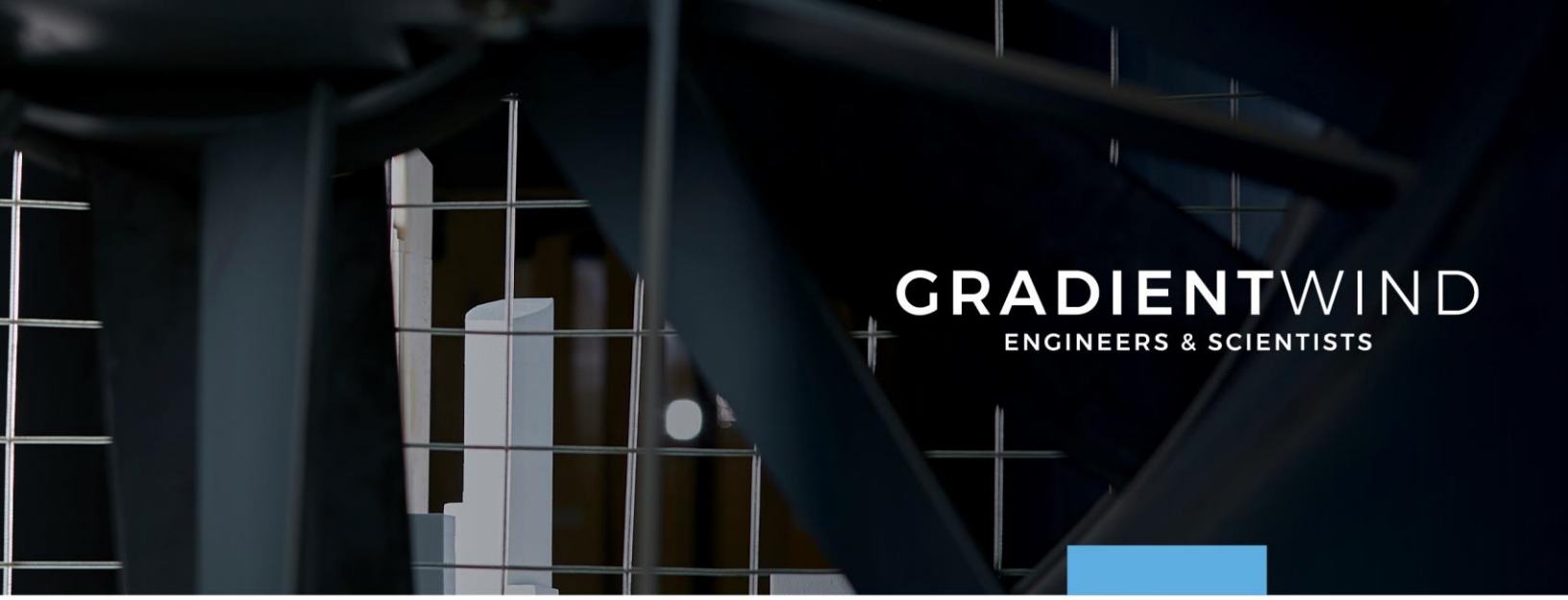

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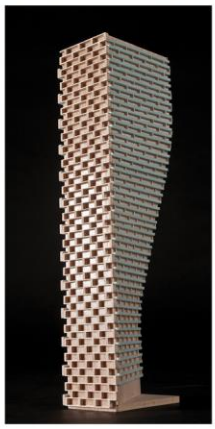
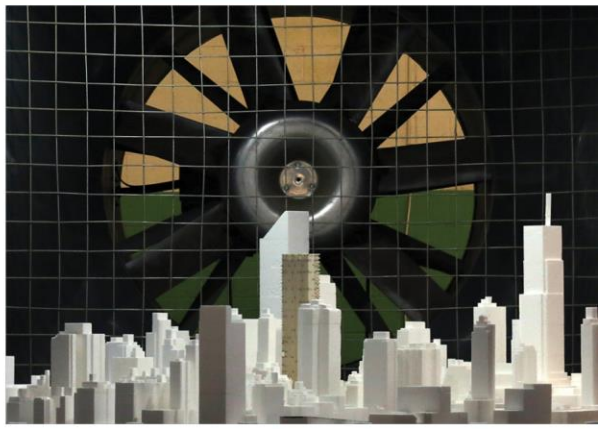
ENGINEERS & SCIENTISTS

TRANSPORTATION NOISE ASSESSMENT

829 Carling Avenue
Ottawa, Ontario

REPORT: 21-086 – Transportation Noise





April 14, 2021

PREPARED FOR
Claridge Homes
210 Gladstone Avenue
Ottawa, ON K2P 0Y6

PREPARED BY
Giuseppe Garro, MASc., Junior Environmental Scientist
Joshua Foster, P.Eng., Principal

EXECUTIVE SUMMARY

This report describes a transportation noise assessment undertaken to satisfy the requirements for concurrent Zoning By-law Amendment (ZBA) and Site Plan Control (SPC) application submissions for the proposed mixed-use tall building development located at 829 Carling Avenue in Ottawa, Ontario. The proposed development comprises 61-stories, including a mechanical level, situated on a nearly square parcel of land at the northwest corner of the Preston Street and Carling Avenue intersection. The primary sources of transportation noise include Carling Avenue, Preston Street, and the O-Train Line 2 (Trillium Line) light rail. 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) 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 Hariri Pontarini Architects in March 2021.

The results of the current analysis indicate that noise levels will range between 49 and 74 dBA during the daytime period (07:00-23:00) and between 57 and 66 dBA during the nighttime period (23:00-07:00). The highest noise level (74 dBA) occurs at the south façade, which is nearest and most exposed to Carling Avenue. 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. Warning Clauses will also be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6 of this report.

Noise levels at the Level 8 amenity terrace areas (Receptors 10 and 11) are expected to exceed 55 dBA during the daytime period without a noise barrier. If these areas are to be used as outdoor living areas, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the noise mitigating impact of raising the perimeter guards to 1.8 m above the walking surface. Results of the investigation proved that noise levels

can be reduced to 54 dBA. Therefore, it is advised that the barrier be raised 1.8 m above the walking surface.

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

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1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Claridge Homes to undertake a transportation noise assessment to satisfy the requirements for concurrent Zoning By-law Amendment (ZBA) and Site Plan Control (SPC) application submissions for the proposed mixed-use tall building development located at 829 Carling Avenue in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local roadway traffic.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings provided by Hariri Pontarini Architects in March 2021, with future traffic volumes corresponding to the City of Ottawa's Official Plan (OP) roadway classifications.

2. TERMS OF REFERENCE

The focus of this transportation noise assessment is a proposed mixed-use building development located at 829 Carling Avenue in Ottawa, Ontario. The proposed development comprises a 61-storey mixed-use residential building situated on a nearly square parcel of land at the northwest corner of the Preston Street and Carling Avenue intersection. The site is bounded by Sidney Street to the north, Preston Street to the east, Carling Avenue to the south, and a low-rise commercial building to the west.

Architectural Rendering, Southeast Perspective
(Courtesy of Hariri Pontarini Architects)

At Level 1, the floorplan includes retail spaces at the northeast corner with access from Preston Street and the southwest corner from Carling Avenue. The main residential entrance is located at the southeast

[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

corner of the building fronting Preston Street. Access to six levels of below-grade parking and six levels of above-grade parking (Levels 2-7, inclusive) is provided at the northwest corner of the floorplan from Sidney Street.

At Level 8, the tall building steps back from west and north perimeters to accommodate an outdoor common amenity terrace. Indoor amenities at Level 8 include a movie theatre, party rooms, a game room, exercise areas, and a swimming pool. The swimming pool resides in a building along the west elevation of the podium that rises approximately 1.5 storeys above Level 8 and includes an outdoor common amenity terrace on the roof deck. The tower rises from Levels 9-21 with a common floorplate. At Level 21, the tower steps back from the west elevation to accommodate a terrace area and continues to Level 47 with a common floorplate. At Level 47, the tower again steps back from the west elevation to accommodate a terrace area and continues to the upper roof with a common floorplate.

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. The primary sources of transportation noise include Carling Avenue, Preston Street, and the O-Train Line 2 (Trillium Line) light rail transit (LRT) system. Figure 1 illustrates a complete site plan with surrounding context.

The development is surrounded by low-rise buildings from the southwest clockwise to north-northeast, mid- and high-rise buildings to the east-northeast, and open land for the remaining compass azimuth. An existing condominium building is located to the immediate northwest (7 Sidney Street), a 31-storey mixed-use residential building under construction to the immediate north (SoHo Italia at 500 Preston Street), and an existing 45-storey residential building to the immediate east-northeast (ICON I at 505 Preston Street). The existing/proposed buildings are serviced by standard HVAC equipment primarily located in a mechanical penthouse/level. Therefore, these buildings are expected to be in compliance with ENCG noise guidelines as they would have required their own stationary noise assessment prior to construction. With that notion, in addition to the set-back distance from the existing nearby HVAC equipment and the proposed development, stationary noise impacts from nearby existing properties are expected to be negligible.

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 Transportation Noise

4.2.1 Criteria for Transportation 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 50, 45 and 40 dBA for office and reception areas, living rooms, and sleeping quarters, respectively, as listed in Table 1.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROAD) [3]

Type of Space	Time Period	L_{eq} (dBA)
General **offices**, **reception areas**, retail stores, etc.	07:00 – 23:00	50
Living/dining/den areas of **residences**, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45
Sleeping quarters of hotels/motels	23:00 – 07:00	45
Sleeping quarters of **residences**, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment[5]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need 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.

[3] Adapted from ENCG 2016 – Tables 2.2b and 2.2c
[4] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125
[5] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.8
[6] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

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

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions.
- The day/night split for all streets was taken to be 92%/8%, respectively.
- Ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- A difference in elevation for the LRT was measured to be approximately 7 meters below grade.
- For select sources where appropriate, receptors considered the existing and the proposed buildings 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 13 locations around the study area (see Figure 2).
- Receptor distances and exposure angles are illustrated in Figures 4-7.

4.2.3 Transportation 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.

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

TABLE 2: TRANSPORTATION TRAFFIC DATA

Segment	Roadway Traffic Data	Speed Limit (km/h)	Traffic Volumes
Carling Avenue	6-Lane Urban Arterial Divided	60	**50,000**
Preston Street	2-Lane Urban Arterial Undivided	50	**15,000**
O-Train Line 2	Light Rail Transit	50	**192/24***

*Daytime/Nighttime volumes based on the City of Ottawa's Environmental Assessment for the LRT Project

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.

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

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

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 a Site Plan Control (SPC) application, 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).

5. RESULTS AND DISCUSSION

5.1 Transportation Traffic Noise Levels

The results of the transportation 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	95.6	POW – 30th Floor – East Façade	72	65
2	186.5	POW – 60th Floor – East Façade	72	65
3	95.6	POW – 30th Floor – South Façade	74	66
4	186.5	POW – 60th Floor – South Façade	74	66
5	95.6	POW – 30th Floor – North Façade	65	57
6	186.5	POW – 60th Floor – North Façade	65	57
7	20	POW – 7th Floor – West Façade	70	62
8	95.6	POW – 30th Floor – West Façade	70	62
9	186.5	POW – 60th Floor – West Façade	69	62
10	25.8	OLA – 8th Floor Southwest Amenity Area	58	N/A*
11	25.8	OLA – 8th Floor Northwest Amenity Area	57	N/A*
12	31.1	OLA – 9th Floor West Amenity Area	55	N/A*
13	147.2	OLA – 47th Floor West Amenity Area	49	N/A*

*Noise levels at an OLA during the nighttime period are not considered as per ENCG

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

The results of the current analysis indicate that noise levels will range between 49 and 74 dBA during the daytime period (07:00-23:00) and between 57 and 66 dBA during the nighttime period (23:00-07:00). The highest noise level (74 dBA) occurs at the south façade, which is nearest and most exposed to Carling Avenue. As noise levels at the Level 8 amenity terrace areas exceed 55 dBA, noise mitigation is required.

5.2 Noise Control Measures

The noise levels predicted due to roadway and LRT 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 east and south will require a minimum STC of 37.

(ii) Bedroom windows facing west will require a minimum STC of 33.

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

- **Living Room Windows**

(i) Living room windows facing east and south will require a minimum STC of 32.

(ii) Living room windows facing west will require a minimum STC of 28.

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

- **Office/Amenity/Reception Area Windows**

(i) Office/amenity/reception area windows facing east and south will require a minimum STC of 27.

(ii) Office/amenity/reception area windows facing west will require a minimum STC of 23.

(iii) All other office/amenity/reception area windows are to satisfy Ontario Building Code (OBC 2012) requirements.

- **Exterior Walls**

(i) Exterior wall components on the south, west, and east façades will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to 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.

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.

5.3 Noise Barrier Calculation

Noise levels at the Level 8 amenity terrace areas (Receptors 10 and 11) are expected to exceed 55 dBA during the daytime period without a noise barrier. If these areas are to be used as outdoor living areas, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the noise mitigating impact of raising the perimeter guards to 1.8 m above the walking surface. Results of the investigation proved that noise levels can be reduced to 54 dBA. Therefore, it is advised that the barrier be raised 1.8 m above the walking surface (see Figure 3).

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

TABLE 4: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	Daytime L_{eq} Noise Levels (dBA)	
			No Barrier	With 1.8 m Barrier
10	25.8	OLA – 8th Floor Southwest Amenity Area	58	54
11	25.8	OLA – 8th Floor Northwest Amenity Area	57	54

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 49 and 74 dBA during the daytime period (07:00-23:00) and between 57 and 66 dBA during the nighttime period (23:00-07:00). The highest noise level (74 dBA) occurs at the south façade, which is nearest and most exposed to Carling Avenue. 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 Warning Clause[11] will also be required be placed on all Lease, Purchase and Sale Agreements, as summarized below:

> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing roadway traffic may, on occasion, interfere with some activities of the dwelling occupants, as the sound levels exceed the sound level limits of the City and the Ministry of the Environment, Conservation and Parks. To help address the need for sound attenuation, this development includes:*
>
> - *STC rated multi-pane glazing elements*
> - *STC rated exterior walls*

[11] City of Ottawa Environmental Noise Control Guidelines, January 2016

This dwelling unit has also been designed with air conditioning. Air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment, Conservation and Parks.

To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features."

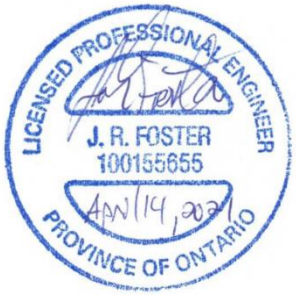
Noise levels at the Level 8 amenity terrace areas (Receptors 10 and 11) are expected to exceed 55 dBA during the daytime period without a noise barrier. If these areas are to be used as outdoor living areas, noise control measures are required to reduce noise levels as close as possible to 55 dBA where technically and administratively feasible. Further analysis investigated the noise mitigating impact of raising the perimeter guards to 1.8 m above the walking surface. Results of the investigation proved that noise levels can be reduced to 54 dBA. Therefore, it is advised that the barrier be raised 1.8 m above the walking surface.

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

This concludes our transportation 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,

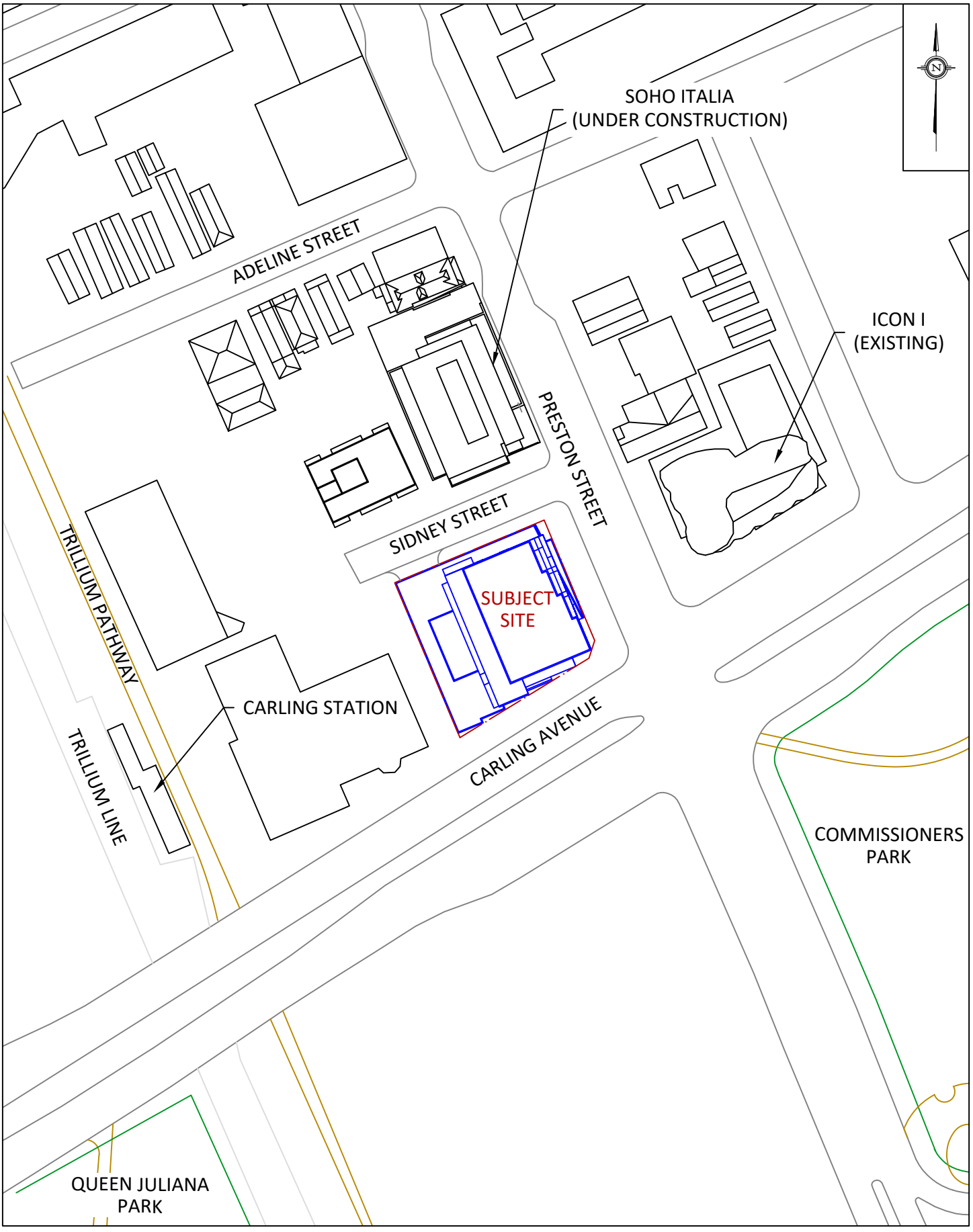
Gradient Wind Engineering Inc.



Giuseppe Garro, MASc.
Junior Environmental Scientist

Joshua Foster, P.Eng.
Principal

Gradient Wind File #21-086 - Transportation Noise



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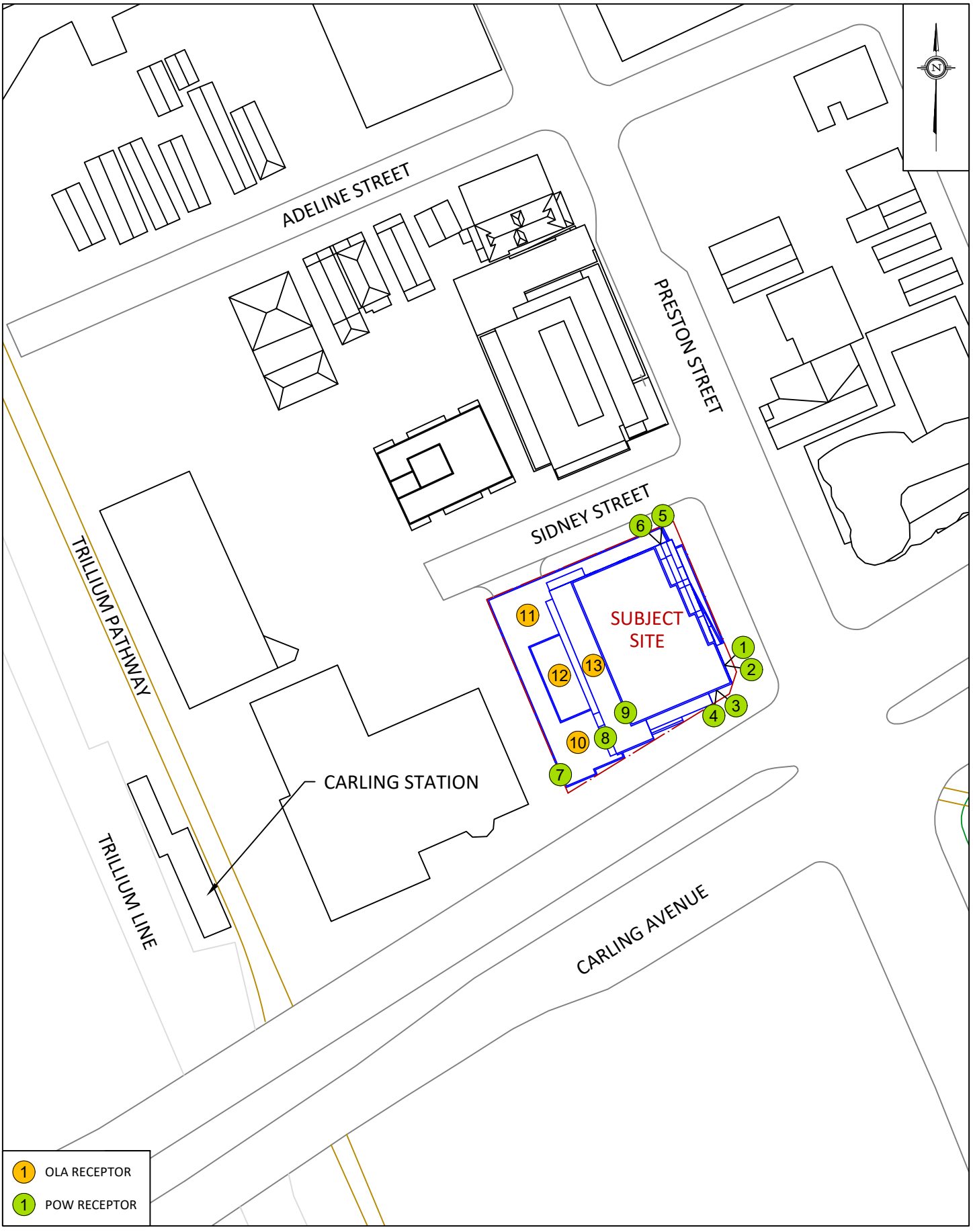
PROJECT	829 CARLING AVNEUE, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:1250
DRAWING NO.	21-086-1
DATE	APRIL 13, 2021
DRAWN BY	G.G.

DESCRIPTION

FIGURE 1:
PROPOSED SITE PLAN AND SURROUNDING CONTEXT



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SCALE	1:1000
DRAWING NO.	21-086-2
DATE	APRIL 13, 2021
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DESCRIPTION

FIGURE 2:
RECEPTOR LOCATION

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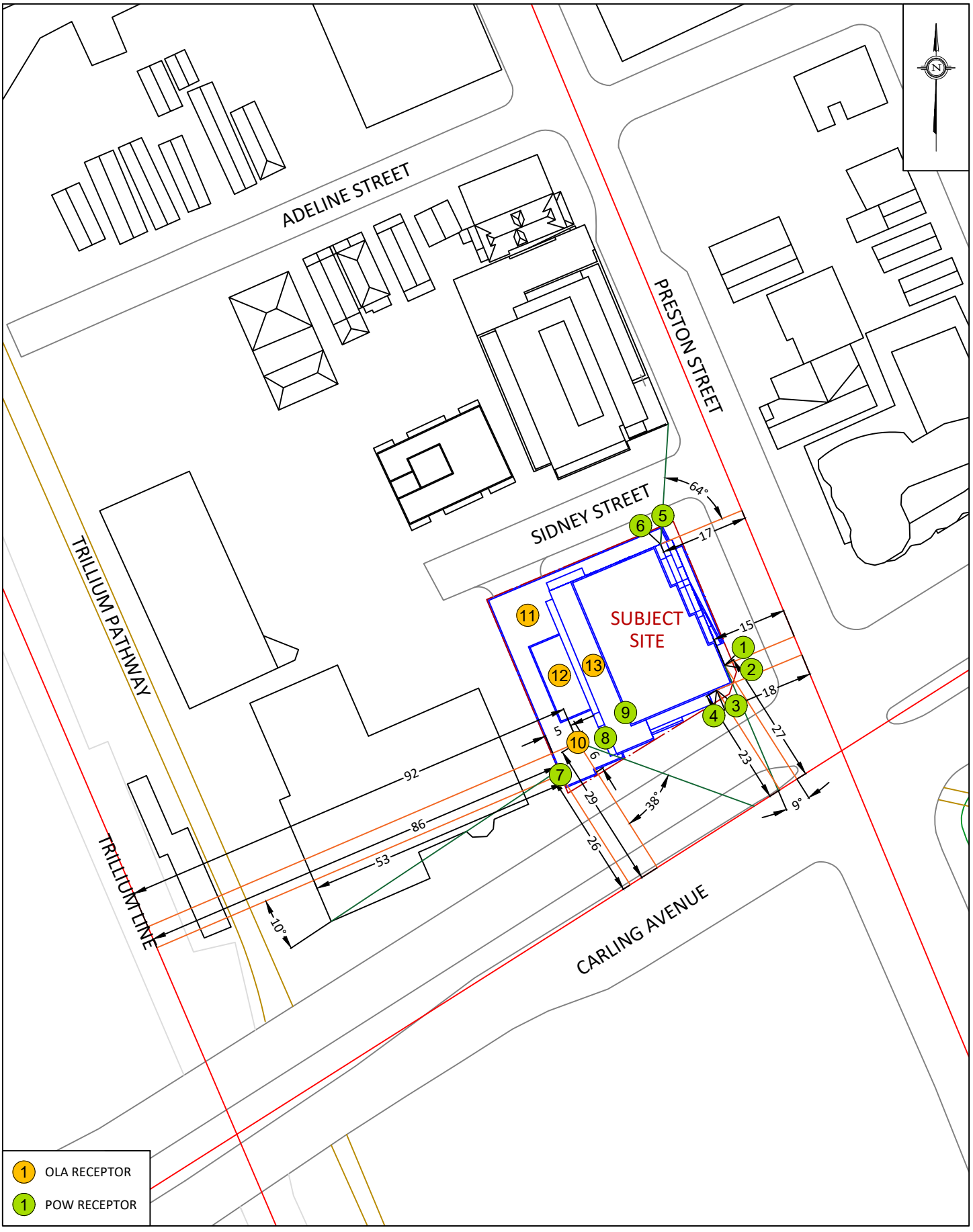
SCALE	1:500
DRAWING NO.	21-086-3
DATE	APRIL 13, 2021
DRAWN BY	G.G.
DESCRIPTION	FIGURE 3: WINDOW STC REQUIREMENTS



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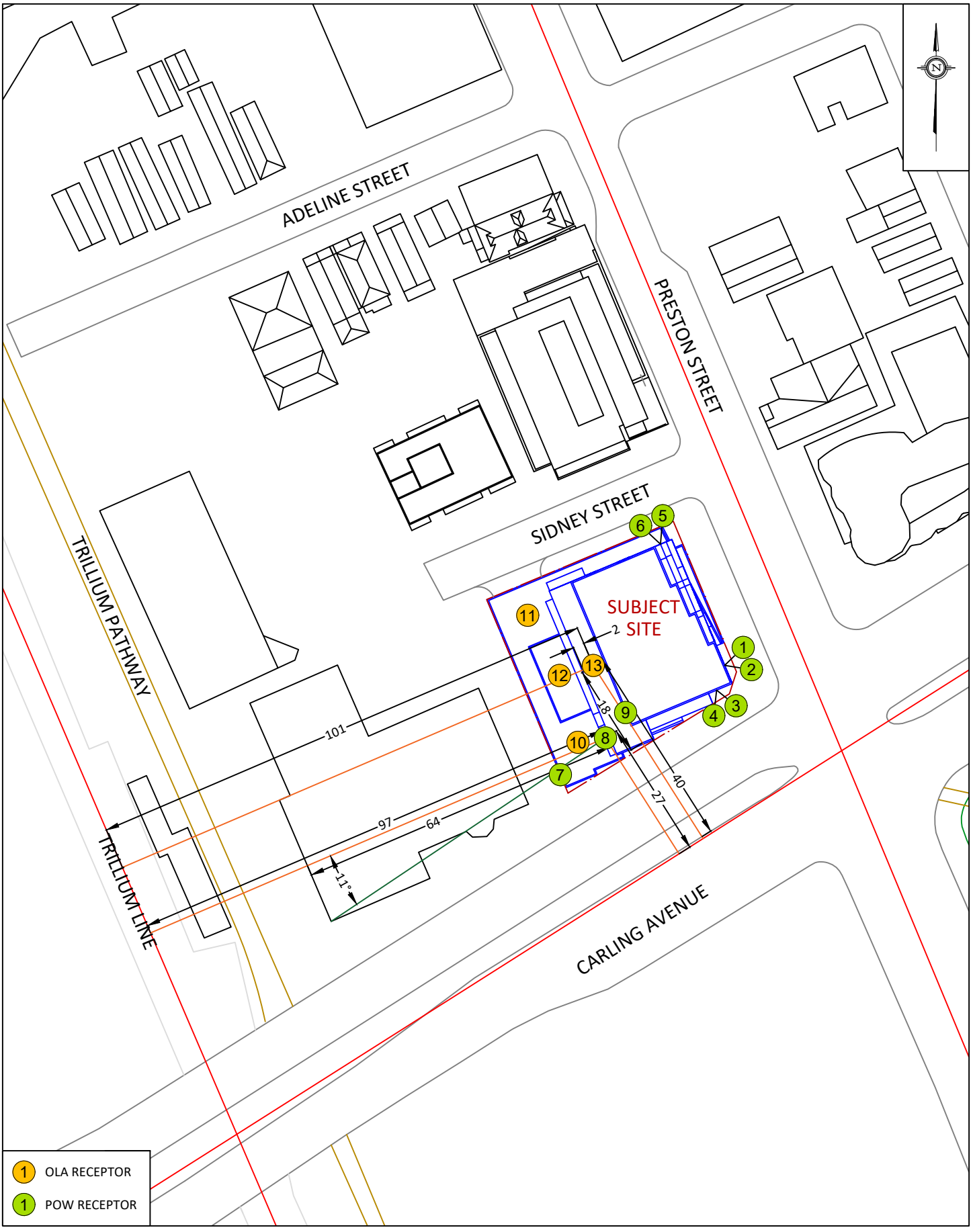
SCALE	1:1000
DRAWING NO.	21-086-4
DATE	APRIL 13, 2021
DRAWN BY	G.G.

DESCRIPTION

FIGURE 4:
STAMSON INPUT PARAMETERS



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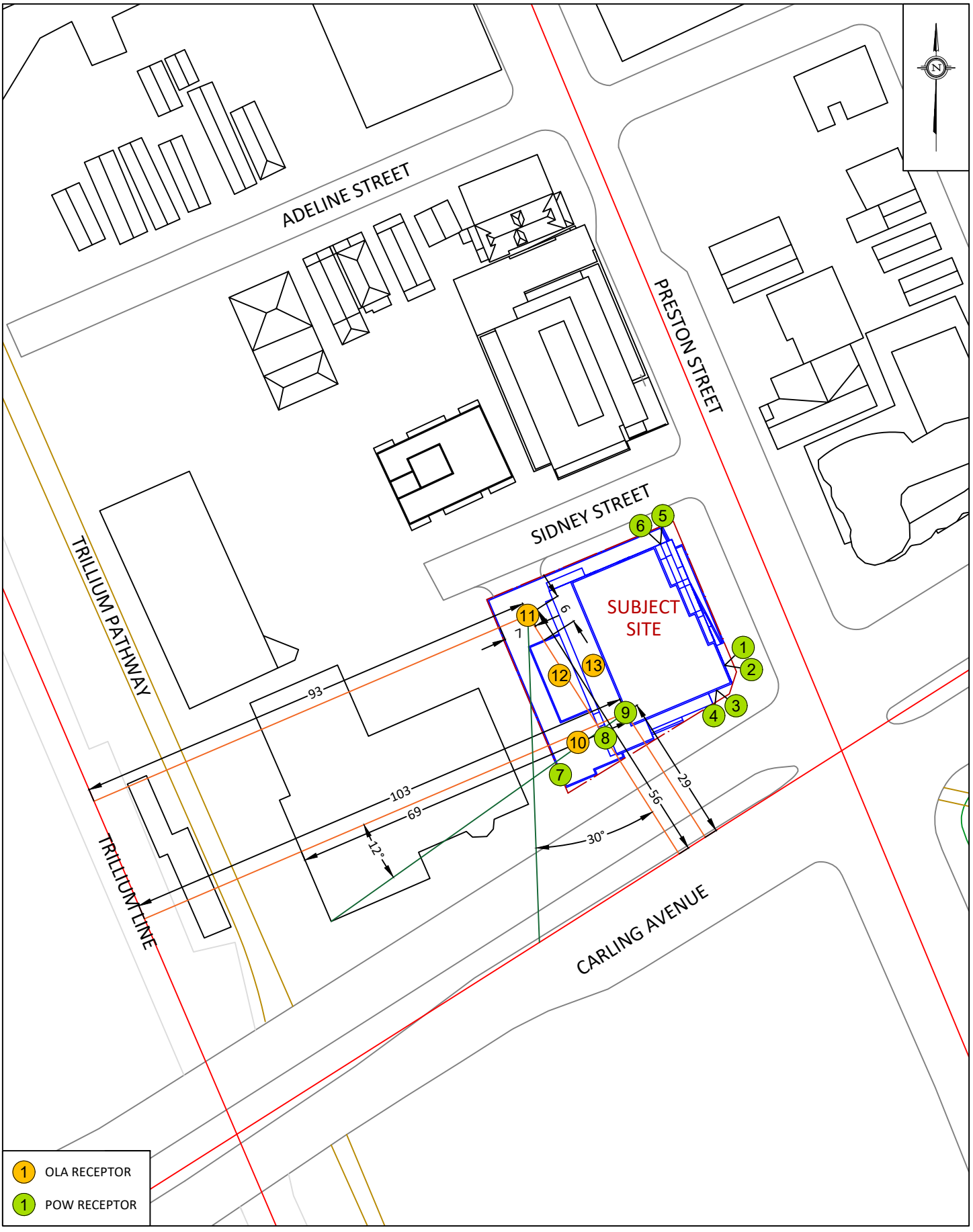
PROJECT	829 CARLING AVNEUE, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	21-086-5
DATE	APRIL 13, 2021
DRAWN BY	G.G.

DESCRIPTION

FIGURE 5:
STAMSON INPUT PARAMETERS



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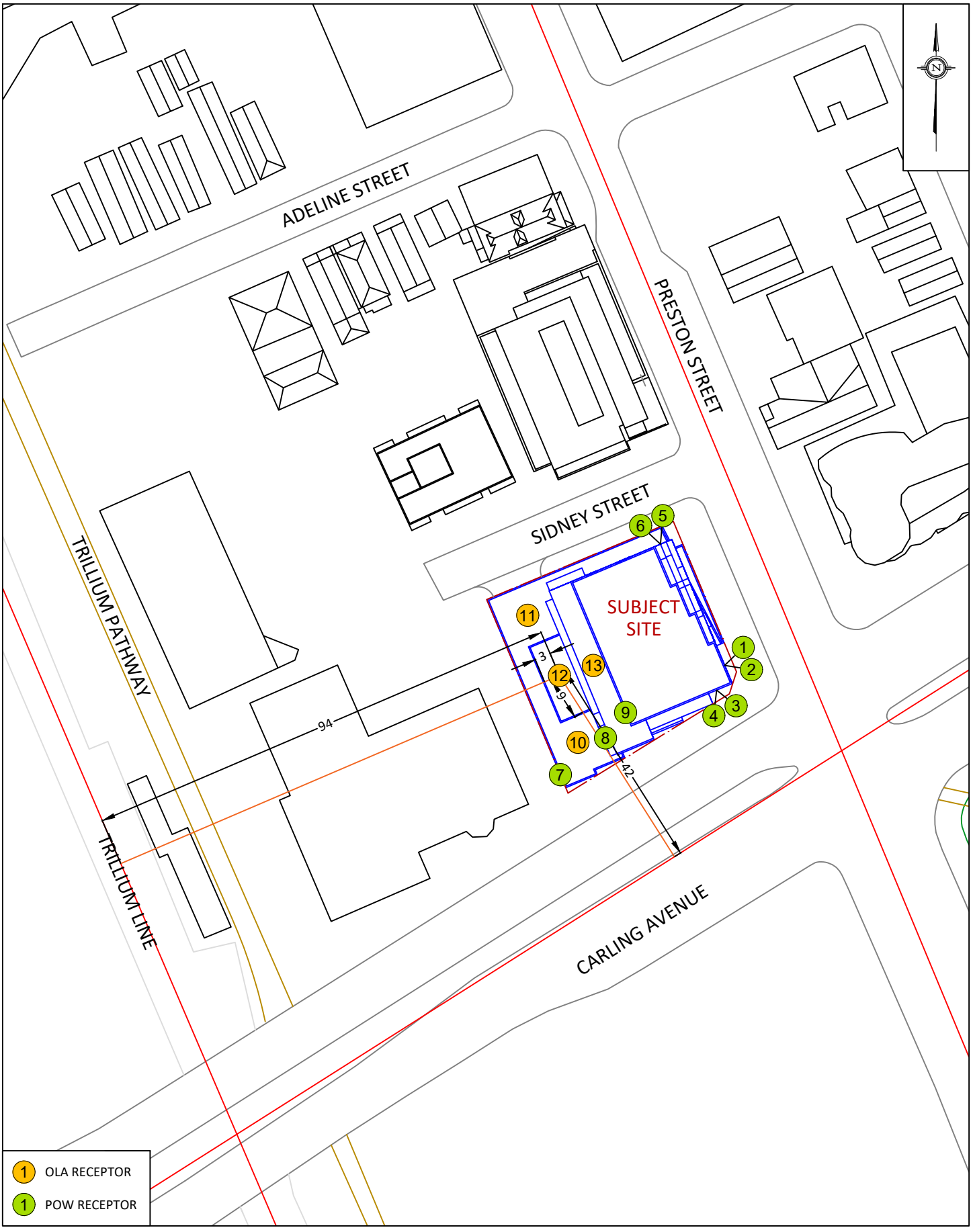
PROJECT	829 CARLING AVNEUE, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	21-086-6
DATE	APRIL 13, 2021
DRAWN BY	G.G.

DESCRIPTION

FIGURE 6:
STAMSON INPUT PARAMETERS



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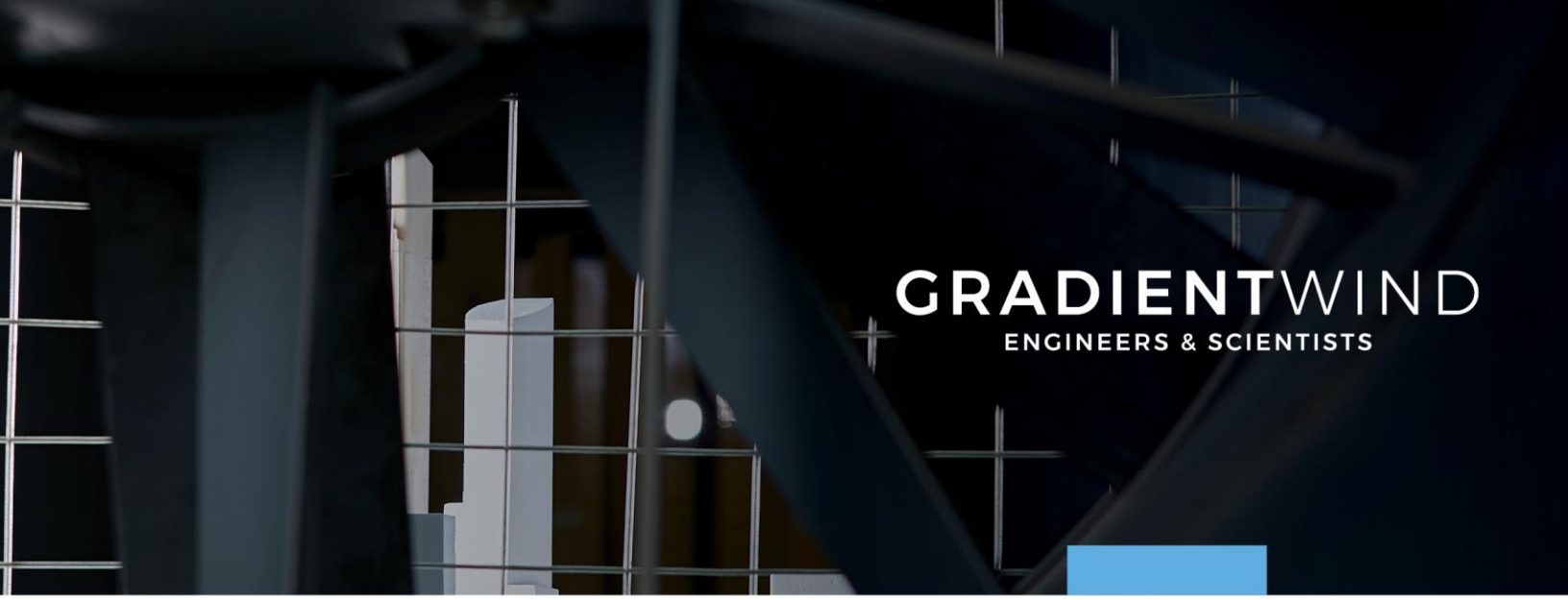
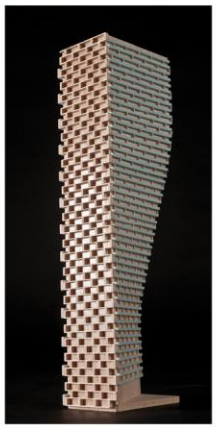
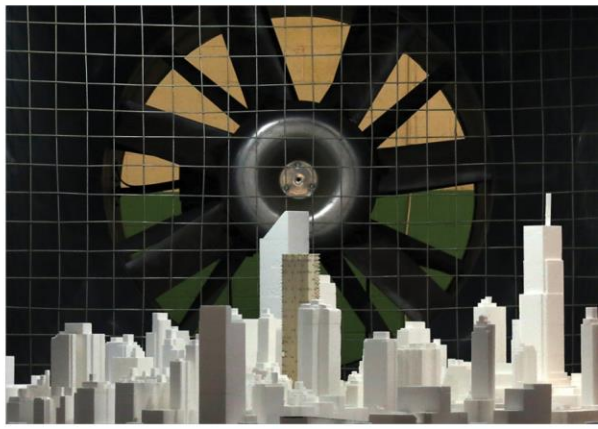
PROJECT	829 CARLING AVNEUE, OTTAWA TRANSPORTATION NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	21-086-7
DATE	APRIL 13, 2021
DRAWN BY	G.G.

DESCRIPTION

FIGURE 7:
STAMSON INPUT PARAMETERS







APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:38:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  15.00 / 15.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: CARLING AV (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 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           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Results segment # 2: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 70.08 + 0.00) = 70.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      9   0.00  75.22   0.00  -2.55  -2.60   0.00   0.00   0.00
70.08
-------------------------------------------------------------------------------
--

Segment Leq : 70.08 dBA

Total Leq All Segments: 72.36 dBA
```

```
Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Results segment # 2: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.48 + 0.00) = 62.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      9   0.00  67.63   0.00  -2.55  -2.60   0.00   0.00   0.00
62.48
-------------------------------------------------------------------------
--

Segment Leq : 62.48 dBA

Total Leq All Segments: 64.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.36
                           (NIGHT): 64.76
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:38:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  15.00 / 15.00  m
Receiver height           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: CARLING AV (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   9.00 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           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.48 + 0.00) = 68.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  68.48   0.00   0.00   0.00   0.00   0.00   0.00
68.48
-------------------------------------------------------------------------------
--

Segment Leq : 68.48 dBA

Results segment # 2: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 70.08 + 0.00) = 70.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      9   0.00  75.22   0.00  -2.55  -2.60   0.00   0.00   0.00
70.08
-------------------------------------------------------------------------------
--

Segment Leq : 70.08 dBA

Total Leq All Segments: 72.36 dBA
```

```
Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.88 + 0.00) = 60.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  60.88   0.00   0.00   0.00   0.00   0.00   0.00
60.88
-------------------------------------------------------------------------
--

Segment Leq : 60.88 dBA

Results segment # 2: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.48 + 0.00) = 62.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      9   0.00  67.63   0.00  -2.55  -2.60   0.00   0.00   0.00
62.48
-------------------------------------------------------------------------
--

Segment Leq : 62.48 dBA

Total Leq All Segments: 64.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.36
                           (NIGHT): 64.76
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  18.00 / 18.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: CARLING AV (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  :  23.00 / 23.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.68 + 0.00) = 64.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00  -0.79  -3.01   0.00   0.00   0.00
64.68
-------------------------------------------------------------------------------
--

Segment Leq : 64.68 dBA

Results segment # 2: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 73.37 + 0.00) = 73.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  75.22   0.00  -1.86   0.00   0.00   0.00   0.00
73.37
-------------------------------------------------------------------------------
--

Segment Leq : 73.37 dBA

Total Leq All Segments: 73.92 dBA
```

```
Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.08 + 0.00) = 57.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00  -0.79  -3.01   0.00   0.00   0.00
57.08
-------------------------------------------------------------------------
--

Segment Leq : 57.08 dBA

Results segment # 2: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 65.77 + 0.00) = 65.77 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  67.63   0.00  -1.86   0.00   0.00   0.00   0.00
65.77
-------------------------------------------------------------------------
--

Segment Leq : 65.77 dBA

Total Leq All Segments: 66.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 73.92
                           (NIGHT): 66.32
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  18.00 / 18.00  m
Receiver height           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
```

```
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: CARLING AV (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  :  23.00 / 23.00  m
Receiver height           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.68 + 0.00) = 64.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  68.48   0.00  -0.79  -3.01   0.00   0.00   0.00
64.68
-------------------------------------------------------------------------------
--

Segment Leq : 64.68 dBA

Results segment # 2: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 73.37 + 0.00) = 73.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     90   0.00  75.22   0.00  -1.86   0.00   0.00   0.00   0.00
73.37
-------------------------------------------------------------------------------
--

Segment Leq : 73.37 dBA

Total Leq All Segments: 73.92 dBA
```

```
Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.08 + 0.00) = 57.08 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  60.88   0.00  -0.79  -3.01   0.00   0.00   0.00
57.08
-------------------------------------------------------------------------
--

Segment Leq : 57.08 dBA

Results segment # 2: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 65.77 + 0.00) = 65.77 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     90   0.00  67.63   0.00  -1.86   0.00   0.00   0.00   0.00
65.77
-------------------------------------------------------------------------
--

Segment Leq : 65.77 dBA

Total Leq All Segments: 66.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 73.92
                           (NIGHT): 66.32
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  17.00 / 17.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.93 + 0.00) = 64.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  68.48   0.00  -0.54  -3.01   0.00   0.00   0.00
64.93
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 64.93 dBA

Total Leq All Segments: 64.93 dBA

Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.33 + 0.00) = 57.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  60.88   0.00  -0.54  -3.01   0.00   0.00   0.00
57.33
-------------------------------------------------------------------------
--

Segment Leq : 57.33 dBA

Total Leq All Segments: 57.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.93
                           (NIGHT): 57.33
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: PRESTON ST (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    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):  15000
    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: PRESTON ST (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  :  17.00 / 17.00  m
Receiver height           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: PRESTON ST (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.93 + 0.00) = 64.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90      0   0.00  68.48   0.00  -0.54  -3.01   0.00   0.00   0.00
64.93
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 64.93 dBA

Total Leq All Segments: 64.93 dBA

Results segment # 1: PRESTON ST (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.33 + 0.00) = 57.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90      0   0.00  60.88   0.00  -0.54  -3.01   0.00   0.00   0.00
57.33
-------------------------------------------------------------------------
--

Segment Leq : 57.33 dBA

Total Leq All Segments: 57.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.93
                           (NIGHT): 57.33
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (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  :  26.00 / 26.00  m
Receiver height           :  20.00 / 20.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 69.83 + 0.00) = 69.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  75.22   0.00  -2.39  -3.01   0.00   0.00   0.00
69.83
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 69.83 dBA

Total Leq All Segments: 69.83 dBA

Results segment # 1: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.23 + 0.00) = 62.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  67.63   0.00  -2.39  -3.01   0.00   0.00   0.00
62.23
-------------------------------------------------------------------------
--

Segment Leq : 62.23 dBA

Total Leq All Segments: 62.23 dBA

RT/Custom data, segment # 1: LRT (day/night)
-------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  86.00 / 86.00  m
Receiver height           :  20.00 / 20.00  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -10.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 m
Elevation                 :   7.00 m
Barrier receiver distance :  53.00 / 53.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: LRT (day)
------------------------------
Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       20.00 !        7.98 !         7.98

RT/Custom (44.92 + 45.89 + 0.00) = 48.44 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -10   0.00  56.02  -7.58  -3.52   0.00   0.00   0.00  44.92
-------------------------------------------------------------------------
   -10     90   0.00  56.02  -7.58  -2.55   0.00   0.00  -0.97  44.92*
   -10     90   0.00  56.02  -7.58  -2.55   0.00   0.00   0.00  45.89
-------------------------------------------------------------------------
 * Bright Zone !

Segment Leq : 48.44 dBA

Total Leq All Segments: 48.44 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       20.00 !        7.98 !         7.98

RT/Custom (38.90 + 39.87 + 0.00) = 42.42 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -10   0.00  50.00  -7.58  -3.52   0.00   0.00   0.00  38.90
-------------------------------------------------------------------------
   -10     90   0.00  50.00  -7.58  -2.55   0.00   0.00  -0.97  38.90*
   -10     90   0.00  50.00  -7.58  -2.55   0.00   0.00   0.00  39.87
-------------------------------------------------------------------------
 * Bright Zone !
Segment Leq : 42.42 dBA
Total Leq All Segments: 42.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.86
                           (NIGHT): 62.28
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:39:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (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  :  27.00 / 27.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 69.66 + 0.00) = 69.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90    0.00  75.22   0.00  -2.55  -3.01   0.00   0.00   0.00
69.66
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 69.66 dBA

Total Leq All Segments: 69.66 dBA

Results segment # 1: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 62.07 + 0.00) = 62.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  67.63   0.00  -2.55  -3.01   0.00   0.00   0.00
62.07
-------------------------------------------------------------------------
--

Segment Leq : 62.07 dBA

Total Leq All Segments: 62.07 dBA

RT/Custom data, segment # 1: LRT (day/night)
-------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  97.00 / 97.00  m
Receiver height           :  95.60 / 95.60  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -11.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 m
Elevation                 :   7.00 m
Barrier receiver distance :  64.00 / 64.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m
```

```
Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       95.60 !       32.85 !        32.85

RT/Custom (44.34 + 45.41 + 0.00) = 47.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -11   0.00  56.02  -8.11  -3.58   0.00   0.00   0.00  44.34
-------------------------------------------------------------------------
   -11     90   0.00  56.02  -8.11  -2.51   0.00   0.00  -0.01  45.40*
   -11     90   0.00  56.02  -8.11  -2.51   0.00   0.00   0.00  45.41
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.92 dBA

Total Leq All Segments: 47.92 dBA

Results segment # 1: LRT (night)
--------------------------------
Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       95.60 !       32.85 !        32.85

RT/Custom (38.32 + 39.39 + 0.00) = 41.90 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -11   0.00  50.00  -8.11  -3.58   0.00   0.00   0.00  38.32
-------------------------------------------------------------------------
   -11     90   0.00  50.00  -8.11  -2.51   0.00   0.00  -0.01  39.38*
   -11     90   0.00  50.00  -8.11  -2.51   0.00   0.00   0.00  39.39
-------------------------------------------------------------------------
 * Bright Zone !
Segment Leq : 41.90 dBA

Total Leq All Segments: 41.90 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.69
                           (NIGHT): 62.11
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:40:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te                Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (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  :  29.00 / 29.00  m
Receiver height           : 186.50 / 186.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: CARLING AV (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 69.35 + 0.00) = 69.35 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     90   0.00  75.22   0.00  -2.86  -3.01   0.00   0.00   0.00
69.35
-------------------------------------------------------------------------------
--
```

```
Segment Leq : 69.35 dBA

Total Leq All Segments: 69.35 dBA

Results segment # 1: CARLING AV (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.75 + 0.00) = 61.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  67.63   0.00  -2.86  -3.01   0.00   0.00   0.00
61.75
-------------------------------------------------------------------------
--

Segment Leq : 61.75 dBA

Total Leq All Segments: 61.75 dBA

RT/Custom data, segment # 1: LRT (day/night)
-------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  : 103.00 / 103.00 m
Receiver height           : 186.50 / 186.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -12.00 deg   Angle2 : 90.00 deg
Barrier height            :   6.00 m
Elevation                 :   7.00 m
Barrier receiver distance :  69.00 / 69.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m
```

```
Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !      186.50 !       61.90 !        61.90

RT/Custom (44.02 + 45.19 + 0.00) = 47.66 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -12   0.00  56.02  -8.37  -3.63   0.00   0.00   0.00  44.02
-------------------------------------------------------------------------
   -12     90   0.00  56.02  -8.37  -2.47   0.00   0.00  -0.00  45.18*
   -12     90   0.00  56.02  -8.37  -2.47   0.00   0.00   0.00  45.19
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.66 dBA

Total Leq All Segments: 47.66 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !      186.50 !       61.90 !        61.90

RT/Custom (38.00 + 39.17 + 0.00) = 41.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -12   0.00  50.00  -8.37  -3.63   0.00   0.00   0.00  38.00
-------------------------------------------------------------------------
   -12     90   0.00  50.00  -8.37  -2.47   0.00   0.00  -0.00  39.16*
   -12     90   0.00  50.00  -8.37  -2.47   0.00   0.00   0.00  39.17
-------------------------------------------------------------------------

 * Bright Zone !
Segment Leq : 41.64 dBA

Total Leq All Segments: 41.64 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.38
                           (NIGHT): 61.79
```

```
STAMSON 5.0        NORMAL REPORT        Date: 13-04-2021 13:25:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (day/night)
--------------------------------------------
Angle1   Angle2           : -38.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  29.00 / 29.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -38.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.30 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV (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 !       25.80 !       20.77 !        20.77

ROAD (0.00 + 57.55 + 0.00) = 57.55 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -38     90   0.00  75.22   0.00  -2.86  -1.48   0.00   0.00 -13.34
57.55
-------------------------------------------------------------------------
--

Segment Leq : 57.55 dBA

Total Leq All Segments: 57.55 dBA

Results segment # 1: CARLING AV (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 !       25.80 !       20.77 !        20.77

ROAD (0.00 + 49.95 + 0.00) = 49.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -38     90   0.00  67.63   0.00  -2.86  -1.48   0.00   0.00 -13.34
49.95
-------------------------------------------------------------------------
--

Segment Leq : 49.95 dBA

Total Leq All Segments: 49.95 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  92.00 / 92.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.30 m
Elevation                 :   7.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       24.42 !        24.42

RT/Custom (0.00 + 48.15 + 0.00) = 48.15 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.02  -7.88   0.00   0.00   0.00  -4.95  43.20*
   -90     90   0.00  56.02  -7.88   0.00   0.00   0.00   0.00  48.15
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 48.15 dBA

Total Leq All Segments: 48.15 dBA

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

Source height = 0.50 m

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

```
       0.50 !       25.80 !       24.42 !        24.42

RT/Custom (0.00 + 42.13 + 0.00) = 42.13 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  50.00  -7.88   0.00   0.00   0.00  -4.95  37.18*
   -90     90   0.00  50.00  -7.88   0.00   0.00   0.00   0.00  42.13
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 42.13 dBA

Total Leq All Segments: 42.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.02
                           (NIGHT): 50.61
```

```
STAMSON 5.0        NORMAL REPORT        Date: 13-04-2021 13:25:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10b.te              Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (day/night)
--------------------------------------------
Angle1   Angle2           : -38.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  29.00 / 29.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -38.00 deg   Angle2 : 90.00 deg
Barrier height            :  26.10 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV (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 !       25.80 !       20.77 !        20.77

ROAD (0.00 + 54.40 + 0.00) = 54.40 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -38     90   0.00  75.22   0.00  -2.86  -1.48   0.00   0.00 -16.49
54.40
-------------------------------------------------------------------------
--

Segment Leq : 54.40 dBA

Total Leq All Segments: 54.40 dBA

Results segment # 1: CARLING AV (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 !       25.80 !       20.77 !        20.77

ROAD (0.00 + 46.80 + 0.00) = 46.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -38     90   0.00  67.63   0.00  -2.86  -1.48   0.00   0.00 -16.49
46.80
-------------------------------------------------------------------------
--

Segment Leq : 46.80 dBA

Total Leq All Segments: 46.80 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  92.00 / 92.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  26.10 m
Elevation                 :   7.00 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       24.42 !        24.42

RT/Custom (0.00 + 38.39 + 0.00) = 38.39 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.02  -7.88   0.00   0.00   0.00  -9.76  38.39
-------------------------------------------------------------------------

Segment Leq : 38.39 dBA

Total Leq All Segments: 38.39 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       24.42 !        24.42

RT/Custom (0.00 + 32.37 + 0.00) = 32.37 dBA
```

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	50.00	-7.88	0.00	0.00	0.00	-9.76	32.37

Segment Leq : 32.37 dBA

Total Leq All Segments: 32.37 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.51
(NIGHT): 46.95

```
STAMSON 5.0        NORMAL REPORT        Date: 13-04-2021 13:33:30
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV1 (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV1 (day/night)
---------------------------------------------
Angle1   Angle2           :   0.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  56.00 / 56.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 30.00 deg
Barrier height            :  29.60 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: CARLING AV2 (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: CARLING AV2 (day/night)
---------------------------------------------
Angle1   Angle2           :  30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  56.00 / 56.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.30 m
Barrier receiver distance :   7.00 / 7.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV1 (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 !       25.80 !       23.20 !        23.20

ROAD (0.00 + 41.72 + 0.00) = 41.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     30   0.00  75.22   0.00  -5.72  -7.78   0.00   0.00 -20.00
41.72
-------------------------------------------------------------------------------
--

Segment Leq : 41.72 dBA
```

```
Results segment # 2: CARLING AV2 (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 !       25.80 !       22.76 !        22.76

ROAD (0.00 + 57.03 + 0.00) = 57.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  75.22   0.00  -5.72  -4.77   0.00   0.00  -7.70
57.03
-------------------------------------------------------------------------------
--

Segment Leq : 57.03 dBA

Total Leq All Segments: 57.16 dBA

Results segment # 1: CARLING AV1 (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 !       25.80 !       23.20 !        23.20

ROAD (0.00 + 34.13 + 0.00) = 34.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     30   0.00  67.63   0.00  -5.72  -7.78   0.00   0.00 -20.00
34.13
-------------------------------------------------------------------------------
--

Segment Leq : 34.13 dBA
```

```
Results segment # 2: CARLING AV2 (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 !       25.80 !       22.76 !        22.76

ROAD (0.00 + 49.44 + 0.00) = 49.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90    0.00  67.63   0.00  -5.72  -4.77   0.00   0.00  -7.70
49.44
-------------------------------------------------------------------------------
--

Segment Leq : 49.44 dBA

Total Leq All Segments: 49.57 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  93.00 / 93.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.30 m
Elevation                 :   7.00 m
Barrier receiver distance :   7.00 / 7.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       23.90 !        23.90

RT/Custom (0.00 + 42.73 + 0.00) = 42.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.02  -7.92   0.00   0.00   0.00  -5.37  42.73
-------------------------------------------------------------------------

Segment Leq : 42.73 dBA

Total Leq All Segments: 42.73 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       23.90 !        23.90

RT/Custom (0.00 + 36.71 + 0.00) = 36.71 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  50.00  -7.92   0.00   0.00   0.00  -5.37  36.71
-------------------------------------------------------------------------

Segment Leq : 36.71 dBA

Total Leq All Segments: 36.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.31
                           (NIGHT): 49.79
```

```
STAMSON 5.0        NORMAL REPORT        Date: 13-04-2021 13:33:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11b.te              Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV1 (day/night)
-----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV1 (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   30.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  56.00 / 56.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 30.00 deg
Barrier height            :  29.60 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: CARLING AV2 (day/night)
-----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: CARLING AV2 (day/night)
---------------------------------------------
Angle1   Angle2           :  30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  56.00 / 56.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :  26.10 m
Barrier receiver distance :   7.00 / 7.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV1 (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 !       25.80 !       23.20 !        23.20

ROAD (0.00 + 41.72 + 0.00) = 41.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     30   0.00  75.22   0.00  -5.72  -7.78   0.00   0.00 -20.00
41.72
-------------------------------------------------------------------------------
--

Segment Leq : 41.72 dBA
```

```
Results segment # 2: CARLING AV2 (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 !       25.80 !       22.76 !        22.76

ROAD (0.00 + 53.02 + 0.00) = 53.02 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90   0.00  75.22   0.00  -5.72  -4.77   0.00   0.00 -11.71
53.02
-------------------------------------------------------------------------------
--

Segment Leq : 53.02 dBA

Total Leq All Segments: 53.33 dBA

Results segment # 1: CARLING AV1 (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 !       25.80 !       23.20 !        23.20

ROAD (0.00 + 34.13 + 0.00) = 34.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
     0     30   0.00  67.63   0.00  -5.72  -7.78   0.00   0.00 -20.00
34.13
-------------------------------------------------------------------------------
--

Segment Leq : 34.13 dBA
```

```
Results segment # 2: CARLING AV2 (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 !       25.80 !       22.76 !        22.76

ROAD (0.00 + 45.42 + 0.00) = 45.42 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    30     90    0.00  67.63   0.00  -5.72  -4.77   0.00   0.00 -11.71
45.42
-------------------------------------------------------------------------------
--

Segment Leq : 45.42 dBA

Total Leq All Segments: 45.73 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  93.00 / 93.00  m
Receiver height           :  25.80 / 25.80  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  24.30 m
Elevation                 :   7.00 m
Barrier receiver distance :   7.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       23.90 !        23.90

RT/Custom (0.00 + 42.73 + 0.00) = 42.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.00  56.02  -7.92   0.00   0.00   0.00  -5.37  42.73
-------------------------------------------------------------------

Segment Leq : 42.73 dBA

Total Leq All Segments: 42.73 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       25.80 !       24.17 !        24.17

RT/Custom (0.00 + 37.03 + 0.00) = 37.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.00  50.00  -7.92   0.00   0.00   0.00  -5.05  37.03
-------------------------------------------------------------------

Segment Leq : 37.03 dBA

Total Leq All Segments: 37.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.69
                           (NIGHT): 46.28
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:40:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (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  :  42.00 / 42.00  m
Receiver height           :  31.10 / 31.10  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            :  29.60 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV (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 !       31.10 !       24.76 !        24.76

ROAD (0.00 + 53.92 + 0.00) = 53.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  75.22   0.00  -4.47  -3.01   0.00   0.00 -13.82
53.92
-------------------------------------------------------------------------
--

Segment Leq : 53.92 dBA

Total Leq All Segments: 53.92 dBA

Results segment # 1: CARLING AV (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 !       31.10 !       24.76 !        24.76

ROAD (0.00 + 46.32 + 0.00) = 46.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  67.63   0.00  -4.47  -3.01   0.00   0.00 -13.82
46.32
-------------------------------------------------------------------------
--

Segment Leq : 46.32 dBA

Total Leq All Segments: 46.32 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  :  94.00 / 94.00  m
Receiver height           :  31.10 / 29.60  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  29.60 m
Elevation                 :   7.00 m
Barrier receiver distance :   3.00 / 3.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !       31.10 !       30.12 !        30.12

RT/Custom (0.00 + 48.05 + 0.00) = 48.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.02  -7.97   0.00   0.00   0.00  -3.43  44.62*
   -90     90   0.00  56.02  -7.97   0.00   0.00   0.00   0.00  48.05
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 48.05 dBA

Total Leq All Segments: 48.05 dBA

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

Source height = 0.50 m

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

```
       0.50 !       29.60 !       28.67 !        28.67

RT/Custom (0.00 + 33.98 + 0.00) = 33.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  50.00  -7.97   0.00   0.00   0.00  -8.06  33.98
-------------------------------------------------------------------------

Segment Leq : 33.98 dBA

Total Leq All Segments: 33.98 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.92
                           (NIGHT): 46.57
```

```
STAMSON 5.0        NORMAL REPORT        Date: 12-04-2021 17:40:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: CARLING AV (day/night)
----------------------------------------------
Car traffic volume  : 40480/3520  veh/TimePeriod  *
Medium truck volume :  3220/280   veh/TimePeriod  *
Heavy truck volume  :  2300/200   veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  50000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: CARLING AV (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  :  40.00 / 40.00  m
Receiver height           : 147.20 / 147.20 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :   0.00 deg   Angle2 : 90.00 deg
Barrier height            : 145.70 m
Barrier receiver distance :  18.00 / 18.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: CARLING AV (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 !      147.20 !       81.63 !        81.63

ROAD (0.00 + 48.91 + 0.00) = 48.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  75.22   0.00  -4.26  -3.01   0.00   0.00 -19.05
48.91
-------------------------------------------------------------------------
--

Segment Leq : 48.91 dBA

Total Leq All Segments: 48.91 dBA

Results segment # 1: CARLING AV (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 !      147.20 !       81.63 !        81.63

ROAD (0.00 + 41.31 + 0.00) = 41.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     0     90   0.00  67.63   0.00  -4.26  -3.01   0.00   0.00 -19.05
41.31
-------------------------------------------------------------------------
--

Segment Leq : 41.31 dBA

Total Leq All Segments: 41.31 dBA

RT/Custom data, segment # 1: LRT (day/night)
--------------------------------------------
1 - 4-car SRT:
Traffic volume    :   192/24    veh/TimePeriod
Speed             :    50 km/h

Data for Segment # 1: LRT (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  : 101.00 / 101.00 m
Receiver height           : 147.20 / 147.20 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            : 145.70 m
Elevation                 :   7.00 m
Barrier receiver distance :   2.00 / 2.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !      147.20 !      144.30 !       144.30

RT/Custom (0.00 + 39.78 + 0.00) = 39.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.02  -8.28   0.00   0.00   0.00  -7.96  39.78
-------------------------------------------------------------------------

Segment Leq : 39.78 dBA

Total Leq All Segments: 39.78 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !      147.20 !      144.30 !       144.30

RT/Custom (0.00 + 33.76 + 0.00) = 33.76 dBA
```

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	50.00	-8.28	0.00	0.00	0.00	-7.96	33.76

Segment Leq : 33.76 dBA

Total Leq All Segments: 33.76 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.41
(NIGHT): 42.01