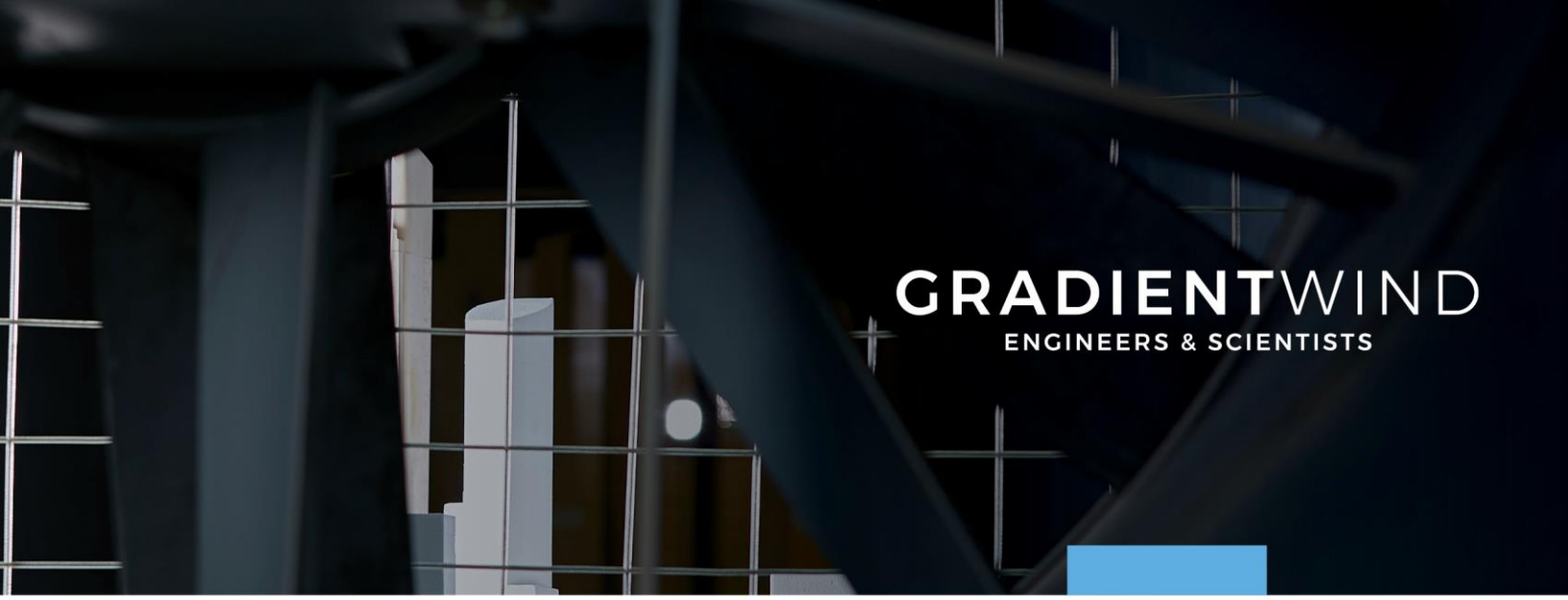
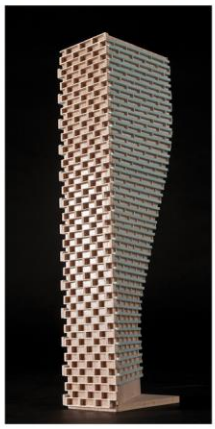


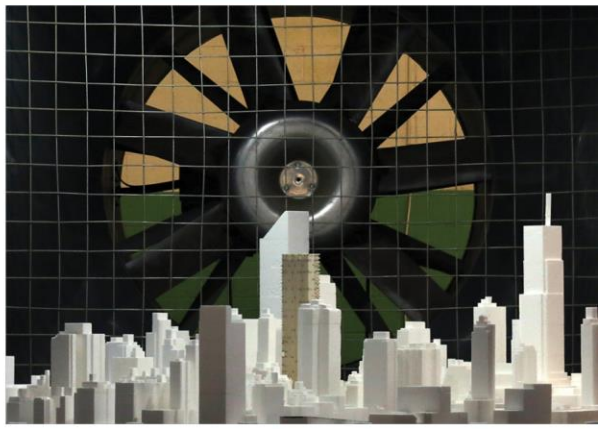
GRADIENTWIND
ENGINEERS & SCIENTISTS

ROADWAY TRAFFIC NOISE ASSESSMENT

1184, 1188, & 1196 Cummings Avenue
Ottawa, Ontario

Report: 23-052–Traffic Noise





April 6, 2023

PREPARED FOR

TCU
1207-150 Isabella Street
Ottawa, ON K1S 5H3

PREPARED BY

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

EXECUTIVE SUMMARY

This report describes a traffic noise assessment undertaken in support of a Zoning By-Law Amendment (ZBA) and Site Plan Control Application (SPA) submission, for the proposed development located at 1184, 1188, and 1196 Cummings Avenue in Ottawa, Ontario. The study site is situated on the east side of a parcel of land bounded by Weldon Drive to the north, Cummings Avenue to the east, low-rise residential buildings to the west and a commercial site to the south which is bordered by Ogilvie Road.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MOECP) 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) site plan drawings prepared by Project1 Studio Incorporated, dated March 2023.

The results of the analysis indicated that noise levels at Plane of Window (POW) receptors will range between 61 and 69 dBA during the daytime period (07:00-23:00) and between 54 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels (68 and 69 dBA) occur at the east and south façades of the study building which are nearest and most exposed to Cummings Avenue and Ogilvie Road.

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 dwellings of the development. In addition, a Type D warning clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

As the noise level at OLA receptor 5 located at the Amenity Level 5 terrace is above the ENCG criteria, a 1.1-metre standard high barrier or parapet wall surrounding the terrace will be sufficient to reduce the noise levels (see Figure 7). The noise barrier for the terrace can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain gaps. Glass railing can be built as glass-to-glass or the gap between the glass and balusters can be avoided. Noise barriers should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps. In addition, a Type B warning clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

Gradient Wind conducted a survey of the study site, using the satellite view of the area; the study site is surrounded by a mix of low-rise residential and commercial buildings. The existing stationary noise sources are either small or the direct line of sight between the sources and the study site is blocked. Moreover, the background noise around the study site will be dominated by roadway traffic noise Therefore, no significant stationary noise impact on the proposed development is anticipated.

With regards to the impacts of the proposed building on the surroundings and itself, by careful placing and judicious selection of noise-generating equipment like cooling towers, chillers, and generators, stationary noise impact from the proposed building can comply with the sound level limits defined in ENCG and NPC-300. Where necessary, noise screens, silencers, and other noise control measures can be added.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by TCU to undertake a roadway traffic noise assessment for a proposed subdivision development located at 1184, 1188, and 1196 Cummings Avenue 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 site plans provided by Project1 Studio Incorporated, dated March, 2023, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications and theoretical capacities.

2. TERMS OF REFERENCE

The focus of this traffic noise assessment is a proposed development located at 1184, 1188, and 1196 Cummings Avenue in Ottawa, Ontario.

ARCHITECTURAL RENDERING, SOUTHWEST PERSPECTIVE (COURTESY OF OPEN PROJECT1 STUDIO INC.)

The study site is surrounded by low-rise residential buildings to the north, east, and west, and a commercial site to the south. Weldon Drive to the north and Cummings Avenue to the east border the site. An arterial roadway, Ogilvie Road runs to the south.

The proposed development comprises a six-storey residential building with an 'L' shaped planform and below-grade parking. The building contains residential units at each level, bicycle storage and outdoor parking at grade. The floorplate sets back at Level 5 creating a terrace to the west. The proposed building is topped by a mechanical penthouse and a rooftop amenity terrace.

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

ENCG and NPC-300 consider balconies and elevated terraces (e.g., rooftops), with a minimum depth of 4 metres, as outdoor living areas (OLA). Therefore, terraces only with a depth greater than 4 metres are included as OLAs in this study. The OLAs that were assessed in this study are the amenity Level 5 terrace, at-grade outdoor communal spaces, and the amenity rooftop terrace.

The primary sources of roadway traffic noise impacting the study site are Cummings Avenue and Ogilvie Road. Figure 1 illustrates the study site 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 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) specify 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

[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] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8

for forced air heating with provision for central air conditioning. Where roadway noise levels exceed 65 dBA daytime and 60 dBA nighttime, central 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 (07:00 to 23:00). When noise levels exceed 55 dBA but are less than 60 dBA, mitigation should be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. If noise levels exceed 60 dBA at OLAs, mitigation is required to reduce the noise levels to or below 60 dBA. If these measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by the associated warning clause.

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 ground (pavement and concrete).
- Noise receptors were strategically placed at eight (8) locations around the study area (see Figure 2).
- POW receptor heights were taken to be 17 metres at the centre of the highest-level window, based on ENCG recommendations.

[6] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

- The OLA receptor on the amenity Level 5 terrace was positioned at 15 metres and on the amenity rooftop terrace was positioned at 19.65 metres (both 1.5 metres above the walking surface) while at-grade outdoor communal space OLAs were positioned at 1.5 metres above grade.
- Receptor locations are illustrated in Figure 2 and distances 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[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/hr)	Traffic Volumes
Cummings Avenue	2-Lane Major Collector (2-UMCU)	50	12,000
Ogilvie Road	4-lane Urban Arterial-Divided (4-UAD)	60	35,000

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

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

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 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 and exterior assemblies 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).

5. RESULTS

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. The results of the analysis indicated that noise levels at Plane of Window (POW) receptors will range between 61 and 69 dBA during the daytime period (07:00-23:00) and between 54 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels (68 and 69 dBA) occur at the east and south façades of the study building which are nearest and most exposed to Cummings Avenue and Ogilvie Road.

[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

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROADWAY TRAFFIC

Receptor ID / Type	Receptor Location	Receptor Height (m)	STAMSON Noise Level (dBA)	
			Day	Night
R1 / POW	East Façade	17	69	61
R2 / POW	South Façade	17	68	61
R3 / POW	West Façade	17	61	54
R4 / POW	North Façade	17	62	55
R5 / OLA	Amenity Level 5 Terrace	15	62	N/A*
R6 / OLA	At-grade Outdoor Communal Space	1.5	53	N/A*
R7 / OLA	At-grade Outdoor Communal Space	1.5	60	N/A*
R8 / OLA	Amenity Rooftop Terrace	19.65	56	N/A*

* Outdoor Living Areas (OLA) during the nighttime are not considered as per the ENCG

The noise level at the OLA receptor 5 located at the amenity Level 5 terrace is higher than 60 dBA, therefore a barrier study was conducted to reduce the noise level below 60 dBA.

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 4.2.1, 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). The STC requirements for the windows are summarized below for various units within the development (see Figure 5):

- **Bedroom Windows**
  - (i) Bedroom windows facing east and south will require a minimum STC of 32
  - (ii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2020) requirements

- **Living Room Windows**
  - (i) Living room windows facing east and south will require a minimum STC of 27
  - (ii) All other living room windows are to satisfy Ontario Building Code (OBC 2020) requirements

- **Exterior Walls**
  - (i) Exterior wall components on the façades mentioned above will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data.[10]

Exterior wall components on these façades are recommended to have a minimum STC of 45, which is achievable with a wood frame exterior wall construction with resilient channel placed on the inside of the studs and using two layers of 16 mm gypsum board. Alternatively, a brick cladding could be 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 specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to the swinging and/or sliding patio doors.

5.2.1 Noise Barrier Calculations

The noise level at the OLA receptor 5 located at the Amenity Level 5 terrace is higher than 60 dBA, therefore a barrier investigation was conducted to reduce the noise level at or below 60 dBA.

The result of the analysis shows that a 1.1-metre standard high barrier or parapet wall surrounding the terrace will be sufficient to reduce the noise levels. The noise barrier for the terrace can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain gaps. Glass railing can be built as glass-to-glass or the gap between the glass and balusters can be avoided.

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

Noise barriers should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps.

In addition, a Type B warning clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6. Table 5 summarizes the results of the barrier investigation.

TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor ID	Above Grade Receptor Height (m)	Receptor Location	Barrier Height Above Walking Surface (m)	Daytime L_{eq} Noise Levels (dBA)	
				Without Barrier	With Barrier
R5	15 (Terrace surface + 1.5 m)	Amenity Level 5 Terrace	1.1	62	56

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicated that noise levels at Plane of Window (POW) receptors will range between 61 and 69 dBA during the daytime period (07:00-23:00) and between 54 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels (68 and 69 dBA) occur at the east and south façades of the study building which are nearest and most exposed to Cummings Avenue and Ogilvie Road.

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 dwellings of the development. 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."*

As the noise level at OLA receptor 5 located at the Amenity Level 5 terrace is above the ENCG criteria, a 1.1-metre standard high barrier or parapet wall surrounding the terrace will be sufficient to reduce the noise levels (see Figure 7). The noise barrier for the terrace can be built as a parapet wall, a solid glass railing, or a combination of both. However, it should not contain gaps. Glass railing can be built as glass-to-glass or the gap between the glass and balusters can be avoided. Noise barriers should be built with solid elements having a minimum surface mass of 20 kg/m² and should contain no gaps. In addition, a Type B warning clause will be required in 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 road traffic (rail traffic) (air traffic) 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."*

Gradient Wind conducted a survey of the study site, using the satellite view of the area; the study site is surrounded by a mix of low-rise residential and commercial buildings. The existing stationary noise sources are either small or the direct line of sight between the sources and the study site is blocked. Moreover, the background noise around the study site will be dominated by roadway traffic noise Therefore, no significant stationary noise impact on the proposed development is anticipated.

With regards to the impacts of the proposed building on the surroundings and itself, by careful placing and judicious selection of noise-generating equipment like cooling towers, chillers, and generators, stationary noise impact from the proposed building can comply with the sound level limits defined in ENCG and NPC-300. Where necessary, noise screens, silencers, and other noise control measures can be added.

This concludes our roadway 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.

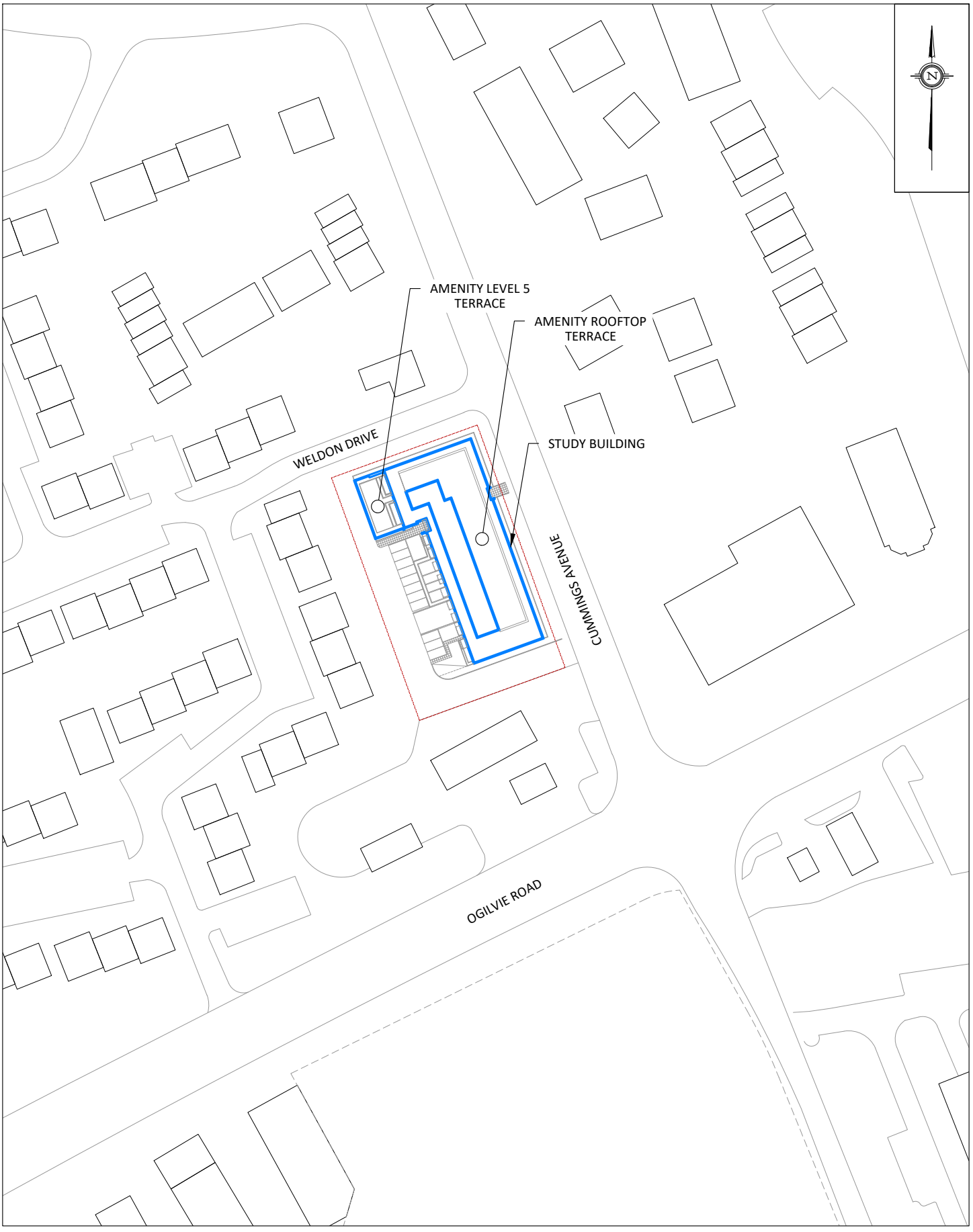
Sincerely,

Gradient Wind Engineering Inc.

Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #23-052-Traffic Noise



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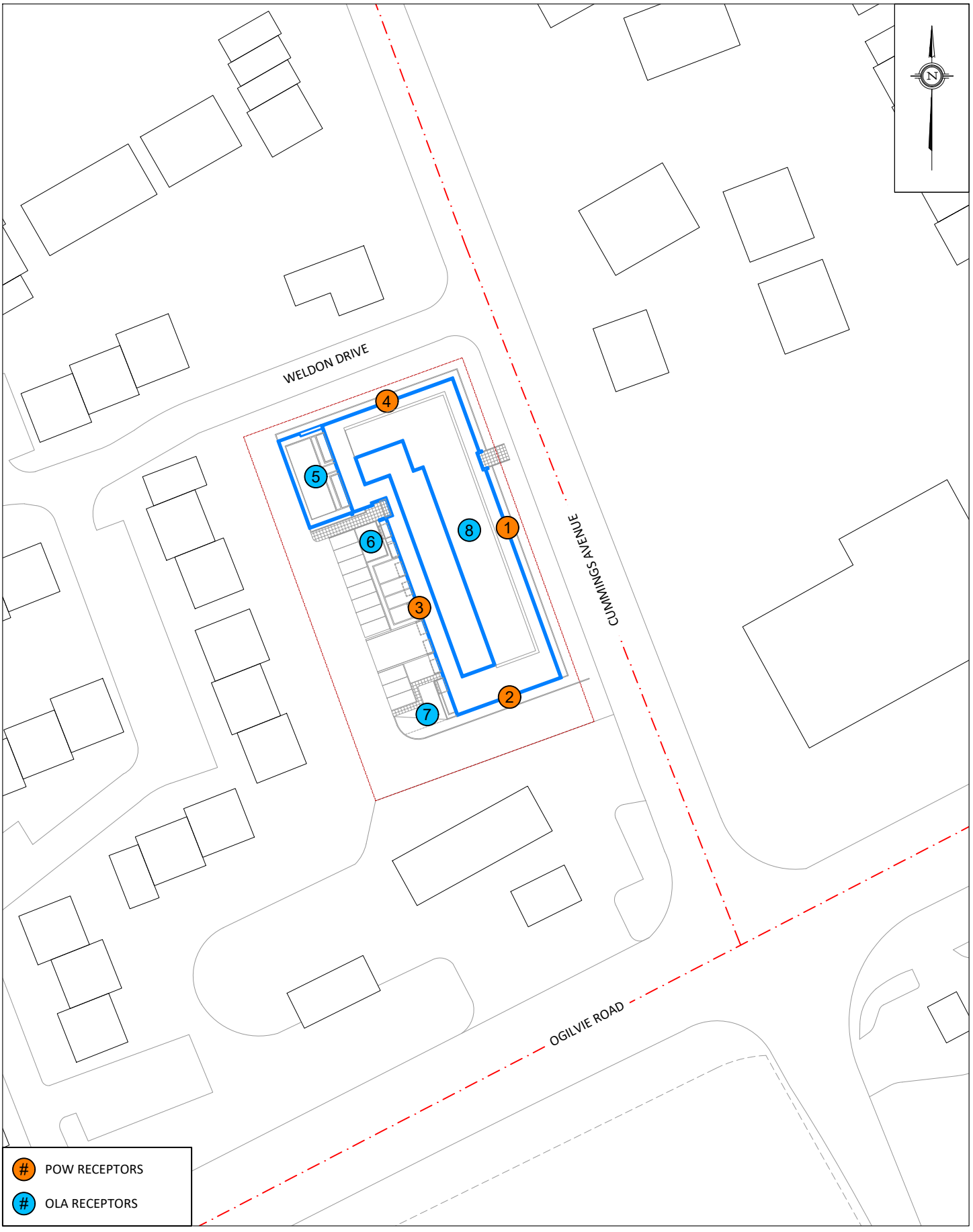
PROJECT	1184, 1188, & 1196 CUMMINGS AVENUE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1500 (APPROX.)
DRAWING NO.	GW23-052-1
DATE	APRIL 5, 2023
DRAWN BY	E.K.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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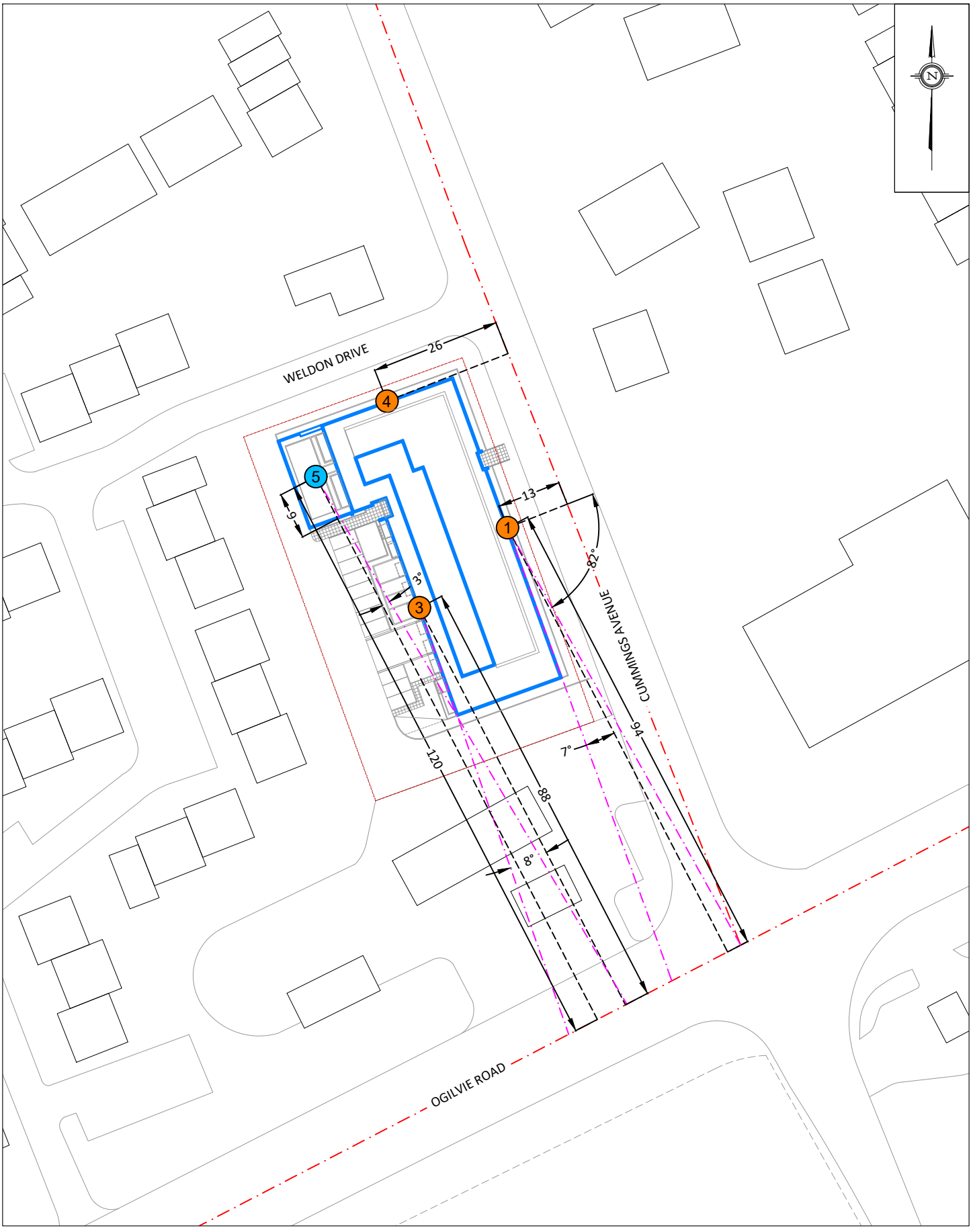
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW23-052-2
DATE	APRIL 5, 2023	DRAWN BY	E.K.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS



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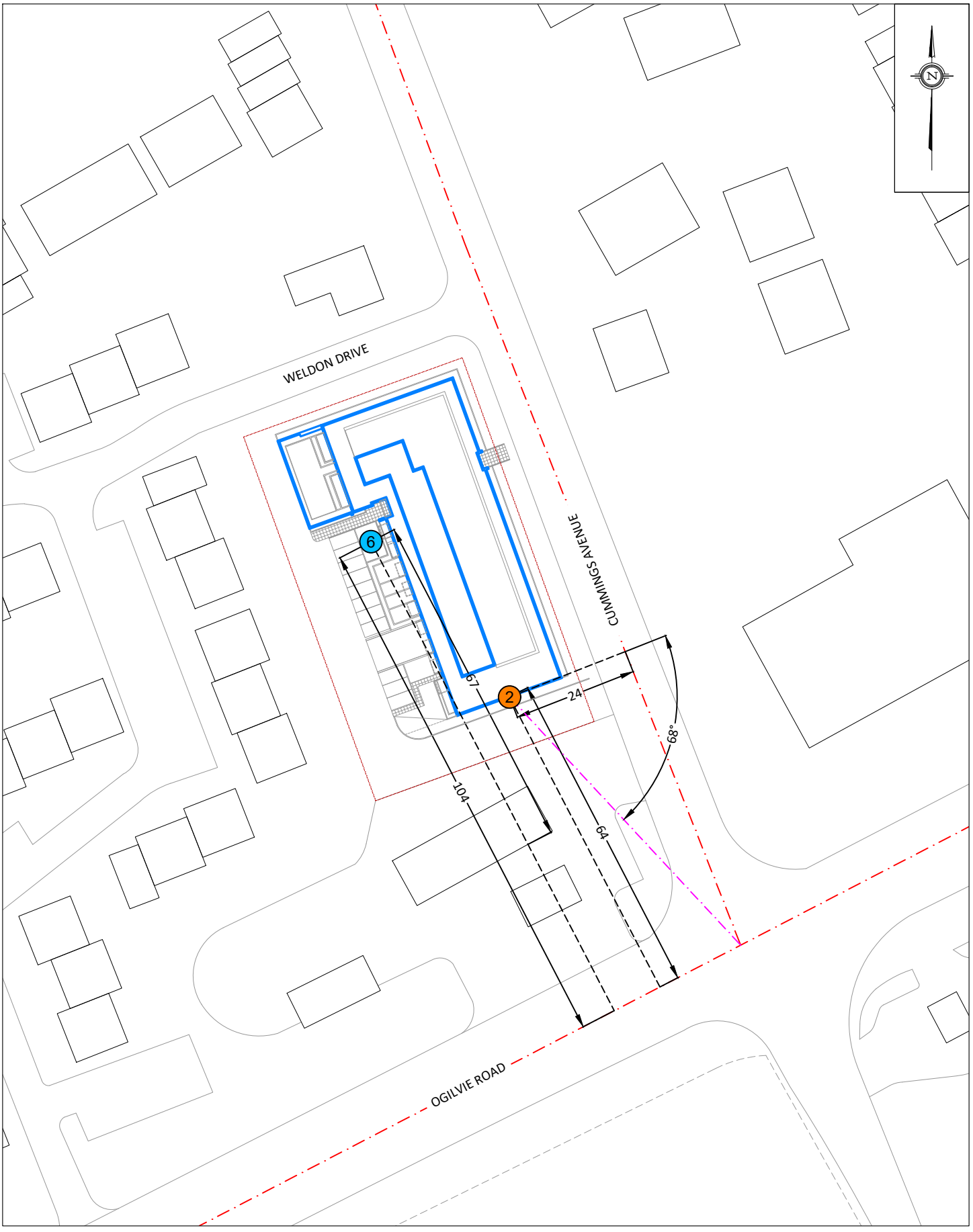
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW23-052-3
DATE	APRIL 5, 2023	DRAWN BY	E.K.

DESCRIPTION

FIGURE 3:
STAMSON INPUT DATA
FOR RECEPTORS 1, 3, 4, & 5



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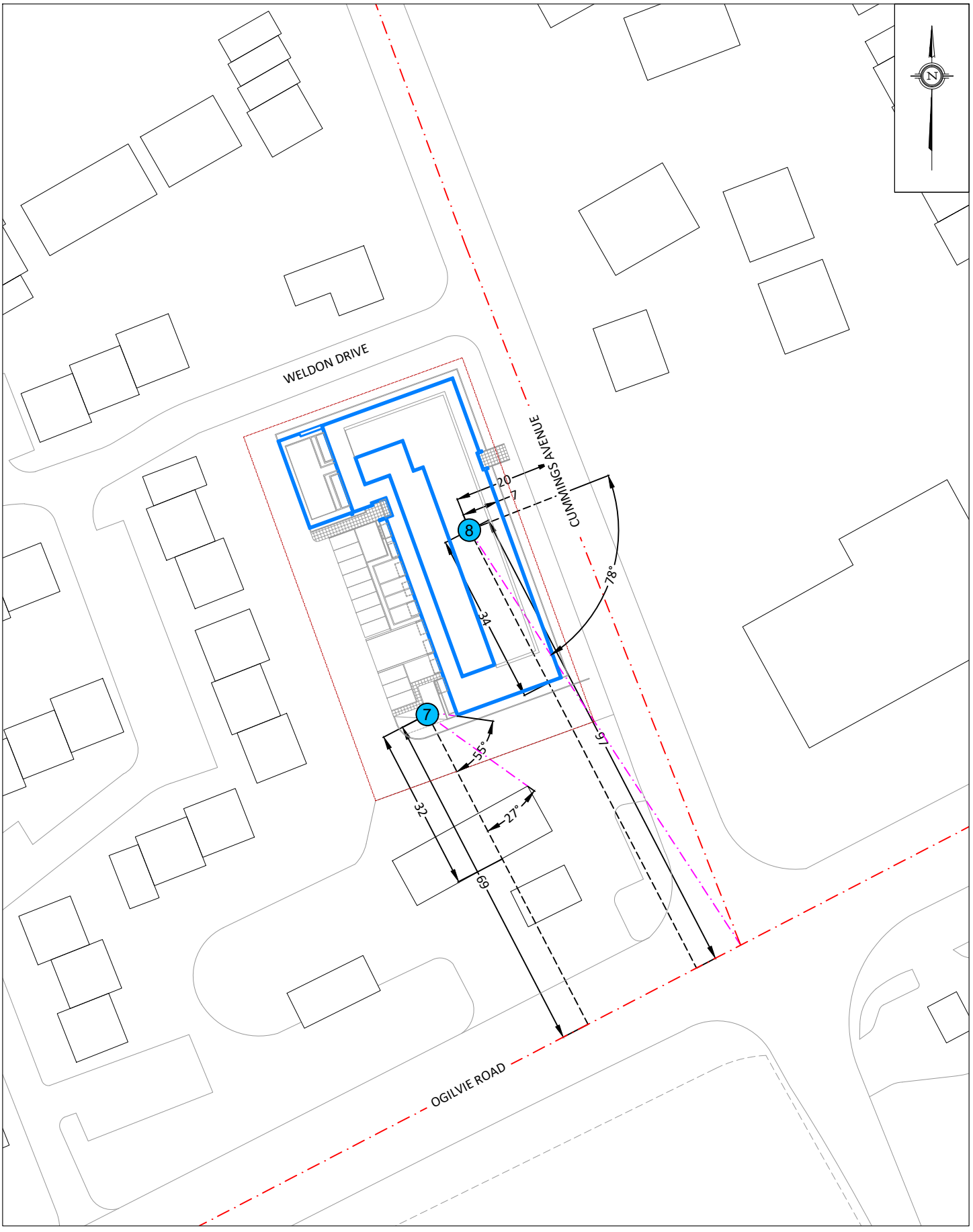
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW23-052-4
DATE	APRIL 5, 2023
DRAWN BY	E.K.

DESCRIPTION

FIGURE 4:
STAMSON INPUT DATA
FOR RECEPTORS 2 & 6



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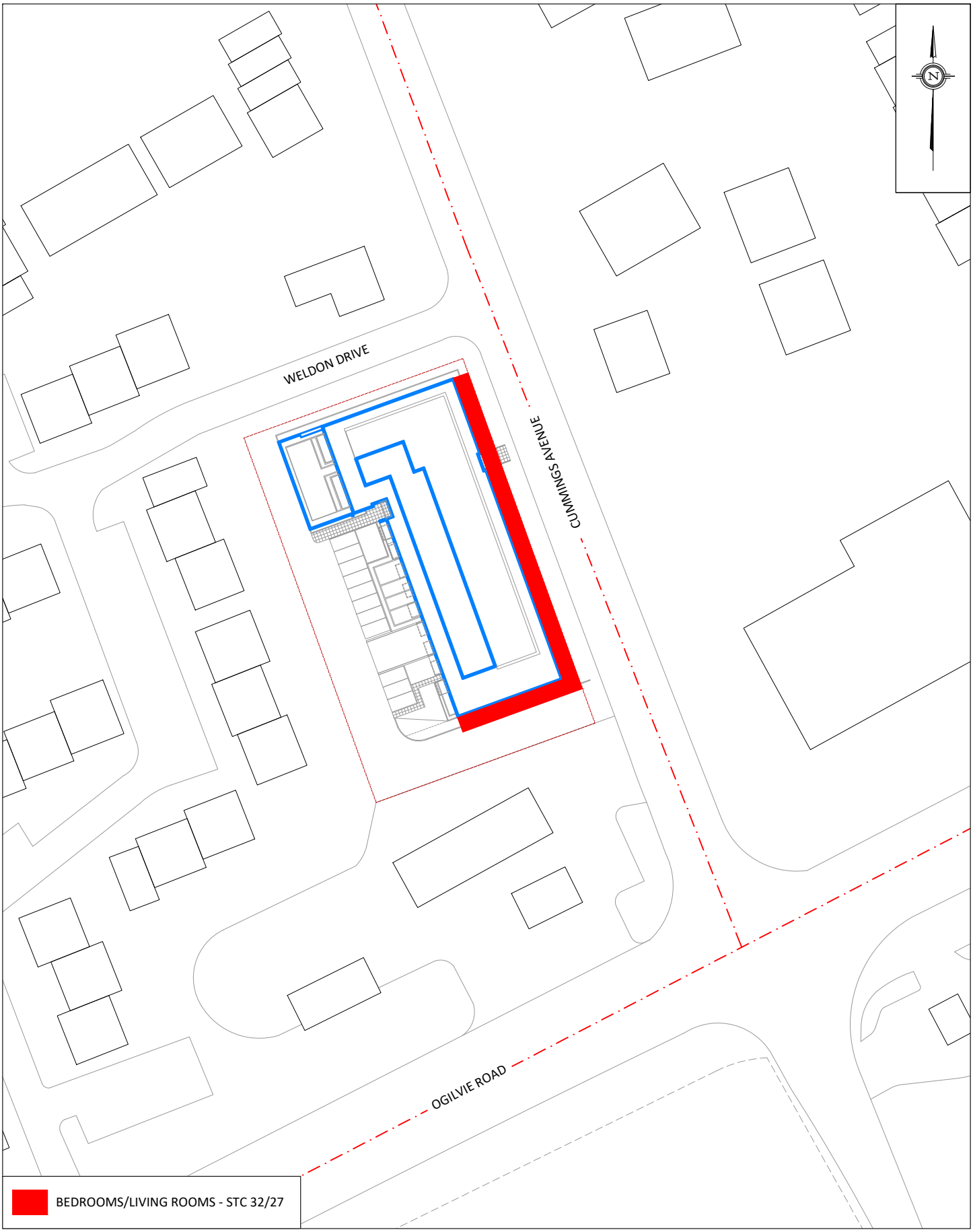
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW23-052-5
DATE	APRIL 5, 2023
DRAWN BY	E.K.

DESCRIPTION

FIGURE 5:
STAMSON INPUT DATA
FOR RECEPTORS 7 & 8



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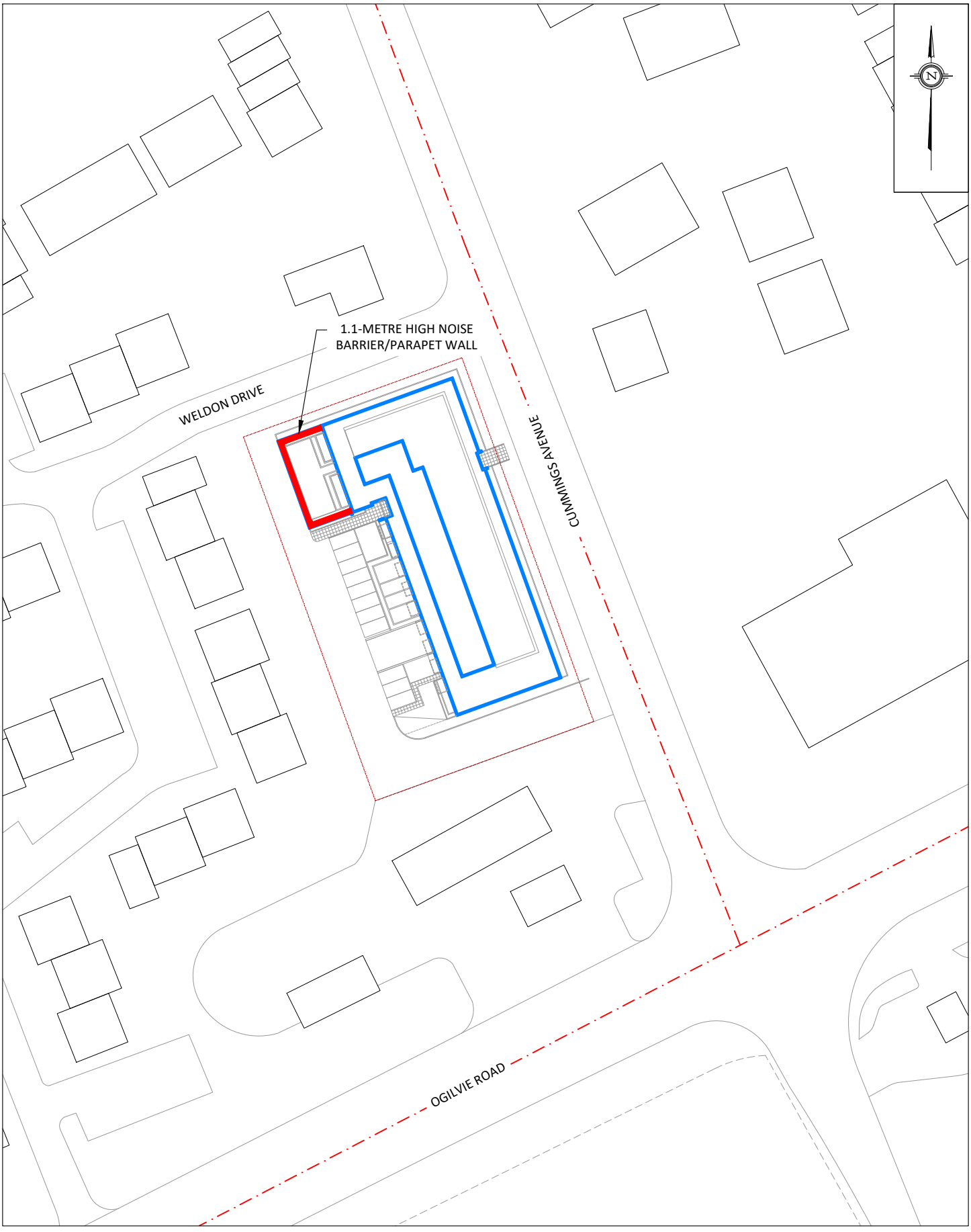
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW23-052-6
DATE	APRIL 5, 2023
DRAWN BY	E.K.

DESCRIPTION

FIGURE 6:
STC REQUIREMENTS



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SCALE	1:1000 (APPROX.)	DRAWING NO.	GW23-052-7
DATE	APRIL 5, 2023	DRAWN BY	E.K.

DESCRIPTION

FIGURE 7:
BARRIER LOCATION

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: 05-04-2023 11:35:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Angle1 Angle2 : -90.00 deg 82.00 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 : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (day/night)

Angle1 Angle2 : -90.00 deg 7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 94.00 / 94.00 m
Receiver height : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cummings Ave (day)

Source height = 1.50 m

ROAD (0.00 + 67.31 + 0.00) = 67.31 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 82 0.00 67.51 0.00 0.00 -0.20 0.00 0.00 0.00 67.31

Segment Leq : 67.31 dBA

Results segment # 2: Ogilvie Rd (day)

Source height = 1.50 m

ROAD (0.00 + 63.02 + 0.00) = 63.02 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 7 0.00 73.68 0.00 -7.97 -2.69 0.00 0.00 0.00 63.02

Segment Leq : 63.02 dBA

Total Leq All Segments: 68.68 dBA

Results segment # 1: Cummings Ave (night)

Source height = 1.50 m

ROAD (0.00 + 59.71 + 0.00) = 59.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	82	0.00	59.91	0.00	0.00	-0.20	0.00	0.00	0.00	59.71

Segment Leq : 59.71 dBA

Results segment # 2: Ogilvie Rd (night)

Source height = 1.50 m

ROAD (0.00 + 55.42 + 0.00) = 55.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	7	0.00	66.08	0.00	-7.97	-2.69	0.00	0.00	0.00	55.42

Segment Leq : 55.42 dBA

Total Leq All Segments: 61.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.68
(NIGHT): 61.08

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 11:41:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Angle1 Angle2 : 0.00 deg 68.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 24.00 / 24.00 m
Receiver height : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (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 : 64.00 / 64.00 m
Receiver height : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cummings Ave (day)

Source height = 1.50 m

ROAD (0.00 + 61.24 + 0.00) = 61.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	68	0.00	67.51	0.00	-2.04	-4.23	0.00	0.00	0.00	61.24

Segment Leq : 61.24 dBA

Results segment # 2: Ogilvie Rd (day)

Source height = 1.50 m

ROAD (0.00 + 67.38 + 0.00) = 67.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-6.30	0.00	0.00	0.00	0.00	67.38

Segment Leq : 67.38 dBA

Total Leq All Segments: 68.33 dBA

Results segment # 1: Cummings Ave (night)

Source height = 1.50 m

ROAD (0.00 + 53.64 + 0.00) = 53.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	68	0.00	59.91	0.00	-2.04	-4.23	0.00	0.00	0.00	53.64

Segment Leq : 53.64 dBA

Results segment # 2: Ogilvie Rd (night)

Source height = 1.50 m

ROAD (0.00 + 59.78 + 0.00) = 59.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-6.30	0.00	0.00	0.00	0.00	59.78

Segment Leq : 59.78 dBA

Total Leq All Segments: 60.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.33
(NIGHT): 60.73

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 11:45:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (day/night)

Angle1 Angle2 : 8.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 88.00 / 88.00 m
Receiver height : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Ogilvie Rd (day)

Source height = 1.50 m

ROAD (0.00 + 61.06 + 0.00) = 61.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
8	90	0.00	72.16	0.00	-7.68	-3.41	0.00	0.00	0.00	61.06

Segment Leq : 61.06 dBA

Total Leq All Segments: 61.06 dBA

Results segment # 1: Ogilvie Rd (night)

Source height = 1.50 m

ROAD (0.00 + 53.46 + 0.00) = 53.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
8	90	0.00	64.56	0.00	-7.68	-3.41	0.00	0.00	0.00	53.46

Segment Leq : 53.46 dBA

Total Leq All Segments: 53.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.06
(NIGHT): 53.46

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 14:23:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Cummings Ave (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 # 1: Cummings 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 : 26.00 / 26.00 m
Receiver height : 17.00 / 17.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cummings Ave (day)

Source height = 1.50 m

ROAD (0.00 + 62.11 + 0.00) = 62.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	67.51	0.00	-2.39	-3.01	0.00	0.00	0.00	62.11

Segment Leq : 62.11 dBA

Total Leq All Segments: 62.11 dBA

Results segment # 1: Cummings Ave (night)

Source height = 1.50 m

ROAD (0.00 + 54.51 + 0.00) = 54.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	59.91	0.00	-2.39	-3.01	0.00	0.00	0.00	54.51

Segment Leq : 54.51 dBA

Total Leq All Segments: 54.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.11
(NIGHT): 54.51

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 15:37:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (day/night)

Angle1 Angle2 : 3.00 deg 90.00 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 : 15.00 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 3.00 deg Angle2 : 90.00 deg
Barrier height : 13.50 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Ogilvie 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 ! 15.00 ! 13.99 ! 13.99

ROAD (0.00 + 61.49 + 0.00) = 61.49 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
3 90 0.00 73.68 0.00 -9.03 -3.16 0.00 0.00 -4.51 56.98*
3 90 0.00 73.68 0.00 -9.03 -3.16 0.00 0.00 0.00 61.49
---

* Bright Zone !

Segment Leq : 61.49 dBA

Total Leq All Segments: 61.49 dBA

Results segment # 1: Ogilvie 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 ! 15.00 ! 13.99 ! 13.99

ROAD (0.00 + 53.89 + 0.00) = 53.89 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
3 90 0.00 66.08 0.00 -9.03 -3.16 0.00 0.00 -4.51 49.38*
3 90 0.00 66.08 0.00 -9.03 -3.16 0.00 0.00 0.00 53.89
---

* Bright Zone !

Segment Leq : 53.89 dBA

Total Leq All Segments: 53.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.49
(NIGHT): 53.89

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 15:44:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5b.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (day/night)

Angle1 Angle2 : 3.00 deg 90.00 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 : 15.00 / 15.00 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 3.00 deg Angle2 : 90.00 deg
Barrier height : 14.60 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Ogilvie 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 ! 15.00 ! 13.99 ! 13.99

ROAD (0.00 + 55.81 + 0.00) = 55.81 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
3 90 0.00 73.68 0.00 -9.03 -3.16 0.00 0.00 -5.67 55.81

Segment Leq : 55.81 dBA

Total Leq All Segments: 55.81 dBA

Barrier table for segment # 1: Ogilvie Rd (day)

Results segment # 1: Ogilvie 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 ! 15.00 ! 13.99 ! 13.99

ROAD (0.00 + 48.22 + 0.00) = 48.22 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
3 90 0.00 66.08 0.00 -9.03 -3.16 0.00 0.00 -5.67 48.22

Segment Leq : 48.22 dBA

Total Leq All Segments: 48.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.81
(NIGHT): 48.22

STAMSON 5.0 NORMAL REPORT Date: 06-04-2023 08:55:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (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 : 104.00 / 104.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
Barrier height : 5.00 m
Barrier receiver distance : 67.00 / 67.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Ogilvie 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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 52.74 + 0.00) = 52.74 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 73.68 0.00 -8.41 -3.01 0.00 0.00 -9.51 52.74

Segment Leq : 52.74 dBA

Total Leq All Segments: 52.74 dBA

Results segment # 1: Ogilvie 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 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 45.15 + 0.00) = 45.15 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
0 90 0.00 66.08 0.00 -8.41 -3.01 0.00 0.00 -9.51 45.15

Segment Leq : 45.15 dBA

Total Leq All Segments: 45.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.74
(NIGHT): 45.15

STAMSON 5.0 NORMAL REPORT Date: 06-04-2023 10:04:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (day/night)

Angle1 Angle2 : -55.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 69.00 / 69.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -27.00 deg Angle2 : 90.00 deg
Barrier height : 5.00 m
Barrier receiver distance : 32.00 / 32.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Ogilvie 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 ! 1.50 ! 1.50 ! 1.50

ROAD (58.97 + 54.29 + 0.00) = 60.24 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-55 -27 0.00 73.68 0.00 -6.63 -8.08 0.00 0.00 0.00 58.97

-27 90 0.00 73.68 0.00 -6.63 -1.87 0.00 0.00 -10.89 54.29

Segment Leq : 60.24 dBA

Total Leq All Segments: 60.24 dBA

Results segment # 1: Ogilvie 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 ! 1.50 ! 1.50 ! 1.50

ROAD (51.37 + 46.69 + 0.00) = 52.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-55 -27 0.00 66.08 0.00 -6.63 -8.08 0.00 0.00 0.00 51.37

-27 90 0.00 66.08 0.00 -6.63 -1.87 0.00 0.00 -10.89 46.69

Segment Leq : 52.64 dBA

Total Leq All Segments: 52.64 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.24
(NIGHT): 52.64

STAMSON 5.0 NORMAL REPORT Date: 05-04-2023 17:23:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Ogilvie Rd (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 : 97.00 / 97.00 m
Receiver height : 19.65 / 19.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 18.15 m
Barrier receiver distance : 34.00 / 34.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Angle1 Angle2 : -90.00 deg 78.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 19.65 / 19.65 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 78.00 deg
Barrier height : 18.15 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Ogilvie 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 ! 19.65 ! 13.29 ! 13.29

ROAD (0.00 + 54.11 + 0.00) = 54.11 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 73.68 0.00 -8.11 0.00 0.00 0.00 -11.46 54.11

Segment Leq : 54.11 dBA

Results segment # 2: Cummings 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 ! 19.65 ! 13.30 ! 13.30

ROAD (0.00 + 50.69 + 0.00) = 50.69 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 78 0.00 67.51 0.00 -1.25 -0.30 0.00 0.00 -15.27 50.69

Segment Leq : 50.69 dBA

Total Leq All Segments: 55.74 dBA

Results segment # 1: Ogilvie 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 ! 19.65 ! 13.29 ! 13.29

ROAD (0.00 + 46.51 + 0.00) = 46.51 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 90 0.00 66.08 0.00 -8.11 0.00 0.00 0.00 -11.46 46.51

Segment Leq : 46.51 dBA

Results segment # 2: Cummings 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 ! 19.65 ! 13.30 ! 13.30

ROAD (0.00 + 43.09 + 0.00) = 43.09 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
---
-90 78 0.00 59.91 0.00 -1.25 -0.30 0.00 0.00 -15.27 43.09

Segment Leq : 43.09 dBA

Total Leq All Segments: 48.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.74
(NIGHT): 48.14