March 22, 2018

Sam Osman
BCI Financials
83 Hinton Avenue North
Ottawa, ON
K2E 7Y8

Dear Mr. Osman

Re: Roadway Traffic Noise Brief
83 Hinton Avenue North
GWE File No.: 18-030 – Noise Brief

1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by BCI Financials to undertake a roadway traffic noise assessment of the proposed mixed-use development at 83 Hinton Avenue North in Ottawa, Ontario. The study was requested by the City of Ottawa, as the subject property is within 100 meters (m) of a major collector roadway, namely Holland Avenue. This roadway traffic noise brief summarizes the methodology, results and recommendations related to a roadway traffic noise assessment. GWE's scope of work involved assessing exterior noise levels generated by local roadway traffic to ensure that the development does not require a detailed analysis for noise control measures and mitigation. The roadway traffic noise assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment and Climate Change (MOECC)[2] guidelines. Our study was based on architectural drawings provided by Colizza Bruni Architecture, future traffic volumes corresponding to the City of Ottawa's Official Plan (OP), and CAD mapping obtained through the City of Ottawa.

[1] City of Ottawa – Environmental Noise Control Guidelines, January 2016
[2] Ministry of the Environment and Climate Change (MOECC) – Environmental Noise Guideline, Publication NPC-300, August 2013

2. TERMS OF REFERENCE

The focus of this roadway traffic noise assessment is a proposed mixed-use development comprising a 7-storey building. The development is located near the southeast corner of the Hamilton Avenue & Armstrong Street intersection. The major sources of roadway traffic noise are Parkdale Avenue to the east, Wellington Street West to the south, and Holland Avenue to the West. There are no plans of future expansion of these roadways under the City of Ottawa's Master Transportation Plan. The development is located a block away from both roads, and benefits from the blockage of intervening houses and buildings. The site is surrounded on all sides with mixed-use land, primarily commercial and residential. Figure 1 illustrates a complete site plan with surrounding context.

3. OBJECTIVES

The main goals of this work are to: (i) calculate the future noise levels on the study buildings produced by local roadway traffic and (ii) ensure that exterior noise levels do not exceed the ENCG objective limit, as specified in Section 4.2.1 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 vehicle traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings.

Predicted noise levels at the plane of window (POW) and outdoor living area (OLA) dictate the action required to achieve the recommended indoor and OLA sound levels, as specified in the ENCG. When noise levels at these areas exceed the ENCG objective limit of 55 dBA, specific outdoor, ventilation and Warning Clause requirements may apply. In addition, where noise levels exceed 65 dBA, upgraded building components must be designed to ensure indoor sound level limits can be met.

4.2.2 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[3] which provides 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 1 (below) summarizes the AADT values used for the roadway included in this assessment.

TABLE 1: ROADWAY TRAFFIC DATA

Roadway	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Parkdale Avenue	2-UAU	50	**15,000**
Wellington Street West	2-UAU	50	**15,000**
Holland Avenue	4-UMCU	50	**24,000**

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

4.2.3 Theoretical Roadway Traffic Noise Predictions

Noise predictions were performed with the aid of the MOECC 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, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 1, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions
- The day/night split was taken to be 92% / 8% respectively for all streets
- Reflective intermediate ground surfaces based on the density of the urban neighborhood
- The study site was treated as having flat or gently sloping topography
- Blockage from Intervening buildings considered as barriers
- Three noise receptors were strategically placed throughout the development

5. RESULTS AND CONCLUSIONS

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 ROADWAY TRAFFIC SOURCES

Receptor Number	Plane of Window Receptor Location	Noise Level (dBA)	
		Day	Night
1	7th Floor – South Façade	57	49
2	7th Floor – West Façade	56	48
3	Ground Level – Rear Yards	55	47

The results of the current study indicate that noise levels will range between 55 and 57 dBA during the daytime period (07:00-23:00) and between 47 and 48 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the development's south façade (Receptor 1), which is nearest and most exposed to Parkdale Avenue and Wellington Street West. Since noise levels exceed the ENCG objective limit of 55 dBA, the development will require forced air heating with provision for air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The

following Warning Clause[4] will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized below:

> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing roadway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment and Climate Change. To help address the need for sound attenuation, this development has been designed with forced air heating with provision for air conditioning. Air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment and Climate Change.*
>
> *To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features."*

Stationary noise from the development's mechanical equipment may adversely impact the surrounding noise-sensitive properties. A review of final equipment selection and locations by a qualified acoustical engineer will be required prior to installation of the equipment, to ensure the proposed development is compatible with the existing and future noise-sensitive land uses.

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

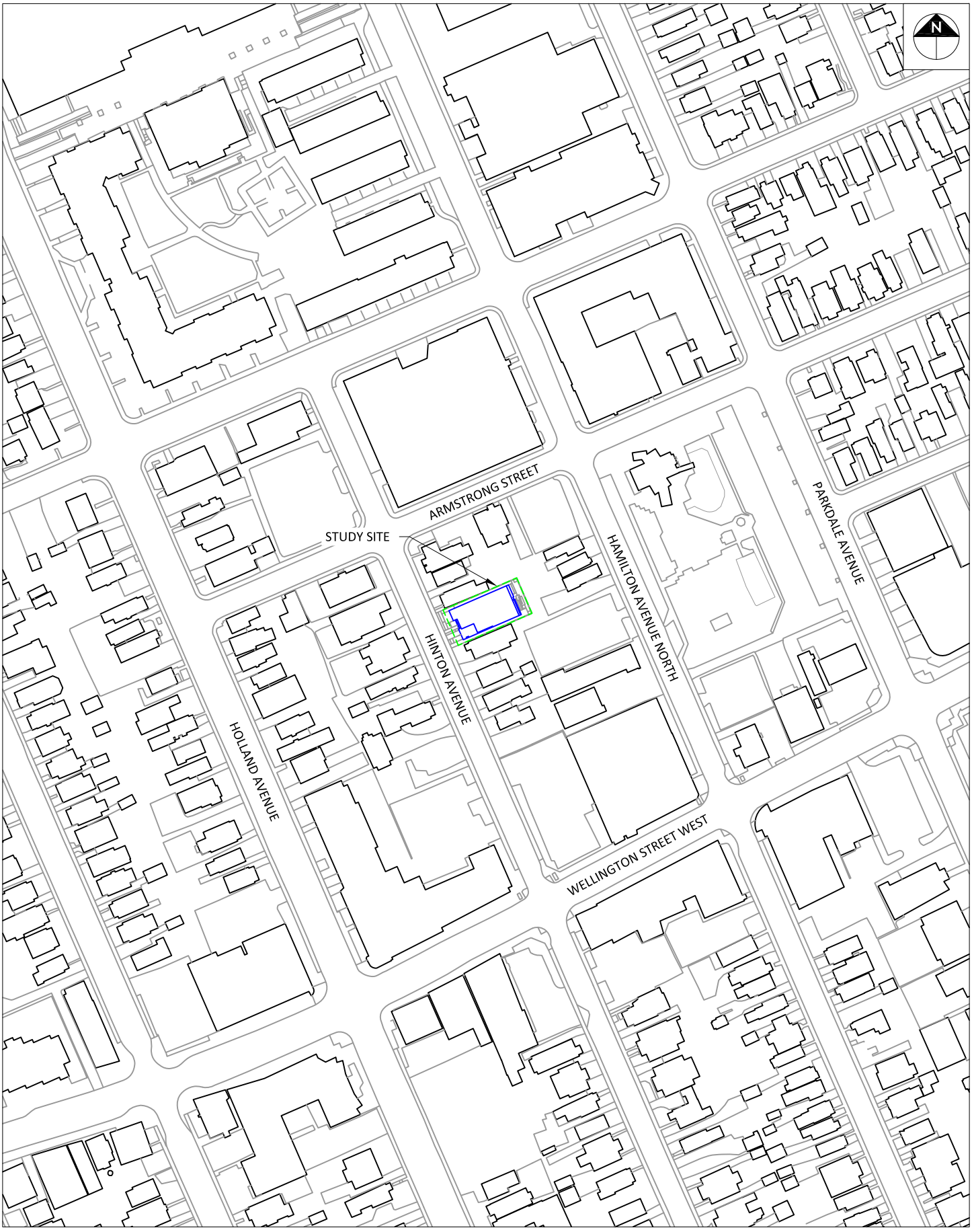
Sincerely,

Gradient Wind Engineering Inc.

Michael Lafortune
Environmental Scientist
GWE18-030 – Noise Brief

Joshua Foster, P.Eng.
Principal

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



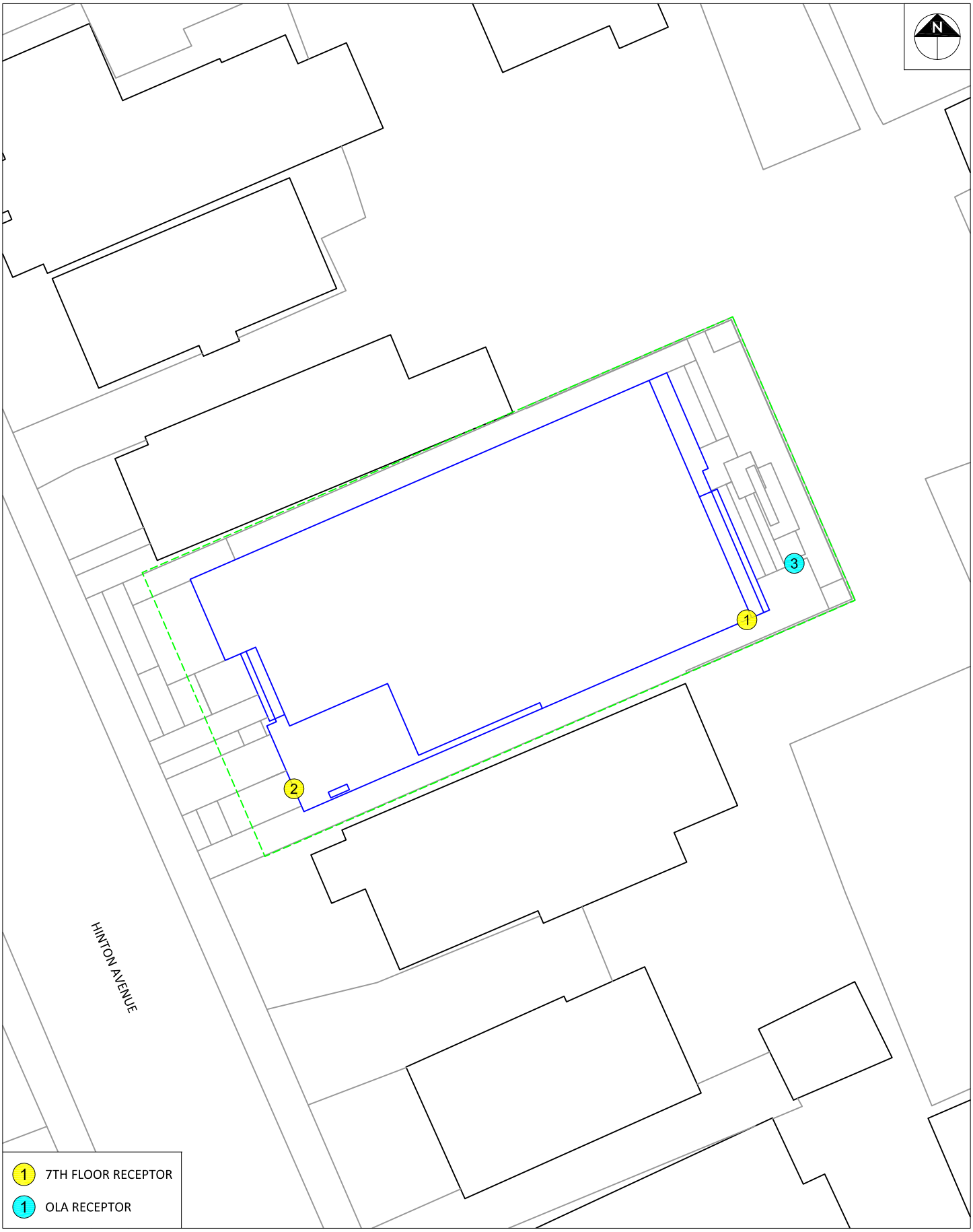
127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	83 HINTON AVENUE ROADWAY TRAFFIC NOISE BRIEF
SCALE	1:2000 (APPROX.)
DRAWING NO.	GWE18-030-1
DATE	MARCH 12, 2018
DRAWN BY	M.L.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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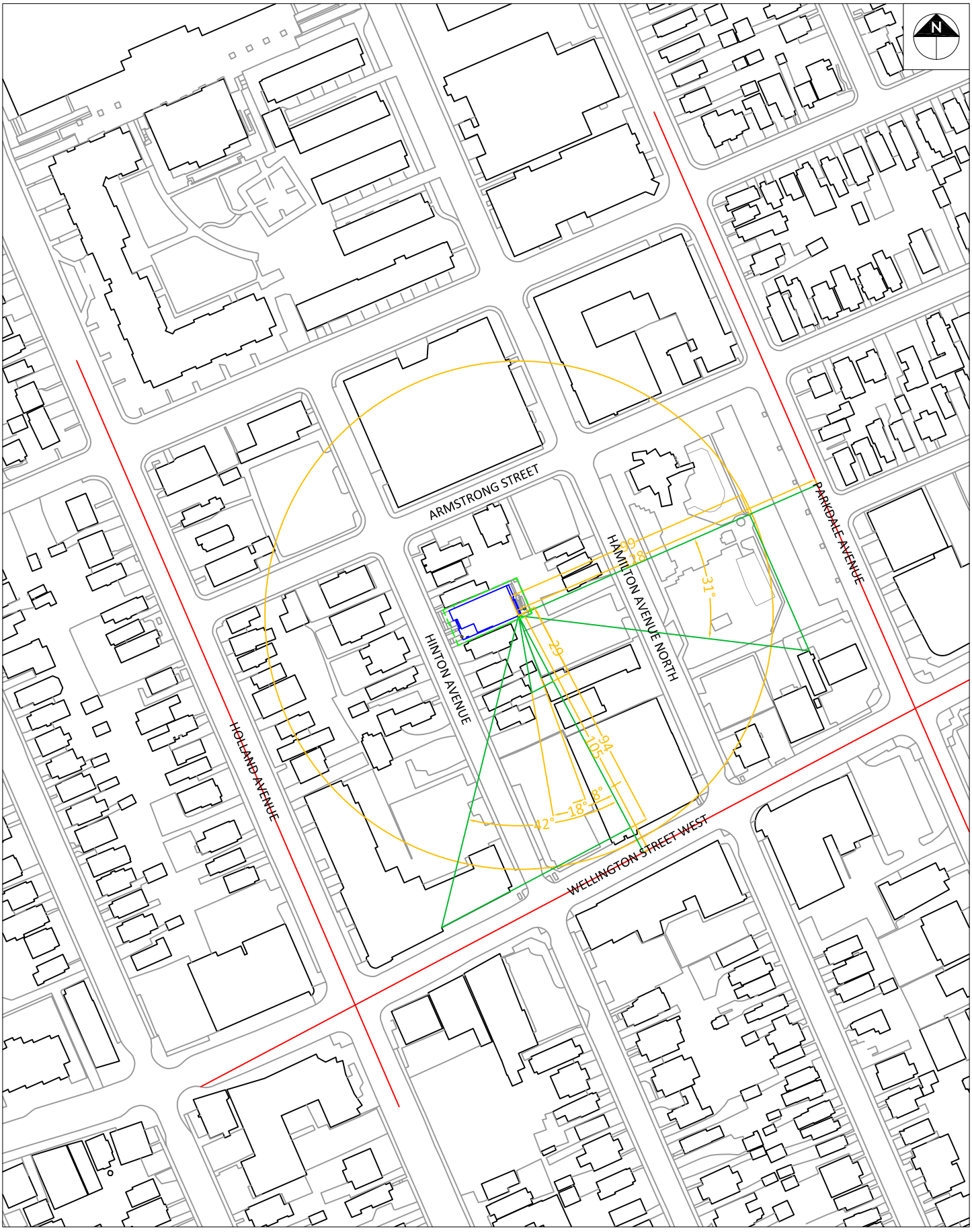
GRADIENT WIND ENGINEERING INC

PROJECT	83 HINTON AVENUE ROADWAY TRAFFIC NOISE BRIEF		
SCALE	1:250 (APPROX.)	DRAWING NO.	GWE18-030-2
DATE	MARCH 12, 2018	DRAWN BY	M.L.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS



127 Walgreen Road
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GRADIENT WIND ENGINEERING INC

PROJECT	83 HINTON AVENUE ROADWAY TRAFFIC NOISE BRIEF		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE18-030-3
DATE	MARCH 12, 2018	DRAWN BY	M.L.

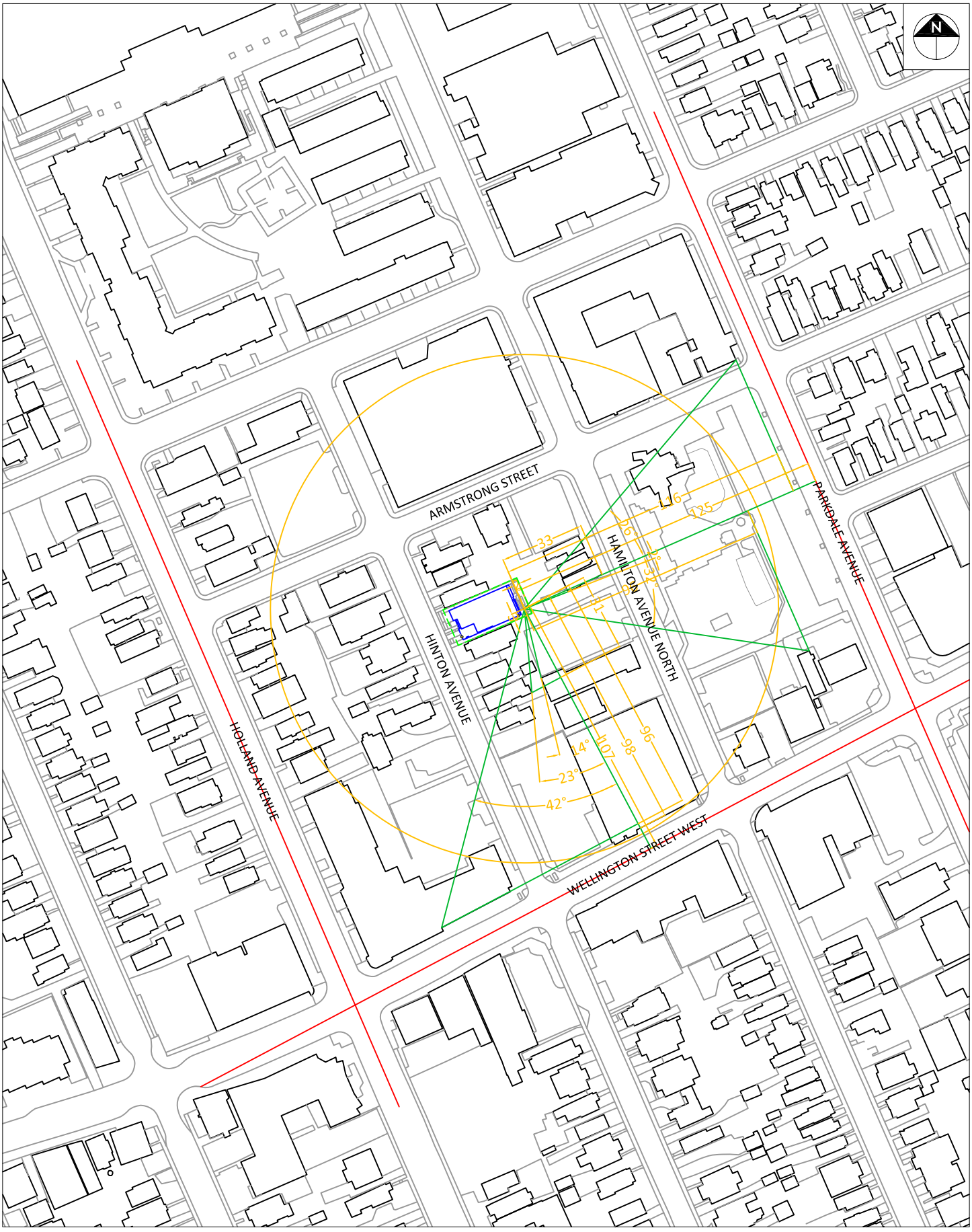
FIGURE 3:
STAMSON INPUT - RECEPTOR 1

127 Walgreen Road
Ottawa, Ontario
(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	83 HINTON AVENUE ROADWAY TRAFFIC NOISE BRIEF		DESCRIPTION
SCALE	1:2000 (APPROX.)	DRAWING NO.	GWE18-030-4
DATE	MARCH 12, 2018	DRAWN BY	M.L.

FIGURE 4:
STAMSON INPUT - RECEPTOR 2



127 Walgreen Road
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(613) 836 0934

GRADIENT WIND ENGINEERING INC

PROJECT	83 HINTON AVENUE ROADWAY TRAFFIC NOISE BRIEF
SCALE	1:2000 (APPROX.)
DRAWING NO.	GWE18-030-5
DATE	MARCH 12, 2018
DRAWN BY	M.L.

DESCRIPTION

FIGURE 5:
STAMSON INPUT - RECEPTOR 3

APPENDIX A

STAMSON 5.04 INPUT AND OUTPUT DATA

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:15:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: James (day/night)
---------------------------------------
Angle1   Angle2           :   0.00 deg   80.00 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           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 60.43 + 0.00) = 60.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     80   0.00  63.96   0.00   0.00  -3.52   0.00   0.00   0.00
60.43
-------------------------------------------------------------------------
--

Segment Leq : 60.43 dBA

Total Leq All Segments: 60.43 dBA


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

Source height = 1.50 m

ROAD (0.00 + 52.84 + 0.00) = 52.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     80   0.00  56.36   0.00   0.00  -3.52   0.00   0.00   0.00
52.84
-------------------------------------------------------------------------
--

Segment Leq : 52.84 dBA

Total Leq All Segments: 52.84 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 60.43
                           (NIGHT): 52.84
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:15:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


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

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

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

Data for Segment # 1: Burlington (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 60.95 + 0.00) = 60.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  63.96   0.00   0.00  -3.01   0.00   0.00   0.00
60.95
-------------------------------------------------------------------------
--

Segment Leq : 60.95 dBA

Total Leq All Segments: 60.95 dBA


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

Source height = 1.50 m

ROAD (0.00 + 53.35 + 0.00) = 53.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  56.36   0.00   0.00  -3.01   0.00   0.00   0.00
53.35
-------------------------------------------------------------------------
--

Segment Leq : 53.35 dBA

Total Leq All Segments: 53.35 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 60.95
                           (NIGHT): 53.35
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:15:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Burlington1 (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: Burlington1 (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   74.00 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           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Burlington2 (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Burlington2 (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   -74.00 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           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: James (day/night)
---------------------------------------
Angle1   Angle2           : -83.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  23.00 / 23.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Burlington1 (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.55 + 0.00) = 63.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     74   0.00  63.96   0.00   0.00  -0.40   0.00   0.00   0.00
63.55
-------------------------------------------------------------------------
--

Segment Leq : 63.55 dBA


Results segment # 2: Burlington2 (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.44 + 0.00) = 53.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -74   0.00  63.96   0.00   0.00 -10.51   0.00   0.00   0.00
53.44
-------------------------------------------------------------------------
--

Segment Leq : 53.44 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 58.74 + 0.00) = 58.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -83      0   0.00  63.96   0.00  -1.86  -3.36   0.00   0.00   0.00
58.74
-------------------------------------------------------------------------
--

Segment Leq : 58.74 dBA

Total Leq All Segments: 65.10 dBA


Results segment # 1: Burlington1 (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.96 + 0.00) = 55.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     74   0.00  56.36   0.00   0.00  -0.40   0.00   0.00   0.00
55.96
-------------------------------------------------------------------------
--

Segment Leq : 55.96 dBA
```

```
Results segment # 2: Burlington2 (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.85 + 0.00) = 45.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -74   0.00  56.36   0.00   0.00 -10.51   0.00   0.00   0.00
45.85
-------------------------------------------------------------------------------
--

Segment Leq : 45.85 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.14 + 0.00) = 51.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -83      0   0.00  56.36   0.00  -1.86  -3.36   0.00   0.00   0.00
51.14
-------------------------------------------------------------------------------
--

Segment Leq : 51.14 dBA

Total Leq All Segments: 57.50 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 65.10
                           (NIGHT): 57.50
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:15:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Burlington1 (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: Burlington1 (day/night)
---------------------------------------------
Angle1   Angle2           :   0.00 deg   46.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  23.00 / 23.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Burlington2 (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Burlington2 (day/night)
-----------------------------------------------
Angle1   Angle2           :  78.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 3: James (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   82.00 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           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Burlington1 (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.17 + 0.00) = 56.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     46   0.00  63.96   0.00  -1.86  -5.93   0.00   0.00   0.00
56.17
-------------------------------------------------------------------------
--

Segment Leq : 56.17 dBA


Results segment # 2: Burlington2 (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.19 + 0.00) = 52.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    78     90   0.00  63.96   0.00   0.00 -11.76   0.00   0.00   0.00
52.19
-------------------------------------------------------------------------
--

Segment Leq : 52.19 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 63.76 + 0.00) = 63.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     82   0.00  63.96   0.00   0.00  -0.20   0.00   0.00   0.00
63.76
-------------------------------------------------------------------------
--

Segment Leq : 63.76 dBA

Total Leq All Segments: 64.71 dBA


Results segment # 1: Burlington1 (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 48.58 + 0.00) = 48.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     46   0.00  56.36   0.00  -1.86  -5.93   0.00   0.00   0.00
48.58
-------------------------------------------------------------------------
--

Segment Leq : 48.58 dBA
```

```
Results segment # 2: Burlington2 (night)
-----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 44.60 + 0.00) = 44.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    78     90   0.00  56.36   0.00   0.00 -11.76   0.00   0.00   0.00
44.60
-------------------------------------------------------------------------------
--

Segment Leq : 44.60 dBA


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

Source height = 1.50 m

ROAD (0.00 + 56.16 + 0.00) = 56.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     82   0.00  56.36   0.00   0.00  -0.20   0.00   0.00   0.00
56.16
-------------------------------------------------------------------------------
--

Segment Leq : 56.16 dBA

Total Leq All Segments: 57.11 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 64.71
                           (NIGHT): 57.11
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:17:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: James1 (day/night)
-----------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: James1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   6.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 6.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :  19.00 / 19.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: James2 (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: James2 (day/night)
----------------------------------------
Angle1   Angle2           :   6.00 deg   67.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   6.00 deg   Angle2 : 67.00 deg
Barrier height            :  21.00 m
Barrier receiver distance :   2.00 / 2.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: James1 (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 !       22.50 !       11.71 !        11.71

ROAD (0.00 + 39.23 + 0.00) = 39.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      6   0.00  63.96   0.00  -3.92  -2.73   0.00   0.00 -18.08
39.23
-------------------------------------------------------------------------------
--

Segment Leq : 39.23 dBA
```

```
Results segment # 2: James2 (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 !       22.50 !       21.36 !        21.36

ROAD (0.00 + 55.33 + 0.00) = 55.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     6     67   0.00  63.96   0.00  -3.92  -4.70   0.00   0.00  -4.05
51.28*
     6     67   0.00  63.96   0.00  -3.92  -4.70   0.00   0.00   0.00
55.33
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 55.33 dBA

Total Leq All Segments: 55.44 dBA
```

```
Results segment # 1: James1 (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 !       22.50 !       11.71 !        11.71

ROAD (0.00 + 31.63 + 0.00) = 31.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      6   0.00  56.36   0.00  -3.92  -2.73   0.00   0.00 -18.08
31.63
-------------------------------------------------------------------------------
--

Segment Leq : 31.63 dBA
```

```
Results segment # 2: James2 (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 !       22.50 !       21.36 !        21.36

ROAD (0.00 + 47.74 + 0.00) = 47.74 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     6     67   0.00  56.36   0.00  -3.92  -4.70   0.00   0.00  -4.05
43.69*
     6     67   0.00  56.36   0.00  -3.92  -4.70   0.00   0.00   0.00
47.74
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 47.74 dBA

Total Leq All Segments: 47.85 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.44
                           (NIGHT): 47.85
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-03-2018 11:17:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: James1 (day/night)
-----------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: James1 (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -49.00 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           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -49.00 deg
Barrier height            :  27.00 m
Barrier receiver distance :   2.00 / 2.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: James2 (day/night)
------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: James2 (day/night)
----------------------------------------
Angle1   Angle2           : -49.00 deg   80.00 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           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -49.00 deg   Angle2 : 80.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Burlington1 (day/night)
------------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: Burlington1 (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   42.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 42.00 deg
Barrier height            :  27.00 m
Barrier receiver distance :   2.00 / 2.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Burlington2 (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

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

Data for Segment # 4: Burlington2 (day/night)
---------------------------------------------
Angle1   Angle2           :  42.00 deg   50.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           :  25.50 / 25.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  42.00 deg   Angle2 : 50.00 deg
Barrier height            :  24.00 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: James1 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       22.50 !        22.50

ROAD (0.00 + 42.75 + 0.00) = 42.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -49   0.00  63.96   0.00  -0.28  -6.42   0.00   0.00 -14.50
42.75
-------------------------------------------------------------------------------
--

Segment Leq : 42.75 dBA


Results segment # 2: James2 (day)
---------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       21.00 !        21.00

ROAD (0.00 + 49.19 + 0.00) = 49.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -49     80   0.00  63.96   0.00  -0.28  -1.45   0.00   0.00 -13.04
49.19
-------------------------------------------------------------------------------
--

Segment Leq : 49.19 dBA
```

```
Results segment # 3: Burlington1 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       23.32 !        23.32

ROAD (0.00 + 43.80 + 0.00) = 43.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     42   0.00  63.96   0.00  -1.66  -1.35   0.00   0.00 -17.14
43.80
-------------------------------------------------------------------------------
--

Segment Leq : 43.80 dBA


Results segment # 4: Burlington2 (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       21.14 !        21.14

ROAD (0.00 + 35.41 + 0.00) = 35.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    42     50   0.00  63.96   0.00  -1.66 -13.52   0.00   0.00 -13.36
35.41
-------------------------------------------------------------------------------
--

Segment Leq : 35.41 dBA

Total Leq All Segments: 51.12 dBA
```

```
Results segment # 1: James1 (night)
----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       22.50 !        22.50

ROAD (0.00 + 35.16 + 0.00) = 35.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -49   0.00  56.36   0.00  -0.28  -6.42   0.00   0.00 -14.50
35.16
-------------------------------------------------------------------------------
--

Segment Leq : 35.16 dBA


Results segment # 2: James2 (night)
----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       21.00 !        21.00

ROAD (0.00 + 41.60 + 0.00) = 41.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -49     80   0.00  56.36   0.00  -0.28  -1.45   0.00   0.00 -13.04
41.60
-------------------------------------------------------------------------------
--

Segment Leq : 41.60 dBA
```

```
Results segment # 3: Burlington1 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       23.32 !        23.32

ROAD (0.00 + 36.21 + 0.00) = 36.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     42   0.00  56.36   0.00  -1.66  -1.35   0.00   0.00 -17.14
36.21
-------------------------------------------------------------------------------
--

Segment Leq : 36.21 dBA
```

```
Results segment # 4: Burlington2 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       25.50 !       21.14 !        21.14

ROAD (0.00 + 27.81 + 0.00) = 27.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    42     50   0.00  56.36   0.00  -1.66 -13.52   0.00   0.00 -13.36
27.81
-------------------------------------------------------------------------------
--

Segment Leq : 27.81 dBA

Total Leq All Segments: 43.53 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 51.12
                           (NIGHT): 43.53
```