 (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 !        8.50 !        7.29 !         7.29

ROAD (0.00 + 47.87 + 0.00) = 47.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -19     90   0.00  63.89   0.00  -8.41  -2.18   0.00   0.00  -5.44
47.87
--------------------------------------------------------------------------
--

Segment Leq : 47.87 dBA

Results segment # 4: River (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 !        8.50 !        7.73 !         7.73

ROAD (0.00 + 27.80 + 0.00) = 27.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
--------------------------------------------------------------------------
--
   -90    -19   0.00  60.88   0.00  -9.28  -4.04   0.00   0.00 -19.77
27.80
--------------------------------------------------------------------------
--

Segment Leq : 27.80 dBA
```

```
Results segment # 5: River2 (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 !        8.50 !        8.00 !         8.00

ROAD (0.00 + 27.58 + 0.00) = 27.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-----------------------------------------------------------------------------
--
   -19     35   0.00  60.88   0.00  -9.28  -5.23   0.00   0.00 -18.79
27.58
-----------------------------------------------------------------------------
--

Segment Leq : 27.58 dBA

Total Leq All Segments: 47.99 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.58
                         (NIGHT): 47.99
```