

**ROADWAY TRAFFIC NOISE  
ASSESSMENT**

130 Slater Street  
Ottawa, Ontario

REPORT: 23-286 – Traffic Noise



March 19, 2024

PREPARED FOR  
**KTS Properties**  
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## EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment undertaken to satisfy the requirements for a Site Plan Control (SPA) application submission for a proposed residential redevelopment located at 130 Slater Street in Ottawa, Ontario. The redevelopment involves the conversion of an existing L-shaped 13-storey office building into a residential building. The primary sources of roadway traffic noise include Slater Street, Metcalfe Street, and O'Connor Street. Figure 1 illustrates a complete site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) architectural drawings provided by Figurr Architects Collective in February 2024.

The results of the current analysis indicate that noise levels will range between 42 and 69 dBA during the daytime period (07:00-23:00) and between 57 and 61 dBA during the nighttime period (23:00-07:00). The highest noise level (69 dBA) occurs at the north façade, which is nearest and most exposed to Slater Street. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 5.

Unattenuated noise levels at the Level 1 outdoor amenity (Receptor 4) are expected to reach 42 dBA during the daytime period. Therefore, Noise control measures are not required for this area.

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. Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 of this report.

With regard to stationary noise impacts, a stationary noise study is recommended for the site during the detailed design once mechanical plans for the proposed building become available. This study would assess the impacts of stationary noise from rooftop mechanical units serving the proposed building on surrounding noise-sensitive areas. This study will include recommendations for any noise control



measures necessary to ensure noise levels fall below ENCG limits. Noise impacts can generally be minimized by judicious selection and placement of the equipment.



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## **1. INTRODUCTION**

Gradient Wind Engineering Inc. (Gradient Wind) was retained by KTS Properties to undertake a roadway traffic noise assessment to satisfy the requirements for a Site Plan Control (SPA) application submission for a residential redevelopment located at 130 Slater Street 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<sup>1</sup> and Ministry of the Environment, Conservation and Parks (MECP)<sup>2</sup> guidelines. Noise calculations were based on architectural drawings provided by Figurr Architects Collective in February 2024, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

## **2. TERMS OF REFERENCE**

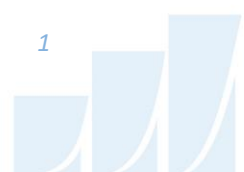
The focus of this roadway traffic noise assessment is a residential redevelopment located at 130 Slater Street in Ottawa, Ontario. The study site is located southwest of the Metcalfe Street and Slater Street intersection. The redevelopment involves the conversion of an existing 13-storey office building into a residential building. The ground floor comprises commercial units and an indoor amenity. The building massing transitions to an L-shape at level two, containing residential occupancies to level thirteen. The study building is completed by a mechanical penthouse. Additionally, the redevelopment includes two levels of below-grade parking with indoor amenities, which is accessible through a ramp located on the southwest façade.

The site is surrounded by medium-rise offices and hotels in all directions. The primary sources of roadway traffic noise include Slater Street, located north of the study site; Metcalfe Street, located east; and O'Connor Street, located west. Figure 1 illustrates a complete site plan with the surrounding context.

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<sup>1</sup> City of Ottawa Environmental Noise Control Guidelines, January 2016

<sup>2</sup> 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 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 ( $2 \times 10^{-5}$  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)<sup>3</sup>**

Type of Space	Time Period	L <sub>eq</sub> (dBA)
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50
Living/dining/den areas of <b>residences</b> , 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 <b>residences</b> , 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<sup>4</sup>. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment<sup>5</sup>. 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<sup>6</sup>.

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

<sup>3</sup> Adapted from ENCG 2016 – Tables 2.2b and 2.2c

<sup>4</sup> Burberry, P.B. (2014). Mitchell’s Environment and Services. Routledge, Page 125

<sup>5</sup> MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

<sup>6</sup> 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 MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- For select sources where appropriate, receptors considered the proposed building as a barrier partially or fully obstructing exposure to the source, as illustrated by exposure angles in Figures 3-4.
- Noise receptors were strategically placed at 4 locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 3-4.

## 4.2.3 Roadway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan<sup>7</sup> 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.

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<sup>7</sup> City of Ottawa Transportation Master Plan, November 2013



**TABLE 2: ROADWAY TRAFFIC DATA**

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Slater Street	2-Lane Urban Arterial Undivided (2-UAU)	50	<b>15,000</b>
Metcalf St	2-Lane Urban Arterial Undivided (2-UAU)	50	<b>15,000</b>
O'Connor St	2-Lane Urban Arterial Undivided (2-UAU)	50	<b>15,000</b>

### 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<sup>8</sup> 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

<sup>8</sup> Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985

- Indoor sound level criteria, which varies according to the intended use of a space

Based on published research<sup>9</sup>, 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. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

**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	37.6	POW – 13 <sup>th</sup> Floor – East Façade	65	57
2	37.6	POW – 13 <sup>th</sup> Floor – North Façade	69	61
3	37.6	POW – 13 <sup>th</sup> Floor - West Façade	65	58
4	1.5	OLA – Ground Floor – West	42	N/A

N/A: Noise levels at an OLA during the nighttime period are not considered as per ENCG

The results of the current analysis indicate that noise levels will range between 42 and 69 dBA during the daytime period (07:00-23:00) and between 57 and 61 dBA during the nighttime period (23:00-07:00). The highest noise level (69 dBA) occurs at the north façade, which is nearest and most exposed to Slater Street.

<sup>9</sup> CMHC, Road & Rail Noise: Effects on Housing



## 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. The STC requirements for the windows are summarized below for various units within the development (see Figure 3):

- **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 data<sup>10</sup>.

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

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<sup>10</sup> J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

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.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

The results of the current analysis indicate that noise levels will range between 42 and 69 dBA during the daytime period (07:00-23:00) and between 57 and 61 dBA during the nighttime period (23:00-07:00). The highest noise level (69 dBA) occurs at the north façade, which is nearest and most exposed to Slater Street. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 5.

Unattenuated noise levels at the Level 1 outdoor amenity (Receptor 4) are expected to reach 42 dBA during the daytime period. Therefore, Noise control measures are not required.

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. The following Type D Warning Clause<sup>11</sup> will be required to 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.”*

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<sup>11</sup> City of Ottawa Environmental Noise Control Guidelines, January 2016

With regard to stationary noise impacts, a stationary noise study is recommended for the site during the detailed design once mechanical plans for the proposed building become available. This study would assess the impacts of stationary noise from rooftop mechanical units serving the proposed building on surrounding noise-sensitive areas. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below ENCG limits. Noise impacts can generally be minimized by judicious selection and placement of the equipment.

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.***

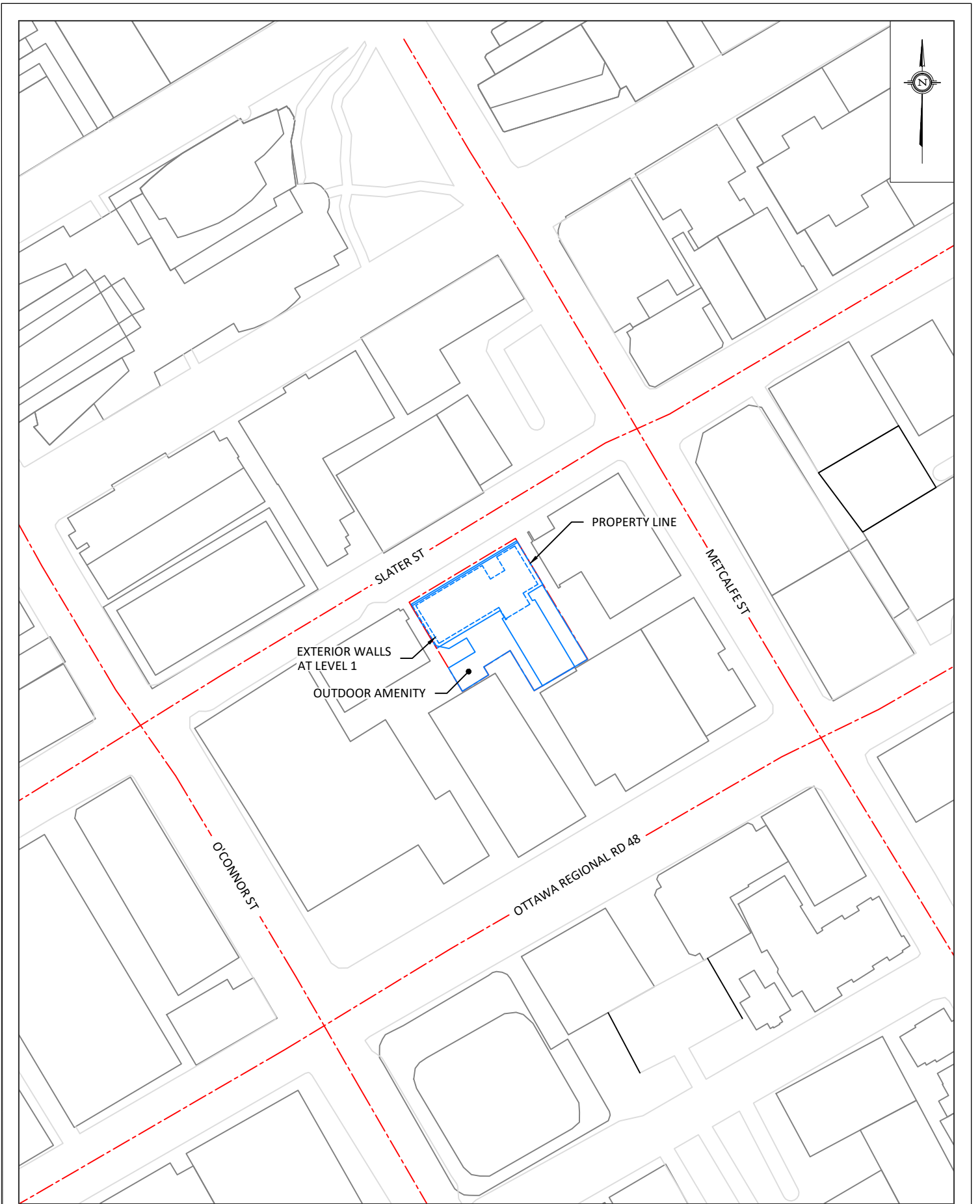


Ben Page, AdvDip.  
Junior Environmental Scientist

*Gradient Wind File #23-286-130 Slater Traffic Noise*

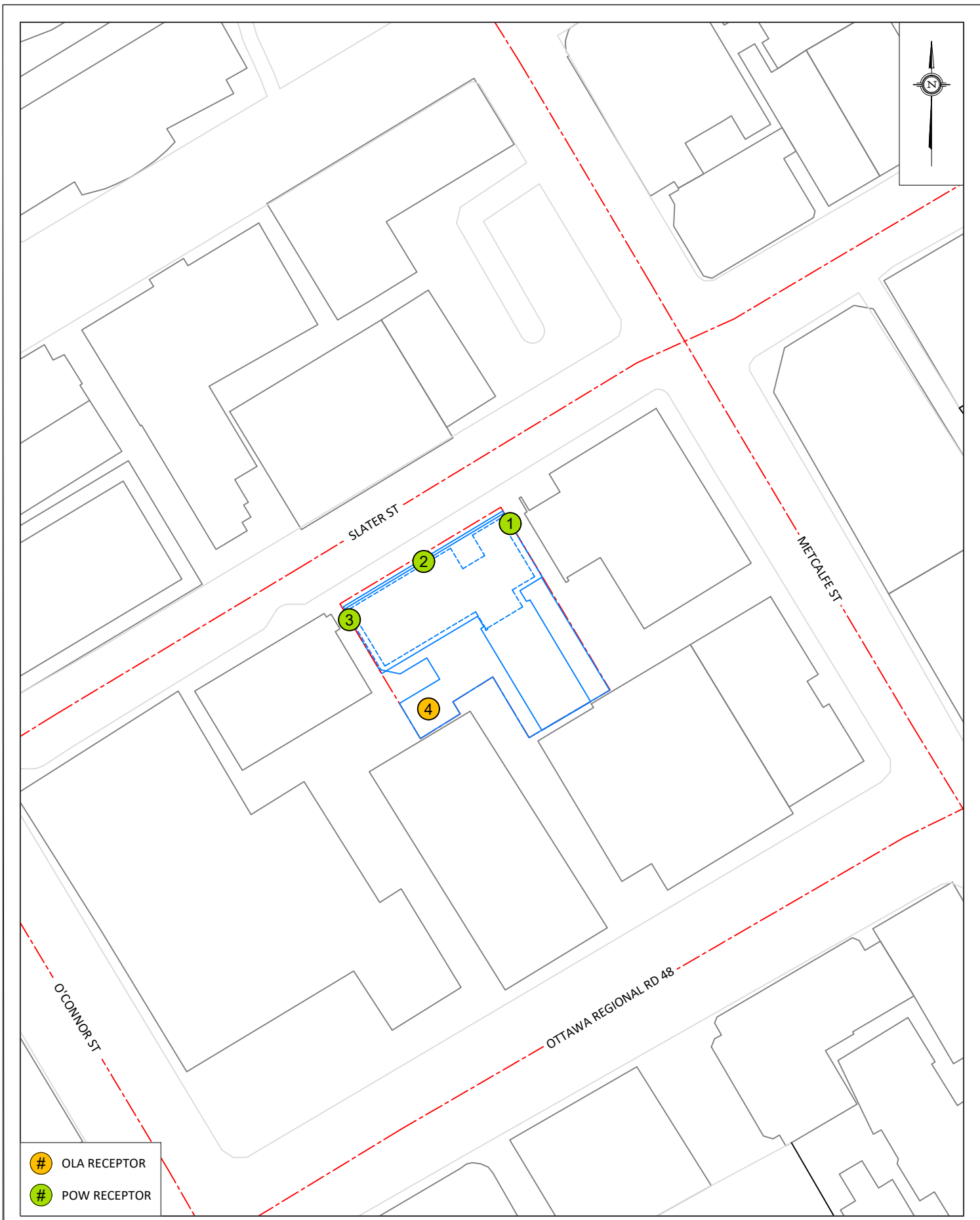


Joshua Foster, P.Eng.  
Principal

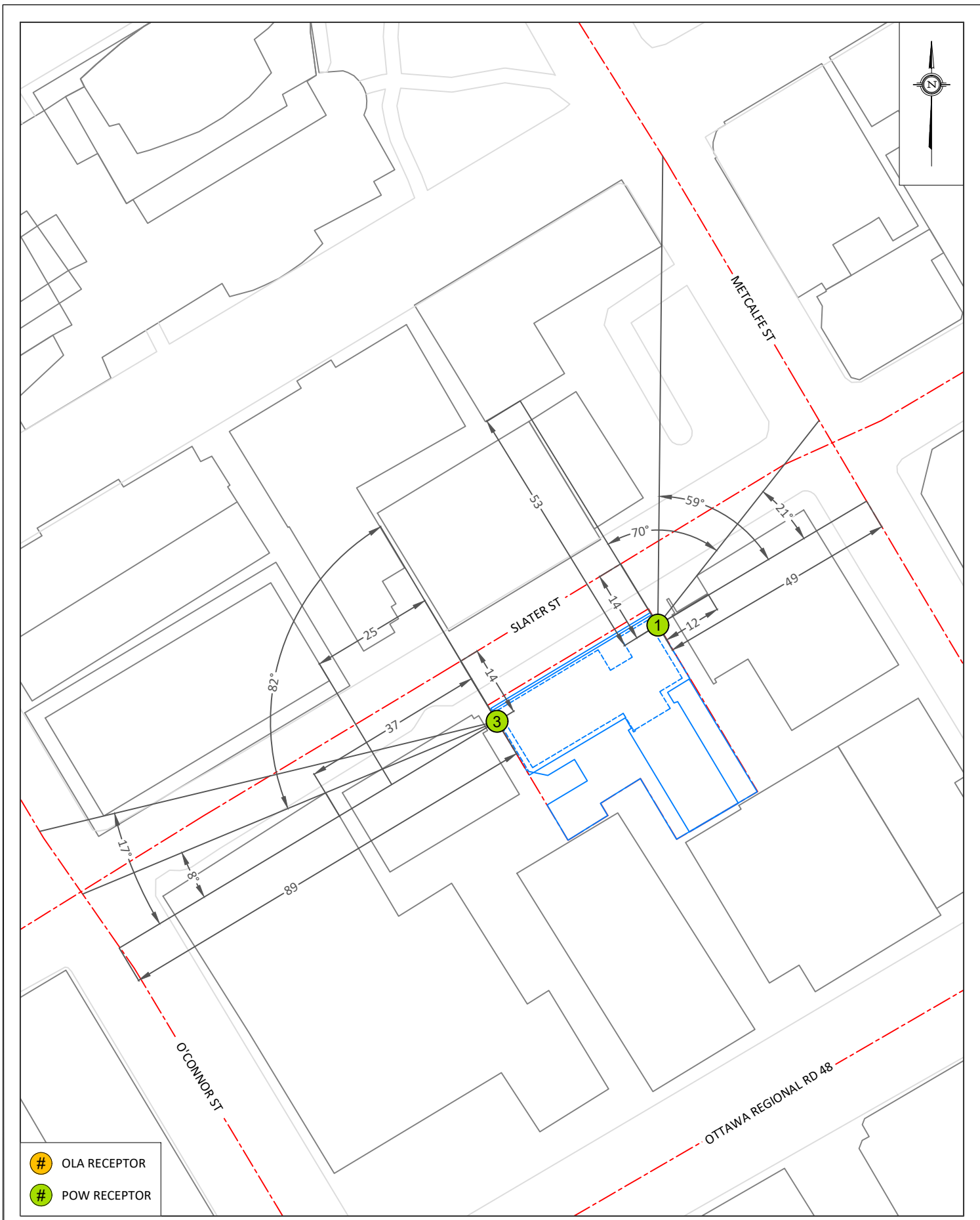


PROJECT	130 SLATER STREET, OTTAWA TRAFFIC NOISE ASSESSMENT	
SCALE	1:1500	DRAWING NO. 23-286-NOISE-FIG1
DATE	MARCH 19, 2024	DRAWN BY B.P.

DESCRIPTION	FIGURE 1: PROPOSED SITE PLAN AND SURROUNDING CONTEXT
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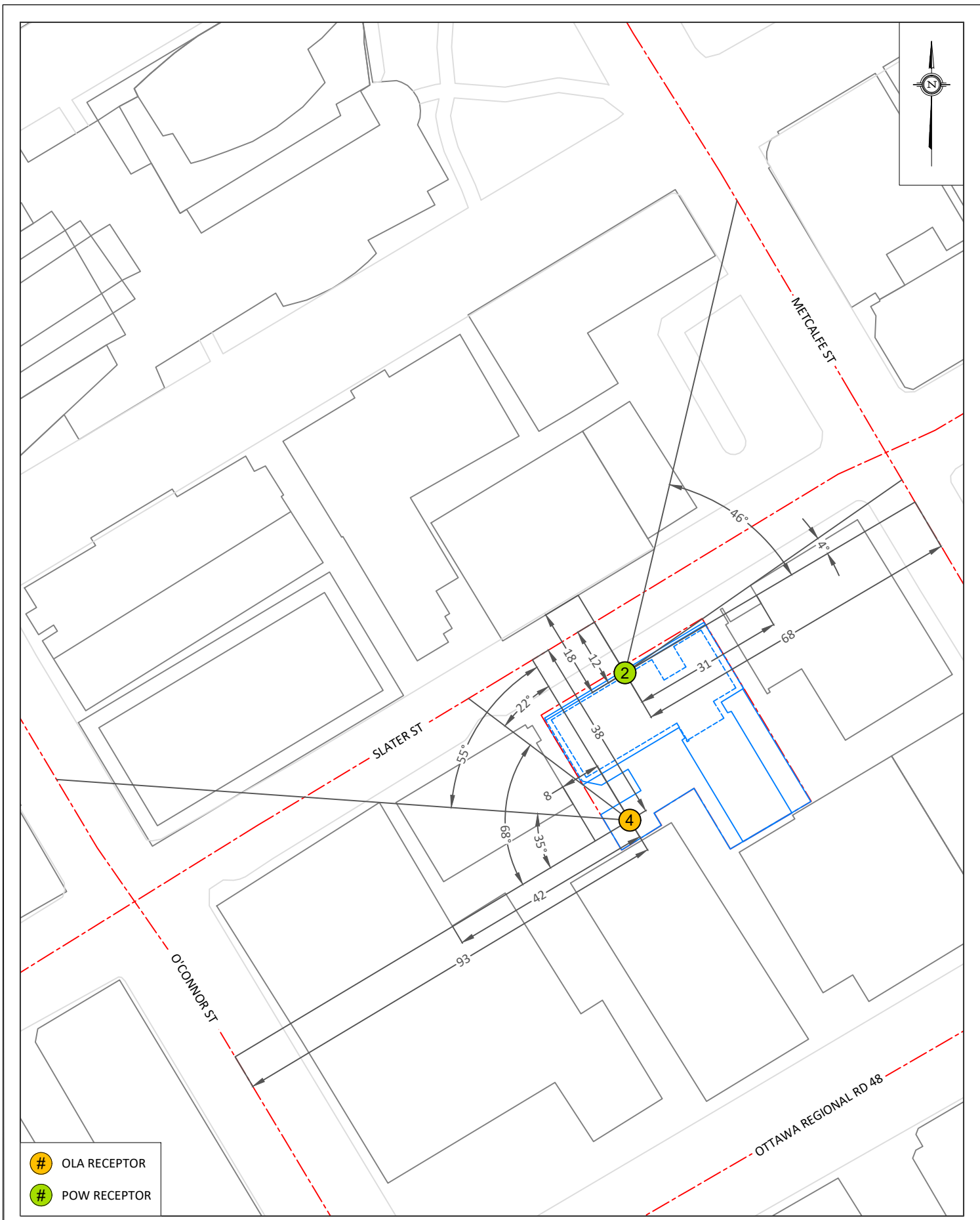
<b>GRADIENTWIND</b> ENGINEERS & SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM	PROJECT	130 SLATER STREET, OTTAWA TRAFFIC NOISE ASSESSMENT		DESCRIPTION	FIGURE 2: RECEPTOR LOCATIONS
	SCALE	1:1000	DRAWING NO.	23-286-NOISE-FIG2	
	DATE	MARCH 19, 2024	DRAWN BY	B.P.	



- # OLA RECEPTOR
- # POW RECEPTOR

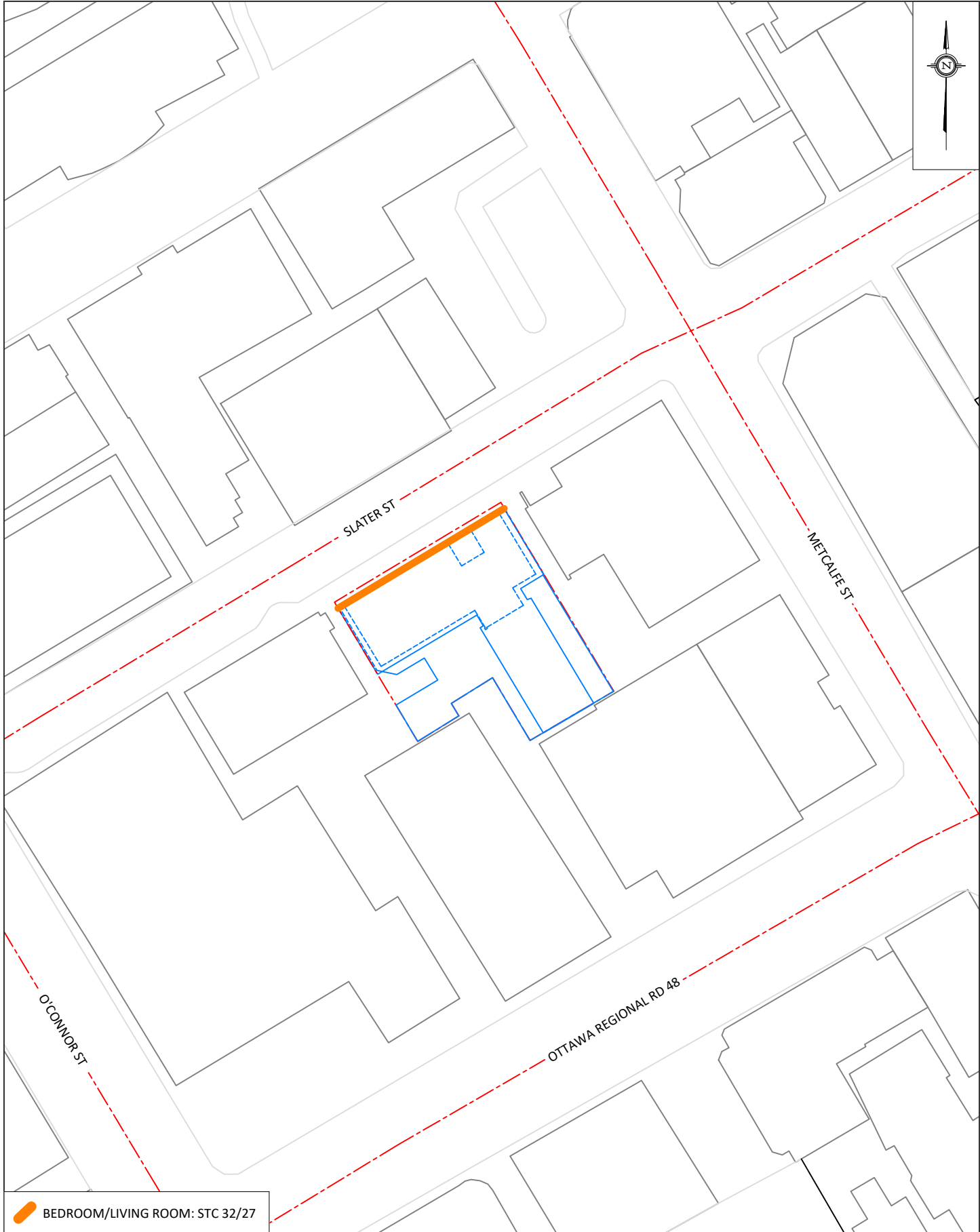
<p><b>GRADIENTWIND</b> ENGINEERS &amp; SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM</p>	PROJECT <b>130 SLATER STREET, OTTAWA TRAFFIC NOISE ASSESSMENT</b>		DESCRIPTION  <b>FIGURE 3: STAMSON INPUT PARAMETERS RECEPTORS 1 &amp; 3</b>
	SCALE <b>1:1000</b>	DRAWING NO. <b>23-286-NOISE-FIG3</b>	
	DATE <b>MARCH 19, 2024</b>	DRAWN BY <b>B.P.</b>	





- # OLA RECEPTOR
- # POW RECEPTOR

<p><b>GRADIENTWIND</b> ENGINEERS &amp; SCIENTISTS 127 WALGREEN ROAD, OTTAWA, ON 613 836 0934 • GRADIENTWIND.COM</p>	PROJECT <b>130 SLATER STREET, OTTAWA TRAFFIC NOISE ASSESSMENT</b>		DESCRIPTION  <b>FIGURE 4: STAMSON INPUT PARAMETERS RECEPTORS 2 &amp; 4</b>
	SCALE <b>1:1000</b>	DRAWING NO. <b>23-286-NOISE-FIG4</b>	
	DATE <b>MARCH 19, 2024</b>	DRAWN BY <b>B.P.</b>	



 BEDROOM/LIVING ROOM: STC 32/27

PROJECT	130 SLATER STREET, OTTAWA TRAFFIC NOISE ASSESSMENT	
SCALE	1:1000	DRAWING NO. 23-286-NOISE-FIG5
DATE	MARCH 19, 2024	DRAWN BY B.P.

# GRADIENTWIND

ENGINEERS & SCIENTISTS



## APPENDIX A

### STAMSON 5.04 – INPUT AND OUTPUT DATA

**STAMSON 5.0 COMPREHENSIVE REPORT Date: 20-02-2024 15:28:32**  
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

**Filename: R1.te** Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1 Angle2 : 0.00 deg 70.00 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 : 37.60 / 37.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

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

-----  
Angle1 Angle2 : -21.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 49.00 / 49.00 m  
Receiver height : 37.60 / 37.60 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -21.00 deg Angle2 : 90.00 deg  
Barrier height : 55.00 m  
Barrier receiver distance : 12.00 / 12.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Road data, segment # 3: Metcalfe 2 (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: Metcalfe 2 (day/night)

```

-----
Angle1 Angle2      : -90.00 deg -21.00 deg
Wood depth          :    0   (No woods.)
No of house rows    :    0 / 0
Surface             :    2   (Reflective ground surface)
Receiver source distance : 49.00 / 49.00 m
Receiver height     : 37.60 / 37.60 m
Topography          :    2   (Flat/gentle slope; with barrier)
Barrier angle1      : -90.00 deg Angle2 : -59.00 deg
Barrier height      : 35.00 m
Barrier receiver distance : 48.99 / 48.99 m
Source elevation    :    0.00 m
Receiver elevation  :    0.00 m
Barrier elevation   :    0.00 m
Reference angle     :    0.00
    
```

Segment # 1: Slater Ave (day)

Source height = 1.50 m

ROAD (0.00 + 64.38 + 0.00) = 64.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.00	68.48	0.00	0.00	-4.10	0.00	0.00	0.00	64.38

0 70 0.00 68.48 0.00 0.00 -4.10 0.00 0.00 0.00 64.38

Segment Leq : 64.38 dBA

Segment # 2: Metcalfe St (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	37.60	28.76	28.76

1.50 ! 37.60 ! 28.76 ! 28.76

ROAD (0.00 + 41.66 + 0.00) = 41.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-21	90	0.00	68.48	0.00	-5.14	-2.10	0.00	0.00	-19.58	41.66

-21 90 0.00 68.48 0.00 -5.14 -2.10 0.00 0.00 -19.58 41.66



Segment Leq : 41.66 dBA

Segment # 3: Metcalfe 2 (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 ! 37.60 ! 1.50 ! 1.50

ROAD (0.00 + 37.23 + 56.58) = 56.63 dBA

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

-----  
-90 -59 0.00 68.48 0.00 -5.14 -7.64 0.00 0.00 -18.47 37.23

-----  
-59 -21 0.00 68.48 0.00 -5.14 -6.75 0.00 0.00 0.00 56.58

Segment Leq : 56.63 dBA

Total Leq All Segments: 65.07 dBA

Segment # 1: Slater Ave (night)

Source height = 1.50 m

ROAD (0.00 + 56.78 + 0.00) = 56.78 dBA

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

-----  
0 70 0.00 60.88 0.00 0.00 -4.10 0.00 0.00 0.00 56.78

Segment Leq : 56.78 dBA



Segment # 2: Metcalfe St (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 ! 37.60 ! 28.76 ! 28.76

ROAD (0.00 + 34.06 + 0.00) = 34.06 dBA

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

-----

-21	90	0.00	60.88	0.00	-5.14	-2.10	0.00	0.00	-19.58	34.06
-----	----	------	-------	------	-------	-------	------	------	--------	-------

-----

Segment Leq : 34.06 dBA

Segment # 3: Metcalfe 2 (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 ! 37.60 ! 1.50 ! 1.50

ROAD (0.00 + 29.63 + 48.99) = 49.04 dBA

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

-----

-90	-59	0.00	60.88	0.00	-5.14	-7.64	0.00	0.00	-18.47	29.63
-----	-----	------	-------	------	-------	-------	------	------	--------	-------

-----

-59	-21	0.00	60.88	0.00	-5.14	-6.75	0.00	0.00	0.00	48.99
-----	-----	------	-------	------	-------	-------	------	------	------	-------

-----

Segment Leq : 49.04 dBA

Total Leq All Segments: 57.48 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.07  
(NIGHT): 57.48





**STAMSON 5.0 COMPREHENSIVE REPORT Date: 20-02-2024 13:47:47**  
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

**Filename: R2.te** Time Period: Day/Night 16/8 hours  
Description:

Road data, segment # 1: Slater Ave (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 Ave (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 : 37.60 / 37.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

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

-----  
Angle1 Angle2 : 0.00 deg 46.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 68.00 / 68.00 m  
Receiver height : 37.60 / 37.60 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 0.00 deg Angle2 : 4.00 deg  
Barrier height : 55.00 m  
Barrier receiver distance : 31.00 / 31.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Road data, segment # 3: Metcalfe 2 (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 : 100 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: Metcalfe 2 (day/night)

```

-----
Angle1 Angle2      : 46.00 deg 90.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 2 (Reflective ground surface)
Receiver source distance : 68.00 / 68.00 m
Receiver height  : 37.60 / 37.60 m
Topography      : 2 (Flat/gentle slope; with barrier)
Barrier angle1   : 46.00 deg Angle2 : 90.00 deg
Barrier height   : 34.00 m
Barrier receiver distance : 18.00 / 18.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
    
```

Segment # 1: Slater Ave (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

Segment # 2: Metcalfe St (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	37.60	21.14	21.14

-----



ROAD (0.00 + 25.38 + 55.60) = 55.60 dBA

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

0	4	0.00	68.48	0.00	-6.56	-16.53	0.00	0.00	-20.00	25.38
4	46	0.00	68.48	0.00	-6.56	-6.32	0.00	0.00	0.00	55.60

Segment Leq : 55.60 dBA

Segment # 3: Metcalfe 2 (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 !	37.60 !	28.04 !	28.04
--------	---------	---------	-------

ROAD (0.00 + 50.26 + 0.00) = 50.26 dBA

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

46	90	0.00	74.50	0.00	-6.56	-6.12	0.00	0.00	-11.56	50.26
----	----	------	-------	------	-------	-------	------	------	--------	-------

Segment Leq : 50.26 dBA

Total Leq All Segments: 68.76 dBA

Segment # 1: Slater Ave (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



Segment # 2: Metcalfe St (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 ! 37.60 ! 21.14 ! 21.14

ROAD (0.00 + 17.79 + 48.00) = 48.00 dBA

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

-----

0 4 0.00 60.88 0.00 -6.56 -16.53 0.00 0.00 -20.00 17.79

-----

4 46 0.00 60.88 0.00 -6.56 -6.32 0.00 0.00 0.00 48.00

-----

Segment Leq : 48.00 dBA

Segment # 3: Metcalfe 2 (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 ! 37.60 ! 28.04 ! 28.04

ROAD (0.00 + 42.66 + 0.00) = 42.66 dBA

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

-----

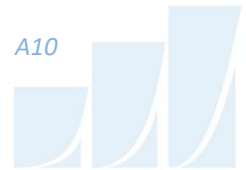
46 90 0.00 66.91 0.00 -6.56 -6.12 0.00 0.00 -11.56 42.66

-----

Segment Leq : 42.66 dBA

Total Leq All Segments: 61.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.76  
(NIGHT): 61.16



**STAMSON 5.0 COMPREHENSIVE REPORT Date: 20-02-2024 14:36:02**  
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

**Filename: R3.te** Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1 Angle2 : -82.00 deg 0.00 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 : 37.60 / 37.60 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 2: O'Connor St (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: O'Connor St (day/night)

-----  
Angle1 Angle2 : -90.00 deg 8.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 89.00 / 89.00 m  
Receiver height : 37.60 / 37.60 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 8.00 deg  
Barrier height : 79.00 m  
Barrier receiver distance : 37.00 / 37.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Road data, segment # 3: O'Connor 2 (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: O'Connor 2 (day/night)

```

-----
Angle1 Angle2      : 8.00 deg 90.00 deg
Wood depth          : 0 (No woods.)
No of house rows    : 0 / 0
Surface             : 2 (Reflective ground surface)
Receiver source distance : 89.00 / 89.00 m
Receiver height     : 37.60 / 37.60 m
Topography          : 2 (Flat/gentle slope; with barrier)
Barrier angle1      : 17.00 deg Angle2 : 90.00 deg
Barrier height      : 40.00 m
Barrier receiver distance : 25.00 / 25.00 m
Source elevation    : 0.00 m
Receiver elevation  : 0.00 m
Barrier elevation    : 0.00 m
Reference angle     : 0.00
    
```

Segment # 1: Slater Ave (day)

Source height = 1.50 m

ROAD (0.00 + 65.07 + 0.00) = 65.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	0	0.00	68.48	0.00	0.00	-3.41	0.00	0.00	0.00	65.07

-----

Segment Leq : 65.07 dBA

Segment # 2: O'Connor St (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	37.60	22.59	22.59

-----

ROAD (0.00 + 38.34 + 0.00) = 38.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	8	0.00	68.48	0.00	-7.73	-2.64	0.00	0.00	-19.77	38.34

-----





Segment Leq : 38.34 dBA

Segment # 3: O'Connor 2 (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 ! 37.60 ! 27.46 ! 27.46

ROAD (47.74 + 39.92 + 0.00) = 48.40 dBA

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

-----  
8 17 0.00 68.48 0.00 -7.73 -13.01 0.00 0.00 0.00 47.74

-----  
17 90 0.00 68.48 0.00 -7.73 -3.92 0.00 0.00 -16.90 39.92

Segment Leq : 48.40 dBA

Total Leq All Segments: 65.17 dBA

Segment # 1: Slater Ave (night)

Source height = 1.50 m

ROAD (0.00 + 57.47 + 0.00) = 57.47 dBA

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

-----  
-82 0 0.00 60.88 0.00 0.00 -3.41 0.00 0.00 0.00 57.47

Segment Leq : 57.47 dBA



Segment # 2: O'Connor St (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 ! 37.60 ! 22.59 ! 22.59

ROAD (0.00 + 30.74 + 0.00) = 30.74 dBA

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

-----

-90	8	0.00	60.88	0.00	-7.73	-2.64	0.00	0.00	-19.77	30.74
-----	---	------	-------	------	-------	-------	------	------	--------	-------

-----

Segment Leq : 30.74 dBA

Segment # 3: O'Connor 2 (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 ! 37.60 ! 27.46 ! 27.46

ROAD (40.14 + 32.33 + 0.00) = 40.81 dBA

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

-----

8	17	0.00	60.88	0.00	-7.73	-13.01	0.00	0.00	0.00	40.14
---	----	------	-------	------	-------	--------	------	------	------	-------

-----

17	90	0.00	60.88	0.00	-7.73	-3.92	0.00	0.00	-16.90	32.33
----	----	------	-------	------	-------	-------	------	------	--------	-------

-----

Segment Leq : 40.81 dBA

Total Leq All Segments: 57.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.17  
(NIGHT): 57.57



**STAMSON 5.0    COMPREHENSIVE REPORT    Date: 20-02-2024 15:11:01**  
**MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT**

**Filename: R4.te**      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1 Angle2 : -55.00 deg -22.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 38.00 / 38.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -55.00 deg Angle2 : -22.00 deg  
Barrier height : 27.00 m  
Barrier receiver distance : 8.00 / 8.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00



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

-----  
Angle1 Angle2 : -90.00 deg -55.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 38.00 / 38.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -55.00 deg  
Barrier height : 79.00 m  
Barrier receiver distance : 37.99 / 37.99 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Road data, segment # 3: O'Connor St (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: O'Connor St (day/night)

-----  
Angle1 Angle2 : 0.00 deg 35.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 93.00 / 93.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 2 (Flat/gentle slope; with barrier)  
Barrier angle1 : 0.00 deg Angle2 : 35.00 deg  
Barrier height : 79.00 m  
Barrier receiver distance : 42.00 / 42.00 m  
Source elevation : 0.00 m  
Receiver elevation : 0.00 m  
Barrier elevation : 0.00 m  
Reference angle : 0.00

Road data, segment # 4: O'Connor 2 (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 # 4: O'Connor 2 (day/night)

```

-----
Angle1 Angle2      : 35.00 deg 68.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 1 (Absorptive ground surface)
Receiver source distance : 93.00 / 93.00 m
Receiver height  : 1.50 / 1.50 m
Topography      : 2 (Flat/gentle slope; with barrier)
Barrier angle1   : 35.00 deg Angle2 : 68.00 deg
Barrier height   : 27.00 m
Barrier receiver distance : 8.00 / 8.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle  : 0.00
  
```

Segment # 1: Slater Ave (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 !   1.50 !   1.50 !   1.50
  
```

ROAD (0.00 + 37.08 + 0.00) = 37.08 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-55 -22 0.00 68.48 0.00 -4.04 -7.37 0.00 0.00 -20.00 37.08
-----
  
```

Segment Leq : 37.08 dBA



Segment # 2: Slater 2 (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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 37.60 + 0.00) = 37.60 dBA

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

-----

-90 -55 0.00 68.48 0.00 -4.04 -7.11 0.00 0.00 -19.73 37.60

-----

Segment Leq : 37.60 dBA

Segment # 3: O'Connor St (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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 33.44 + 0.00) = 33.44 dBA

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

-----

0 35 0.00 68.48 0.00 -7.92 -7.11 0.00 0.00 -20.00 33.44

-----

Segment Leq : 33.44 dBA



Segment # 4: O'Connor 2 (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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 33.19 + 0.00) = 33.19 dBA

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

-----

35 68 0.00 68.48 0.00 -7.92 -7.37 0.00 0.00 -20.00 33.19

-----

Segment Leq : 33.19 dBA

Total Leq All Segments: 41.80 dBA

Segment # 1: Slater Ave (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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 29.48 + 0.00) = 29.48 dBA

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

-----

-55 -22 0.00 60.88 0.00 -4.04 -7.37 0.00 0.00 -20.00 29.48

-----

Segment Leq : 29.48 dBA





Segment # 2: Slater 2 (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 !    1.50 !    1.50 !    1.50

ROAD (0.00 + 30.01 + 0.00) = 30.01 dBA

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

-----

-90	-55	0.00	60.88	0.00	-4.04	-7.11	0.00	0.00	-19.73	30.01
-----	-----	------	-------	------	-------	-------	------	------	--------	-------

-----

Segment Leq : 30.01 dBA

Segment # 3: O'Connor St (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 !    1.50 !    1.50 !    1.50

ROAD (0.00 + 25.85 + 0.00) = 25.85 dBA

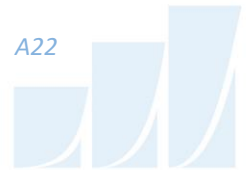
Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
--------	--------	-------	--------	-------	-------	-------	-------	-------	-------	--------

-----

0	35	0.00	60.88	0.00	-7.92	-7.11	0.00	0.00	-20.00	25.85
---	----	------	-------	------	-------	-------	------	------	--------	-------

-----

Segment Leq : 25.85 dBA



Segment # 4: O'Connor 2 (night)  
-----

Source height = 1.50 m

Barrier height for grazing incidence  
-----

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
-----+-----+-----+-----			
1.50 !	1.50 !	1.50 !	1.50

1.50 !    1.50 !    1.50 !    1.50

ROAD (0.00 + 25.59 + 0.00) = 25.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----										
35	68	0.00	60.88	0.00	-7.92	-7.37	0.00	0.00	-20.00	25.59
-----										

35    68    0.00    60.88    0.00    -7.92    -7.37    0.00    0.00    -20.00    25.59

Segment Leq : 25.59 dBA

Total Leq All Segments: 34.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 41.80  
(NIGHT): 34.21

