

REPORT  
Project: 136974-6.04

NOISE CONTROL FEASIBILITY STUDY  
RIVERSIDE SOUTH DEVELOPMENT  
CORPORATION (RSDC)  
RIVERSIDE SOUTH EMPLOYMENT LANDS &  
BLOCKS 13, 14

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Prepared for RIVERSIDE SOUTH DEVELOPMENT CORPORATION  
by IBI GROUP

July 11, 2022

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# 1 Introduction

IBI Group (IBI) was retained by Riverside South Development Corporation to undertake a Noise Control Feasibility Study in support of a Draft Plan of Subdivision for the Riverside South Employment Lands and Blocks 13, 14. It is assumed that the proposed development will consist of employment, institutional and a small enclave of mid-density residential uses located in Block 14. The subject site is generally bound by undeveloped land and Leitrim Road to the north, Limebank Road to the east, Spratt Road to the south and Mosquito Creek to the west.

The objective of this study is to conduct a preliminary review of the internal and external transportation (dynamic) noise impacts to the site through the use of noise contour lines. A cursory review of on- and off-site potential stationary noise sources was evaluated as part of this study as well. This evaluation will help inform preliminary recommendations regarding the usage of any required noise control measures or warning clauses in the Agreement of Purchase and Sale or Tenancy Agreement for any 'noise-sensitive' land uses for further investigation during the detailed design stage. The employment and institutional blocks should not have 'noise sensitive' buildings.

The site location and its surrounding context is illustrated in **Figure 1** below.



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Scale  
N.T.S.

Project Title  
**RIVERSIDE SOUTH  
EMPLOYMENT LANDS  
AND BLOCKS 13, 14**

Drawing Title  
**LOCATION PLAN**

Sheet No.  
**FIGURE 1**



## 2 Background

### 2.1 Noise Sources

#### 2.1.1 Dynamic Noise

The proposed development is primarily subjected to traffic noise externally from Leitrim Road, Limebank Road and Spratt Road. As part of the Draft Plan of Subdivision application process, a public road network is planned through the subject lands which will consist primarily of local roads and therefore are not considered as significant noise sources.

The proposed development design also protects right-of-way for the eventual realignment of Leitrim Road through the site, based on the Recommended Plan developed as part of the Leitrim Road Realignment and Widening Environmental Assessment (Parsons, August 2018).

The site is located within the Airport Vicinity Development Zone (AVDZ) and Airport Operating Influence Zone (AOIZ), as shown on Schedule C-14 of the 2021 Draft Official Plan and therefore aircraft noise will be considered in this study.

There are no rail lines within 500 metres of the site. As such, no consideration has been given to noise impacts from rail traffic in accordance with the *City of Ottawa Environmental Noise Control (ENC) Guidelines*, dated January 2016.

#### 2.1.2 Stationary Noise

A desktop review of the surrounding area did not identify any potential off-site stationary noise sources which would have the potential to 'noise sensitive' uses impact the subject lands.

Potential on-site stationary noise sources, including chillers, generators, commercial air-conditioners, make-up air units or frequently-used loading docks for deliveries or waste collection will be considered as the proposed development plans for each parcel are refined through the City's Site Plan Control application process. The subject lands designated for employment uses are well separated from the existing low-rise residential uses and the proposed residential development in Block 14 by Mosquito Creek which provides a significant natural buffer ranging from approximately 85 to 200 metres from these 'noise-sensitive' uses.

It is important to note that both on- and off-site surface parking lots are generally not considered as a stationary noise source.

### 2.2 Sound Level Limits for Road Traffic

Sound level criteria for road traffic is referenced from the ENC Guidelines and the *Ministry of the Environment Publication NPC-300 (August 2013)*, hereafter referred to as NPC-300. 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.

The following sound level limits are for 'noise sensitive' land uses which include the residential land uses in Block 14. The employment and institutional blocks are not expected to contain 'noise sensitive' buildings.

#### 2.2.1 Indoor Sound Level Criterion

For 'noise-sensitive' land uses, the sound level limits for Indoor Living Areas from Table 2.2b (NPC-300, Table C-2) of the ENC Guidelines are as follows:

- Nighttime – sleeping quarters – 23:00 to 07:00 – 40 dBA  $Leq(8)$

- Daytime – living areas, den areas, hospitals, nursing homes (excludes schools or daycares) – 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, receptors are located at the building facade to align with the plan of the window 1.5 metres above the ground for daytime noise and at the plane of the bedroom window 4.5 metres above the ground for nighttime noise.

As per NPC-300 C7.1.2.1 and C7.1.2.2, when the outdoor noise levels at the plane of the window are greater than 55 dBA and less than or equal to 65 dBA (daytime) and/or greater than 50 dBA and less than or equal to 60 dBA (nighttime), then a warning clause is required along with forced air heating and a provision for central air conditioning.

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.

### **2.2.2 Outdoor Sound Level Criterion**

As per Table 2.2a of NPC-300, the sound level criteria for the outdoor living area (OLA) during the daytime period between 07:00 and 23:00 hours is 55 dBA Leq (16). Sound levels for the OLA are typically calculated 3 metres from the building face at the centre of the façade or within the centre of the OLA at a height of 1.5 metres 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 proponent. If the sound level exceeds the criteria by less than 5 dBA then the proponent may, with City approval, either provide a warning clause to prospective purchasers/tenants 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.

### **2.2.3 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 'daytime' window and/or less than or equal to 60 dBA at the 'nighttime' window, 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.

## **2.3 Sound Level Limits for Aircraft Noise**

Aircraft noise impact assessment is based on the Noise Exposure Forecast (NEF) and Noise Exposure Projection (NEP) methods approved by Transport Canada. The noise contours were used to define the Airport Operating Influence Zone (AOIZ) and Airport Vicinity Development Zone (AVDZ), as indicated on Schedule C-14 of the 2021 Draft Official Plan.

No new noise sensitive developments are permitted within the AOIZ. Noise sensitive development is permitted within the AVDZ and outside of the AOIZ subject to a noise study or under the Prescribed Measures for Aircraft Noise in Part 6 of the ENC Guidelines, while indoor and outdoor sound level limits for aircraft noise are included in Table 4.2a.

### 3 Roadway Noise

#### 3.1 Road Traffic Data

The major sources of traffic noise are expected to originate from the segments of the adjacent road network directly abutting the site and are described in **Table 3.1** below.

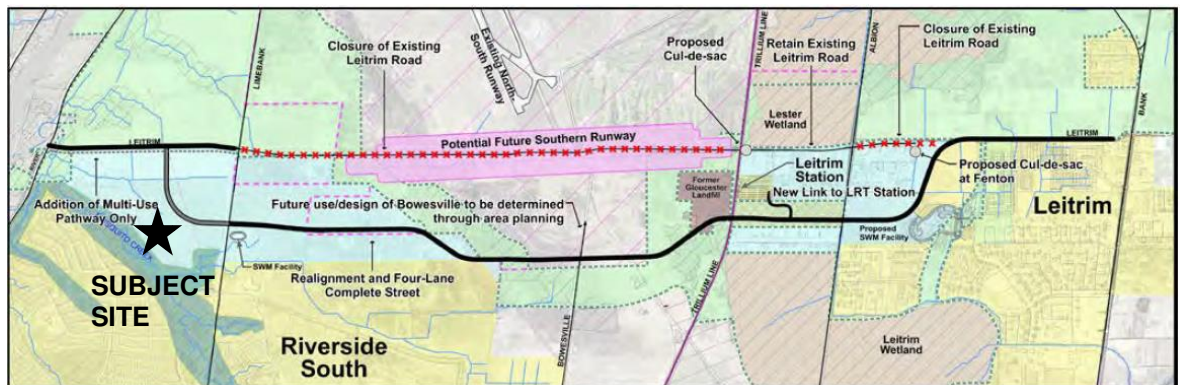
Table 1.1 - Existing & Proposed Roadways Impacting the Subject Site

| NAME   | CLASS           | JURISDICTION   | ORIENTATION & EXTENTS                          | CROSS-SECTION THROUGH STUDY AREA | ROW (m) | SPEED LIMIT (km/h) |
|--|-----------------|----------------|--|----------------------------------|---------|--------------------|
| Spratt Road                                  | Major Collector | City of Ottawa | North-South, Mitch Owens Road to Limebank Road | 4-Lane, Urban, Divided           | 34.0    | 60                 |
| Limebank Road                                | Arterial        | City of Ottawa | North-South, River Road to Mitch Owen's Road   | 4-Lane, Urban, Divided           | 44.5    | 80                 |
| Future Leitrim Road Realignment <sup>1</sup> | Arterial        | City of Ottawa | East-West, River Road to Russell Road          | 4-Lane, Urban, Undivided         | 32.0    | 60                 |

Notes: <sup>1</sup> Leitrim Road Realignment & Widening ESR (Parsons, 2018)

Leitrim Road presently exists as a two-lane rural arterial road within the vicinity of the site with a posted speed limit of 80km/h. The Leitrim Road Environmental Study Report (ESR) which was published in August 2018, proposes a Recommended Plan which would result in changes to the alignment of this arterial road to accommodate the future expansion of the Ottawa International Airport, as shown in **Figure 2** below.

Figure 2 – Recommended Plan for Leitrim Road Realignment & Widening <sup>1</sup>



<sup>1</sup> Source: Figure 7-1 – Recommended Plan from the Leitrim Road Realignment & Widening ESR (Parsons, 2018)

Based on the four-lane, divided road cross-sections of both Spratt and Limebank and the proposed 4-lane, undivided cross-section recommended in the Leitrim Road EA, **Table 3.2** below summarizes the corresponding traffic and road parameters prescribed in Appendix B of the ENC Guidelines.



Table 3.2 – Traffic and Roadway Summary Data

| PARAMETER                           | SPRATT ROAD<br>(4-UMCD) | LIMEBANK ROAD<br>(4-UAD) | LEITRIM ROAD<br>REALIGNMENT<br>(4-UAU) |
|-------------------------------------|-------------------------|--------------------------|--|
| Annual Average Daily Traffic (AADT) | 24,000                  | 35,000                   | 30,000                                 |
| Posted Speed Limit (km/h)           | 60                      | 80                       | 60                                     |
| % Medium Trucks                     | 7%                      | 7%                       | 7%                                     |
| % Heavy Trucks                      | 5%                      | 5%                       | 5%                                     |
| % Daytime Traffic                   | 92%                     | 92%                      | 92%                                    |

### 3.2 Calculation Methods

The roadway noise analysis for this study was conducted using STAMSON v5.04, an industry-standard software program developed by the Ontario Ministry of the Environment (MOE).

Noise contours were developed to establish the limits of both the indoor and outdoor noise criteria and were conservatively based on the capacity of each road, as discussed previously in Section 3.1.

Details pertaining to the noise criteria of interest are outlined below:

- The limits of requirements pertaining to a building component review, mandatory air conditioning and a Type 'D' warning clause, the 65 dBA (daytime) and 60 dBA (nighttime) noise contours were analysed at the building face.
- To determine the limits of forced air heating, provision for central air-conditioning and a Type 'C' warning clause, the 55 dBA (daytime) and 50 dBA (nighttime) noise contours were evaluated at the building face.
- The noise criteria limits for the outdoor living areas (OLAs) at 60 dBA and 55 dBA were evaluated under daytime conditions only.

The off-set distances presented in **Table 3.2** below were measured from the right-of-way centreline or from the centre of the right-of-way protection for each roadway identified for inclusion in the noise analysis, as discussed in the preceding section.

All relevant STAMSON noise output is provided in **Appendix A**.

TABLE 3.2: NOISE CONTOUR OFFSETS

| NOISE CRITERIA                     |        | DISTANCE FROM CENTRELINE (M) |                        |                                      |
|------------------------------------|--------|------------------------------|------------------------|--------------------------------------|
|                                    |        | SPRATT<br>(4-UMCD 60)        | LIMEBANK<br>(4-UAD 80) | LEITRIM<br>REALIGNMENT<br>(4-UAU 60) |
| Indoor Daytime                     | 65 dBA | 32.55                        | 57.69                  | 37.20                                |
|                                    | 55 dBA | 130.30                       | 230.98                 | 149.04                               |
| Indoor Nighttime                   | 60 dBA | 23.75                        | 43.54                  | 27.40                                |
|                                    | 50 dBA | 103.00                       | 188.80                 | 118.73                               |
| Outdoor Living Area (Daytime Only) | 60 dBA | 65.10                        | 115.41                 | 74.44                                |
|                                    | 55 dBA | 130.30                       | 230.98                 | 149.04                               |

Based on **Table 3.2** above for the indoor noise evaluation, the daytime contours for arterial roads are further from centreline than the nighttime levels for each criterion. As such, only the daytime levels will be considered in the noise analysis for this study. Noise contours for both indoor (daytime only) and outdoor noise evaluation are shown in **Figure 3**. These contours have not been adjusted to reflect screening from proposed buildings. For clarity purposes, the noise contours have not been extended beyond the contours of an intersecting road.

The subject site is well separated from the existing Leitrim Road alignment by at least 235 metres which significantly exceeds the 55 dBA (daytime) noise contour centreline offset of approximately 121 meters. As such, no further consideration of the traffic-related noise impacts of the existing Leitrim Road alignment were carried forward to further review in this study. Calculations pertaining to the noise criteria for the existing Leitrim Road alignment are included in **Appendix A**.

## 4 Stationary Noise

In terms of stationary noise, any noise sources of significance identified in the ENC Guidelines will be considered in the detailed noise analysis undertaken as part of the Site Plan Control application process and may include any on-site sources such as frequently-used loading docks or mechanical equipment (e.g. emergency generators) or off-site sources which have the potential to negatively impact any potential 'noise-sensitive land uses' within the subject lands.

## 5 Results

### 5.1 Indoor Sound Levels

The 55 dBA (daytime) contours shown on **Figure 3** represent the limit in which a Type 'C' warning clause and forced air heating with provision for central air conditioning are required for the 'noise-sensitive' indoor uses. Similarly, the 65 dBA (daytime) contours represent the limit in which a Type 'D' warning clause, central air conditioning and an acoustical review/design of the building components are required. As noted in Section 3.2, the noise contours have not been adjusted to account for screening by the proposed buildings. The exact number of units that exceed either the 65 dBA or 55 dBA thresholds will be determined during detailed design phase.

A summary of the results of each roadway is as follows:

**Spratt Road (4-UMCD 60km/h)** – For this major collector road, the 65 dBA noise contour will extend approximately 32.6 metres from the right-of-way centreline (or approximately 15.6 metres from the edge of the property line). As such, it is expected that only 'noise-sensitive' land uses within closest proximity to Spratt Road will require a Type 'D' warning clause or accompanying noise abatement measures.

The 55 dBA noise contour, extending approximately 130.3 metres beyond the right-of-way centreline for both arterial roads encompasses nearly the entire Block 14 parcel and therefore the remaining Indoor Living Areas on-site may require warning clause Type 'C'.

**Limebank Road (4-UAD 80km/h)** – For this arterial roadway, the 65 dBA noise contour will extend approximately 57.7 metres from the right-of-way centreline (or approximately 35.5 metres from the edge of the property line). As such, it is expected that only 'noise-sensitive' land uses within closest proximity to either road will require a Type 'D' warning clause or accompanying noise abatement measures.



The 55 dBA noise contour, extending approximately 231.0 metres beyond the right-of-way centreline for both arterial roads encompasses a significantly larger area than and therefore any on-site 'noise-sensitive uses' in Blocks 3 and 8 may require warning clause Type 'C'.

**Leitrim Road Realignment (4-UAU) 60km/h** – The 65 dBA indoor contour, located 37.2 metres from the centreline of the future Leitrim Road alignment, impacts only a select number of dwelling units within closest proximity to roadway. In the future, when Leitrim Road is realigned, any 'noise sensitive' land uses adjacent to the road will be impacted. The 55 dBA noise contour, extending 149.0 metres from the centreline, impacts a large number of units, however it is anticipated that the uses will be limited primarily to warehouse commercial and are unlikely to consist of residential or 'noise-sensitive' uses.

Any residential units that cross or are located within the 65 dBA contour in either the interim or ultimate scenarios require mandatory central air conditioning, a review of building components and a Type 'D' warning clause. Units that fall between 65 dBA and 55 dBA, requiring alternative means of ventilation and a Type 'C' warning clause, will be determined during detailed design.

Warning clauses for indoor noise are as follows:

Type 'C'

*"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property."*

Type 'D'

*"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."*

### 5.1.1 Sound Transmission Class (STC) Ratings

All dwelling units requiring a Type 'D' warning clause shall have mandatory central air conditioning and an acoustical review of building components. Sound Transmission Class (STC) ratings for windows and glazed doors will be required for any 'noise sensitive' uses with the highest exposure to Spratt Road, Limebank Road or Leitrim Road as part of the Site Plan Control (SPC) application process.

## 5.2 Outdoor Sound Levels

The outdoor 60 dBA contour on **Figure 3** represents the limit in which physical attenuation is required in the outdoor living areas (OLAs) for 'noise-sensitive' uses. For OLA receptor locations between the 60 dBA and 55 dBA contours, physical attenuation may not be required but should be considered as stated in Part 4, Section 3.4 of the ENC Guidelines. As noted in Section 3.2, the noise contours have not been adjusted to account for screening by the proposed buildings.

A summary of the results for each roadway is as follows:

**Spratt Road (4-UMCD 60km/h)** – The 60 dBA noise criteria was determined to be approximately 65.1 metres from the roadway centreline (or 48.1 metres from the right-of-way limits), therefore any outdoor living areas (OLAs) in this range may require physical attenuation.

Similar to the Indoor Noise Analysis, the 55 dBA noise contour extends approximately 130.3 metres beyond the Spratt Road right-of-way centreline, encompassing the vast majority of Blocks 14. As such, any 'noise-sensitive' OLAs beyond the 60 dBA threshold may still require the application of warning clause Type 'A'.

**Limebank Road (4-UAD 80km/h)** – The 60 dBA noise criteria was determined to be 115.4 metres from the roadway centreline (or 93.2 metres from the right-of-way limits), therefore any outdoor living areas (OLAs) in this range may require physical attenuation.

Similar to the Indoor Noise Analysis, the 55 dBA noise contour extends approximately 231.0 metres beyond the right-of-way centreline for both arterial roads encompasses the entirety of the Block 13 property and the eastern-most portion of Block 14. As such, any 'noise-sensitive' OLAs beyond the 60 dBA threshold may still require the application of warning clause Type 'A'.

**Leitrim Road Realignment (4-UAU 60km/h)** – The 60 dBA noise criteria was determined to be approximately 74.4 metres, therefore any OLAs within these property blocks directly adjacent to the realigned Leitrim Road may require physical attenuation.

The 55 dBA noise contour extends approximately 149.0 metres beyond the proposed road centreline which may impact outdoor living areas (OLAs) in Blocks 7 and 8 as well.

Warning clauses for outdoor noise are as follows:

Type 'A'

*“Purchasers/tenants are advised that sound levels due to increasing Spratt Road, Limebank Road and Leitrim Road traffic volumes may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”*

Type 'B'

*“Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing Spratt Road, Limebank Road and Leitrim Road traffic volumes may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”*

### 5.3 Aircraft Noise

Given that 'noise-sensitive' land uses are proposed in Block 14 within the Airport Vicinity Development Zone (ADVZ), the following warning clause will apply to Indoor or Outdoor Living Areas which conform to the City's criteria for 'noise-sensitive' land uses, as prescribed in the ENC Guidelines.

In accordance with the ENC Guidelines, no 'noise-sensitive' uses are permitted in the Airport Operating Influence Zone (AOIZ) which extends across the majority of the site, excluding Blocks 13 and 14.

The standard warning clause for aircraft noise is as follows:

*“Purchasers/tenants are advised that due to the proximity of the Ottawa Macdonald-Cartier International Airport, noise from the airport and individual aircraft may at times interfere with outdoor or indoor activities”.*



## 6 Conclusion

IBI Group (IBI) was retained by Riverside South Development Corporation to undertake a Noise Control Feasibility Study in support of a Draft Plan of Subdivision application for the proposed Riverside South Development Corporation (RSDC) Employments Lands in Ottawa, Ontario. In terms of stationary noise, a preliminary review did not identify any off-site noise sources within the study area, while on-site noise sources will require further review as the proposed development plans are further refined through the Site Plan Control (SPC) application process. It should be noted that any potential on-site noise sources in Block 14 will be screened from existing or proposed 'noise-sensitive' uses on adjacent lands by Mosquito Creek which provides a significant natural buffer which will help mitigate noise impacts.

Any 'noise-sensitive' land uses proposed on-site will be further investigated, following Draft Plan approval for the subject property. Detailed noise analysis will be conducted, as required, to inform the recommendations for appropriate warning clauses, Sound Transmission Class (STC) ratings for windows/doors or physical attenuation with respect to either aircraft or traffic noise in support of the SPC application submission package.

The need for an aircraft warning clauses for any 'noise-sensitive' land uses located in the Airport Vicinity Development Zone (ADVZ) will be further reviewed during the SPC application process for each property parcel. It is anticipated that 'noise-sensitive' uses located in Blocks 13 and 14 will require this warning clause, while the remainder of the site is located within the Airport Operating Influence Zone (AOIZ) which does not permit this type of development.

## 7 Professional Authorization

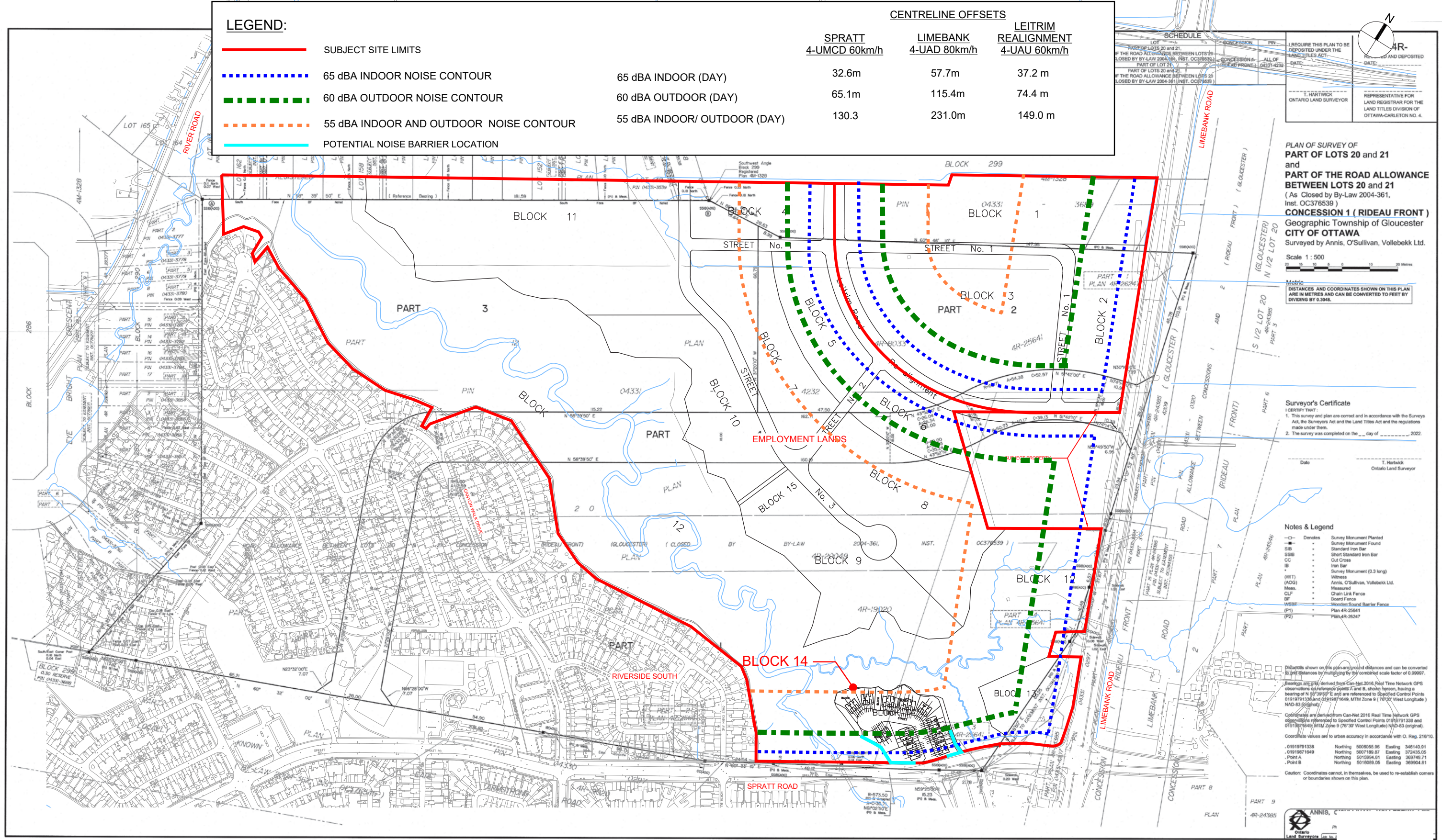
Prepared By:



Ben Pascolo-Neveu, P.Eng.



| LEGEND:                                 | CENTRELINE OFFSETS           |                          |  |
|---|------------------------------|--------------------------|--|
|   | SPRATT<br>4-UMCD 60km/h      | LIMEBANK<br>4-UAD 80km/h | LEITRIM<br>REALIGNMENT<br>4-UAU 60km/h |
| SUBJECT SITE LIMITS                     |                              |                          |  |
| 65 dBA INDOOR NOISE CONTOUR             | 65 dBA INDOOR (DAY)          | 32.6m                    | 37.2 m                                 |
| 60 dBA OUTDOOR NOISE CONTOUR            | 60 dBA OUTDOOR (DAY)         | 65.1m                    | 74.4 m                                 |
| 55 dBA INDOOR AND OUTDOOR NOISE CONTOUR | 55 dBA INDOOR/ OUTDOOR (DAY) | 130.3                    | 149.0 m                                |
| POTENTIAL NOISE BARRIER LOCATION        |                              |                          |  |



**SCHEDULE**

REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: \_\_\_\_\_

T. HARTWICK  
ONTARIO LAND SURVEYOR

REPRESENTATIVE FOR  
LAND REGISTRAR FOR THE  
LAND TITLES DIVISION OF  
OTTAWA-CARLETON NO. 4.

**PLAN OF SURVEY OF  
PART OF LOTS 20 and 21  
and  
PART OF THE ROAD ALLOWANCE  
BETWEEN LOTS 20 and 21**  
(As Closed by By-Law 2004-361,  
Inst. OC376539)  
**CONCESSION 1 (RIDEAU FRONT)**  
Geographic Township of Gloucester  
**CITY OF OTTAWA**  
Surveyed by Annis, O'Sullivan, Vollebek Ltd.

Scale 1 : 500

Distances and coordinates shown on this plan are in metres and can be converted to feet by dividing by 0.3048.

**Surveyor's Certificate**

I CERTIFY THAT:

- This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
- The survey was completed on the \_\_\_ day of \_\_\_\_\_ 2022.

Date: \_\_\_\_\_  
T. Hartwick  
Ontario Land Surveyor

- Notes & Legend**
- Densets
  - Survey Monument Planted
  - Survey Monument Found
  - Standard Iron Bar
  - SSB
  - Short Standard Iron Bar
  - CC
  - Out Cross
  - IB
  - Iron Bar
  - Survey Monument (0.3 long)
  - Witness
  - Annis, O'Sullivan, Vollebek Ltd.
  - Meas.
  - Chain Link Fence
  - BF
  - Board Fence
  - WBSF
  - Wooded Sound Barrier Fence
  - (P1)
  - Plan 4R-25641
  - (P2)
  - Plan 4R-25247

Distances shown on this plan are ground distances and can be converted to plan distances by multiplying by the combined scale factor of 0.99997.

Bearings are given derived from Can-Net 2016 Real Time Network GPS observations of reference points A and B, whose position, having a bearing of N 69°29'59" E and are referenced to Specified Control Points 01919791338 and 01919871648, MTM Zone 9 (78°00' West Longitude) NAD-83 (original).

Coordinates are derived from Can-Net 2016 Real Time Network GPS observations referenced to Specified Control Points 01919791338 and 01919871648, MTM Zone 9 (78°00' West Longitude) NAD-83 (original).

Coordinate values are to urban accuracy in accordance with O. Reg. 210/10.

- 01919791338    Northing 5006055.96    Easting 346140.01
- 01919871648    Northing 5007189.87    Easting 372435.05
- Point A        Northing 5015994.81    Easting 360740.71
- Point B        Northing 5016026.05    Easting 360904.81

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

Figure 3 - Noise Plan



## Appendix A – STAMSON Output

Filename: sprt6560.te                    Time Period: Day/Night 16/8 hours  
Description: spratt road umcd 60km/h 65 dBA day/ 60 dBA night

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

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 32.55 / 23.75 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

 Road data, segment # 2: spratt WB (day/night)

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 32.55 / 23.75 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

RF

Results segment # 1: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -5.59 | -1.46 | 0.00  | 0.00  | 0.00  | 61.99  |

Segment Leq : 61.99 dBA

RF

Results segment # 2: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -5.59 | -1.46 | 0.00  | 0.00  | 0.00  | 61.99  |

Segment Leq : 61.99 dBA

Total Leq All Segments: 65.00 dBA

RF

Results segment # 1: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -3.13 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

RF

Results segment # 2: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -3.13 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

RF

TOTAL Leq FROM ALL SOURCES (DAY): 65.00  
(NIGHT): 60.00



Filename: sprt6050.te                    Time Period: Day/Night 16/8 hours  
Description: spratt road umcd 60km/h 60 dBA day/ 50 dBA night

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

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 65.10 / 103.00 m  
Receiver height : 1.50 / 4.50    m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

 Road data, segment # 2: spratt WB (day/night)

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 65.10 / 103.00 m  
Receiver height : 1.50 / 4.50    m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

RF

Results segment # 1: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -10.58 | -1.46 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

RF

Results segment # 2: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -10.58 | -1.46 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

RF

Results segment # 1: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -13.14 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

RF

Results segment # 2: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -13.14 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

Total Leq All Segments: 50.00 dBA

RF

TOTAL Leq FROM ALL SOURCES (DAY): 60.00  
(NIGHT): 50.00

Filename: sprt5550.te                    Time Period: Day/Night 16/8 hours  
Description: spratt road umcd 60km/h 55 dBA day/ 50 dBA night

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


-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 130.30 / 103.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00

 Road data, segment # 2: spratt WB (day/night)

-----  
Car traffic volume : 9715/845    veh/TimePeriod \*  
Medium truck volume : 773/67    veh/TimePeriod \*  
Heavy truck volume : 552/48    veh/TimePeriod \*  
Posted speed limit : 60 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): 12000  
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: spratt WB (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 : 130.30 / 103.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1                    (Flat/gentle slope; no barrier)  
Reference angle : 0.00



RF

Results segment # 1: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -15.58 | -1.46 | 0.00  | 0.00  | 0.00  | 51.99  |

Segment Leq : 51.99 dBA

RF

Results segment # 2: spratt WB (day)

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 69.03  | 0.00  | -15.58 | -1.46 | 0.00  | 0.00  | 0.00  | 51.99  |

Segment Leq : 51.99 dBA

Total Leq All Segments: 55.00 dBA

RF

Results segment # 1: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -13.14 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

RF

Results segment # 2: spratt WB (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 61.43  | 0.00  | -13.14 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

Total Leq All Segments: 50.00 dBA

RF

TOTAL Leq FROM ALL SOURCES (DAY) : 55.00  
(NIGHT) : 50.00

RSDCEMP

STAMSON 5.0            NORMAL REPORT            Date: 16-01-2020 17:27:35  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: RSDCEMP.te                    Time Period: Day/Night 16/8 hours  
Description: LEITRIM ROAD Realignment 65dBA/60 dBA

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

-----  
Car traffic volume : 24288/2112 veh/TimePeriod \*  
Medium truck volume : 1932/168 veh/TimePeriod \*  
Heavy truck volume : 1380/120 veh/TimePeriod \*  
Posted speed limit : 60 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): 30000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: LEITRIM (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 : 37.20 / 27.40 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: LEITRIM (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 65.00 + 0.00) = 65.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.01  | 0.00  | -6.55 | -1.46 | 0.00  | 0.00  | 0.00  | 65.00  |

-----

RSDCEMP

Segment Leq : 65.00 dBA

Total Leq All Segments: 65.00 dBA

Results segment # 1: LEITRIM (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA

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

|     |    |      |       |      |       |       |      |      |      |       |
|-----|----|------|-------|------|-------|-------|------|------|------|-------|
| -90 | 90 | 0.57 | 65.41 | 0.00 | -4.11 | -1.30 | 0.00 | 0.00 | 0.00 | 60.00 |
|-----|----|------|-------|------|-------|-------|------|------|------|-------|

-----

Segment Leq : 60.00 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00  
(NIGHT): 60.00

Filename: rsdcemp.te                      Time Period: Day/Night 16/8 hours  
 Description: Leitrim Road Realignment 60 dBA

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

```
-----
Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 60 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): 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
```

Data for Segment # 1: LEITRIM (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 : 74.44 / 27.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: LEITRIM (day)

Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.01  | 0.00  | -11.55 | -1.46 | 0.00  | 0.00  | 0.00  | 60.00  |



RSDCEMP

Segment Leq : 60.00 dBA

Total Leq All Segments: 60.00 dBA

Results segment # 1: LEITRIM (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA

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

|     |    |      |       |      |       |       |      |      |      |       |
|-----|----|------|-------|------|-------|-------|------|------|------|-------|
| -90 | 90 | 0.57 | 65.41 | 0.00 | -4.11 | -1.30 | 0.00 | 0.00 | 0.00 | 60.00 |
|-----|----|------|-------|------|-------|-------|------|------|------|-------|

-----

Segment Leq : 60.00 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.00  
(NIGHT): 60.00

RSDCEMP

STAMSON 5.0            NORMAL REPORT            Date: 17-01-2020 13:46:47  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: rsdcomp.te                    Time Period: Day/Night 16/8 hours  
Description: Leitrim Road Realignment 55/ 50 dBA

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

-----  
Car traffic volume : 24288/2112 veh/TimePeriod \*  
Medium truck volume : 1932/168 veh/TimePeriod \*  
Heavy truck volume : 1380/120 veh/TimePeriod \*  
Posted speed limit : 60 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): 30000  
Percentage of Annual Growth : 0.00  
Number of Years of Growth : 0.00  
Medium Truck % of Total Volume : 7.00  
Heavy Truck % of Total Volume : 5.00  
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: LEITRIM (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 : 149.04 / 118.73 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: LEITRIM (day)

-----  
Source height = 1.50 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.01  | 0.00  | -16.55 | -1.46 | 0.00  | 0.00  | 0.00  | 55.00  |

-----

RSDCEMP

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: LEITRIM (night)

-----  
Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

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

|     |    |      |       |      |        |       |      |      |      |       |
|-----|----|------|-------|------|--------|-------|------|------|------|-------|
| -90 | 90 | 0.57 | 65.41 | 0.00 | -14.11 | -1.30 | 0.00 | 0.00 | 0.00 | 50.00 |
|-----|----|------|-------|------|--------|-------|------|------|------|-------|

-----

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00  
(NIGHT): 50.00

Filename: 4-UAD.te                            Time Period: Day/Night 16/8 hours  
Description: 4-UAD 80km/h - 65 dBA (day)/ 60 dBA (night)

Road data, segment # 1: 4-UAD (day/night)

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: 4-UAD (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 : 57.69 / 43.54 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: 4-UAD (day/night)

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: 4-UAD (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 : 57.69 / 43.54 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Results segment # 1: 4-UAD (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -9.71 | -1.46 | 0.00  | 0.00  | 0.00  | 61.99  |

-----

Segment Leq : 61.99 dBA

Results segment # 2: 4-UAD (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -9.71 | -1.46 | 0.00  | 0.00  | 0.00  | 61.99  |

-----

Segment Leq : 61.99 dBA

Total Leq All Segments: 65.00 dBA

Results segment # 1: 4-UAD (night)

-----



Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -7.27 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Results segment # 2: 4-UAD (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -7.27 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00  
(NIGHT): 60.00

Filename: 4uad.te                    Time Period: Day/Night 16/8 hours  
Description: 4uad 80km/h - 60 dba (day) / 50 dba (night)

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

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: (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 : 115.41 / 188.80 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



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

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: (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 : 115.41 / 188.80 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

RF

Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -14.71 | -1.46 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

RF

Results segment # 2: (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -14.71 | -1.46 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

RF

Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -17.27 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

RF

Results segment # 2: (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -17.27 | -1.30 | 0.00  | 0.00  | 0.00  | 46.99  |

Segment Leq : 46.99 dBA

Total Leq All Segments: 50.00 dBA

RF

TOTAL Leq FROM ALL SOURCES (DAY): 60.00  
(NIGHT): 50.00

Filename: 4-UAD.te                            Time Period: Day/Night 16/8 hours  
Description: 4-UAD 80km/h - 55 dBA (day)/ 60 dBA (night)

Road data, segment # 1: 4-UAD (day/night)

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: 4-UAD (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 : 230.98 / 43.54 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: 4-UAD (day/night)

-----  
Car traffic volume : 14168/1232 veh/TimePeriod \*  
Medium truck volume : 1127/98 veh/TimePeriod \*  
Heavy truck volume : 805/70 veh/TimePeriod \*  
Posted speed limit : 80 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): 17500  
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: 4-UAD (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 : 230.98 / 43.54 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Results segment # 1: 4-UAD (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -19.71 | -1.46 | 0.00  | 0.00  | 0.00  | 51.99  |

-----

Segment Leq : 51.99 dBA

Results segment # 2: 4-UAD (day)

-----  
 Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 73.16  | 0.00  | -19.71 | -1.46 | 0.00  | 0.00  | 0.00  | 51.99  |

-----

Segment Leq : 51.99 dBA

Total Leq All Segments: 55.00 dBA

Results segment # 1: 4-UAD (night)

-----



Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -7.27 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Results segment # 2: 4-UAD (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 65.56  | 0.00  | -7.27 | -1.30 | 0.00  | 0.00  | 0.00  | 56.99  |

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00  
(NIGHT): 60.00

Filename: 2rau80.te                    Time Period: Day/Night 16/8 hours  
 Description: existing leitrim road 55 dBA (day) / 50 dBA night

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

```
-----
Car traffic volume   : 9715/845   veh/TimePeriod *
Medium truck volume  : 773/67    veh/TimePeriod *
Heavy truck volume   : 552/48    veh/TimePeriod *
Posted speed limit   : 80 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): 12000
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: rau (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 : 121.09 / 95.40 m
Receiver height  : 1.50 / 4.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```



Results segment # 1: rau (day)

Source height = 1.50 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.66  | 71.52  | 0.00  | -15.06 | -1.46 | 0.00  | 0.00  | 0.00  | 55.00  |

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA



Results segment # 1: rau (night)

Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj  | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|--------|-------|-------|-------|-------|--------|
| -90    | 90     | 0.57  | 63.92  | 0.00  | -12.62 | -1.30 | 0.00  | 0.00  | 0.00  | 50.00  |

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 55.00  
(NIGHT): 50.00

