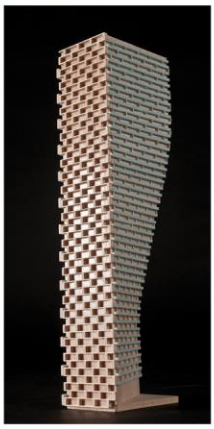
GRADIENTWIND
ENGINEERS & SCIENTISTS

ROADWAY TRAFFIC NOISE ASSESSMENT

30-48 Chamberlain Avenue
Ottawa, Ontario

Report: 20-098 - T. Noise Detailed



May 17, 2024

PREPARED FOR

Scarabelli Realties Inc.
44 Chamberlain Avenue
Ottawa, ON K1S 1V9

PREPARED BY

Efser Kara, MSc, LEED GA, Acoustic Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment undertaken to satisfy the requirements for a Site Plan Control (SPC) application submission for a proposed mixed-use development located at 30-48 Chamberlain Avenue in Ottawa, Ontario. The development comprises a 15-storey, trapezoidal planform building with a 3-storey, rectangular planform podium. The ground floor contains commercial space, a lobby, residential units and back-of-house space, while all podium levels above are reserved for residential occupancy. At Level 4, the floorplate is set back at the west side to accommodate a terrace, comprising a green roof on the north side and outdoor amenity space on the south side, and create a trapezoidal floor plan. The floor consists of indoor amenity areas, a lounge and a gym, besides residential units. The building rises with a uniform planform from levels 5 to 15. The major sources of roadway traffic noise are Chamberlain Avenue, Bank Street and Highway 417. 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 the 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 prepared by Hobin Architecture in April 2024.

The results of the current analysis indicate that noise levels will range between 63 and 77 dBA during the daytime period (07:00-23:00) and between 55 and 70 dBA during the nighttime period (23:00-07:00). The highest noise level (77 dBA) occurs at the north façade, which is nearest and most exposed to Highway 417.

The noise levels predicted due to roadway traffic exceed the 65 dBA criteria listed in Section 4.2 for building components. Therefore, upgraded building components will be required where noise levels exceed 65 dBA as illustrated in Figure 4. Building components compliant with the Ontario Building Code (OBC 2020) will be sufficient for the remaining façades of the buildings. In addition, a Type D warning clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

The noise levels at the podium rooftop OLA (receptor 5) are expected to be 64 dBA during the daytime. Therefore, a noise barrier investigation was completed. The results of the noise barrier investigation showed that a 1.8 metres high barrier will be required to reduce the noise levels to 60 dBA. The noise barrier should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps. The noise barrier for the podium rooftop amenity can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain any gaps.

In addition to a noise barrier, a Type B Warning Clause will be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

With regard to stationary noise impacts, a stationary noise study will be completed for the site during the detailed design stage 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. Where necessary noise screens and silencers can be incorporated into the design.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Quantum Project Management Services Inc. on behalf of Scarabelli Realties Inc. to undertake a roadway traffic noise feasibility assessment to satisfy the requirements for a Site Plan Control (SPC) application submission for a proposed mixed-use development located at 30-48 Chamberlain Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings prepared by Hobin Architecture in April 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 feasibility assessment is a proposed mixed-use development located at 30-48 Chamberlain Avenue in Ottawa, Ontario. The subject site is located on the north edge of a parcel of land bounded by Bank Street to the east, Chamberlain Avenue to the north, Rosebery Avenue to the south, and Lyon Street to the west.

Rendering, Northwest Perspective (Hobin Architecture)

The development comprises a 15-storey, trapezoidal planform building with a 3-storey, rectangular planform podium. A driveway along the west side of the site provides access to surface parking and a ramp to two levels of below-grade parking from Chamberlain Avenue. At Level 2, the floorplate extends at the west side to cover the northbound lane of the driveway below.

[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

The ground floor contains commercial space, a lobby, residential units and back-of-house space. All levels above grade are reserved for residential occupancy except indoor amenity space provided on Level 4. On the west side of Level 4, the floorplate is set back to accommodate a terrace, comprising a green roof on the north side and outdoor amenity space on the south side, and create a trapezoidal floor plan. The floor consists of indoor amenity areas, a lounge and a gym, besides residential units and the west side terrace. The building continues to rise with a uniform planform from levels 5 to 15.

The floor plate steps back from all directions on Level 16 creating terraces. The balconies and terraces extending less than 4 metres from the façade are not considered as outdoor living areas (OLA) as per ENCG. Therefore, they are not considered as outdoor living areas in this study.

The site is surrounded by low-rise residential and commercial buildings in all directions, with elevated Highway 417 to the north, Patterson's Creek Park to the southeast, Central Park to the south and Chamberlain Park to the west. The major sources of traffic noise are Chamberlain Avenue, Bank Street and Highway 174. Figure 1 illustrates a complete site plan with the surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise and vibration levels on the study buildings produced by local transportation, and (ii) determine whether exterior noise levels exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG).

4. METHODOLOGY

4.1 Background

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

3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For surface roadway traffic noise, the equivalent sound energy level, L_{eq}, provides a measure of the time-varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time-varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 50, 45 and 40 dBA for retail space, living rooms and sleeping quarters, respectively, for roadway traffic, as listed in Table 1.

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

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

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor

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

environment[5]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[6].

The sound level criterion for outdoor living areas (OLA) is 55 dBA, which applies during the daytime period (07:00 to 23:00). When noise levels exceed 55 dBA and are less than or equal to 60 dBA, mitigation should be considered to reduce noise levels to as close to 55 dBA if technically, economically, and administratively feasible. If noise levels exceed 60 dBA, mitigation must be provided to reduce noise levels at or below 60 dBA.

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. Highway 417 was considered to be elevated approximately 5 metres (m) above local grade.
- A 3-metre tall noise barrier was considered along the south perimeter of Highway 417.

[5] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

- For select sources where appropriate, the proposed building as well as existing surrounding buildings were considered as barriers, partially or fully obstructing exposure to the source as illustrated by exposure angles in Figures 3-6.
- Noise receptors were strategically placed at eight (8) locations around the study area, see Figure 2.
- Receptor distances and exposure angles are illustrated in Figures 3-6.

4.2.3 Roadway Traffic Volumes

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

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Highway 417	6-Lane Freeway	100	**110,000**
Chamberlain Avenue	2-Lane Urban Arterial	50	**15,000**
Bank Street	4-Lane Urban Arterial Undivided	50	**30,000**

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2020) typically exceed STC 35, depending on exterior

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

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 points in a partition.

As per Section 4.2.1, 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 are achieved. The calculation procedure[8] 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[9], 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, detailed floor layouts 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

[8] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985
[9] CMHC, Road & Rail Noise: Effects on Housing

Receptor Number	Receptor Height Above Grade (m)	Receptor Type – Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	46.45	POW – Level 15 North Façade	77	70
2	46.45	POW – Level 15 West Façade	73	65
3	46.45	POW – Level 15 East Façade	74	66
4	46.45	POW – Level 15 South Façade	63	55
5	13.80	OLA – Podium Rooftop Amenity Area	64	N/A*
6	13.65	POW – Level 3 North Façade	73	65
7	13.65	POW – Level 3 West Façade	69	61
8	13.65	POW – Level 3 East Façade	69	61

*Noise levels at OLAs during the nighttime are not considered, as per the ENCG.

The results of the current analysis indicate that noise levels will range between 63 and 77 dBA during the daytime period (07:00-23:00) and between 55 and 70 dBA during the nighttime period (23:00-07:00). The highest noise level (77 dBA) occurs at the north façade, which is nearest and most exposed to Highway 417.

Results of the calculations indicate that upgrades building components will be required as well as 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 to be placed on all Lease, Purchase and Sale Agreements.

The noise levels at the podium rooftop OLA (receptor 5) are expected to be 64 dBA during the daytime. Therefore, noise control measures will be required for the OLA to reduce the L_{eq} to or below 60 dBA.

5.2 Noise Control Measures

Upgraded building components, including STC-rated glazing elements and exterior walls, will be required where noise levels due to roadway traffic exceed 65 dBA, as discussed in Section 4.2.1. As outlined in Section 4.3, the anticipated STC requirements for windows and walls 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 the City of Ottawa requirements, detailed STC calculations will

be required to be completed prior to the building permit application. The STC requirements for the windows as well as ventilation requirements and warning clauses are summarized below in Table 4 for various types of spaces within the development (see also Figure 7):

TABLE 4: STC & VENTILATION REQUIREMENTS

Building Section	Façade	Windows STC Requirements			Ventilation Requirement	Warning Clause
		Office / Retail	Living Room	Bedroom		
Tower	North Façade	N/A	35	35	Central Air Conditioning	Type D
	South Façade		OBC Compliant	OBC Compliant		
	East Façade		33	33		
	West Façade		33	33		
Podium	North Façade	30	35	35		
	South Façade	OBC Compliant	OBC Compliant	OBC Compliant		
	East Façade	30	33	33		
	West Façade	30	33	33		

- **Exterior Walls**

(i) Exterior wall components on north, east, and west façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[10]

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 punched window and 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 that have a combination of glass thickness and inter-pane spacing. It is the responsibility of the manufacturer to ensure that the 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

[10] J.S. Bradley and J.A. Birta. Laboratory Measurements of the Sound Insulation of Building Façade Elements, National Research Council October 2000.

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.

The results of the calculations also indicate that the building will require central air conditioning, or a similar ventilation system for the residential units, which will allow occupants to keep windows closed and maintain a comfortable working 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 Noise Barrier Investigation

The noise levels at the podium rooftop OLA (receptor 5) are expected to be 64 dBA during the daytime. Therefore, a noise barrier investigation was completed to determine the required barrier height to reduce the L_{eq} to or below 60 dBA. The noise barrier heights and the noise level results used in the study are noted in Table 5 below.

The results of the noise barrier investigation showed that a 1.8 metres high barrier will be required to reduce the noise levels to 60 dBA. The noise barrier should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps. The noise barrier for the podium rooftop amenity can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain any gaps. However, it should not contain gaps. Glass noise screens can be built as glass-to-glass. If balusters are used the screen should be designed without any gap between the glass and balusters. Figure 8 illustrates the barrier locations. In addition to a noise barrier, a Type B Warning Clause will be required to be placed on all Lease, Purchase and Sale Agreements.

TABLE 6: NOISE BARRIER INVESTIGATION RESULTS

Receptor Reference	Location	Daytime L_{eq} Noise Levels (dBA)	Barrier Height Above Walking Surface (m)	Daytime L_{eq} Noise Levels (dBA)
		Without Barrier		With Barrier
R5	Podium Rooftop Amenity Area	64	1.1	62
			1.5	61
			1.8	60

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 63 and 77 dBA during the daytime period (07:00-23:00) and between 55 and 70 dBA during the nighttime period (23:00-07:00). The highest noise level (77 dBA) occurs at the north façade, which is nearest and most exposed to Highway 417.

The noise levels predicted due to roadway traffic exceed the 65 dBA criteria listed in Section 4.2 for building components. Therefore, upgraded building components will be required where noise levels exceed 65 dBA as illustrated in Figure 4. Building components compliant with the Ontario Building Code (OBC 2020) will be sufficient for the remaining façades of the buildings. In addition, a Type D warning clause will be required in 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."*

The noise levels at the podium rooftop OLA (receptor 5) are expected to be 64 dBA during the daytime. Therefore, a noise barrier investigation was completed. The results of the noise barrier investigation showed that a 1.8 metres high barrier will be required to reduce the noise levels to 60 dBA. The noise barrier should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps. The noise barrier for the podium rooftop amenity can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain any gaps.

In addition to a noise barrier, a Type B Warning Clause will be required to be placed on all Lease, Purchase and Sale Agreements, as summarized below:

Type B

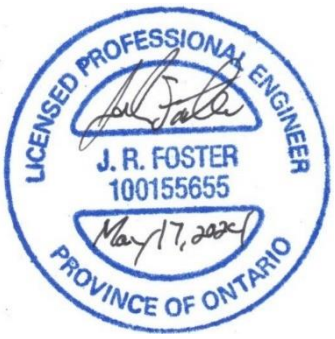
> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing transportation noise may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."*

With regard to stationary noise impacts, a stationary noise study will be completed for the site during the detailed design stage 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. Where necessary noise screens and silencers can be incorporated into the design.

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

Sincerely,

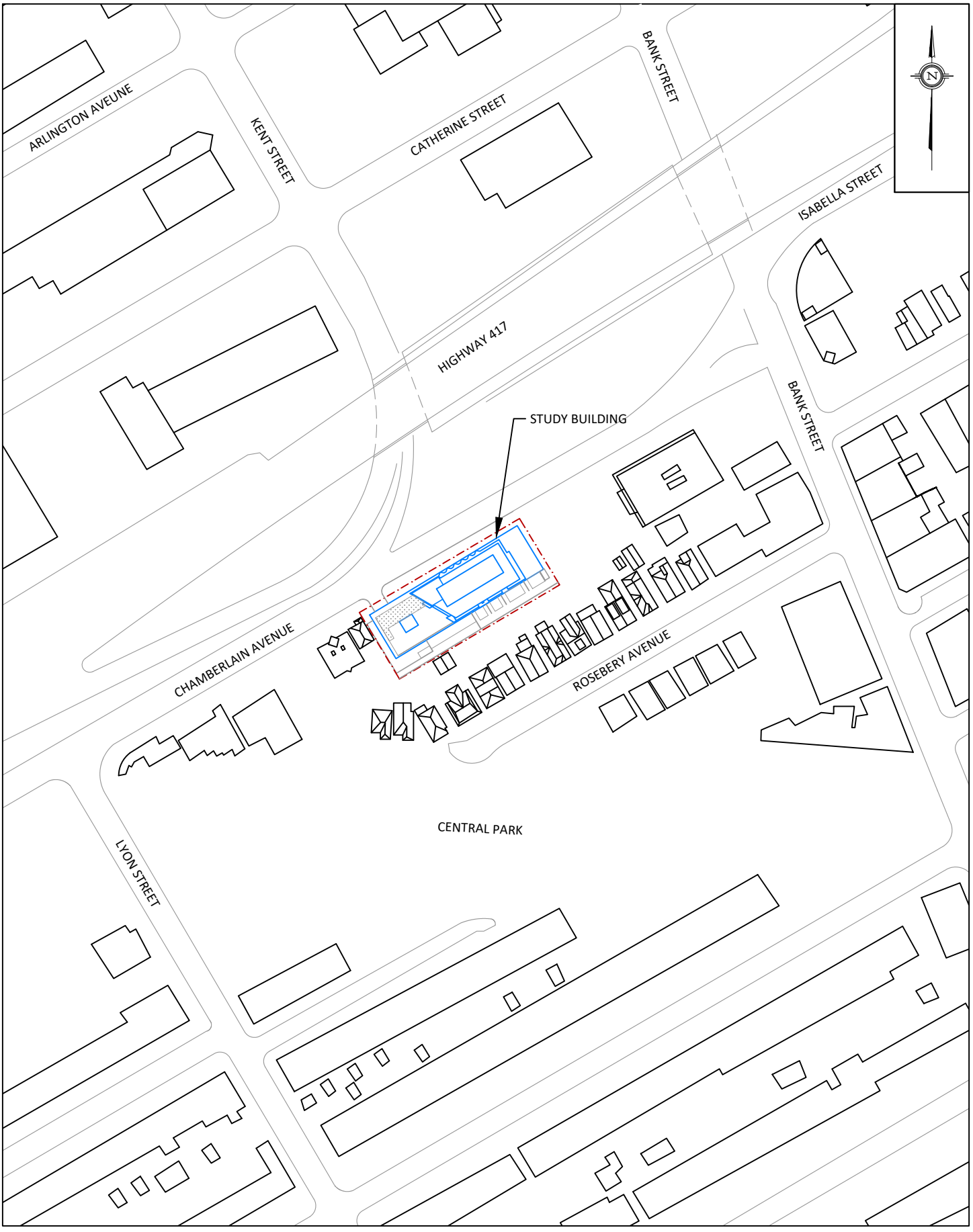
Gradient Wind Engineering Inc.



Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File 20-098 – T. Noise Detailed



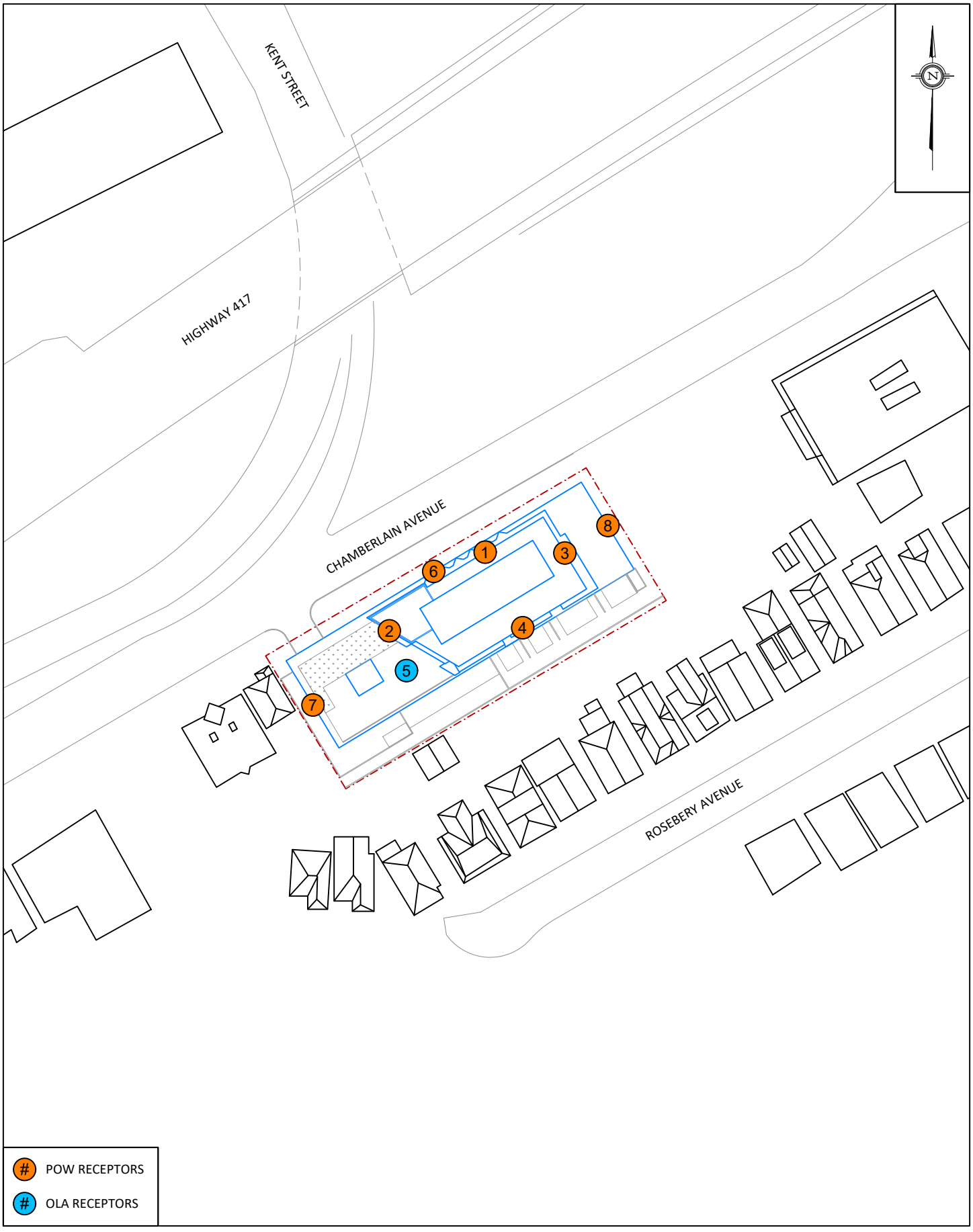
GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW20-098-1
DATE	MAY 09, 2024
DRAWN BY	E.K.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT

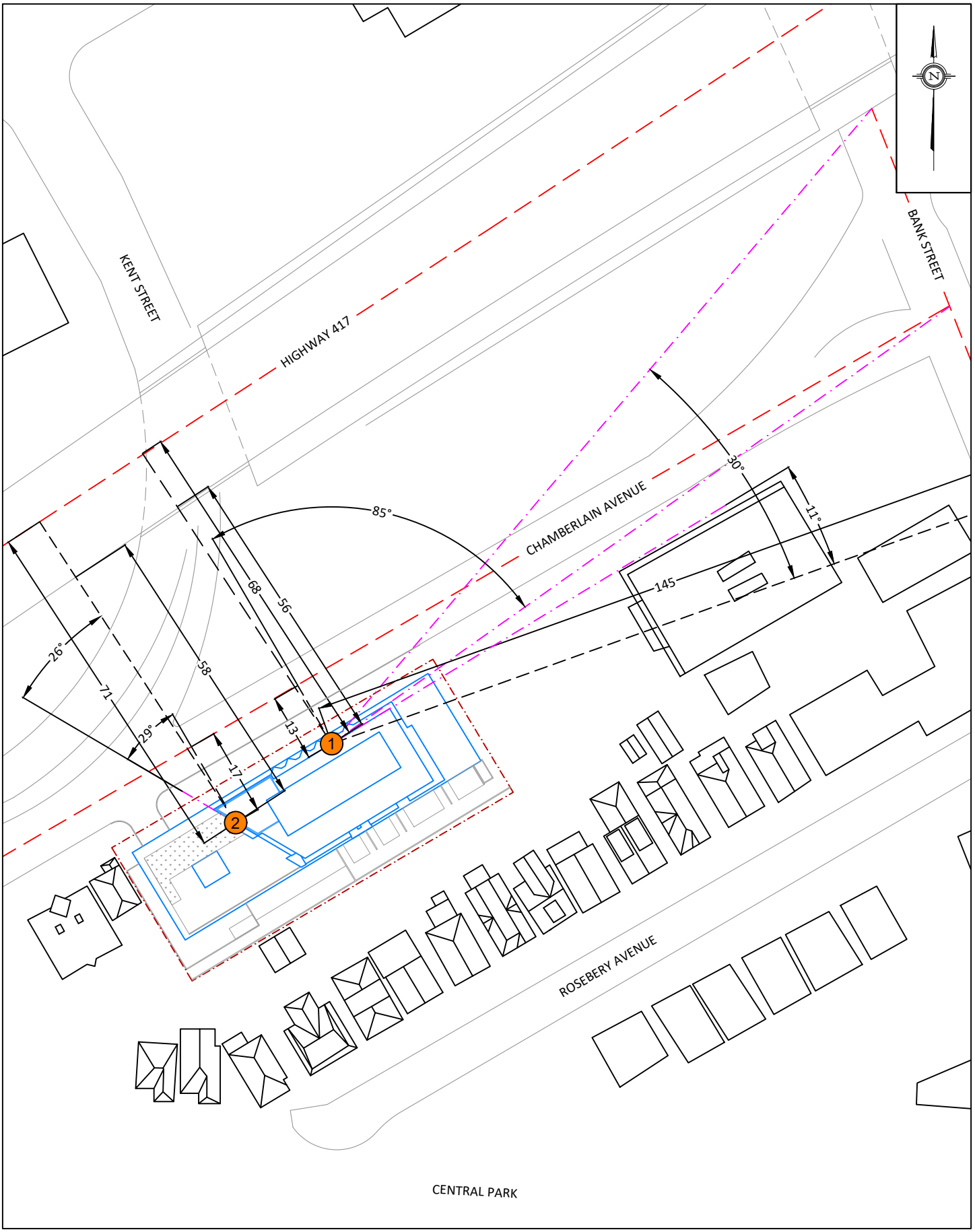


GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-098-2
DATE	MAY 09, 2024	DRAWN BY	E.K.

FIGURE 2:
RECEPTOR LOCATIONS

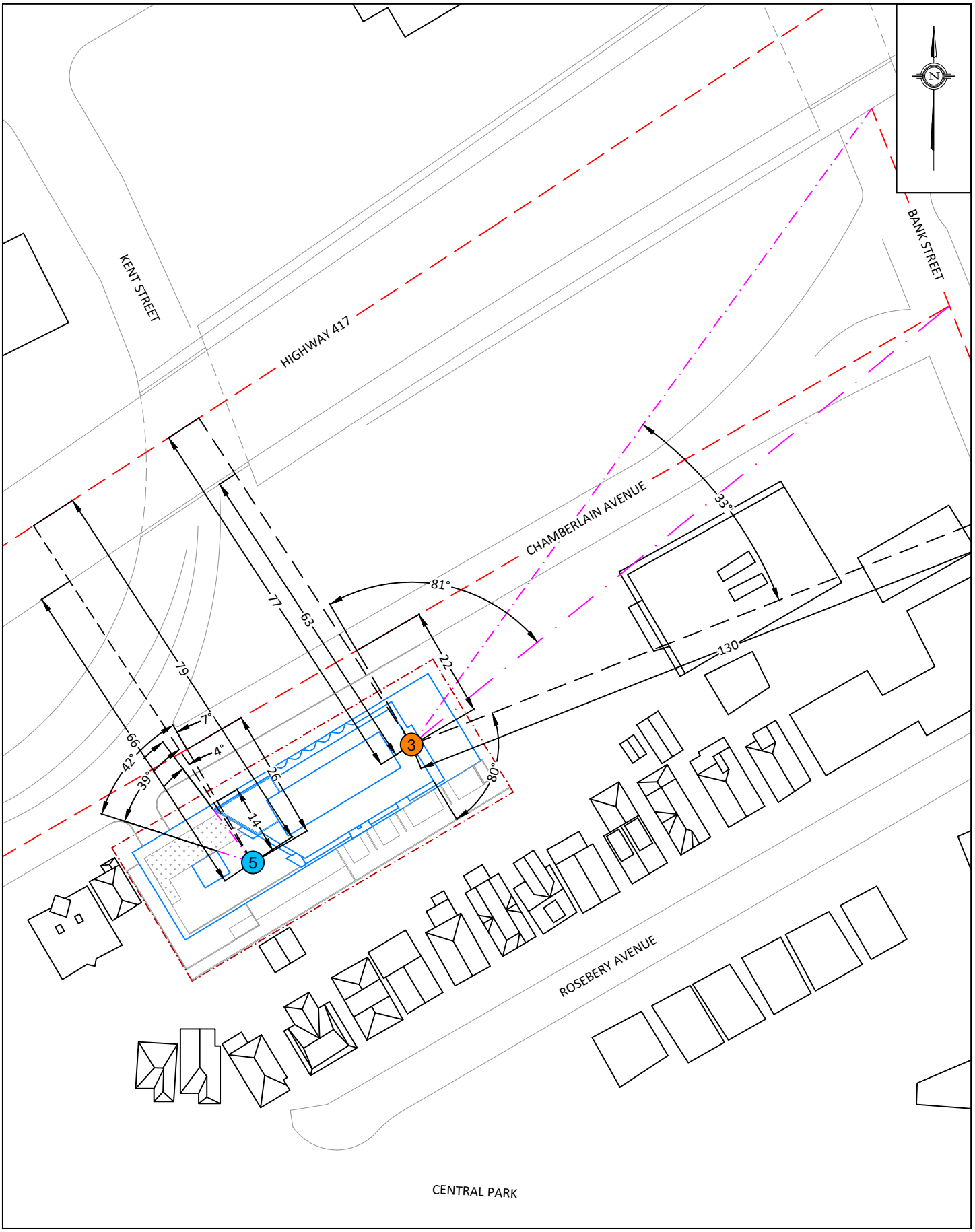


GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-098-3
DATE	MAY 09, 2024	DRAWN BY	E.K.

FIGURE 3:
STAMSON INPUT PARAMETERS - RECEPTORS 1 & 2

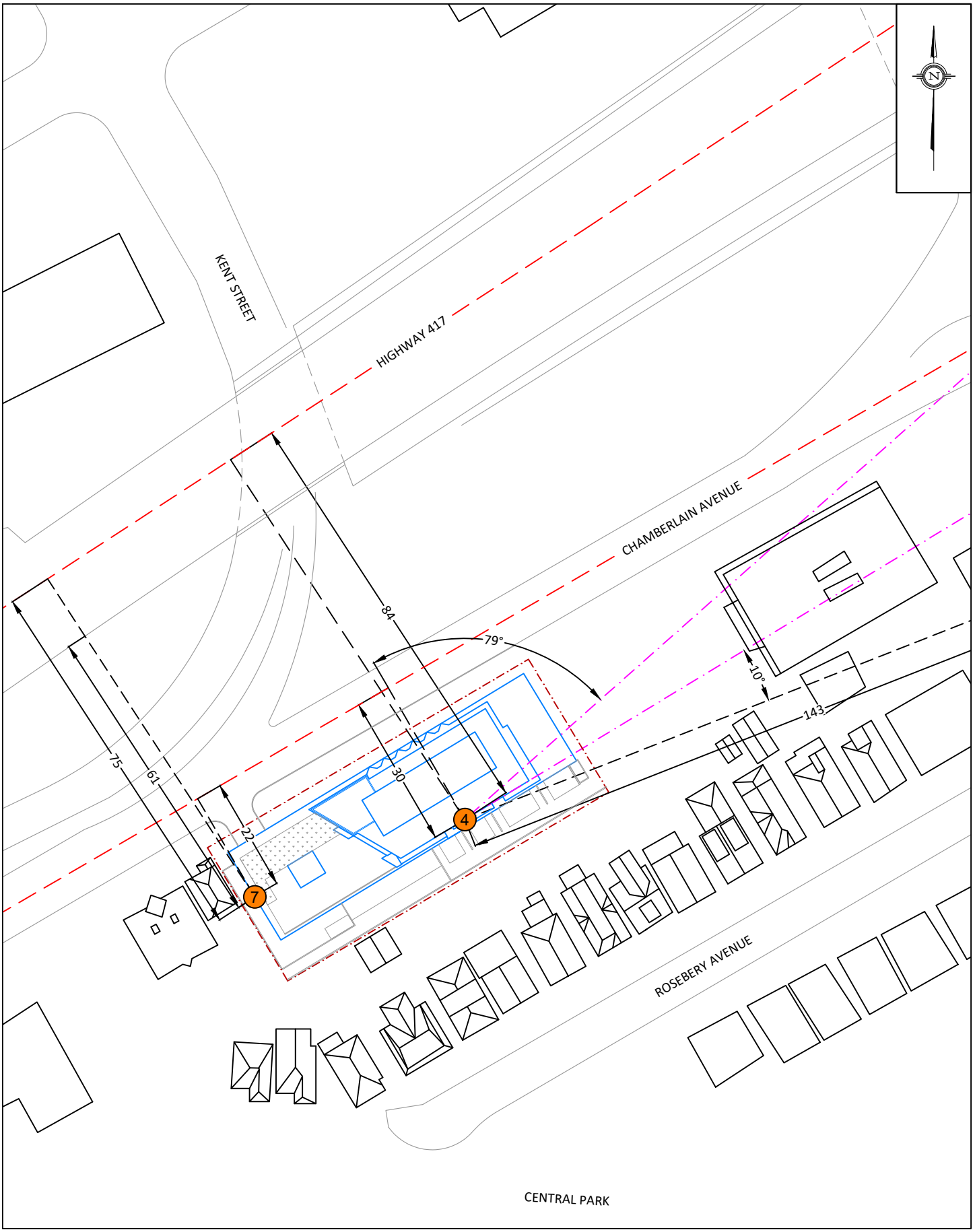


GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-098-4
DATE	MAY 09, 2024	DRAWN BY	E.K.

FIGURE 4:
STAMSON INPUT PARAMETERS - RECEPTORS 3 & 5



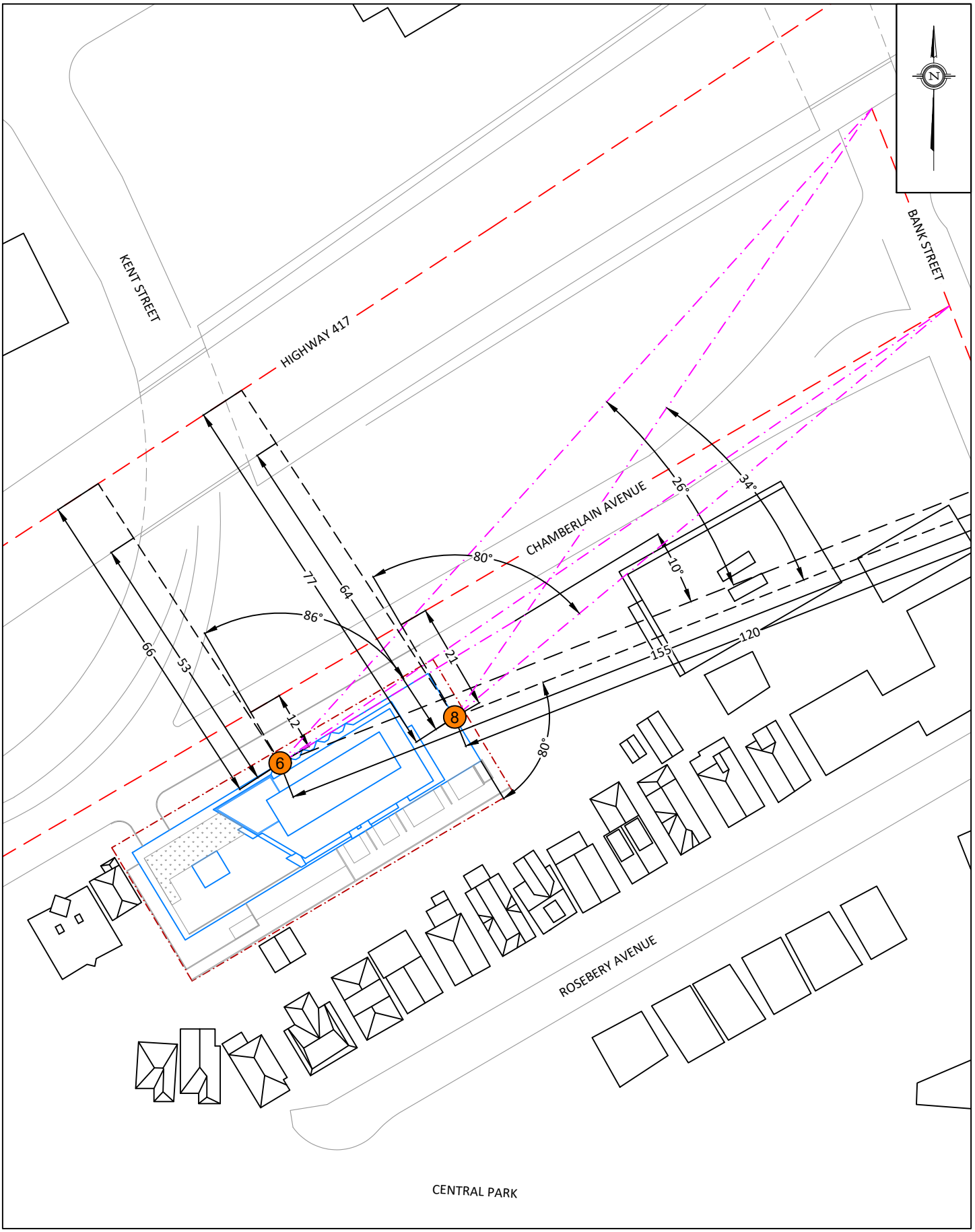
GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-098-5
DATE	MAY 09, 2024	DRAWN BY	E.K.

DESCRIPTION

FIGURE 5:
STAMSON INPUT PARAMETERS - RECEPTORS 4 & 7



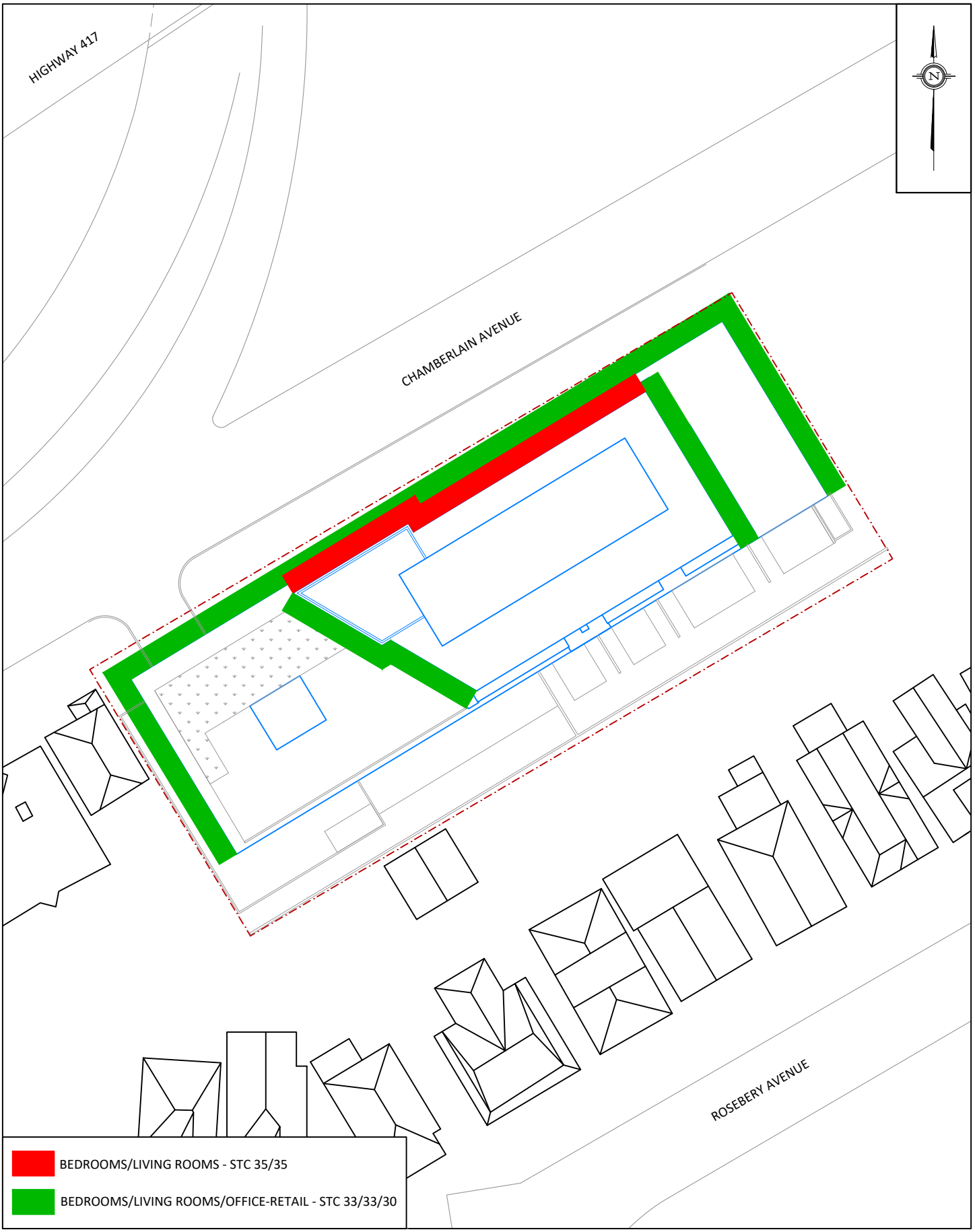
GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW20-098-6
DATE	MAY 09, 2024
DRAWN BY	E.K.

DESCRIPTION

FIGURE 6:
STAMSON INPUT PARAMETERS - RECEPTORS 6 & 8

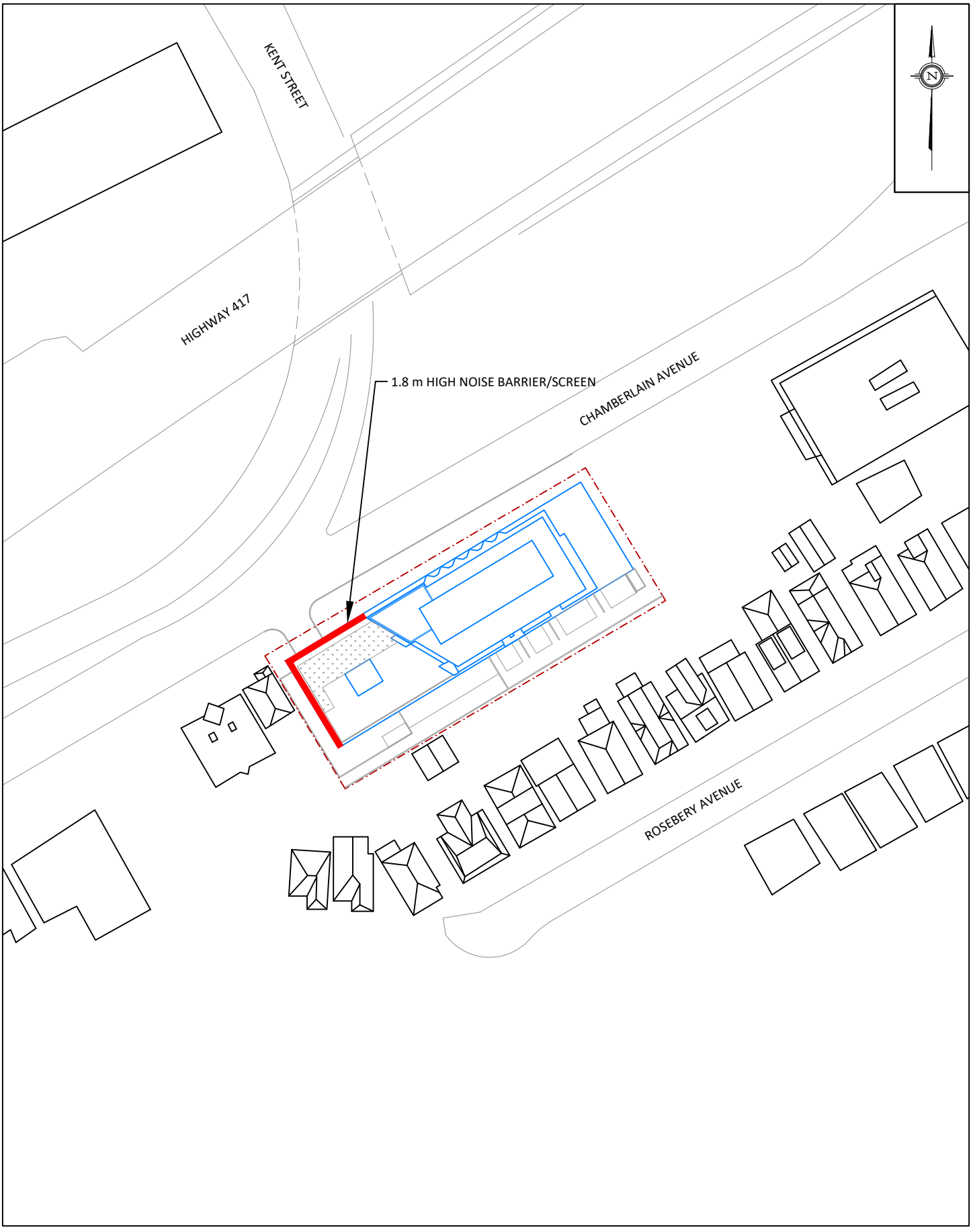


GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW20-098-7
DATE	MAY 09, 2024	DRAWN BY	E.K.

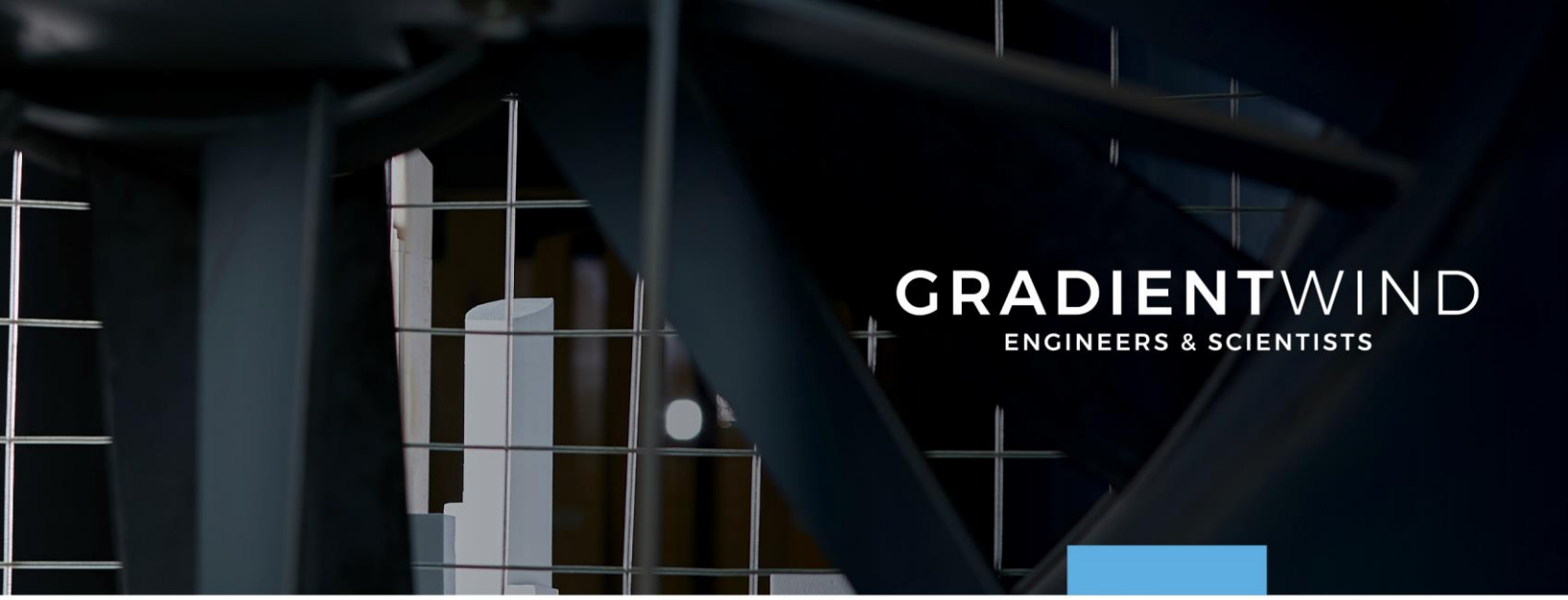
FIGURE 7:
STC REQUIREMENTS

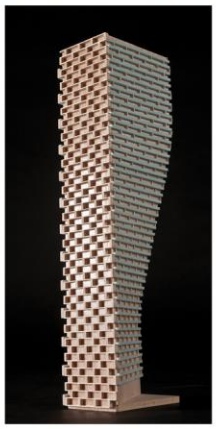


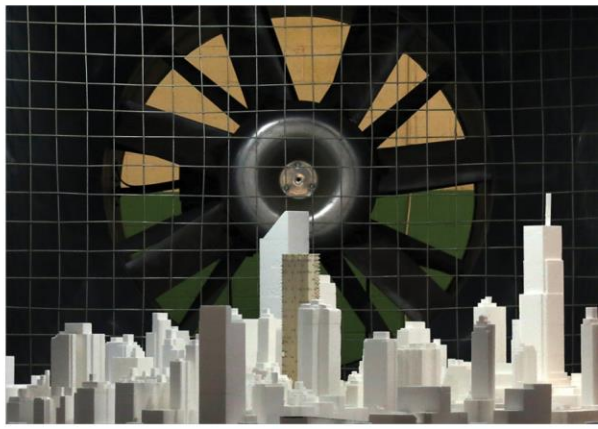
GRADIENTWIND
ENGINEERS & SCIENTISTS

127 WALGREEN ROAD , OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	30-48 CHAMBERLAIN AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. GW20-098-8	FIGURE 8: NOISE BARRIER/SCREEN LOCATIONS
DATE	MAY 09, 2024	DRAWN BY E.K.	







APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
GRADIENTWIND.COM

STAMSON 5.0 NORMAL REPORT Date: 08-05-2024 15:39:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (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 : 68.00 / 69.00 m
Receiver height : 46.45 / 46.20 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 56.00 / 57.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg 85.00 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 : 46.45 / 46.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Bank St (day/night)

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

Data for Segment # 3: Bank St (day/night)

Angle1 Angle2 : -30.00 deg -11.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 137.00 / 137.00 m
Receiver height : 46.20 / 46.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 46.45 ! 13.55 ! 13.55

ROAD (0.00 + 76.59 + 0.00) = 76.59 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 83.16 0.00 -6.56 0.00 0.00 0.00 -0.07 76.52*
-90 90 0.00 83.16 0.00 -6.56 0.00 0.00 0.00 0.00 76.59
---

* Bright Zone !

Segment Leq : 76.59 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 68.36 + 0.00) = 68.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 85 0.00 68.48 0.00 0.00 -0.12 0.00 0.00 0.00 68.36

Segment Leq : 68.36 dBA

Results segment # 3: Bank St (day)

Source height = 1.50 m

ROAD (0.00 + 52.12 + 0.00) = 52.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-30 -11 0.00 71.49 0.00 -9.61 -9.77 0.00 0.00 0.00 52.12

Segment Leq : 52.12 dBA

Total Leq All Segments: 77.21 dBA

Results segment # 1: Highway 417 (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 ! 46.20 ! 13.40 ! 13.40

ROAD (0.00 + 68.93 + 0.00) = 68.93 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 75.56 0.00 -6.63 0.00 0.00 0.00 -0.07 68.86*
-90 90 0.00 75.56 0.00 -6.63 0.00 0.00 0.00 0.00 68.93
---

* Bright Zone !

Segment Leq : 68.93 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 60.76 + 0.00) = 60.76 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 85 0.00 60.88 0.00 0.00 -0.12 0.00 0.00 0.00 60.76

Segment Leq : 60.76 dBA

Results segment # 3: Bank St (night)

Source height = 1.50 m

ROAD (0.00 + 44.52 + 0.00) = 44.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	-11	0.00	63.89	0.00	-9.61	-9.77	0.00	0.00	0.00	44.52

Segment Leq : 44.52 dBA

Total Leq All Segments: 69.56 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 77.21
(NIGHT): 69.56

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 14:50:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -90.00 deg -26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 71.00 / 71.00 m
Receiver height : 46.45 / 46.45 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -26.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 58.00 / 58.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg -29.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 17.00 / 17.00 m
Receiver height : 46.45 / 46.45 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 46.45 ! 13.81 ! 13.81

ROAD (0.00 + 71.92 + 0.00) = 71.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -26 0.00 83.16 0.00 -6.75 -4.49 0.00 0.00 -0.10 71.82*
-90 -26 0.00 83.16 0.00 -6.75 -4.49 0.00 0.00 0.00 71.92
---

* Bright Zone !

Segment Leq : 71.92 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 63.24 + 0.00) = 63.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-29	0.00	68.48	0.00	-0.54	-4.70	0.00	0.00	0.00	63.24

Segment Leq : 63.24 dBA

Total Leq All Segments: 72.47 dBA

Results segment # 1: Highway 417 (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	46.45	13.81	13.81

ROAD (0.00 + 64.32 + 0.00) = 64.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-26	0.00	75.56	0.00	-6.75	-4.49	0.00	0.00	-0.10	64.22*
-90	-26	0.00	75.56	0.00	-6.75	-4.49	0.00	0.00	0.00	64.32

* Bright Zone !

Segment Leq : 64.32 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 55.64 + 0.00) = 55.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-29	0.00	60.88	0.00	-0.54	-4.70	0.00	0.00	0.00	55.64

Segment Leq : 55.64 dBA

Total Leq All Segments: 64.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.47
(NIGHT): 64.87

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 14:36:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.00 / 77.00 m
Receiver height : 46.45 / 46.45 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 63.00 / 63.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : 0.00 deg 81.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 46.45 / 46.45 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Bank St (day/night)

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

Data for Segment # 3: Bank St (day/night)

Angle1 Angle2 : -33.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 130.00 / 130.00 m
Receiver height : 46.45 / 46.45 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 46.45 ! 13.76 ! 13.76

ROAD (0.00 + 73.04 + 0.00) = 73.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 83.16 0.00 -7.10 -3.01 0.00 0.00 -0.07 72.97*
0 90 0.00 83.16 0.00 -7.10 -3.01 0.00 0.00 0.00 73.04
---

* Bright Zone !

Segment Leq : 73.04 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 63.35 + 0.00) = 63.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	81	0.00	68.48	0.00	-1.66	-3.47	0.00	0.00	0.00	63.35

Segment Leq : 63.35 dBA

Results segment # 3: Bank St (day)

Source height = 1.50 m

ROAD (0.00 + 60.09 + 0.00) = 60.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-33	80	0.00	71.49	0.00	-9.38	-2.02	0.00	0.00	0.00	60.09

Segment Leq : 60.09 dBA

Total Leq All Segments: 73.68 dBA

Results segment # 1: Highway 417 (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 ! 46.45 ! 13.76 ! 13.76

ROAD (0.00 + 65.45 + 0.00) = 65.45 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 75.56 0.00 -7.10 -3.01 0.00 0.00 -0.07 65.37*
0 90 0.00 75.56 0.00 -7.10 -3.01 0.00 0.00 0.00 65.45
---

* Bright Zone !

Segment Leq : 65.45 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 55.75 + 0.00) = 55.75 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 81 0.00 60.88 0.00 -1.66 -3.47 0.00 0.00 0.00 55.75

Segment Leq : 55.75 dBA

Results segment # 3: Bank St (night)

Source height = 1.50 m

ROAD (0.00 + 52.49 + 0.00) = 52.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-33	80	0.00	63.89	0.00	-9.38	-2.02	0.00	0.00	0.00	52.49

Segment Leq : 52.49 dBA

Total Leq All Segments: 66.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 73.68
(NIGHT): 66.09

STAMSON 5.0 NORMAL REPORT Date: 08-05-2024 16:59:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (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 : 84.00 / 84.00 m
Receiver height : 46.45 / 46.45 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 48.10 m
Barrier receiver distance : 0.05 / 0.05 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg 79.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 46.45 / 46.45 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 79.00 deg
Barrier height : 48.10 m
Barrier receiver distance : 0.05 / 0.05 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 3: Bank St (day/night)

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

Data for Segment # 3: Bank St (day/night)

Angle1 Angle2 : -10.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 143.00 / 143.00 m
Receiver height : 46.45 / 46.45 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 46.45 ! 46.43 ! 46.43

ROAD (0.00 + 59.44 + 0.00) = 59.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 83.16 0.00 -7.48 0.00 0.00 0.00 -16.24 59.44

Segment Leq : 59.44 dBA

Results segment # 2: Chamberlain (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 ! 46.45 ! 46.38 ! 46.38

ROAD (0.00 + 47.38 + 0.00) = 47.38 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 79 0.00 68.48 0.00 -3.01 -0.27 0.00 0.00 -17.82 47.38

Segment Leq : 47.38 dBA

Results segment # 3: Bank St (day)

Source height = 1.50 m

ROAD (0.00 + 59.15 + 0.00) = 59.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-10 90 0.00 71.49 0.00 -9.79 -2.55 0.00 0.00 0.00 59.15

Segment Leq : 59.15 dBA

Total Leq All Segments: 62.45 dBA

Results segment # 1: Highway 417 (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 ! 46.45 ! 46.43 ! 46.43

ROAD (0.00 + 51.84 + 0.00) = 51.84 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 75.56 0.00 -7.48 0.00 0.00 0.00 -16.24 51.84

Segment Leq : 51.84 dBA

Results segment # 2: Chamberlain (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 ! 46.45 ! 46.38 ! 46.38

ROAD (0.00 + 39.78 + 0.00) = 39.78 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 79 0.00 60.88 0.00 -3.01 -0.27 0.00 0.00 -17.82 39.78

Segment Leq : 39.78 dBA

Results segment # 3: Bank St (night)

Source height = 1.50 m

ROAD (0.00 + 51.55 + 0.00) = 51.55 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-10 90 0.00 63.89 0.00 -9.79 -2.55 0.00 0.00 0.00 51.55

Segment Leq : 51.55 dBA

Total Leq All Segments: 54.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.45
(NIGHT): 54.85

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 11:28:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -39.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.00 / 79.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -39.00 deg Angle2 : -4.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 66.00 / 66.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -42.00 deg -7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -7.00 deg
Barrier height : 12.30 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 13.80 ! 7.70 ! 7.70

ROAD (0.00 + 63.63 + 0.00) = 63.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 83.16 0.00 -7.22 -7.11 0.00 0.00 -5.20 63.63

Segment Leq : 63.63 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 40.81 + 0.00) = 40.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 68.48 0.00 -2.71 -7.11 0.00 0.00 -17.84 40.81

Segment Leq : 40.81 dBA

Total Leq All Segments: 63.65 dBA

Results segment # 1: Highway 417 (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 ! 13.80 ! 7.70 ! 7.70

ROAD (0.00 + 56.04 + 0.00) = 56.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 75.56 0.00 -7.22 -7.11 0.00 0.00 -5.20 56.04

Segment Leq : 56.04 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 33.22 + 0.00) = 33.22 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 60.88 0.00 -2.71 -7.11 0.00 0.00 -17.84 33.22

Segment Leq : 33.22 dBA

Total Leq All Segments: 56.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.65
(NIGHT): 56.06

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 13:54:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (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 : 66.00 / 68.00 m
Receiver height : 10.65 / 10.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 53.00 / 55.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg 86.00 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 : 10.65 / 10.65 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Bank St (day/night)

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

Data for Segment # 3: Bank St (day/night)

Angle1 Angle2 : -26.00 deg -10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 155.00 / 155.00 m
Receiver height : 10.65 / 10.65 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.31 ! 7.31

ROAD (0.00 + 71.03 + 0.00) = 71.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 83.16 0.00 -6.43 0.00 0.00 0.00 -5.69 71.03

Segment Leq : 71.03 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 68.38 + 0.00) = 68.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	86	0.00	68.48	0.00	0.00	-0.10	0.00	0.00	0.00	68.38

Segment Leq : 68.38 dBA

Results segment # 3: Bank St (day)

Source height = 1.50 m

ROAD (0.00 + 50.84 + 0.00) = 50.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-26	-10	0.00	71.49	0.00	-10.14	-10.51	0.00	0.00	0.00	50.84

Segment Leq : 50.84 dBA

Total Leq All Segments: 72.94 dBA

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.29 ! 7.29

ROAD (0.00 + 63.27 + 0.00) = 63.27 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 75.56 0.00 -6.56 0.00 0.00 0.00 -5.73 63.27

Segment Leq : 63.27 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 60.79 + 0.00) = 60.79 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 86 0.00 60.88 0.00 0.00 -0.10 0.00 0.00 0.00 60.79

Segment Leq : 60.79 dBA

Results segment # 3: Bank St (night)

Source height = 1.50 m

ROAD (0.00 + 43.24 + 0.00) = 43.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-26	-10	0.00	63.89	0.00	-10.14	-10.51	0.00	0.00	0.00	43.24

Segment Leq : 43.24 dBA

Total Leq All Segments: 65.24 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.94
(NIGHT): 65.24

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 14:29:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 10.65 / 10.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 61.00 / 61.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 10.65 / 10.65 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.27 ! 7.27

ROAD (0.00 + 67.44 + 0.00) = 67.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 83.16 0.00 -6.99 -3.01 0.00 0.00 -5.71 67.44

Segment Leq : 67.44 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 63.81 + 0.00) = 63.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 68.48 0.00 -1.66 -3.01 0.00 0.00 0.00 63.81

Segment Leq : 63.81 dBA

Total Leq All Segments: 69.00 dBA

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.27 ! 7.27

ROAD (0.00 + 59.85 + 0.00) = 59.85 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 75.56 0.00 -6.99 -3.01 0.00 0.00 -5.71 59.85

Segment Leq : 59.85 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 56.21 + 0.00) = 56.21 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 0 0.00 60.88 0.00 -1.66 -3.01 0.00 0.00 0.00 56.21

Segment Leq : 56.21 dBA

Total Leq All Segments: 61.41 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.00
(NIGHT): 61.41

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 14:40:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.00 / 77.00 m
Receiver height : 10.65 / 10.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
Barrier height : 8.00 m
Barrier receiver distance : 64.00 / 64.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : 0.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.00 / 21.00 m
Receiver height : 10.65 / 10.65 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Bank St (day/night)

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

Data for Segment # 3: Bank St (day/night)

Angle1 Angle2 : -34.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 120.00 / 120.00 m
Receiver height : 10.65 / 10.65 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.20 ! 7.20

ROAD (0.00 + 67.15 + 0.00) = 67.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 83.16 0.00 -7.10 -3.01 0.00 0.00 -5.89 67.15

Segment Leq : 67.15 dBA

Results segment # 2: Chamberlain (day)

Source height = 1.50 m

ROAD (0.00 + 63.50 + 0.00) = 63.50 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 80 0.00 68.48 0.00 -1.46 -3.52 0.00 0.00 0.00 63.50

Segment Leq : 63.50 dBA

Results segment # 3: Bank St (day)

Source height = 1.50 m

ROAD (0.00 + 60.48 + 0.00) = 60.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-34 80 0.00 71.49 0.00 -9.03 -1.98 0.00 0.00 0.00 60.48

Segment Leq : 60.48 dBA

Total Leq All Segments: 69.32 dBA

Results segment # 1: Highway 417 (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 ! 10.65 ! 7.20 ! 7.20

ROAD (0.00 + 59.56 + 0.00) = 59.56 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 75.56 0.00 -7.10 -3.01 0.00 0.00 -5.89 59.56

Segment Leq : 59.56 dBA

Results segment # 2: Chamberlain (night)

Source height = 1.50 m

ROAD (0.00 + 55.90 + 0.00) = 55.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	80	0.00	60.88	0.00	-1.46	-3.52	0.00	0.00	0.00	55.90

Segment Leq : 55.90 dBA

Results segment # 3: Bank St (night)

Source height = 1.50 m

ROAD (0.00 + 52.88 + 0.00) = 52.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-34	80	0.00	63.89	0.00	-9.03	-1.98	0.00	0.00	0.00	52.88

Segment Leq : 52.88 dBA

Total Leq All Segments: 61.72 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.32
(NIGHT): 61.72

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 11:30:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5b1_1m.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -39.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.00 / 79.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -39.00 deg Angle2 : -4.00 deg
Barrier height : 13.40 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -42.00 deg -7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -7.00 deg
Barrier height : 13.40 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 62.35 + 0.00) = 62.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 83.16 0.00 -7.22 -7.11 0.00 0.00 -6.48 62.35

Segment Leq : 62.35 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 39.01 + 0.00) = 39.01 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 68.48 0.00 -2.71 -7.11 0.00 0.00 -19.65 39.01

Segment Leq : 39.01 dBA

Total Leq All Segments: 62.37 dBA

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 54.76 + 0.00) = 54.76 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 75.56 0.00 -7.22 -7.11 0.00 0.00 -6.48 54.76

Segment Leq : 54.76 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 31.41 + 0.00) = 31.41 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 60.88 0.00 -2.71 -7.11 0.00 0.00 -19.65 31.41

Segment Leq : 31.41 dBA

Total Leq All Segments: 54.78 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.37
(NIGHT): 54.78

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 11:29:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5b1_5m.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -39.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.00 / 79.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -39.00 deg Angle2 : -4.00 deg
Barrier height : 13.80 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -42.00 deg -7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -7.00 deg
Barrier height : 13.80 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 61.07 + 0.00) = 61.07 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 83.16 0.00 -7.22 -7.11 0.00 0.00 -7.76 61.07

Segment Leq : 61.07 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 38.73 + 0.00) = 38.73 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 68.48 0.00 -2.71 -7.11 0.00 0.00 -19.93 38.73

Segment Leq : 38.73 dBA

Total Leq All Segments: 61.10 dBA

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 53.48 + 0.00) = 53.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 75.56 0.00 -7.22 -7.11 0.00 0.00 -7.76 53.48

Segment Leq : 53.48 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 31.13 + 0.00) = 31.13 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 60.88 0.00 -2.71 -7.11 0.00 0.00 -19.93 31.13

Segment Leq : 31.13 dBA

Total Leq All Segments: 53.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.10
(NIGHT): 53.51

STAMSON 5.0 NORMAL REPORT Date: 09-05-2024 11:31:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5b1_8m.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: Highway 417 (day/night)

Car traffic volume : 89056/7744 veh/TimePeriod *
Medium truck volume : 7084/616 veh/TimePeriod *
Heavy truck volume : 5060/440 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): 110000
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: Highway 417 (day/night)

Angle1 Angle2 : -39.00 deg -4.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 79.00 / 79.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -39.00 deg Angle2 : -4.00 deg
Barrier height : 14.10 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 5.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -42.00 deg -7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 28.00 / 28.00 m
Receiver height : 13.80 / 13.80 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -42.00 deg Angle2 : -7.00 deg
Barrier height : 14.10 m
Barrier receiver distance : 14.00 / 14.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 60.04 + 0.00) = 60.04 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 83.16 0.00 -7.22 -7.11 0.00 0.00 -8.79 60.04

Segment Leq : 60.04 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 38.66 + 0.00) = 38.66 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 68.48 0.00 -2.71 -7.11 0.00 0.00 -20.00 38.66

Segment Leq : 38.66 dBA

Total Leq All Segments: 60.07 dBA

Results segment # 1: Highway 417 (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 ! 13.80 ! 12.51 ! 12.51

ROAD (0.00 + 52.44 + 0.00) = 52.44 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-39 -4 0.00 75.56 0.00 -7.22 -7.11 0.00 0.00 -8.79 52.44

Segment Leq : 52.44 dBA

Results segment # 2: Chamberlain (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 ! 13.80 ! 7.65 ! 7.65

ROAD (0.00 + 31.06 + 0.00) = 31.06 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-42 -7 0.00 60.88 0.00 -2.71 -7.11 0.00 0.00 -20.00 31.06

Segment Leq : 31.06 dBA

Total Leq All Segments: 52.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.07
(NIGHT): 52.47