

REPORT  
PROJECT: 39124-5.2.2

ENVIRONMENTAL NOISE IMPACT  
ASSESSMENT  
1919 MAPLE GROVE ROAD  
KANATA WEST

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Prepared for FORMASIAN DEVELOPMENT CORP.  
by IBI GROUP

MAY 2019

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# 1 INTRODUCTION

This report has been prepared to determine the impact of roadway traffic on the residential lands of 1919 Maple Grove Road in the Kanata West area. The report deals with the expected noise levels in the development and any required noise control measures.

1919 Maple Grove Road is a residential subdivision consisting of semi-detached units, stacked townhomes and four-storey apartment buildings proposed along Maple Grove Road at the recently-constructed multi-use pathway (formerly Johnwoods Street). The site is bounded to the north and west by undeveloped lands, to the south by Maple Grove Road and to the east by an existing residential development. A park is proposed at the northwest corner of the subject site. It is assumed that existing single-family residences situated near the southwest and southeast corners of the proposed development are to remain.

## 2 BACKGROUND

### 2.1 Noise Sources

The study area is primarily subject to roadway noise from existing Maple Grove Road, and from the future Kanata West Main Street, both of which are classified as collector roads.

The proposed development is not located in the Airport Vicinity Development Zone (AVDZ) according to Schedule K of the Official Plan nor is it within 300 metres of a rail line, therefore noise generated from aircraft or rail traffic was not considered in this study.

### 2.2 Sound Level Limits for Road Traffic

Sound level criteria for road traffic is taken from the City of Ottawa Environmental Noise Control Guidelines (January 2016) hereafter referred to as the guidelines. Noise levels are expressed in the form Leq (T) which refers to a weighted level of a steady sound carrying the same total energy in the time period T (in hours) as the observed fluctuation sound.

#### 2.2.1 Outdoor sound level criterion

As per Table 2.2a of the guidelines the sound level criteria for the outdoor living area (OLA) for the daytime period between 07:00 and 23:00 hours is 55 dBA Leq (16). Sound levels for the OLA are calculated 3 metres from the building face at the centre of the unit or within the centre of the OLA at a height of 1.5 meters above the ground.

If the Leq sound level is less than or equal to the above criteria then no further action is required by the developer. If the sound level exceeds the criteria by less than 5 dBA then the developer may, with City approval, either provide a warning clause to prospective purchasers or install physical attenuation. For sound levels greater than 5 dBA above the criteria, control measures are required to reduce the noise levels as close to 55 dBA as technically, economically and administratively possible. Should the sound levels with the barrier in place exceed 55 dBA a warning clause is also required.

#### 2.2.2 Indoor sound level criterion – ventilation and warning clause requirements

Similar to outdoor noise levels, the recommended indoor sound, the sound level criteria from Table 2.2b of the guidelines are:

- Bedrooms – 23:00 to 07:00 – 40 dBA Leq (8)
- Other areas – 07:00 to 23:00 – 45 dBA Leq (16)

The sound levels are based on the windows and doors to an indoor space being closed.

For the purpose of assessing indoor sound levels of the semi-detached units, the outdoor sound levels are observed at the plane of the living room window at 1.5 meters above the ground for daytime noise and at the plane of the bedroom window 4.5 meters above the ground for nighttime noise. The four-storey apartment buildings, shown on Drawing No. 39124-N1 in Blocks 23 and 24, are observed at 10.5 metres above ground level for both the plane of the living room and bedroom windows for daytime and nighttime noise levels, respectively.

As per the MOE Environmental Noise Guideline NPC-300 sections C7.1.2.1 and C7.1.2.2 when the outdoor noise levels at the living room are greater than 55 dBA and less than or equal to 65 dBA and/or greater than 50 dBA and less than or equal to 60 dBA at the bedroom window, then a warning clause is required and forced air heating with provision for central air conditioning is required.

Should the outdoor noise levels exceed 65 dBA at the living room and/or exceed 60 dBA at the bedroom then central air conditioning is mandatory and a warning clause is required.

### **2.2.3 Indoor Sound Level Criterion – Building Components**

As per NPC-300 C7.1.3 when the outdoor sound levels are less than or equal to 65 dBA at the living room window and/or less than or equal to 60 dBA at the bedroom level then the building must be compliant with the Ontario Building Code. Should the outdoor sound levels exceed this criteria then the building component (walls, windows etc.) must be designed to achieve indoor sound level criteria.

## 3 ROADWAY NOISE

### 3.1 Road Traffic Data

The major source of road noise impacting the site is the traffic moving along Maple Grove Road along the southern property boundary, as well as the future Kanata West Main Street, which will extend along the northern boundary of the subject site.

The section of Maple Grove Road adjacent to the site is currently a two-lane urban collector roadway with a posted speed limit of 50 km/h (road classification – 2-UCU). For the purpose of this study, it is assumed that the future Kanata West Main Street will also be classified as a two-lane urban collector (2-UCU). Traffic volume parameters are taken from Appendix B of the guidelines. **Table 3.1** summarizes the traffic and road parameters used to assess the noise levels.

TABLE 3.1 – TRAFFIC AND ROAD DATA SUMMARY

| PARAMETERS                          | MAPLE GROVE<br>KANATA W. MAIN ST. |
|-------------------------------------|-----------------------------------|
| Annual Average Daily Traffic (AADT) | 8,000                             |
| Posted Speed Limit (km/hr)          | 50                                |
| % Medium Trucks                     | 7%                                |
| % Heavy Trucks                      | 5%                                |
| % Daytime Traffic                   | 92%                               |

### 3.2 Calculation Methods

Roadway noise is calculated using the STAMSON 5.04 computer program from the Ontario Ministry of the Environment.

Numerous locations are used to calculate the sound levels for the outdoor living area (OLA) and at the building face to determine indoor sound levels. Sound levels for Maple Grove Road and the future Kanata West Main Street are calculated from the centreline of each roadway.

Unattenuated daytime at the building face for determining indoor sound levels at each of the specified locations are shown on **Tables 3.2**, and unattenuated daytime noise levels at the outdoor living area (OLA) are shown in **Table 3.3**. Parameters used for calculating the noise levels, the perpendicular distance from source to receiver, and the roadway segment angle are also included in the tables.

As noted previously, the indoor noise levels for the apartment buildings located in Blocks 23 and 24 were determined on the upper floor of these four-storey apartment buildings, which was assumed to be 10.5 metres above ground level. The apartment buildings most susceptible to noise traffic noise are referred to as Buildings 1 to 3 in **Table 3.2**, and are labelled accordingly on Drawing No. N1-39124.

TABLE 3.2 – UNATTENUATED NOISE LEVELS AT BUILDING FACE (INDOOR)

| Location   | Roadway               | Distance to Centreline (m) | Angles |       | Noise (dBA) |           |
|------------|-----------------------|----------------------------|--------|-------|-------------|-----------|
|            |                       |                            | Left   | Right | Daytime     | Nighttime |
| Building 1 | Kanata W. Main Street | 17.0                       | -90    | 90    | 64.03       | 56.44     |
| Building 2 | Kanata W. Main Street | 17.4                       | -90    | 90    | 63.89       | 56.30     |
| Building 3 | Kanata W. Main Street | 17.4                       | -90    | 90    | 63.89       | 56.30     |
| Block 1    | Kanata W. Main Street | 15.2                       | -90    | 90    | 64.20       | 56.76     |
| Block 2    | Kanata W. Main Street | 31.2                       | 0      | 90    | 56.00       | 48.85     |
| Block 3    | Kanata W. Main Street | 46.2                       | 0      | 90    | 53.17       | 46.17     |
| Block 16   | Maple Grove Road      | 48.4                       | 0      | 90    | 52.84       | 45.86     |
| Block 17   | Maple Grove Road      | 33.1                       | 0      | 90    | 55.58       | 48.45     |
| Block 18   | Maple Grove Road      | 17.5                       | -90    | 90    | 63.18       | 55.80     |
| Block 19   | Maple Grove Road      | 17.3                       | -90    | 90    | 63.26       | 55.88     |

As indicated in Table 3.2 above, the daytime noise exceeds 55 dBA at numerous locations.



TABLE 3.3 – UNATTENUATED NOISE LEVELS AT OLA

| Location | Roadway               | Distance to Centreline (m) | Angles |       | Daytime     |
|----------|-----------------------|----------------------------|--------|-------|-------------|
|          |                       |                            | Left   | Right | Noise (dBA) |
| Block 1  | Kanata W. Main Street | 22.0                       | -25    | 90    | 59.92       |
| Block 2  | Kanata W. Main Street | 38.0                       | -10    | 90    | 55.21       |
| Block 3  | Kanata W. Main Street | 53.1                       | -5     | 90    | 52.49       |
| Block 16 | Maple Grove Road      | 54.7                       | -5     | 90    | 52.28       |
| Block 17 | Maple Grove Road      | 39.3                       | -10    | 90    | 54.96       |
| Block 18 | Maple Grove Road      | 23.8                       | -25    | 90    | 59.35       |

As indicated in Table 3.3 above, the day time noise does not exceed 55 dBA at any locations.

## 4 ABATEMENT MEASURES

### 4.1 Indoor Sound Levels

Based on the analysis conducted in the previous section, for dwelling units flanking Maple Grove Road or the future Kanata West Main Street, the daytime sound level at the building face were shown to be less than 65 dBA but may exceed 55 dBA at select locations. An alternative means of ventilation is required as well as a Type 'C' warning clause in the Agreement of Purchase and Sale, which typically consists of a forced air heating system with ducts sized for future installation of central air conditioning.

### 4.2 Outdoor Living Area

The results of the analysis indicate that the outdoor living area (OLA) is not expected to exceed 60 dBA in the rear yards of the proposed semi-detached units directly flanking Maple Grove Road or the future Kanata West Main Street. Since the 60 dBA threshold is not met but noise levels are expected to be in excess of 55 dBA, it is recommended that warning clause Type 'A' be included in the Agreement of Purchase and Sale of select units to inform potential property owners that sound levels may occasionally interfere with some activities of the dwelling occupants.

Noise abatement measures such as noise barrier walls were not considered for properties flanking Maple Grove Road or Kanata West Main Street, as the sound levels at the properties nearest to these collector roads were shown to be under the 60 dBA threshold.

## 5 SUMMARY OF ATTENUATION MEASURES

### 5.1 Warning Clauses

The following warning clauses regarding noise should appear on the Agreement of Purchase and Sale of semi-detached dwellings, as indicated on the noise plan drawing No. 39124-N1:

|          |                      |                  |            |          |
|----------|----------------------|------------------|------------|----------|
| Type 'A' | Kanata West Main St. | -                | Block 1    |          |
|          |                      | -                | Block 2    |          |
|          | Maple Grove Road     | -                | Block 18   |          |
| Type 'C' | Kanata W. Main St.   | -                | Building 1 |          |
|          |                      | -                | Building 2 |          |
|          |                      | -                | Building 3 |          |
|          |                      |                  | -          | Block 1  |
|          |                      |                  | -          | Block 2  |
|          |                      | Maple Grove Road | -          | Block 17 |
|          |                      | -                | Block 18   |          |
|          |                      | -                | Block 19   |          |

The Type 'A' and 'C' warning clauses, extracted from Section C8.1 of NPC-300 of the guidelines, are provided below:

#### Type A

*"Purchasers/ tenants are advised that sound levels due to increasing road traffic on Maple Grove Road and Kanata West Main Street may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment."*

#### Type C

*"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments 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 of Ottawa and the Ministry of the Environment."*

### 5.2 Ventilation Requirements

All units requiring a Type 'C' warning clause listed in Section 5.1 must be provisioned for a forced air heating system sized to accommodate a central air conditioning system.

## 6 Conclusion

This report outlines the impact of roadway noise on the proposed development at 1919 Maple Grove Road. As indicated through the analysis conducted for this study, it is anticipated that noise levels will remain within the standards established by the City of Ottawa and Ministry of the Environment with the exception of select units located within close proximity to either Maple Grove Road or the future Kanata West Main Street. For these dwelling units, appropriate warning clauses must be provided on the Agreement of Purchase and Sale as discussed in this report.

## 7 Professional Authorization

Prepared By:

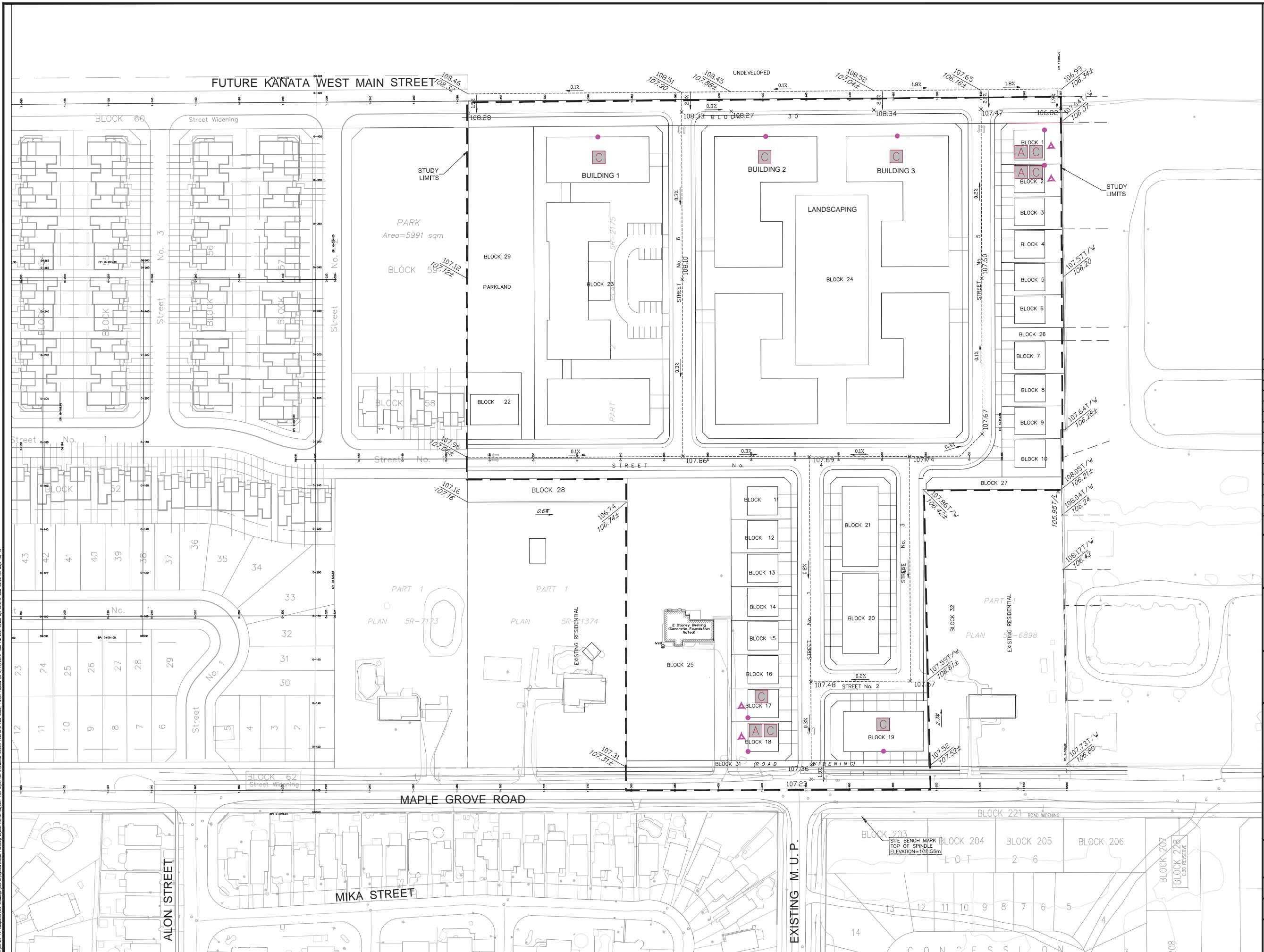
Reviewed By:



Ben Pascolo-Neveu, P.Eng.

Lance Erion, P.Eng.  
Associate

A:\0124-1918\MapleGroves\Drawings\Site\Noise\Noise\_Plan.dwg  
 Plot Date: 5/12/2019 10:31 PM  
 Plot Scale: 1:2500  
 Plot Size: 36.00 x 48.00  
 Plot Title: NOISE PLAN  
 Plot User: BPN  
 Plot Date: 5/12/2019 10:31 PM  
 Plot Scale: 1:2500  
 Plot Size: 36.00 x 48.00  
 Plot Title: NOISE PLAN  
 Plot User: BPN



**LEGEND:**

- C NOISE RECEIVER LOCATION
- LOCATION OF INDOOR NOISE RECEPTOR
- ▼ LOCATION OF OUTDOOR NOISE RECEPTOR

| 14  |                   |     |          |
|-----|-------------------|-----|----------|
| 13  |                   |     |          |
| 12  |                   |     |          |
| 11  |                   |     |          |
| 10  |                   |     |          |
| 9   |                   |     |          |
| 8   |                   |     |          |
| 7   |                   |     |          |
| 6   |                   |     |          |
| 5   |                   |     |          |
| 4   |                   |     |          |
| 3   |                   |     |          |
| 2   |                   |     |          |
| 1   | ISSUED FOR REVIEW | BPN | 19-05-09 |
| No. | REVISIONS         | By  | Date     |

**IBI GROUP**  
 400 - 333 Preston Street  
 Ottawa ON K1S 5N4 Canada  
 tel 613 225 1311 fax 613 225 9868  
 ibigroup.com

Project Title  
**MAPLE GROVE LANDS**  
**1919 MAPLE GROVE ROAD**

LICENSED PROFESSIONAL ENGINEER  
 B. PASCOLOREBEN  
 200205757  
 2014-05-04  
 PROVINCE OF ONTARIO

Drawing Title  
**NOISE PLAN**

Scale  
 1:750

|             |       |             |           |
|-------------|-------|-------------|-----------|
| Design      | BPN   | Date        | MAY, 2019 |
| Drawn       | DPS   | Checked     | LME       |
| Project No. | 39124 | Drawing No. | N1        |

# APPENDIX

Filename: Bldg1.te                    Time Period: Day/Night 16/8 hours  
Description: Building 1 Indoor

Road data, segment # 1: kw main (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 : 50 km/h  
Road gradient : 1 %  
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: kw main (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 : 17.00 / 17.00 m  
Receiver height : 10.50 / 10.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kw main (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 64.03 + 0.00) = 64.03 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.39 | 65.75 | 0.00 | -0.76 | -0.96 | 0.00 | 0.00 | 0.00 |
| 64.03  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 64.03 dBA

Total Leq All Segments: 64.03 dBA

Results segment # 1: kw main (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 56.44 + 0.00) = 56.44 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.39 | 58.16 | 0.00 | -0.76 | -0.96 | 0.00 | 0.00 | 0.00 |
| 56.44  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 56.44 dBA

Total Leq All Segments: 56.44 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.03  
(NIGHT): 56.44



Filename: Bldg2.te                    Time Period: Day/Night 16/8 hours  
Description: Building 2 Indoor

Road data, segment # 1: kw main (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 : 50 km/h  
Road gradient : 1 %  
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: kw main (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 : 17.40 / 17.40 m  
Receiver height : 10.50 / 10.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kw main (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 63.89 + 0.00) = 63.89 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.39 | 65.75 | 0.00 | -0.90 | -0.96 | 0.00 | 0.00 | 0.00 |
| 63.89  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 63.89 dBA

Total Leq All Segments: 63.89 dBA

Results segment # 1: kw main (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 56.30 + 0.00) = 56.30 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.39 | 58.16 | 0.00 | -0.90 | -0.96 | 0.00 | 0.00 | 0.00 |
| 56.30  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 56.30 dBA

Total Leq All Segments: 56.30 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.89  
(NIGHT): 56.30

Filename: Bldg3.te                      Time Period: Day/Night 16/8 hours  
 Description: Building 3 Indoor

Road data, segment # 1: kw main (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   : 50 km/h
Road gradient        : 1 %
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: kw main (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 : 17.40 / 17.40 m
Receiver height     : 10.50 / 10.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

Results segment # 1: kw main (day)

Source height = 1.50 m

ROAD (0.00 + 63.89 + 0.00) = 63.89 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| -90    | 90     | 0.39  | 65.75  | 0.00  | -0.90 | -0.96 | 0.00  | 0.00  | 0.00  |

```
-----
SubLeq
-----
63.89
-----
```

Segment Leq : 63.89 dBA

Total Leq All Segments: 63.89 dBA

Results segment # 1: kw main (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 56.30 + 0.00) = 56.30 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.39 | 58.16 | 0.00 | -0.90 | -0.96 | 0.00 | 0.00 | 0.00 |
| 56.30  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 56.30 dBA

Total Leq All Segments: 56.30 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.89  
(NIGHT): 56.30

STAMSON 5.0                    NORMAL REPORT                    Date: 08-05-2019 16:30:53  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Block1.te                    Time Period: Day/Night 16/8 hours  
Description: Block 1 Indoor

Road data, segment # 1: kw main (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   : 50 km/h  
Road gradient         : 1 %  
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: kw main (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           : 15.20 / 15.20 m  
Receiver height                     : 1.50 / 4.50 m  
Topography                         : 1            (Flat/gentle slope; no barrier)  
Reference angle                     : 0.00

Results segment # 1: kw main (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 64.20 + 0.00) = 64.20 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.66 | 65.75 | 0.00 | -0.10 | -1.46 | 0.00 | 0.00 | 0.00 |
| 64.20  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 64.20 dBA

Total Leq All Segments: 64.20 dBA

Results segment # 1: kw main (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 56.76 + 0.00) = 56.76 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.57 | 58.16 | 0.00 | -0.09 | -1.30 | 0.00 | 0.00 | 0.00 |
| 56.76  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 56.76 dBA

Total Leq All Segments: 56.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.20  
(NIGHT): 56.76

STAMSON 5.0                    NORMAL REPORT                    Date: 08-05-2019 16:23:51  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Block2.te                    Time Period: Day/Night 16/8 hours  
Description: Block 2 Indoor

Road data, segment # 1: kw main (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 : 50 km/h  
Road gradient : 1 %  
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: kw main (day/night)

-----  
Angle1    Angle2                    : 0.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 31.20 / 31.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kw main (day)

Source height = 1.50 m

ROAD (0.00 + 56.00 + 0.00) = 56.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

|       |    |      |       |      |       |       |      |      |      |
|-------|----|------|-------|------|-------|-------|------|------|------|
| ---   |    |      |       |      |       |       |      |      |      |
| 0     | 90 | 0.66 | 65.75 | 0.00 | -5.28 | -4.47 | 0.00 | 0.00 | 0.00 |
| 56.00 |    |      |       |      |       |       |      |      |      |
| ---   |    |      |       |      |       |       |      |      |      |

Segment Leq : 56.00 dBA

Total Leq All Segments: 56.00 dBA

Results segment # 1: kw main (night)

Source height = 1.50 m

ROAD (0.00 + 48.85 + 0.00) = 48.85 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

|       |    |      |       |      |       |       |      |      |      |
|-------|----|------|-------|------|-------|-------|------|------|------|
| ---   |    |      |       |      |       |       |      |      |      |
| 0     | 90 | 0.57 | 58.16 | 0.00 | -4.99 | -4.31 | 0.00 | 0.00 | 0.00 |
| 48.85 |    |      |       |      |       |       |      |      |      |
| ---   |    |      |       |      |       |       |      |      |      |

Segment Leq : 48.85 dBA

Total Leq All Segments: 48.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.00  
(NIGHT): 48.85



Filename: Block3.te                    Time Period: Day/Night 16/8 hours  
Description: Block 3 Indoor

Road data, segment # 1: kw main (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 : 50 km/h  
Road gradient : 1 %  
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: kw main (day/night)

-----  
Angle1    Angle2                    : 0.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 46.20 / 46.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kw main (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 53.17 + 0.00) = 53.17 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
0 90 0.66 65.75 0.00 -8.11 -4.47 0.00 0.00 0.00  
53.17  
-----  
---

Segment Leq : 53.17 dBA

Total Leq All Segments: 53.17 dBA

Results segment # 1: kw main (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 46.17 + 0.00) = 46.17 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
0 90 0.57 58.16 0.00 -7.67 -4.31 0.00 0.00 0.00  
46.17  
-----  
---

Segment Leq : 46.17 dBA

Total Leq All Segments: 46.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.17  
(NIGHT): 46.17

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MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: block16.te                    Time Period: Day/Night 16/8 hours  
Description: Block 16 Indoor

Road data, segment # 1: maplegrove (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 : 50 km/h  
Road gradient : 1 %  
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: maplegrove (day/night)

-----  
Angle1    Angle2                    : 0.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 48.40 / 48.40 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: maplegrove (day)

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     | 90 | 0.66 | 65.75 | 0.00 | -8.45 | -4.47 | 0.00 | 0.00 | 0.00 |
| 52.84 |    |      |       |      |       |       |      |      |      |

Segment Leq : 52.84 dBA

Total Leq All Segments: 52.84 dBA

Results segment # 1: maplegrove (night)

Source height = 1.50 m

ROAD (0.00 + 45.86 + 0.00) = 45.86 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

|       |    |      |       |      |       |       |      |      |      |
|-------|----|------|-------|------|-------|-------|------|------|------|
| 0     | 90 | 0.57 | 58.16 | 0.00 | -7.99 | -4.31 | 0.00 | 0.00 | 0.00 |
| 45.86 |    |      |       |      |       |       |      |      |      |

Segment Leq : 45.86 dBA

Total Leq All Segments: 45.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.84  
(NIGHT): 45.86

Filename: Block17.te                    Time Period: Day/Night 16/8 hours  
Description: Block 17 Indoor

Road data, segment # 1: maplegrove (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 : 50 km/h  
Road gradient : 1 %  
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: maplegrove (day/night)

-----  
Angle1    Angle2                    : 0.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 33.10 / 33.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: maplegrove (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.58 + 0.00) = 55.58 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
0 90 0.66 65.75 0.00 -5.71 -4.47 0.00 0.00 0.00  
55.58  
-----  
---

Segment Leq : 55.58 dBA

Total Leq All Segments: 55.58 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 48.45 + 0.00) = 48.45 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
0 90 0.57 58.16 0.00 -5.40 -4.31 0.00 0.00 0.00  
48.45  
-----  
---

Segment Leq : 48.45 dBA

Total Leq All Segments: 48.45 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.58  
(NIGHT): 48.45

Filename: Block18.te                    Time Period: Day/Night 16/8 hours  
Description: Block 18 Indoor

Road data, segment # 1: maplegrove (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 : 50 km/h  
Road gradient : 1 %  
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: maplegrove (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 : 17.50 / 17.50 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: maplegrove (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 63.18 + 0.00) = 63.18 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----

|       |    |      |       |      |       |       |      |      |      |
|-------|----|------|-------|------|-------|-------|------|------|------|
| ---   |    |      |       |      |       |       |      |      |      |
| -90   | 90 | 0.66 | 65.75 | 0.00 | -1.11 | -1.46 | 0.00 | 0.00 | 0.00 |
| 63.18 |    |      |       |      |       |       |      |      |      |

-----

Segment Leq : 63.18 dBA

Total Leq All Segments: 63.18 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.80 + 0.00) = 55.80 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----

|       |    |      |       |      |       |       |      |      |      |
|-------|----|------|-------|------|-------|-------|------|------|------|
| ---   |    |      |       |      |       |       |      |      |      |
| -90   | 90 | 0.57 | 58.16 | 0.00 | -1.05 | -1.30 | 0.00 | 0.00 | 0.00 |
| 55.80 |    |      |       |      |       |       |      |      |      |

-----

Segment Leq : 55.80 dBA

Total Leq All Segments: 55.80 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.18  
(NIGHT): 55.80



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MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Block19.te                    Time Period: Day/Night 16/8 hours  
Description: Block 19 Indoor

Road data, segment # 1: maplegrove (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 : 50 km/h  
Road gradient : 1 %  
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: maplegrove (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 : 17.30 / 17.30 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: maplegrove (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 63.26 + 0.00) = 63.26 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.66 | 65.75 | 0.00 | -1.03 | -1.46 | 0.00 | 0.00 | 0.00 |
| 63.26  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 63.26 dBA

Total Leq All Segments: 63.26 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.88 + 0.00) = 55.88 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -90    | 90 | 0.57 | 58.16 | 0.00 | -0.97 | -1.30 | 0.00 | 0.00 | 0.00 |
| 55.88  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 55.88 dBA

Total Leq All Segments: 55.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.26  
(NIGHT): 55.88

STAMSON 5.0                    NORMAL REPORT                    Date: 08-05-2019 17:16:46  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Bllola.te                    Time Period: Day/Night 16/8 hours  
Description: Block 1 Outdoor Living Area

Road data, segment # 1: kwmainst (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 : 50 km/h  
Road gradient : 1 %  
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: kwmainst (day/night)

-----  
Angle1    Angle2                    : -25.00 deg    90.00 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 : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kwmainst (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 59.92 + 0.00) = 59.92 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -25    | 90 | 0.66 | 65.75 | 0.00 | -2.76 | -3.07 | 0.00 | 0.00 | 0.00 |
| 59.92  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 59.92 dBA

Total Leq All Segments: 59.92 dBA

Results segment # 1: kwmainst (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 52.59 + 0.00) = 52.59 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -25    | 90 | 0.57 | 58.16 | 0.00 | -2.61 | -2.95 | 0.00 | 0.00 | 0.00 |
| 52.59  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 52.59 dBA

Total Leq All Segments: 52.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.92  
(NIGHT): 52.59

Filename: Bl2ola.te                    Time Period: Day/Night 16/8 hours  
Description: Block 2 Outdoor Living Area

Road data, segment # 1: kwmainst (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 : 50 km/h  
Road gradient : 1 %  
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: kwmainst (day/night)

-----  
Angle1    Angle2                    : -10.00 deg    90.00 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 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kwmainst (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 |        |       |        |       |       |       |       |       |       |

-----  
---  
-10      90      0.66    65.75      0.00    -6.70    -3.84      0.00      0.00      0.00  
55.21  
-----  
---

Segment Leq : 55.21 dBA

Total Leq All Segments: 55.21 dBA

Results segment # 1: kwmainst (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 48.11 + 0.00) = 48.11 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
-10      90      0.57    58.16      0.00    -6.34    -3.71      0.00      0.00      0.00  
48.11  
-----  
---

Segment Leq : 48.11 dBA

Total Leq All Segments: 48.11 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.21  
(NIGHT): 48.11

Filename: bl3ola.te                    Time Period: Day/Night 16/8 hours  
Description: Block 3 Outdoor Living Area

Road data, segment # 1: kwmainst (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 : 50 km/h  
Road gradient : 1 %  
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: kwmainst (day/night)

-----  
Angle1    Angle2                    : -5.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 53.10 / 53.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: kwmainst (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 52.49 + 0.00) = 52.49 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
-5      90      0.66   65.75    0.00   -9.11   -4.14    0.00    0.00    0.00  
52.49  
-----  
---

Segment Leq : 52.49 dBA

Total Leq All Segments: 52.49 dBA

Results segment # 1: kwmainst (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 45.54 + 0.00) = 45.54 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
-5      90      0.57   58.16    0.00   -8.62   -4.00    0.00    0.00    0.00  
45.54  
-----  
---

Segment Leq : 45.54 dBA

Total Leq All Segments: 45.54 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.49  
(NIGHT): 45.54



Filename: B116ola.te                    Time Period: Day/Night 16/8 hours  
 Description: Block 16 Outdoor Living Area

Road data, segment # 1: maplegrove (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  : 50 km/h
Road gradient       : 1 %
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: maplegrove (day/night)

```
-----
Angle1  Angle2      : -5.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows   : 0 / 0
Surface            : 1          (Absorptive ground surface)
Receiver source distance : 54.70 / 54.70 m
Receiver height    : 1.50 / 4.50 m
Topography         : 1          (Flat/gentle slope; no barrier)
Reference angle    : 0.00
```

Results segment # 1: maplegrove (day)

Source height = 1.50 m

ROAD (0.00 + 52.28 + 0.00) = 52.28 dBA  
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj  
 SubLeq

```
-----
---
-5    90    0.66  65.75  0.00  -9.33  -4.14  0.00  0.00  0.00
52.28
-----
---
```

Segment Leq : 52.28 dBA

Total Leq All Segments: 52.28 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 45.33 + 0.00) = 45.33 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -5     | 90 | 0.57 | 58.16 | 0.00 | -8.82 | -4.00 | 0.00 | 0.00 | 0.00 |
| 45.33  |    |      |       |      |       |       |      |      |      |

-----  
Segment Leq : 45.33 dBA

Total Leq All Segments: 45.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.28  
(NIGHT): 45.33

STAMSON 5.0                    NORMAL REPORT                    Date: 08-05-2019 17:27:05  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: B117ola.te                    Time Period: Day/Night 16/8 hours  
Description: Block 17 Outdoor Living Area

Road data, segment # 1: maplegrove (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 : 50 km/h  
Road gradient : 1 %  
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: maplegrove (day/night)

-----  
Angle1    Angle2                    : -10.00 deg    90.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                    (Absorptive ground surface)  
Receiver source distance : 39.30 / 39.30 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: maplegrove (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 54.96 + 0.00) = 54.96 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
-10      90      0.66    65.75    0.00    -6.94    -3.84    0.00    0.00    0.00  
54.96  
-----  
---

Segment Leq : 54.96 dBA

Total Leq All Segments: 54.96 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 47.88 + 0.00) = 47.88 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| SubLeq |        |       |        |       |       |       |       |       |       |

-----  
---  
-10      90      0.57    58.16    0.00    -6.57    -3.71    0.00    0.00    0.00  
47.88  
-----  
---

Segment Leq : 47.88 dBA

Total Leq All Segments: 47.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.96  
(NIGHT): 47.88

Filename: B118ola.te                      Time Period: Day/Night 16/8 hours  
 Description: Block 18 Outdoor Living Area

Road data, segment # 1: maplegrove (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  : 50 km/h
Road gradient       : 1 %
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: maplegrove (day/night)

```
-----
Angle1  Angle2      : -25.00 deg  90.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 1          (Absorptive ground surface)
Receiver source distance : 23.80 / 23.80 m
Receiver height     : 1.50 / 4.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

Results segment # 1: maplegrove (day)

Source height = 1.50 m

ROAD (0.00 + 59.35 + 0.00) = 59.35 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
| -25    | 90     | 0.66  | 65.75  | 0.00  | -3.33 | -3.07 | 0.00  | 0.00  | 0.00  |

```
-----
SubLeq
---
```

|       |
|-------|
| 59.35 |
|-------|

```
-----
---
```

Segment Leq : 59.35 dBA

Total Leq All Segments: 59.35 dBA

Results segment # 1: maplegrove (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 52.06 + 0.00) = 52.06 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|

|        |    |      |       |      |       |       |      |      |      |
|--------|----|------|-------|------|-------|-------|------|------|------|
| SubLeq |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |
| -25    | 90 | 0.57 | 58.16 | 0.00 | -3.15 | -2.95 | 0.00 | 0.00 | 0.00 |
| 52.06  |    |      |       |      |       |       |      |      |      |
| -----  |    |      |       |      |       |       |      |      |      |
| ---    |    |      |       |      |       |       |      |      |      |

Segment Leq : 52.06 dBA

Total Leq All Segments: 52.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.35  
(NIGHT): 52.06