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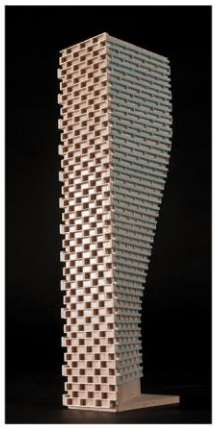
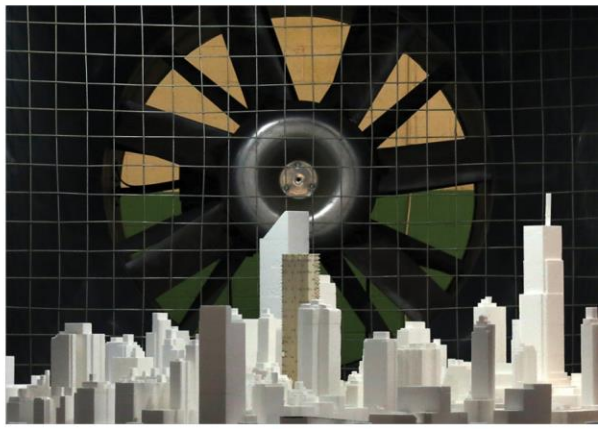
ENGINEERS & SCIENTISTS

ROADWAY TRAFFIC NOISE ASSESSMENT

246 Westhaven Crescent
Ottawa, Ontario

REPORT: 24-018 – Traffic Noise





March 5, 2024

PREPARED FOR

SDS Architect
941 Merivale Road,
Ottawa, ON K1Z 6A1

PREPARED BY

Ben Page, AdvDip, Junior Environmental Scientist
Joshua Foster, P.Eng., Principal

EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment undertaken to satisfy the requirements for a rezoning (ZBA) application submission for a proposed residential development located at 246 Westhaven Crescent in Ottawa, Ontario. The proposed development comprises a 3-storey an existing three-storey building with a rectangular planform. The primary sources of roadway traffic noise include Clare Street and Krikwood Avenue. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (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 SDS Architect in January 2024.

The results of the current analysis indicate that noise levels will range between 39 and 55 dBA during the daytime period (07:00-23:00) and between 32 and 55 dBA during the nighttime period (23:00-07:00). The highest noise level (55 dBA) occurs at the north façade, which is nearest and most exposed to Clare Street. The noise levels predicted due to roadway traffic comply the criteria listed in Section 4.2 for no noise control measures are required for this development.

Due to the nature of the development, no large pieces of heating ventilation or air condition are expected for this type of development. The building would be serviced by small internal furnaces and residential air conditioning devices. As such stationary noise impacts on surroundings are expected to be minimal.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by SDS Architect to undertake a roadway traffic noise assessment to satisfy the requirements for a zoning by-law amendment (ZBA) application submission for the conversion of an existing building located at 246 Westhaven Crescent in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings provided by SDS Architect in January 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 246 Westhaven Crescent in Ottawa, Ontario. The proposed development is situated southwest of the Clare Street and Westhaven Crescent intersection, overlooking residential buildings in all compass directions. Krikwood Avenue aligned north to south is situated to the west of the development, within approximately 200 meters (m). Please note, that as the study site is not located within 75 metres (m) of any existing or future light and heavy rail transit corridors, a ground vibrations assessment will not be required.

The redevelopment comprises an existing three-storey building with a rectangular planform. The interior, which is being renovated, features three units at grade, and three units that occupy levels two and three. Vehicular access is provided via Westhaven Crescent. Balconies serving the residential units are located on the east and west façades of the building. Balconies/terraces extending less than 4 metres (m) in depth from the façade do not require consideration as Outdoor Living Areas (OLA) as mentioned in the ENCG. The primary sources of roadway traffic noise include Clare Street and Krikwood Avenue. Figure 1 illustrates the complete site plan with surrounding context.

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

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study building produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines as outlined in Section 4.2 of this report.

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

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

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

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

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

[3] Adapted from ENCG 2016 – Tables 2.2b and 2.2c
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[5] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the 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 four (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[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.

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

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Clare Street	2-Lane Urban Collector Undivided (2-UCU)	50	**8,000**
Krikwood Avenue	2-Lane Urban Arterial Undivided (2-UAU)	50	**15,000**

4.3 Indoor Noise Calculations

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

As per Section 4.2, when daytime noise levels from road 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[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 varies according to the intended use of a space

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

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, 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	7.3	POW – 3rd Floor – West Façade	55	55
2	7.3	POW – 3th Floor – North Façade	54	53
3	7.3	POW – 3rd Floor – East Façade	52	51
4	7.3	POW – 3rd Floor – South Façade	39	32

The results of the current analysis indicate that noise levels will range between 39 and 55 dBA during the daytime period (07:00-23:00) and between 32 and 55 dBA during the nighttime period (23:00-07:00). The highest noise level (55 dBA) occurs at the north façade, which is nearest and most exposed to Clare Street.

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

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 39 and 55 dBA during the daytime period (07:00-23:00) and between 32 and 55 dBA during the nighttime period The highest noise level (55 dBA) occurs at the north façade, which is nearest and most exposed to Clare Street. The noise levels predicted due to roadway traffic do not exceed the City of Ottawa's objective limit, noise control measures for this project are not required.

Due to the nature of the development, no large pieces of heating ventilation or air condition are expected for this type of development. The building would be serviced by small internal furnaces and residential air conditioning devices. As such stationary noise impacts on surroundings are expected to be minimal.

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.

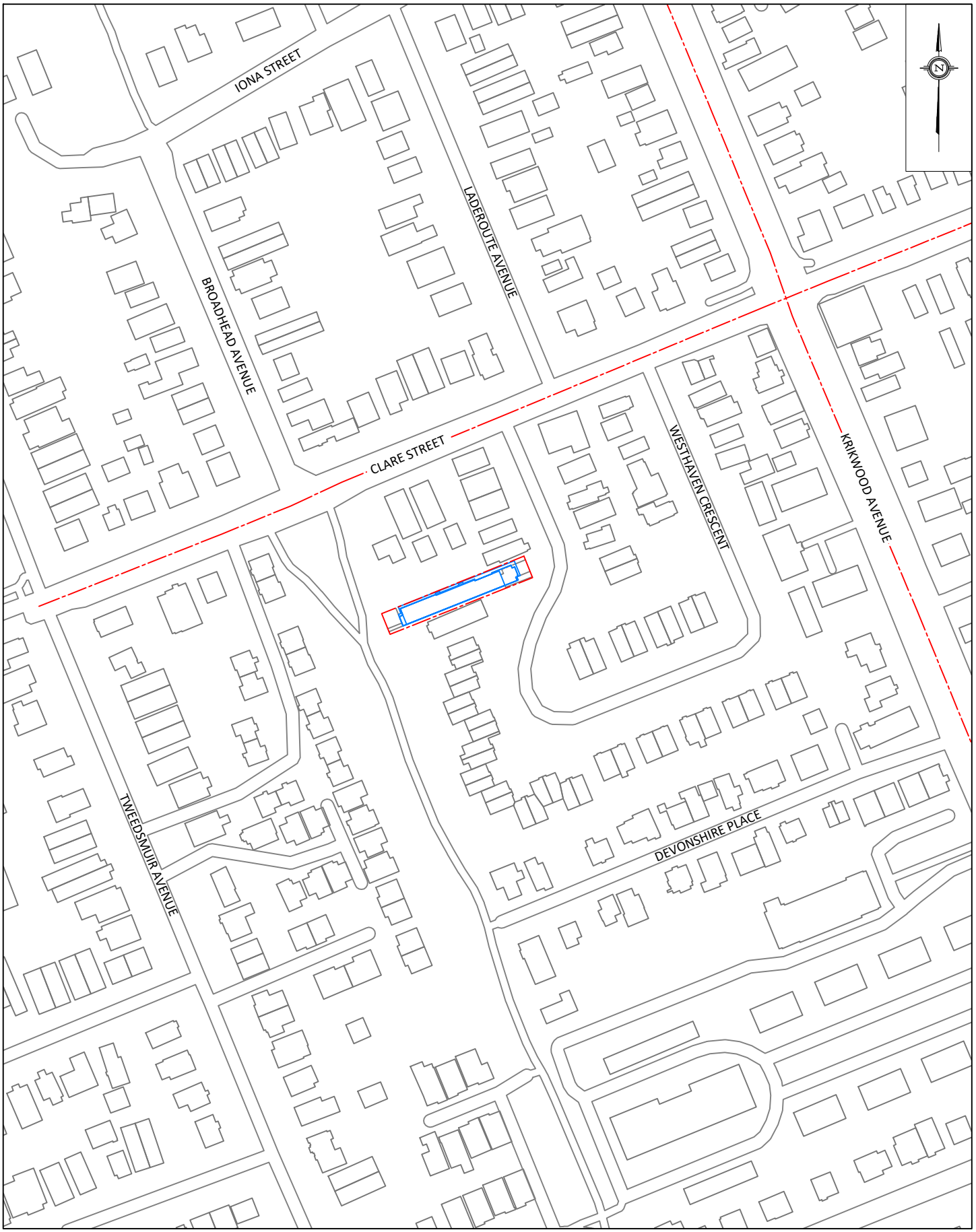
Sincerely,

Gradient Wind Engineering Inc.

Ben Page, AdvDip.
Junior Environmental Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File #24-018-Traffic Noise



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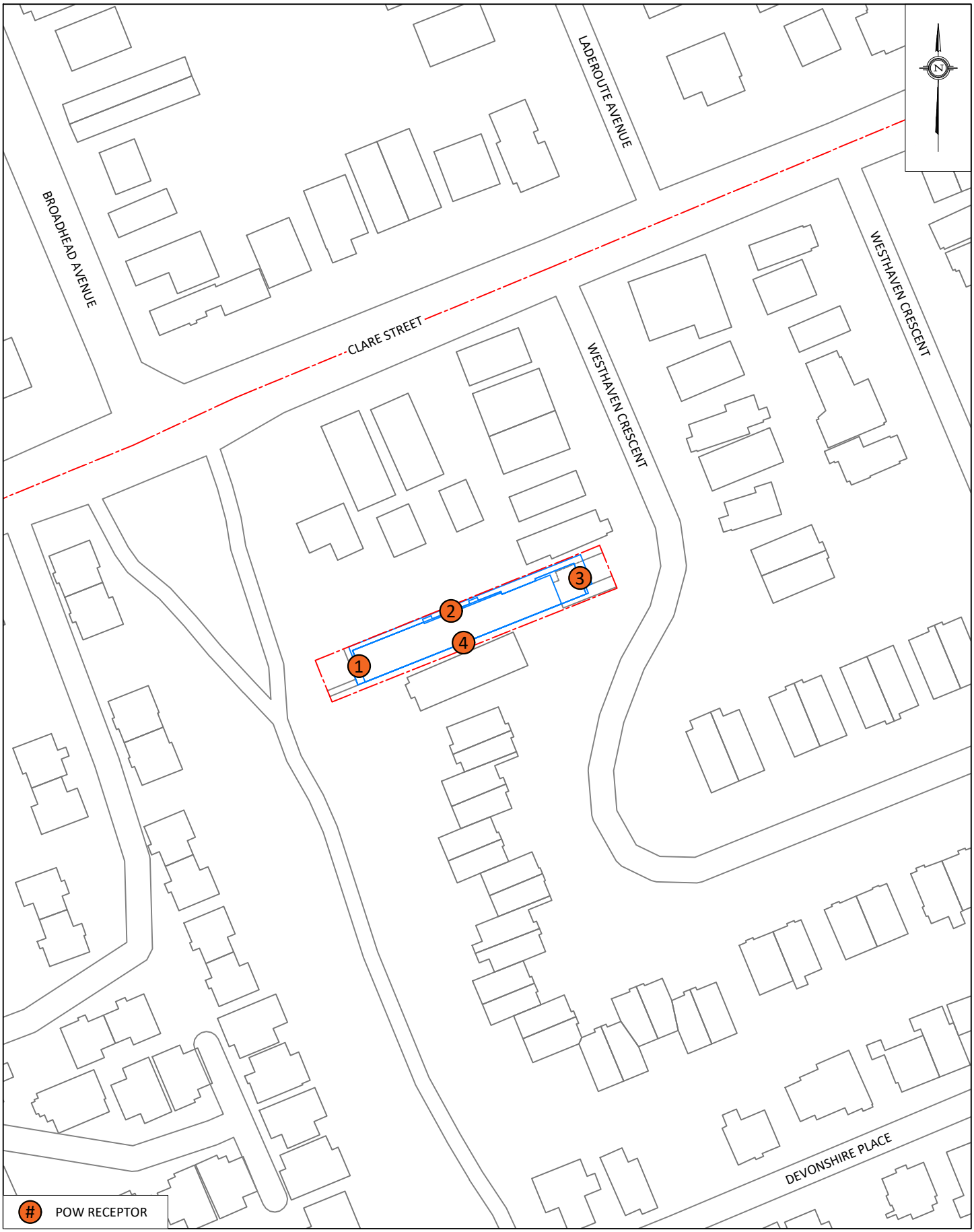
PROJECT	246 WESTHAVEN CRESCENT, OTTAWA TRAFFIC NOISE STUDY		DESCRIPTION
SCALE	1:2000	DRAWING NO. 24-018-NOISE-FIG1	FIGURE 1: PROPOSED SITE PLAN AND SURROUNDING CONTEXT
DATE	MARCH 5, 2024	DRAWN BY B.P.	



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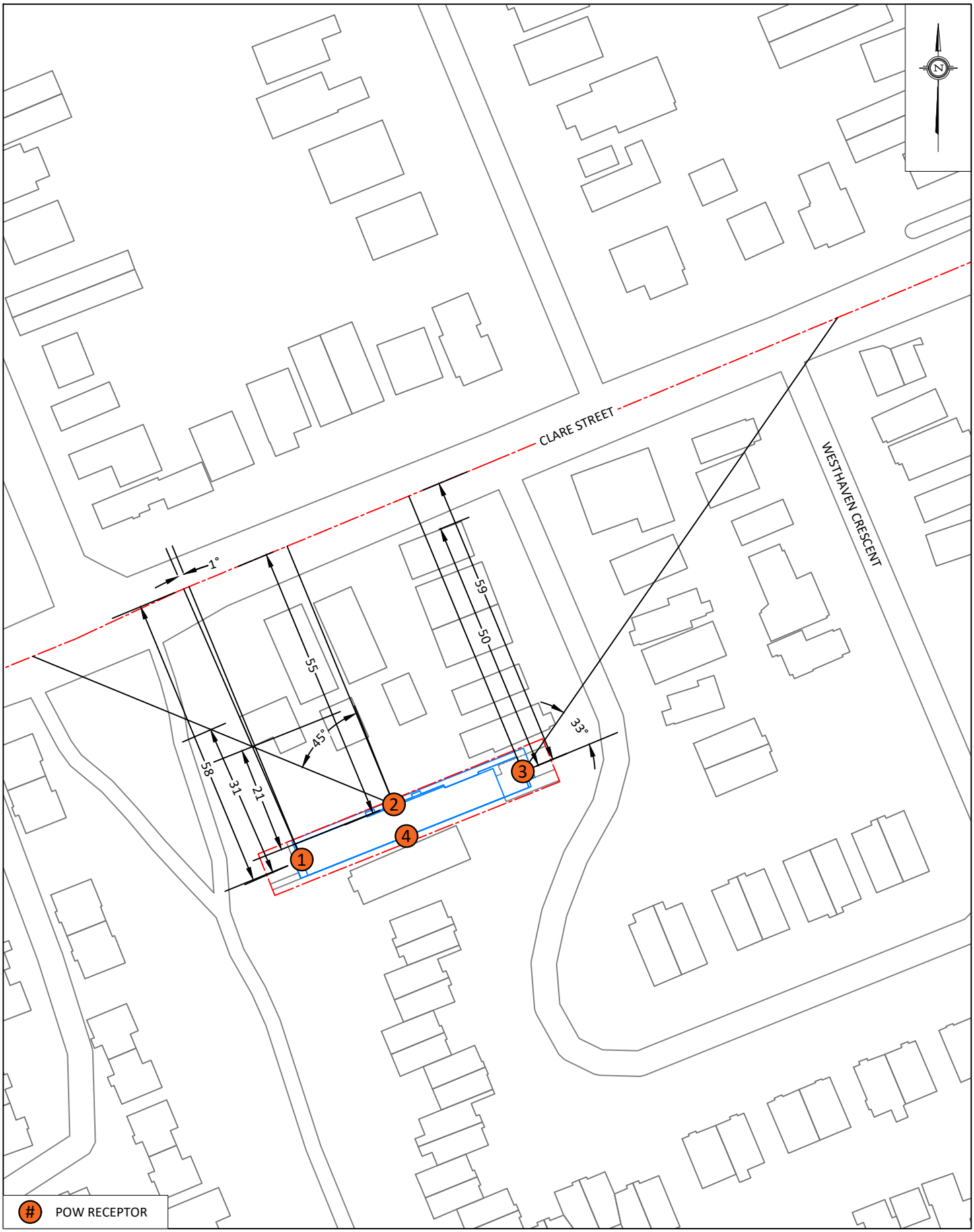
PROJECT	246 WESTHAVEN CRESCENT, OTTAWA TRAFFIC NOISE STUDY	DESCRIPTION
SCALE	1:1000	DRAWING NO. 24-018-NOISE-FIG2
DATE	MARCH 5, 2024	DRAWN BY B.P.

FIGURE 2:
RECEPTOR LOCATIONS



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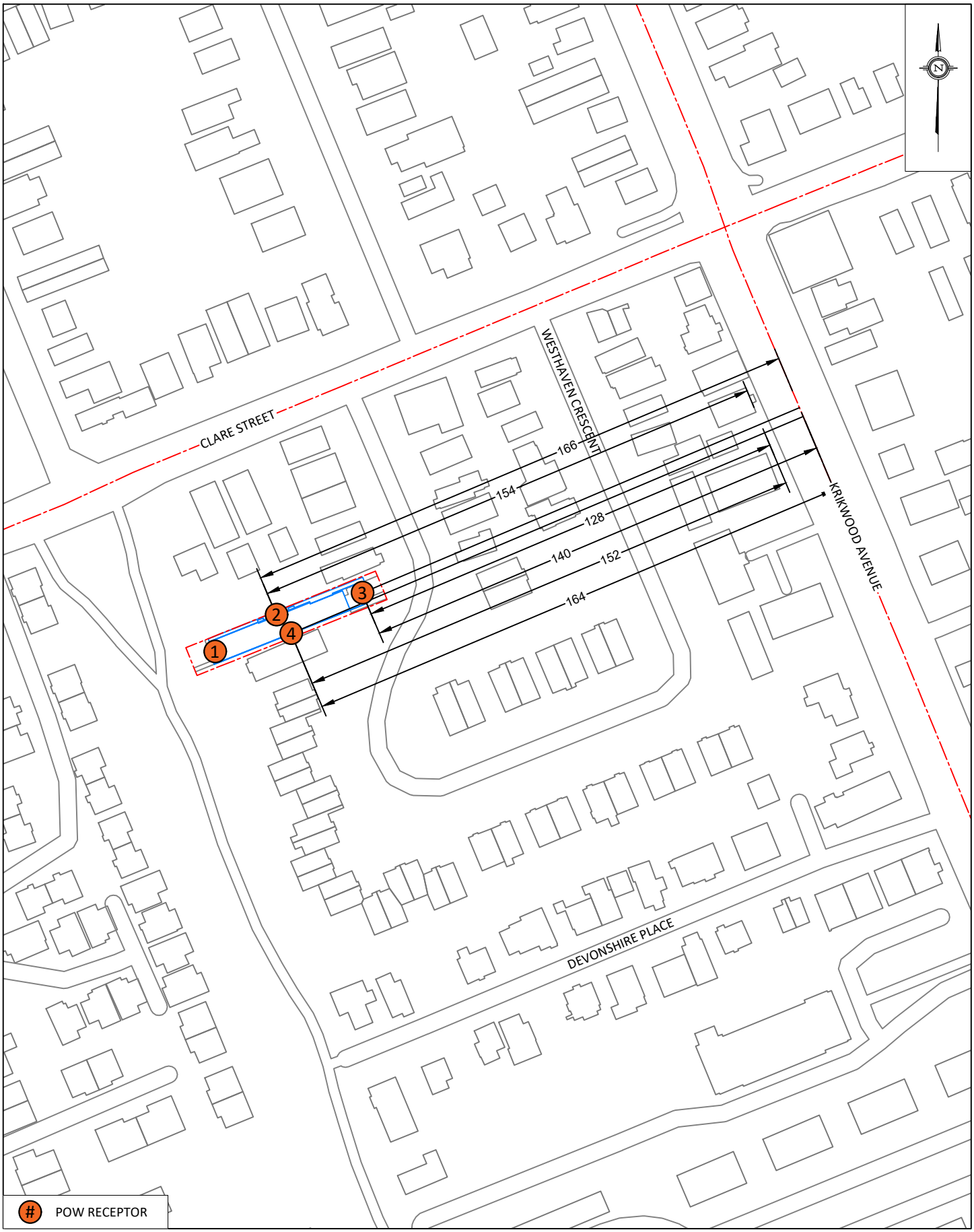
PROJECT	246 WESTHAVEN CRESCENT, OTTAWA TRAFFIC NOISE STUDY
SCALE	1:1000
DRAWING NO.	24-018-NOISE-FIG3
DATE	MARCH 5, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 3:
STAMSON INPUT PARAMETERS
CLARE STREET



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PROJECT	246 WESTHAVEN CRESCENT, OTTAWA TRAFFIC NOISE STUDY
SCALE	1:1500
DRAWING NO.	24-018-NOISE-FIG4
DATE	MARCH 5, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 4:
STAMSON INPUT PARAMETERS
KIRKWOOD AVENUE

APPENDIX A

STAMSON 5.04 INPUT AND OUTPUT DATA

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STAMSON 5.0 NORMAL REPORT Date: 29-02-2024 11:36:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R01.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: CLARE ST (day/night)

Car traffic volume : 4693/2347 veh/TimePeriod
Medium truck volume : 373/187 veh/TimePeriod
Heavy truck volume : 267/133 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: CLARE ST (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 : 58.00 / 58.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 1.00 deg
Barrier height : 9.00 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

Results segment # 1: CLARE 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 ! 7.30 ! 4.20 ! 4.20

ROAD (0.00 + 19.37 + 55.42) = 55.42 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 1 0.00 64.35 0.00 -5.87 -22.55 0.00 0.00 -16.56 19.37
---
1 90 0.00 64.35 0.00 -5.87 -3.06 0.00 0.00 0.00 55.42

Segment Leq : 55.42 dBA

Total Leq All Segments: 55.42 dBA

Results segment # 1: CLARE ST (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.49 ! 7.30 ! 4.20 ! 4.20

ROAD (0.00 + 19.36 + 55.41) = 55.42 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 1 0.00 64.35 0.00 -5.87 -22.55 0.00 0.00 -16.56 19.36
---
1 90 0.00 64.35 0.00 -5.87 -3.06 0.00 0.00 0.00 55.41

Segment Leq : 55.42 dBA

Total Leq All Segments: 55.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.42
(NIGHT): 55.42

STAMSON 5.0 NORMAL REPORT Date: 29-02-2024 34:37:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R02.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: CLARE ST (day/night)

Car traffic volume : 4693/2347 veh/TimePeriod
Medium truck volume : 373/187 veh/TimePeriod
Heavy truck volume : 267/133 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: CLARE ST (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 : 55.00 / 55.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -45.00 deg Angle2 : 90.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 21.00 / 21.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: KRIKWOOD 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 # 2: KRIKWOOD AVE (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 : 166.00 / 166.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 154.00 / 154.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: CLARE 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 ! 7.30 ! 5.08 ! 5.08

ROAD (52.69 + 44.84 + 0.00) = 53.35 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -45 0.00 64.35 0.00 -5.64 -6.02 0.00 0.00 0.00 52.69

-45 90 0.00 64.35 0.00 -5.64 -1.25 0.00 0.00 -12.62 44.84

Segment Leq : 53.35 dBA

Results segment # 2: KRIKWOOD 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 ! 7.30 ! 1.91 ! 1.91

ROAD (0.00 + 39.12 + 0.00) = 39.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 68.48 0.00 -10.44 -3.01 0.00 0.00 -15.91 39.12

Segment Leq : 39.12 dBA

Total Leq All Segments: 53.51 dBA

Results segment # 1: CLARE ST (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

1.49 ! 7.30 ! 5.08 ! 5.08

ROAD (52.68 + 44.83 + 0.00) = 53.34 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -45 0.00 64.35 0.00 -5.64 -6.02 0.00 0.00 0.00 52.68

-45 90 0.00 64.35 0.00 -5.64 -1.25 0.00 0.00 -12.63 44.83

Segment Leq : 53.34 dBA

Results segment # 2: KRIKWOOD 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 ! 7.30 ! 1.91 ! 1.91

ROAD (0.00 + 31.52 + 0.00) = 31.52 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 60.88 0.00 -10.44 -3.01 0.00 0.00 -15.91 31.52

Segment Leq : 31.52 dBA

Total Leq All Segments: 53.37 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.51
(NIGHT): 53.37

STAMSON 5.0 NORMAL REPORT Date: 29-02-2024 13:25:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R03.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: CLARE ST (day/night)

Car traffic volume : 4693/2347 veh/TimePeriod
Medium truck volume : 373/187 veh/TimePeriod
Heavy truck volume : 267/133 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: CLARE ST (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 : 59.00 / 59.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -33.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 50.00 / 50.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: KRIKWOOD 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 # 2: KRIKWOOD 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 : 140.00 / 140.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 128.00 / 128.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: CLARE 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 ! 7.30 ! 2.38 ! 2.38

ROAD (0.00 + 38.26 + 51.04) = 51.26 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -33 0.00 64.35 0.00 -5.95 -4.99 0.00 0.00 -15.15 38.26

-33 0 0.00 64.35 0.00 -5.95 -7.37 0.00 0.00 0.00 51.04

Segment Leq : 51.26 dBA

Results segment # 2: KRIKWOOD 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 ! 7.30 ! 1.99 ! 1.99

ROAD (0.00 + 42.89 + 0.00) = 42.89 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 -9.70 0.00 0.00 0.00 -15.89 42.89

Segment Leq : 42.89 dBA

Total Leq All Segments: 51.85 dBA

Results segment # 1: CLARE ST (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
---+---+---+---
1.49 ! 7.30 ! 2.38 ! 2.38

ROAD (0.00 + 38.25 + 51.03) = 51.25 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 -33 0.00 64.35 0.00 -5.95 -4.99 0.00 0.00 -15.15 38.25

-33 0 0.00 64.35 0.00 -5.95 -7.37 0.00 0.00 0.00 51.03

Segment Leq : 51.25 dBA

Results segment # 2: KRIKWOOD 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 ! 7.30 ! 1.99 ! 1.99

ROAD (0.00 + 35.30 + 0.00) = 35.30 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 -9.70 0.00 0.00 0.00 -15.89 35.30

Segment Leq : 35.30 dBA

Total Leq All Segments: 51.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.85
(NIGHT): 51.36

STAMSON 5.0 NORMAL REPORT Date: 29-02-2024 13:30:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R04.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: KRIKWOOD 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: KRIKWOOD AVE (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 : 164.00 / 164.00 m
Receiver height : 7.30 / 7.30 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
Barrier height : 9.00 m
Barrier receiver distance : 152.00 / 152.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: KRIKWOOD 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 ! 7.30 ! 1.92 ! 1.92

ROAD (0.00 + 39.18 + 0.00) = 39.18 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 -10.39 -3.01 0.00 0.00 -15.91 39.18

Segment Leq : 39.18 dBA

Total Leq All Segments: 39.18 dBA

Results segment # 1: KRIKWOOD 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 ! 7.30 ! 1.92 ! 1.92

ROAD (0.00 + 31.58 + 0.00) = 31.58 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 -10.39 -3.01 0.00 0.00 -15.91 31.58

Segment Leq : 31.58 dBA

Total Leq All Segments: 31.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 39.18
(NIGHT): 31.58