



Roadway Traffic Noise Feasibility Assessment

Half Moon Bay West

Ottawa, Ontario

REPORT: GWE16-131 - Traffic Noise R2

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EXECUTIVE SUMMARY

This document describes a roadway traffic noise feasibility assessment performed for a proposed mixed-use subdivision. The study site known as Half Moon Bay West, is situated in the southwest area of Barrhaven in Ottawa, Ontario. The report reflects recent changes to the draft plan of subdivision which include the addition of a park in the southwest corner and additional residential blocs on the west side. The revised concept plan being considered, comprises detached dwelling blocks, townhomes, apartment buildings, a secondary school, commercial buildings, and park/open space. However, the road network and arrangement of land uses may be subject to change throughout the development approval process. The major sources of noise affecting the development are roadway traffic along Cambrian Road, Borrisokane Road, Highway 416 and proposed collector streets within the development, as well as a realigned Greenbank Road.

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

As the site plan may be subject to change, GWE took the approach to establish noise contours around the site with no massing consideration for any buildings or homes. The contours, based on the City of Ottawa noise criteria, were used to determine what level of noise control for various areas on site would be required. The results of the current study indicate that noise levels due to roadway traffic over the site will range between approximately 55 and 72 dBA during the daytime period (07:00-23:00). The highest roadway traffic noise levels will occur nearest to the realigned Greenbank Road.

Results of the roadway traffic noise calculations also indicate that outdoor living areas having direct exposure to the noise sources that are within approximately 180 metres of realigned Greenbank Road, and within 35 metres of the internal collectors, may require noise control measures depending on final site orientation. These measures are in Section 5.2, with the aim to reduce the L_{eq} to as close to 55 dBA as technically, economically and administratively feasible.

Once the final site plan configuration has been established, at the time of subdivision registration, future detailed noise studies would be performed to determine site specific noise mitigation and appropriate warning clauses.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (GWE) was retained by Mattamy Homes to undertake a roadway traffic noise feasibility assessment of the proposed mixed-use subdivision known as Half Moon Bay West situated in the southwest area of Barrhaven in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to a roadway traffic noise feasibility assessment, and was prepared in support of the client's draft plan of subdivision applications. This report provided an update to the recent changes to the overall draft plan of subdivision which now includes a park on the southwest corner of the site. GWE's scope of work involved assessing exterior noise levels throughout the site, generated by local roadway traffic. The report also quantitatively addresses any potential noise impacts. The assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa¹ and Ministry of the Environment and Climate Change² guidelines. Noise calculations were based on an initial concept plan received from Mattamy Homes, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this roadway traffic noise feasibility assessment is a proposed concept for a mixed-use subdivision in Half Moon Bay West in Ottawa, Ontario. The proposed concept plan comprises a mixture of town houses, detached dwellings, an apartment block, commercial areas, a secondary school, and open park space. The development is split into four-phases, with Phase 1 encompassing the southeast corner of the site excluding the secondary school block, Phase 2 the northeast corner of the site, Phase 3 on the north side, and finally Phase 4 on the west side of the site as indicated in Figure 1. Single homes are located throughout the development, and the town houses mainly on the northwest/west side of the site. The development has two parks, on the northeast and southwest side of the site, as well as a storm water management pond in the middle of the development with a channel running to the northern boundary of the site. There are commercial lots on the southeast corners of the development. A secondary school lot is proposed across Cambrian Road in proximity to the proposed realigned Greenbank Road. The study area is bordered by Cambrian Road to the south, realigned Greenbank Road to the east, Borrisokane Road to the west, and contains several proposed internal Streets. Highway 416 is approximately 300 metres (m)

¹ City of Ottawa Environmental Noise Control Guidelines, January 2016

² Ontario Ministry of the Environment and Climate Change – Publication NPC-300

southwest of the subdivision. Surrounding the subdivision is a woodlot to the southwest north of Cambrian Road and east of Borrisokane Road.

The major sources of noise are traffic along Cambrian Road to the south, Borrisokane Road north of Cambrian Road, realigned Greenbank Road, Highway 416 to the southwest, and three proposed interior collector streets running inside the development. The first is the proposed Street 1A which runs along the middle of the development, the second is Street 31A/B running from Borrisokane Road to the middle of the development, and finally Street 18 running in the northern side of the development from the realigned Greenbank Road. Figure 1 illustrates a site plan, showing the proposed development and the streets used in our assessment.

Even though the concept plan has been updated, the final site configuration may be subject to change. Therefore, GWE took the approach to establish noise contours around the site as per the current plans. The contours, based on the City of Ottawa noise criteria, were used to determine what level of noise control for various areas on site would be required.

3. OBJECTIVES

The principal objective of this work is to calculate the future noise levels on the study site produced by local roadway traffic and explore potential for noise mitigation where required.

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicle traffic, the equivalent sound energy level, L_{eq} , provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended Outdoor Living Area (OLA) noise limit is 55 dBA during the daytime period. OLA do not need to be considered during the nighttime period.

Predicted noise levels at the outdoor living area dictate the action required to achieve the recommended sound levels. According to the ENCG, if an area is to be used as an outdoor living area (OLA), noise control measures are required to reduce the L_{eq} to 55 dBA. This is typically done with noise control measures outlined in Section 5.2. When noise levels at these areas exceed the criteria, specific Warning Clause requirements may apply. As this is a preliminary assessment, noise control recommendations are of a general nature; specific mitigation requirements would be the work of a future study.

4.3 Roadway Noise Assessment

4.3.1 Theoretical Roadway Traffic Noise Predictions

Noise predictions were determined by computer modelling using two programs. To provide a general sense of noise across the site, the software program *Predictor-Lima*, which incorporates the United States Federal Highway Administration's (FHWA) Transportation Noise Model (TNM) 2.5. This computer program is capable of representing three-dimensional surface and first reflections of sound waves over a suitable spectrum for human hearing. A receptor grid with 5 × 5 m spacing was placed across the study site, along with a number of discrete receptors at key sensitive areas. This program outputs noise contours, however, is not the approved model for roadway predictions by the City of Ottawa. Therefore, the results were confirmed by performing discrete noise calculations with the Ministry of the Environment and Climate Change's (MOECC) computerized noise assessment program, STAMSON 5.04, at key receptor locations coinciding with receptor locations in Predictor as shown in Figure 1. Appendix A includes the STAMSON 5.04 input and output data.

Roadway noise calculations were performed by treating each road segment as separate line sources of noise. 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
- Grassland/Lots taken as absorptive ground, while hard ground and roadways taken as reflective ground
- The study site was treated as having flat or gently sloping topography
- General massing of the entire site ignored as potential screening elements
- Proposed Streets treated as minor collectors as stated in Table 1

4.3.2 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan³ (TMP) 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 each roadway included in this assessment.

³ City of Ottawa Transportation Master Plan, November 2013
Mattamy Homes – Half Moon Bay West

TABLE 1: ROADWAY TRAFFIC DATA

Roadway	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Highway 416 (2 lanes each direction)	Highway	100	18,333 per lane
Cambrian Road	2-Lane Urban Arterial-Undivided (2-UAU)	70	15,000
Realigned Greenbank Road	4-Lane Urban Arterial-Divided (4-UAD)	70	35,000
Borrisokane North	2-Lane Urban Arterial-Undivided (2-UAU)	80	15,000
Proposed Street 1A	2-Lane Collector (2-UCU)	40	8,000
Proposed Street 18	2-Lane Collector (2-UCU)	40	8,000
Proposed Street 31A/B	2-Lane Collector (2-UCU)	40	8,000

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations for the daytime period are shown in Figure 3, which cover the entire study site. Discrete receptors were also placed at ground level at key locations throughout the site. The noise contours were generated using *Predictor-Lima* and verified with discrete receptors using STAMSON 5.04 as shown in Figure 1 and summarized in Table 2 below. Receptors 1-6 are located on the eastern side of the site, receptors 7-12 on the southern/ central side of the site, and receptors 13-15 on the northern/ central side of the site. With the revisions to the concept plan receptor 9 has been shifted northwest to the centre of the park. An additional receptor 16 was added to address the new residential blocks on the west side of the site. Appendix A contains the complete set of input and output data from all STAMSON 5.04 calculations. Sample STAMSON input parameters are illustrated in Figure 2.

TABLE 2: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Zone Location	STAMSON 5.04 Noise Level (dBA)	Predictor-Lima Noise Level (dBA)
		Day	Day
1	OLA – Grade Level – Rear of single home	71	69
2	OLA – Grade Level – Rear of single home	69	68
3	OLA – Grade Level – Rear of single home	72	69
4	OLA – Grade Level – Apartment Block area	71	68
5	OLA – Grade Level – Commercial Area	69	66
6	OLA – Grade Level – Secondary School	64	63
7	OLA – Grade Level – Rear of townhome	62	64
8	OLA – Grade Level – Rear of single home	70	67
9	OLA – Grade Level – Park	55	60
10	OLA – Grade Level – Rear of single home	57	60
11	OLA – Grade Level – Rear of townhome	62	61
12	OLA – Grade Level – Rear of townhome	65	63
13	OLA – Grade Level – Rear of single home	63	62
14	OLA – Grade Level – Rear of single home	63	62
15	OLA – Grade Level – Rear of single home	61	60
16	OLA – Rear of townhouses	58	61

As shown above, the results calculated from *Predictor-Lima* generally have good correlation with calculations performed in STAMSON 5.04. A tolerance of 3 dBA between models is generally considered acceptable given human hearing cannot detect a change in sound level of less than 3 dBA. As stated in Section 4.3.1, general massing was ignored for the entire site. Results of the roadway traffic noise calculations also indicate that outdoor living areas having direct exposure to the noise sources that are within approximately 180 metres of realigned Greenbank Road, and 35 metres of the internal collectors may require noise control measures. These measures are in Section 5.2, with the aim to reduce the L_{eq} to as close to 55 dBA as technically, economically and administratively feasible.

5.2 Summary of Noise Control Measures

The OLA noise levels predicted due to roadway traffic, at a number of receptors, exceed the criteria listed in the ENCG for outdoor living areas, as discussed in Section 4.2. Therefore, noise control measures as described below from Table 2.3a in the ENCG, in order of preference, will be required to reduce the L_{eq} to 55 dBA:

- Distance setback with soft ground
- Insertion of noise insensitive land uses between the source and sensitive points of reception
- Orientation of buildings to provide sheltered zones in rear yards
- Shared outdoor amenity areas
- Earth berms (sound barriers)
- Acoustic barriers

Examining the noise control measures listed above, not all of the OLA have the buildings oriented to provide screening elements against traffic sources. Areas throughout the whole site have OLA with direct exposure to the arterial and collector roads surrounding and inside the development. Distance setback, insertion of noise insensitive land uses, and building orientation to provide sheltered zones in rear yards may not be feasible due to the requirements of the Community Development Plan. It is also not feasible to have shared outdoor amenity areas for this development with respect to rear yards as this would have a significant impact on salability. Therefore, the most feasible measures are insertion of earth berms or acoustic wall barriers between the sensitive rear yards and sources of noise. By siding lots onto the collector and arterial roadways the extent of barriers are minimized. The use of earth berms or acoustic barriers will depend on the grading plan when it becomes available. Both options can reduce OLA noise levels to below 55 dBA.

Regarding Figure 2, the area(s) with noise levels under 55 dBA (yellow and light orange) have no ventilation or mitigation requirements. The area(s) with noise levels between 55 and 65 dBA (orange and red) require forced air heating with provision for central air conditioning with an applicable generic Warning Clause. Finally, the area(s) that represent noise levels above 65 dBA (maroon) require central air conditioning with an applicable extensive mitigation Warning Clause.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current study indicate that noise levels due to roadway traffic over the site will range between approximately 55 and 72 dBA during the daytime period (07:00-23:00). The highest roadway traffic noise levels will occur nearest to the realigned Greenbank Road.

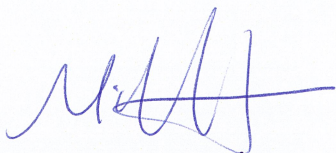
Results of the roadway traffic noise calculations also indicate that outdoor living areas having direct exposure to the noise sources that are within approximately 180 metres realigned Greenbank Road, and 35 metres of the internal collectors may require noise control measures. These measures are in Section 5.2, with the aim to reduce the L_{eq} to as close to 55 dBA as technically, economically and administratively feasible.

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.

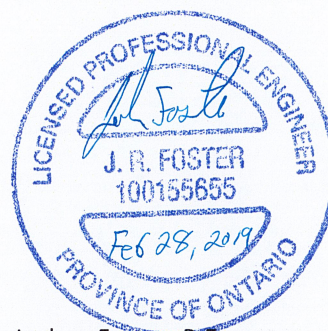
This concludes our assessment and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

Yours truly,

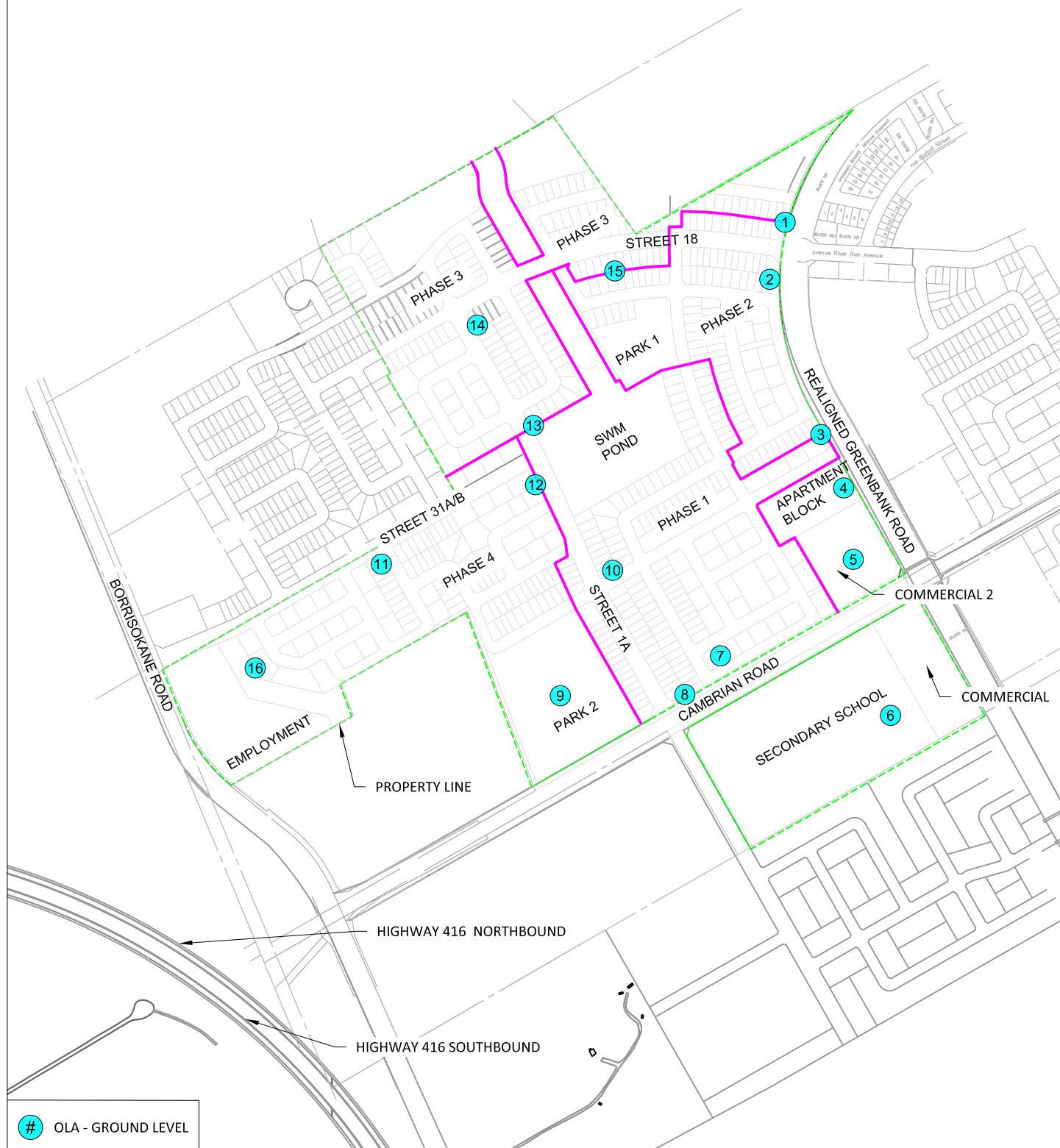
Gradient Wind Engineering Inc.

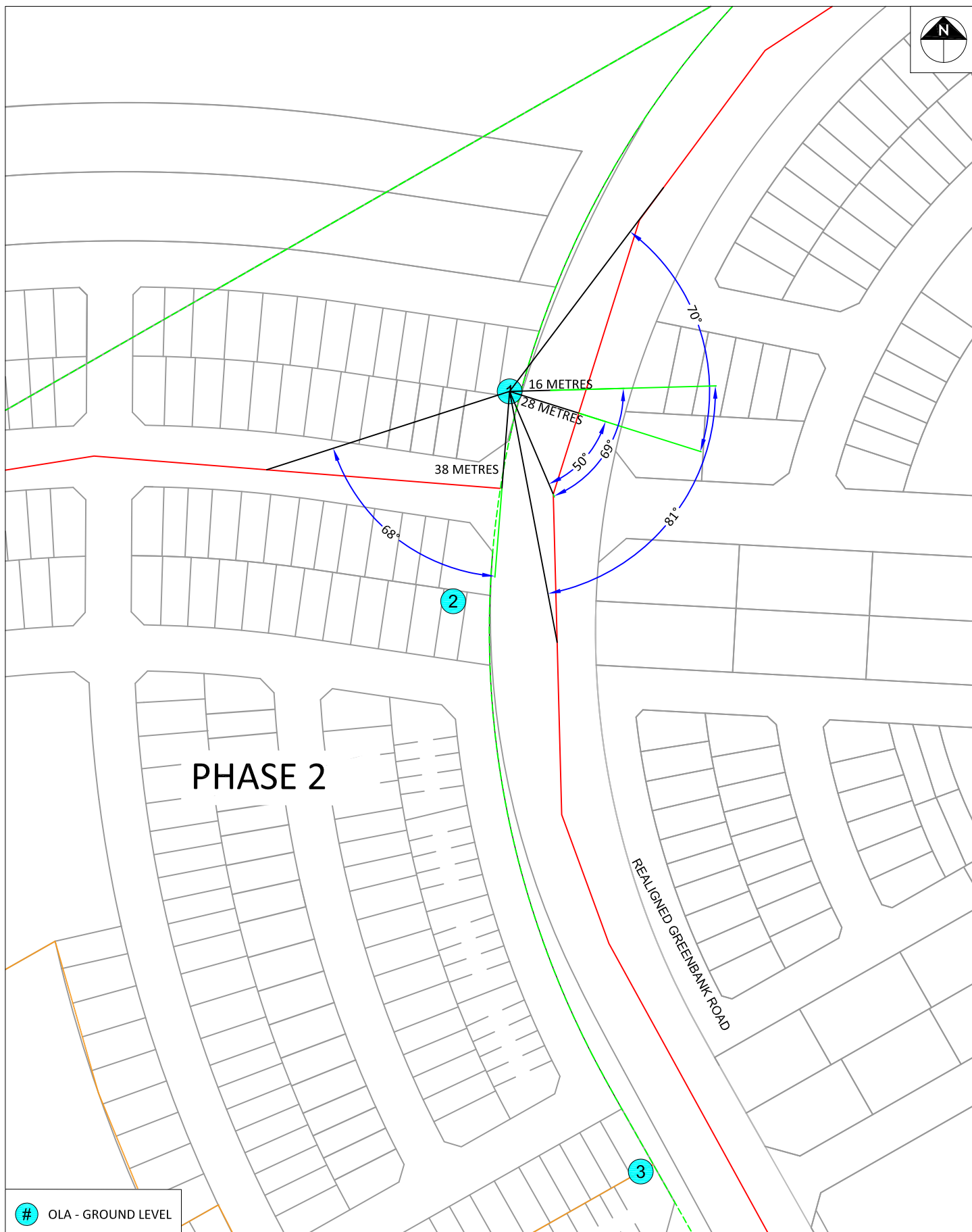
P.P. 

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GRADIENT WIND
ENGINEERING INC.

PROJECT
HALF MOON BAY WEST - TRAFFIC NOISE FEASIBILITY ASSESSMENT

SCALE
1:2000 (APPROX.)

DATE
JANUARY 31, 2018

DRAWING NO.
GWE16-131-2

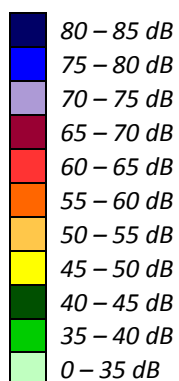
DRAWN BY
O.D.

DESCRIPTION

FIGURE 2:
SAMPLE RECEPTOR CALCULATION



FIGURE 3: GROUND LEVEL NOISE CONTOURS FOR THE SITE (DAYTIME PERIOD)



APPENDIX A

STAMSON 5.04 - INPUT AND OUTPUT DATA

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:51:47
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Street 18 (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: Street 18 (day/night)

```
-----
Angle1   Angle2       : 0.00 deg  70.00 deg
Wood depth : 0        (No woods.)
No of house rows : 0 / 0
Surface     : 1        (Absorptive ground surface)
Receiver source distance : 38.00 / 38.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 1        (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Road data, segment # 2: Greenbank 1 (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume  : 2254/196    veh/TimePeriod  *
Heavy truck volume   : 1610/140    veh/TimePeriod  *
Posted speed limit   : 70 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): 35000
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: Greenbank 1 (day/night)

```
-----
Angle1   Angle2           : -70.00 deg  50.00 deg
Wood depth           : 0          (No woods.)
No of house rows     : 0 / 0
Surface              : 2          (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height       : 1.50 / 1.50 m
Topography            : 1          (Flat/gentle slope; no barrier)
Reference angle       : 0.00
```

#

Road data, segment # 3: Greenbank 2 (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume  : 2254/196    veh/TimePeriod  *
Heavy truck volume   : 1610/140    veh/TimePeriod  *
Posted speed limit   : 70 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): 35000
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: Greenbank 2 (day/night)

```
-----
Angle1   Angle2       : 69.00 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 : 1.50 / 1.50 m
Topography    : 1          (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Results segment # 1: Street 18 (day)

Source height = 1.50 m

ROAD (0.00 + 52.36 + 0.00) = 52.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.66	63.96	0.00	-6.70	-4.89	0.00	0.00	0.00	52.36

Segment Leq : 52.36 dBA

Results segment # 2: Greenbank 1 (day)

Source height = 1.50 m

ROAD (0.00 + 70.52 + 0.00) = 70.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	50	0.00	75.00	0.00	-2.71	-1.76	0.00	0.00	0.00	70.52

Segment Leq : 70.52 dBA

#

Results segment # 3: Greenbank 2 (day)

Source height = 1.50 m

ROAD (0.00 + 62.95 + 0.00) = 62.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
69	81	0.00	75.00	0.00	-0.28	-11.76	0.00	0.00	0.00	62.95

Segment Leq : 62.95 dBA

Total Leq All Segments: 71.28 dBA

Results segment # 1: Street 18 (night)

Source height = 1.50 m

ROAD (0.00 + 44.77 + 0.00) = 44.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.66	56.36	0.00	-6.70	-4.89	0.00	0.00	0.00	44.77

Segment Leq : 44.77 dBA

#

Results segment # 2: Greenbank 1 (night)

Source height = 1.50 m

ROAD (0.00 + 62.93 + 0.00) = 62.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	50	0.00	67.40	0.00	-2.71	-1.76	0.00	0.00	0.00	62.93

Segment Leq : 62.93 dBA

Results segment # 3: Greenbank 2 (night)

Source height = 1.50 m

ROAD (0.00 + 55.36 + 0.00) = 55.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
69	81	0.00	67.40	0.00	-0.28	-11.76	0.00	0.00	0.00	55.36

Segment Leq : 55.36 dBA

Total Leq All Segments: 63.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.28
(NIGHT): 63.69

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:53:06
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Greenbank (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume : 2254/196    veh/TimePeriod  *
Heavy truck volume  : 1610/140    veh/TimePeriod  *
Posted speed limit  : 70 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): 35000
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: Greenbank (day/night)

```
-----
Angle1   Angle2       : -57.00 deg   65.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface         : 2           (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1           (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Road data, segment # 2: Street 18 (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: Street 18 (day/night)

```
-----
Angle1   Angle2       : -60.00 deg  18.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 1 (Absorptive ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Greenbank (day)

Source height = 1.50 m

ROAD (0.00 + 69.05 + 0.00) = 69.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-57	65	0.00	75.00	0.00	-4.26	-1.69	0.00	0.00	0.00	69.05

Segment Leq : 69.05 dBA

Results segment # 2: Street 18 (day)

Source height = 1.50 m

ROAD (0.00 + 51.81 + 0.00) = 51.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	18	0.66	63.96	0.00	-8.08	-4.07	0.00	0.00	0.00	51.81

Segment Leq : 51.81 dBA

Total Leq All Segments: 69.13 dBA

#

Results segment # 1: Greenbank (night)

Source height = 1.50 m

ROAD (0.00 + 61.45 + 0.00) = 61.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-57	65	0.00	67.40	0.00	-4.26	-1.69	0.00	0.00	0.00	61.45

Segment Leq : 61.45 dBA

Results segment # 2: Street 18 (night)

Source height = 1.50 m

ROAD (0.00 + 44.21 + 0.00) = 44.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	18	0.66	56.36	0.00	-8.08	-4.07	0.00	0.00	0.00	44.21

Segment Leq : 44.21 dBA

Total Leq All Segments: 61.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.13
(NIGHT): 61.53

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:44:11
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Greenbank (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume : 2254/196    veh/TimePeriod  *
Heavy truck volume  : 1610/140    veh/TimePeriod  *
Posted speed limit  : 70 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): 35000
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: Greenbank (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   90.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface         : 2           (Reflective ground surface)
Receiver source distance : 32.00 / 32.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1           (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Greenbank (day)

Source height = 1.50 m

ROAD (0.00 + 71.70 + 0.00) = 71.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.00	0.00	-3.29	0.00	0.00	0.00	0.00	71.70

Segment Leq : 71.70 dBA

Total Leq All Segments: 71.70 dBA

Results segment # 1: Greenbank (night)

Source height = 1.50 m

ROAD (0.00 + 64.11 + 0.00) = 64.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.40	0.00	-3.29	0.00	0.00	0.00	0.00	64.11

Segment Leq : 64.11 dBA

Total Leq All Segments: 64.11 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.70

(NIGHT): 64.11

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:57:02
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Greenbank (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume : 2254/196    veh/TimePeriod  *
Heavy truck volume  : 1610/140    veh/TimePeriod  *
Posted speed limit  : 70 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): 35000
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: Greenbank (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 2      (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Greenbank (day)

Source height = 1.50 m

ROAD (0.00 + 70.74 + 0.00) = 70.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.00	0.00	-4.26	0.00	0.00	0.00	0.00	70.74

Segment Leq : 70.74 dBA

Total Leq All Segments: 70.74 dBA

Results segment # 1: Greenbank (night)

Source height = 1.50 m

ROAD (0.00 + 63.14 + 0.00) = 63.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.40	0.00	-4.26	0.00	0.00	0.00	0.00	63.14

Segment Leq : 63.14 dBA

Total Leq All Segments: 63.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.74
(NIGHT): 63.14

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:57:33
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Greenbank (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume : 2254/196    veh/TimePeriod  *
Heavy truck volume  : 1610/140    veh/TimePeriod  *
Posted speed limit  : 70 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): 35000
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: Greenbank (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 2      (Reflective ground surface)
Receiver source distance : 78.00 / 78.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Road data, segment # 2: Cambrian (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   :    70 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: Cambrian (day/night)

```
-----
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth           :         0      (No woods.)
No of house rows     :         0 / 0
Surface              :         2      (Reflective ground surface)
Receiver source distance :  73.00 / 73.00  m
Receiver height       :   1.50 / 1.50   m
Topography           :         1      (Flat/gentle slope; no barrier)
Reference angle       :         0.00
```

#

Results segment # 1: Greenbank (day)

Source height = 1.50 m

ROAD (0.00 + 67.84 + 0.00) = 67.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	75.00	0.00	-7.16	0.00	0.00	0.00	0.00	67.84

Segment Leq : 67.84 dBA

Results segment # 2: Cambrian (day)

Source height = 1.50 m

ROAD (0.00 + 64.44 + 0.00) = 64.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.32	0.00	-6.87	0.00	0.00	0.00	0.00	64.44

Segment Leq : 64.44 dBA

Total Leq All Segments: 69.47 dBA

#

Results segment # 1: Greenbank (night)

Source height = 1.50 m

ROAD (0.00 + 60.24 + 0.00) = 60.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.40	0.00	-7.16	0.00	0.00	0.00	0.00	60.24

Segment Leq : 60.24 dBA

Results segment # 2: Cambrian (night)

Source height = 1.50 m

ROAD (0.00 + 56.85 + 0.00) = 56.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	0.00	-6.87	0.00	0.00	0.00	0.00	56.85

Segment Leq : 56.85 dBA

Total Leq All Segments: 61.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.47
(NIGHT): 61.88

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:58:07
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Greenbank (day/night)

```
-----
Car traffic volume   : 28336/2464   veh/TimePeriod  *
Medium truck volume : 2254/196    veh/TimePeriod  *
Heavy truck volume  : 1610/140    veh/TimePeriod  *
Posted speed limit  : 70 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): 35000
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: Greenbank (day/night)

```
-----
Angle1   Angle2       : -45.00 deg   45.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 139.00 / 139.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Road data, segment # 2: Cambrian (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   :    70 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: Cambrian (day/night)

```
-----
Angle1   Angle2           : -45.00 deg   45.00 deg
Wood depth           :         0       (No woods.)
No of house rows     :         0 / 0
Surface              :         2       (Reflective ground surface)
Receiver source distance : 149.00 / 149.00 m
Receiver height       :     1.50 / 1.50   m
Topography           :         1       (Flat/gentle slope; no barrier)
Reference angle       :     0.00
```

#

Results segment # 1: Greenbank (day)

Source height = 1.50 m

ROAD (0.00 + 62.32 + 0.00) = 62.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.00	75.00	0.00	-9.67	-3.01	0.00	0.00	0.00	62.32

Segment Leq : 62.32 dBA

Results segment # 2: Cambrian (day)

Source height = 1.50 m

ROAD (0.00 + 58.33 + 0.00) = 58.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.00	71.32	0.00	-9.97	-3.01	0.00	0.00	0.00	58.33

Segment Leq : 58.33 dBA

Total Leq All Segments: 63.78 dBA

#

Results segment # 1: Greenbank (night)

Source height = 1.50 m

ROAD (0.00 + 54.72 + 0.00) = 54.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.00	67.40	0.00	-9.67	-3.01	0.00	0.00	0.00	54.72

Segment Leq : 54.72 dBA

Results segment # 2: Cambrian (night)

Source height = 1.50 m

ROAD (0.00 + 50.74 + 0.00) = 50.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.00	63.72	0.00	-9.97	-3.01	0.00	0.00	0.00	50.74

Segment Leq : 50.74 dBA

Total Leq All Segments: 56.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.78
(NIGHT): 56.18

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 85:59:24
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Cambrian Roa (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  :    70 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: Cambrian Roa (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   90.00 deg
Wood depth :          0      (No woods.)
No of house rows :          0 / 0
Surface     :          1      (Absorptive ground surface)
Receiver source distance : 47.00 / 47.00 m
Receiver height :    1.50 / 1.50 m
Topography    :          1      (Flat/gentle slope; no barrier)
Reference angle :    0.00
```

#

Results segment # 1: Cambrian Roa (day)

Source height = 1.50 m

ROAD (0.00 + 61.63 + 0.00) = 61.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.32	0.00	-8.23	-1.46	0.00	0.00	0.00	61.63

Segment Leq : 61.63 dBA

Total Leq All Segments: 61.63 dBA

Results segment # 1: Cambrian Roa (night)

Source height = 1.50 m

ROAD (0.00 + 54.03 + 0.00) = 54.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.72	0.00	-8.23	-1.46	0.00	0.00	0.00	54.03

Segment Leq : 54.03 dBA

Total Leq All Segments: 54.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.63
(NIGHT): 54.03

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:00:10
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Cambrian (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  :    70 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: Cambrian (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   90.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      2      (Reflective ground surface)
Receiver source distance : 24.00 / 24.00 m
Receiver height  :   1.50 / 1.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :   0.00
```

#

Road data, segment # 2: Street 1A (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: Street 1A (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 39.00 / 39.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Cambrian (day)

Source height = 1.50 m

ROAD (0.00 + 69.27 + 0.00) = 69.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	71.32	0.00	-2.04	0.00	0.00	0.00	0.00	69.27

Segment Leq : 69.27 dBA

Results segment # 2: Street 1A (day)

Source height = 1.50 m

ROAD (0.00 + 59.81 + 0.00) = 59.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-4.15	0.00	0.00	0.00	0.00	59.81

Segment Leq : 59.81 dBA

Total Leq All Segments: 69.74 dBA

#

Results segment # 1: Cambrian (night)

Source height = 1.50 m

ROAD (0.00 + 61.68 + 0.00) = 61.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.72	0.00	-2.04	0.00	0.00	0.00	0.00	61.68

Segment Leq : 61.68 dBA

Results segment # 2: Street 1A (night)

Source height = 1.50 m

ROAD (0.00 + 52.21 + 0.00) = 52.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-4.15	0.00	0.00	0.00	0.00	52.21

Segment Leq : 52.21 dBA

Total Leq All Segments: 62.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.74
(NIGHT): 62.14

#

STAMSON 5.0 NORMAL REPORT Date: 20-02-2019 15:29:40
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9p.te Time Period: Day/Night 16/8 hours
 Description: Receptor 9 - Park

Road data, segment # 1: Cambrian (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  :    70 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: Cambrian (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   90.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 111.00 / 15.00 m
Receiver height  :    1.50 / 4.50 m
Topography      :      1      (Flat/gentle slope; no barrier)
Reference angle  :    0.00
```

Results segment # 1: Cambrian (day)

Source height = 1.50 m

ROAD (0.00 + 55.43 + 0.00) = 55.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.32	0.00	-14.43	-1.46	0.00	0.00	0.00	55.43

Segment Leq : 55.43 dBA

Total Leq All Segments: 55.43 dBA

Results segment # 1: Cambrian (night)

Source height = 1.50 m

ROAD (0.00 + 62.42 + 0.00) = 62.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.72	0.00	0.00	-1.30	0.00	0.00	0.00	62.42

Segment Leq : 62.42 dBA

Total Leq All Segments: 62.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.43
(NIGHT): 62.42

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:04:32
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Street 1A (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: Street 1A (day/night)

```
-----
Angle1   Angle2       : -68.00 deg  -38.00 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 : 1.50 / 1.50 m
Topography    : 1         (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Road data, segment # 2: Street 1A2 (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: Street 1A2 (day/night)

```
-----
Angle1   Angle2       : -43.00 deg   70.00 deg
Wood depth      : 0           (No woods.)
No of house rows : 0 / 0
Surface         : 1           (Absorptive ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1           (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Street 1A (day)

Source height = 1.50 m

ROAD (0.00 + 52.25 + 0.00) = 52.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-68	-38	0.00	63.96	0.00	-3.92	-7.78	0.00	0.00	0.00	52.25

Segment Leq : 52.25 dBA

Results segment # 2: Street 1A2 (day)

Source height = 1.50 m

ROAD (0.00 + 55.45 + 0.00) = 55.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	70	0.66	63.96	0.00	-5.90	-2.61	0.00	0.00	0.00	55.45

Segment Leq : 55.45 dBA

Total Leq All Segments: 57.15 dBA

#

Results segment # 1: Street 1A (night)

Source height = 1.50 m

ROAD (0.00 + 44.66 + 0.00) = 44.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-68	-38	0.00	56.36	0.00	-3.92	-7.78	0.00	0.00	0.00	44.66

Segment Leq : 44.66 dBA

Results segment # 2: Street 1A2 (night)

Source height = 1.50 m

ROAD (0.00 + 47.85 + 0.00) = 47.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	70	0.66	56.36	0.00	-5.90	-2.61	0.00	0.00	0.00	47.85

Segment Leq : 47.85 dBA

Total Leq All Segments: 49.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.15
(NIGHT): 49.55

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:05:10
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Street 31A (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: Street 31A (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 2      (Reflective ground surface)
Receiver source distance : 24.00 / 24.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Street 31A (day)

Source height = 1.50 m

ROAD (0.00 + 61.91 + 0.00) = 61.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-2.04	0.00	0.00	0.00	0.00	61.91

Segment Leq : 61.91 dBA

Total Leq All Segments: 61.91 dBA

Results segment # 1: Street 31A (night)

Source height = 1.50 m

ROAD (0.00 + 54.32 + 0.00) = 54.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-2.04	0.00	0.00	0.00	0.00	54.32

Segment Leq : 54.32 dBA

Total Leq All Segments: 54.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.91
(NIGHT): 54.32

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:05:44
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Street 31B (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: Street 31B (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  17.00 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  : 1.50 / 1.50 m
Topography       : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Road data, segment # 2: Street 1A (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: Street 1A (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 16.00 / 16.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Street 31B (day)

Source height = 1.50 m

ROAD (0.00 + 58.27 + 0.00) = 58.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.00	63.96	0.00	-3.42	-2.26	0.00	0.00	0.00	58.27

Segment Leq : 58.27 dBA

Results segment # 2: Street 1A (day)

Source height = 1.50 m

ROAD (0.00 + 63.68 + 0.00) = 63.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-0.28	0.00	0.00	0.00	0.00	63.68

Segment Leq : 63.68 dBA

Total Leq All Segments: 64.78 dBA

#

Results segment # 1: Street 31B (night)

Source height = 1.50 m

ROAD (0.00 + 50.68 + 0.00) = 50.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	17	0.00	56.36	0.00	-3.42	-2.26	0.00	0.00	0.00	50.68

Segment Leq : 50.68 dBA

Results segment # 2: Street 1A (night)

Source height = 1.50 m

ROAD (0.00 + 56.08 + 0.00) = 56.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-0.28	0.00	0.00	0.00	0.00	56.08

Segment Leq : 56.08 dBA

Total Leq All Segments: 57.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.78
(NIGHT): 57.18

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:06:40
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te Time Period: Day/Night 16/8 hours
 Description:

Road data, segment # 1: Street 1a (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: Street 1a (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 2      (Reflective ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Road data, segment # 2: Street 31A (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: Street 31A (day/night)

```
-----
Angle1   Angle2       : 34.00 deg  90.00 deg
Wood depth : 0         (No woods.)
No of house rows : 0 / 0
Surface     : 1         (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 1         (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Results segment # 1: Street 1a (day)

Source height = 1.50 m

ROAD (0.00 + 62.93 + 0.00) = 62.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-1.03	0.00	0.00	0.00	0.00	62.93

Segment Leq : 62.93 dBA

Results segment # 2: Street 31A (day)

Source height = 1.50 m

ROAD (0.00 + 48.82 + 0.00) = 48.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
34	90	0.66	63.96	0.00	-7.59	-7.55	0.00	0.00	0.00	48.82

Segment Leq : 48.82 dBA

Total Leq All Segments: 63.10 dBA

#

Results segment # 1: Street 1a (night)

Source height = 1.50 m

ROAD (0.00 + 55.34 + 0.00) = 55.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-1.03	0.00	0.00	0.00	0.00	55.34

Segment Leq : 55.34 dBA

Results segment # 2: Street 31A (night)

Source height = 1.50 m

ROAD (0.00 + 41.22 + 0.00) = 41.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
34	90	0.66	56.36	0.00	-7.59	-7.55	0.00	0.00	0.00	41.22

Segment Leq : 41.22 dBA

Total Leq All Segments: 55.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.10
(NIGHT): 55.51

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:07:41
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te Time Period: Day/Night 16/8 hours
 Description:

Road data, segment # 1: Street 1a (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: Street 1a (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   62.00 deg
Wood depth : 0         (No woods.)
No of house rows : 0 / 0
Surface     : 2         (Reflective ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 1         (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

#

Road data, segment # 2: Street 18 (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: Street 18 (day/night)

```
-----
Angle1   Angle2       : -30.00 deg  90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 1 (Absorptive ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height  : 1.50 / 1.50 m
Topography       : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Street 1a (day)

Source height = 1.50 m

ROAD (0.00 + 62.19 + 0.00) = 62.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	62	0.00	63.96	0.00	-1.03	-0.73	0.00	0.00	0.00	62.19

Segment Leq : 62.19 dBA

Results segment # 2: Street 18 (day)

Source height = 1.50 m

ROAD (0.00 + 55.21 + 0.00) = 55.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.66	63.96	0.00	-5.90	-2.85	0.00	0.00	0.00	55.21

Segment Leq : 55.21 dBA

Total Leq All Segments: 62.98 dBA

#

Results segment # 1: Street 1a (night)

Source height = 1.50 m

ROAD (0.00 + 54.60 + 0.00) = 54.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	62	0.00	56.36	0.00	-1.03	-0.73	0.00	0.00	0.00	54.60

Segment Leq : 54.60 dBA

Results segment # 2: Street 18 (night)

Source height = 1.50 m

ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.66	56.36	0.00	-5.90	-2.85	0.00	0.00	0.00	47.62

Segment Leq : 47.62 dBA

Total Leq All Segments: 55.39 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.98
(NIGHT): 55.39

#

STAMSON 5.0 NORMAL REPORT Date: 20-10-2017 86:09:29
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te Time Period: Day/Night 16/8 hours
 Description:

Road data, segment # 1: Street 18 (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: Street 18 (day/night)

```
-----
Angle1   Angle2       : -90.00 deg  90.00 deg
Wood depth      : 0      (No woods.)
No of house rows : 0 / 0
Surface         : 2      (Reflective ground surface)
Receiver source distance : 31.00 / 31.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 1      (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

#

Results segment # 1: Street 18 (day)

Source height = 1.50 m

ROAD (0.00 + 60.80 + 0.00) = 60.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	63.96	0.00	-3.15	0.00	0.00	0.00	0.00	60.80

Segment Leq : 60.80 dBA

Total Leq All Segments: 60.80 dBA

Results segment # 1: Street 18 (night)

Source height = 1.50 m

ROAD (0.00 + 53.21 + 0.00) = 53.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.36	0.00	-3.15	0.00	0.00	0.00	0.00	53.21

Segment Leq : 53.21 dBA

Total Leq All Segments: 53.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.80

(NIGHT): 53.21

#

STAMSON 5.0 COMPREHENSIVE REPORT Date: 20-02-2019 15:46:46
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r16.te Time Period: Day/Night 16/8 hours
 Description: Receptor 16 - OLA

Road data, segment # 1: Borrisokane (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 : 80 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: Borrisokane (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 137.00 / 137.00 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: 416 NB (day/night)

```
-----
Car traffic volume   : 29685/2581   veh/TimePeriod  *
Medium truck volume  : 2361/205    veh/TimePeriod  *
Heavy truck volume   : 1687/147    veh/TimePeriod  *
Posted speed limit   : 100 km/h
Road gradient        : 0 %
Road pavement        : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 36666
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: 416 NB (day/night)

```
-----
Angle1   Angle2          : -45.00 deg   45.00 deg
Wood depth          : 0             (No woods.)
No of house rows    : 0 / 0
Surface            : 1             (Absorptive ground surface)
Receiver source distance : 407.00 / 407.00 m
Receiver height     : 1.50 / 4.50   m
Topography          : 1             (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

Road data, segment # 3: 416 SB (day/night)

```
-----
Car traffic volume : 29685/2581 veh/TimePeriod *
Medium truck volume : 2361/205 veh/TimePeriod *
Heavy truck volume : 1687/147 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

```
24 hr Traffic Volume (AADT or SADT): 36666
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: 416 SB (day/night)

```
-----
Angle1 Angle2 : -45.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 438.00 / 438.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Segment # 1: Borrisokane (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
-90	90	0.66	72.49	0.00	-15.95	-1.46	0.00	0.00	0.00	55.08

Segment Leq : 55.08 dBA

Segment # 2: 416 NB (day)

Source height = 1.50 m

ROAD (0.00 + 51.27 + 0.00) = 51.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.66	78.39	0.00	-23.80	-3.32	0.00	0.00	0.00	51.27

Segment Leq : 51.27 dBA

#

Segment # 3: 416 SB (day)

Source height = 1.50 m

ROAD (0.00 + 50.75 + 0.00) = 50.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.66	78.39	0.00	-24.33	-3.32	0.00	0.00	0.00	50.75

Segment Leq : 50.75 dBA

Total Leq All Segments: 57.60 dBA

Segment # 1: Borrisokane (night)

Source height = 1.50 m

ROAD (0.00 + 48.50 + 0.00) = 48.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	64.89	0.00	-15.08	-1.30	0.00	0.00	0.00	48.50

Segment Leq : 48.50 dBA

Segment # 2: 416 NB (night)

Source height = 1.50 m

ROAD (0.00 + 45.01 + 0.00) = 45.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.57	70.79	0.00	-22.51	-3.28	0.00	0.00	0.00	45.01

Segment Leq : 45.01 dBA

Segment # 3: 416 SB (night)

Source height = 1.50 m

ROAD (0.00 + 44.51 + 0.00) = 44.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	45	0.57	70.79	0.00	-23.01	-3.28	0.00	0.00	0.00	44.51

Segment Leq : 44.51 dBA

Total Leq All Segments: 51.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.60
(NIGHT): 51.16