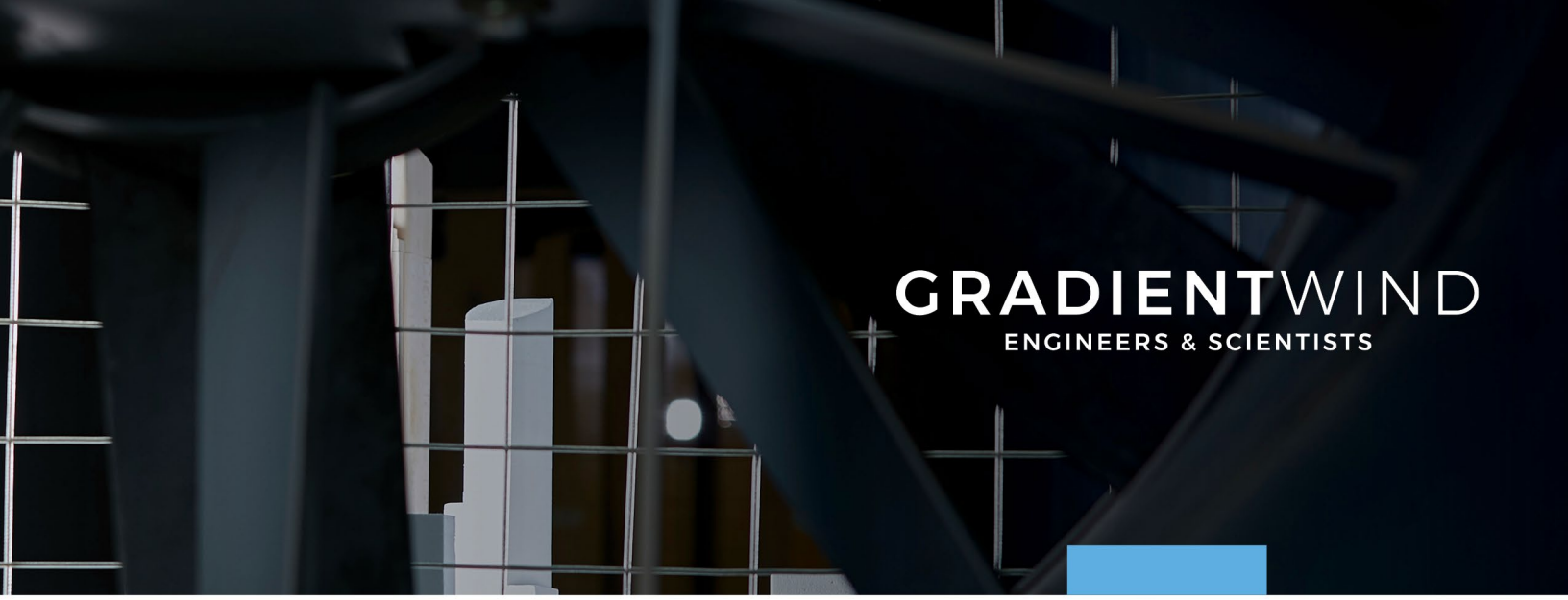

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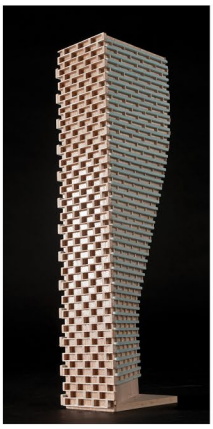
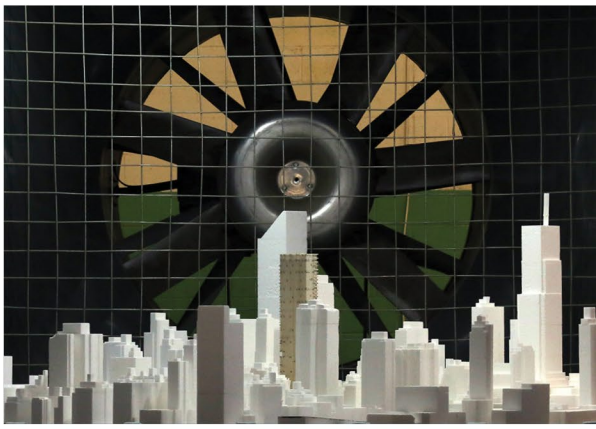
ENGINEERS & SCIENTISTS

ROADWAY TRAFFIC NOISE ASSESSMENT

6408 Renaud Road
Ottawa, Ontario

Report: 24-223 – Detailed Traffic Noise





April 9, 2026

PREPARED FOR

NCTL Homes Inc.
336 Ventoux Avenue
Ottawa, ON K4A 5L8

PREPARED BY

Sunny Kang, B.A.S., Project Coordinator
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a detailed roadway traffic noise assessment performed for a proposed residential development situated on a parallelogram-shaped parcel of land at 6408 Renaud Road in Ottawa, Ontario. The study site is bordered by Renaud Road to the north and is surrounded by green areas and low-rise residential development. Mer Bleue Catholic College (Collège Catholique Mer Bleue) is located on the northeast corner of Fern Casey Street and Renaud Road intersection across the study site. The Renaud Street façade is referred to as "North" throughout this study.

The proposed development comprises three blocks of residential buildings placed on the northwest and northeast corners and along the south side with surface parking at the centre of the site. The major sources of roadway traffic noise are Fern Casey Street, Renaud Road, and the future Fern Casey Street extension. Figure 1 illustrates the site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) a site plan by Modulink Planning & Design, dated November 2024.

The results of the current analysis indicate that noise levels will range between 57 and 68 dBA during the daytime period (07:00-23:00) and 50 and 60 dBA during the nighttime period (23:00-07:00). The highest noise level occurs along the north façade, which is most exposed to Renaud Road and Fern Casey Street.

The results of the calculations indicate that upgraded building components will be required for the road-facing façades of the buildings (see Figure 6). Building components compliant with the Ontario Building Code (OBC 2020) will be sufficient for the remaining façades.

The results of the calculations also indicate that the dwelling units on the roadsides will require central air conditioning, or a similar mechanical system (see Figure 7). A Type D Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

For all the remaining dwelling units, provision for forced air heating and air conditioning will be required (see Figure 7). A Type C Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

There are no outdoor living areas (OLA) associated with this development. Balconies of less than 4 m in depth are not considered as point of assessment for a noise study. The landscaped area south of the proposed utility building labelled amenity area, is also not an OLA because it is not immediately accessible from the buildings and will function more as a parkette which is not considered OLA as per the ENCG.

No major pieces of mechanical equipment are expected to be associated with the development, thus impacts of stationary noise sources on the surroundings and the development itself will be negligible.

The surroundings comprise existing and future low-rise residential buildings except the Mer Bleue Catholic College (Collège Catholique Mer Bleue), which is located across the study site. The noise impact from the small equipment located on the rooftop of the Mer Bleue Catholic College will be mitigated by the upgraded STC components of the building.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by NCTL Homes Inc. to undertake a roadway traffic noise assessment for the proposed residential development located at 6408 Renaud Road in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to the assessment of exterior noise levels generated by local roadway traffic.

This assessment is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and the Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on a site plan prepared by Modulink Planning & Design, dated November 2024, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

This detailed roadway traffic noise assessment focuses on the proposed residential development situated on a parallelogram-shaped parcel of land at 6408 Renaud Road in Ottawa, Ontario. The study site is bordered by Renaud Road to the north and is surrounded by green areas and low-rise residential development. Mer Bleue Catholic College (Collège Catholique Mer Bleue) is located on the northeast corner of Fern Casey Street and Renaud Road intersection across the study site. The Renaud Street façade is referred to as "North" throughout this study.

The proposed development comprises three blocks of residential buildings placed on the northwest and northeast corners and along the south side with surface parking at the centre of the site. There are no outdoor living areas (OLA) associated with this development. Balconies of less than 4 m in depth are not considered as point of assessment for a noise study. The landscaped area south of the proposed utility building labeled amenity area, is also not an OLA because it is not immediately accessible from the buildings and will function more as a landscape buffer which is not considered OLA as per the ENCG.

[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 major sources of roadway traffic noise are Fern Casey Street, Renaud Road, and the future Fern Casey Street extension. Figure 1 illustrates the site plan with the surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) ensure that interior and exterior noise levels do not exceed the allowable limits specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG) 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 level 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 sound pressure 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 vehicular traffic, 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 and LRT, 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) for roadways is 45 and 40 dBA for living rooms and sleeping quarters, respectively, as listed in Table 1.

TABLE 1: INDOOR SOUND LEVEL CRITERIA

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[3]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[4]. 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[5].

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 below 60 dBA.

[3] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[4] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[5] MECP, 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 roadway noise analysis. Noise receptors were strategically identified at five (5) locations around the study area, as illustrated in Figure 2. Roadway noise calculations were performed by treating each road segment as separate line sources of noise, and by using existing and proposed building locations as noise barriers. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all roads was taken to be 92% / 8%, respectively.
- Ground surfaces were taken to be absorptive due to the presence of soft ground (lawns and grassland).
- Topography was assumed to be a flat/gentle slope surrounding the study site.
- A total of five (5) receptors were placed strategically around the study site.
- POW receptor heights were taken to be at the centre of the Level 3 windows at 7.5 metres.
- The receptor distances to roadway traffic and exposure angles are illustrated in Figures 3-5.

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[6] 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.

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

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Renaud Road	2-Lane Urban Collector (2-UCU)	50	**8,000**
Fern Casey Street	4-Lane Major Collector (4-UMCU)	60	**24,000**
Future Fern Casey Street	2-Lane Major Collector (2-UMCU)	50	**12,000**

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 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 4.2.1, 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. The calculation procedure[7] considers:

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

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

Based on published research[8], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, 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. ROADWAY TRAFFIC NOISE 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 is available in Appendix A.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Type/Location	Noise Level (dBA)	
			Day	Night
1	7.5	POW – North Façade – Level 3	68	60
2	7.5	POW – Northeast Façade – Level 3	62	54
3	7.5	POW – Southeast Façade – Level 3	57	50
4	7.5	POW – Southwest Façade – Level 3	66	58
5	7.5	POW – Northwest Façade – Level 3	66	58

The results of the current analysis indicate that noise levels will range between 57 and 68 dBA during the daytime period (07:00-23:00) and 50 and 60 dBA during the nighttime period (23:00-07:00). The highest noise level occurs along the north façade, which is most exposed to Renaud Road and Fern Casey Street.

The results of the calculations indicate that upgraded building components will be required for the road-facing façades of the buildings (see Figure 6). Building components compliant with the Ontario Building Code (OBC 2020) will be sufficient for the remaining façades.

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

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the 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).

Where specific updated building components are not identified, bedroom/living room windows and walls are to satisfy Ontario Building Code (OBC 2020) requirements.

The STC requirements for the windows are summarized below (see Figure 6).

- **Bedroom Windows and Living Room Windows**

(i) Windows facing Renaud Road and Future Fern Casey Street will require a minimum STC of 30.

- **Exterior Walls**

(i) Exterior wall components on all façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[9]

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 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.

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

The results of the calculations also indicate that the dwelling units on the roadsides will require central air conditioning, or a similar mechanical system, and the remaining dwelling units will require provision for forced air heating and air conditioning (see Figure 7). Warning clauses will also be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 57 and 68 dBA during the daytime period (07:00-23:00) and 50 and 60 dBA during the nighttime period (23:00-07:00). The highest noise level occurs along the north façade, which is most exposed to Renaud Road and Fern Casey Street.

The results of the calculations indicate that upgraded building components will be required for the road-facing façades of the buildings (see Figure 6). Building components compliant with the Ontario Building Code (OBC 2020) will be sufficient for the remaining façades.

The results of the calculations also indicate that the dwelling units on the roadsides will require central air conditioning, or a similar mechanical system (see Figure 7). A Type D Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized below:

Type D

> *"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."*

For all the remaining dwelling units, provision for forced air heating and air conditioning will be required (see Figure 7). A Type C Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized below:

Type C

> *"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."*

There are no outdoor living areas (OLA) associated with this development. Balconies of less than 4 m in depth are not considered as point of assessment for a noise study. The landscaped area south of the proposed utility building labelled amenity area, is also not an OLA because it is not immediately accessible from the buildings and will function more as a parkette which is not considered OLA as per the ENCG.

No major pieces of mechanical equipment are expected to be associated with the development, thus impacts of stationary noise sources on the surroundings and the development itself will be negligible.

The surroundings comprise existing and future low-rise residential buildings except the Mer Bleue Catholic College (Collège Catholique Mer Bleue), which is located across the study site. The noise impact from the small equipment located on the rooftop of the Mer Bleue Catholic College will be mitigated by the upgraded STC components of the building.

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.

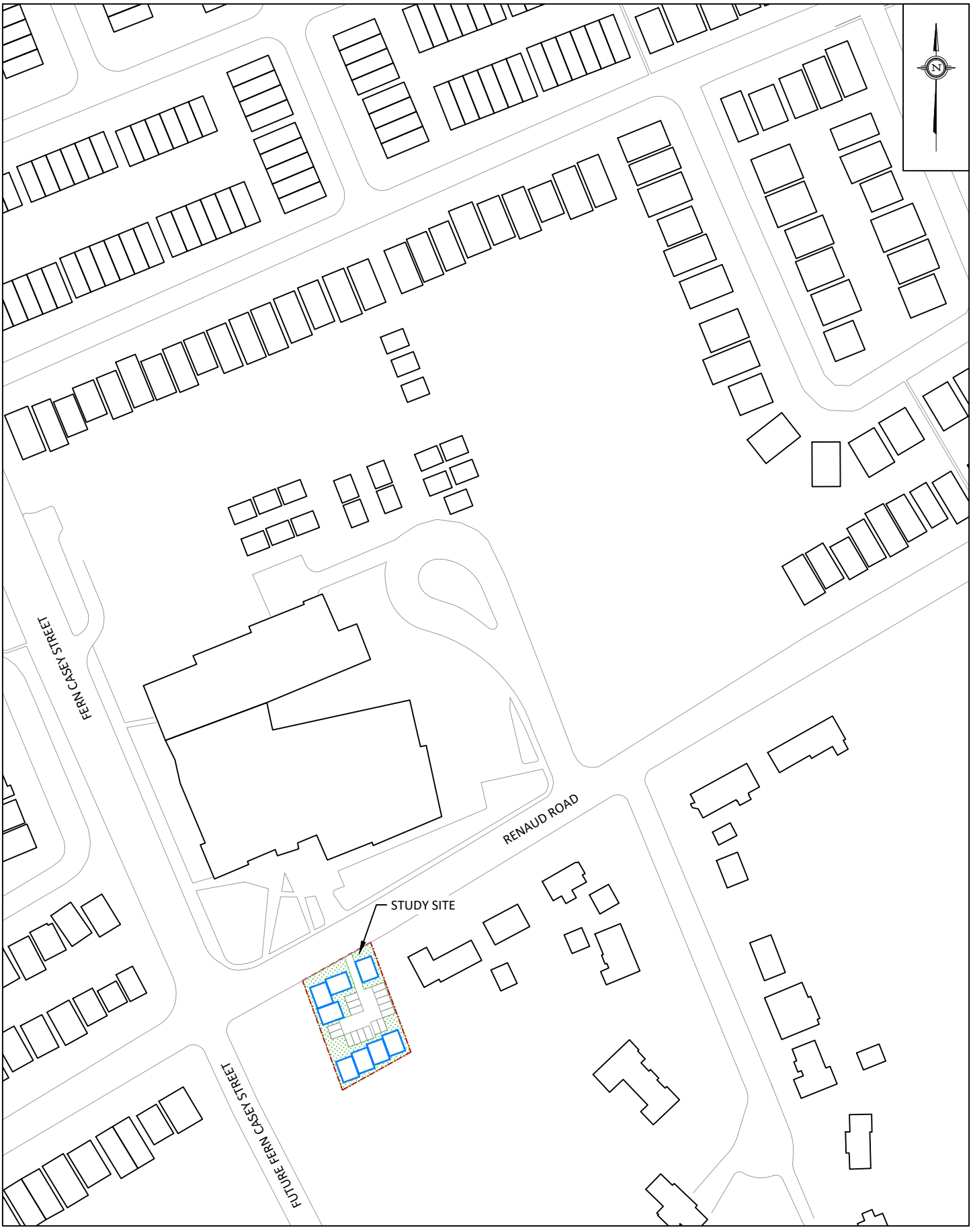
Sincerely,

Gradient Wind Engineering Inc.

Sunny Kang, B.A.S.
Project Coordinator

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #24-223 – Detailed Traffic Noise



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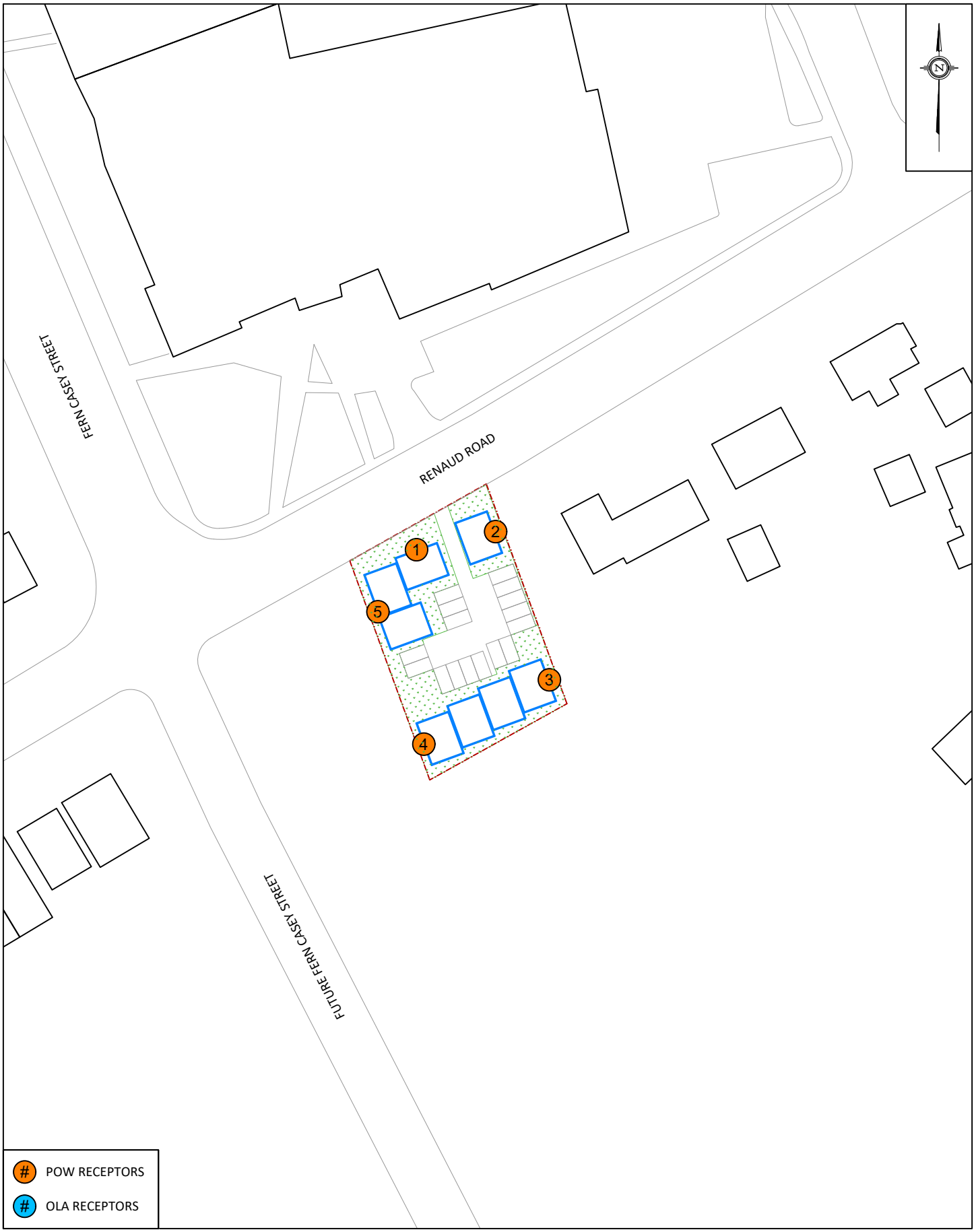
SCALE	1:2000 (APPROX.)
DRAWING NO.	24-223 - 1
DATE	DECEMBER 16, 2024
DRAWN BY	E.K.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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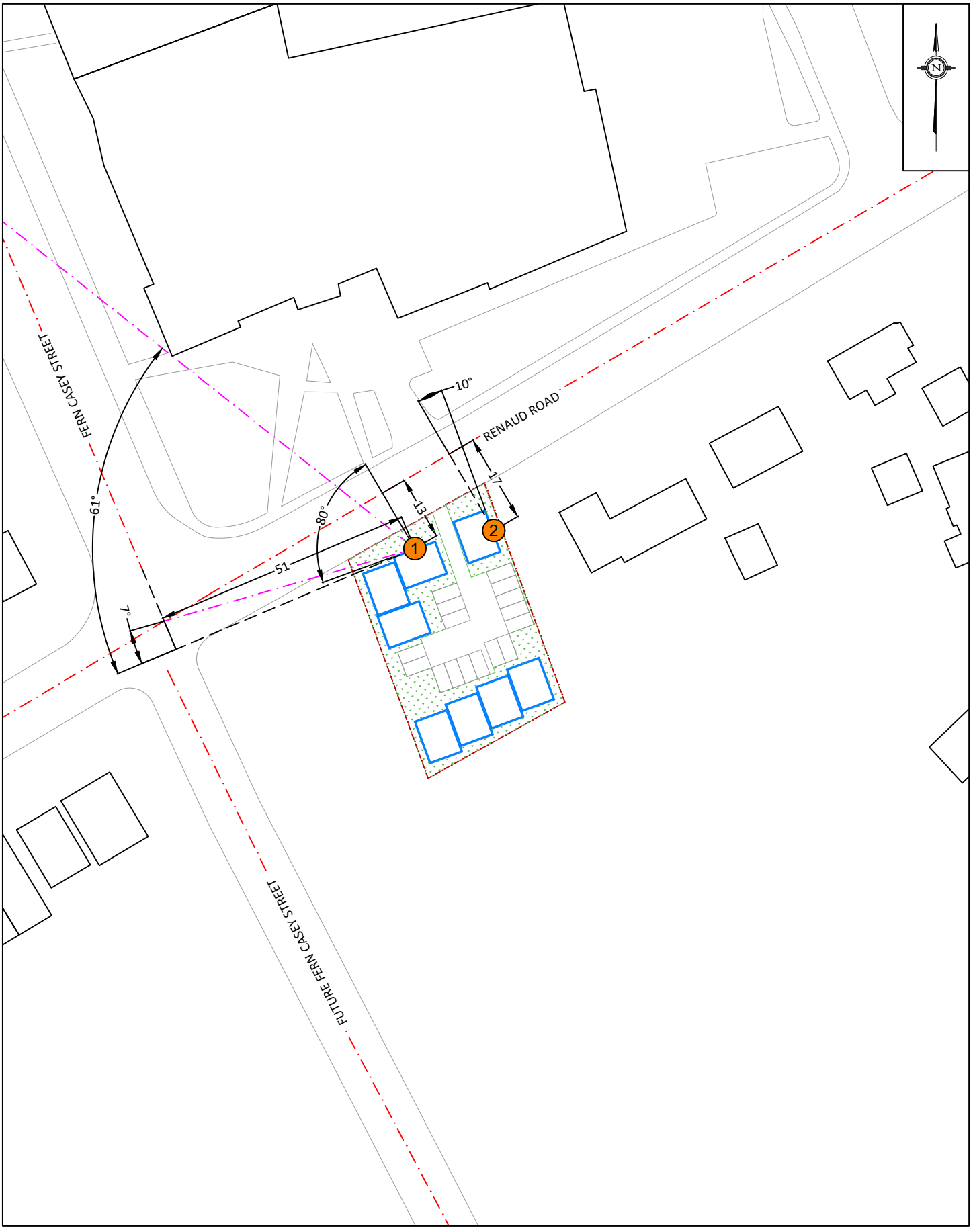
SCALE	1:1000 (APPROX.)
DRAWING NO.	24-223 - 2
DATE	DECEMBER 16, 2024
DRAWN BY	E.K.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS



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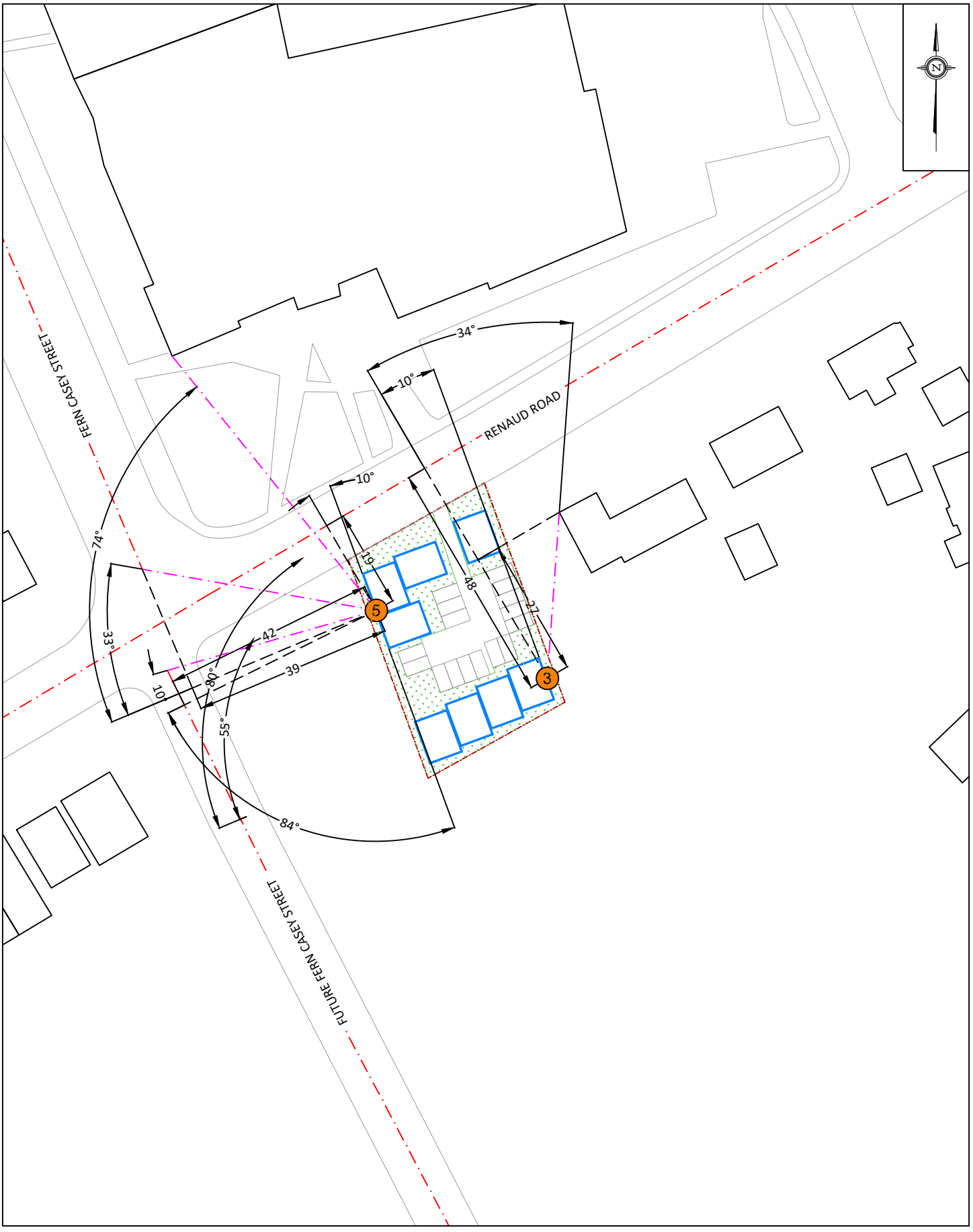
SCALE	1:1000 (APPROX.)	DRAWING NO.	24-223 - 3
DATE	DECEMBER 16, 2024	DRAWN BY	E.K.

FIGURE 3:
LOCATIONS OF RECEPTORS 1 & 2



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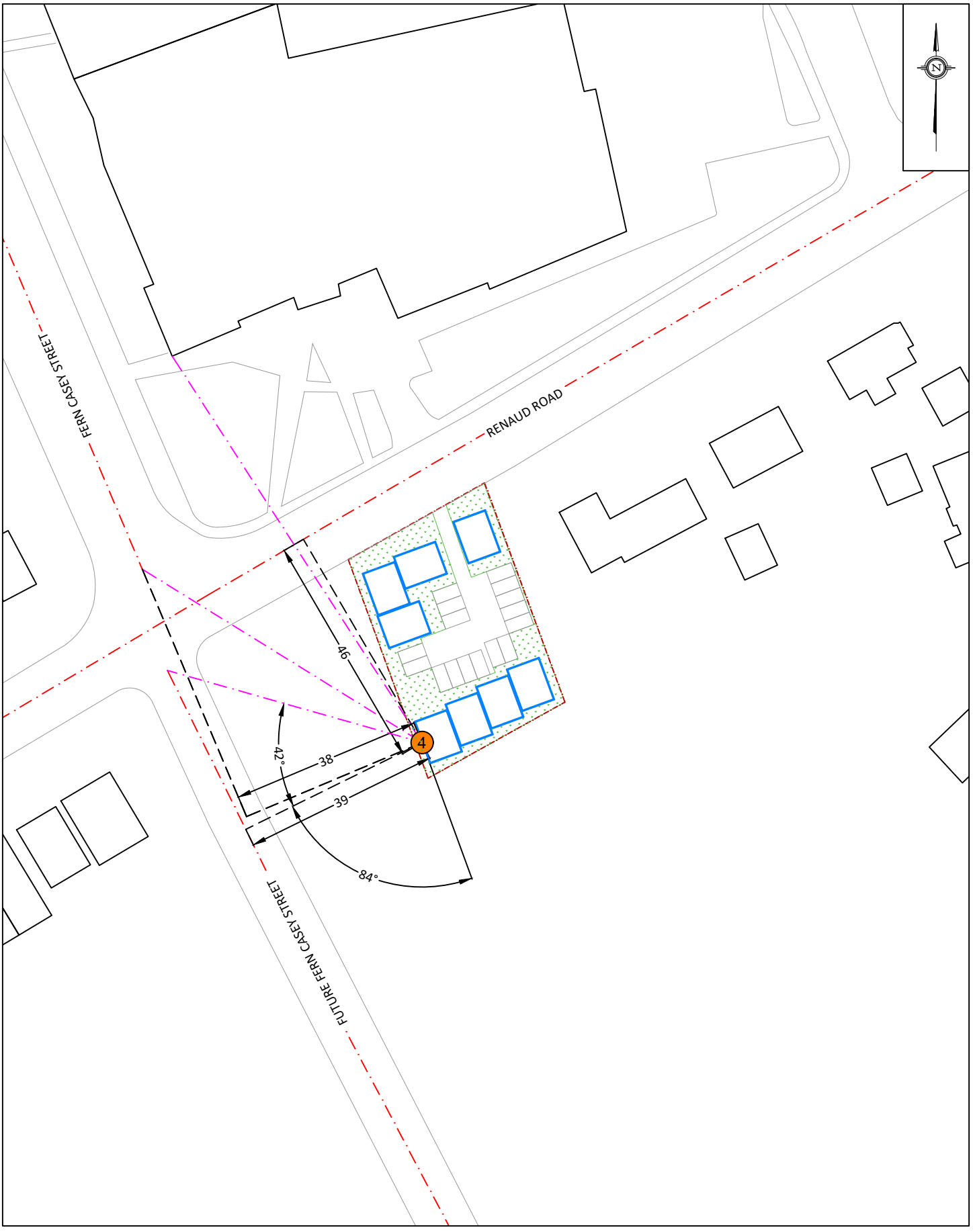
SCALE	1:1000 (APPROX.)
DRAWING NO.	24-223 - 4
DATE	DECEMBER 16, 2024
DRAWN BY	E.K.

DESCRIPTION

FIGURE 4:
LOCATIONS OF RECEPTORS 3 & 5



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DATE	DECEMBER 16, 2024	DRAWN BY	E.K.

FIGURE 5:
LOCATION OF RECEPTOR 4

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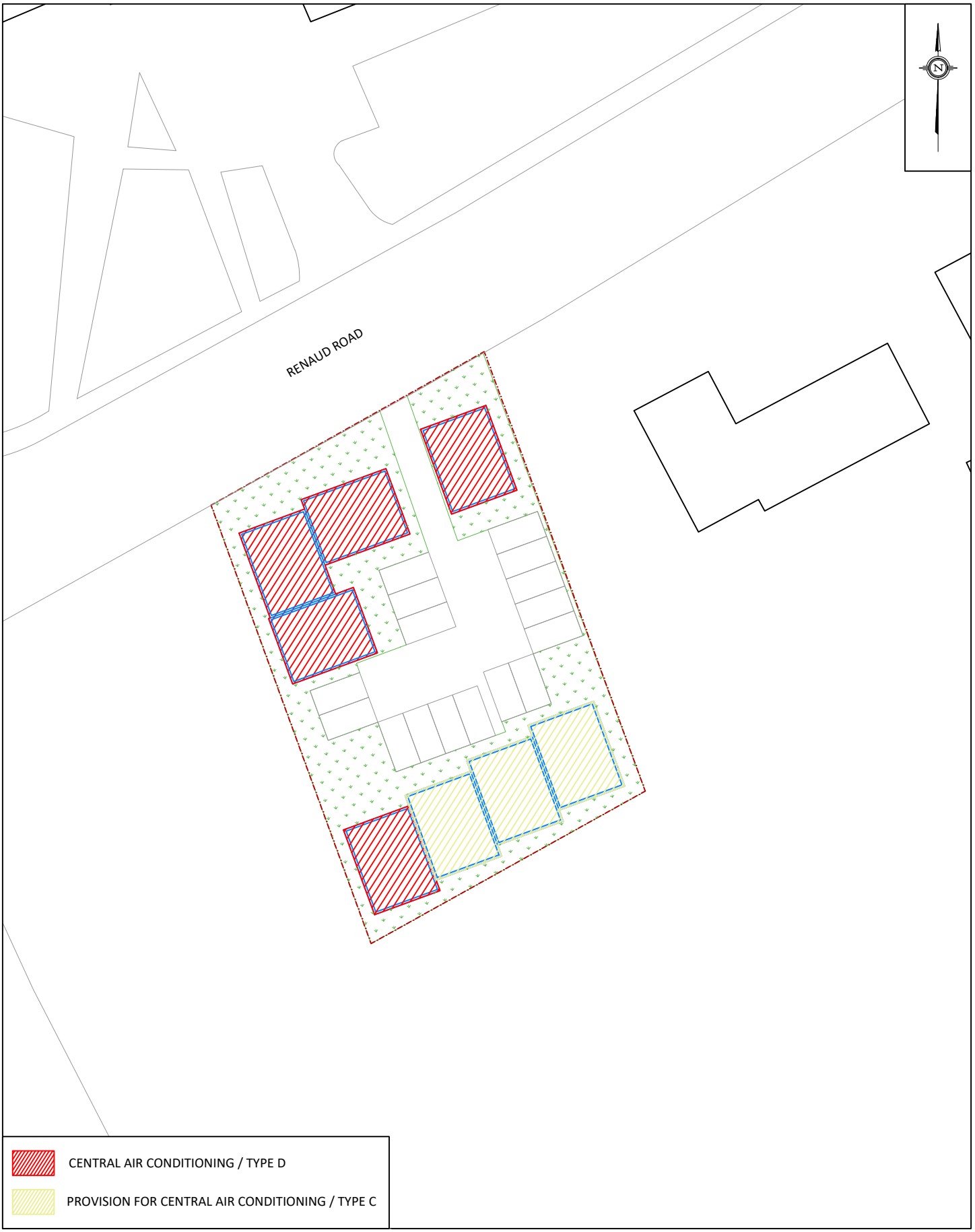
SCALE	1:500 (APPROX.)
DRAWING NO.	24-223 - 6
DATE	DECEMBER 16, 2024
DRAWN BY	E.K.
DESCRIPTION	FIGURE 6: STC REQUIREMENTS



CENTRAL AIR CONDITIONING / TYPE D

PROVISION FOR CENTRAL AIR CONDITIONING / TYPE C

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SCALE	1:500 (APPROX.)
DRAWING NO.	24-223 - 7
DATE	DECEMBER 16, 2024
DRAWN BY	E.K.
DESCRIPTION	FIGURE 7: VENTILATION REQUIREMENTS

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 17:34:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Renaud Rd (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Renaud Rd (day/night)

Angle1 Angle2 : -80.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 19430/1690 veh/TimePeriod *
Medium truck volume : 1546/134 veh/TimePeriod *
Heavy truck volume : 1104/96 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24000
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: FernCasey (day/night)

Angle1 Angle2 : 7.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 51.00 / 51.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Renaud Rd (day)

Source height = 1.50 m

ROAD (0.00 + 65.50 + 0.00) = 65.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	65.75	0.00	0.00	-0.25	0.00	0.00	0.00	65.50

Segment Leq : 65.50 dBA

Results segment # 2: FernCasey (day)

Source height = 1.50 m

ROAD (0.00 + 63.36 + 0.00) = 63.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
7	90	0.00	72.04	0.00	-5.31	-3.36	0.00	0.00	0.00	63.36

Segment Leq : 63.36 dBA

Total Leq All Segments: 67.57 dBA

Results segment # 1: Renaud Rd (night)

Source height = 1.50 m

ROAD (0.00 + 57.91 + 0.00) = 57.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	58.16	0.00	0.00	-0.25	0.00	0.00	0.00	57.91

Segment Leq : 57.91 dBA

Results segment # 2: FernCasey (night)

Source height = 1.50 m

ROAD (0.00 + 55.76 + 0.00) = 55.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
7	90	0.00	64.44	0.00	-5.31	-3.36	0.00	0.00	0.00	55.76

Segment Leq : 55.76 dBA

Total Leq All Segments: 59.98 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.57
(NIGHT): 59.98

STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 18:08:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Renaud Rd (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Renaud Rd (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 : 17.00 / 17.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Renaud Rd (day)

Source height = 1.50 m

ROAD (0.00 + 61.68 + 0.00) = 61.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	90	0.00	65.75	0.00	-0.54	-3.52	0.00	0.00	0.00	61.68

Segment Leq : 61.68 dBA

Total Leq All Segments: 61.68 dBA

Results segment # 1: Renaud Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.09 + 0.00) = 54.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	90	0.00	58.16	0.00	-0.54	-3.52	0.00	0.00	0.00	54.09

Segment Leq : 54.09 dBA

Total Leq All Segments: 54.09 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.68
(NIGHT): 54.09

STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 18:07:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Renaud Rd (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Renaud Rd (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 : 48.00 / 48.00 m
Receiver height : 7.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 10.00 deg Angle2 : 34.00 deg
Barrier height : 4.00 m
Barrier receiver distance : 27.00 / 27.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Renaud Rd (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 ! 7.50 ! 4.12 ! 4.12

ROAD (0.00 + 51.95 + 55.63) = 57.18 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
10 34 0.00 65.75 0.00 -5.05 -8.75 0.00 0.00 -4.97 46.98*
10 34 0.00 65.75 0.00 -5.05 -8.75 0.00 0.00 0.00 51.95
---
34 90 0.00 65.75 0.00 -5.05 -5.07 0.00 0.00 0.00 55.63
---

* Bright Zone !

Segment Leq : 57.18 dBA

Total Leq All Segments: 57.18 dBA

Results segment # 1: Renaud Rd (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 ! 7.50 ! 4.12 ! 4.12

ROAD (0.00 + 44.35 + 48.03) = 49.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
10	34	0.00	58.16	0.00	-5.05	-8.75	0.00	0.00	-4.97	39.39*
10	34	0.00	58.16	0.00	-5.05	-8.75	0.00	0.00	0.00	44.35
34	90	0.00	58.16	0.00	-5.05	-5.07	0.00	0.00	0.00	48.03

* Bright Zone !

Segment Leq : 49.58 dBA

Total Leq All Segments: 49.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.18
(NIGHT): 49.58

STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 17:54:53
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Renaud Rd (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Renaud Rd (day/night)

Angle1 Angle2 : -80.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.00 / 46.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 19430/1690 veh/TimePeriod *
Medium truck volume : 1546/134 veh/TimePeriod *
Heavy truck volume : 1104/96 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24000
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: FernCasey (day/night)

Angle1 Angle2 : 55.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 38.00 / 38.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: FutFernCasey (day/night)

Angle1 Angle2 : -84.00 deg 42.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.00 / 39.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Renaud Rd (day)

Source height = 1.50 m

ROAD (0.00 + 60.63 + 0.00) = 60.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	65.75	0.00	-4.87	-0.25	0.00	0.00	0.00	60.63

Segment Leq : 60.63 dBA

Results segment # 2: FernCasey (day)

Source height = 1.50 m

ROAD (0.00 + 59.43 + 0.00) = 59.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
55	80	0.00	72.04	0.00	-4.04	-8.57	0.00	0.00	0.00	59.43

Segment Leq : 59.43 dBA

Results segment # 3: FutFernCasey (day)

Source height = 1.50 m

ROAD (0.00 + 61.81 + 0.00) = 61.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	42	0.00	67.51	0.00	-4.15	-1.55	0.00	0.00	0.00	61.81

Segment Leq : 61.81 dBA

Total Leq All Segments: 65.50 dBA

Results segment # 1: Renaud Rd (night)

Source height = 1.50 m

ROAD (0.00 + 53.04 + 0.00) = 53.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	90	0.00	58.16	0.00	-4.87	-0.25	0.00	0.00	0.00	53.04

Segment Leq : 53.04 dBA

Results segment # 2: FernCasey (night)

Source height = 1.50 m

ROAD (0.00 + 51.83 + 0.00) = 51.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
55	80	0.00	64.44	0.00	-4.04	-8.57	0.00	0.00	0.00	51.83

Segment Leq : 51.83 dBA

Results segment # 3: FutFernCasey (night)

Source height = 1.50 m

ROAD (0.00 + 54.21 + 0.00) = 54.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	42	0.00	59.91	0.00	-4.15	-1.55	0.00	0.00	0.00	54.21

Segment Leq : 54.21 dBA

Total Leq All Segments: 57.91 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.50
(NIGHT): 57.91

STAMSON 5.0 NORMAL REPORT Date: 17-12-2024 17:49:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Renaud Rd (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Renaud Rd (day/night)

Angle1 Angle2 : -90.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 19430/1690 veh/TimePeriod *
Medium truck volume : 1546/134 veh/TimePeriod *
Heavy truck volume : 1104/96 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 24000
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: FernCasey (day/night)

Angle1 Angle2 : 33.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.00 / 39.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: FutFernCasey (day/night)

Angle1 Angle2 : -84.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.00 / 42.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Renaud Rd (day)

Source height = 1.50 m

ROAD (0.00 + 62.17 + 0.00) = 62.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	10	0.00	65.75	0.00	-1.03	-2.55	0.00	0.00	0.00	62.17

Segment Leq : 62.17 dBA

Results segment # 2: FernCasey (day)

Source height = 1.50 m

ROAD (0.00 + 61.25 + 0.00) = 61.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
33	72	0.00	72.04	0.00	-4.15	-6.64	0.00	0.00	0.00	61.25

Segment Leq : 61.25 dBA

Results segment # 3: FutFernCasey (day)

Source height = 1.50 m

ROAD (0.00 + 60.22 + 0.00) = 60.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	10	0.00	67.51	0.00	-4.47	-2.82	0.00	0.00	0.00	60.22

Segment Leq : 60.22 dBA

Total Leq All Segments: 66.06 dBA

Results segment # 1: Renaud Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.58 + 0.00) = 54.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	10	0.00	58.16	0.00	-1.03	-2.55	0.00	0.00	0.00	54.58

Segment Leq : 54.58 dBA

Results segment # 2: FernCasey (night)

Source height = 1.50 m

ROAD (0.00 + 53.65 + 0.00) = 53.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
33	72	0.00	64.44	0.00	-4.15	-6.64	0.00	0.00	0.00	53.65

Segment Leq : 53.65 dBA

Results segment # 3: FutFernCasey (night)

Source height = 1.50 m

ROAD (0.00 + 52.62 + 0.00) = 52.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	10	0.00	59.91	0.00	-4.47	-2.82	0.00	0.00	0.00	52.62

Segment Leq : 52.62 dBA

Total Leq All Segments: 58.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.06
(NIGHT): 58.46