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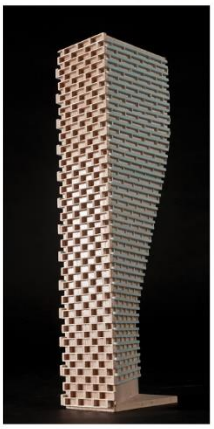
ROADWAY TRAFFIC NOISE ASSESMENT

77 Metcalfe Street
Ottawa, Ontario

Report: 24-254-Traffic Noise



January 10, 2025

PREPARED FOR
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EXECUTIVE SUMMARY

This report describes a detailed noise study undertaken to satisfy Zoning By-Law Amendment (ZBLA) application submission requirements for the proposed development located at 77 Metcalfe Street in Ottawa, Ontario (hereinafter referred to as "subject site" or "proposed development"). This study aims to analyze the sound pressure levels in the area of interest.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300, and City of Ottawa Noise Control Guidelines; and (ii) future vehicular traffic volumes corresponding to the theoretical maximum capacities. As the site is not within 75 metres (m) of any above- or below-grade rail lines or the Confederation Transit Line, a ground vibrations study will not be required

The results of the roadway traffic noise calculations are summarized in Table 3. The results of the current analysis indicate that noise levels for POW receptors will be 69 dBA during the daytime period (07:00-23:00) and will be at 62 dBA during the nighttime period (23:00-07:00). In order to achieve the indoor sound level criteria, specified in Table 1upgraded building components will be required, with Sound Transmission Class (STC) ratings for windows needing to be up to 32.

Windows will also need to remain closed in order to achieve the desired sound levels, therefore the building should be designed to include a central air conditioning system. Tenants should also be advised of his restriction.

Unmitigated noise levels at Outdoor Living Area (OLA) on the 3rd and 11th floor terraces will range between 45 and 59 respectively. Through the use of a 1.1 m tall sound barrier around the perimeter of the 11th Floor terrace, noise levels can be reduced to below the 55 dBA criterion, as seen in Section 5.3

Regarding stationary noise sources, no large stationary noise sources, which may impact the proposed development, are observed in the vicinity of the subject site. No adverse noise impacts are anticipated on potential outdoor areas of the proposed development from these buildings based on the level difference between the buildings and the proposed development's rooftop areas. Stationary noise impacts from the proposed development onto neighbouring buildings and surroundings can be minimized by judicious placement of mechanical equipment or the incorporation of silencers and noise screens as necessary. It

is also recommended that any large pieces of HVAC equipment, which is required to be situated outdoors, be placed closer to the penthouse avoiding the line of sight with the surrounding noise-sensitive buildings.

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Édifice 77 Metcalfe Inc. to undertake an environmental noise assessment to satisfy Zoning By-Law Amendment (ZBLA) application submission requirements for the proposed development located at 77 Metcalfe Street in Ottawa, Ontario (hereinafter referred to as "subject site" or "proposed development"). 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 and Ministry of the Environment, Conservation and Parks (MECP) guidelines[1]. Noise calculations were based on architectural drawings prepared by NEUF architect(e)s in December 2024, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications[2].

2. TERMS OF REFERENCE

The focus of this traffic noise study is the proposed development located 77 Metcalfe Street, situated at the northwest corner of a city block bounded by Metcalfe Street to the west, Albert Street to the north, Elgin Street to the east, and Slater Street to the south. The proposed development comprises a 23-storey mixed-use residential building topped with a mechanical penthouse (MPH).

Above below-grade parking, the ground floor of the proposed development includes a residential lobby to the north along Albert Street, a loading zone at the northeast corner, a garbage room to the east, and commercial space along the south and west. Access to the below-grade parking is provided by 81 Metcalfe Street situated to the immediate south of the proposed development. Level 2 includes lockers to the east and south, a central leasing office, and residential units throughout the remainder of the level. Level 3 includes indoor amenities to the east, lockers to the south, and residential units to the north and west. The building steps back from the southeast elevation at this level, accommodating a common amenity terrace at the southeast corner. Levels 4-10 are reserved for residential use, while Level 11 includes an indoor amenity to the east and residential units throughout the remainder of the level. At Level 11, a

[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

common amenity terrace is provided within setbacks from the north and east elevations and private terraces are provided within a setback from the west elevation. Levels 12-23 are reserved for residential occupancy. The building steps back from the south elevation at Level 16, accommodating private terraces.

The primary sources of transportation noise impacting the subject site are Metcalfe Street, Slater Street, and Albert Street.

As the site is not within 75 metres (m) of any above- or below-grade rail lines or the Confederation Transit Line, a ground vibrations study will not be required.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study building 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 Transportation

4.2.1 Criteria for Transportation 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 NPC-300 specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms during daytime and sleeping quarters during nighttime, respectively, 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

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 can provide 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. Therefore, where noise levels exceed 55 dBA during daytime and 50 dBA at 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

[3] Adapted from ENCG 2016 – Tables 2.2b and 2.2c
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[5].

The objective sound level for Outdoor Living Areas (OLA) is 55 dBA, which applies during the daytime (07:00 to 23:00). Predicted noise levels at the outdoor living areas dictate the action required to achieve the recommended sound levels. According to the ENCG, if an area is to be used as an OLA, noise control measures are recommended where technical and administratively feasible to reduce the L_{eq} to 55 dBA. Where noise levels exceed 60 dBA noise mitigation is required. If these measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause. As such, when noise levels at the POWs and OLAs exceed the criteria, specific Warning Clause requirements may apply.

4.2.2 Theoretical Roadway Noise Predictions

The impact of transportation noise sources on the development was determined by computer modelling. Transportation noise source modelling is based on the software program *Predictor-Lima* which utilizes the United States Federal Highway Administration's Traffic Noise Model (TNM) to represent the roadway line sources. The TNM model is also being accepted in the updated Environmental Guide for Noise of Ontario, 2022 by the Ministry of Transportation (MTO)[6]. This computer program can represent three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing.

A total of (5) receptor locations were identified around the site, as illustrated in Figure 2. Roadway noise calculations were performed by treating each road segment as separate line sources of noise, and by using existing and proposed building locations as noise barriers. 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.
- The day/night split was taken to be 92% / 8% respectively for all roadways.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Default ground surfaces were taken to be reflective due to the presence of hard (paved) ground.

[5] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3
[6] Ministry of Transportation Ontario, "*Environmental Guide for Noise*", February 2022

- Three (3) Plane of Window (POW) receptors at different heights, representative of the different levels on the building, were strategically placed as well as two (2) Outdoor Living Area (OLA) receptors throughout the study area.

4.2.3 Roadway Traffic Volumes

NPC-300 dictates that noise calculations should consider future sound levels based on a road's mature state of development. Therefore, theoretical maximum traffic volume capacities for the roadways are used based on roadway classifications. Table 2 (below) summarizes the roadway AADT values used in this assessment.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Slater Steet	2-Lane Urban Arterial	50	**15,000 ****
Metcalfe Street	2-Lane Urban Arterial	50	**15,000 ****
Albert Street	2-Lane Urban Arterial	50	**15,000 ****

* Daytime/nighttime volumes
** Based on theoretical roadway capacity

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 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 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 vary according to the intended use of a space

Based on published research, 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. ROADWAY TRAFFIC NOISE RESULTS

5.1 Transportation Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3. The results of the current analysis indicate that noise levels for POW receptors will be 69 dBA during the daytime period (07:00-23:00) and will range between 61 and 62 dBA during the nighttime period (23:00-07:00).

TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor / Receptor Type	Location	Receptor Height (m)	Noise Level (dBA)	
			Day	Night
R01 / POW	West façade	4.5	69	62
		41.5	69	62
R02 / POW	North façade	4.5	69	62
		41.5	69	62
R03 / POW	North façade	41.5	69	61
			69	61
R04 / OLA	Level 11th Terrace	35	59	N/A*
R05 / OLA	Level 3rd Terrace	10.5	45	N/A*

*Noise levels during the nighttime are not considered for OLAs

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 + safety factor). As per city of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application for each unit type.

- **Bedroom Windows**

(i) Bedroom windows facing north will require a minimum STC of 32.

(ii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements.

- **Living Room Windows**

(i) Living room windows facing north will require a minimum STC of 27.

(ii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements.

- **Exterior Walls**

(i) Exterior wall components on the north façade will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data10.

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a window/wall system is 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. Results of the calculations also indicate that the development 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.

5.3 Barrier Calculations

Noise levels at the amenity areas on Level 11 approach 59 dBA without a noise barrier. As such, noise control measures are recommended to reduce noise levels to as close as possible to 55 dBA, where technically and administratively feasible.

Further analysis investigated the noise-mitigating impact of noise barriers of 1.1 m above the walking surface. As shown in Table 4, the noise levels from receptor 4 can be reduced below 55 dBA with a 1.1-metre-high barrier which is architecturally, economically, and structurally feasible to build. The solid screens can be glass; however, the screens should not contain any gaps. The noise screens should have a minimum surface mass of 20 kg/m² or should provide a minimum STC rating of 30.

TABLE 4: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor No	Receptor Location	Receptor Height Above Grade (m)	Daytime L_{eq} Noise Levels (dBA)	
			No Barrier	With 1.1 m high Barrier
R4	Level 11th Terrace	35	59	**39**

6. CONCLUSION AND RECOMMENDATIONS

The results of the roadway traffic noise calculations are summarized in Table 3. The results of the current analysis indicate that noise levels for POW receptors will be 69 dBA during the daytime period (07:00-23:00) and will be at 62 dBA during the nighttime period (23:00-07:00). In order to achieve the indoor sound level criteria, specified in Table 1upgraded building components will be required, with Sound Transmission Class (STC) ratings for windows needing to be up to 32.

Windows will also need to remain closed in order to achieve the desired sound levels, therefore the building should be designed to include a central air conditioning system. Tenants should also be advised of his restriction.

Unmitigated noise levels at Outdoor Living Area (OLA) on the 3rd and 11th floor terraces will range between 45 and 59 respectively. Through the use of a 1.1 m tall sound barrier around the perimeter of the 11th Floor terrace, noise levels can be reduced to below the 55 dBA criterion, as seen in Section 5.3

Regarding stationary noise sources, no large stationary noise sources, which may impact the proposed development, are observed in the vicinity of the subject site. The noise from the rooftop equipment of the surrounded buildings will be mitigated by OBC-compliant exterior building components. No adverse noise impacts are anticipated on potential outdoor areas of the proposed development from these buildings based on the level difference between the buildings and the proposed development's rooftop areas.

Stationary noise impacts from the proposed development onto the neighbouring buildings and surroundings can be minimized by judicious placement of mechanical equipment or the incorporation of silencers and noise screens as necessary. It is also recommended that any large pieces of HVAC equipment,

which is required to be situated outdoors, be placed closer to the penthouse avoiding the line of sight with the surrounding noise-sensitive buildings.

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

Sincerely,

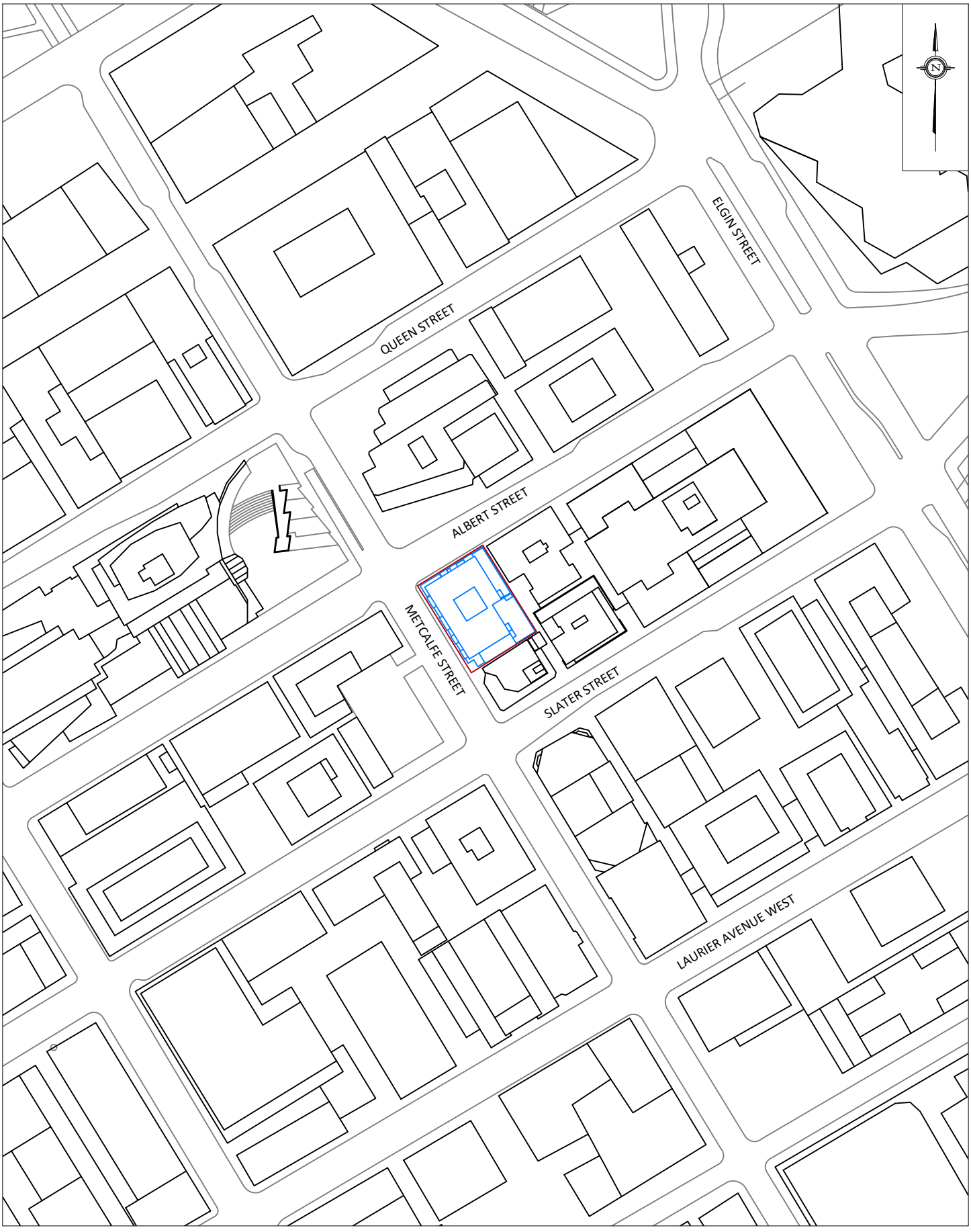
Gradient Wind Engineering Inc.

Sergio Nunez Andres

Sergio Nunez Andres, B.Eng.
Junior Environmental Scientist

Joshua Foster., P.Eng.
Lead Engineer

GWE24-254-Detailed Noise Study



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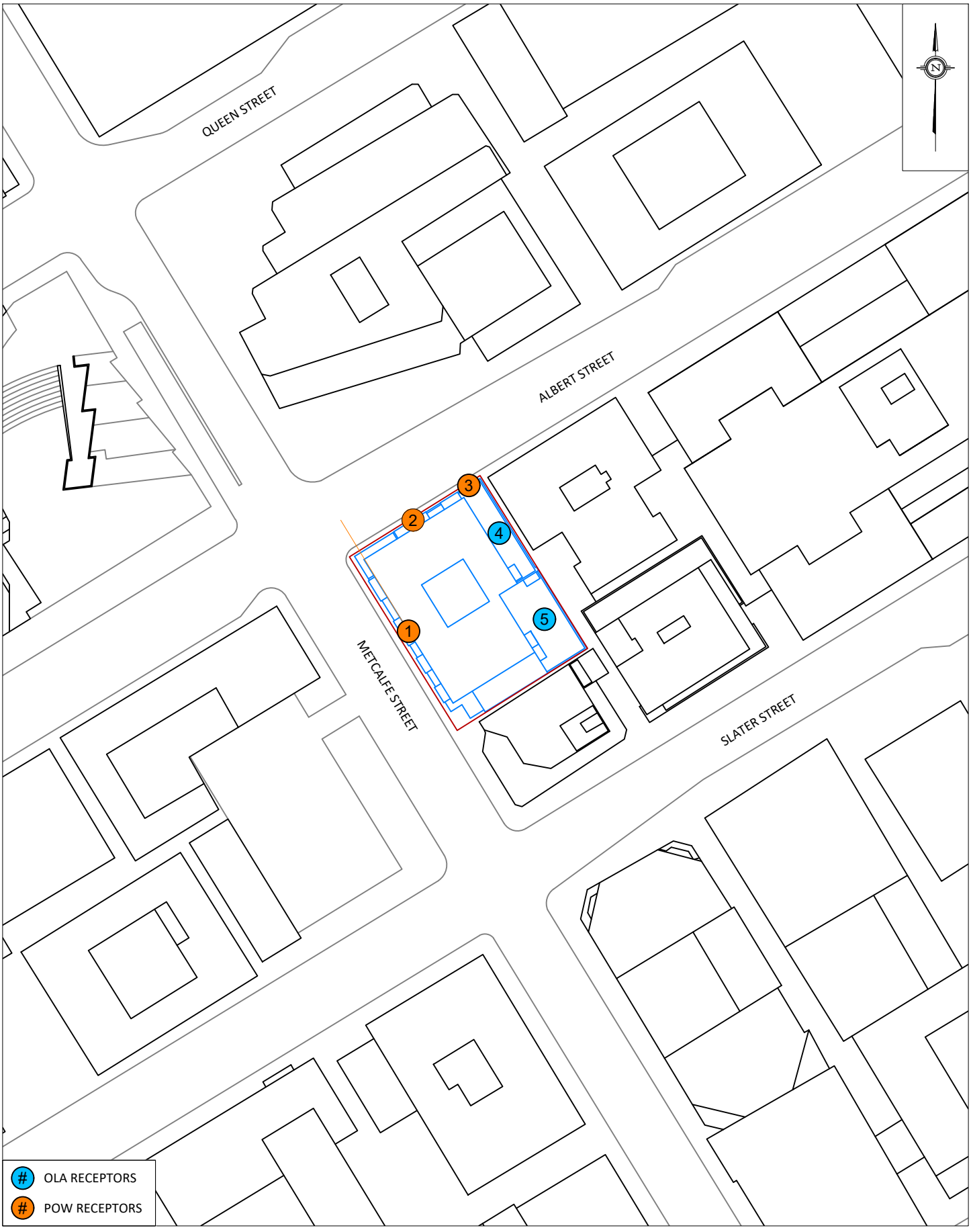
PROJECT	77 METCALFE STREET, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:2000
DRAWING NO.	24-254-1
DATE	JANUARY 2, 2024
DRAWN BY	T.K.

DESCRIPTION

FIGURE 1:
PROPERTY LINE AND SURROUNDING CONTEXT



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PROJECT	77 METCALFE STREET, OTTAWA TRANSPORTATION NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000	DRAWING NO. 24-254-2	FIGURE 2: RECEPTORS LOCATION
DATE	JANUARY 2, 2024	DRAWN BY T.K.	

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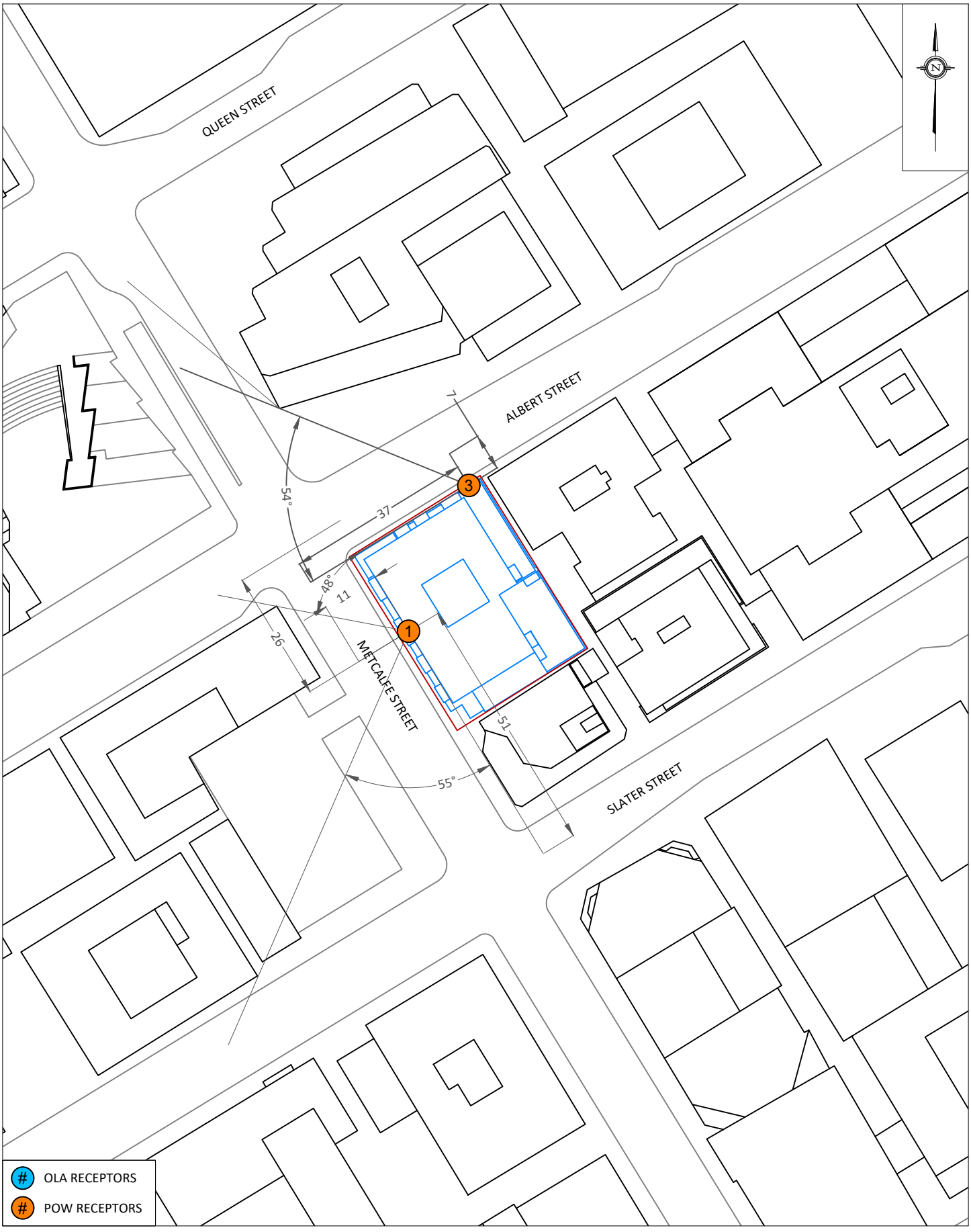
PROJECT	77 METCALFE STREET, OTTAWA TRANSPORTATION NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000	DRAWING NO. 24-254-3	FIGURE 3: STAMSON INPUT PARAMETERS RECEPTORS 2, 4 & 5
DATE	JANUARY 2, 2024	DRAWN BY T.K.	



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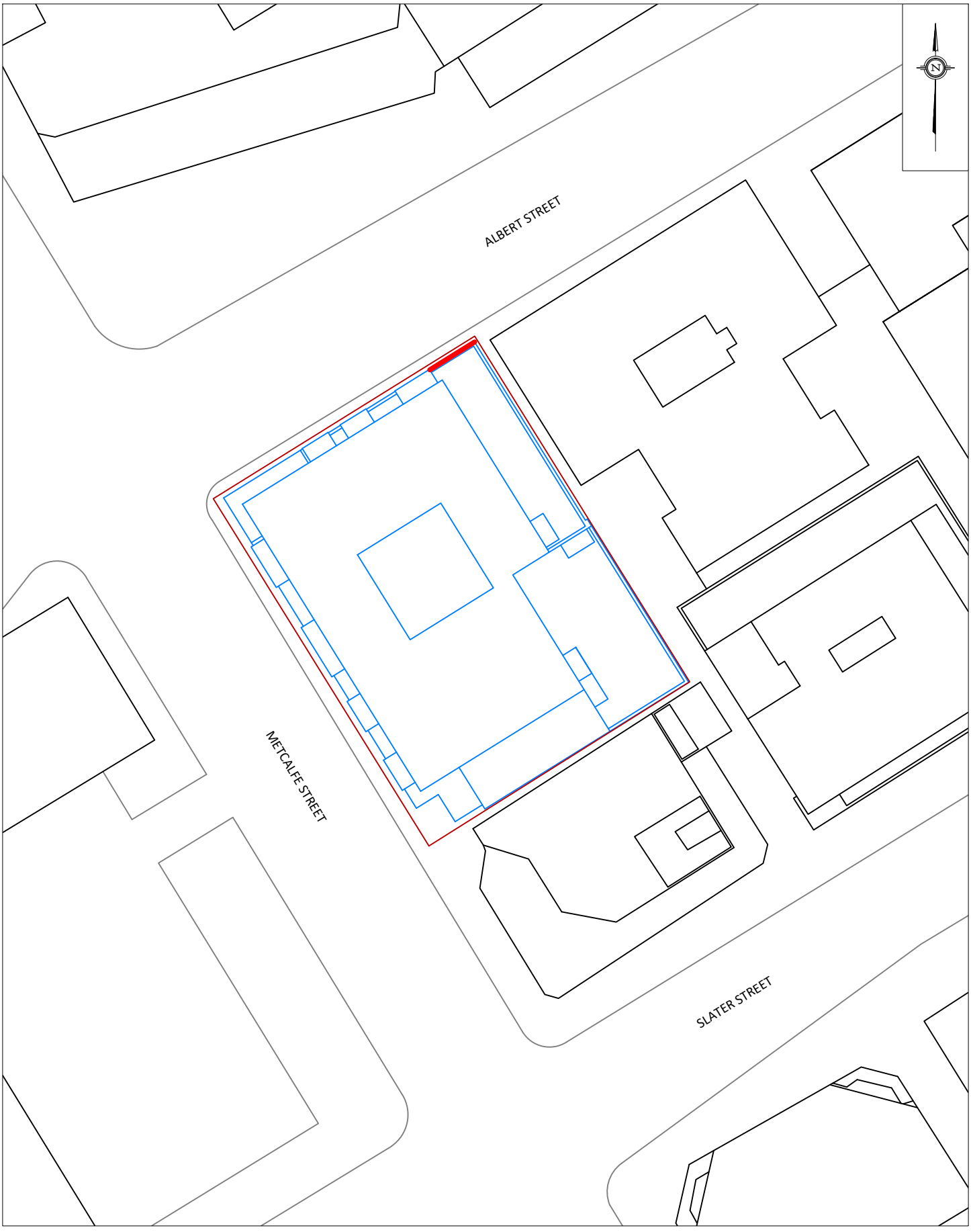
PROJECT	77 METCALFE STREET, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	24-254-4
DATE	JANUARY 2, 2024
DRAWN BY	T.K.

DESCRIPTION

FIGURE 4:
STAMSON INPUT PARAMETERS RECEPTORS 3 & 1



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PROJECT	77 METCALFE STREET, OTTAWA TRANSPORTATION NOISE ASSESSMENT		DESCRIPTION
SCALE	2:1000	DRAWING NO. 24-254-5	FIGURE 5: STAMSON NOISE BARRIER
DATE	JANUARY 2, 2024	DRAWN BY T.K.	

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: 09-01-2025 11:45:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -48.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  26.00 / 26.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Slater (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 3: Slater (day/night)
----------------------------------------
Angle1   Angle2           :   0.00 deg   55.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  51.00 / 51.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA
```

```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -48      0   0.00  68.48   0.00  -2.39  -5.74   0.00   0.00   0.00
60.35
-------------------------------------------------------------------------
--

Segment Leq : 60.35 dBA


Results segment # 3: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.02 + 0.00) = 58.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     55   0.00  68.48   0.00  -5.31  -5.15   0.00   0.00   0.00
58.02
-------------------------------------------------------------------------
--

Segment Leq : 58.02 dBA

Total Leq All Segments: 69.43 dBA


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

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
```

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

Segment Leq : 60.88 dBA


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

Source height = 1.50 m

ROAD (0.00 + 52.75 + 0.00) = 52.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -48      0   0.00  60.88   0.00  -2.39  -5.74   0.00   0.00   0.00
52.75
-------------------------------------------------------------------------
--

Segment Leq : 52.75 dBA


Results segment # 3: Slater (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.42 + 0.00) = 50.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     55   0.00  60.88   0.00  -5.31  -5.15   0.00   0.00   0.00
50.42
-------------------------------------------------------------------------
--

Segment Leq : 50.42 dBA

Total Leq All Segments: 61.83 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.43
                           (NIGHT): 61.83
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:21:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
---------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
---------------------------------------------
Angle1   Angle2           :   0.00 deg   71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 62.40 + 0.00) = 62.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     71   0.00  68.48   0.00  -2.04  -4.04   0.00   0.00   0.00
62.40
-------------------------------------------------------------------------------
--

Segment Leq : 62.40 dBA
```

```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Total Leq All Segments: 69.44 dBA


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

Source height = 1.50 m

ROAD (0.00 + 54.80 + 0.00) = 54.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     71   0.00  60.88   0.00  -2.04  -4.04   0.00   0.00   0.00
54.80
-------------------------------------------------------------------------
--

Segment Leq : 54.80 dBA
```

```
Results segment # 2: Albert (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Total Leq All Segments: 61.84 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.44
                           (NIGHT): 61.84
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:23:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
----------------------------------------------
Angle1   Angle2           : -54.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 59.33 + 0.00) = 59.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -54      0   0.00  68.48   0.00  -3.92  -5.23   0.00   0.00   0.00
59.33
-------------------------------------------------------------------------------
--

Segment Leq : 59.33 dBA
```

```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Total Leq All Segments: 68.98 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.73 + 0.00) = 51.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -54      0   0.00  60.88   0.00  -3.92  -5.23   0.00   0.00   0.00
51.73
-------------------------------------------------------------------------
--

Segment Leq : 51.73 dBA
```

```
Results segment # 2: Albert (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Total Leq All Segments: 61.38 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.98
                           (NIGHT): 61.38
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:23:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Albert (day/night)
-----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -13.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 59.07 + 0.00) = 59.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -13     20   0.00  68.48   0.00  -2.04  -7.37   0.00   0.00   0.00
59.07
-------------------------------------------------------------------------
--

Segment Leq : 59.07 dBA

Total Leq All Segments: 59.07 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.47 + 0.00) = 51.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -13     20   0.00  60.88   0.00  -2.04  -7.37   0.00   0.00   0.00
51.47
-------------------------------------------------------------------------
--

Segment Leq : 51.47 dBA

Total Leq All Segments: 51.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.07
                           (NIGHT): 51.47
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:33:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Slater (day/night)
-----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Slater (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  39.00 / 39.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  46.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       10.50 !        8.19 !         8.19

ROAD (0.00 + 44.60 + 0.00) = 44.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00  -4.15   0.00   0.00   0.00 -19.73
44.60
-------------------------------------------------------------------------------
--

Segment Leq : 44.60 dBA

Total Leq All Segments: 44.60 dBA


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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       10.50 !        8.19 !         8.19

ROAD (0.00 + 37.00 + 0.00) = 37.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00  -4.15   0.00   0.00   0.00 -19.73
37.00
-------------------------------------------------------------------------------
--

Segment Leq : 37.00 dBA
```

```
Total Leq All Segments: 37.00 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 44.60
                           (NIGHT): 37.00
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:45:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -48.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  26.00 / 26.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 3: Slater (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Slater (day/night)
----------------------------------------
Angle1   Angle2           :   0.00 deg   55.00 deg
```

```
Wood depth                 :      0       (No woods.)
No of house rows           :      0 / 0
Surface                    :      2       (Reflective ground surface)
Receiver source distance   :  51.00 / 51.00  m
Receiver height            :   4.50 / 4.50   m
Topography                 :      1       (Flat/gentle slope; no barrier)
Reference angle            :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA


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

Source height = 1.50 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -48      0   0.00  68.48   0.00  -2.39  -5.74   0.00   0.00   0.00
60.35
-------------------------------------------------------------------------
--

Segment Leq : 60.35 dBA
```

```
Results segment # 3: Slater (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.02 + 0.00) = 58.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     55   0.00  68.48   0.00  -5.31  -5.15   0.00   0.00   0.00
58.02
-------------------------------------------------------------------------
--

Segment Leq : 58.02 dBA

Total Leq All Segments: 69.43 dBA


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

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA


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

Source height = 1.50 m

ROAD (0.00 + 52.75 + 0.00) = 52.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -48      0   0.00  60.88   0.00  -2.39  -5.74   0.00   0.00   0.00
52.75
```

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

Segment Leq : 52.75 dBA


Results segment # 3: Slater (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.42 + 0.00) = 50.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     55   0.00  60.88   0.00  -5.31  -5.15   0.00   0.00   0.00
50.42
-------------------------------------------------------------------------------
--

Segment Leq : 50.42 dBA

Total Leq All Segments: 61.83 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.43
                           (NIGHT): 61.83
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:50:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
---------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
---------------------------------------------
Angle1   Angle2           :   0.00 deg   71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 62.40 + 0.00) = 62.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     71   0.00  68.48   0.00  -2.04  -4.04   0.00   0.00   0.00
62.40
-------------------------------------------------------------------------------
--

Segment Leq : 62.40 dBA
```

```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Total Leq All Segments: 69.44 dBA


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

Source height = 1.50 m

ROAD (0.00 + 54.80 + 0.00) = 54.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     71   0.00  60.88   0.00  -2.04  -4.04   0.00   0.00   0.00
54.80
-------------------------------------------------------------------------
--

Segment Leq : 54.80 dBA
```

```
Results segment # 2: Albert (night)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Total Leq All Segments: 61.84 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.44
                           (NIGHT): 61.84
```

```
STAMSON 5.0        NORMAL REPORT        Date: 09-01-2025 11:55:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Metcalfe (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Metcalfe (day/night)
----------------------------------------------
Angle1   Angle2           : -54.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Albert (day/night)
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


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

Source height = 1.50 m

ROAD (0.00 + 59.33 + 0.00) = 59.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -54      0   0.00  68.48   0.00  -3.92  -5.23   0.00   0.00   0.00
59.33
-------------------------------------------------------------------------------
--

Segment Leq : 59.33 dBA
```

```
Results segment # 2: Albert (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Total Leq All Segments: 68.98 dBA


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

Source height = 1.50 m

ROAD (0.00 + 51.73 + 0.00) = 51.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -54      0   0.00  60.88   0.00  -3.92  -5.23   0.00   0.00   0.00
51.73
-------------------------------------------------------------------------
--

Segment Leq : 51.73 dBA
```

```
Results segment # 2: Albert (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Total Leq All Segments: 61.38 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.98
                           (NIGHT): 61.38
```

```
STAMSON 5.0        NORMAL REPORT        Date: 30-01-2025 13:27:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Albert (day/night)
-----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Albert (day/night)
----------------------------------------
Angle1   Angle2           : -13.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :  41.50 / 41.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -13.00 deg   Angle2 : 20.00 deg
Barrier height            :   1.10 m
Barrier receiver distance :  11.00 / 11.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :  41.50 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       41.50 !      -18.34 !        23.16

ROAD (0.00 + 39.07 + 0.00) = 39.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -13     20   0.00  68.48   0.00  -2.04  -7.37   0.00   0.00 -20.00
39.07
-------------------------------------------------------------------------------
--

Segment Leq : 39.07 dBA

Total Leq All Segments: 39.07 dBA

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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       41.50 !      -18.34 !        23.16

ROAD (0.00 + 31.47 + 0.00) = 31.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -13     20   0.00  60.88   0.00  -2.04  -7.37   0.00   0.00 -20.00
31.47
-------------------------------------------------------------------------------
--

Segment Leq : 31.47 dBA

Total Leq All Segments: 31.47 Dba
```

```
TOTAL Leq FROM ALL SOURCES (DAY): 39.07
                           (NIGHT): 31.47
```