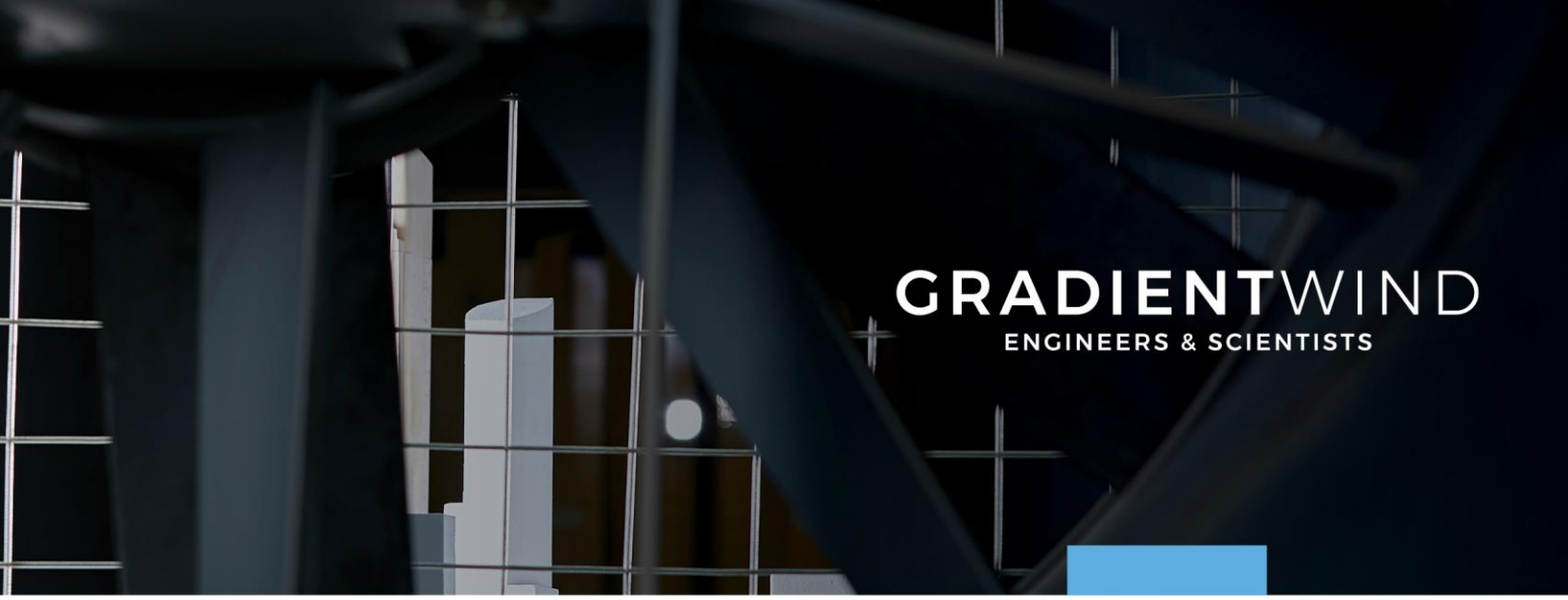

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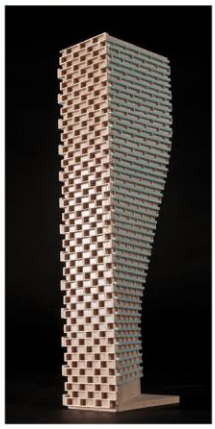
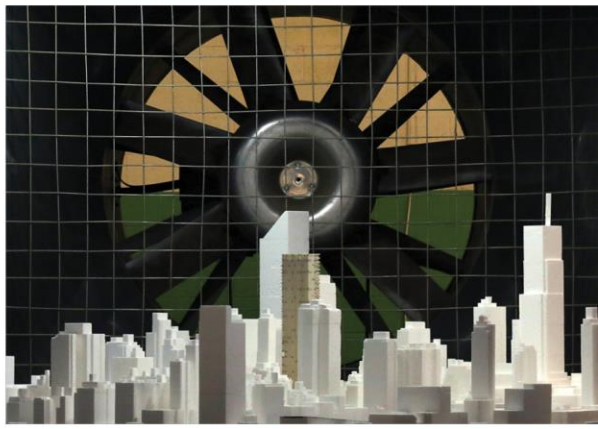
TRAFFIC NOISE FEASIBILITY ASSESSMENT

91-93 and 99 Lakeshore Road East and
42 Port Street East
Mississauga, Ontario

Report: 22-279 – Traffic Noise Feasibility





November 15, 2022

PREPARED FOR

Centre City Capital Ltd.
FRAM + Slokker
Kilmer Group
141 Lakeshore Road East
Mississauga, ON L5G 1E8

PREPARED BY

Essraa Alqassab, BASc., Junior Environmental Scientist
Joshua Foster, P.Eng., Lead Engineer

EXECUTIVE SUMMARY

This report describes a roadway traffic noise feasibility assessment undertaken in support of Official Plan Amendment and Zoning By-Law Amendment (ZBA) application requirements for the proposed mixed-use development located at 91-93 and 99 Lakeshore Road East and 42 Port Street East in Mississauga, Ontario. The proposed development comprises an 11-storey mixed-use residential building topped with a mechanical penthouse (MPH). 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); (ii) future vehicular traffic volumes based on theoretical roadway capacities and roadway classifications based on the City of Mississauga's Official Plan; and (iv) site plan drawings provided by B+H Architects, in November 2022.

The results of the current analysis indicate that noise levels will range between 64 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 Lakeshore Road East. The noise levels predicted due to roadway traffic exceed the criteria listed in NPC-300; therefore, upgraded building components with higher Sound Transmission Class (STC) rating will be required for building facades exceeding 65 dBA.

Results of the calculations also indicate that the development will require central air conditioning, or a similar ventilation system, due to roadway traffic noise. This will allow occupants to keep windows closed and maintain a comfortable living environment. Warning Clauses will also be required on all Lease, Purchase and Sale Agreements.

The results indicate that noise levels for terraces/outdoor amenity areas (Receptors 5-8) are expected to be under criteria listed in the NPC-300 for OLAs, as discussed in Section 4.2. As such, acoustic mitigation for these areas is not required.

With regards to stationary noise impacts of the development on the surroundings and upon itself, noise levels produced by the proposed mechanical equipment will be required to comply with the NPC-300 sound level limits. This will be accomplished through judicious selections of the equipment, placing

equipment away from noise sensitive spaces, and where necessary, incorporating silencers or noise screens into the design. Once the location and types of mechanical equipment have been determined, a review by a qualified acoustic consultant will be undertaken.

Regarding existing stationary noise sources, there are no industrial facilities within 1000 m of the site. The Port Credit Harbor Marina is across Port Street East from the proposed development. As the marina is home to small pleasure crafts, it is not considered to be a significant source of stationary noise. The proposed noise control measures for transportation noise will also address any noise concerns from the marina.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Centre City Capital Ltd., FRAM + Slokker, and Kilmer Group to undertake a roadway traffic noise feasibility assessment in support of an Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) applications for the proposed mixed-use development located at 91-93 and 99 Lakeshore Road East and 42 Port Street East in Mississauga, Ontario. This report summarizes the methodology, results, and recommendations related to a roadway traffic noise feasibility assessment of exterior noise levels generated by local roadway traffic.

The assessment was performed on the basis of theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP)[1] guidelines. Noise calculations were based on site plan drawings provided by B+H Architected, in November 2022, with future traffic volumes corresponding to the City of Mississauga's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The subject site is located at 91-93 and 99 Lakeshore Road East and 42 Port Street East in Mississauga; situated on a parcel of land bounded by Lakeshore Road East to the northwest, Helene Street South to the northeast, Port Street East to the southeast, and Elizabeth Street South to the southwest. Throughout this report, Lakeshore Road East is referred to as project north. A heritage two-storey commercial building (91 Lakeshore Road East) is situated at the northwest corner of the subject site. The proposed development comprises an 11-storey mixed-use residential building topped with a mechanical penthouse (MPH).

The proposed development comprises an 11-storey mixed-use building. Above three levels of underground parking, accessed via a laneway connecting to Elizabeth Street East along the west elevation, the ground floor consists of a central residential lobby fronting Elizabeth Street South, retail units fronting Lakeshore Road East, a loading area accessed from the west elevation, indoor and outdoor amenities along the east elevation, and building support services throughout the remainder of the level. This level also includes live/work units fronting Elizabeth Street South and townhouse fronting Port Street East.

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

Level 2 (Mezzanine) is mostly open to below with residential units and storage spaces. Level 3 assumes an approximately 'C'-shaped planform open to the east, accommodating outdoor and indoor amenity spaces to the east, office/commercial space to the north, and residential units elsewhere. Levels 4-11 are reserved for residential occupancy with progressive setbacks from the northeast accommodating various private terraces and green roofs. Above Level 11, setbacks from all directions meet a mechanical penthouse, creating additional private terraces and completing the development.

The study site is surrounded by low-rise commercial buildings to the south and from the southwest clockwise to the northeast, with a mid-rise and high-rise hotel building to the southwest, a high-rise residential building to the west-northwest, isolated mid-rise residential buildings from the northwest clockwise to the east, St. Lawrence Park to the east, and Port Credit Harbour Marina to the southeast. Notably, a nine-storey residential building is under construction at 55 Port Street East, approximately 110 m to the east of the subject site. In addition, an 11-storey mixed-use residential building is proposed at 128 Lakeshore Road East, approximately 180 m to the northeast of the subject site. The far-field surroundings (defined as the area beyond the near field and within a 2-kilometre (km) radius) include the open exposure of Lake Ontario from the northeast clockwise southwest and low-rise massing with isolated mid- and high-rise buildings from the southwest clockwise to the northeast.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local roadway traffic, and (ii) 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 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 NPC-300 specifies that the recommended indoor noise limit range is 50, 45, and 40 dBA for reception/retail, living rooms, and sleeping quarters, respectively, as listed in Table 1. Based on Gradient Wind's experience, more comfortable indoor noise levels should be targeted, towards 47, 42, and 37 dBA, respectively, to control peak noise and deficiencies in building envelope construction.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) [2]

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

[2] Adapted from NPC-300

a standard closed window is capable of providing a minimum 20 dBA noise reduction[3]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[4]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[5].

The sound level criterion for outdoor living areas (OLAs) is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. The NPC-300 considers OLAs to include balconies and elevated terraces with a minimum depth of 4 meters, as well as common outdoor living areas associated with high-rise multi-unit buildings. As such, select terraces nearest and most exposed to the relevant roadway source were used in this assessment to determine if any mitigation will be required.

4.2.2 Theoretical Roadway Noise Predictions

Noise predictions were performed with the aid of the MECP computerized noise assessment program, STAMSON 5.04, for road analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise. In addition to the traffic volumes summarized in Table 2, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks.
- The day/night split for all streets was taken to be 90%/10%, 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.

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

- For select receptors, the proposed building and surrounding existing buildings were considered as noise barriers partially obstructing exposure to the roadway.
- Noise receptors were strategically placed at 8 locations around the study area (see Figure 2).
- Distances and exposure angles can be seen in Figure 3.

4.2.3 Roadway Traffic Volumes

The NPC-300 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 Mississauga's Official Plan (OP) and Transportation Master Plan[6] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on theoretical capacity based on 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 Volume
Lakeshore Road	4-Lane Urban Arterial Undivided (4-UAU)	50	**30,000**

5. RESULTS AND DISCUSSION

5.1 Roadway Traffic Noise Levels

The results of the current analysis indicate that Plane-of-Window noise levels will range between 64 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 Lakeshore Road. The results of the roadway traffic noise calculations are summarized in Table 3. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A.

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

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	6.6	POW - Level 2 North Façade	71	64
2	33.3	POW - Level 10 North Façade	69	61
3	33.3	POW - Level 10 West Façade	64	58
4	6.6	POW - Level 2 East Façade	65	58
5	30.3	OLA – Level 9 Private Terrace	50	N/A*
6	27.3	OLA – Level 8 Private Terrace	50	N/A*
7	11.7	OLA – Level 3 Outdoor Amenity Area	46	N/A*
8	40.2	OLA – Rooftop Private Terrace	44	N/A*

*OLA noise levels during the nighttime are not considered as per NPC-300

6. CONCLUSIONS AND RECOMMENDATIONS

The noise levels predicted due to roadway traffic exceed the criteria listed in NPC-300 for building components, therefore, upgraded building components with a higher Sound Transmission Class (STC) rating will be required. Due to the limited information available at the time of the study, which was prepared for OPA and ZBA application, detailed STC calculations could not be performed at this time. A detailed review of the window and wall assemblies should be performed by a qualified engineer with expertise in acoustics during the detailed design stage of the building.

Results of the calculations also indicate that the development will require central air conditioning, or a similar ventilation system, due to roadway traffic noise. This will allow occupants to keep windows closed and maintain a comfortable living environment. Warning Clauses will also be required on all Lease, Purchase and Sale Agreements.

The results indicate that noise levels for terraces/outdoor amenity areas (Receptors 5-8) are expected to be under criteria listed in the NPC-300 for OLAs, as discussed in Section 4.2. Therefore, acoustic mitigation for these areas is not required.

With regards to stationary noise impacts of the development on the surroundings and upon itself, noise levels produced by the proposed mechanical equipment will be required to comply with the NPC-300 sound level limits. This will be accomplished through judicious selections of the equipment, placing equipment away from noise sensitive spaces, and where necessary, incorporating silencers or noise screens into the design. Once the location and types of mechanical equipment have been determined, a review by a qualified acoustic consultant will be undertaken.

Regarding existing stationary noise sources, there are no industrial facilities within 1000 m of the site. The Port Credit Harbor Marina is across Port Street East from the proposed development. As the marina is home to small pleasure crafts, it is not considered to be a significant source of stationary noise. The proposed noise control measures for transportation noise will also address any noise concerns from the marina.

This concludes our roadway traffic noise feasibility 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.

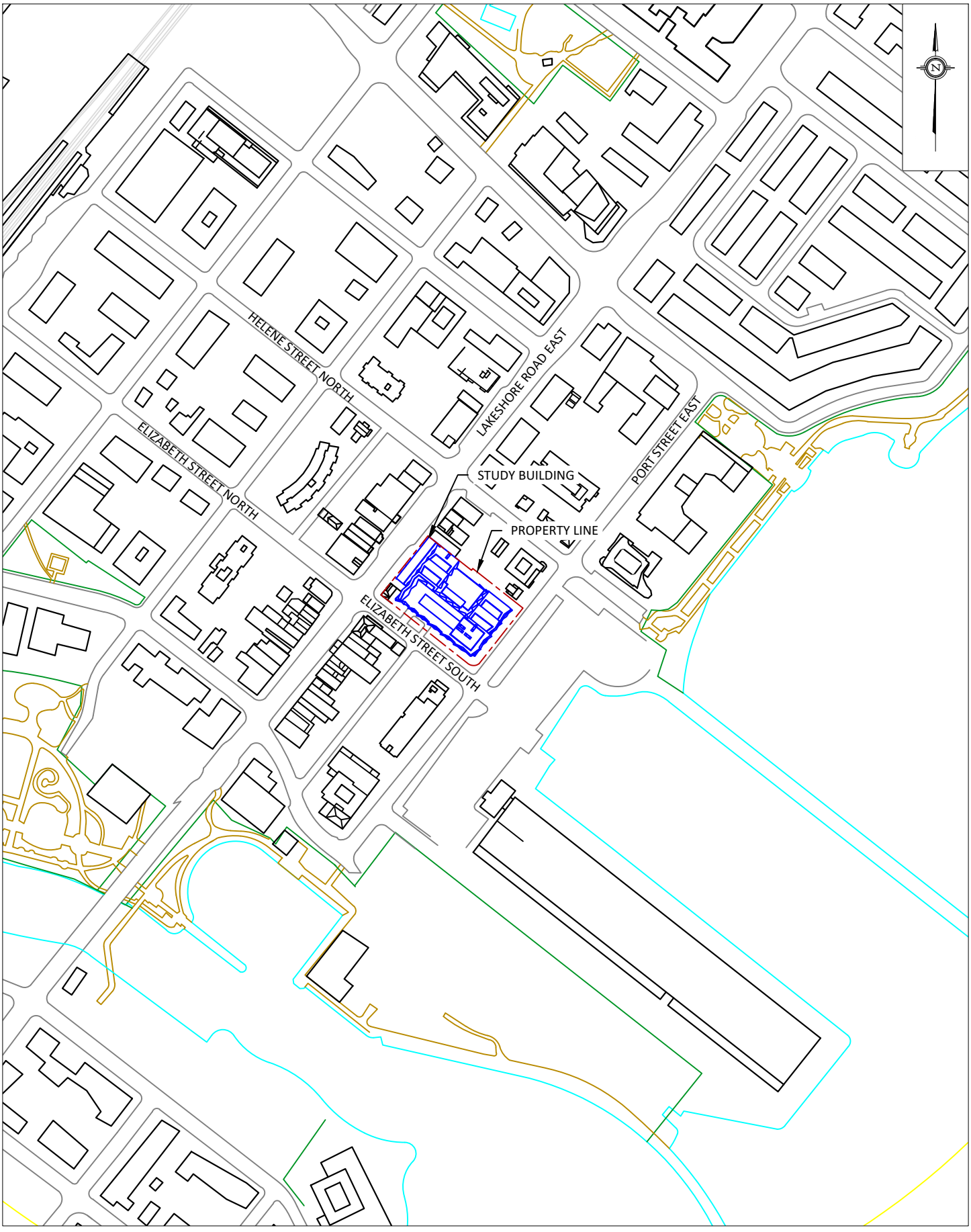
Sincerely,

Gradient Wind Engineering Inc.

Essraa Alqassab , BASc
Junior Environmental Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File 22-279 – Traffic Noise Feasibility



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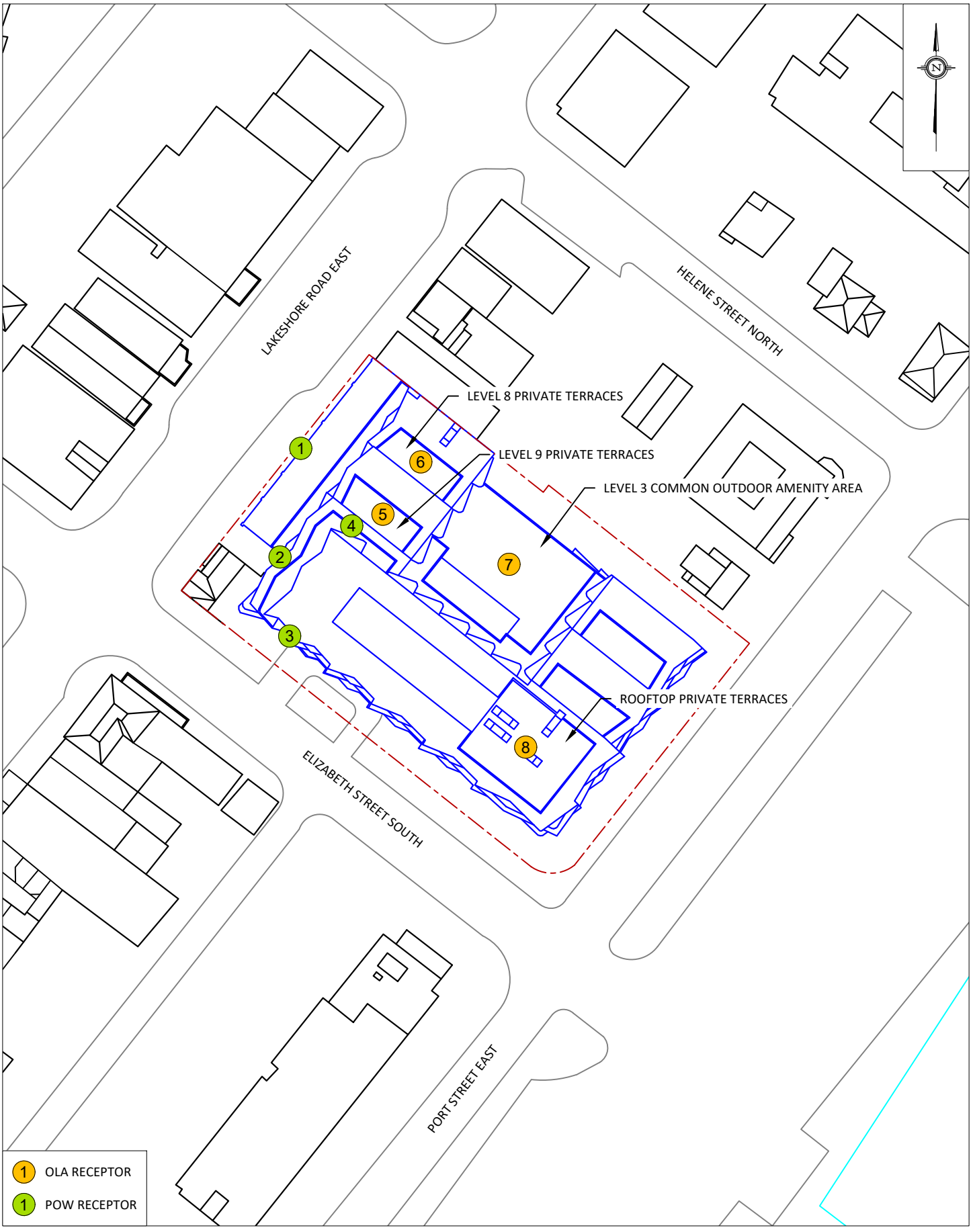
PROJECT	42 PORT STREET EAST, MISSISSAUGA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:4000 (APPROX.)	DRAWING NO.	GW22-279-1
DATE	OCTOBER 27, 2022	DRAWN BY	E.A.

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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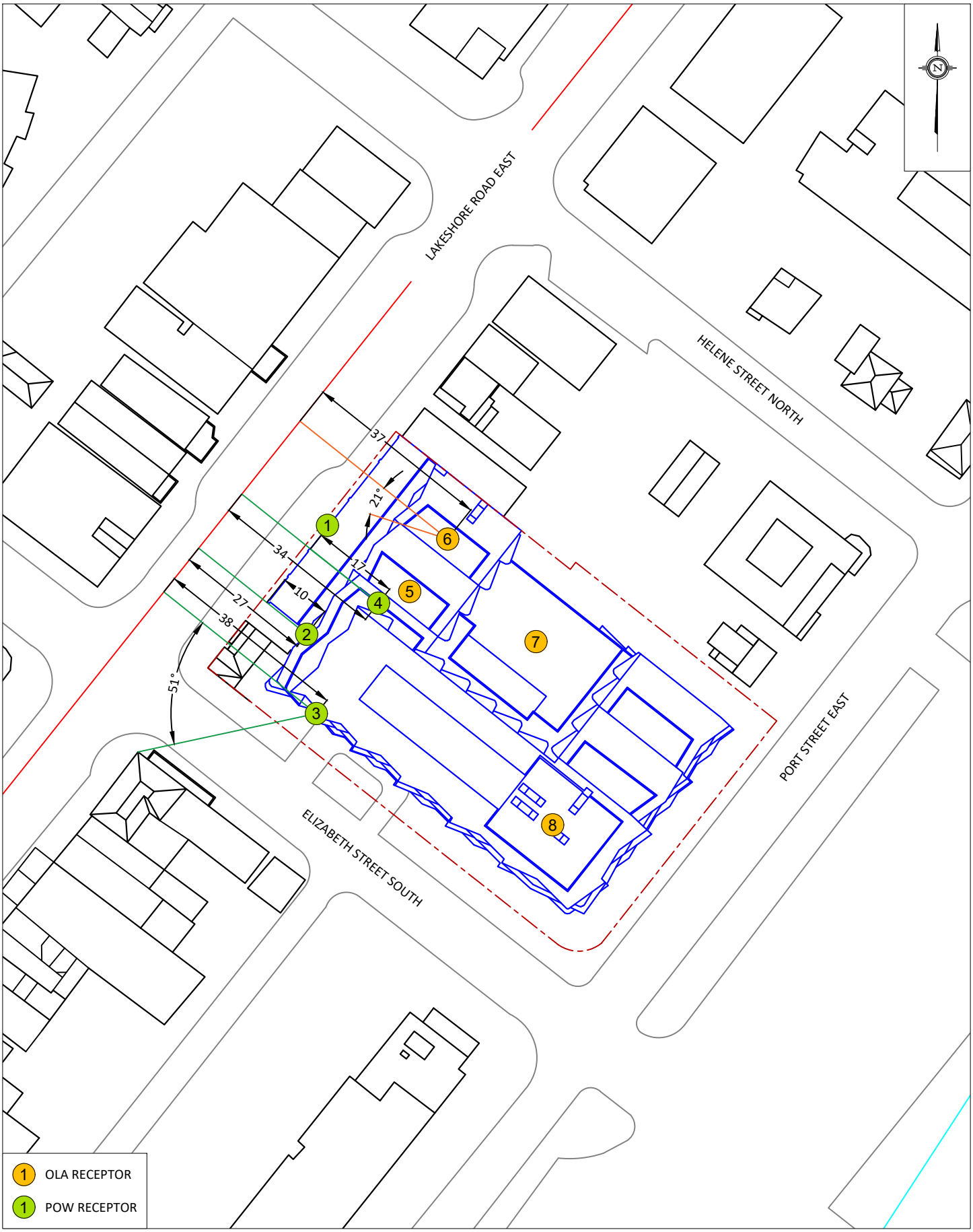
PROJECT	42 PORT STREET EAST, MISSISSAUGA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-279-2
DATE	OCTOBER 27, 2022
DRAWN BY	E.A.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS



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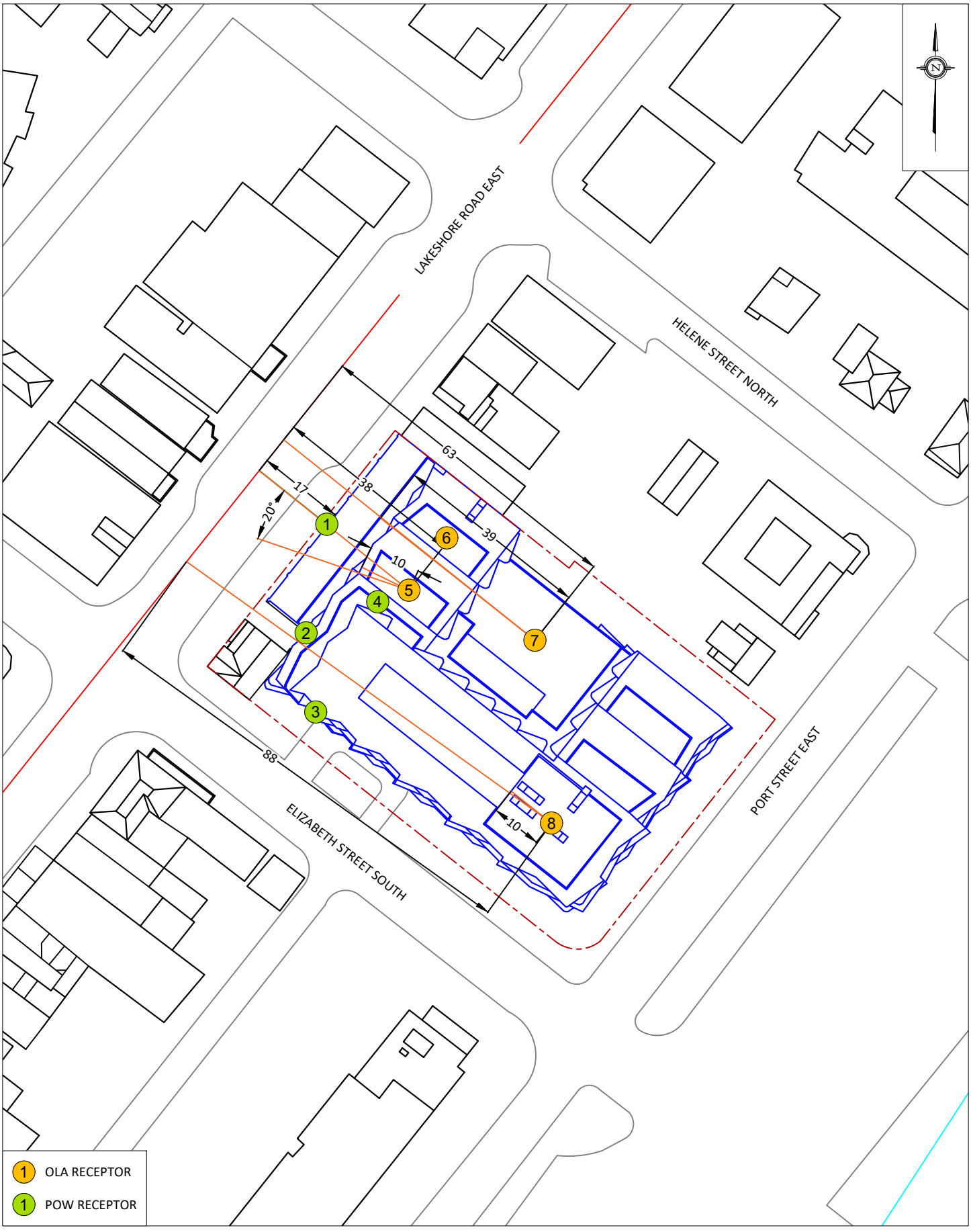
PROJECT	42 PORT STREET EAST, MISSISSAUGA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-279-3
DATE	OCTOBER 27, 2022	DRAWN BY	E.A.

FIGURE 3:
STAMSON PARAMETERS (1)



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PROJECT	42 PORT STREET EAST, MISSISSAUGA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-279-4
DATE	OCTOBER 27, 2022
DRAWN BY	E.A.

DESCRIPTION

FIGURE 4:
STAMSON PARAMETERS (2)

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2022 09:26:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakshore Rd (day/night)
----------------------------------------------
Car traffic volume  : 23760/2640  veh/TimePeriod  *
Medium truck volume :  1890/210   veh/TimePeriod  *
Heavy truck volume  :  1350/150   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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     :  90.00

Data for Segment # 1: Lakshore Rd (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  17.00 / 17.00  m
Receiver height           :   6.60 / 6.60   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: Lakshore Rd (day)
--------------------------------------

Source height = 1.50 m

ROAD (0.00 + 70.85 + 0.00) = 70.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
```

```
   -90     90   0.00  71.39   0.00  -0.54   0.00   0.00   0.00   0.00
70.85
-------------------------------------------------------------------------
--

Segment Leq : 70.85 dBA

Total Leq All Segments: 70.85 dBA


Results segment # 1: Lakshore Rd (night)
----------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.32 + 0.00) = 64.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  64.86   0.00  -0.54   0.00   0.00   0.00   0.00
64.32
-------------------------------------------------------------------------
--

Segment Leq : 64.32 dBA

Total Leq All Segments: 64.32 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 70.85
                           (NIGHT): 64.32
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2022 09:26:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore Rd (day/night)
-----------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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: Lakeshore Rd (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  27.00 / 27.00  m
Receiver height           :  33.30 / 33.30  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   9.50 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore Rd (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
```

```
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       33.30 !       21.52 !        21.52

ROAD (0.00 + 68.94 + 0.00) = 68.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  71.49   0.00  -2.55   0.00   0.00   0.00  -0.03
68.91*
   -90     90   0.00  71.49   0.00  -2.55   0.00   0.00   0.00   0.00
68.94
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 68.94 dBA

Total Leq All Segments: 68.94 dBA


Results segment # 1: Lakeshore Rd (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       33.30 !       21.52 !        21.52

ROAD (0.00 + 61.34 + 0.00) = 61.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  63.89   0.00  -2.55   0.00   0.00   0.00  -0.03
61.31*
   -90     90   0.00  63.89   0.00  -2.55   0.00   0.00   0.00   0.00
61.34
-------------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 61.34 dBA
```

```
Total Leq All Segments: 61.34 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 68.94
                           (NIGHT): 61.34
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2022 09:27:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore (day/night)
----------------------------------------------
Car traffic volume  : 23760/2640  veh/TimePeriod  *
Medium truck volume :  1890/210   veh/TimePeriod  *
Heavy truck volume  :  1350/150   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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     :  90.00

Data for Segment # 1: Lakeshore (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :  33.30 / 33.30  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -51.00 deg
Barrier height            :   5.00 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore (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 !       33.30 !       24.93 !        24.93

ROAD (0.00 + 60.72 + 61.88) = 64.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -51   0.00  71.39   0.00  -4.04  -6.64   0.00   0.00  -0.02
60.69*
   -90    -51   0.00  71.39   0.00  -4.04  -6.64   0.00   0.00   0.00
60.72
-------------------------------------------------------------------------
--
   -51      0   0.00  71.39   0.00  -4.04  -5.48   0.00   0.00   0.00
61.88
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 64.35 dBA

Total Leq All Segments: 64.35 dBA


Results segment # 1: Lakeshore (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 !       33.30 !       24.93 !        24.93

ROAD (0.00 + 54.18 + 55.35) = 57.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -51   0.00  64.86   0.00  -4.04  -6.64   0.00   0.00  -0.02
54.16*
   -90    -51   0.00  64.86   0.00  -4.04  -6.64   0.00   0.00   0.00
54.18
-------------------------------------------------------------------------
--
```

```
   -51      0   0.00  64.86   0.00  -4.04  -5.48   0.00   0.00   0.00
55.35
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 57.82 dBA

Total Leq All Segments: 57.82 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 64.35
                           (NIGHT): 57.82
```

```
STAMSON 5.0        NORMAL REPORT        Date: 27-10-2022 09:33:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore RD (day/night)
-----------------------------------------------
Car traffic volume  : 23760/2640  veh/TimePeriod  *
Medium truck volume :  1890/210   veh/TimePeriod  *
Heavy truck volume  :  1350/150   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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     :  90.00

Data for Segment # 1: Lakeshore RD (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :  33.30 / 33.30  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :   9.50 m
Barrier receiver distance :  17.00 / 17.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore RD (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
```

```
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       33.30 !       17.40 !        17.40

ROAD (0.00 + 64.83 + 0.00) = 64.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  71.39   0.00  -3.55  -3.01   0.00   0.00  -0.06
64.78*
     0     90   0.00  71.39   0.00  -3.55  -3.01   0.00   0.00   0.00
64.83
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 64.83 dBA

Total Leq All Segments: 64.83 dBA


Results segment # 1: Lakeshore RD (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       33.30 !       17.40 !        17.40

ROAD (0.00 + 58.30 + 0.00) = 58.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  64.86   0.00  -3.55  -3.01   0.00   0.00  -0.06
58.24*
     0     90   0.00  64.86   0.00  -3.55  -3.01   0.00   0.00   0.00
58.30
-------------------------------------------------------------------------
--

 * Bright Zone !

Segment Leq : 58.30 dBA
```

```
Total Leq All Segments: 58.30 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.83
                           (NIGHT): 58.30
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-11-2022 09:18:25
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakshore Rd (day/night)
----------------------------------------------
Car traffic volume  : 23760/2640  veh/TimePeriod  *
Medium truck volume :  1890/210   veh/TimePeriod  *
Heavy truck volume  :  1350/150   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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     :  90.00

Data for Segment # 1: Lakshore Rd (day/night)
---------------------------------------------
Angle1   Angle2           : -20.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :  30.30 / 30.30  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -20.00 deg   Angle2 : 90.00 deg
Barrier height            :  28.80 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakshore Rd (day)
--------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
```

```
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       30.30 !       22.72 !        22.72

ROAD (0.00 + 49.68 + 0.00) = 49.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -20     90   0.00  71.39   0.00  -4.04  -2.14   0.00   0.00 -15.54
49.68
-------------------------------------------------------------------------
--

Segment Leq : 49.68 dBA

Total Leq All Segments: 49.68 dBA


Results segment # 1: Lakshore Rd (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       30.30 !       22.72 !        22.72

ROAD (0.00 + 43.15 + 0.00) = 43.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -20     90   0.00  64.86   0.00  -4.04  -2.14   0.00   0.00 -15.54
43.15
-------------------------------------------------------------------------
--

Segment Leq : 43.15 dBA

Total Leq All Segments: 43.15 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 49.68
                           (NIGHT): 43.15
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-11-2022 09:18:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore Rd (day/night)
-----------------------------------------------
Car traffic volume  : 23760/2640  veh/TimePeriod  *
Medium truck volume :  1890/210   veh/TimePeriod  *
Heavy truck volume  :  1350/150   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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     :  90.00

Data for Segment # 1: Lakeshore Rd (day/night)
-----------------------------------------------
Angle1   Angle2           : -21.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.00 / 37.00  m
Receiver height           :  27.30 / 27.30  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -21.00 deg   Angle2 : 90.00 deg
Barrier height            :  25.80 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore Rd (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
```

```
Height   (m) ! Height   (m) ! Height   (m) ! Barrier Top   (m)
------------+-------------+-------------+--------------
       1.50 !       27.30 !       20.33 !        20.33

ROAD (0.00 + 50.32 + 0.00) = 50.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -21     90   0.00  71.39   0.00  -3.92  -2.10   0.00   0.00 -15.06
50.32
-------------------------------------------------------------------------------
--

Segment Leq : 50.32 dBA

Total Leq All Segments: 50.32 dBA


Results segment # 1: Lakeshore Rd (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height   (m) ! Height   (m) ! Height   (m) ! Barrier Top   (m)
------------+-------------+-------------+--------------
       1.50 !       27.30 !       20.33 !        20.33

ROAD (0.00 + 43.79 + 0.00) = 43.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -21     90   0.00  64.86   0.00  -3.92  -2.10   0.00   0.00 -15.06
43.79
-------------------------------------------------------------------------------
--

Segment Leq : 43.79 dBA

Total Leq All Segments: 43.79 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 50.32
                           (NIGHT): 43.79
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-11-2022 09:19:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore (day/night)
----------------------------------------------
Car traffic volume  : 24288/2112  veh/TimePeriod  *
Medium truck volume :  1932/168   veh/TimePeriod  *
Heavy truck volume  :  1380/120   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  30000
    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: Lakeshore (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  :  63.00 / 63.00  m
Receiver height           :  11.70 / 11.70  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  35.70 m
Barrier receiver distance :  39.00 / 39.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore (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  !       11.70 !        5.38 !         5.38

ROAD (0.00 + 45.80 + 0.00) = 45.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  71.49   0.00  -6.23   0.00   0.00   0.00 -19.46
45.80
-------------------------------------------------------------------------
--

Segment Leq : 45.80 dBA

Total Leq All Segments: 45.80 dBA


Results segment # 1: Lakeshore (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  !       11.70 !        5.38 !         5.38

ROAD (0.00 + 38.20 + 0.00) = 38.20 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  63.89   0.00  -6.23   0.00   0.00   0.00 -19.46
38.20
-------------------------------------------------------------------------
--

Segment Leq : 38.20 dBA

Total Leq All Segments: 38.20 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 45.80
                           (NIGHT): 38.20
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-11-2022 09:17:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Lakeshore Rd (day/night)
----------------------------------------------
Car traffic volume  :  1600/800   veh/TimePeriod
Medium truck volume :   320/160   veh/TimePeriod
Heavy truck volume  :   160/80    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Lakeshore Rd (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  88.00 / 88.00  m
Receiver height           :  40.20 / 40.20  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  38.70 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Lakeshore Rd (day)
---------------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       40.20 !       35.82 !        35.82

ROAD (0.00 + 43.84 + 0.00) = 43.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
```

```
   -90     90    0.00   62.18    0.00   -7.68    0.00    0.00    0.00 -10.66
43.84
-------------------------------------------------------------------------------
--

Segment Leq : 43.84 dBA

Total Leq All Segments: 43.84 dBA


Results segment # 1: Lakeshore Rd (night)
-----------------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       40.20 !       35.82 !        35.82

ROAD (0.00 + 43.84 + 0.00) = 43.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90    0.00   62.18    0.00   -7.68    0.00    0.00    0.00 -10.66
43.84
-------------------------------------------------------------------------------
--

Segment Leq : 43.84 dBA

Total Leq All Segments: 43.84 dBA




TOTAL Leq FROM ALL SOURCES (DAY): 43.84
                           (NIGHT): 43.84
```