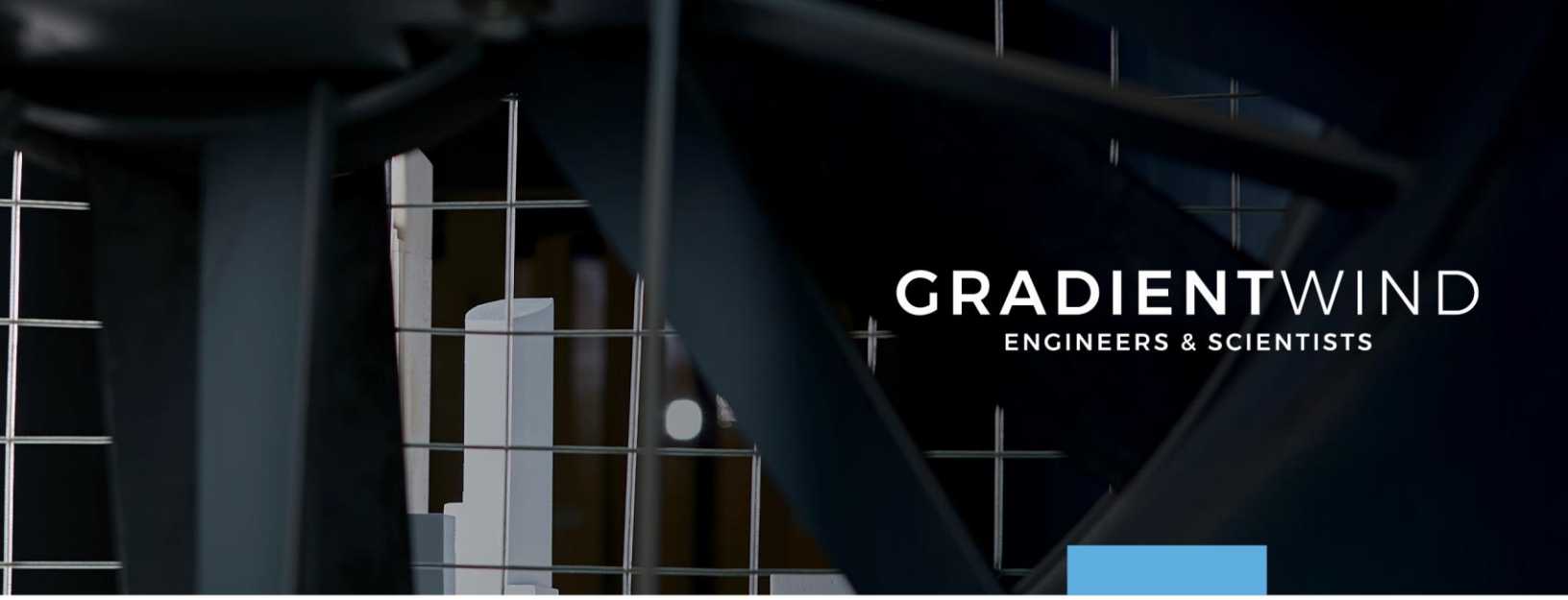

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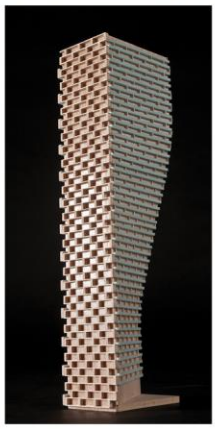
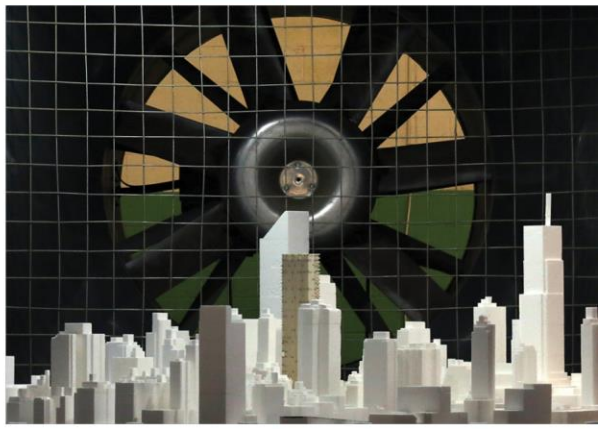
DETAILED TRAFFIC NOISE STUDY

Kanata West Block 1
815 Roger Griffiths
Ottawa, Ontario

REPORT: GWE25-118 – Traffic Noise





June 24, 2025

PREPARED FOR

Richcraft Homes Ltd.
2280 St. Laurent Boulevard, Suite 201
Ottawa, Ontario
K1G 4K1

PREPARED BY

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EXECUTIVE SUMMARY

This report describes a traffic noise assessment to support a Site Plan Control application (SPA), for a proposed residential development located at 815 Roger Griffiths in Ottawa, Ontario. The proposed development comprises a two, 3-storey apartment blocks totalling 52 dwelling units, and 6 blocks of 2.5-storey terrace flats townhouses totalling 63 dwelling units. The development will be built in two phases, Phase 1 will comprise the two apartment buildings, and Phase 2 the five terrace flat blocks. The major source of roadway traffic noise is Maple Grove Road and Roger Griffiths Road. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MOECP) 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 M. David Blakely Architect Inc. dated June 2025.

The results of the roadway traffic noise calculations are summarized in Table 3 below. The results of the current analysis indicate that noise levels will range between 45 and 67 dBA during the daytime period (07:00-23:00) and between 37 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the façade north facades, which is nearest and most exposed to Maple Grove Road.

Results of the calculations also indicate that Building 1, Block 1 and Block 2 will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. Noise levels at the plane of window for the other dwellings are expected to be between 55 dBA and 65 dBA during the daytime period. As such building components in conformance with Ontario Building Coded (OBC) standards will be sufficient to attenuate indoor sound levels. Building 2, and Blocks 3, 4, 5 and 6 blocks will require a forced air heating systems, with provisions for adding air conditioning by the owner. If air conditioning is installed it will allow windows to remain closed, thus providing a quiet and comfortable indoor environment. A Type D and a Type C warning clause should be applied to purchase, sale and lease agreements, see section 6.

A review of satellite imagery and a site visit conduced June 9, 2025, confirmed there are no existing stationary noise sources impacting the site. To the east is an existing pump station, no audible noise was observed coming form the facility.

The proposed development is not anticipated to have any external pieces of heating ventilation and air conditioning equipment, as such the stationary noise impacts form the building on the surroundings and itself are expected to be minimal.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Richcraft to undertake a detailed traffic noise assessment for Kanata Block 1 of the proposed development, located at 815 Roger Griffiths 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.

Our 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 architectural drawings prepared by M. David Blakely Architect Inc. dated June 2025, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The proposed development comprises a two, 3-storey apartment blocks totalling 52 dwelling units, and 6 blocks of 2.5-storey terrace flats townhouses totalling 63 dwelling units. The development will be built in two phases, Phase 1 will comprise the two apartment buildings, and Phase 2 the five terrace flat blocks. There are no outdoor living areas (OLA) associated with this development. Balconies of less than 4 m in depth are not considered as point of assessment for a noise study. The landscaped area south of the utility building labeled amenity area, is also not an OLA because it is not immediately accessible from the buildings and will function more as a parkette which is not considered OLA as per the ENCG. The major source of roadway traffic noise is Maple Grove Road and Roger Griffiths Road. Figure 1 illustrates a complete site plan with surrounding context.

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

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) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For 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	Leq (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.	07:00 – 23:00	45
Sleeping quarters of **residences**, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40

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 is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion.

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

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MOECP 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.
- Receptor heights taken to be 7.5 m and 4.5 m above grade, representative of the third level Plane of Window (POW).
- Absorptive and reflective intermediate ground surfaces based on specific source-receiver path ground characteristics.
- Noise receptors were strategically placed at 13 locations around the study area (see Figure 2).

4.2.1 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 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 each roadway included in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Roger Griffith Avenue	2-Lane Urban Collector (2-UCU)	40	**8,000**
Maple Grove Road	4-Lane Urban Arterial Divided (4-UAD)	60	**35,000**

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2012) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels (from road and rail sources) at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[7] considers:

- Window type and total area as a percentage of total room floor area
- Exterior wall type and total area as a percentage of the total room floor area
- Acoustic absorption characteristics of the room
- Outdoor noise source type and approach geometry
- Indoor sound level criteria, which varies according to the intended use of a space

[7] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

Based on published research[8], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, which was prepared for site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factor).

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. The results of the current analysis indicate that noise levels will range between 45 and 67 dBA during the daytime period (07:00-23:00) and between 37 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the façade north facades, which is nearest and most exposed to Maple Grove Road.

[8] CMHC, Road & Rail Noise: Effects on Housing

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	4.5	POW – Building 1 - North Facade	66	58
	7.5		67	59
2	4.5	POW - Block 2- West Facade	63	55
	7.5		63	56
3	4.5	POW – Block 2 - North Facade	67	59
	7.5		67	59
4	4.5	POW - Block 1- North Facade	67	59
	7.5		67	59
5	4.5	POW - Block 1- East Facade	62	54
	7.5		63	55
6	4.5	POW - Block 6- North Facade	55	48
	7.5		57	49
7	4.5	POW - Block 5- North Facade	47	40
	7.5		50	42
8	4.5	POW - Block 5- West Facade	45	37
	7.5		46	38
9	4.5	POW - Block 4- West Façade	49	42
	7.5		51	43
10	4.5	POW - Block 3- West Façade	54	46
	7.5		55	48
11	4.5	POW – Building 2 - South Façade	48	40
	7.5		49	41
12	4.5	POW - Building 2 - West Façade	56	49
	7.5		57	49
13	4.5	POW – Building 1 - West Facade	60	53
	7.5		62	54

Table 4 below provides a comparison between Predictor-Lima and STAMSON. Noise levels calculated in STAMSON were found to have good correlation with Predictor-Lima and variability between the two programs was within an acceptable level of ±1-3 dBA.

TABLE 4: RESULT CORRELATION WITH STAMSON

Receptor ID	Receptor Location	Receptor Height (m)	STAMSON 5.04 Noise Level (dBA)		CadnA Noise Level (dBA)	
			Day	Night	Day	Night
R1	POW – Building 1 - North Facade	4.5	68	61	66	58
R3	POW – Block 2 - North Facade	4.5	69	61	67	59
R4	POW - Block 1- North Facade	4.5	69	61	67	59

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). As per city of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application for each unit type.

The STC requirements apply to window and door elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a window and wall system may be used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors.

TABLE 5: NOISE CONTROL MEASURES

Building	STC Bedroom / Living Room Windows	Ventilation Requirements	Warning Clause
Building 1 North Façade	30 / 25*	A/C	Type D
Building 1 South, East and West Façades	OBC		
Building 2	OBC	FAH	Type C
Block 1 North Façade	30 / 25*	A/C	Type D
Block 1 South, East and West Façades	OBC		
Block 2 North Façade	30 / 25*	A/C	Type D
Block 2 South, East and West Façades	OBC		
Block 3	OBC	FAH	Type C
Block 4	OBC	FAH	Type C
Block 5	OBC	FAH	Type C
Block 6	OBC	FAH	Type C

Note: A/C = Air Conditioning, FAC = Forced Air Heating with Provisions for AC
*Exterior Walls to have a minimum STC 45

Results of the calculations also indicate that some of the buildings will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the roadway traffic noise calculations are summarized in Table 3 below. The results of the current analysis indicate that noise levels will range between 45 and 67 dBA during the daytime period (07:00-23:00) and between 37 and 59 dBA during the nighttime period (23:00-07:00). The highest noise level (67 dBA) occurs at the façade north facades, which is nearest and most exposed to Maple Grove Road.

Results of the calculations also indicate that Building 1, Block 1 and Block 2 will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. Bedroom and Living room windows on the north façade will require an STC rating of 30 and exterior walls will require STC 45. The following Type D Warning Clause[9] will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized below:

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 sound level limits of the Municipality and the Ministry of the Environment."

Noise levels at the plane of window for Building 2, and Blocks 3, 4 5, and 6 are expected to be between 55 dBA and 65 dBA during the daytime period. As such building components in conformance with Ontario Building Coded (OBC) standards will be sufficient to attenuate indoor sound levels. The blocks will require a forced air heating systems, which as provisions for adding air conditioning by the owner. If air conditioning is installed it will allow windows to remain closed, thus providing a quiet and comfortable indoor environment. The following Warning Clause[10] Type C will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized below:

Type C

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

"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 Municipality and the Ministry of the Environment, Conservation and Parks."

This concludes our traffic noise 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.

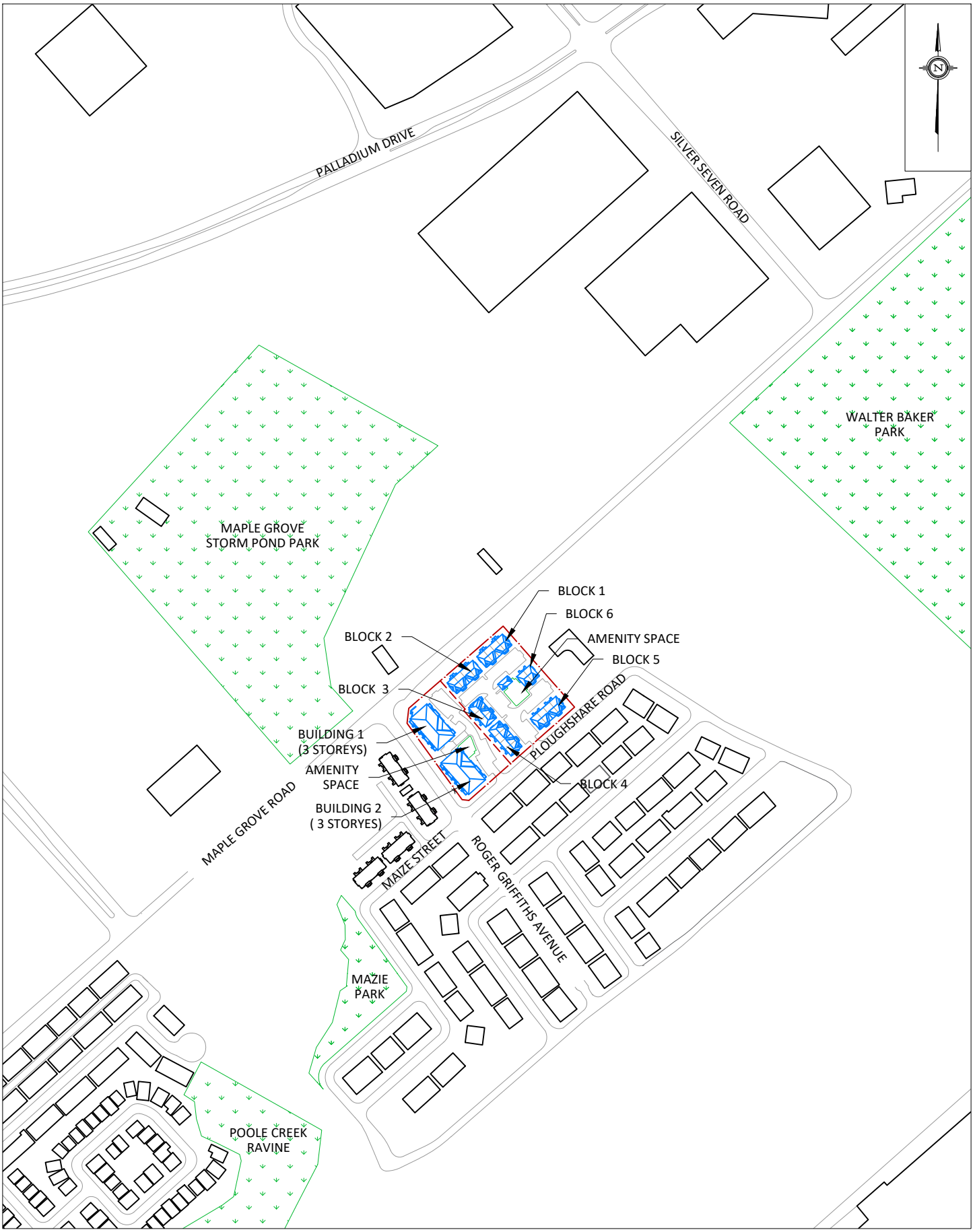
Sincerely,

Gradient Wind Engineering Inc.

Sergio Nunez Andres

Sergio Nunez Andres, B.Eng,
Junior Environmental Scientist
GWE 25-118

Joshua Foster, P.Eng.
Lead Engineer



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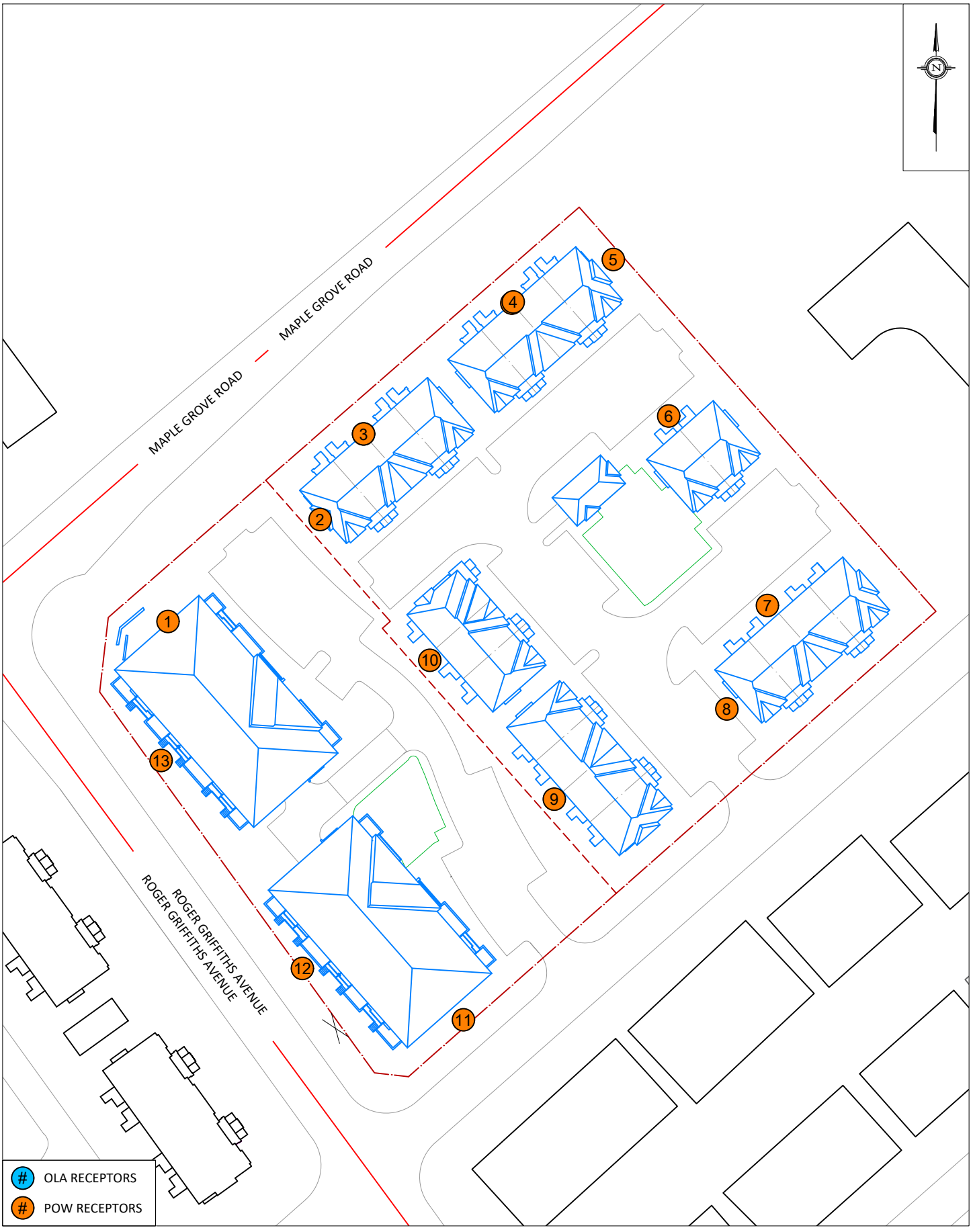
PROJECT	KANATA WEST BLOCK 1, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY
SCALE	1:5000 (APPROX.)
DRAWING NO.	25-118-ANV-1
DATE	JUNE 13, 2025
DRAWN BY	N.M.P.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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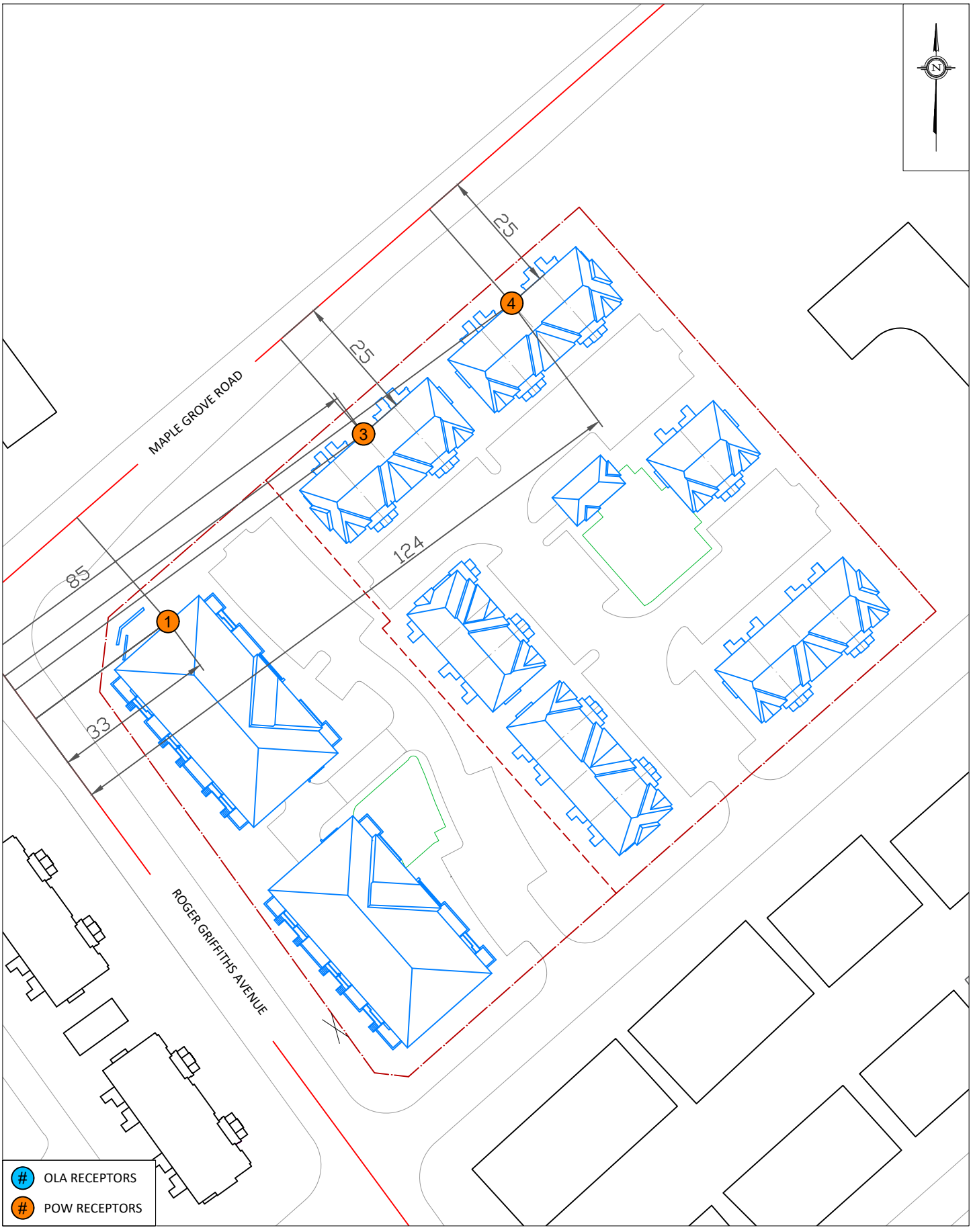
PROJECT	KANATA WEST BLOCK 1, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	25-118-ANV-2
DATE	JUNE 13, 2025	DRAWN BY	N.M.P.

FIGURE 2:
RECEPTOR LOCATION



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PROJECT	KANATA WEST BLOCK 1, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	25-118-ANV-3
DATE	JUNE 13, 2025	DRAWN BY	N.M.P.

FIGURE 3:
STAMSON CALCULATIONS

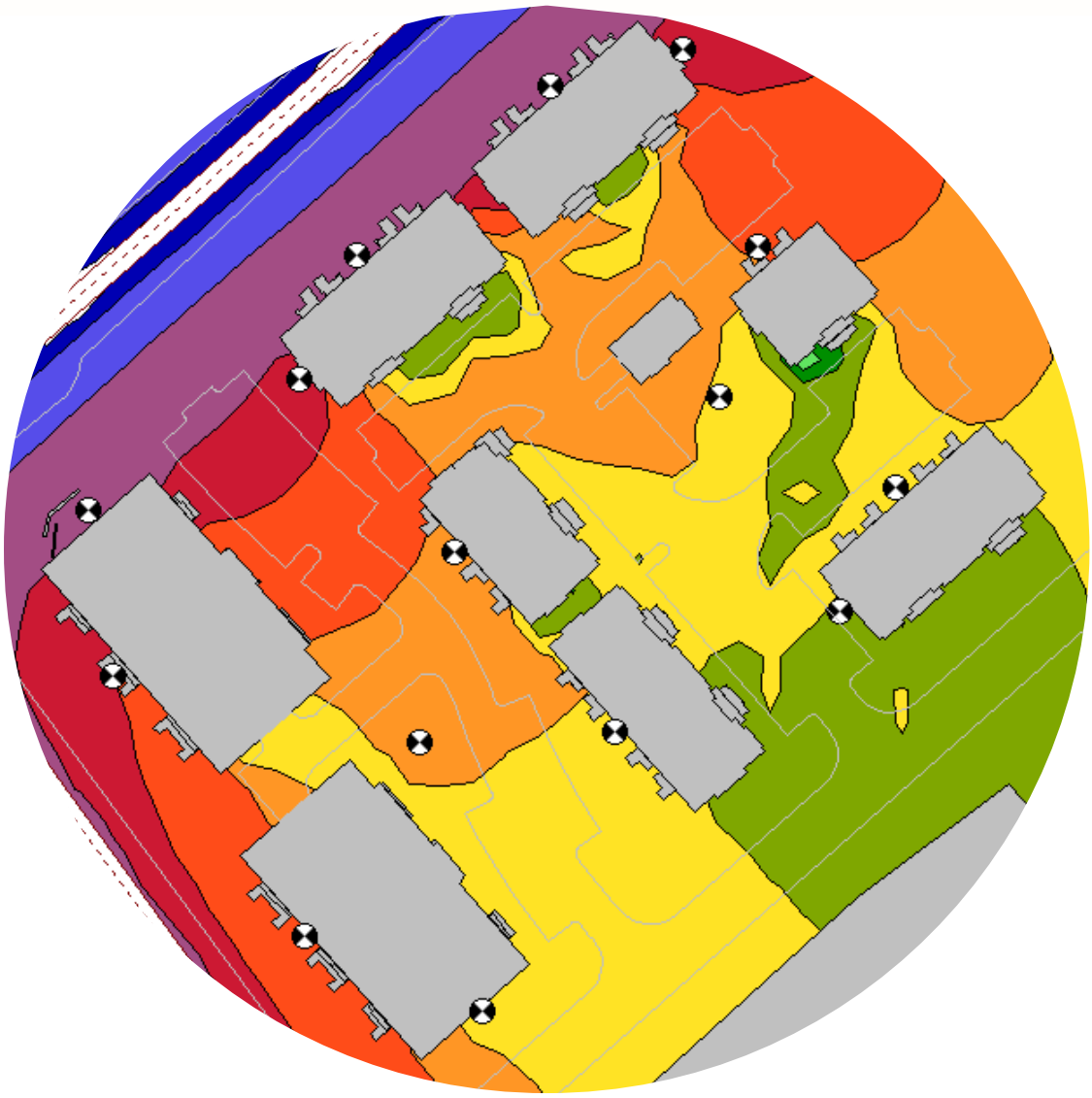

FIGURE 4: DAYTIME NOISE CONTOURS (4.5 M ABOVE GRADE)

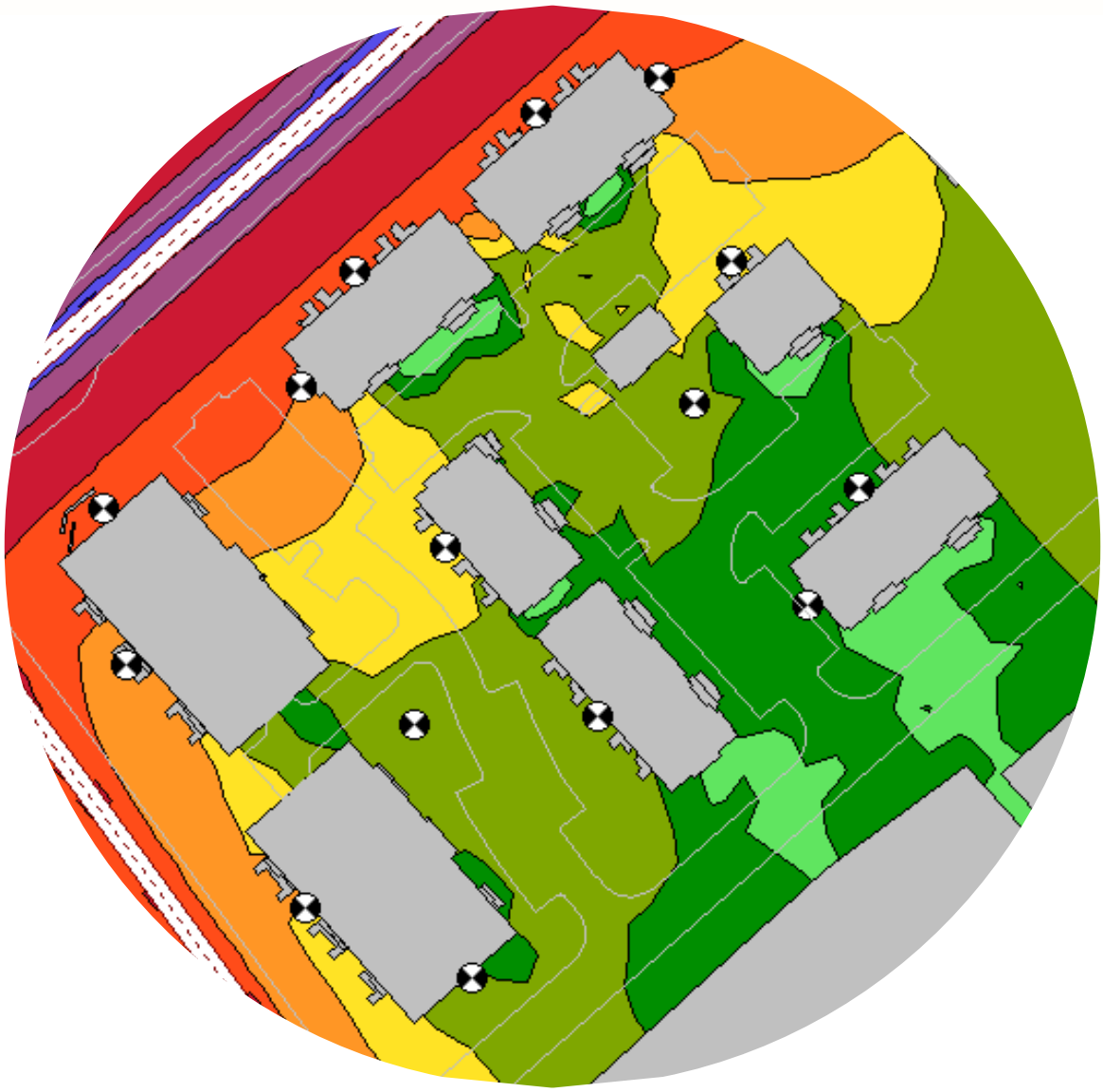

FIGURE 5: NIGHTTIME NOISE CONTOURS (4.5 M ABOVE GRADE)

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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```
STAMSON 5.0        NORMAL REPORT        Date: 23-06-2025 16:41:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Mapple (day/night)
-----------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Mapple (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  :  28.00 / 28.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Rogger (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  :  33.00 / 33.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 68.12 + 0.00) = 68.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  73.68   0.00  -4.26  -1.30   0.00   0.00   0.00
68.12
-------------------------------------------------------------------------
--

Segment Leq : 68.12 dBA


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

Source height = 1.50 m

ROAD (0.00 + 54.27 + 0.00) = 54.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  63.96   0.00  -5.38  -4.31   0.00   0.00   0.00
54.27
-------------------------------------------------------------------------
--

Segment Leq : 54.27 dBA

Total Leq All Segments: 68.30 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 60.52 + 0.00) = 60.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  66.08   0.00  -4.26  -1.30   0.00   0.00   0.00
60.52
-------------------------------------------------------------------------
--

Segment Leq : 60.52 dBA


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

Source height = 1.50 m

ROAD (0.00 + 46.67 + 0.00) = 46.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  56.36   0.00  -5.38  -4.31   0.00   0.00   0.00
46.67
-------------------------------------------------------------------------
--

Segment Leq : 46.67 dBA

Total Leq All Segments: 60.70 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.30
                           (NIGHT): 60.70
```

```
STAMSON 5.0        NORMAL REPORT        Date: 23-06-2025 16:43:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Mapple (day/night)
-----------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Mapple (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  :  25.00 / 25.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Rogger (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  :  85.00 / 85.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 68.89 + 0.00) = 68.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  73.68   0.00  -3.48  -1.30   0.00   0.00   0.00
68.89
-------------------------------------------------------------------------
--

Segment Leq : 68.89 dBA


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

Source height = 1.50 m

ROAD (0.00 + 47.81 + 0.00) = 47.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  63.96   0.00 -11.83  -4.31   0.00   0.00   0.00
47.81
-------------------------------------------------------------------------
--

Segment Leq : 47.81 dBA

Total Leq All Segments: 68.92 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 61.29 + 0.00) = 61.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  66.08   0.00  -3.48  -1.30   0.00   0.00   0.00
61.29
-------------------------------------------------------------------------
--

Segment Leq : 61.29 dBA


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

Source height = 1.50 m

ROAD (0.00 + 40.22 + 0.00) = 40.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  56.36   0.00 -11.83  -4.31   0.00   0.00   0.00
40.22
-------------------------------------------------------------------------
--

Segment Leq : 40.22 dBA

Total Leq All Segments: 61.32 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.92
                           (NIGHT): 61.32
```

```
STAMSON 5.0        NORMAL REPORT        Date: 23-06-2025 16:44:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Mapple (day/night)
-----------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  35000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Mapple (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  :  25.00 / 25.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

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

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

Data for Segment # 2: Rogger (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  : 124.00 / 124.00 m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 68.89 + 0.00) = 68.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  73.68   0.00  -3.48  -1.30   0.00   0.00   0.00
68.89
-------------------------------------------------------------------------
--

Segment Leq : 68.89 dBA


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

Source height = 1.50 m

ROAD (0.00 + 45.24 + 0.00) = 45.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  63.96   0.00 -14.40  -4.31   0.00   0.00   0.00
45.24
-------------------------------------------------------------------------
--

Segment Leq : 45.24 dBA

Total Leq All Segments: 68.91 dBA
```

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

Source height = 1.50 m

ROAD (0.00 + 61.29 + 0.00) = 61.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.57  66.08   0.00  -3.48  -1.30   0.00   0.00   0.00
61.29
-------------------------------------------------------------------------
--

Segment Leq : 61.29 dBA


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

Source height = 1.50 m

ROAD (0.00 + 37.65 + 0.00) = 37.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.57  56.36   0.00 -14.40  -4.31   0.00   0.00   0.00
37.65
-------------------------------------------------------------------------
--

Segment Leq : 37.65 dBA

Total Leq All Segments: 61.31 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.91
                           (NIGHT): 61.31
```