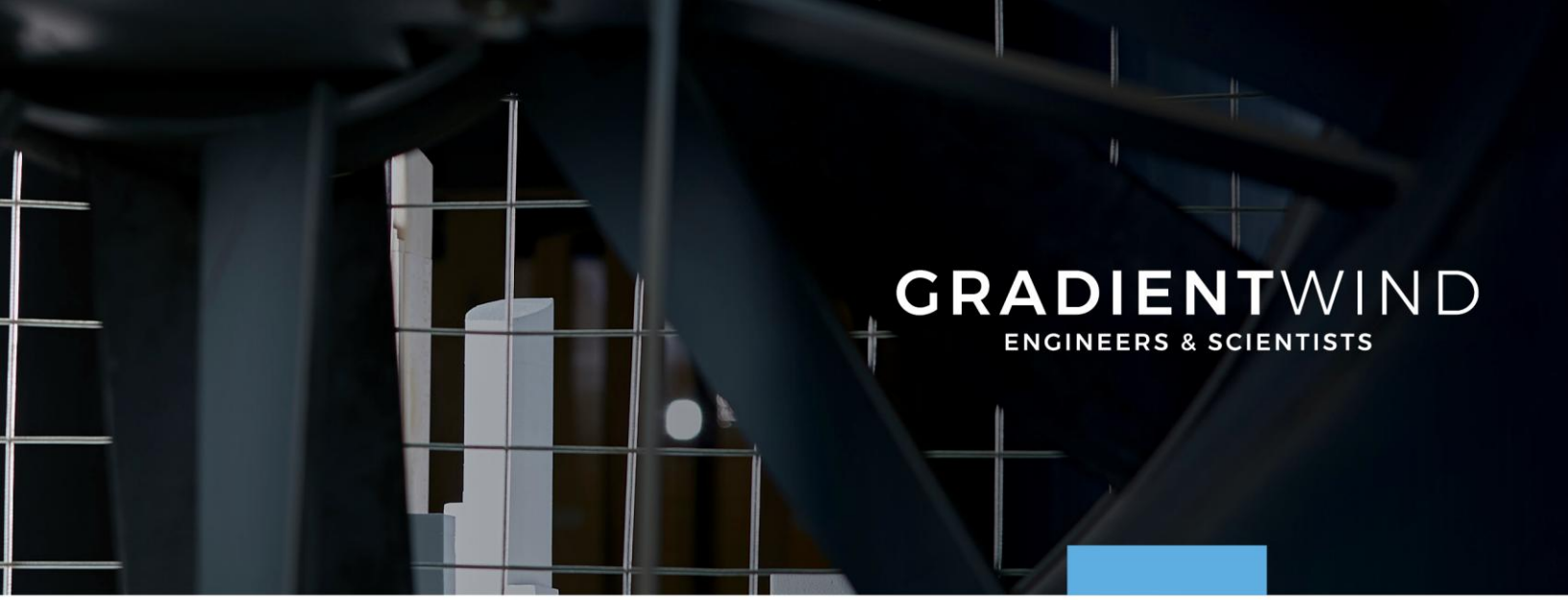
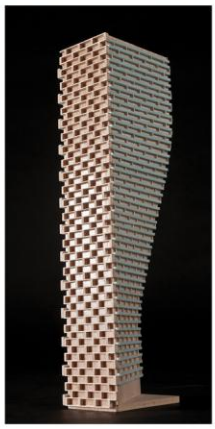


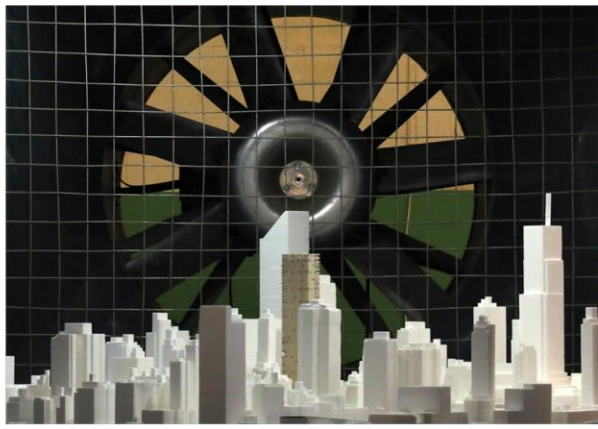
GRADIENTWIND
ENGINEERS & SCIENTISTS

ENVIRONMENTAL NOISE & VIBRATION ASSESSMENT

500 & 508 Edgeworth Avenue
Ottawa, Ontario

REPORT: GWE25-101 - Noise & Vibration





October 29, 2025

PREPARED FOR

Edgeworth Development Lands Corp
451 Daly Avenue, 2nd Floor
Ottawa, Ontario
K1N 6H6

PREPARED BY

Doryan Saavedra, B.Eng., Junior Acoustic Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a traffic noise and vibration assessment undertaken to satisfy Zoning By-Law Amendment application submission requirements for the proposed residential development located at 500 & 508 Edgeworth Avenue in Ottawa, Ontario (hereinafter referred to as "subject site" or "proposed development"). The proposed development comprises a 24-storey residential building with a rectangular planform and a four-storey podium. At grade, the development features a lobby, indoor amenities, an outdoor amenity, townhouse units, bicycle storage, and a ramp leading to two levels of below-grade parking. The remaining floors comprise residential units with floorplate changes at levels two, five, 10 and 22. Level 23 features an outdoor amenity, and the building is topped with a mechanical penthouse. The primary sources of traffic noise are Carling Avenue to the south, Kichi Zībī Mīkan Parkway to the west, and the future Confederation Line 1 Light Rail Transit (LRT) west extension to the west, currently under construction. As the site is in proximity to the future west extension of the Regional Transit Commission (OC Transpo) Light Rail Transit Confederation Line, a ground vibration impact assessment from the LRT system on the development was conducted following the procedures outlined in the Federal Transit Authorities (FTA) protocol. Figure 1 illustrates a complete site plan with surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300, Ministry of Transportation Ontario (MTO), and City of Ottawa Environmental Noise Control Guidelines (ENCG) guidelines; (ii) future vehicular traffic volumes corresponding to roadway classification, roadway traffic volumes obtained from the City of Ottawa, and LRT information from the Rail Implementation Office; (iii) architectural drawings provided by RLA Architecture in May 2025; and (iv) ground borne vibration criteria as specified by the Federal Transit Authority (FTA) Protocol.

The results of the current analysis indicate that noise levels will range between 58 and 63 dBA during the daytime period (07:00-23:00) and between 50 and 55 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 63 dBA) occurs at the west façade between levels 1 to 9, which are nearest and most exposed to Kichi Zībī Mīkan Parkway and the LRT Confederation Line west extension.

The results indicate that noise levels fall between 55 dBA and 65 dBA during the daytime period. As such, the development will required forced air heating systems with provisions for central air conditioning, as a

minimum requirement. If air conditioning is installed it will allow occupants to keep windows closed and maintain a comfortable living environment. Given the nature of the development, air conditioning is expected to be provided, therefore a type D Warning Clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6. Standard building components will be sufficient to reduce indoor noise levels at or below the ENCG criterion for noise sensitive spaces.

As the development is adjacent to a future LRT line and station, the Rail Construction Program Office recommends a warning clause specific to light rail transit lines be included in all Lease, Purchase and Sale Agreements. All of which are summarized in Section 6.

The outdoor amenity provided on level 23 is expected to fall below 55 dBA in compliance with the ENCG criteria assuming the inclusion of a 1.2 m solid guard surrounding the OLA as is detailed in the architectural drawings. The guard or parapet wall will need to be constructed of solid materials and have a surface density of 20 kg/m^2.

Noise levels at the at-grade outdoor amenity extending from the southern side to the western side of the development is expected to exceed 55 dBA during the daytime period without a noise barrier. If this area is to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the use of adding noise barriers to the at-grade outdoor amenity as summarised in Section 5.3. A solid guard with a height of 2.0 m (above the walking surface) surrounding the at-grade OLA will be sufficient to reduce the noise level below 60 dBA. As the noise level continues to exceed the ENCG criteria with an included noise barrier, a Type B Warning Clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

As the subject site is located further than 75 metres from the future OC Transpo LRT Confederation Line west extension, the development is outside of the LRT zone of influence and vibration levels are expected to be minimal.

A review of satellite imagery confirmed there are no significant sources of stationary noise surrounding the site. The dominant source of noise impacting the development is from transportation noise sources.

The development's own mechanical equipment has the potential to generate noise off-site at surrounding noise sensitive (residential) developments and on the development itself. Any potential impacts can be minimized by judicious selection of mechanical equipment and its location. It is preferable to locate large pieces of equipment, such as cooling towers and make up air units, on the roof of the towers or in mechanical penthouses. These systems will be designed to comply with the ENCG sound level limits. A review by a qualified acoustic consultant is recommended once the mechanical design of the building has developed.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Edgeworth Development Lands Corp to undertake a traffic noise and vibration assessment to satisfy Zoning By-Law Amendment application submission requirements for the proposed residential development located at 500 & 508 Edgeworth Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior noise and vibration levels generated by local transportation traffic.

This assessment is based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) NPC-300[1], Ministry of Transportation Ontario (MTO)[2], and City of Ottawa Environmental Noise Control Guidelines (ENCG)[3] guideline. Noise calculations were based on architectural drawings provided by RLA Architecture in May 2025, with future traffic volumes corresponding to transit classification, roadway classification and theoretical roadway capacities, and recent satellite imagery.

2. TERMS OF REFERENCE

The focus of this transportation noise assessment is a proposed residential development located at 500 & 508 Edgeworth Avenue in Ottawa, Ontario. The subject site is located on a parcel of land located northwest of the intersection of Edgeworth Avenue and Carling Avenue.

The proposed development comprises a 24-storey residential building with a rectangular planform and a four-storey podium. At grade, the development features a lobby, indoor amenities, an outdoor amenity, townhouse units, bicycle storage, and a ramp leading to two levels of below-grade parking. The remaining floors comprise residential units with floorplate changes at levels two, five, 10 and 23. In addition to the outdoor amenity at grade, an outdoor living area (OLA) is provided on level 23. The building is topped with a mechanical penthouse (MPH).

[1] Ontario Ministry of the Environment and Climate Change – Environmental Noise Guidelines, Publication NPC-300, Queens Printer for Ontario, Toronto, 2013
[2] Ministry of Transportation Ontario, "*Environmental Guide for Noise*", August 2021
[3] City of Ottawa Environmental Noise Control Guidelines, January 2016

The site is surrounded by low-rise residential buildings to the north and east, a high-rise building to the south, and Edgeworth Avenue located directly east of the subject site. Additionally, the Ottawa-Carleton Regional Transit Commission (OC Transpo) Light Rail Transit (LRT) Confederation Line extension and the future Lincoln Fields Station are currently under construction approximately 118 m to the west of the subject site. The primary sources of traffic noise are Carling Avenue to the south, Kichi Zībī Mīkan Parkway to the west, and the upcoming Line 1 Light Rail Transit (LRT) west extension to the west. Figure 1 illustrates a complete site plan with surrounding context.

The primary source of ground borne vibration is the future OC Transpo LRT line located to the west of the subject site. As per the City of Ottawa's Official Plan, the LRT system is situated greater than 75 m from the nearest property line. As a result, ground vibration impact from the LRT system on the proposed development is expected to be minimal as the subject site is outside of the LRT zone of influence. Airborne noise transmission from the LRT onto the development was considered as part of the transportation noise as the LRT is located entirely aboveground.

With regard to stationary noise impacts, a stationary noise study is recommended for the site during the detailed design once mechanical plans become available. This study would assess impacts of stationary noise from rooftop mechanical units serving the proposed development onto surrounding noise sensitive areas. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below NPC-300 limits. As the mechanical equipment is expected to reside primarily in the mechanical level located on the high roof of the building, noise levels on the surrounding noise sensitive properties are expected to be negligible. In the event that noise levels exceed the ENCG criteria, noise impacts can generally be minimized by judicious selection and placement of the equipment.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study building produced by local transportation sources, (ii) predict vibration levels on the study building produced from the LRT system, and (iii) explore potential noise mitigation where required.

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 and LRT Traffic Noise

4.2.1 Criteria for Roadway and LRT Traffic Noise

For surface roadway and LRT 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. NPC-300 specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms, and sleeping quarters, respectively, as listed in Table 1.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) [4]

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[5]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[6]. 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[7].

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation should be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion.

[4] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Table C-9
[5] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[6] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[7] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

4.2.2 Roadway and LRT 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[8] 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 and LRT line included in this assessment.

TABLE 2: ROADWAY AND LRT TRAFFIC DATA

Segment	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Carling Avenue	4-Lane Urban Arterial-Divided (4-UAD)	60	**35,000**
Kichi Zībī Mīkan Parkway	4-Lane Urban Arterial-Divided (4-UAD)	60	**35,000**
Confederation Line LRT	Light Rail Transit	70	**540/60***

4.2.3 Theoretical Roadway and LRT Traffic Noise Predictions

The impact of transportation noise sources on the development was determined by computer modelling. Transportation noise source modelling is based on the software program *CadnaA* which utilizes the United States Federal Highway Administration's Traffic Noise Model (TNM) to represent the roadway line sources. The TNM model is also being accepted in the updated Environmental Guide for Noise of Ontario, 2021 by the Ministry of Transportation (MTO)[9]. This computer program can represent three-dimensional surfaces and three orders of reflections of sound waves over a suitable spectrum for human hearing. A set of comparative calculations were performed in the current Ontario traffic noise prediction model STAMSON for comparisons to CadnaA simulation results. The STAMSON model is, however, older and requires each receptor to be calculated separately. STAMSON also does not accurately account for building reflections and multiple screening elements, and curved road geometry. A total of 12 receptor locations were identified around the site, as illustrated in Figure 2.

[8] City of Ottawa Transportation Master Plan, November 2013
[9] Ministry of Transportation Ontario, "*Environmental Guide for Noise*", August 2021, pg. 16

Roadway and LRT noise calculations were performed by treating each 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.
- Default ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- A solid guard with a height of 1.2 m (above the walking surface) surrounds the level 23 OLA as shown in the architectural drawings.
- Noise receptors were strategically placed at 12 locations around the study area (see Figure 2).

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 (2024) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[10] considers:

- Window type and total area as a percentage of total room floor area

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

- 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

Based on published research[11], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, which was prepared for site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factor).

5. RESULTS

5.1 Roadway Traffic Noise Levels

The results of the roadway and LRT traffic noise calculations are summarized in Table 3 below. The results of the current analysis indicate that noise levels will range between 58 and 63 dBA during the daytime period (07:00-23:00) and between 50 and 55 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 63 dBA) occurs at the west façade between levels 1 to 9, which are nearest and most exposed to Kichi Zībī Mīkan and the upcoming LRT Confederation Line. Figures 4 to 7 illustrate daytime and nighttime noise contours of the site 1.5 m and 73.8 m above grade. Additionally, Figures 8 to 11 illustrate the daytime and nighttime noise contours along all façades of the development.

The results indicate that noise levels fall between 55 dBA and 65 dBA during the daytime period. As such, the development will need forced air heating with provisions for central air conditioning, as a minimum requirement. These requirements will allow occupants to keep windows closed and maintain a comfortable living environment. A Warning Clause will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

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

The results also indicate that noise levels for the outdoor amenity at grade exceed 55 dBA. As noise levels are above the ENCG criteria, noise mitigation is required and detailed in Section 5.3. The noise level at the level 23 outdoor amenity is expected to be below 55 dBA with the included solid guard surrounding the OLA that is shown in the architectural drawings.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor Number	Receptor Height Above Grade/Roof (m)	Receptor Location	Roadway and LRT Noise Level (dBA)	
			Day	Night
R1	13.8	POW – Level 4 South Façade	60	53
R2	13.8	POW – Level 4 East Façade	58	50
R3	13.8	POW – Level 4 North Façade	60	52
R4	28.8	POW – Level 9 West Façade	63	55
R5	67.8	POW – Level 22 West Façade	59	52
R6	73.8	POW – Level 24 South Façade	61	53
R7	73.8	POW – Level 24 East Façade	58	50
R8	73.8	POW – Level 24 North Façade	59	51
R9	73.8	POW – Level 24 West Façade	61	53
R10	1.5	OLA- South Facing At-Grade Outdoor Amenity	60	N/A*
R11	1.5	OLA- West Facing At-Grade Outdoor Amenity	62	N/A*
R12	70.8	OLA – Level 23 Outdoor Amenity	53	N/A*

*Noise levels during the nighttime are not considered for OLAs

Table 4 shows a comparison in results between CadnaA and STAMSON. Noise levels calculated in STAMSON were found to have a good correlation with CadnaA and variability between the two programs was within an acceptable level of ±0-3 dBA. STAMSON inputs and output data are provided in Appendix A and Figures A1 to A3.

TABLE 4: RESULTS OF STAMSON/CADNAA CORRELATION

Receptor ID	Receptor Height (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)		CadnaA Noise Level (dBA)	
			Day	Night	Day	Night
R6	73.8	POW – Level 24 South Façade	63	56	61	53
R9	73.8	POW – Level 24 West Façade	63	56	61	53
R12	70.8	OLA – Level 23 Outdoor Amenity	55	48	53	45

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic do not exceed the criteria listed in Section 4.2 for building components. Therefore, standard building components, compliant with the Ontario building Code will be sufficient to attenuate indoor sound levels to appropriate indoor criteria.

Results of the calculations also indicate that the development will require forced air heating with provisions for central air conditioning, as a minimum requirement. However, it is anticipated the building will have air conditioning as part of its design. If provided air conditioning would allow occupants to keep windows closed and maintain a comfortable and quite living environment, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

5.3 Noise Barrier Calculation

Noise levels at the at-grade outdoor amenity which extends from the southern side to the western side of the development is expected to exceed 55 dBA during the daytime period without a noise barrier. If this area is to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the noise mitigating impact of adding noise barriers to the at-grade outdoor amenity and is summarised in Table 5. A solid guard with a height of 2.0 m (above the walking surface) surrounding the at-grade OLA shown of Figure 3 will be sufficient to reduce the noise level below 60 dBA. As the noise level continues to exceed the ENCG criteria with an included noise barrier, a Type B Warning Clause will be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

The outdoor amenity provided on level 23 is expected to fall below 55 dBA with the inclusion of a 1.17 m solid guard surrounding the OLA that is detailed in the architectural drawings.

TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	Daytime L_{eq} Noise Levels (dBA)				
			No Barrier	With 1.1 m Barrier	With 1.5 m Barrier	With 2.0 m Barrier	With 2.6 m Barrier
R10	1.5	OLA- South Facing At-Grade Outdoor Amenity	60	60	57	53	50
R11	1.5	OLA- West Facing At-Grade Outdoor Amenity	62	62	60	**57**	55

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 58 and 63 dBA during the daytime period (07:00-23:00) and between 50 and 55 dBA during the nighttime period (23:00-07:00). The highest noise level (i.e. 63 dBA) occurs at the west façade between levels 1 to 9, which are nearest and most exposed to Kichi Zībī Mīkan Parkway and the upcoming LRT Confederation Line.

The results indicate that noise levels fall between 55 dBA and 65 dBA during the daytime period. As such, the development will required forced air heating systems with provisions for central air conditioning, as a minimum requirement. If air conditioning is installed it will allow occupants to keep windows closed and maintain a comfortable living environment. Given the nature of the development, air conditioning is expected to be provided, therefore 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 noise levels fall below 65 dBA, standard building components will be sufficient to reduce indoor noise levels at or below the ENCG criterion for noise sensitive spaces.

As the development is adjacent to a future LRT line and station, the Rail Construction Program Office recommends that the warning clause identified below be included in all Lease, Purchase and Sale Agreements.

"The Owner hereby acknowledges and agrees:

i) The proximity of the proposed development of the lands described in Schedule "A" hereto (the "Lands") to the City's existing and future transit operations, may result in noise, vibration, electromagnetic interferences, stray current transmissions, smoke and particulate matter (collectively referred to as "Interferences") to the development;

ii) *It has been advised by the City to apply reasonable attenuation measures with respect to the level of the Interferences on and within the Lands and the proposed development; and*

iii) *The Owner acknowledges and agrees all agreements of purchase and sale and lease agreements, and all information on all plans and documents used for marketing purposes, for the whole or any part of the subject lands, shall contain the following clauses which shall also be incorporated in all transfer/deeds and leases from the Owner so that the clauses shall be covenants running with the lands for the benefit of the owner of the adjacent road:*

'The Transferee/Lessee for himself, his heirs, executors, administrators, successors and assigns acknowledges being advised that a public transit light-rail rapid transit system (LRT) is proposed to be located in proximity to the subject lands, and the construction, operation and maintenance of the LRT may result in environmental impacts including, but not limited to noise, vibration, electromagnetic interferences, stray current transmissions, smoke and particulate matter (collectively referred to as the Interferences) to the subject lands. The Transferee/Lessee acknowledges and

agrees that despite the inclusion of noise control features within the subject lands, Interferences may continue to be of concern, occasionally interfering with some activities of the occupants on the subject lands.

The Transferee covenants with the Transferor and the Lessee covenants with the Lessor that the above clauses verbatim shall be included in all subsequent lease agreements, agreements of purchase and sale and deeds conveying the lands described herein, which covenants shall run with the lands and are for the benefit of the owner of the adjacent road.'"

The outdoor amenity provided on level 23 is expected to fall below 55 dBA in compliance with the ENCG criteria assuming the inclusion of a 1.2 m solid guard surrounding the OLA that is detailed in the architectural drawings. The guard or parapet wall will need to be constructed of solid materials and have a surface density of 20 kg/m^2.

Noise levels at the at-grade outdoor amenity extending from the southern side to the western side of the development is expected to exceed 55 dBA during the daytime period without a noise barrier. If this area is to be used as an outdoor living area, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the noise mitigating impact of adding noise barriers to the at-grade outdoor amenity and is summarised in Section 5.3. A solid guard with a height of 2.0 m (above the walking surface) surrounding the at-grade OLA shown on Figure 3 will be sufficient to reduce the noise level below 60 dBA. In addition to the solid guard, 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 and LRT 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."

The guard must be constructed from materials having a minimum surface density of 20 kg/m^2 (STC rating of 30) and contain no gaps. Design of the guardrail will conform to the requirements outlined in Part 5 of the ENCG. The following information will be required by the City for review prior to installation of the barrier:

1. Shop drawings, signed and sealed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing the details of the acoustic barrier systems components, including material specifications.
2. Structural drawing(s), signed by a qualified Professional Engineer licenced by the Professional Engineers of Ontario, showing foundation details, and specifying design criteria, climatic design loads, as well as applicable geotechnical data used in the design.
3. Layout plan, and wall elevations, showing proposed colours and patterns.

As the subject site is located further than 75 metres from the future OC Transpo LRT Confederation Line west extension, the development is outside of the LRT zone of influence and vibration levels are expected to be minimal.

A review of satellite imagery confirmed there are no significant sources of stationary noise surrounding the site. The dominant source of noise impacting the development is from transportation noise sources.

The development's own mechanical equipment has the potential to generate noise off-site at surrounding noise sensitive (residential) developments and on the development itself. Any potential impacts can be minimized by judicious selection of mechanical equipment and its location. It is preferable to locate large pieces of equipment, such as cooling towers and make up air units, on the roof of the towers or in mechanical penthouses. These systems will be designed to comply with the ENCG sound level limits. A review by a qualified acoustic consultant is recommended once the mechanical design of the building has developed.

This concludes our traffic noise and vibration 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.

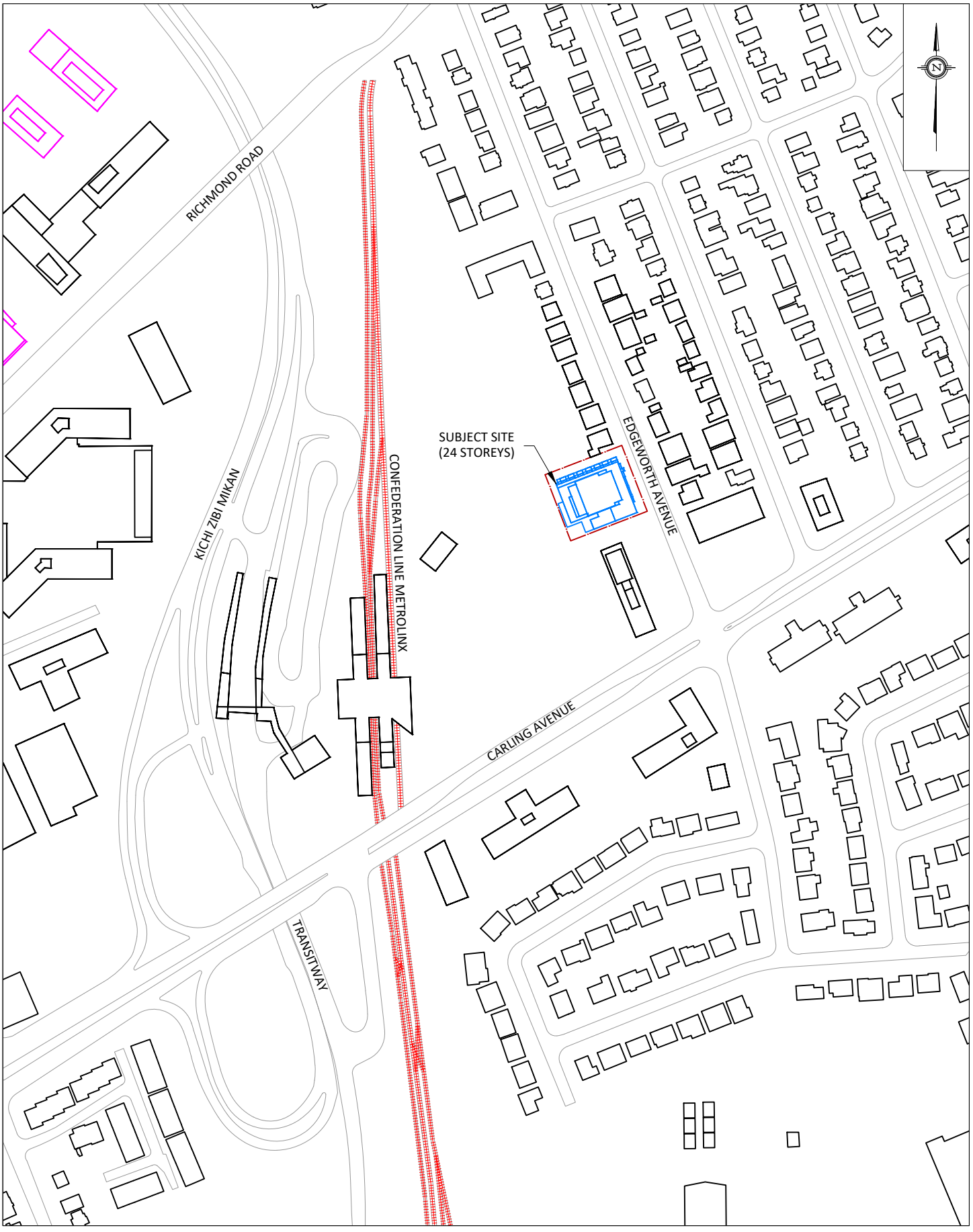
Sincerely,

Gradient Wind Engineering Inc.

Doryan Saavedra, B.Eng.
Junior Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File 25-101- Noise & Vibration

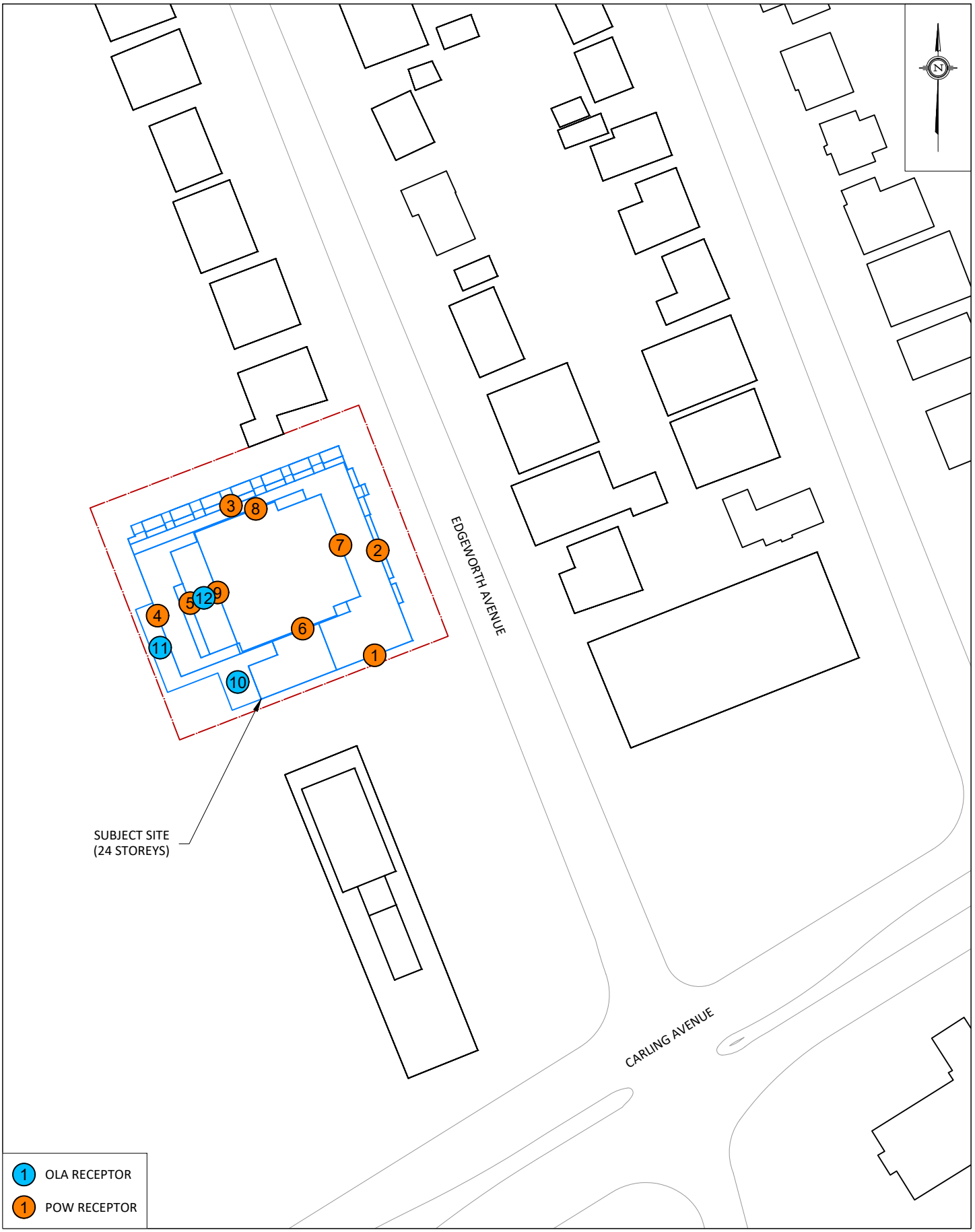


GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		DESCRIPTION
SCALE	1:3500 (APPROX.)	DRAWING NO.	25-101-ANV-1
DATE	MAY 28, 2025	DRAWN BY	N.M.P.

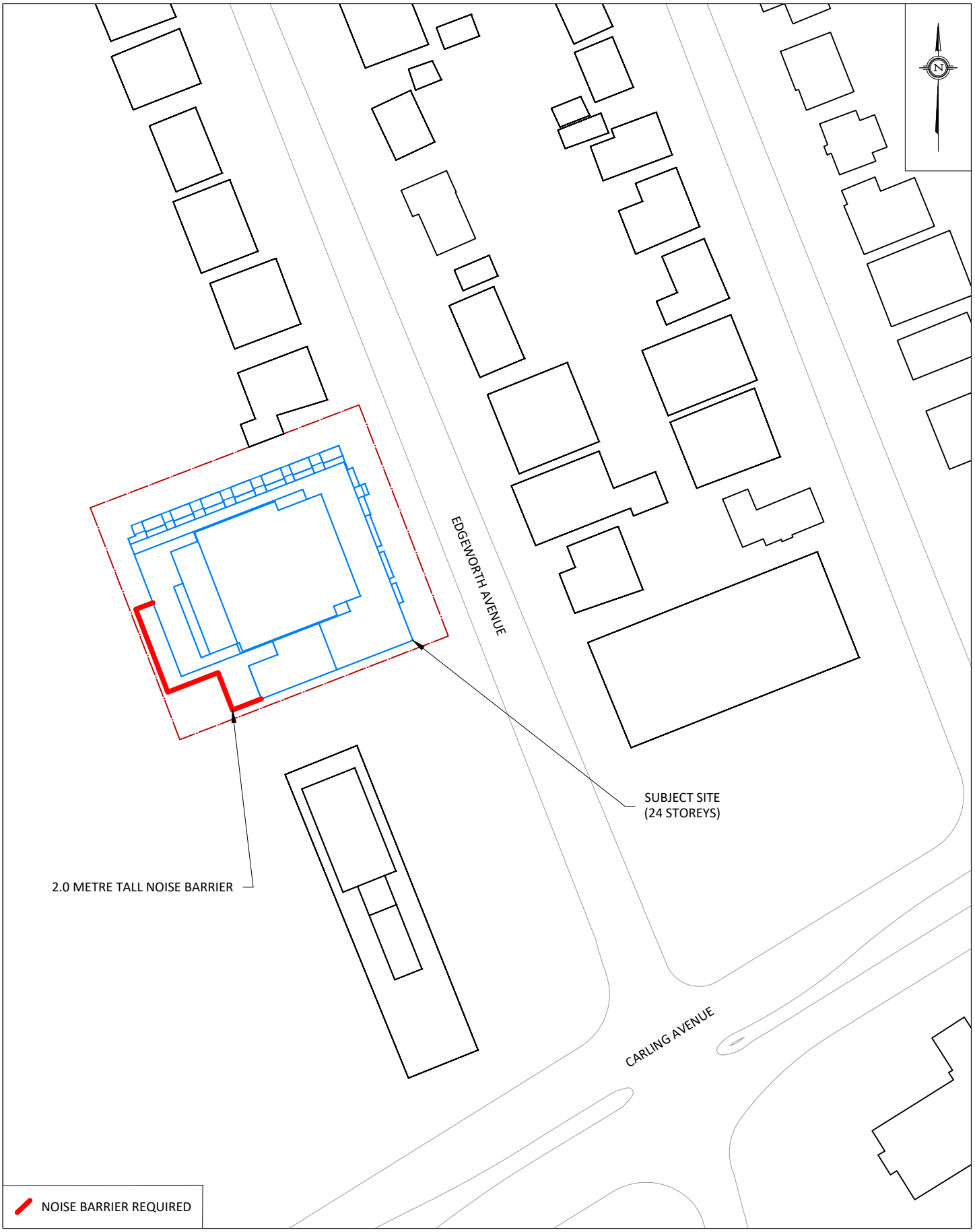
FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	25-101-ANV-2
DATE	MAY 28, 2025	DRAWN BY	N.M.P.

FIGURE 2:
RECEPTOR LOCATIONS



GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO. 25-101-ANV-3	FIGURE 3: NOISE BARRIER LOCATION
DATE	MAY 28, 2025	DRAWN BY N.M.P.	

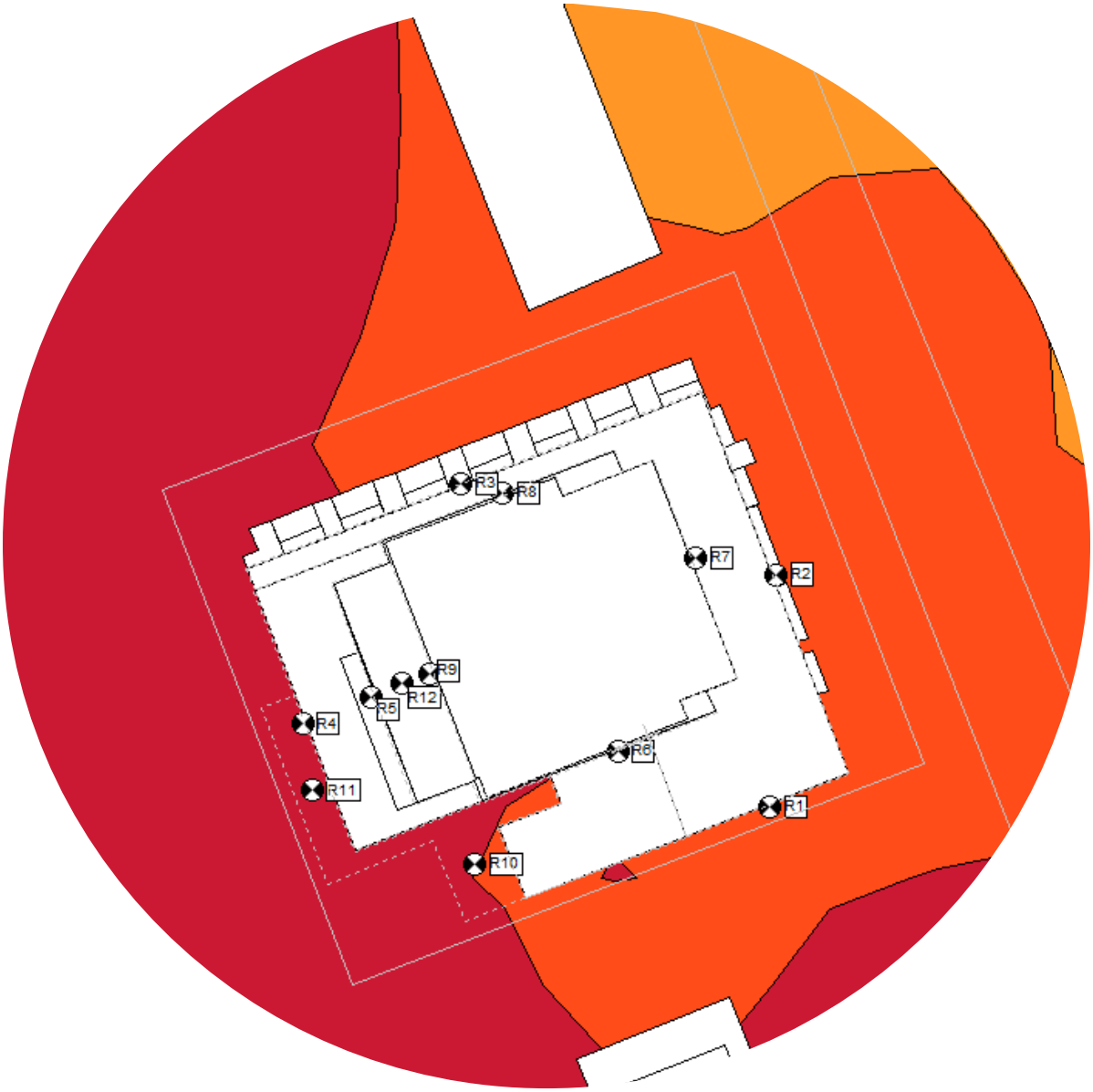


FIGURE 4: DAYTIME TRAFFIC NOISE CONTOUR (1.5 M ABOVE GRADE)

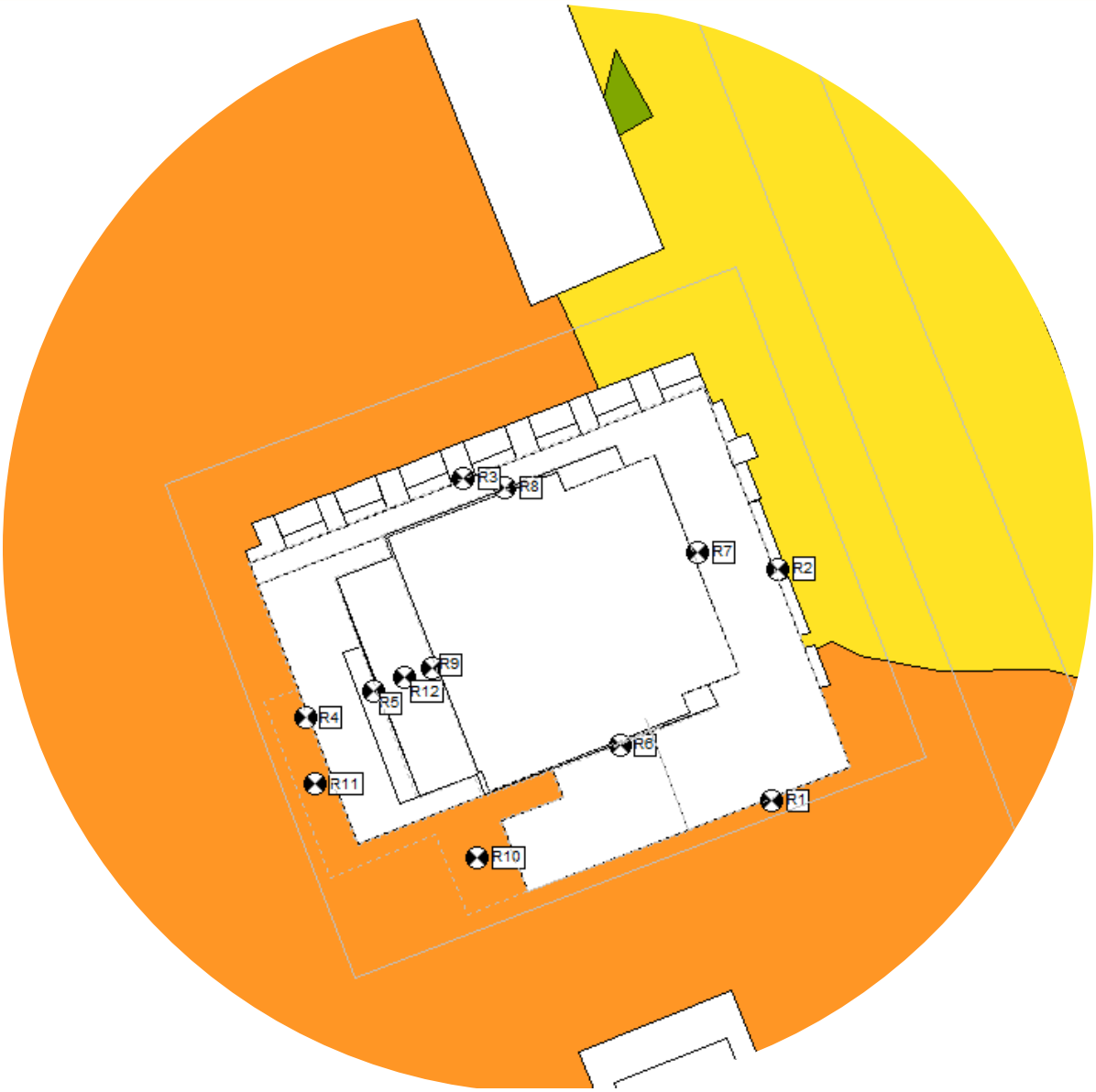


FIGURE 5: NIGHTTIME TRAFFIC NOISE CONTOUR (1.5 M ABOVE GRADE)

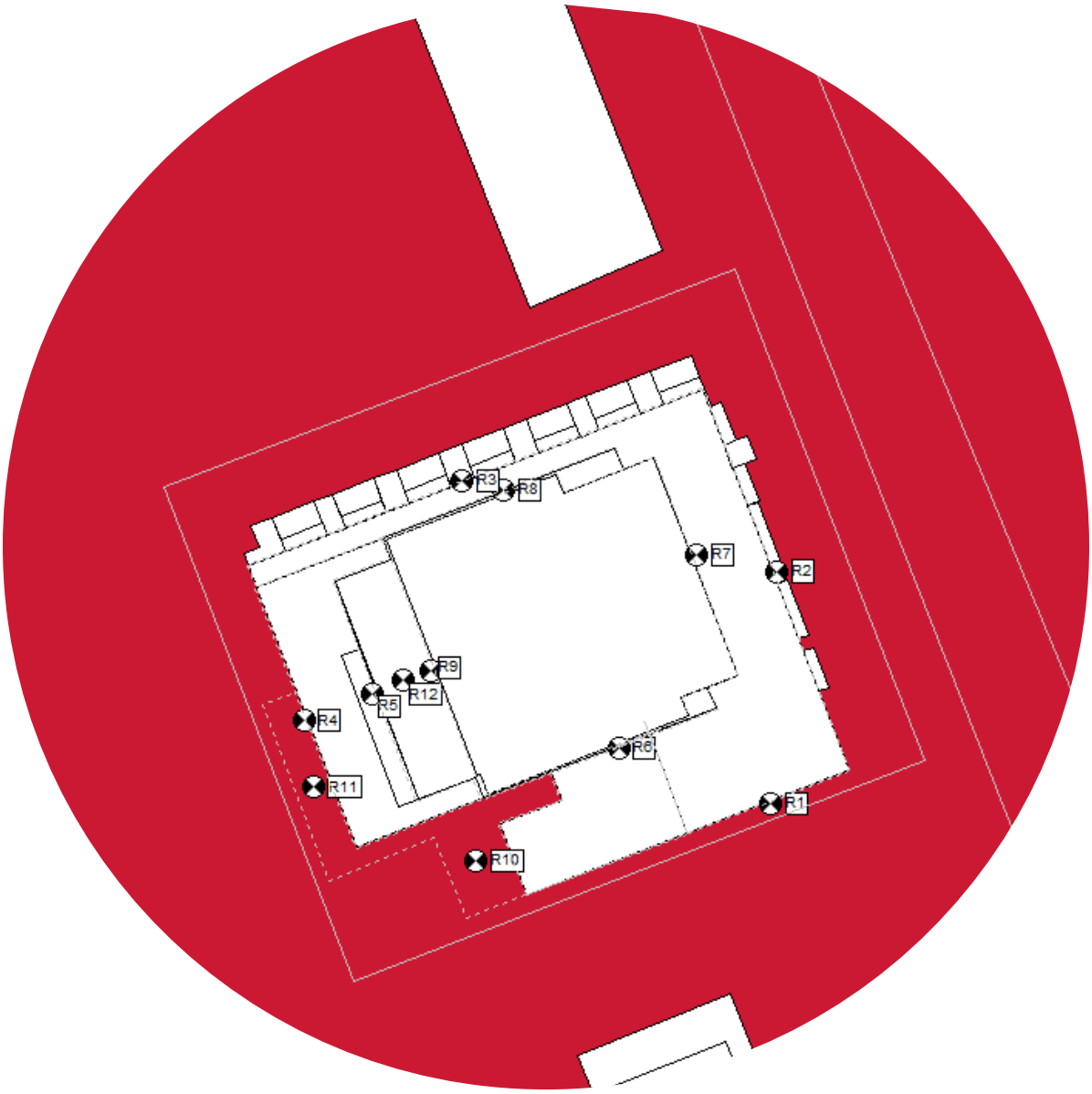


FIGURE 6: DAYTIME TRAFFIC NOISE CONTOUR (73.8 M ABOVE GRADE)

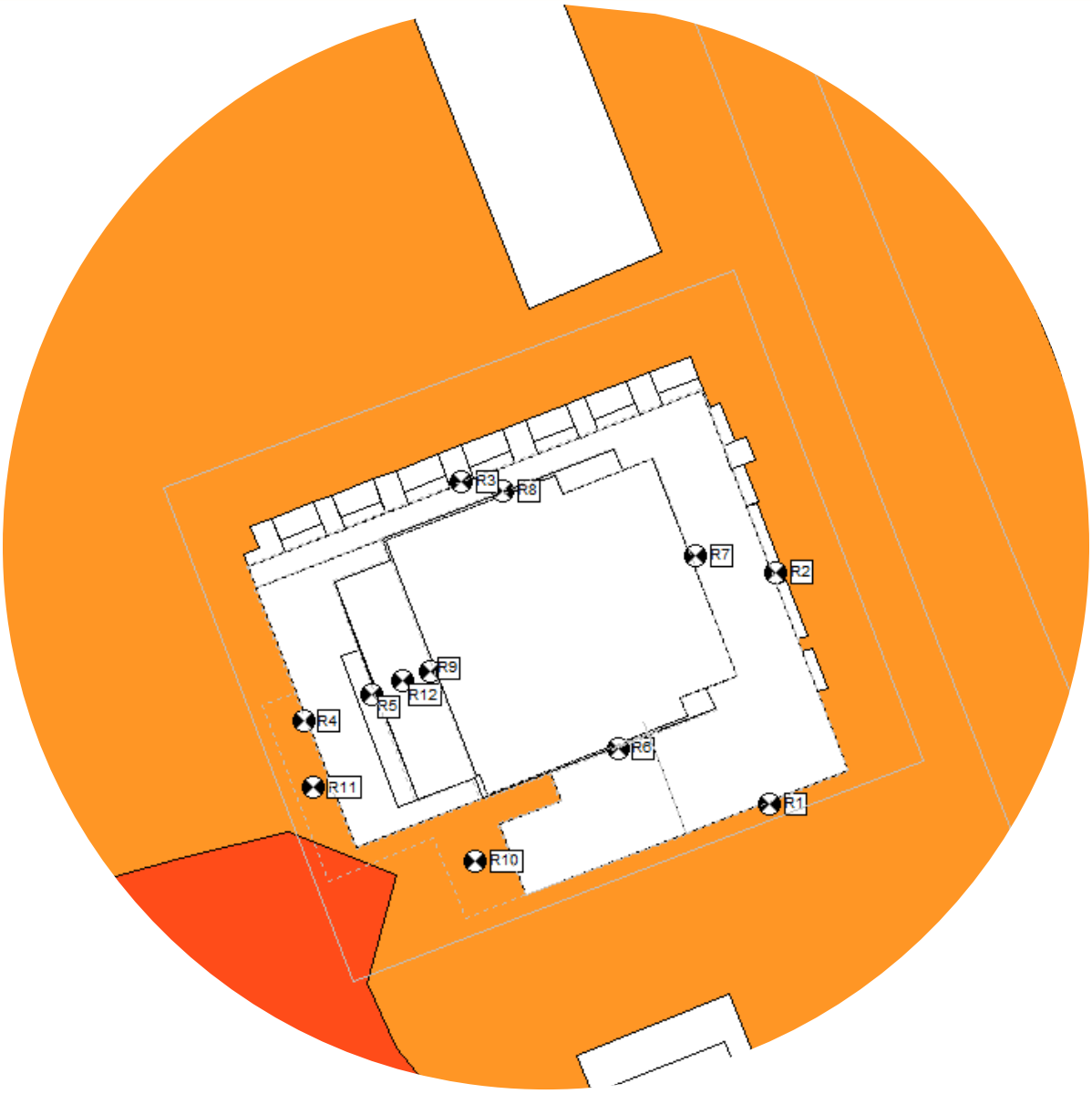


FIGURE 7: NIGHTTIME TRAFFIC NOISE CONTOUR (73.8 M ABOVE GRADE)

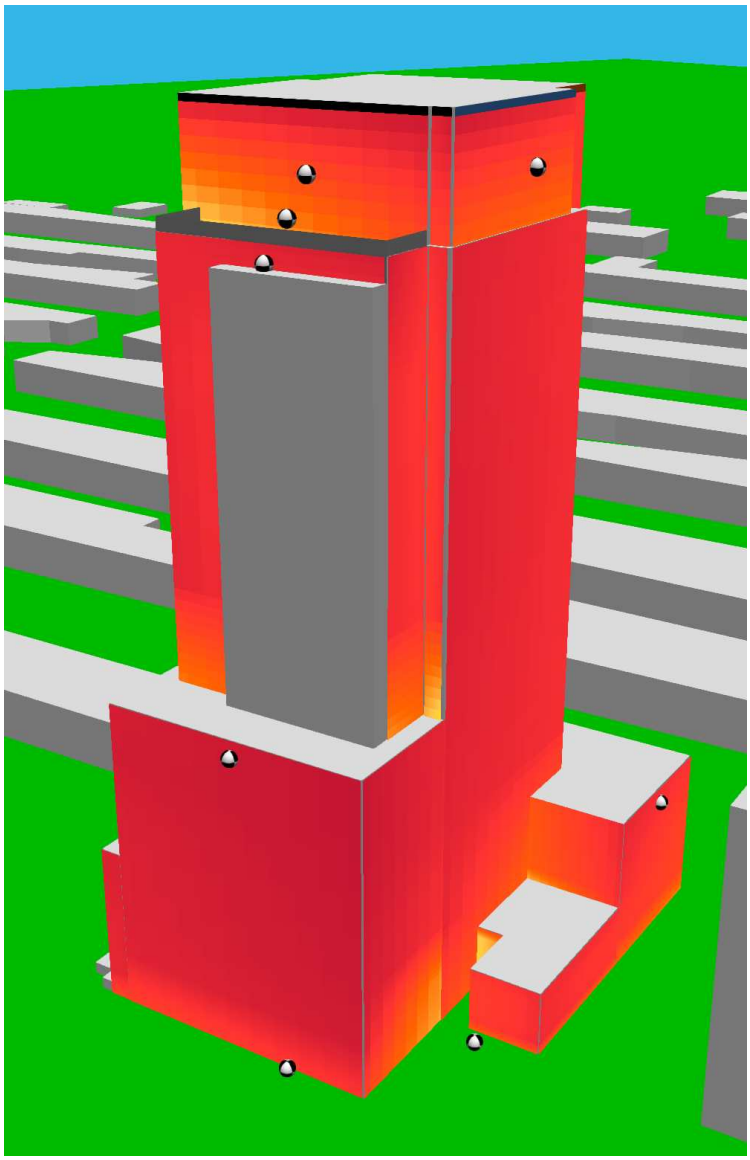
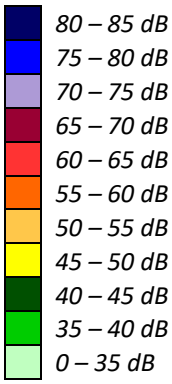


FIGURE 8: DAYTIME TRAFFIC NOISE CONTOUR (SOUTH AND WEST FAÇADES)



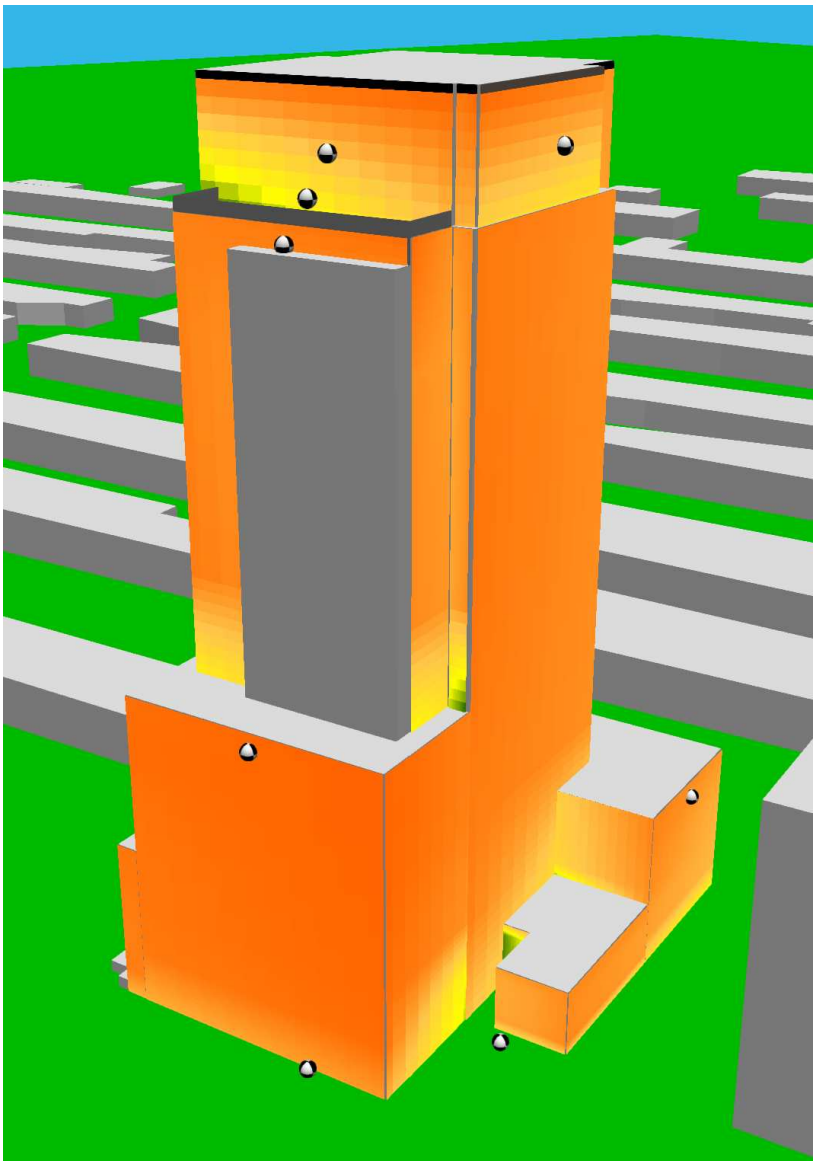


FIGURE 9: NIGHTTIME TRAFFIC NOISE CONTOUR (SOUTH AND WEST FAÇADES)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

FIGURE 10: DAYTIME TRAFFIC NOISE CONTOUR (NORTH AND EAST FAÇADES)

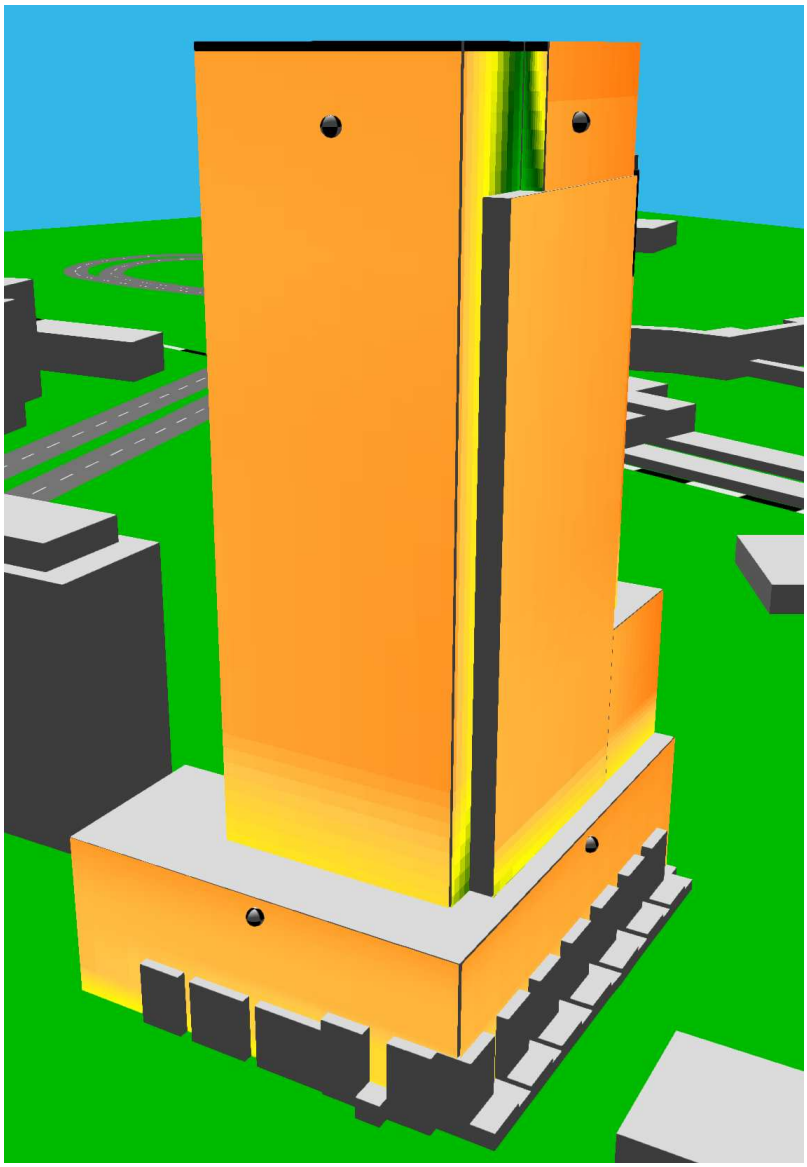


FIGURE 11: NIGHTTIME TRAFFIC NOISE CONTOUR (NORTH AND EAST FAÇADES)

APPENDIX A

STAMSON 5.04 – SAMPLE NOISE CALCULATIONS

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

```
STAMSON 5.0        NORMAL REPORT        Date: 10-06-2025 11:29:20
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te                Time Period: Day/Night 16/8 hours
Description: POW Level 24 South Facade


Road data, segment # 1: Carling East (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling East (day/night)
-----------------------------------------------
Angle1   Angle2           : -51.75 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 119.67 / 119.67 m
Receiver height           :  73.80 / 73.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   5.00 deg   Angle2 : 38.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  90.00 / 90.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Carling West (day/night)
------------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling West (day/night)
----------------------------------------------
Angle1   Angle2           : -53.03 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 104.84 / 104.84 m
Receiver height           :  73.80 / 73.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   7.00 deg   Angle2 : 40.00 deg
Barrier height            :  30.00 m
Barrier receiver distance :  90.00 / 90.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Carling East (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 !       73.80 !       19.42 !        19.42

ROAD (56.63 + 35.52 + 56.25) = 59.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -52      5   0.00  70.67   0.00  -9.02  -5.01   0.00   0.00   0.00  56.63
-------------------------------------------------------------------------------
     5     38   0.00  70.67   0.00  -9.02  -7.37   0.00   0.00 -18.75  35.52
-------------------------------------------------------------------------------
    38     90   0.00  70.67   0.00  -9.02  -5.39   0.00   0.00   0.00  56.25
-------------------------------------------------------------------------------

Segment Leq : 59.48 dBA

Results segment # 2: Carling West (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 !       73.80 !       11.73 !        11.73

ROAD (57.45 + 34.85 + 56.66) = 60.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -53      7   0.00  70.67   0.00  -8.44  -4.77   0.00   0.00   0.00  57.45
-------------------------------------------------------------------------------
     7     40   0.00  70.67   0.00  -8.44  -7.37   0.00   0.00 -20.00  34.85
-------------------------------------------------------------------------------
    40     90   0.00  70.67   0.00  -8.44  -5.56   0.00   0.00   0.00  56.66
-------------------------------------------------------------------------------

Segment Leq : 60.10 dBA

Total Leq All Segments: 62.81 dBA
```

```
Results segment # 1: Carling East (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 !       73.80 !       19.42 !        19.42

ROAD (49.04 + 27.93 + 48.66) = 51.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -52      5   0.00  63.07   0.00  -9.02  -5.01   0.00   0.00   0.00  49.04
-------------------------------------------------------------------------------
     5     38   0.00  63.07   0.00  -9.02  -7.37   0.00   0.00 -18.75  27.93
-------------------------------------------------------------------------------
    38     90   0.00  63.07   0.00  -9.02  -5.39   0.00   0.00   0.00  48.66
-------------------------------------------------------------------------------

Segment Leq : 51.88 dBA

Results segment # 2: Carling West (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 !       73.80 !       11.73 !        11.73

ROAD (49.86 + 27.26 + 49.06) = 52.50 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -53      7   0.00  63.07   0.00  -8.44  -4.77   0.00   0.00   0.00  49.86
-------------------------------------------------------------------------------
     7     40   0.00  63.07   0.00  -8.44  -7.37   0.00   0.00 -20.00  27.26
-------------------------------------------------------------------------------
    40     90   0.00  63.07   0.00  -8.44  -5.56   0.00   0.00   0.00  49.06
-------------------------------------------------------------------------------

Segment Leq : 52.50 dBA

Total Leq All Segments: 55.21 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 6-car Subway:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    60 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   -18.24 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 151.30 / 151.30 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 51.87 + 0.00) = 51.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -18   0.00  65.90 -10.04  -3.99   0.00   0.00   0.00  51.87
-------------------------------------------------------------------------

Segment Leq : 51.87 dBA

Total Leq All Segments: 51.87 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 45.34 + 0.00) = 45.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -18   0.00  59.37 -10.04  -3.99   0.00   0.00   0.00  45.34
-------------------------------------------------------------------------

Segment Leq : 45.34 dBA

Total Leq All Segments: 45.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.15
                           (NIGHT): 55.64
```

```
STAMSON 5.0        NORMAL REPORT        Date: 10-06-2025 11:37:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te                Time Period: Day/Night 16/8 hours
Description: POW Level 24 West Facade


Road data, segment # 1: Carling East (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling East (day/night)
-----------------------------------------------
Angle1   Angle2           :  11.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 134.63 / 134.63 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Carling West (day/night)
------------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling West (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  : 119.56 / 119.56 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Kichi North (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Kichi North (day/night)
---------------------------------------------
Angle1   Angle2           : -28.89 deg   19.61 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 220.74 / 220.74 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 4: Kichi South (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Kichi South (day/night)
---------------------------------------------
Angle1   Angle2           : -27.33 deg   21.16 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 233.70 / 233.70 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Carling East (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.56 + 0.00) = 57.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    11     90   0.00  70.67   0.00  -9.53  -3.58   0.00   0.00   0.00  57.56
-------------------------------------------------------------------------------

Segment Leq : 57.56 dBA

Results segment # 2: Carling West (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.13 + 0.00) = 58.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    10     90   0.00  70.67   0.00  -9.01  -3.52   0.00   0.00   0.00  58.13
-------------------------------------------------------------------------------

Segment Leq : 58.13 dBA

Results segment # 3: Kichi North (day)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.29 + 0.00) = 53.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -29     20   0.00  70.67   0.00 -11.68  -5.70   0.00   0.00   0.00  53.29
-------------------------------------------------------------------------------

Segment Leq : 53.29 dBA

Results segment # 4: Kichi South (day)
---------------------------------------

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
-------------------------------------------------------------------------------
   -27     21   0.00  70.67   0.00 -11.93  -5.70   0.00   0.00   0.00  53.04
-------------------------------------------------------------------------------

Segment Leq : 53.04 dBA

Total Leq All Segments: 62.14 dBA
```

```
Results segment # 1: Carling East (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.96 + 0.00) = 49.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    11     90   0.00  63.07   0.00  -9.53  -3.58   0.00   0.00   0.00  49.96
-------------------------------------------------------------------------------

Segment Leq : 49.96 dBA

Results segment # 2: Carling West (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 50.53 + 0.00) = 50.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    10     90   0.00  63.07   0.00  -9.01  -3.52   0.00   0.00   0.00  50.53
-------------------------------------------------------------------------------

Segment Leq : 50.53 dBA

Results segment # 3: Kichi North (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.70 + 0.00) = 45.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -29     20   0.00  63.07   0.00 -11.68  -5.70   0.00   0.00   0.00  45.70
-------------------------------------------------------------------------------

Segment Leq : 45.70 dBA

Results segment # 4: Kichi South (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.45 + 0.00) = 45.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -27     21   0.00  63.07   0.00 -11.93  -5.70   0.00   0.00   0.00  45.45
-------------------------------------------------------------------------------

Segment Leq : 45.45 dBA

Total Leq All Segments: 54.54 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 6-car Subway:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    60 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   71.76 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 134.95 / 134.95 m
Receiver height           :  73.80 / 73.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 55.89 + 0.00) = 55.89 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     72   0.00  65.90  -9.54  -0.46   0.00   0.00   0.00  55.89
-------------------------------------------------------------------------

Segment Leq : 55.89 dBA

Total Leq All Segments: 55.89 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

RT/Custom (0.00 + 49.36 + 0.00) = 49.36 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     72   0.00  59.37  -9.54  -0.46   0.00   0.00   0.00  49.36
-------------------------------------------------------------------------

Segment Leq : 49.36 dBA

Total Leq All Segments: 49.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.06
                           (NIGHT): 55.69
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-06-2025 16:51:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12.te               Time Period: Day/Night 16/8 hours
Description: OLA Level 23


Road data, segment # 1: Carling East (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling East (day/night)
-----------------------------------------------
Angle1   Angle2           :  -4.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 135.17 / 135.17 m
Receiver height           :  70.80 / 70.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  -4.00 deg   Angle2 : 90.00 deg
Barrier height            :  70.47 m
Barrier receiver distance :   2.88 / 2.88   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Carling West (day/night)
------------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Carling West (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  : 120.04 / 120.04 m
Receiver height           :  70.80 / 70.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  -3.00 deg   Angle2 : 90.00 deg
Barrier height            :  70.47 m
Barrier receiver distance :   2.88 / 2.88   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Kichi North (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    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: Kichi North (day/night)
---------------------------------------------
Angle1   Angle2           : -26.21 deg   22.78 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 218.37 / 218.37 m
Receiver height           :  70.80 / 70.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -26.00 deg   Angle2 : 23.00 deg
Barrier height            :  70.47 m
Barrier receiver distance :   2.88 / 2.88   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Kichi South (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    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):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Kichi South (day/night)
---------------------------------------------
Angle1   Angle2           : -27.66 deg   21.33 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 231.47 / 231.47 m
Receiver height           :  70.80 / 70.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -28.00 deg   Angle2 : 21.00 deg
Barrier height            :  70.47 m
Barrier receiver distance :   2.88 / 2.88   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Carling East (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 !       70.80 !       69.32 !        69.32

ROAD (0.00 + 49.48 + 0.00) = 49.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -4     90   0.00  70.67   0.00  -9.55  -2.82   0.00   0.00  -8.82  49.48
-------------------------------------------------------------------------------

Segment Leq : 49.48 dBA

Results segment # 2: Carling West (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 !       70.80 !       69.14 !        69.14

ROAD (0.00 + 49.32 + 0.00) = 49.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -3     90   0.00  70.67   0.00  -9.03  -2.87   0.00   0.00  -9.44  49.32
-------------------------------------------------------------------------------

Segment Leq : 49.32 dBA
```

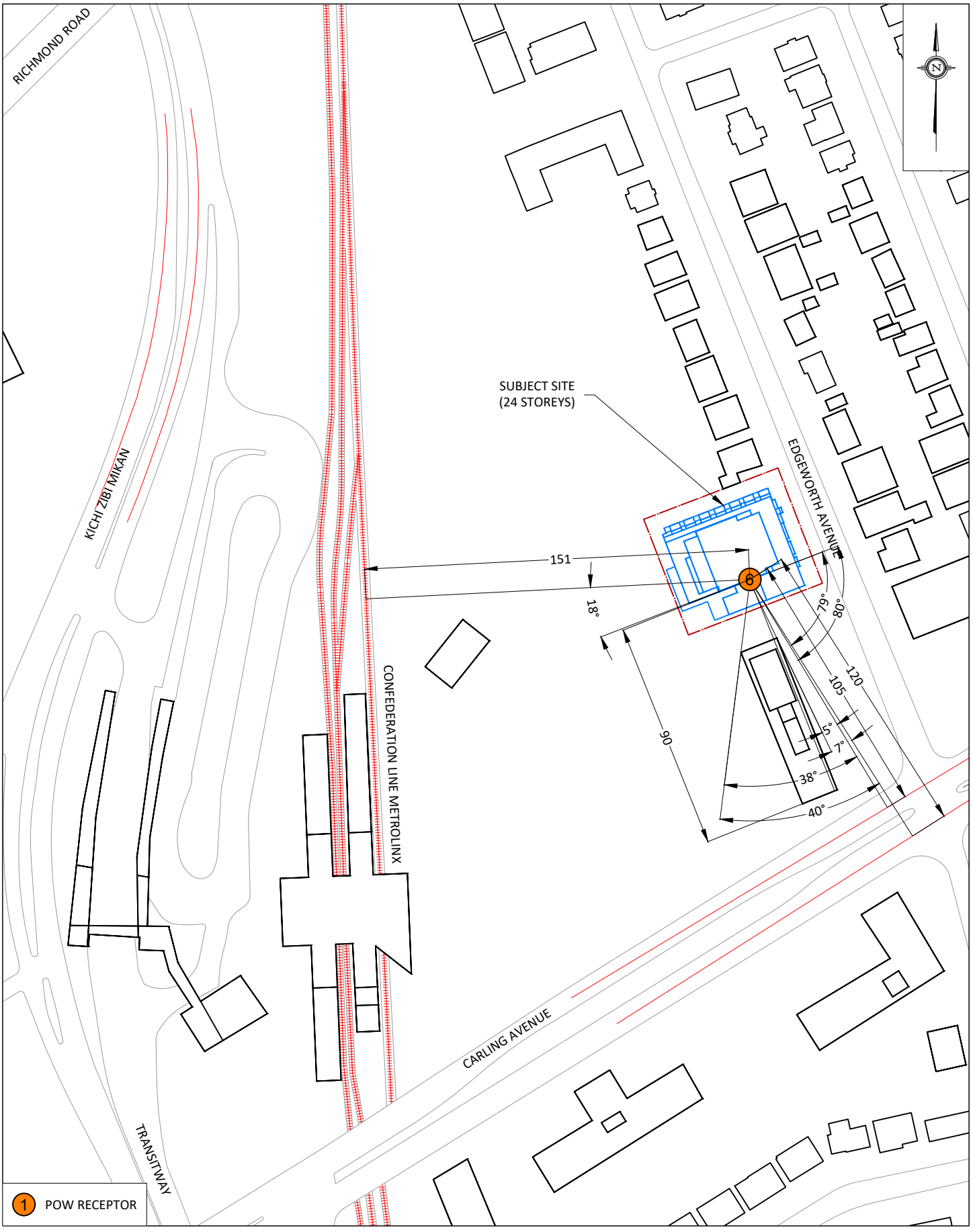
```
Results segment # 3: Kichi North (day)
---------------------------------------

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 !       70.80 !       69.89 !        69.89

ROAD (29.70 + 46.08 + 0.00) = 46.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -26    -26   0.00  70.67   0.00 -11.63 -29.33   0.00   0.00   0.00  29.70
-------------------------------------------------------------------------------
   -26     23   0.00  70.67   0.00 -11.63  -5.65   0.00   0.00  -7.31  46.08
-------------------------------------------------------------------------------

Segment Leq : 46.18 dBA

Results segment # 4: Kichi South (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 !       70.80 !       69.94 !        69.94

ROAD (0.00 + 46.15 + 31.41) = 46.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -28     21   0.00  70.67   0.00 -11.88  -5.65   0.00   0.00  -6.98  46.15
-------------------------------------------------------------------------------
    21     21   0.00  70.67   0.00 -11.88 -27.37   0.00   0.00   0.00  31.41
-------------------------------------------------------------------------------

Segment Leq : 46.29 dBA

Total Leq All Segments: 54.12 dBA
```

```
Results segment # 1: Carling East (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 !       70.80 !       69.32 !        69.32

ROAD (0.00 + 41.88 + 0.00) = 41.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -4     90   0.00  63.07   0.00  -9.55  -2.82   0.00   0.00  -8.82  41.88
-------------------------------------------------------------------------------

Segment Leq : 41.88 dBA

Results segment # 2: Carling West (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 !       70.80 !       69.14 !        69.14

ROAD (0.00 + 41.72 + 0.00) = 41.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    -3     90   0.00  63.07   0.00  -9.03  -2.87   0.00   0.00  -9.44  41.72
-------------------------------------------------------------------------------

Segment Leq : 41.72 dBA
```

```
Results segment # 3: Kichi North (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 !       70.80 !       69.89 !        69.89

ROAD (22.11 + 38.48 + 0.00) = 38.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -26    -26   0.00  63.07   0.00 -11.63 -29.33   0.00   0.00   0.00  22.11
-------------------------------------------------------------------------------
   -26     23   0.00  63.07   0.00 -11.63  -5.65   0.00   0.00  -7.31  38.48
-------------------------------------------------------------------------------

Segment Leq : 38.58 dBA

Results segment # 4: Kichi South (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 !       70.80 !       69.94 !        69.94

ROAD (0.00 + 38.55 + 23.82) = 38.69 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -28     21   0.00  63.07   0.00 -11.88  -5.65   0.00   0.00  -6.98  38.55
-------------------------------------------------------------------------------
    21     21   0.00  63.07   0.00 -11.88 -27.37   0.00   0.00   0.00  23.82
-------------------------------------------------------------------------------

Segment Leq : 38.69 dBA

Total Leq All Segments: 46.52 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 6-car Subway:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    60 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   84.62 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 132.22 / 132.22 m
Receiver height           :  70.80 / 70.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 85.00 deg
Barrier height            :  70.47 m
Barrier receiver distance :   2.88 / 2.88   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: LRT (day)
------------------------------

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       70.80 !       69.27 !        69.27

RT/Custom (0.00 + 47.23 + 0.00) = 47.23 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     85   0.00  65.90  -9.45  -0.12   0.00   0.00  -9.10  47.23
-------------------------------------------------------------------------

Segment Leq : 47.23 dBA

Total Leq All Segments: 47.23 dBA

Results segment # 1: LRT (night)
--------------------------------

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       70.80 !       69.27 !        69.27

RT/Custom (0.00 + 40.69 + 0.00) = 40.69 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     85   0.00  59.37  -9.45  -0.12   0.00   0.00  -9.10  40.69
-------------------------------------------------------------------------

Segment Leq : 40.69 dBA

Total Leq All Segments: 40.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.93
                           (NIGHT): 47.53
```



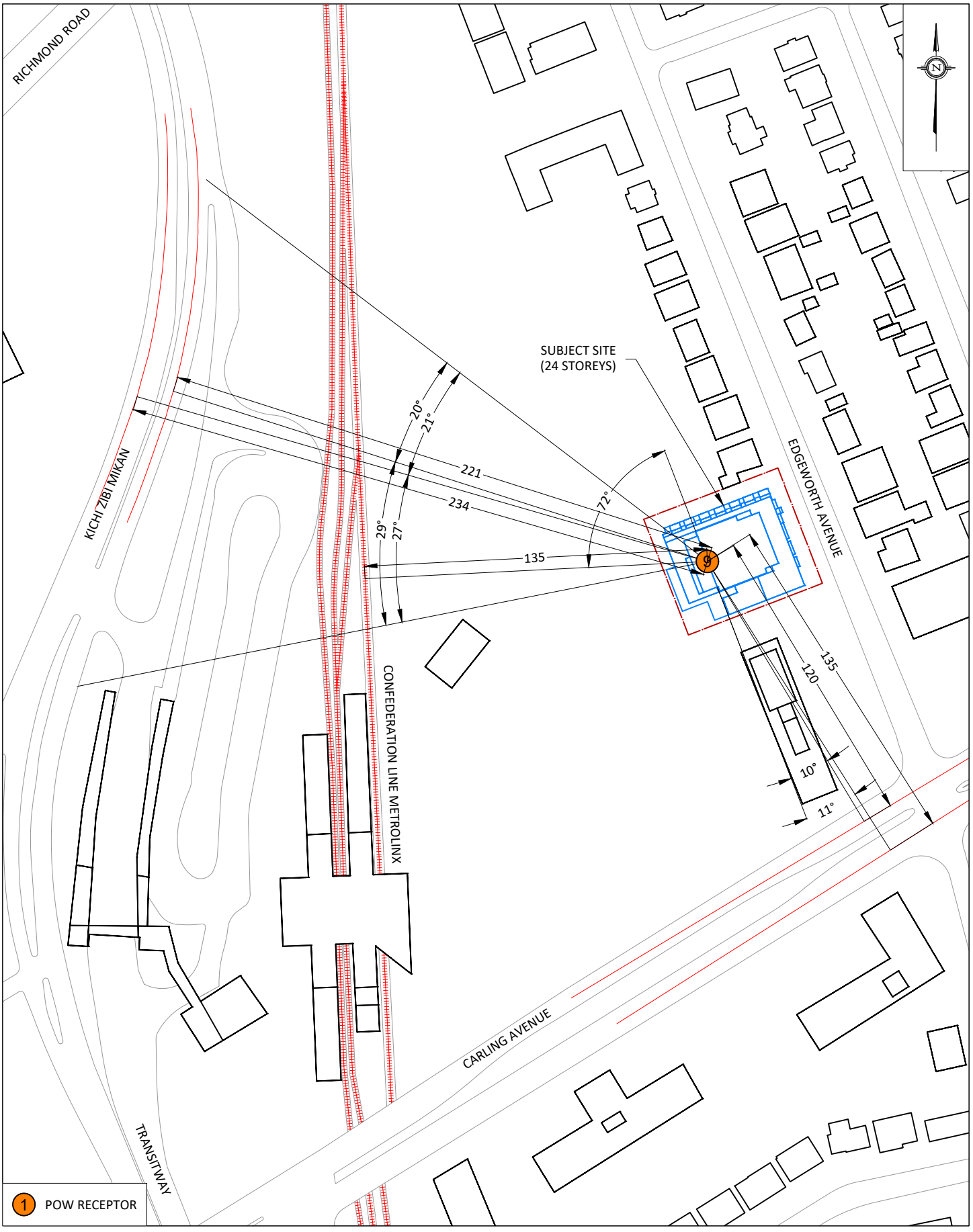
GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		
SCALE	1:2000 (APPROX.)	DRAWING NO.	25-101-ANV-A1
DATE	MAY 28, 2025	DRAWN BY	N.M.P.

DESCRIPTION

FIGURE A1:
STAMSON INPUT PARAMETERS
RECEPTOR 6



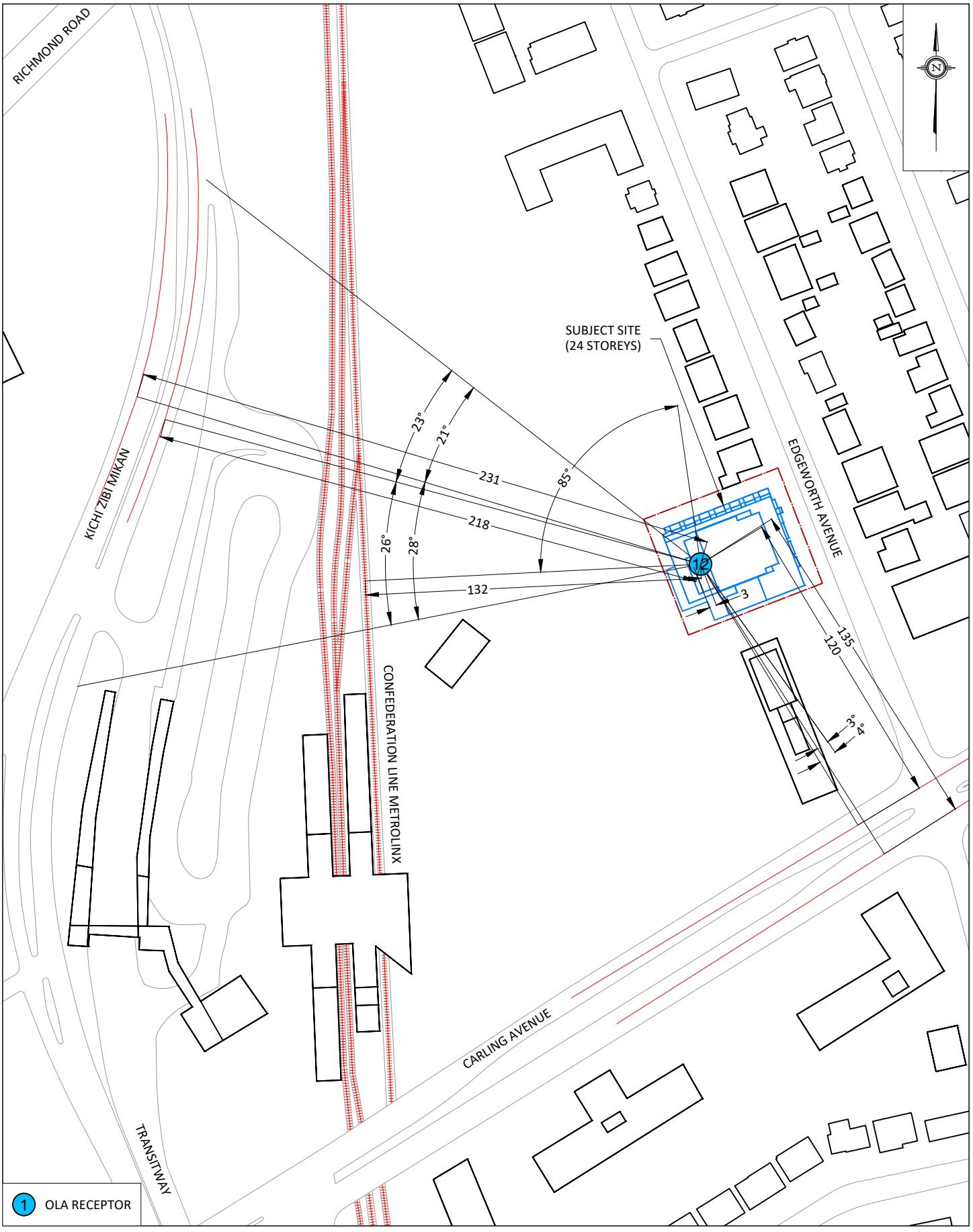
GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		
SCALE	1:2000 (APPROX.)	DRAWING NO.	25-101-ANV-A2
DATE	MAY 28, 2025	DRAWN BY	N.M.P.

DESCRIPTION

FIGURE A2:
STAMSON INPUT PARAMETERS
RECEPTOR 9



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

PROJECT	500 & 508 EDGEWORTH AVENUE, OTTAWA TRANSPORTATION NOISE AND VIBRATION STUDY		
SCALE	1:2000 (APPROX.)	DRAWING NO.	25-101-ANV-A3
DATE	MAY 28, 2025	DRAWN BY	N.M.P.

DESCRIPTION

FIGURE A3:
STAMSON INPUT PARAMETERS
RECEPTOR 12