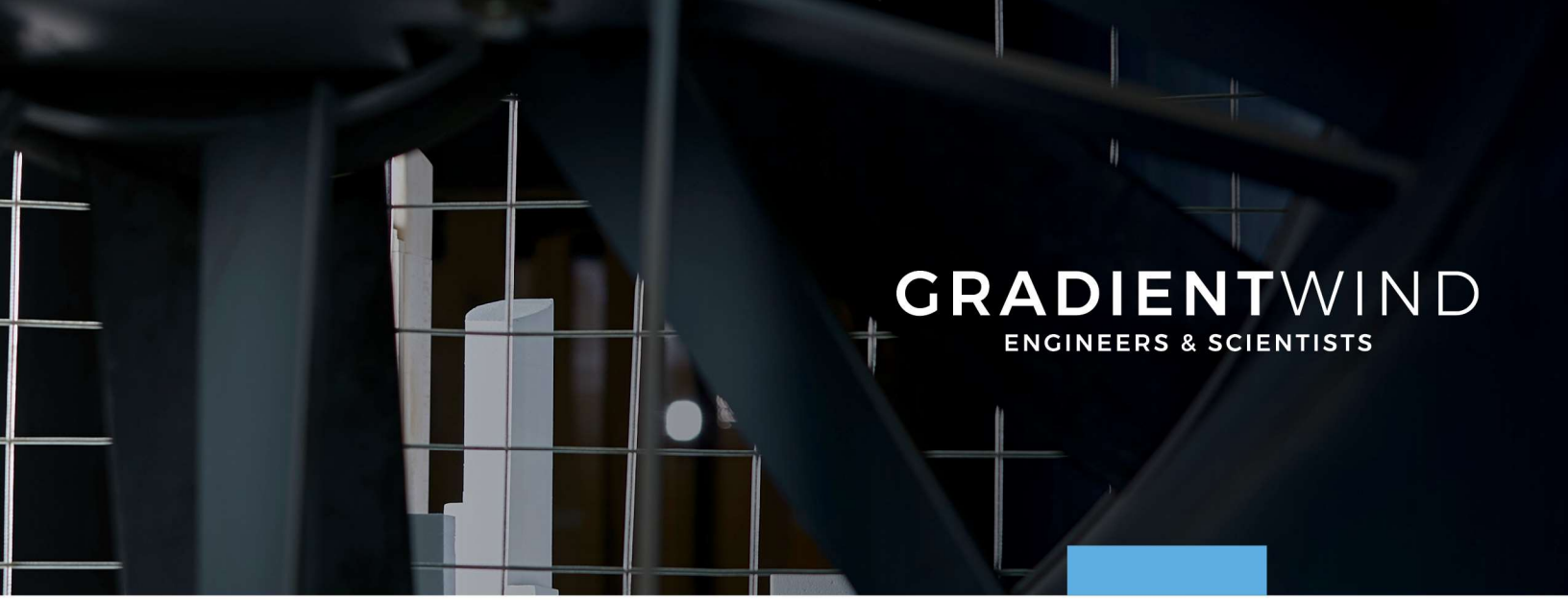

GRADIENTWIND
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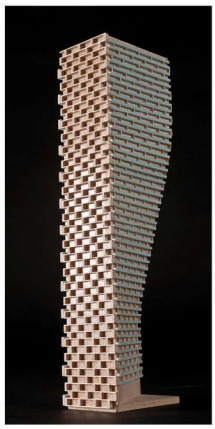
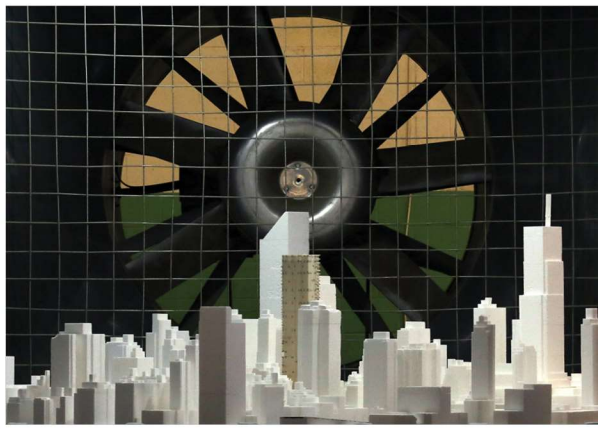
# TRAFFIC NOISE ASSESSMENT

71 Russell Avenue
Ottawa, Ontario

Report: 25-223–Traffic Noise Assessment





January 26, 2026

PREPARED FOR
Jersey Developments Inc.
71 Russell Avenue
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PREPARED BY
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# EXECUTIVE SUMMARY

This report describes a traffic noise assessment undertaken for a proposed four-storey low-rise apartment building located at 71 Russell Avenue in Ottawa, Ontario. The primary source of environmental noise affecting the site is Chapel Street, a 2-lane urban collector roadway near the property.

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

The results of the current analysis indicate that exterior noise levels at the building façade will reach 51 dBA at the worst-case location in the daytime period (07:00-23:00) and 49 dBA in the nighttime period (23:00-07:00). The traffic noise was found to be in compliance with the ENCG objective sound level of 55 dBA, therefore no noise control measures are required for the development.

The building is surrounded by residential low-rise buildings. There are no significant sources of stationary noise impacting the development.

The development is expected to have small internal heating and cooling equipment; therefore, no significant sources of noise are associated with the development, and it will not have a significant impact of the surroundings.

# TABLE OF CONTENTS

# 1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Jersey Developments Inc. to undertake a traffic noise assessment for a proposed low-rise apartment building located at 71 Russell Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

This work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on site plan drawings prepared by Lawrence Architects, received November 2025, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

# 2. TERMS OF REFERENCE

The focus of this environmental noise assessment is a proposed four-storey apartment building that will be located at 71 Russell Avenue in Ottawa, Ontario. The site is situated within an urban residential context. The property fronts onto Russell Avenue, with Chapel Street identified as the primary source of noise. No other major roadways were close enough to the site to warrant inclusion in the analysis, and none of the adjacent buildings have significant sources of stationary noise.

# 3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) explore potential noise mitigation where required.

# 4. METHODOLOGY

## 4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular

[1] City of Ottawa Environmental Noise Control Guidelines, January 2016
[2] Ontario Ministry of the Environment, Conservation and Parks – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013

source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level ($2\times10^{-5}$ Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

## 4.2 Roadway Traffic Noise

### 4.2.1 Criteria for Roadway Traffic Noise

For surface roadway traffic noise, the equivalent sound energy level, $L_{eq}$, provides a measure of the time-varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time-varying noise level over a period of time. For roadways, the $L_{eq}$ is commonly calculated on the basis of a 16-hour ($L_{eq16}$) daytime (07:00-23:00) / 8-hour ($L_{eq8}$) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms and sleeping quarters respectively for roadway as listed in Table 1.

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

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

[3] Adapted from ENCG 2016 – Tables 2.2b and 2.2c

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

The sound level criterion for outdoor living areas (OLA) is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation should be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. Furthermore, noise levels at the OLA must not exceed 60 dBA if mitigation can be technically and administratively achieved.

### 4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data. Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split was taken to be 92% / 8% respectively for all streets.
- The ground surface was modelled as reflective where pavement and concrete are present (hard ground).
- The primary road segment (Chapel Street) was modeled with a gradient of 4%.
- The study site was treated as having flat or gently sloping topography.

[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[5] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

- No massing in the study site considered as potential noise screening elements.
- Three receptors were strategically placed throughout the study area, each defined on plane of window (POW) at the centre of the windows which would have the highest noise exposure.
- The buildings separating 71 Russell Avenue from Chapel Street were conservatively simplified to be a 10.5 m tall barrier.
- Noise receptors were strategically placed at 3 locations around the study area (see Figure A2).
- Receptor distances and exposure angles are illustrated in Figure A3

### 4.2.3 Roadway Traffic Volumes

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

**TABLE 2: ROADWAY TRAFFIC DATA**

| Segment | Roadway Traffic Data | Speed Limit (km/h) | Traffic Volumes |
|---|---|---|---|
| Chapel Street | 2-Lane Urban Collector (2-UCU) | 30 | **8,000** |

## 5. RESULTS & DISCUSSION

### 5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3. The results indicate that exterior noise levels at the proposed building façade will range from approximately 47 to 51 dBA during the daytime period to 42 to 49 dBA during the nighttime period at the upper floor. These levels are below the 55 dBA criterion, therefore no noise control measures are required for the development.

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

### TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

| Receptor Number | Receptor Height Above Grade (m) | Receptor Location | Noise Level (dBA) | |
|---|---|---|---|---|
| | | | Day | Night |
| 1 | 11 | Center of north-east façade | 48 | 41 |
| 2 | 11 | Center of north-west façade | 51 | 49 |
| 3 | 11 | East corner of façade | 50 | 48 |

## 6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 48 to 51 dBA during the daytime period (07:00-23:00) and 41 to 49 dBA during the nighttime period (23:00-07:00). The traffic noise was found to be in compliance with the ENCG criterion of 55 dBA, therefore no noise control measures are required for the development.

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

Sincerely,

***Gradient Wind Engineering Inc.***


Nick Cunnington-Bourbonniere, MSc
Jr. Acoustic, Environmental Noise and Vibrations Scientist

Joshua Foster, P.Eng.
Lead Engineer

*Gradient Wind File #25-223-Traffic Noise Assessment*


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| | | | |
|---|---|---|---|
| PROJECT | 71 RUSSELL AVENUE, OTTAWA<br>ROADWAY TRAFFIC/STATIONARY NOISE ASSESSMENT | | DESCRIPTION |
| SCALE | 1:1000 (APPROX.) | DRAWING NO. | GW25-223-1 |
| DATE | DECEMBER 2, 2025 | DRAWN BY | N.C.B. |

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT


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| | | | |
|---|---|---|---|
| PROJECT | 71 RUSSELL AVENUE, OTTAWA<br>ROADWAY TRAFFIC/STATIONARY NOISE ASSESSMENT | | DESCRIPTION |
| SCALE | 1:750 (APPROX.) | DRAWING NO. | GW25-223-2 |
| DATE | DECEMBER 2, 2025 | DRAWN BY | N.C.B. |

FIGURE 2:
RECEPTOR LOCATIONS


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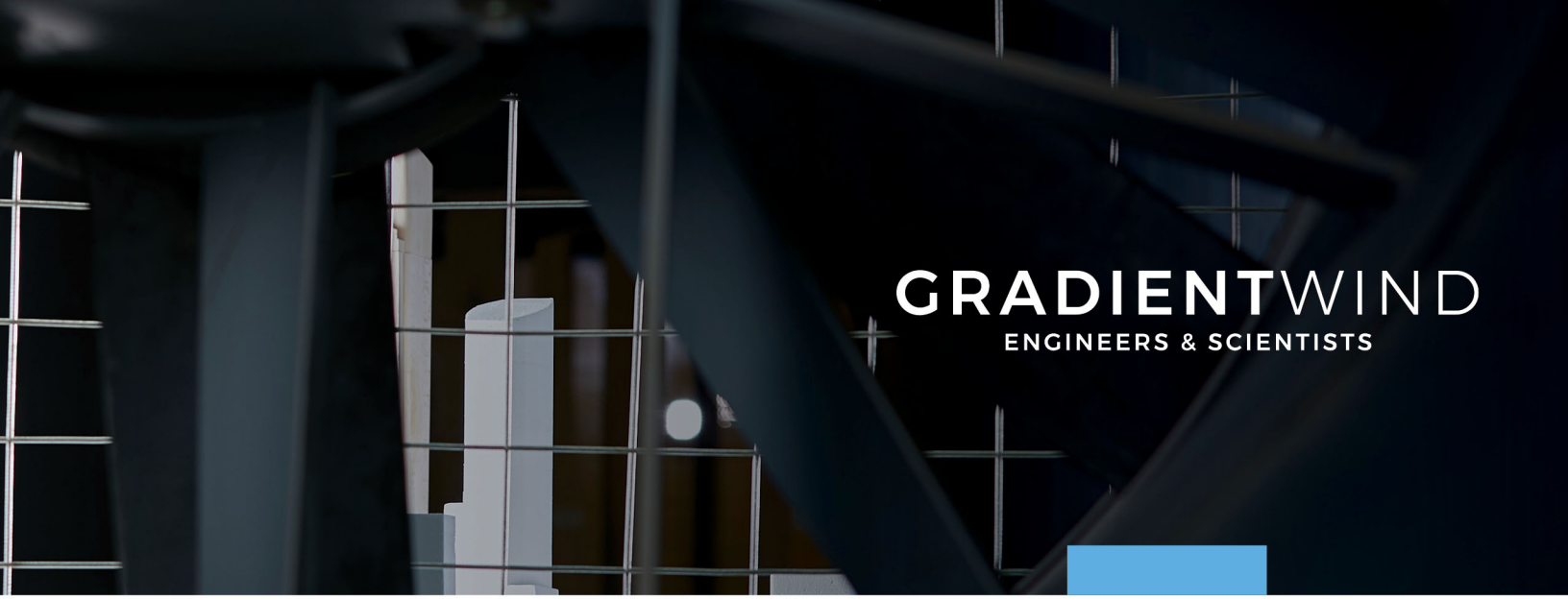
| | | | |
|---|---|---|---|
| PROJECT | 71 RUSSELL AVENUE, OTTAWA<br>ROADWAY TRAFFIC/STATIONARY NOISE ASSESSMENT | | DESCRIPTION |
| SCALE | 1:1000 (APPROX.) | DRAWING NO. | GW25-223-3 |
| DATE | DECEMBER 2, 2025 | DRAWN BY | N.C.B. |

FIGURE 3:
STAMSON INPUT PARAMETERS



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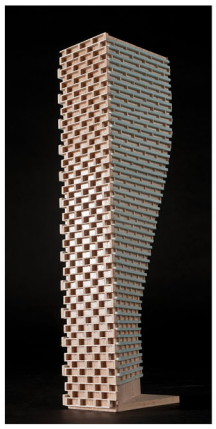

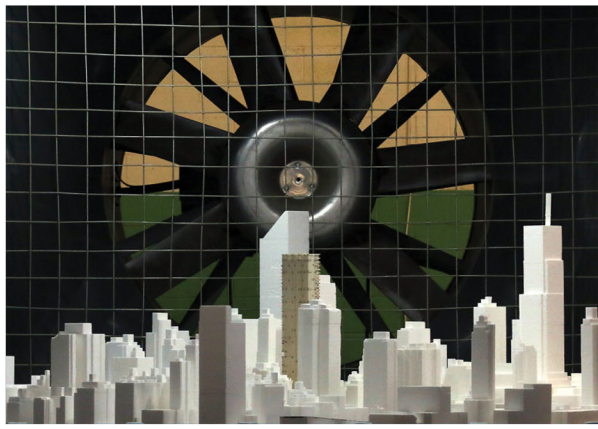

# APPENDIX A

# STAMSON 5.04 – INPUT AND OUTPUT DATA

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**STAMSON 5.0 NORMAL REPORT Date: 09-12-2025 09:37:14**
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

Filename: t233r.te Time Period: Day/Night 16/8 hours
Description: 71 Russell: Reciever 1

Road data, segment # 1: (day/night)
---
Car traffic volume : 4693/2347 veh/TimePeriod
Medium truck volume : 373/187 veh/TimePeriod
Heavy truck volume : 267/133 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 4 %
Road pavement : 1 (Typical asphalt or concrete)

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 : 60.00 / 58.00 m
Receiver height : 10.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 10.50 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Source height = 1.50 m

ROAD (0.00 + 48.32 + 0.00) = 48.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.24   0.00  -6.02   0.00   0.00   0.00  -8.90  48.32
-------------------------------------------------------------------------------

Segment Leq : 48.32 dBA

Total Leq All Segments: 48.32 dBA


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

Source height = 1.50 m


ROAD (0.00 + 41.45 + 0.00) = 41.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.24   0.00  -5.87   0.00   0.00   0.00 -15.91  41.45
-------------------------------------------------------------------------------

Segment Leq : 41.45 dBA

Total Leq All Segments: 41.45 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 48.32
                           (NIGHT): 41.45
```

**STAMSON 5.0 NORMAL REPORT Date: 09-12-2025 09:37:52**
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

Filename: t233r.te Time Period: Day/Night 16/8 hours
Description: 71 Russell: Reciever 2

Road data, segment # 1: (day/night)
---
Car traffic volume : 4693/2347 veh/TimePeriod
Medium truck volume : 373/187 veh/TimePeriod
Heavy truck volume : 267/133 veh/TimePeriod
Posted speed limit : 40 km/h
Road gradient : 4 %
Road pavement : 1 (Typical asphalt or concrete)

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 : 71.00 / 71.00 m
Receiver height : 10.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
Barrier height : 10.50 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Source height = 1.50 m

ROAD (0.00 + 43.52 + 49.88) = 50.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  63.24   0.00  -6.75  -3.01   0.00   0.00  -9.96  43.52
-------------------------------------------------------------------------------
     0     90   0.39  63.24   0.00  -9.39  -3.97   0.00   0.00   0.00  49.88
-------------------------------------------------------------------------------

Segment Leq : 50.79 dBA

Total Leq All Segments: 50.79 dBA


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

Source height = 1.50 m

ROAD (0.00 + 38.53 + 48.32) = 48.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  63.24   0.00  -6.75  -3.01   0.00   0.00 -14.95  38.53
-------------------------------------------------------------------------------
     0     90   0.57  63.24   0.00 -10.60  -4.31   0.00   0.00   0.00  48.32
-------------------------------------------------------------------------------

Segment Leq : 48.76 dBA

Total Leq All Segments: 48.76 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 50.79
                           (NIGHT): 48.76
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-12-2025 09:38:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: t233r.te              Time Period: Day/Night 16/8 hours
Description: 71 Russell: Receiver 3


Road data, segment # 1:  (day/night)
-----------------------------------
Car traffic volume  :  4693/2347  veh/TimePeriod
Medium truck volume :   373/187   veh/TimePeriod
Heavy truck volume  :   267/133   veh/TimePeriod
Posted speed limit  :    40 km/h
Road gradient       :     4 %
Road pavement       :     1 (Typical asphalt or concrete)

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  :  82.00 / 82.00  m
Receiver height           :  10.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :  10.50 m
Barrier receiver distance :  36.00 / 36.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (49.01 + 42.27 + 0.00) = 49.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.39  63.24   0.00 -10.26  -3.97   0.00   0.00   0.00  49.01
-------------------------------------------------------------------------------
     0     90   0.00  63.24   0.00  -7.38  -3.01   0.00   0.00 -10.58  42.27
-------------------------------------------------------------------------------

Segment Leq : 49.85 dBA

Total Leq All Segments: 49.85 dBA


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

Source height = 1.50 m


ROAD (47.34 + 38.39 + 0.00) = 47.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.57  63.24   0.00 -11.58  -4.31   0.00   0.00   0.00  47.34
-------------------------------------------------------------------------------
     0     90   0.00  63.24   0.00  -7.38  -3.01   0.00   0.00 -14.46  38.39
-------------------------------------------------------------------------------

Segment Leq : 47.86 dBA

Total Leq All Segments: 47.86 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 49.85
                           (NIGHT): 47.86
```