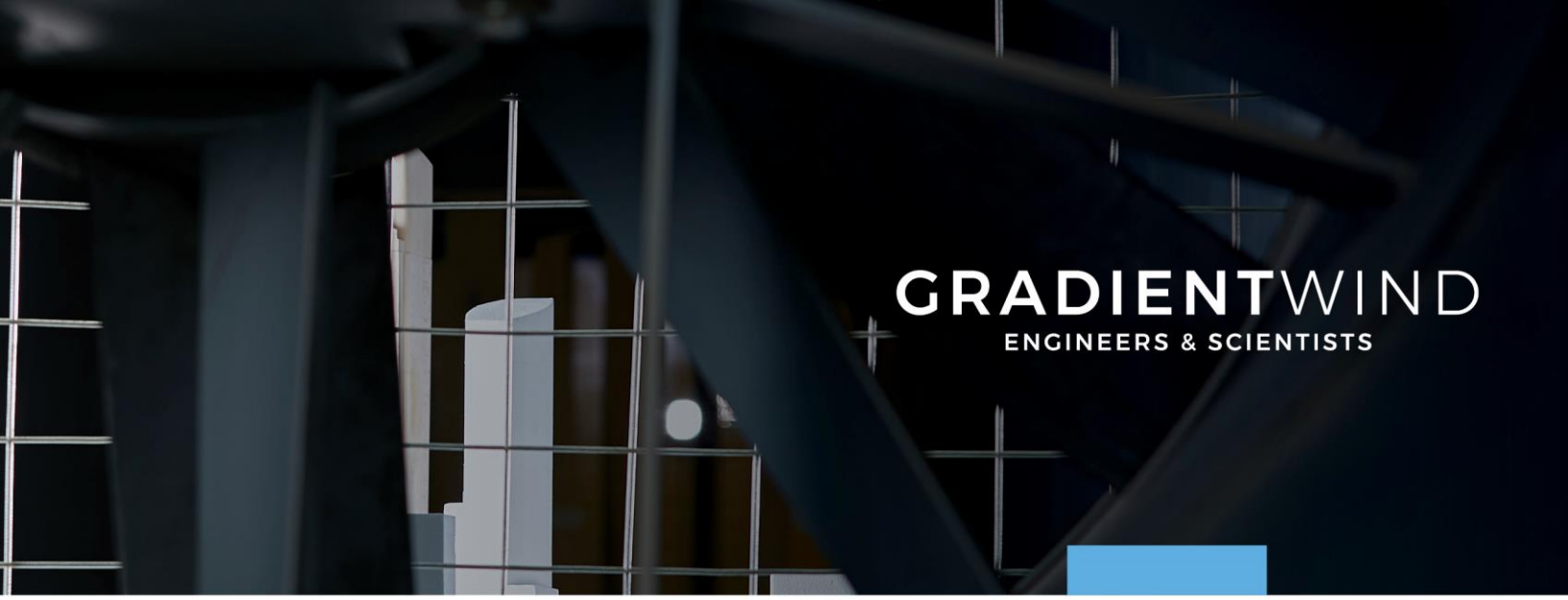

GRADIENTWIND
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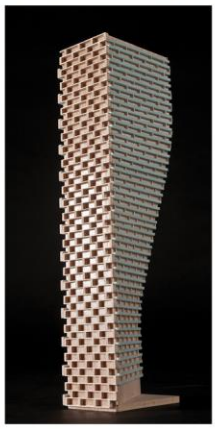
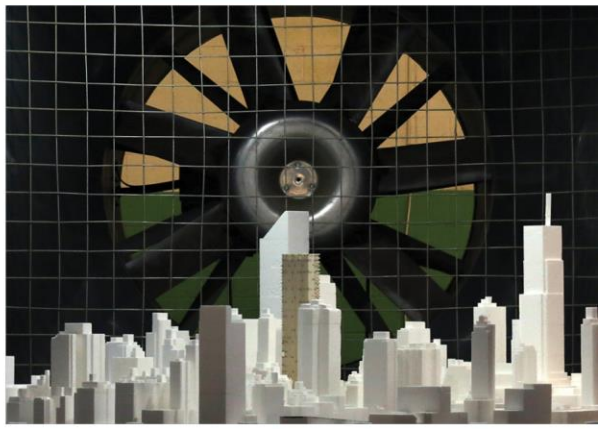
ROADWAY TRAFFIC NOISE ASSESSMENT

1600 James Naismith Drive (Phase 1)
Ottawa, Ontario

REPORT: 22-051 – Traffic Noise





April 29, 2022

PREPARED FOR

1600 James Naismith LP
1460 The Queensway
Suite M264
Toronto, ON M8Z 1S4

PREPARED BY

Giuseppe Garro, MASc., Environmental Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a roadway traffic noise assessment undertaken to satisfy the requirements for a Site Plan Control (SPC) application submission for a proposed conversion of an existing development located at 1600 James Naismith Drive in Ottawa, Ontario. The proposed development comprises an existing eight-storey commercial building with an irregular planform and outdoor parking to the east, north and west. The building will be converted into a residential space with communal and private amenity spaces. This represents Phase 1 of a 3 Phase masterplan and is the focus of this assessment. A portion of the west parking area will be sectioned off for Phase 2 development. The primary source of roadway traffic noise is the Queensway (Highway 417). Figure 1 illustrates a complete site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications; and (iv) architectural drawings provided by Figurr Architect Collective in April 2022.

The results of the current analysis indicate that noise levels will range between 66 and 71 dBA during the daytime period (07:00-23:00) and between 58 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the north façade, which is nearest and most exposed to the Queensway. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 3.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. A Type D Warning Clause will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6 of this report.

In addition, the results indicate that noise levels at the outdoor amenity terrace to the north are expected to exceed 60 dBA during the daytime period. The north amenity terraces are expected to function similar to a commercial patio and should not be considered/programmed as noise-sensitive OLAs. It is worth noting that the overall master plan includes Phase 2 and 3 which will comprise townhouse buildings and a

residential complex, respectively. Phase 2 will occupy the west portion and Phase 3 will occupy the north portion adjacent to Phase 1. These phases will provide additional blockage from roadway noise (Highway 417) once construction begins, further reducing noise levels at the terraces and building facades.

Moreover, the stationary noise impacts of the building on the surroundings would be considered at a future stage once the mechanical design has progressed and equipment has been selected. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Should noise levels from these units exceed the criteria established in NPC-300, noise from these sources can be controlled to acceptable limits by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by 1600 James Naismith LP to undertake a roadway traffic noise assessment to satisfy the requirements for a Site Plan Control (SPC) application submission for a proposed conversion of an existing development located at 1600 James Naismith Drive in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings provided by Figurr Architect Collective in April 2022, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this roadway traffic noise assessment is a proposed conversion of an existing development located at 1600 James Naismith Drive in Ottawa, Ontario. The proposed development comprises an existing eight-storey commercial building with an irregular planform and outdoor parking to the east, north and west. The building will be converted into a residential space. This proposed conversion represents Phase 1 of a three-phase master plan and is the primary focus of this assessment. A portion of the west parking area will be sectioned off for Phase 2 development. Phase 2 will comprise several stacked townhouse buildings along the west half of the overall site, and Phase 3 will comprise a residential building with two 18-storey towers connected by a shared podium to the north of Phase 1.

The development will comprise communal and private amenity spaces along the west, north, and south façades. Part of the existing solarium will be converted into an outdoor communal terrace space for the residents. Balconies/terraces extending less than 4 metres (m) in depth from the façade do not require consideration as Outdoor Living Areas (OLA) as mentioned in the ENCG. Furthermore, given the location of the terraces to the north nearest to the Queensway, these areas are expected to function similar to a

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

commercial patio and should not be considered/programmed as noise-sensitive OLAs. The primary source of roadway traffic noise is the Queensway (Highway 417). Figure 1 illustrates a complete site plan with the surrounding context. The development is surrounded by low-rise residential buildings to the west, the Queensway to the north, commercially zoned land to the east, and parkland to the south.

In addition, the stationary noise impacts of the building on the surroundings would be considered at a future stage once the mechanical design has progressed and equipment has been selected. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Should noise levels from these units exceed the criteria established in NPC-300, noise from these sources can be controlled to acceptable limits by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

3. OBJECTIVES

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

4. METHODOLOGY

4.1 Background

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

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For surface roadway traffic noise, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) specifies that the recommended indoor noise limit range (that is relevant to this study) is 45 and 40 dBA for living rooms, and sleeping quarters, respectively, as listed in Table 1. However, to account for deficiencies in building construction and to control peak noise, these levels should be targeted toward 42, and 37 dBA.

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

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

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

The sound level criterion for outdoor living areas (OLA) is 55 dBA, which applies during the daytime (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. Furthermore, noise levels at the OLA must not exceed 60 dBA if mitigation can be technically and administratively achieved.

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 source of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- For select sources where appropriate, receptors considered the existing and the proposed building as a barrier partially or fully obstructing exposure to the source as illustrated by exposure angles in Figures 4-7.
- Noise receptors were strategically placed at 8 locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 4-7.

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

- The existing 5m noise wall north of Eugene Street was considered in the analysis.

4.2.3 Roadway Traffic Volumes

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

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Queensway (Highway 417) West Bound	Freeway	100	**36,666**
Queensway (Highway 417) East Bound	Freeway	100	**36,666**

4.3 Indoor Noise Calculations

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

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

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[8] considers:

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

Based on published research[9], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. Due to the limited information available at the time of the study, which was prepared for site plan approval, detailed floor layouts and building elevations have not been finalized; therefore, detailed STC calculations could not be performed at this time. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels).

[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

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the roadway traffic noise calculations are summarized in Table 3 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD TRAFFIC

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	STAMSON 5.04 Noise Level (dBA)	
			Day	Night
1	22.5	POW – 8th Floor – East Façade	66	58
2	22.5	POW – 8th Floor – North Façade	71	64
3	22.5	POW – 8th Floor – West Façade	70	62
4	22.5	POW – 8th Floor – West Façade	69	62
5	22.5	POW – 8th Floor – West Façade	68	60
6	22.5	POW – 8th Floor – Southwest Façade	66	58
7	22.5	POW – 8th Floor – East Façade	66	58
8	1.5	OLA – North Amenity Terrace	70*	N/A

*Noise level is provided for context as this area is expected to function similar to a non-noise sensitive commercial patio.

The results of the current analysis indicate that noise levels will range between 66 and 71 dBA during the daytime period (07:00-23:00) and between 58 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the north façade, which is nearest and most exposed to the Queensway.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the 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). As per city of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application for each unit type. The STC

requirements for the windows are summarized below for various units within the development (see Figure 3):

- **Bedroom Windows**

(i) Bedroom windows facing north and west will require a minimum STC of 34.

(ii) Bedroom windows facing southwest and east will require a minimum STC of 29.

(iii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2012) requirements.

- **Living Room Windows**

(i) Living room windows facing north and west will require a minimum STC of 29.

(ii) Living room windows facing southwest and east will require a minimum STC of 24.

(iii) All other living room windows are to satisfy Ontario Building Code (OBC 2012) requirements.

- **Exterior Walls**

(i) Exterior wall components on the north, west, southwest, and east façades will require a minimum STC of 45, in-line with NRC test data[10].

The STC requirements apply to windows, doors, spandrel panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 45, where a punch window and wall system may be used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have specified an example window configuration, however, several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. 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 swinging and/or sliding patio doors.

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

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

In addition, the results indicate that noise levels at the outdoor amenity terrace to the north are expected to exceed 60 dBA during the daytime period. As previously mentioned, the north amenity terraces are expected to function similar to a commercial patio and should not be considered/programmed as noise-sensitive OLAs. It is worth noting that the overall master plan includes Phase 2 and 3 which will comprise townhouse buildings and a residential complex, respectively. Phase 2 will occupy the west portion and Phase 3 will occupy the north portion adjacent to Phase 1. These phases will provide additional blockage from roadway noise (Highway 417) once construction begins, further reducing noise levels at the terraces and building facades.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 66 and 71 dBA during the daytime period (07:00-23:00) and between 58 and 64 dBA during the nighttime period (23:00-07:00). The highest noise level (71 dBA) occurs at the north façade, which is nearest and most exposed to the Queensway. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 65 dBA, as indicated in Figure 3.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The following Type D Warning Clause will also be required on all Lease, Purchase and Sale Agreements, as summarized below:

Type D:

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

In addition, the results indicate that noise levels at the outdoor amenity terrace to the north are expected to exceed 60 dBA during the daytime period. As previously mentioned, the north amenity terraces are expected to function similar to a commercial patio and should not be considered/programmed as noise-sensitive OLAs. It is worth noting that the overall master plan includes Phase 2 and 3 which will comprise townhouse buildings and a residential complex, respectively. Phase 2 will occupy the west portion and Phase 3 will occupy the north portion adjacent to Phase 1. These phases will provide additional blockage from roadway noise (Highway 417) once construction begins, further reducing noise levels at the terraces and building facades.

Moreover, the stationary noise impacts of the building on the surroundings would be considered at a future stage once the mechanical design has progressed and equipment has been selected. Stationary noise sources associated with the development could include rooftop air handling units, cooling towers or dry coolers, and emergency generators. Should noise levels from these units exceed the criteria established in NPC-300, noise from these sources can be controlled to acceptable limits by judicious selection of the equipment, locating the equipment on a high roof away from nearby residential receptors, and where necessary, installing silencers or noise screens.

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

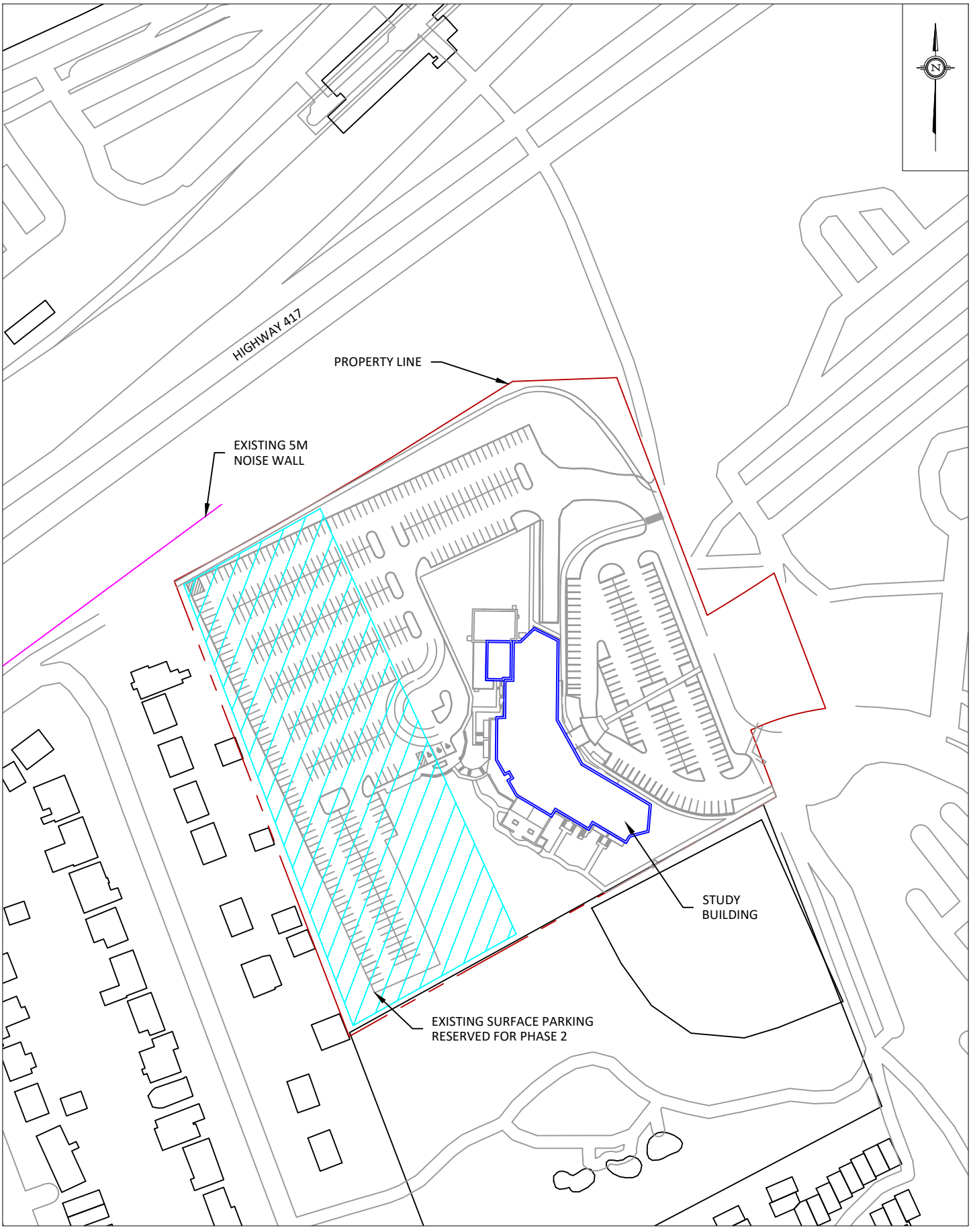
Sincerely,

Gradient Wind Engineering Inc.

Giuseppe Garro, MASc.
Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #22-051-Traffic Noise



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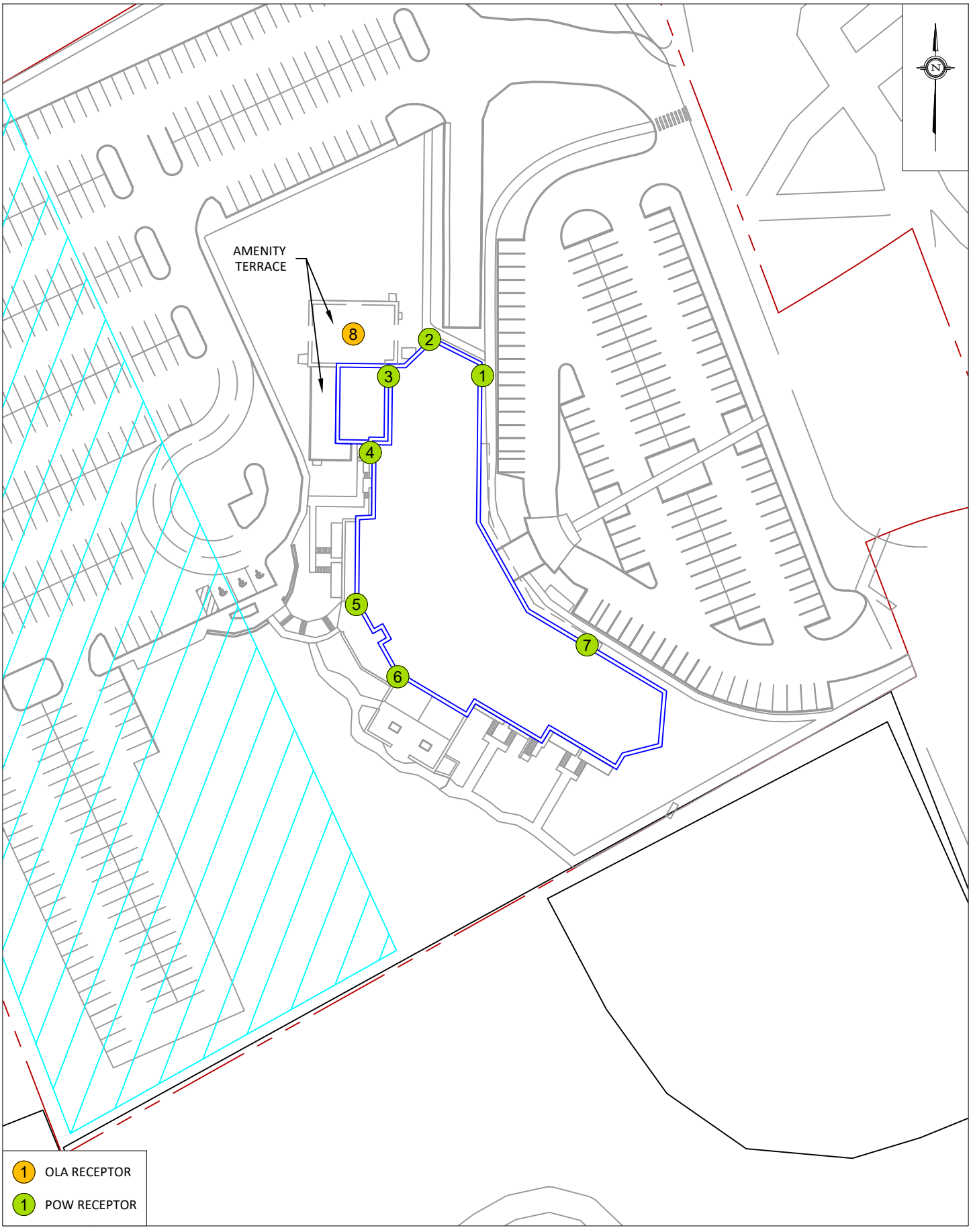
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW22-051-1
DATE	APRIL 12, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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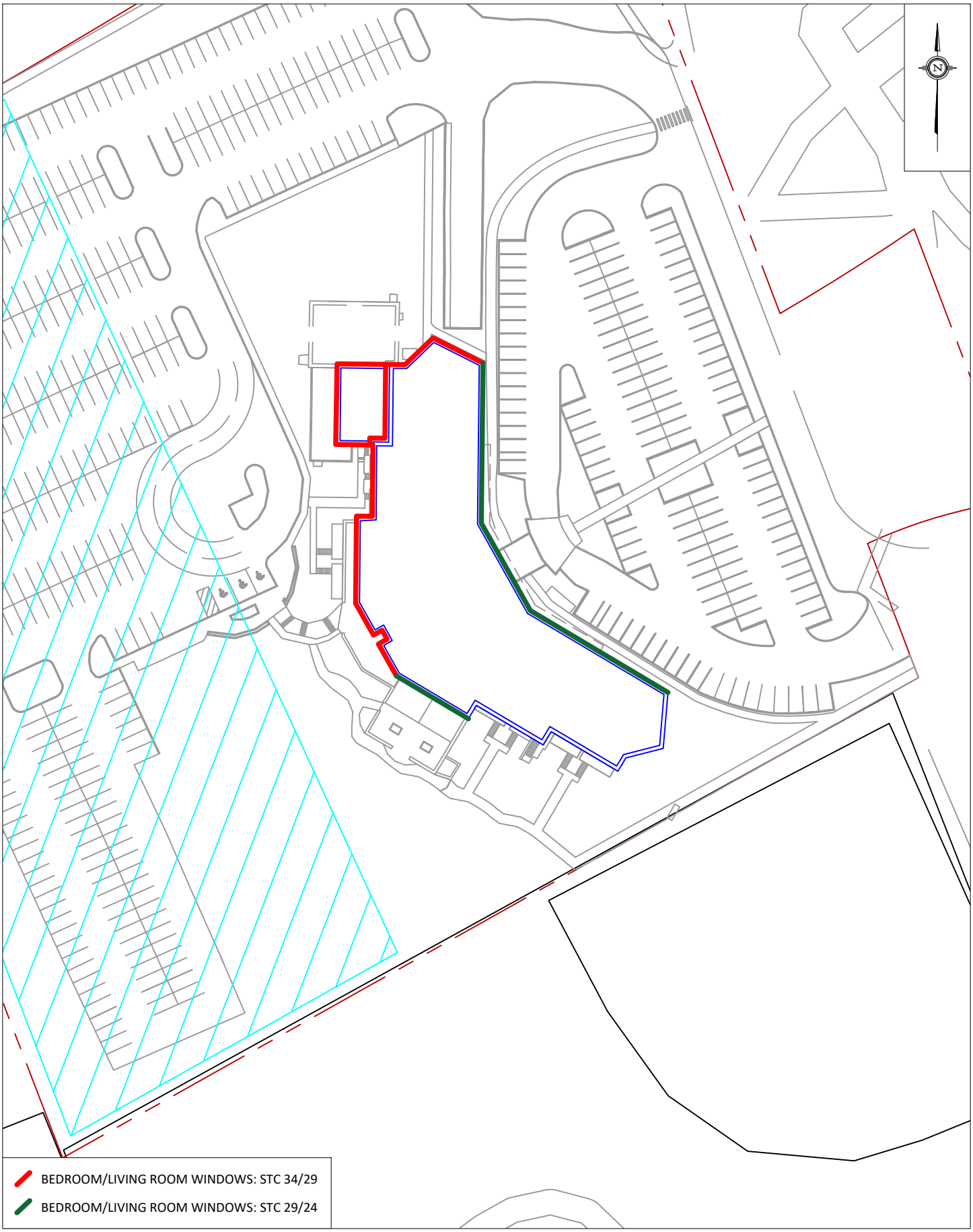
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-051-2
DATE	APRIL 12, 2022	DRAWN BY	G.G.

FIGURE 2:
RECEPTOR LOATIONS



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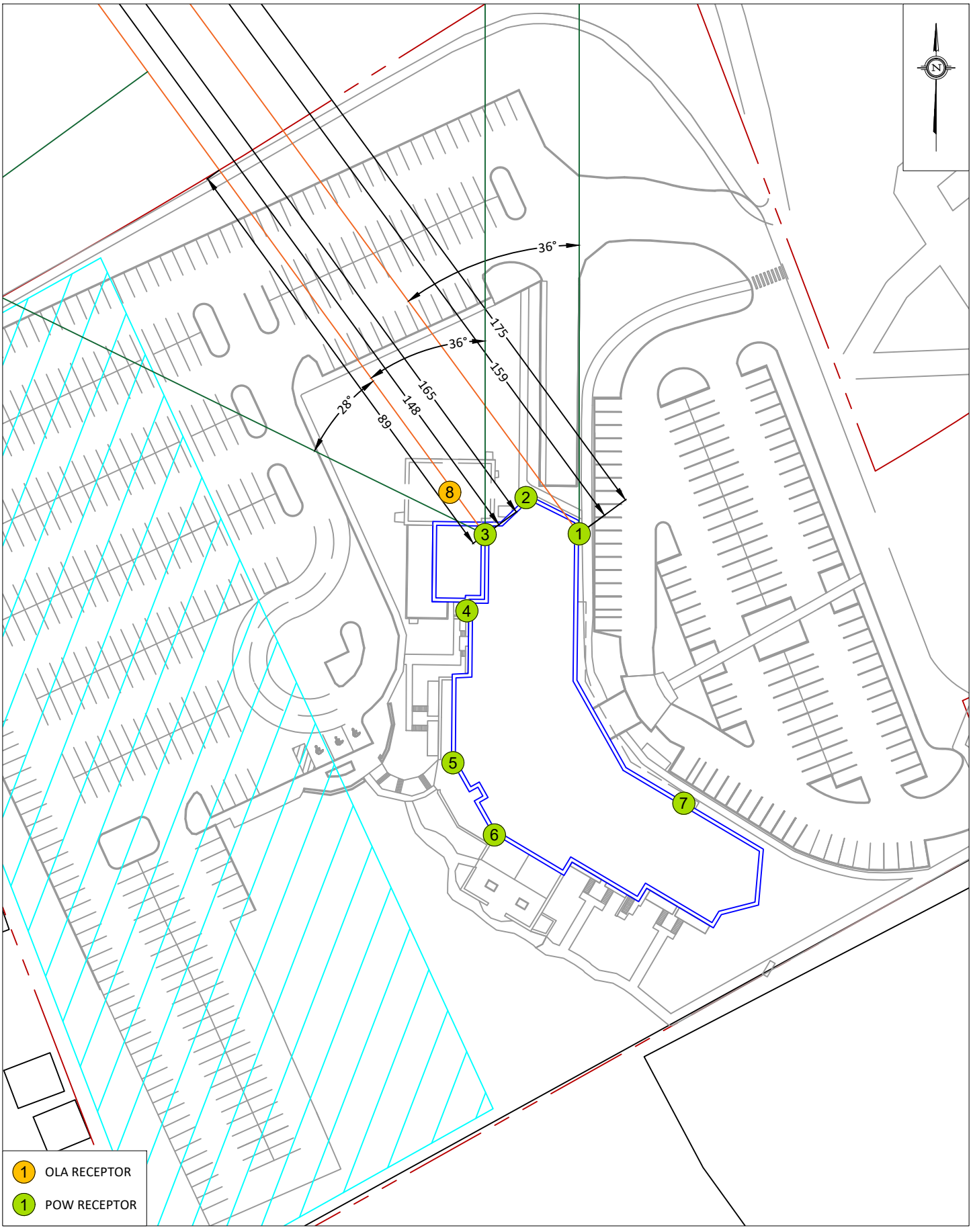
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-051-3
DATE	APRIL 12, 2022	DRAWN BY	G.G.

FIGURE 3:
WINDOW STC REQUIREMENTS



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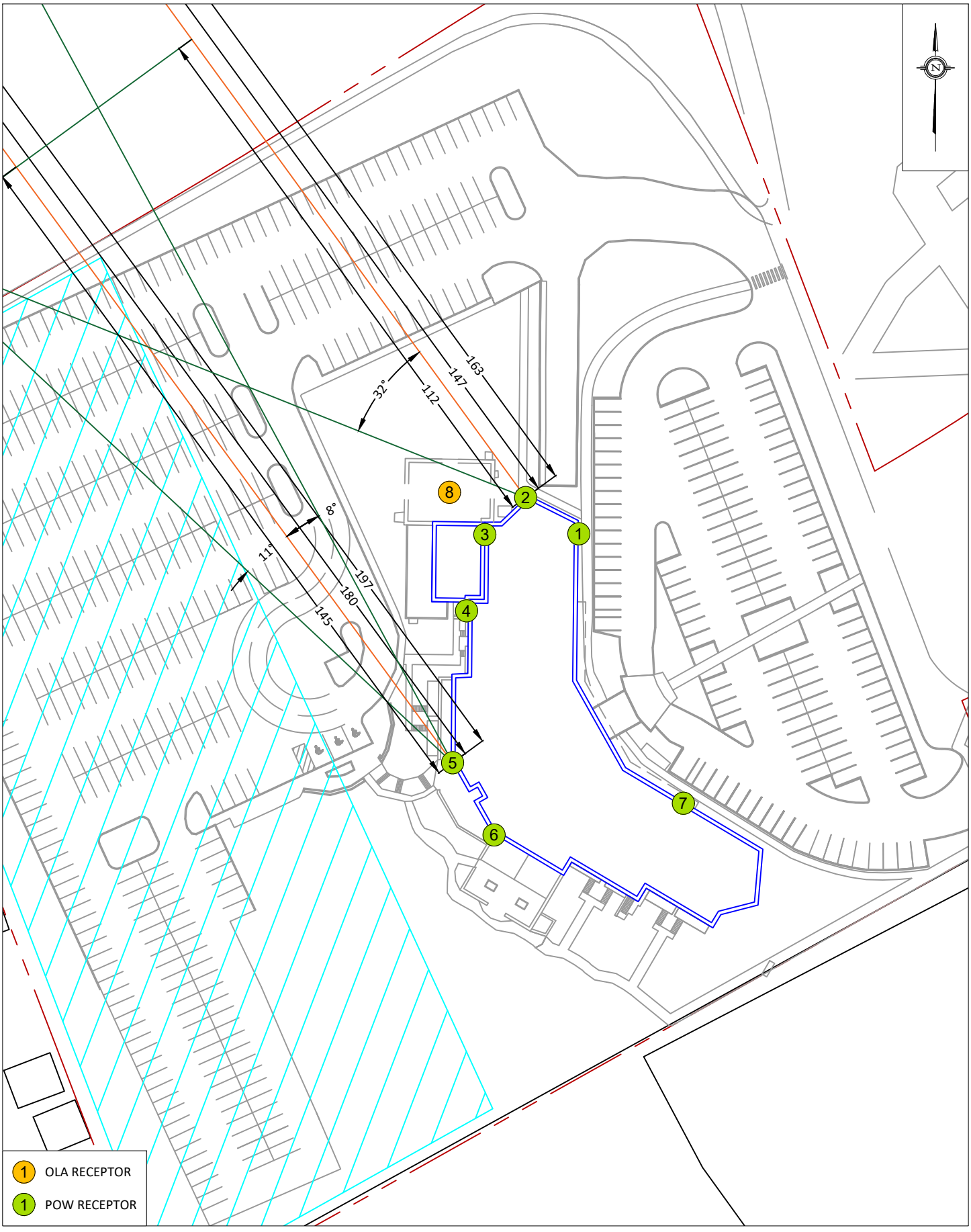
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-051-4
DATE	APRIL 12, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 4:
STAMSON INPUT PARAMETERS



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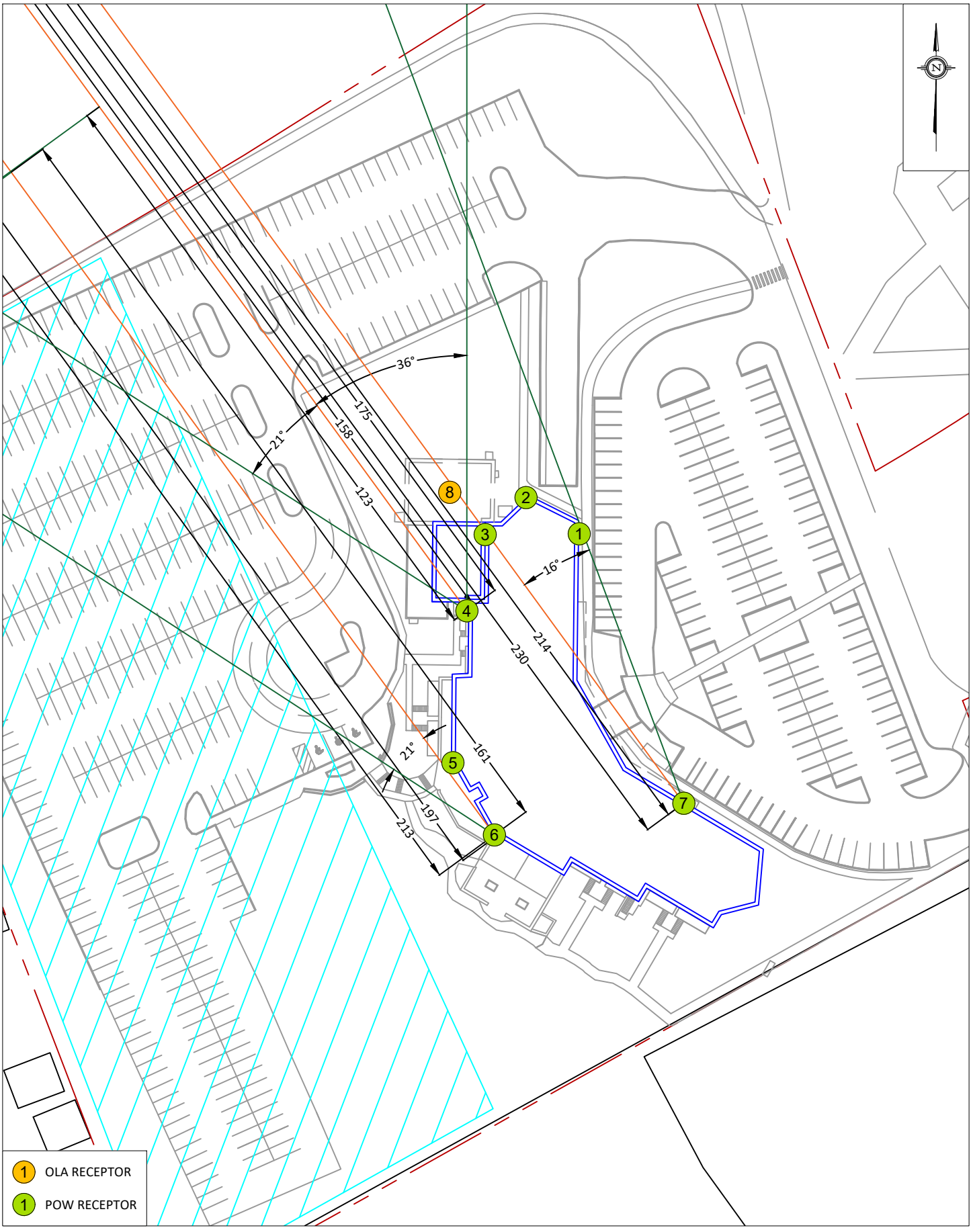
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-051-5
DATE	APRIL 12, 2022	DRAWN BY	G.G.

FIGURE 5:
STAMSON INPUT PARAMETERS



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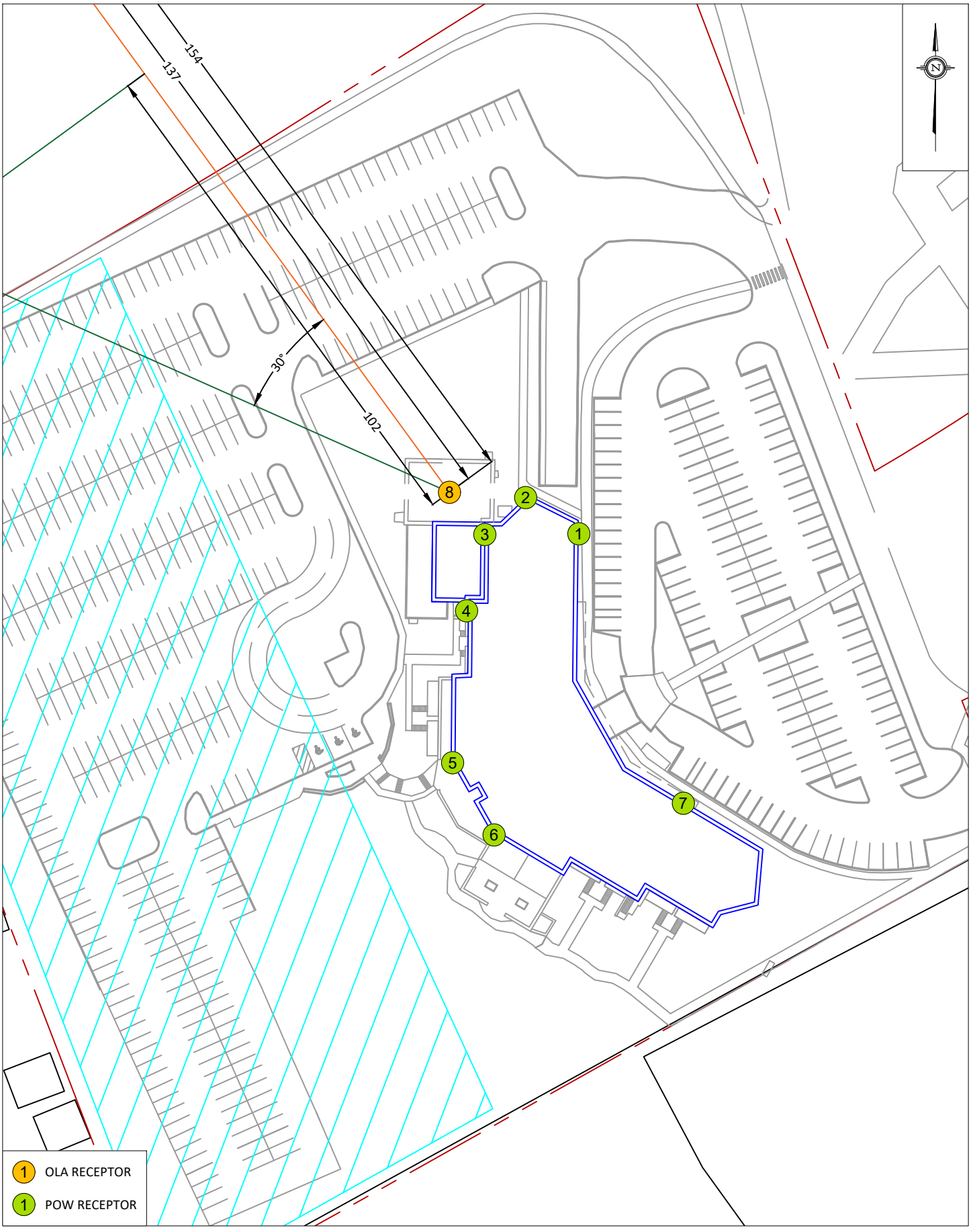
PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-051-6
DATE	APRIL 12, 2022	DRAWN BY	G.G.

FIGURE 6:
STAMSON INPUT PARAMETERS



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PROJECT	1600 JAMES NAISMITH DRIVE, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-051-7
DATE	APRIL 12, 2022
DRAWN BY	G.G.

DESCRIPTION

FIGURE 7:
STAMSON INPUT PARAMETERS

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: 12-04-2022 12:47:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           :  36.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 175.00 / 175.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           :  36.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 159.00 / 159.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: HW WB (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.49 + 0.00) = 62.49 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    36     90   0.00  78.39   0.00 -10.67  -5.23   0.00   0.00   0.00
62.49
-------------------------------------------------------------------------------
--

Segment Leq : 62.49 dBA

Results segment # 2: HW EB (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.90 + 0.00) = 62.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    36     90   0.00  78.39   0.00 -10.25  -5.23   0.00   0.00   0.00
62.90
-------------------------------------------------------------------------------
--

Segment Leq : 62.90 dBA

Total Leq All Segments: 65.71 dBA
```

```
Results segment # 1: HW WB (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.89 + 0.00) = 54.89 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    36     90   0.00  70.79   0.00 -10.67  -5.23   0.00   0.00   0.00
54.89
-------------------------------------------------------------------------
--

Segment Leq : 54.89 dBA

Results segment # 2: HW EB (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.31 + 0.00) = 55.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    36     90   0.00  70.79   0.00 -10.25  -5.23   0.00   0.00   0.00
55.31
-------------------------------------------------------------------------
--

Segment Leq : 55.31 dBA

Total Leq All Segments: 58.12 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 65.71
                           (NIGHT): 58.12
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:47:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (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  : 163.00 / 163.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -32.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 112.00 / 112.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (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  : 147.00 / 147.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -32.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 112.00 / 112.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 !       22.50 !        8.07 !         8.07

ROAD (0.00 + 63.11 + 66.34) = 68.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -32   0.00  78.39   0.00 -10.36  -4.92   0.00   0.00  -1.12
61.99*
   -90    -32   0.00  78.39   0.00 -10.36  -4.92   0.00   0.00   0.00
63.11
-------------------------------------------------------------------------------
--
   -32     90   0.00  78.39   0.00 -10.36  -1.69   0.00   0.00   0.00
66.34
```

```
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.03 dBA

Results segment # 2: HW EB (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 !       22.50 !        6.50 !         6.50

ROAD (0.00 + 63.56 + 66.79) = 68.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -32   0.00  78.39   0.00  -9.91  -4.92   0.00   0.00  -3.82
59.73*
   -90    -32   0.00  78.39   0.00  -9.91  -4.92   0.00   0.00   0.00
63.56
-------------------------------------------------------------------------
--
   -32     90   0.00  78.39   0.00  -9.91  -1.69   0.00   0.00   0.00
66.79
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.47 dBA

Total Leq All Segments: 71.27 dBA

Results segment # 1: HW WB (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 !       22.50 !        8.07 !         8.07

ROAD (0.00 + 55.51 + 58.74) = 60.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -32   0.00  70.79   0.00 -10.36  -4.92   0.00   0.00  -1.12
54.39*
   -90    -32   0.00  70.79   0.00 -10.36  -4.92   0.00   0.00   0.00
55.51
-------------------------------------------------------------------------
--
   -32     90   0.00  70.79   0.00 -10.36  -1.69   0.00   0.00   0.00
58.74
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 60.43 dBA

Results segment # 2: HW EB (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 !       22.50 !        6.50 !         6.50

ROAD (0.00 + 55.96 + 59.19) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -32   0.00  70.79   0.00  -9.91  -4.92   0.00   0.00  -3.82
52.14*
   -90    -32   0.00  70.79   0.00  -9.91  -4.92   0.00   0.00   0.00
55.96
-------------------------------------------------------------------------
--
   -32     90   0.00  70.79   0.00  -9.91  -1.69   0.00   0.00   0.00
59.19
-------------------------------------------------------------------------
--

 * Bright Zone !
```

```
Segment Leq : 60.88 dBA

Total Leq All Segments: 63.67 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.27
                           (NIGHT): 63.67
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:47:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   36.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 165.00 / 165.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -28.00 deg
Barrier height            :   5.00 m
Barrier receiver distance :  89.00 / 89.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   36.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 147.00 / 147.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -28.00 deg
Barrier height            :   5.00 m
Barrier receiver distance :  89.00 / 89.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 !       22.50 !       11.17 !        11.17

ROAD (0.00 + 63.34 + 63.48) = 66.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -28   0.00  78.39   0.00 -10.41  -4.63   0.00   0.00  -0.27
63.08*
   -90    -28   0.00  78.39   0.00 -10.41  -4.63   0.00   0.00   0.00
63.34
-------------------------------------------------------------------------------
--
   -28     36   0.00  78.39   0.00 -10.41  -4.49   0.00   0.00   0.00
63.48
```

```
------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.42 dBA

Results segment # 2: HW EB (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 !       22.50 !        9.78 !         9.78

ROAD (0.00 + 63.85 + 63.98) = 66.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------------
--
   -90    -28   0.00  78.39   0.00  -9.91  -4.63   0.00   0.00  -0.39
63.45*
   -90    -28   0.00  78.39   0.00  -9.91  -4.63   0.00   0.00   0.00
63.85
------------------------------------------------------------------------------
--
   -28     36   0.00  78.39   0.00  -9.91  -4.49   0.00   0.00   0.00
63.98
------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.93 dBA

Total Leq All Segments: 69.69 dBA

Results segment # 1: HW WB (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 !       22.50 !       11.17 !        11.17

ROAD (0.00 + 55.75 + 55.89) = 58.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -28   0.00  70.79   0.00 -10.41  -4.63   0.00   0.00  -0.27
55.48*
   -90    -28   0.00  70.79   0.00 -10.41  -4.63   0.00   0.00   0.00
55.75
-------------------------------------------------------------------------
--
   -28     36   0.00  70.79   0.00 -10.41  -4.49   0.00   0.00   0.00
55.89
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.83 dBA

Results segment # 2: HW EB (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 !       22.50 !        9.78 !         9.78

ROAD (0.00 + 56.25 + 56.39) = 59.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -28   0.00  70.79   0.00  -9.91  -4.63   0.00   0.00  -0.39
55.86*
   -90    -28   0.00  70.79   0.00  -9.91  -4.63   0.00   0.00   0.00
56.25
-------------------------------------------------------------------------
--
   -28     36   0.00  70.79   0.00  -9.91  -4.49   0.00   0.00   0.00
56.39
-------------------------------------------------------------------------
--

 * Bright Zone !
```

```
Segment Leq : 59.33 dBA

Total Leq All Segments: 62.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.69
                           (NIGHT): 62.10
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:48:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   36.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 175.00 / 175.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 123.00 / 123.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   36.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 158.00 / 158.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 123.00 / 123.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 !       22.50 !        7.74 !         7.74

ROAD (0.00 + 63.55 + 62.72) = 66.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -21   0.00  78.39   0.00 -10.67  -4.16   0.00   0.00  -1.28
62.27*
   -90    -21   0.00  78.39   0.00 -10.67  -4.16   0.00   0.00   0.00
63.55
-------------------------------------------------------------------------------
--
   -21     36   0.00  78.39   0.00 -10.67  -4.99   0.00   0.00   0.00
62.72
```

```
------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.17 dBA

Results segment # 2: HW EB (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 !       22.50 !        6.15 !         6.15

ROAD (0.00 + 64.00 + 63.17) = 66.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
------------------------------------------------------------------------------
--
   -90    -21   0.00  78.39   0.00 -10.23  -4.16   0.00   0.00  -4.26
59.73*
   -90    -21   0.00  78.39   0.00 -10.23  -4.16   0.00   0.00   0.00
64.00
------------------------------------------------------------------------------
--
   -21     36   0.00  78.39   0.00 -10.23  -4.99   0.00   0.00   0.00
63.17
------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 66.61 dBA

Total Leq All Segments: 69.41 dBA

Results segment # 1: HW WB (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 !       22.50 !        7.74 !         7.74

ROAD (0.00 + 55.96 + 55.13) = 58.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  70.79   0.00 -10.67  -4.16   0.00   0.00  -1.28
54.68*
   -90    -21   0.00  70.79   0.00 -10.67  -4.16   0.00   0.00   0.00
55.96
-------------------------------------------------------------------------
--
   -21     36   0.00  70.79   0.00 -10.67  -4.99   0.00   0.00   0.00
55.13
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.57 dBA

Results segment # 2: HW EB (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 !       22.50 !        6.15 !         6.15

ROAD (0.00 + 56.40 + 55.57) = 59.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  70.79   0.00 -10.23  -4.16   0.00   0.00  -4.26
52.14*
   -90    -21   0.00  70.79   0.00 -10.23  -4.16   0.00   0.00   0.00
56.40
-------------------------------------------------------------------------
--
   -21     36   0.00  70.79   0.00 -10.23  -4.99   0.00   0.00   0.00
55.57
-------------------------------------------------------------------------
--

 * Bright Zone !
```

```
Segment Leq : 59.02 dBA

Total Leq All Segments: 61.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.41
                           (NIGHT): 61.81
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:48:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   8.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 197.00 / 197.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -11.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 145.00 / 145.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   8.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 180.00 / 180.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -11.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 145.00 / 145.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 !       22.50 !        7.04 !         7.04

ROAD (0.00 + 63.63 + 57.44) = 64.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -11   0.00  78.39   0.00 -11.18  -3.58   0.00   0.00  -2.83
60.80*
   -90    -11   0.00  78.39   0.00 -11.18  -3.58   0.00   0.00   0.00
63.63
-------------------------------------------------------------------------------
--
   -11      8   0.00  78.39   0.00 -11.18  -9.77   0.00   0.00   0.00
57.44
```

```
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 64.56 dBA

Results segment # 2: HW EB (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 !       22.50 !        5.58 !         5.58

ROAD (0.00 + 64.02 + 57.83) = 64.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -11   0.00  78.39   0.00 -10.79  -3.58   0.00   0.00  -4.81
59.20*
   -90    -11   0.00  78.39   0.00 -10.79  -3.58   0.00   0.00   0.00
64.02
-------------------------------------------------------------------------
--
   -11      8   0.00  78.39   0.00 -10.79  -9.77   0.00   0.00   0.00
57.83
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 64.95 dBA

Total Leq All Segments: 67.77 dBA

Results segment # 1: HW WB (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 !       22.50 !        7.04 !         7.04

ROAD (0.00 + 56.03 + 49.84) = 56.97 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -11   0.00  70.79   0.00 -11.18  -3.58   0.00   0.00  -2.82
53.21*
   -90    -11   0.00  70.79   0.00 -11.18  -3.58   0.00   0.00   0.00
56.03
-------------------------------------------------------------------------
--
   -11      8   0.00  70.79   0.00 -11.18  -9.77   0.00   0.00   0.00
49.84
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 56.97 dBA

Results segment # 2: HW EB (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 !       22.50 !        5.58 !         5.58

ROAD (0.00 + 56.42 + 50.23) = 57.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -11   0.00  70.79   0.00 -10.79  -3.58   0.00   0.00  -4.81
51.61*
   -90    -11   0.00  70.79   0.00 -10.79  -3.58   0.00   0.00   0.00
56.42
-------------------------------------------------------------------------
--
   -11      8   0.00  70.79   0.00 -10.79  -9.77   0.00   0.00   0.00
50.23
-------------------------------------------------------------------------
--

 * Bright Zone !
```

```
Segment Leq : 57.36 dBA

Total Leq All Segments: 60.18 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.77
                           (NIGHT): 60.18
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:48:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           : -90.00 deg   -21.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 213.00 / 213.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 161.00 / 161.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           : -90.00 deg   -21.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 197.00 / 197.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 161.00 / 161.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 !       22.50 !        6.62 !         6.62

ROAD (0.00 + 62.70 + 0.00) = 62.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -21   0.00  78.39   0.00 -11.52  -4.16   0.00   0.00  -3.93
58.77*
   -90    -21   0.00  78.39   0.00 -11.52  -4.16   0.00   0.00   0.00
62.70
-------------------------------------------------------------------------------
--

 * Bright Zone !
```

```
Segment Leq : 62.70 dBA

Results segment # 2: HW EB (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 !       22.50 !        5.33 !         5.33

ROAD (0.00 + 63.04 + 0.00) = 63.04 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  78.39   0.00 -11.18  -4.16   0.00   0.00  -4.95
58.09*
   -90    -21   0.00  78.39   0.00 -11.18  -4.16   0.00   0.00   0.00
63.04
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 63.04 dBA

Total Leq All Segments: 65.88 dBA

Results segment # 1: HW WB (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 !       22.50 !        6.62 !         6.62

ROAD (0.00 + 55.10 + 0.00) = 55.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
```

```
   -90    -21   0.00  70.79   0.00 -11.52  -4.16   0.00   0.00  -3.92
51.18*
   -90    -21   0.00  70.79   0.00 -11.52  -4.16   0.00   0.00   0.00
55.10
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 55.10 dBA

Results segment # 2: HW EB (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 !       22.50 !        5.33 !         5.33

ROAD (0.00 + 55.44 + 0.00) = 55.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -21   0.00  70.79   0.00 -11.18  -4.16   0.00   0.00  -4.95
50.50*
   -90    -21   0.00  70.79   0.00 -11.18  -4.16   0.00   0.00   0.00
55.44
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 55.44 dBA

Total Leq All Segments: 58.28 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.88
                           (NIGHT): 58.28
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:48:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (day/night)
----------------------------------------
Angle1   Angle2           :  16.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 230.00 / 230.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (day/night)
---------------------------------------
Angle1   Angle2           :  16.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 214.00 / 214.00 m
Receiver height           :  22.50 / 22.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: HW WB (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.67 + 0.00) = 62.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    16     90   0.00  78.39   0.00 -11.86  -3.86   0.00   0.00   0.00
62.67
-------------------------------------------------------------------------------
--

Segment Leq : 62.67 dBA

Results segment # 2: HW EB (day)
--------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.98 + 0.00) = 62.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    16     90   0.00  78.39   0.00 -11.54  -3.86   0.00   0.00   0.00
62.98
-------------------------------------------------------------------------------
--

Segment Leq : 62.98 dBA

Total Leq All Segments: 65.84 dBA
```

```
Results segment # 1: HW WB (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    16     90   0.00  70.79   0.00 -11.86  -3.86   0.00   0.00   0.00
55.08
-------------------------------------------------------------------------
--

Segment Leq : 55.08 dBA

Results segment # 2: HW EB (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.39 + 0.00) = 55.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    16     90   0.00  70.79   0.00 -11.54  -3.86   0.00   0.00   0.00
55.39
-------------------------------------------------------------------------
--

Segment Leq : 55.39 dBA

Total Leq All Segments: 58.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.84
                           (NIGHT): 58.25
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2022 12:48:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: HW WB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW WB (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  : 154.00 / 154.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -30.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 102.00 / 102.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: HW EB (day/night)
----------------------------------------
Car traffic volume  : 29685/2581  veh/TimePeriod  *
Medium truck volume :  2361/205   veh/TimePeriod  *
Heavy truck volume  :  1687/147   veh/TimePeriod  *
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  36666
    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: HW EB (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  : 137.00 / 137.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -30.00 deg
Barrier height            :   5.00 m
Barrier receiver distance : 102.00 / 102.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: HW WB (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 + 55.58 + 66.51) = 66.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -30   0.00  78.39   0.00 -10.11  -4.77   0.00   0.00  -7.92
55.58
-------------------------------------------------------------------------------
--
   -30     90   0.00  78.39   0.00 -10.11  -1.76   0.00   0.00   0.00
66.51
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 66.85 dBA

Results segment # 2: HW EB (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 + 55.50 + 67.02) = 67.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -30   0.00  78.39   0.00  -9.61  -4.77   0.00   0.00  -8.51
55.50
-------------------------------------------------------------------------------
--
   -30     90   0.00  78.39   0.00  -9.61  -1.76   0.00   0.00   0.00
67.02
-------------------------------------------------------------------------------
--

Segment Leq : 67.32 dBA

Total Leq All Segments: 70.10 dBA

Results segment # 1: HW WB (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 + 47.98 + 58.92) = 59.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
```

```
   -90    -30    0.00  70.79   0.00 -10.11  -4.77   0.00   0.00  -7.92
47.98
-------------------------------------------------------------------------
--
   -30     90    0.00  70.79   0.00 -10.11  -1.76   0.00   0.00   0.00
58.92
-------------------------------------------------------------------------
--

Segment Leq : 59.25 dBA

Results segment # 2: HW EB (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 + 47.91 + 59.42) = 59.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -30    0.00  70.79   0.00  -9.61  -4.77   0.00   0.00  -8.51
47.91
-------------------------------------------------------------------------
--
   -30     90    0.00  70.79   0.00  -9.61  -1.76   0.00   0.00   0.00
59.42
-------------------------------------------------------------------------
--

Segment Leq : 59.72 dBA

Total Leq All Segments: 62.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.10
                           (NIGHT): 62.50
```