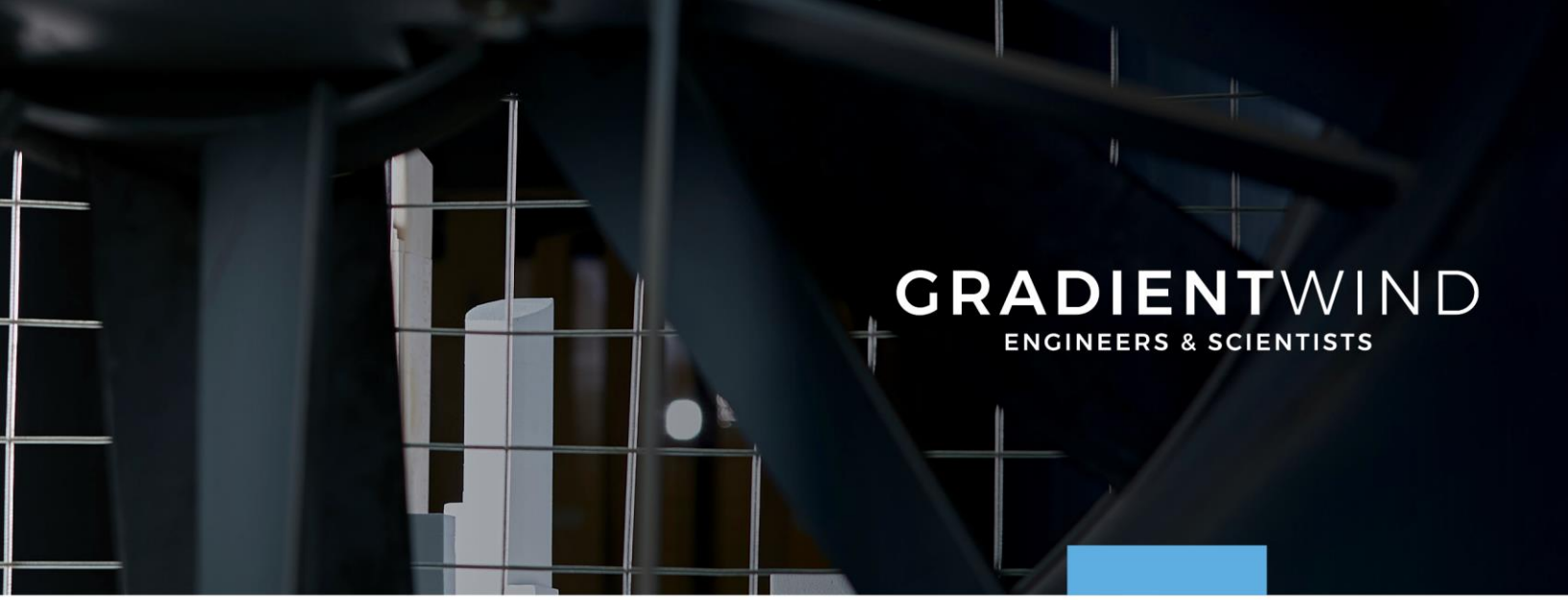

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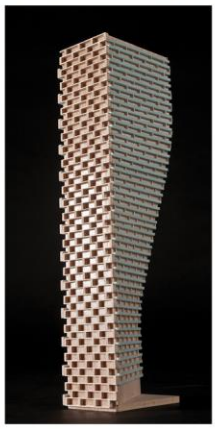
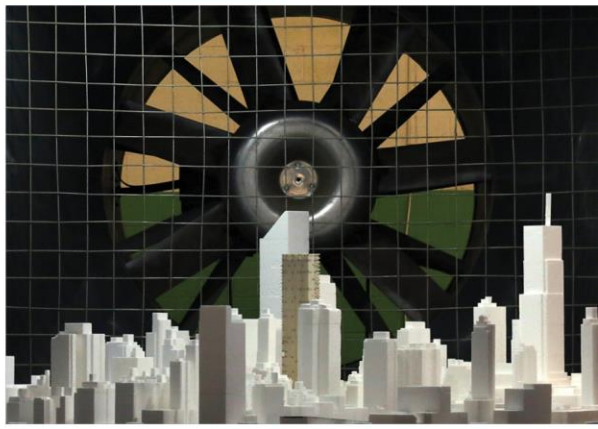
TRANSPORTATION NOISE & VIBRATION ASSESSMENT

2026 Scott Street
Ottawa, Ontario

REPORT #22-006-Transportation Noise & Vibration





April 5, 2022

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EXECUTIVE SUMMARY

This report describes a transportation noise and ground vibration assessment undertaken to satisfy the requirements for Zoning By-Law Amendment (ZBA) application for a proposed mixed-use development located at 2026 Scott Street in Ottawa, Ontario. This study examines the impact of light rail transit corridor (Confederation Line LRT) and roadway traffic on the development to ensure that future occupants are afforded comfortable use of indoor and outdoor living spaces, as directed by the City of Ottawa's Environmental Noise Control Guidelines (ENCG). As the development is located in close proximity of the Confederation Line LRT; within the 75 metres limit as indicated for railways in Guidelines for New Development in Proximity to Railway Operations [1]; ground vibrations were considered in the study as well.

The proposed development comprises two phases: Phase 1, and Phase 2. Phase 1 includes two towers referred to as "Building 2" and "Building 3", situated to the northeast and to the northwest of the subject site, respectively, and Phase 2 includes a tower referred to as "Building 1", located to the southwest. All three towers are served by six levels of below-grade parking, rise above a five-storey podium, and include a mechanical penthouse (MPH) level.

The surroundings of the development include mid-rise residential buildings to the northwest and to the northeast, low-rise residential buildings to the east and southeast, a community centre and Lion's Park to the south, low-rise residential buildings to the southwest and northwest, and a mid-rise residential building to the west. Notably, Westboro Station is situated approximately 50 m to the northeast of the subject site and the Confederation Line LRT runs from the northeast to the southwest. In addition, a 26-storey mixed-use development is under construction at 320 McRae, located approximately 200 m to the east, a 30-storey mixed-use apartment building is proposed at 2046-2050 Scott Street, located to the immediate west of the subject site, and a 25-storey mixed-use building is proposed at 2070 Scott Street, located approximately 130 m to the west.

[1] Dialog and J.E. Coulter Associates Limited, prepared for The Federation of Canadian Municipalities and The Railway Associated of Canada, May 2013.

The development site is bordered by Scott Street to the north, Athlone Avenue to the east, low-rise residential buildings and park area to the south, and low to mid-rise residential buildings to the west. Figure 1 illustrates a complete site plan with the surrounding context. The noise generated by trains slowing down and accelerating at Westboro Station will be masked by the LRT corridor and roadway traffic noise. Therefore, any noise impact on the development site from the station is not anticipated.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) (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; (iv) future rail traffic volumes based on the ultimate buildout LRT volumes were based on our past experience with the Confederation Line LRT; and (v) drawings prepared by Hobin Architecture, dated November 18, 2021.

Results of the current analysis indicate that noise levels at POW receptors will range between 48 and 69 dBA during the daytime period (07:00-23:00) and between 41 and 61 dBA during the nighttime period (23:00-07:00). The highest noise level (69 dBA) occurs at the north façades of Buildings 2 and 3, which are nearest and most exposed to Scott Street and the Confederation Line LRT. The noise levels at the terraces (OLA Receptors 14, 15, 16, and 17) do not exceed the 55 dBA ENCG criteria. Therefore, no noise mitigation measure is required for these areas.

The results of the calculations also indicate that Buildings 2 and 3 should be designed with central air conditioning or a similar system, which will allow occupants to keep windows closed and maintain a comfortable living environment. Since the high-rise buildings are likely to be designed with central air conditioning, a Type D Warning Clause can be used in all Lease, Purchase and Sale Agreements of all three buildings' units, as summarized in Section 6. In addition, the Rail Construction Program Office recommends that the warning clause summarized in Section 6 be included in all agreements of purchase and sale and lease agreements.

Estimated vibration levels at the property line of the proposed development to the Confederation Line LRT are expected to be at 0.08 mm/s RMS (70 dBV), based on the FTA protocol and an offset distance of 43 m. Details of the calculation are provided in Appendix B. Since predicted vibration levels do not exceed the criterion of 0.14 mm/s RMS at the property line, vibration mitigation will not be required. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

With regards to stationary noise impacts, the site is surrounded by low- to mid-rise buildings with only small equipment on the rooftop of some neighbouring buildings. Therefore, on-site stationary noise impacts from these properties are considered insignificant. Westboro Station is located to the northeast 49 metres from the property line of the development; the noise generated by trains slowing down and accelerating at the station will be masked by the LRT corridor and roadway traffic noise. Therefore, any noise impact on the development site from the station is not anticipated.

For off-site impacts from the proposed building onto the surroundings, the stationary noise levels can be reduced by judicious equipment selection and correct placing of the mechanical equipment. Therefore, we anticipate that the noise levels compliant with ENCG and NPC-300 limits can be achieved with prudent planning of the mechanical areas and equipment. The final selection of the mechanical equipment should be reviewed by a qualified acoustic engineer prior to the installation of the equipment.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Morley Hoppner to undertake a transportation noise assessment for a proposed mixed-use development located at 2026 Scott Street in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local transportation sources and the ground vibration impact of the Confederation Line on the development.

Our work is based on theoretical noise calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines, City of Ottawa[3]. Noise calculations were based on architectural drawings prepared by Hobin Architecture with future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications and the ultimate buildout LRT volumes based on the Environmental Assessment for the Confederation Line LRT.

2. TERMS OF REFERENCE

The proposed development is located at 2026 Scott Street in Ottawa; situated at the southwest corner of Scott Street and Athlone Avenue. Throughout this report, Scott Street is referred to as project north.

The proposed development comprises two phases: Phase 1, and Phase 2. Phase 1 includes two towers referred to as "Building 2" and "Building 3", situated to the northeast and to the northwest of the subject site, respectively, and Phase 2 includes a tower referred to as "Building 1", located to the southwest. All three towers are served by six levels of below-grade parking, rise above a five-storey podium, and include a mechanical penthouse (MPH) level.

Building 1 comprises a near rectangular 20-storey building. Above the below-grade parking levels, the ground floor includes a residential main entrance within the inset at the northeast corner, commercial space from the northeast clockwise southwest, a bike room as well as a garbage and recycling room at the northwest corner, a central elevator core, and shared building support spaces throughout the

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

remainder of the level. Levels 2-20 are reserved for residential use. Outdoor amenity terraces are located in all compass directions at the podium roof level and to the south at the MPH Level.

Building 2 comprises a near rectangular 36-storey building. Above the below-grade parking levels, the ground floor includes a residential main entrance to the east, a gym at the southeast corner, a bike room to the south, garbage and recycling room at the southwest corner, commercial spaces fronting Scott Street to the north, a central elevator core, and shared building support spaces throughout the remainder of the level. Access to underground parking is provided by a ramp at the northwest corner of Building 2 via a laneway from Scott Street. Levels 2-36 are reserved for residential use and Levels 6-36 overhang the levels below to the east. Outdoor amenity terraces are located from the southeast clockwise northeast at the podium roof level and to the north and east at the MPH Level.

Building 3 comprises a near rectangular 40-storey mixed-use residential building. Above the below-grade parking levels, the ground floor includes a residential main entrance to the west, commercial spaces fronting Scott Street to the north, a garbage and recycling room to the east, a gym at the southwest corner, a central elevator core, and shared building support spaces throughout the remainder of the level. Access to underground parking is provided by a ramp at the southeast corner of Building 3 via a laneway from Athlone Avenue. Levels 2-40 are reserved for residential use. Outdoor amenity terraces are located from the east clockwise west at the podium roof level, to the north and west at Level 36, and to the north at the MPH level.

The surroundings of the development include mid-rise residential buildings to the northwest and to the northeast, low-rise residential buildings to the east and southeast, a community centre and Lion's Park to the south, low-rise residential buildings to the southwest and northwest, and a mid-rise residential building to the west. Notably, Westboro Station is situated approximately 50 m to the northeast of the subject site and the Confederation Line LRT runs from the northeast to the southwest. In addition, a 26-storey mixed-use development is under construction at 320 McRae, located approximately 200 m to the east, a 30-storey mixed-use apartment building is proposed at 2046-2050 Scott Street, located to the immediate west of the subject site, and a 25-storey mixed-use building is proposed at 2070 Scott Street, located approximately 130 m to the west.

The major source of transportation noise impacting the site is the Confederation Line LRT and Scott Street located to the north of the site. There are no other major roads or railways within 100 metres of the site. As the development is located in close proximity of the Confederation Line LRT; within the 75 metres limit as indicated for railways in Guidelines for New Development in Proximity to Railway Operations [4]; ground vibrations were considered in the study as well. The noise generated by trains slowing down and accelerating at Westboro Station will be masked by the LRT corridor and roadway traffic noise. Therefore, any noise impact on the development site from the station is not anticipated. Figure 1 illustrates a complete site plan with the surrounding context.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study buildings produced by local transportation 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 Noise 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] Dialog and J.E. Coulter Associates Limited, prepared for The Federation of Canadian Municipalities and The Railway Associated of Canada, May 2013.

4.2 Transportation Noise

4.2.1 Criteria for Transportation Noise

For vehicle traffic, 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 that has the same energy as a time-varying noise level over a period of time. For road and railways including LRT, 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 for roadway and LRT noise is 45 (during daytime) and 40 (during nighttime) for residences, as listed in Table 1. However, to account for deficiencies in building construction and control peak noise, these levels should be targeted toward 42, 37 for living areas during the daytime and sleeping quarters during the nighttime respectively.

TABLE 1: INDOOR SOUND LEVEL CRITERIA (ROADWAYS & LRT)[5]

Type of Space	Time Period	L_{eq} (dBA)
		Road / LRT
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[6]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider

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

the need for having windows and doors closed, which normally triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime building components will require higher levels of sound attenuation[7]. These noise levels also trigger the need for central air conditioning or a similar system.

The sound level criterion for outdoor living areas (OLA) is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA but are less than 60 dBA, mitigation should be provided to reduce noise levels where technically and administratively feasible to acceptable levels at or below the criterion. Where noise levels exceed 60 dBA noise mitigation is required to reduce the noise levels at or below 60 dBA. If these measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause.

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 transportation noise analysis. Appendix A includes the STAMSON 5.04 input and output data.

Roadway and light rail traffic noise calculations were performed by treating each road and railway segment as separate line sources of noise. Existing building locations and the study building were considered as noise barriers partially or fully obstructing exposure to the source where appropriate. In addition to the roadway and LRT volumes summarized in Table 2 below, theoretical noise predictions were also based on the following parameters:

(i) Noise receptors were strategically placed at eighteen (18) locations around the proposed building (see Figure 2).
(ii) Ground surfaces were taken as reflective due to the presence of hard ground (pavement and concrete areas).
(iii) The topography surrounding the study building was assumed to be a flat/gentle slope.
(iv) LRT is located in a trench approximately 5 metres below the local grade of the study site.

[7] MOECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3

(v) Plane of window (POW) receptor heights were taken to be at the centre of the highest storey windows of Building 1, 2, and 3; 66.15/61.50, 109.40, and 121.50 respectively. Also, POW receptors were placed on the façades of Building 2 and 3 Podia.

(vi) The Outdoor living area (OLA) receptors were taken 1.5 metres above the terrace floor levels.

(vii) Receptor distance and exposure angles are outlined in Figures 3-7.

4.2.3 Roadway and Light Rail Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on roadways' classification and the railway transit systems at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[8] which provide additional details on future roadway expansions and the ultimate buildout LRT volumes were used which were established in the Confederation Line West Extension Environmental Assessment Study. 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 of roadways and the volume of the Confederation Line LRT considered in the assessment.

TABLE 2: TRANSPORTATION TRAFFIC DATA

Segment	Roadway / LRT Traffic Data	Speed Limit (km/h)	Traffic Volumes
Scott Street	2-Lane Urban Arterial (2-UAU)	50	**15,000**
Confederation Line LRT	LRT	70	**540/60***

* Daytime/nighttime volumes

4.3 Ground Vibration & Ground-borne Noise

4.3.1 Background on Vibrations

Transit systems and heavy vehicles on roadways can produce perceptible levels of ground vibrations, especially when they are in close proximity to residential neighbourhoods or vibration-sensitive buildings. Similar to sound waves in air, vibrations in solids are generated at a source, propagated through a medium,

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

and intercepted by a receiver. In the case of ground vibrations, the medium can be uniform, or more often, a complex layering of soils and rock strata.

Similar to sound waves in air, ground vibrations also produce perceptible motions and regenerated noise known as 'ground-borne noise' when the vibrations encounter a hollow structure such as a building. Ground-borne noise and vibrations are generated when there is excitation of the ground, such as from a train. The repetitive motion of steel wheels on the track or rubber tires passing over an uneven surface causes vibration to propagate through the soil. When they encounter a building, vibrations pass along the structure of the building beginning at the foundation and propagating to all floors. Air inside the building excited by the vibrating walls and floors represents regenerated airborne noise. Characteristics of the soil and the building are imparted to the noise, thereby creating a noise signature that is unique to that structure and soil combination.

Human response to ground vibrations is dependent on the magnitude of the vibrations, which is measured by the root mean square (RMS) of the movement of a particle on a surface. Typical measurement units of ground vibration are millimetres per second (mm/s) or inches per second (in/s). Since vibrations can vary over a wide range, it is also convenient to represent them in decibel units, or dBV. In North America, it is common practice to use the reference value of one micro-inch per second (µin/s) to represent vibration levels for this purpose. The threshold level of human perception to vibrations is about 0.10 mm/s RMS or about 72 dBV. Although somewhat variable, the threshold of annoyance for continuous vibrations is 0.5 mm/s RMS (or 85 dBV), five times higher than the perception threshold, whereas the threshold for significant structural damage is 10 mm/s RMS (or 112 dBV), at least one hundred times higher than the perception threshold level.

4.3.2 Ground Vibration Criteria

The Canadian Railway Association and Canadian Association of Municipalities have set standards for new sensitive land developments within 300 metres of a railway right-of-way as published in their document *Guidelines for New Development in Proximity to Railway Operations*[9], which indicate that vibration

[9] Dialog and J.E. Coulter Associates Limited, prepared for The Federation of Canadian Municipalities and The Railway Associated of Canada, May 2013

conditions should not exceed 0.14 mm/s RMS averaged over a one-second time-period at the first floor and above of the proposed building.

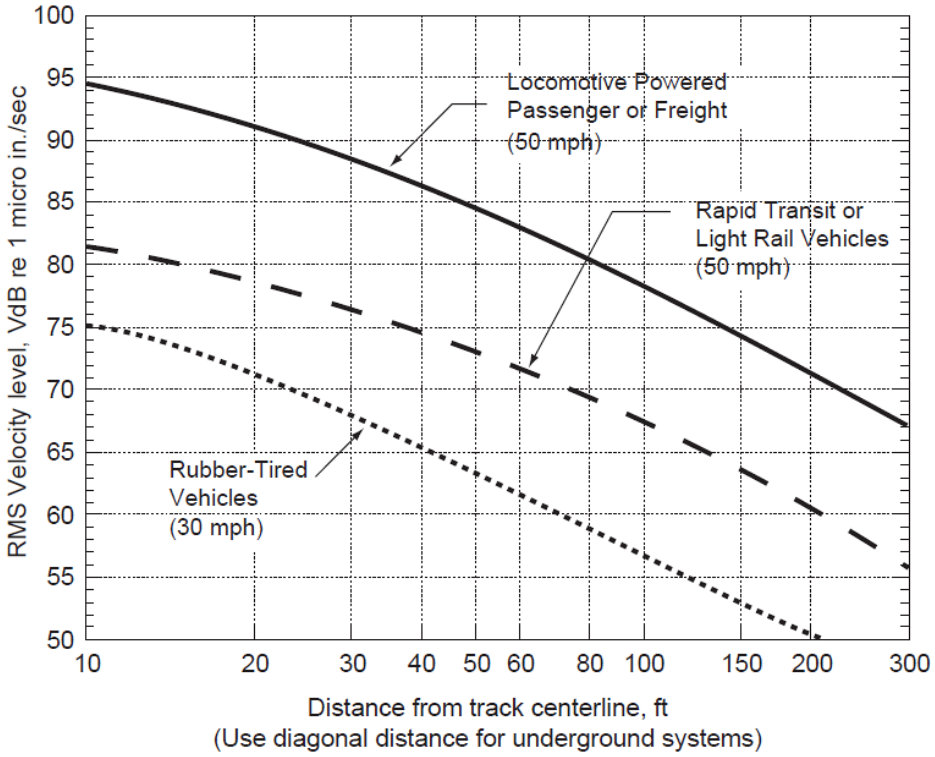
4.3.3 Theoretical Ground Vibration Prediction Procedure

Potential vibration impacts of the trains were predicted using the Federal Transit Authority's (FTA) Transit Noise and Vibration Impact Assessment[10] protocol. The FTA general vibration assessment is based on an upper bound generic set of curves that show vibration level attenuation with distance. These curves, illustrated in the figure on the following page, are based on ground vibration measurements at various transit systems throughout North America. Vibration levels at points of reception are adjusted by various factors to incorporate known characteristics of the system being analyzed, such as operating speed of vehicle, conditions of the track, construction of the track and geology, as well as the structural type of the impacted building structures.

Confederation Line LRT passes approximately 43 metres to the north of the development. Therefore, the vibration impact of the subway line on the building was determined using a set of curves for Rapid Transit or Light Rail Vehicles at a speed of 43 mph (equals to 70 km/hr, maximum speed for the train) using FTA's Transit Noise and Vibration Impact Assessment protocol. Adjustment factors were considered based on the following information:

- The maximum operating speed of the subway train is 70 km/h (43 mph)
- The distance between the development's property line and the closest subway track is 43 m
- There are no crossover tracks near the development
- The vehicles are assumed to have soft primary suspensions
- Tracks are not welded, though in otherwise good condition
- Soil conditions; propagation through rock
- The building's foundation is in rock

[10] C. E. Hanson; D. A. Towers; and L. D. Meister, Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006



FTA GENERALIZED CURVES OF VIBRATION LEVELS VERSUS DISTANCE (ADOPTED FROM FIGURE 10-1, FTA TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT)

4.4 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2020) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, concrete and masonry walls can achieve STC 50 or more. Curtainwall systems typically provide around STC 35, depending on the glazing elements. 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.

According to the ENCG and NPC-300, when daytime noise levels (from roadway 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[11] considers:

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

Based on published research[12], 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 Zoning By-Law Amendment (ZBA) application, final detailed floor layouts and building elevations were unavailable and 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 Noise Levels

The results of the roadway and LRT 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.

[11] Building Practice Note: Controlling Sound Transmission into Buildings by J.D. Quirt, National Research Council of Canada, September 1985
[12] CMHC, Road & Rail Noise: Effects on Housing

TABLE 3: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION NOISE SOURCES

Receptor Number	Receptor Height (m)	Plane of Window Receptor Location	LRT Noise Levels (dBA)		Road Noise Levels (dBA)		Total Noise Levels (dBA)	
			Day	Night	Day	Night	Day	Night
1	16.5	POW / North Façade Podium of Building 2	51	44	68	61	69	61
2	16.5	POW / North Façade Podium of Building 3	50	43	68	61	68	61
3	109.4	POW / North Façade Building 2	59	52	68	61	69	61
4	109.4	POW / East Façade Building 2	51	44	59	52	60	53
5	109.4	POW / South Façade Building 2	51	45	59	51	60	52
6	121.5	POW / North Façade Building 3	58	51	67	60	68	60
7	121.5	POW / East Façade Building 3	53	47	61	54	62	54
8	121.5	POW / South Façade Building 3	40	33	47	40	48	41
9	121.5	POW / West Façade Building 3	55	48	63	56	64	56
10	66.15	POW / North Façade Building 1	51	45	58	51	59	52
11	66.15	POW / East Façade Building 1	49	42	56	48	57	49
12	61.6	POW / South Façade Building 1	39	32	45	38	46	39
13	61.6	POW / West Façade Building 1	48	41	59	52	60	52
14	19.6	OLA / Building 3 Terrace L6	45	N/A*	48	N/A*	50	N/A*
15	10.5	OLA / Building 3 Terrace L3	40	N/A*	47	N/A*	48	N/A*
16	19.5	OLA / Building 2 Terrace L6	44	N/A*	48	N/A*	49	N/A*
17	19.5	OLA / Building 1 Terrace L6	45	N/A*	50	N/A*	52	N/A*
18	109.4	POW / West Façade Building 2	55	48	63	56	64	57
19	112.5	OLA / MPH Terrace Building 2	42	N/A*	51	N/A*	51	N/A*
20	124.75	OLA / MPH Terrace Building 3	45	N/A*	52	N/A*	53	N/A*
21	64.5	OLA / MPH Terrace Building 1	39	N/A*	44	N/A*	46	N/A*

* OLA noise levels during the nighttime are not considered as per the ENCG

Results of the current analysis indicate that noise levels at POW receptors will range between 48 and 69 dBA during the daytime period (07:00-23:00) and between 41 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels (68 and 69 dBA) occurs at the north façades of Buildings 2 and 3, which are nearest and most exposed to Scott Street and the Confederation Line LRT. The noise level at the terraces (OLA Receptors 14, 15, 16, 17, 19, 20, and 21) do not exceed the 55 dBA ENCG criteria. Therefore, no noise mitigation measure is required for these areas.

5.2 Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4.2 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). As per ENCG 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 8):

- **Bedroom Windows**

(i) Bedroom windows of Buildings 2 and 3 facing north will require a minimum STC of 32

(ii) All other bedroom windows are to satisfy Ontario Building Code (OBC 2020) requirements

- **Living Room/Office Windows**

(i) Living room windows of Buildings 2 and 3 facing north will require a minimum STC of 27

(ii) All other living room windows are to satisfy Ontario Building Code (OBC 2020) requirements

- **Exterior Walls**

(i) Exterior wall components on the north façade will require a minimum STC of 45, which will be achieved with brick cladding or an acoustical equivalent according to NRC test data[13]

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 window/wall system is used. A review of window supplier literature indicates that the specified STC ratings can be

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

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 Ground Vibrations & Ground-Borne Noise Levels

Estimated vibration levels at the property line of the proposed development to the Confederation Line LRT are expected to be at 0.08 mm/s RMS (70 dBV), based on the FTA protocol and an offset distance of 43 m. Details of the calculation are provided in Appendix B. Since predicted vibration levels do not exceed the criterion of 0.14 mm/s RMS at the property line, vibration mitigation will not be required. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

6. CONCLUSIONS AND RECOMMENDATIONS

Results of the current analysis indicate that noise levels at POW receptors will range between 48 and 69 dBA during the daytime period (07:00-23:00) and between 41 and 61 dBA during the nighttime period (23:00-07:00). The highest noise levels (68 and 69 dBA) occurs at the north façades of Buildings 2 and 3, which are nearest and most exposed to Scott Street and the Confederation Line LRT.

The noise level at the terraces (OLA Receptors 14, 15, 16, 17, 19, 20, and 21) do not exceed the 55 dBA ENCG criteria. Therefore, no noise mitigation measure is required for these areas.

The results of the calculations also indicate that Buildings 2 and 3 should be designed with central air conditioning or a similar system, which will allow occupants to keep windows closed and maintain a comfortable living environment. Since the high-rise buildings are likely to be designed with central air conditioning, a Type D Warning Clause can be used in all Lease, Purchase and Sale Agreements of all three buildings' units, as summarized below:

TYPE D

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

In addition, the Rail Construction Program Office recommends that the warning clause identified below be included in all agreements of purchase and sale and lease agreements:

> *"The Owner hereby acknowledges and agrees:*
>
> *i) The proximity of the proposed development of the lands described in Schedule "A" hereto (the "Lands") to the City's existing and future transit operations, may result in noise, vibration, electromagnetic interferences, stray current transmissions, smoke and particulate matter (collectively referred to as "Interferences") to the development;*
>
> *ii) It has been advised by the City to apply reasonable attenuation measures with respect to the level of the Interferences on and within the Lands and the proposed development; and*
>
> *iii) The Owner acknowledges and agrees all agreements of purchase and sale and lease agreements, and all information on all plans and documents used for marketing purposes, for the whole or any part of the subject lands, shall contain the following clauses which shall also be incorporated in all transfer/deeds and leases from the Owner so that the clauses shall be covenants running with the lands for the benefit of the owner of the adjacent road:*

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

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

Estimated vibration levels at the property line of the proposed development to the Confederation Line LRT are expected to be at 0.08 mm/s RMS (70 dBV), based on the FTA protocol and an offset distance of 43 m. Details of the calculation are provided in Appendix B. Since predicted vibration levels do not exceed the criterion of 0.14 mm/s RMS at the property line, vibration mitigation will not be required. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

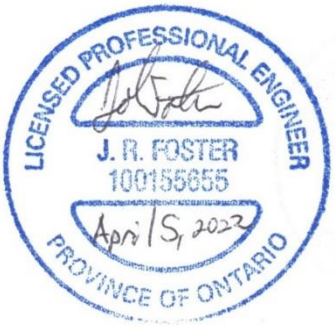
With regards to stationary noise impacts, the site is surrounded by low- to mid-rise buildings with only small equipment on the rooftop of some neighbouring buildings. Therefore, on-site stationary noise impacts from these properties are considered insignificant. Westboro Station is located approximately 50 metres to the northeast of the development; the noise generated by trains slowing down and accelerating at the station will be masked by the LRT corridor and roadway traffic noise. Therefore, any noise impact on the development site from the station is not anticipated.

For off-site impacts from the proposed building onto the surroundings, the stationary noise levels can be reduced by judicious equipment selection and correct placing of the mechanical equipment. Therefore, we anticipate that the noise levels compliant with ENCG and NPC-300 limits can be achieved with prudent planning of the mechanical areas and equipment. The final selection of the mechanical equipment should be reviewed by a qualified acoustic engineer prior to the installation of the equipment.

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

Sincerely,

Gradient Wind Engineering Inc.



Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File#22-006 – Transportation Noise & Vibration

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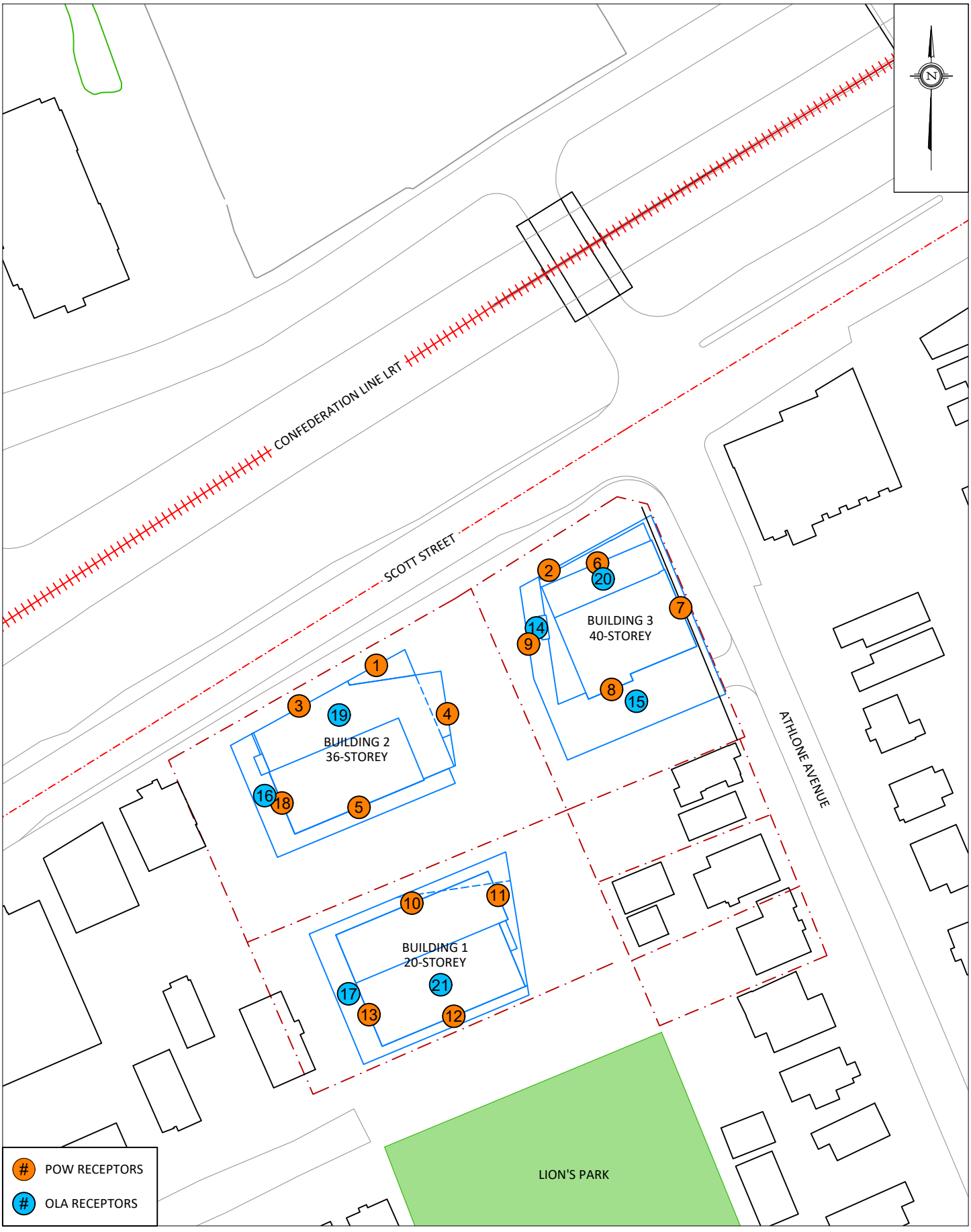
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1500 (APPROX.)
DRAWING NO.	GW22-006-1
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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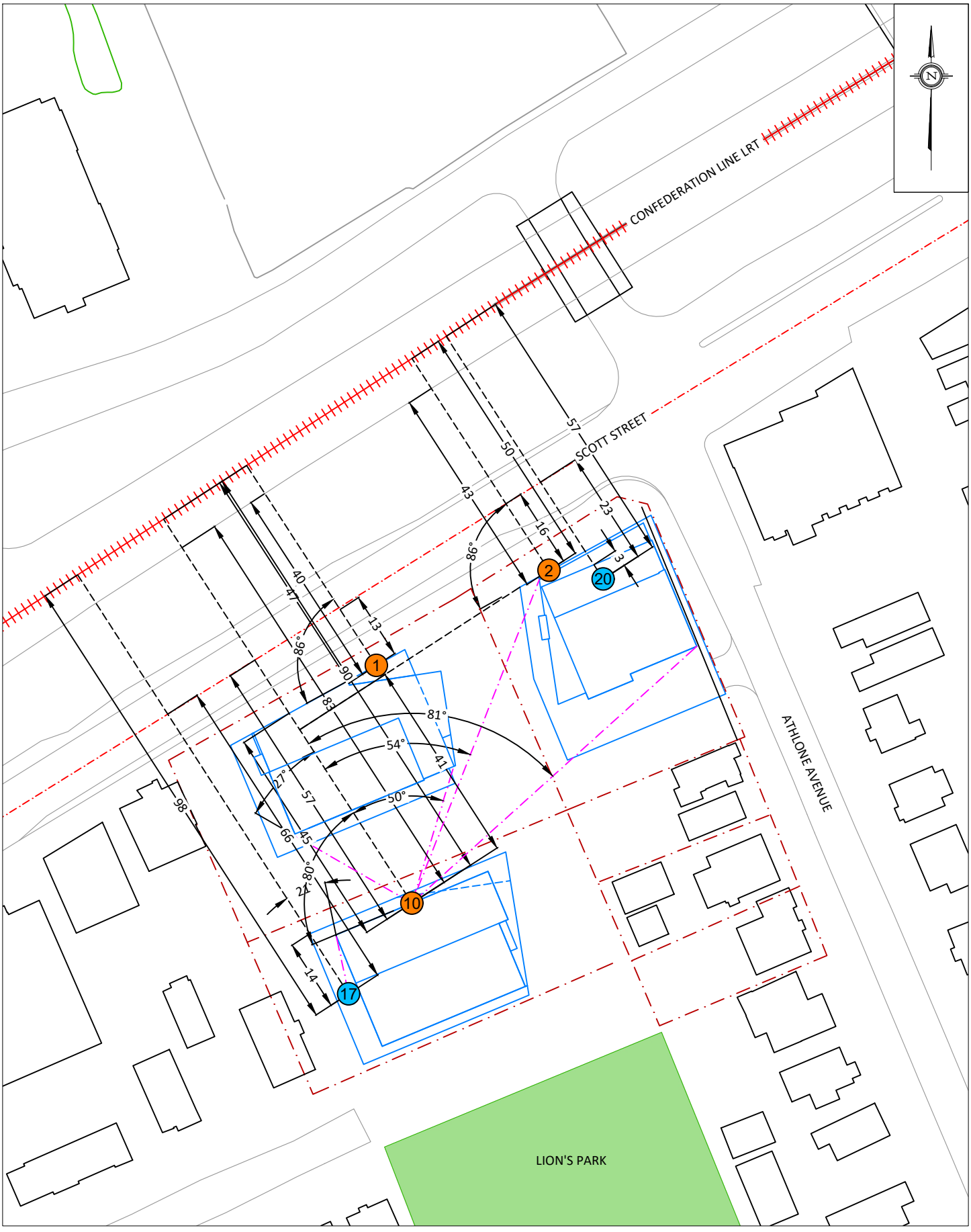
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-2
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS



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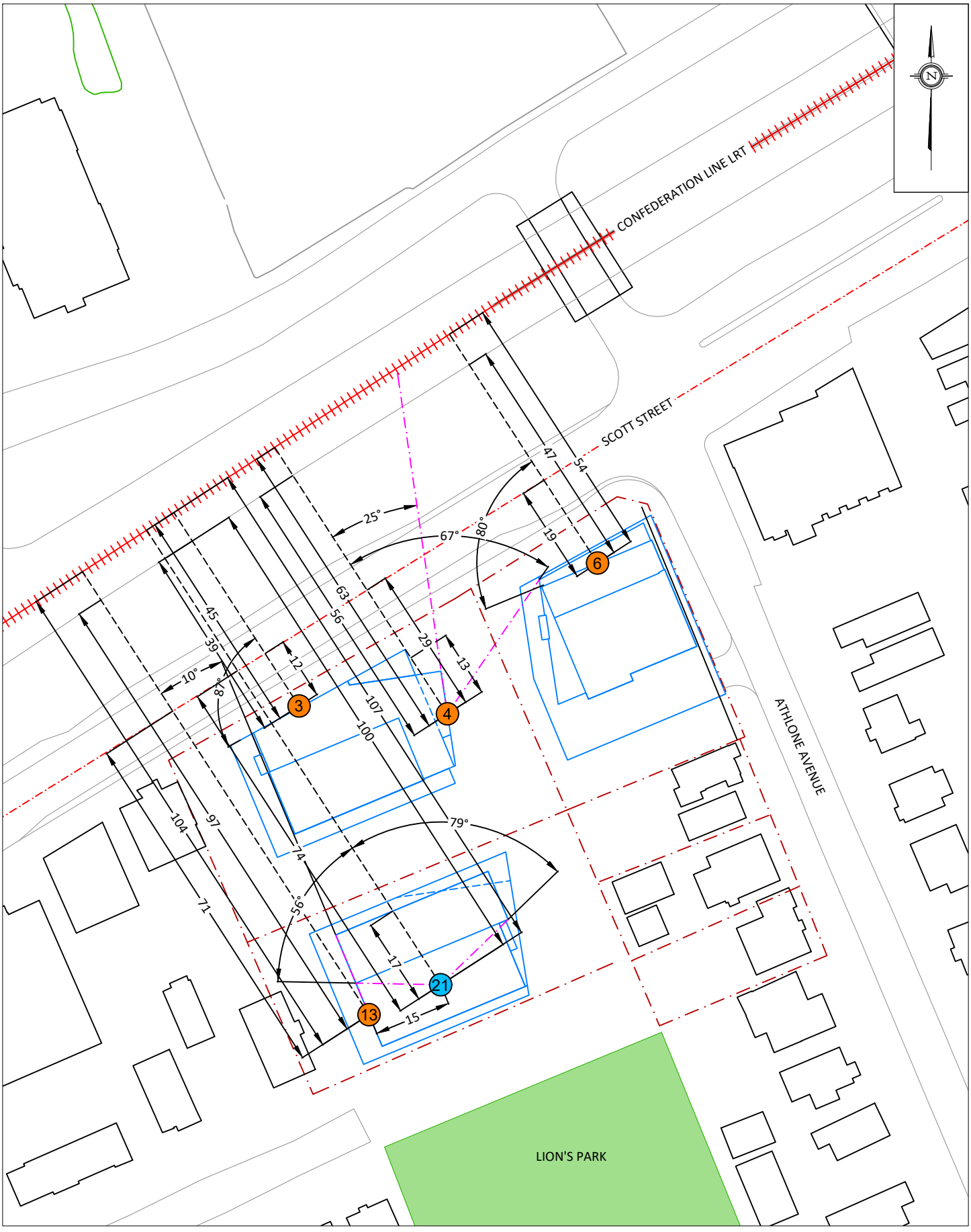
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-3
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 3:
STAMSON INPUT DATA
FOR RECEPTORS 1, 2, 10, 17, & 20



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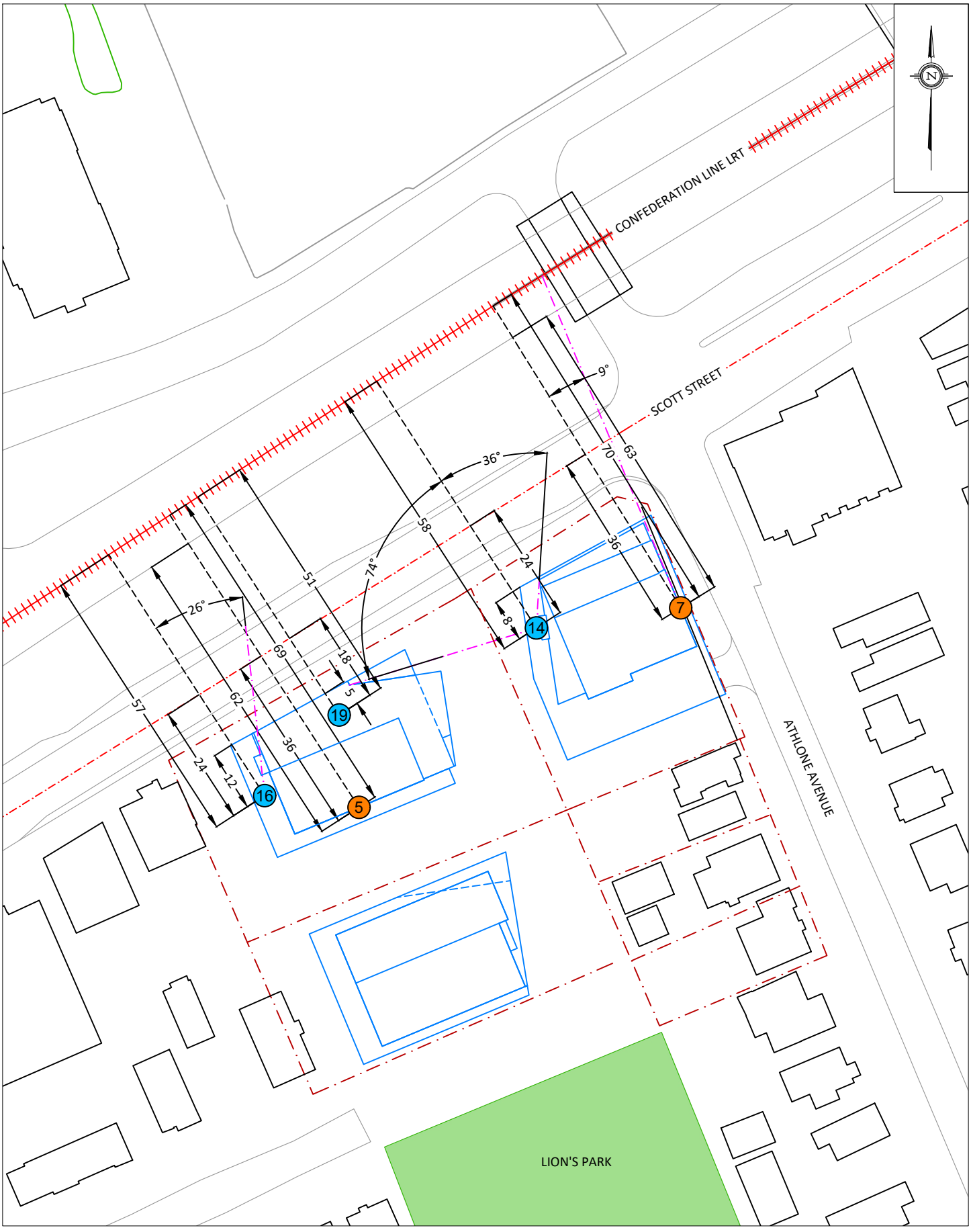
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-006-4
DATE	APRIL 4, 2022	DRAWN BY	E.K.

DESCRIPTION

FIGURE 4:
STAMSON INPUT DATA
FOR RECEPTORS 3, 4, 6, 13, & 21



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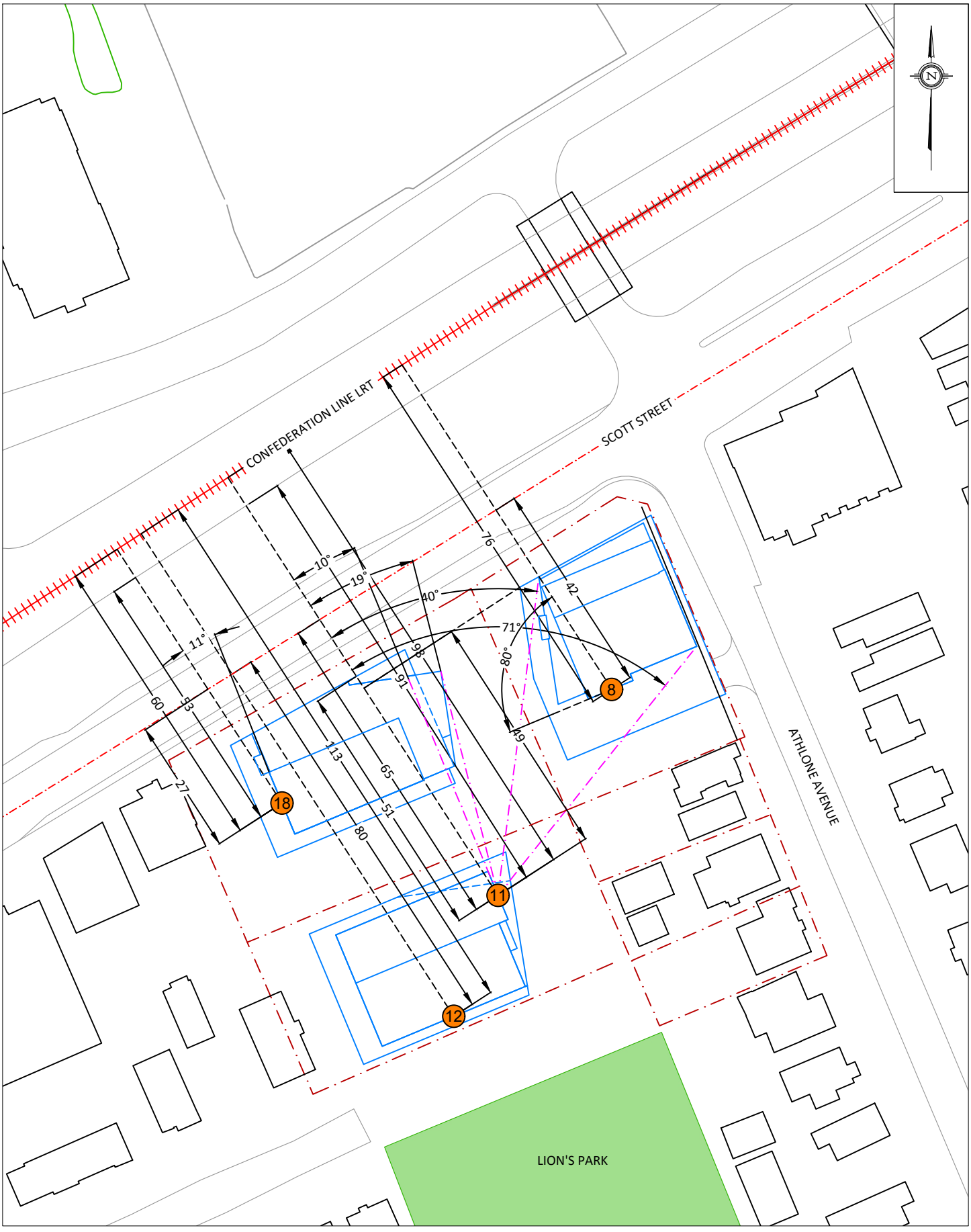
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-5
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 5:
STAMSON INPUT DATA
FOR RECEPTORS 5, 7, 14, 16, & 19



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PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-6
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 6:
STAMSON INPUT DATA
FOR RECEPTORS 8, 11, 12, & 18

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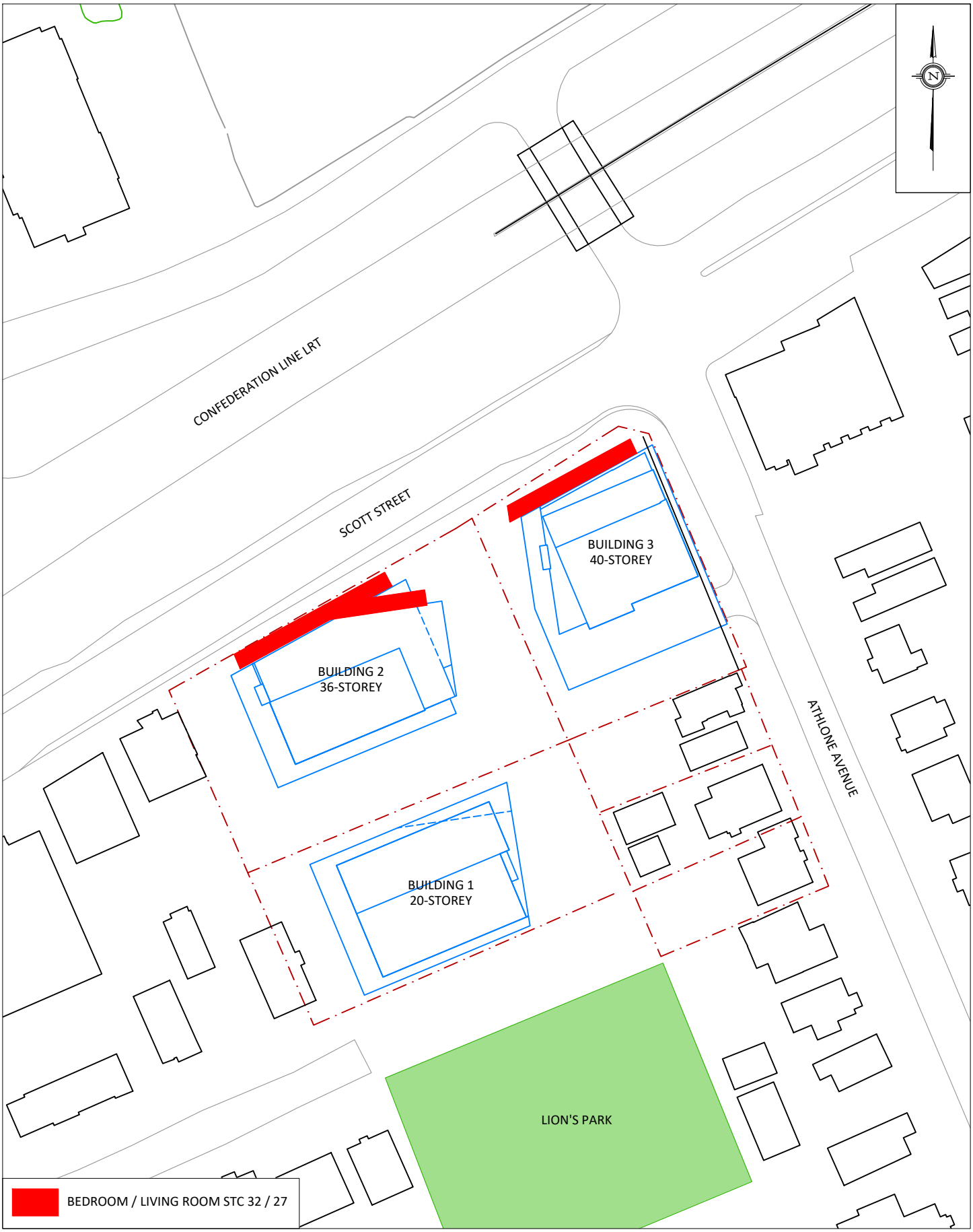
PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT		
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW22-006-7
DATE	APRIL 4, 2022	DRAWN BY	E.K.

DESCRIPTION

FIGURE 7:
STAMSON INPUT DATA
FOR RECEPTORS 9, 10, & 15



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PROJECT	2026 SCOTT STREET, OTTAWA TRANSPORTATION NOISE & VIBRATION ASSESSMENT
SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-8
DATE	APRIL 4, 2022
DRAWN BY	E.K.

DESCRIPTION

FIGURE 8:
STC REQUIREMENTS

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SCALE	1:1000 (APPROX.)
DRAWING NO.	GW22-006-9
DATE	APRIL 4, 2022
DRAWN BY	E.K.
DESCRIPTION	FIGURE 9: VENTILATION REQUIREMENTS & WARNING CLAUSES

APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 15:27:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r01.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 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           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.38 + 0.00) = 68.38 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  68.48   0.00   0.00  -0.10   0.00   0.00   0.00
68.38
-------------------------------------------------------------------------
--

Segment Leq : 68.38 dBA

Total Leq All Segments: 68.38 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.79 + 0.00) = 60.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  60.88   0.00   0.00  -0.10   0.00   0.00   0.00
60.79
-------------------------------------------------------------------------
--

Segment Leq : 60.79 dBA

Total Leq All Segments: 60.79 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -86.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  40.00 / 40.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       16.50 !       -1.76 !        -1.76

RT/Custom (0.00 + 49.43 + 0.00) = 49.43 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -86     90   0.00  63.44  -4.87  -0.10   0.00   0.00  -9.04  49.43
-------------------------------------------------------------------------

Segment Leq : 49.43 dBA

Total Leq All Segments: 49.43 dBA


Results segment # 1: Conf.Line (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 !       16.50 !       -1.76 !        -1.76

RT/Custom (0.00 + 42.90 + 0.00) = 42.90 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -86     90   0.00  56.91  -4.87  -0.10   0.00   0.00  -9.04  42.90
-------------------------------------------------------------------------

Segment Leq : 42.90 dBA

Total Leq All Segments: 42.90 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 68.43
                           (NIGHT): 60.86
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 15:23:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r02.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  16.00 / 16.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.10 + 0.00) = 68.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  68.48   0.00  -0.28  -0.10   0.00   0.00   0.00
68.10
-------------------------------------------------------------------------
--

Segment Leq : 68.10 dBA

Total Leq All Segments: 68.10 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.51 + 0.00) = 60.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  60.88   0.00  -0.28  -0.10   0.00   0.00   0.00
60.51
-------------------------------------------------------------------------
--

Segment Leq : 60.51 dBA

Total Leq All Segments: 60.51 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  50.00 / 50.00  m
Receiver height           :  16.50 / 16.50  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -86.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  43.00 / 43.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       16.50 !       -1.56 !        -1.56

RT/Custom (0.00 + 49.82 + 0.00) = 49.82 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -86     90   0.00  63.44  -5.23  -0.10   0.00   0.00  -8.29  49.82
-------------------------------------------------------------------

Segment Leq : 49.82 dBA

Total Leq All Segments: 49.82 dBA


Results segment # 1: Conf.Line (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 !       16.50 !       -1.56 !        -1.56

RT/Custom (0.00 + 43.29 + 0.00) = 43.29 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -86     90   0.00  56.91  -5.23  -0.10   0.00   0.00  -8.29  43.29
-------------------------------------------------------------------

Segment Leq : 43.29 dBA

Total Leq All Segments: 43.29 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 68.16
                           (NIGHT): 60.59
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 16:32:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r03.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 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           : 109.40 / 109.40 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.38 + 0.00) = 68.38 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  68.48   0.00   0.00  -0.10   0.00   0.00   0.00
68.38
-------------------------------------------------------------------------
--

Segment Leq : 68.38 dBA

Total Leq All Segments: 68.38 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 60.79 + 0.00) = 60.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -86     90   0.00  60.88   0.00   0.00  -0.10   0.00   0.00   0.00
60.79
-------------------------------------------------------------------------
--

Segment Leq : 60.79 dBA

Total Leq All Segments: 60.79 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -86.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           : 109.40 / 109.40 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -86.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  39.00 / 39.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !      109.40 !       10.69 !        10.69

RT/Custom (0.00 + 58.57 + 0.00) = 58.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -86     90   0.00  63.44  -4.77  -0.10   0.00   0.00  -0.04  58.53*
   -86     90   0.00  63.44  -4.77  -0.10   0.00   0.00   0.00  58.57
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 58.57 dBA

Total Leq All Segments: 58.57 dBA
```

```
Results segment # 1: Conf.Line (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 !      109.40 !       10.69 !        10.69

RT/Custom (0.00 + 52.04 + 0.00) = 52.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -86     90   0.00  56.91  -4.77  -0.10   0.00   0.00  -0.04  52.00*
   -86     90   0.00  56.91  -4.77  -0.10   0.00   0.00   0.00  52.04
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 52.04 dBA

Total Leq All Segments: 52.04 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 68.81
                           (NIGHT): 61.33
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 16:56:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r04.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott St1 (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: Scott St1 (day/night)
--------------------------------------------
Angle1   Angle2           :  25.00 deg   66.00 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           : 109.40 / 109.40 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Scott St2 (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 # 2: Scott St2 (day/night)
-------------------------------------------
Angle1   Angle2           :  66.00 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           : 109.40 / 109.40 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  66.00 deg   Angle2 : 90.00 deg
Barrier height            : 123.00 m
Barrier receiver distance :  16.00 / 16.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St1 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.19 + 0.00) = 59.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    25     66   0.00  68.48   0.00  -2.86  -6.42   0.00   0.00   0.00
59.19
-------------------------------------------------------------------------------
--

Segment Leq : 59.19 dBA


Results segment # 2: Scott St2 (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 !      109.40 !       49.87 !        49.87

ROAD (0.00 + 38.25 + 0.00) = 38.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    66     90   0.00  68.48   0.00  -2.86  -8.75   0.00   0.00 -18.61
38.25
-------------------------------------------------------------------------------
--

Segment Leq : 38.25 dBA

Total Leq All Segments: 59.22 dBA
```

```
Results segment # 1: Scott St1 (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.60 + 0.00) = 51.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    25     66   0.00  60.88   0.00  -2.86  -6.42   0.00   0.00   0.00
51.60
-------------------------------------------------------------------------------
--

Segment Leq : 51.60 dBA


Results segment # 2: Scott St2 (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 !      109.40 !       49.87 !        49.87

ROAD (0.00 + 30.66 + 0.00) = 30.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    66     90   0.00  60.88   0.00  -2.86  -8.75   0.00   0.00 -18.61
30.66
-------------------------------------------------------------------------------
--

Segment Leq : 30.66 dBA

Total Leq All Segments: 51.63 dBA
```

```
RT/Custom data, segment # 1: Conf.Line1 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line1 (day/night)
-------------------------------------------
Angle1   Angle2          :  25.00 deg   66.00 deg
Wood depth               :      0        (No woods.)
No of house rows         :      0 / 0
Surface                  :      2        (Reflective ground surface)
Receiver source distance :  63.00 / 63.00  m
Receiver height          : 109.40 / 109.40 m
Topography               :      4        (Elevated; with barrier)
Barrier angle1           :  25.00 deg   Angle2 : 66.00 deg
Barrier height           :   0.00 m
Elevation                :   0.00 m
Barrier receiver distance :  56.00 / 56.00  m
Source elevation         :  -5.00 m
Receiver elevation       :   0.00 m
Barrier elevation        :   0.00 m
Reference angle          :   0.00
```

```
RT/Custom data, segment # 2: Conf.Line2 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 2: Conf.Line2 (day/night)
-------------------------------------------
Angle1   Angle2          :  66.00 deg   90.00 deg
Wood depth               :      0       (No woods.)
No of house rows         :      0 / 0
Surface                  :      2       (Reflective ground surface)
Receiver source distance :  63.00 / 63.00  m
Receiver height          : 109.40 / 109.40 m
Topography               :      4       (Elevated; with barrier)
Barrier angle1           :  66.00 deg   Angle2 : 90.00 deg
Barrier height           : 123.00 m
Elevation                :   0.00 m
Barrier receiver distance :  16.00 / 16.00  m
Source elevation         :  -5.00 m
Receiver elevation       :   0.00 m
Barrier elevation        :   0.00 m
Reference angle          :   0.00
```

```
Results segment # 1: Conf.Line1 (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 !      109.40 !        8.16 !         8.16

RT/Custom (0.00 + 50.78 + 0.00) = 50.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    25     66   0.00  63.44  -6.23  -6.42   0.00   0.00   0.00  50.78*
    25     66   0.00  63.44  -6.23  -6.42   0.00   0.00   0.00  50.78
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 50.78 dBA


Results segment # 2: Conf.Line2 (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 !      109.40 !       80.47 !        80.47

RT/Custom (0.00 + 30.05 + 0.00) = 30.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    66     90   0.00  63.44  -6.23  -8.75   0.00   0.00 -18.41  30.05
-------------------------------------------------------------------------

Segment Leq : 30.05 dBA

Total Leq All Segments: 50.82 dBA
```

```
Results segment # 1: Conf.Line1 (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 !      109.40 !        8.16 !         8.16

RT/Custom (0.00 + 44.25 + 0.00) = 44.25 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    25     66   0.00  56.91  -6.23  -6.42   0.00   0.00   0.00  44.25*
    25     66   0.00  56.91  -6.23  -6.42   0.00   0.00   0.00  44.25
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 44.25 dBA
```

```
Results segment # 2: Conf.Line2 (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 !      109.40 !       80.47 !        80.47

RT/Custom (0.00 + 23.51 + 0.00) = 23.51 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    66     90   0.00  56.91  -6.23  -8.75   0.00   0.00 -18.41  23.51
-------------------------------------------------------------------------

Segment Leq : 23.51 dBA

Total Leq All Segments: 44.29 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 59.81
                           (NIGHT): 52.37
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 17:14:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r05.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -42.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           : 109.40 / 109.40 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.06 + 0.00) = 59.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -42   0.00  68.48   0.00  -3.68  -5.74   0.00   0.00   0.00
59.06
-------------------------------------------------------------------------
--

Segment Leq : 59.06 dBA

Total Leq All Segments: 59.06 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.46 + 0.00) = 51.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -42   0.00  60.88   0.00  -3.68  -5.74   0.00   0.00   0.00
51.46
-------------------------------------------------------------------------
--

Segment Leq : 51.46 dBA

Total Leq All Segments: 51.46 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -42.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 / 68.00  m
Receiver height           : 109.40 / 109.40 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -42.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  61.00 / 61.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !      109.40 !        7.23 !         7.23

RT/Custom (0.00 + 51.13 + 0.00) = 51.13 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -42   0.00  63.44  -6.56  -5.74   0.00   0.00  -0.17  50.96*
   -90    -42   0.00  63.44  -6.56  -5.74   0.00   0.00   0.00  51.13
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 51.13 dBA

Total Leq All Segments: 51.13 dBA
```

```
Results segment # 1: Conf.Line (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 !      109.40 !        7.23 !         7.23

RT/Custom (0.00 + 44.60 + 0.00) = 44.60 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -42   0.00  56.91  -6.56  -5.74   0.00   0.00  -0.17  44.43*
   -90    -42   0.00  56.91  -6.56  -5.74   0.00   0.00   0.00  44.60
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 44.60 dBA

Total Leq All Segments: 44.60 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 59.71
                           (NIGHT): 52.27
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 17:42:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r06.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -80.00 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           : 121.50 / 121.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 67.44 + 0.00) = 67.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80     90   0.00  68.48   0.00  -0.79  -0.25   0.00   0.00   0.00
67.44
-------------------------------------------------------------------------
--

Segment Leq : 67.44 dBA

Total Leq All Segments: 67.44 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.84 + 0.00) = 59.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80     90   0.00  60.88   0.00  -0.79  -0.25   0.00   0.00   0.00
59.84
-------------------------------------------------------------------------
--

Segment Leq : 59.84 dBA

Total Leq All Segments: 59.84 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -80.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  52.00 / 52.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -80.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  45.00 / 45.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !      121.50 !       12.46 !        12.46

RT/Custom (0.00 + 57.79 + 0.00) = 57.79 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -80     90   0.00  63.44  -5.40  -0.25   0.00   0.00  -0.03  57.76*
   -80     90   0.00  63.44  -5.40  -0.25   0.00   0.00   0.00  57.79
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 57.79 dBA

Total Leq All Segments: 57.79 dBA
```

```
Results segment # 1: Conf.Line (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 !      121.50 !       12.46 !        12.46

RT/Custom (0.00 + 51.26 + 0.00) = 51.26 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -80     90   0.00  56.91  -5.40  -0.25   0.00   0.00  -0.03  51.23*
   -80     90   0.00  56.91  -5.40  -0.25   0.00   0.00   0.00  51.26
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 51.26 dBA

Total Leq All Segments: 51.26 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 67.89
                           (NIGHT): 60.40
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 18:07:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r07.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  32.00 / 32.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.72 + 0.00) = 61.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     9     90   0.00  68.48   0.00  -3.29  -3.47   0.00   0.00   0.00
61.72
-------------------------------------------------------------------------
--

Segment Leq : 61.72 dBA

Total Leq All Segments: 61.72 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.12 + 0.00) = 54.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
     9     90   0.00  60.88   0.00  -3.29  -3.47   0.00   0.00   0.00
54.12
-------------------------------------------------------------------------
--

Segment Leq : 54.12 dBA

Total Leq All Segments: 54.12 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2          :   9.00 deg   90.00 deg
Wood depth               :      0       (No woods.)
No of house rows         :      0 / 0
Surface                  :      2       (Reflective ground surface)
Receiver source distance :  66.00 / 66.00  m
Receiver height          : 121.50 / 121.50 m
Topography               :      4       (Elevated; with barrier)
Barrier angle1           :   9.00 deg   Angle2 : 90.00 deg
Barrier height           :   0.00 m
Elevation                :   0.00 m
Barrier receiver distance :  59.00 / 59.00  m
Source elevation         :  -5.00 m
Receiver elevation       :   0.00 m
Barrier elevation        :   0.00 m
Reference angle          :   0.00
```

```
Results segment # 1: Conf.Line (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 !      121.50 !        8.86 !         8.86

RT/Custom (0.00 + 53.54 + 0.00) = 53.54 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     9     90   0.00  63.44  -6.43  -3.47   0.00   0.00  -0.08  53.46*
     9     90   0.00  63.44  -6.43  -3.47   0.00   0.00   0.00  53.54
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 53.54 dBA

Total Leq All Segments: 53.54 dBA
```

```
Results segment # 1: Conf.Line (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 !      121.50 !        8.86 !         8.86

RT/Custom (0.00 + 47.00 + 0.00) = 47.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     9     90   0.00  56.91  -6.43  -3.47   0.00   0.00  -0.08  46.92*
     9     90   0.00  56.91  -6.43  -3.47   0.00   0.00   0.00  47.00
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.00 dBA

Total Leq All Segments: 47.00 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 62.33
                           (NIGHT): 54.89
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 18:15:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r08.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott 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  :  40.00 / 40.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            : 123.00 m
Barrier receiver distance :   0.10 / 0.10   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (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 !      121.50 !      121.20 !       121.20

ROAD (0.00 + 47.44 + 0.00) = 47.44 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  -4.26   0.00   0.00   0.00 -16.78
47.44
-------------------------------------------------------------------------------
--

Segment Leq : 47.44 dBA

Total Leq All Segments: 47.44 dBA
```

```
Results segment # 1: Scott St (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 !      121.50 !      121.20 !       121.20

ROAD (0.00 + 39.85 + 0.00) = 39.85 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  -4.26   0.00   0.00   0.00 -16.78
39.85
-------------------------------------------------------------------------------
--

Segment Leq : 39.85 dBA

Total Leq All Segments: 39.85 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (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  :  74.00 / 74.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            : 123.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   0.10 / 0.10   m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !      121.50 !      121.33 !       121.33

RT/Custom (0.00 + 39.85 + 0.00) = 39.85 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  63.44  -6.93   0.00   0.00   0.00 -16.65  39.85
-------------------------------------------------------------------------

Segment Leq : 39.85 dBA

Total Leq All Segments: 39.85 dBA


Results segment # 1: Conf.Line (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 !      121.50 !      121.33 !       121.33

RT/Custom (0.00 + 33.32 + 0.00) = 33.32 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.91  -6.93   0.00   0.00   0.00 -16.65  33.32
-------------------------------------------------------------------------

Segment Leq : 33.32 dBA

Total Leq All Segments: 33.32 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 48.14
                           (NIGHT): 40.72
```

```
STAMSON 5.0        NORMAL REPORT        Date: 25-02-2022 18:36:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r09.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott St1 (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: Scott St1 (day/night)
--------------------------------------------
Angle1   Angle2           : -69.00 deg   25.00 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           : 121.50 / 121.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Scott St2 (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 # 2: Scott St2 (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -69.00 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           : 121.50 / 121.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -69.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St1 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 63.11 + 0.00) = 63.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -69     25   0.00  68.48   0.00  -2.55  -2.82   0.00   0.00   0.00
63.11
-------------------------------------------------------------------------
--

Segment Leq : 63.11 dBA


Results segment # 2: Scott St2 (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 !      121.50 !       59.28 !        59.28

ROAD (0.00 + 42.45 + 0.00) = 42.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90    -69   0.00  68.48   0.00  -2.55  -9.33   0.00   0.00 -14.15
42.45
-------------------------------------------------------------------------
--

Segment Leq : 42.45 dBA

Total Leq All Segments: 63.15 dBA
```

```
Results segment # 1: Scott St1 (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.51 + 0.00) = 55.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -69     25   0.00  60.88   0.00  -2.55  -2.82   0.00   0.00   0.00
55.51
-------------------------------------------------------------------------------
--

Segment Leq : 55.51 dBA


Results segment # 2: Scott St2 (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 !      121.50 !       59.28 !        59.28

ROAD (0.00 + 34.85 + 0.00) = 34.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -69   0.00  60.88   0.00  -2.55  -9.33   0.00   0.00 -14.15
34.85
-------------------------------------------------------------------------------
--

Segment Leq : 34.85 dBA

Total Leq All Segments: 55.55 dBA
```

```
RT/Custom data, segment # 1: Conf.Line1 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line1 (day/night)
-------------------------------------------
Angle1   Angle2           : -69.00 deg   25.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  61.00 / 61.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -69.00 deg   Angle2 : 25.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  54.00 / 54.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


RT/Custom data, segment # 2: Conf.Line2 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 2: Conf.Line2 (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -69.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  61.00 / 61.00  m
Receiver height           : 121.50 / 121.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -69.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line1 (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 !      121.50 !        9.96 !         9.96

RT/Custom (0.00 + 54.52 + 0.00) = 54.52 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -69     25   0.00  63.44  -6.09  -2.82   0.00   0.00   0.00  54.52*
   -69     25   0.00  63.44  -6.09  -2.82   0.00   0.00   0.00  54.52
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 54.52 dBA


Results segment # 2: Conf.Line2 (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 !      121.50 !       93.73 !        93.73

RT/Custom (0.00 + 36.44 + 0.00) = 36.44 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -69   0.00  63.44  -6.09  -9.33   0.00   0.00 -11.57  36.44
-------------------------------------------------------------------------

Segment Leq : 36.44 dBA

Total Leq All Segments: 54.59 dBA
```

```
Results segment # 1: Conf.Line1 (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 !      121.50 !        9.96 !         9.96

RT/Custom (0.00 + 47.99 + 0.00) = 47.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -69     25   0.00  56.91  -6.09  -2.82   0.00   0.00   0.00  47.99*
   -69     25   0.00  56.91  -6.09  -2.82   0.00   0.00   0.00  47.99
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.99 dBA


Results segment # 2: Conf.Line2 (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 !      121.50 !       93.73 !        93.73

RT/Custom (0.00 + 29.91 + 0.00) = 29.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -69   0.00  56.91  -6.09  -9.33   0.00   0.00 -11.57  29.91
-------------------------------------------------------------------------

Segment Leq : 29.91 dBA

Total Leq All Segments: 48.06 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 63.71
                           (NIGHT): 56.26
```

```
STAMSON 5.0         NORMAL REPORT         Date: 28-02-2022 14:37:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Scott St1 (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: Scott St1 (day/night)
--------------------------------------------
Angle1   Angle2           : -80.00 deg   -27.00 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           :  66.15 / 66.15  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: Scott St2 (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 # 2: Scott St2 (day/night)
--------------------------------------------
Angle1   Angle2           : -27.00 deg   50.00 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           :  66.15 / 66.15  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -27.00 deg   Angle2 : 50.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  44.00 / 44.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Scott St3 (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 # 3: Scott St3 (day/night)
-------------------------------------------
Angle1   Angle2           :  50.00 deg   54.00 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           :  66.15 / 66.15  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 4: Scott St4 (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 # 4: Scott St4 (day/night)
--------------------------------------------
Angle1   Angle2           :  54.00 deg   81.00 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           :  66.15 / 66.15  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  54.00 deg   Angle2 : 81.00 deg
Barrier height            : 123.00 m
Barrier receiver distance :  40.00 / 40.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 5: Scott St5 (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 # 5: Scott St5 (day/night)
-------------------------------------------
Angle1   Angle2           :  81.00 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           :  66.15 / 66.15  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St1 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 57.45 + 0.00) = 57.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80    -27   0.00  68.48   0.00  -5.72  -5.31   0.00   0.00   0.00
57.45
-------------------------------------------------------------------------
--

Segment Leq : 57.45 dBA


Results segment # 2: Scott St2 (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 !       66.15 !       15.35 !        15.35

ROAD (0.00 + 39.07 + 0.00) = 39.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -27     50   0.00  68.48   0.00  -5.72  -3.69   0.00   0.00 -20.00
39.07
-------------------------------------------------------------------------
--

Segment Leq : 39.07 dBA
```

```
Results segment # 3: Scott St3 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 46.23 + 0.00) = 46.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    50     54   0.00  68.48   0.00  -5.72 -16.53   0.00   0.00   0.00
46.23
-------------------------------------------------------------------------
--

Segment Leq : 46.23 dBA


Results segment # 4: Scott St4 (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 !       66.15 !       19.97 !        19.97

ROAD (0.00 + 34.52 + 0.00) = 34.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    54     81   0.00  68.48   0.00  -5.72  -8.24   0.00   0.00 -20.00
34.52
-------------------------------------------------------------------------
--

Segment Leq : 34.52 dBA
```

```
Results segment # 5: Scott St5 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.75 + 0.00) = 49.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
    81     90   0.00  68.48   0.00  -5.72 -13.01   0.00   0.00   0.00
49.75
-------------------------------------------------------------------------
--

Segment Leq : 49.75 dBA

Total Leq All Segments: 58.47 dBA


Results segment # 1: Scott St1 (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 49.85 + 0.00) = 49.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -80    -27   0.00  60.88   0.00  -5.72  -5.31   0.00   0.00   0.00
49.85
-------------------------------------------------------------------------
--

Segment Leq : 49.85 dBA
```

```
Results segment # 2: Scott St2 (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 !       66.15 !       15.35 !        15.35

ROAD (0.00 + 31.47 + 0.00) = 31.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -27     50   0.00  60.88   0.00  -5.72  -3.69   0.00   0.00 -20.00
31.47
-------------------------------------------------------------------------------
--

Segment Leq : 31.47 dBA


Results segment # 3: Scott St3 (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 38.63 + 0.00) = 38.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    50     54   0.00  60.88   0.00  -5.72 -16.53   0.00   0.00   0.00
38.63
-------------------------------------------------------------------------------
--

Segment Leq : 38.63 dBA
```

```
Results segment # 4: Scott St4 (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 !       66.15 !       19.97 !        19.97

ROAD (0.00 + 26.92 + 0.00) = 26.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    54     81    0.00  60.88   0.00  -5.72  -8.24   0.00   0.00 -20.00
26.92
-------------------------------------------------------------------------------
--

Segment Leq : 26.92 dBA


Results segment # 5: Scott St5 (night)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 42.15 + 0.00) = 42.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    81     90    0.00  60.88   0.00  -5.72 -13.01   0.00   0.00   0.00
42.15
-------------------------------------------------------------------------------
--

Segment Leq : 42.15 dBA

Total Leq All Segments: 50.87 dBA
```

```
RT/Custom data, segment # 1: Conf.Line1 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line1 (day/night)
-------------------------------------------
Angle1   Angle2           : -80.00 deg   -27.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.00 / 89.00  m
Receiver height           :  66.16 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -80.00 deg   Angle2 : -27.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  82.00 / 82.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


RT/Custom data, segment # 2: Conf.Line2 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 2: Conf.Line2 (day/night)
-------------------------------------------
Angle1   Angle2           : -27.00 deg   50.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.00 / 89.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -27.00 deg   Angle2 : 50.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  44.00 / 44.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
RT/Custom data, segment # 3: Conf.Line3 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 3: Conf.Line3 (day/night)
-------------------------------------------
Angle1   Angle2           :  50.00 deg   54.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.00 / 89.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  50.00 deg   Angle2 : 54.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  82.00 / 82.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


RT/Custom data, segment # 4: Conf.Line4 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 4: Conf.Line4 (day/night)
-------------------------------------------
Angle1   Angle2           :  54.00 deg   81.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.00 / 89.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  54.00 deg   Angle2 : 81.00 deg
Barrier height            : 123.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  40.00 / 40.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
RT/Custom data, segment # 5: Conf.Line5 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 5: Conf.Line5 (day/night)
--------------------------------------------
Angle1   Angle2           :  81.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  89.00 / 89.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  81.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  82.00 / 82.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Results segment # 1: Conf.Line1 (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 !       66.16 !        1.06 !         1.06

RT/Custom (0.00 + 50.39 + 0.00) = 50.39 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
   -80    -27   0.00  63.44  -7.73  -5.31   0.00   0.00  -3.40  47.00*
   -80    -27   0.00  63.44  -7.73  -5.31   0.00   0.00   0.00  50.39
-----------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 50.39 dBA
```

```
Results segment # 2: Conf.Line2 (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 !       66.15 !       31.22 !        31.22

RT/Custom (0.00 + 32.02 + 0.00) = 32.02 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -27     50   0.00  63.44  -7.73  -3.69   0.00   0.00 -20.00  32.02
-------------------------------------------------------------------------

Segment Leq : 32.02 dBA


Results segment # 3: Conf.Line3 (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 !       66.15 !        1.06 !         1.06

RT/Custom (0.00 + 39.17 + 0.00) = 39.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    50     54   0.00  63.44  -7.73 -16.53   0.00   0.00  -3.35  35.82*
    50     54   0.00  63.44  -7.73 -16.53   0.00   0.00   0.00  39.17
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 39.17 dBA
```

```
Results segment # 4: Conf.Line4 (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 !       66.15 !       34.40 !        34.40

RT/Custom (0.00 + 27.47 + 0.00) = 27.47 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    54     81   0.00  63.44  -7.73  -8.24   0.00   0.00 -20.00  27.47
-------------------------------------------------------------------

Segment Leq : 27.47 dBA


Results segment # 5: Conf.Line5 (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 !       66.15 !        1.06 !         1.06

RT/Custom (0.00 + 42.69 + 0.00) = 42.69 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    81     90   0.00  63.44  -7.73 -13.01   0.00   0.00  -4.81  37.88*
    81     90   0.00  63.44  -7.73 -13.01   0.00   0.00   0.00  42.69
-------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 42.69 dBA

Total Leq All Segments: 51.41 dBA
```

```
Results segment # 1: Conf.Line1 (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 !       66.15 !        1.06 !         1.06

RT/Custom (0.00 + 43.86 + 0.00) = 43.86 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -80    -27   0.00  56.91  -7.73  -5.31   0.00   0.00  -3.40  40.46*
   -80    -27   0.00  56.91  -7.73  -5.31   0.00   0.00   0.00  43.86
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 43.86 dBA


Results segment # 2: Conf.Line2 (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 !       66.15 !       31.22 !        31.22

RT/Custom (0.00 + 25.48 + 0.00) = 25.48 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -27     50   0.00  56.91  -7.73  -3.69   0.00   0.00 -20.00  25.48
-------------------------------------------------------------------------

Segment Leq : 25.48 dBA
```

```
Results segment # 3: Conf.Line3 (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 !       66.15 !        1.06 !         1.06

RT/Custom (0.00 + 32.64 + 0.00) = 32.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    50     54   0.00  56.91  -7.73 -16.53   0.00   0.00  -3.35  29.29*
    50     54   0.00  56.91  -7.73 -16.53   0.00   0.00   0.00  32.64
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 32.64 dBA


Results segment # 4: Conf.Line4 (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 !       66.15 !       34.40 !        34.40

RT/Custom (0.00 + 20.93 + 0.00) = 20.93 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    54     81   0.00  56.91  -7.73  -8.24   0.00   0.00 -20.00  20.93
-------------------------------------------------------------------------

Segment Leq : 20.93 dBA
```

```
Results segment # 5: Conf.Line5 (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 !       66.15 !        1.06 !         1.06

RT/Custom (0.00 + 36.16 + 0.00) = 36.16 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    81     90   0.00  56.91  -7.73 -13.01   0.00   0.00  -4.81  31.35*
    81     90   0.00  56.91  -7.73 -13.01   0.00   0.00   0.00  36.16
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 36.16 dBA

Total Leq All Segments: 44.88 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 59.25
                           (NIGHT): 51.85
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 15:41:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Scott St1 (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: Scott St1 (day/night)
--------------------------------------------
Angle1   Angle2           :  10.00 deg   18.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  63.00 / 63.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  10.00 deg   Angle2 : 18.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Scott St2 (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 # 2: Scott St2 (day/night)
--------------------------------------------
Angle1   Angle2           :  18.00 deg   40.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  63.00 / 63.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Scott St3 (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 # 3: Scott St3 (day/night)
--------------------------------------------
Angle1   Angle2           :  40.00 deg   71.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  63.00 / 63.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  40.00 deg   Angle2 : 71.00 deg
Barrier height            : 123.00 m
Barrier receiver distance :  47.00 / 47.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Scott St4 (day/night)
----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   690/60    veh/TimePeriod  *
Heavy truck volume  :   966/84    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     :   5.00
    Heavy Truck  % of Total Volume     :   7.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Scott St4 (day/night)
--------------------------------------------
Angle1   Angle2           :  71.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  63.00 / 63.00  m
Receiver height           :  66.15 / 66.15  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St1 (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 !       66.15 !       15.86 !        15.86

ROAD (0.00 + 28.73 + 0.00) = 28.73 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    10     18    0.00  68.48   0.00  -6.23 -13.52   0.00   0.00 -20.00
28.73
-------------------------------------------------------------------------------
--

Segment Leq : 28.73 dBA


Results segment # 2: Scott St2 (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 53.12 + 0.00) = 53.12 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    18     40    0.00  68.48   0.00  -6.23  -9.13   0.00   0.00   0.00
53.12
-------------------------------------------------------------------------------
--

Segment Leq : 53.12 dBA
```

```
Results segment # 3: Scott St3 (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 !       66.15 !       17.92 !        17.92

ROAD (0.00 + 34.61 + 0.00) = 34.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    40     71    0.00  68.48   0.00  -6.23  -7.64   0.00   0.00 -20.00
34.61
-------------------------------------------------------------------------------
--

Segment Leq : 34.61 dBA


Results segment # 4: Scott St4 (day)
-----------------------------------

Source height = 1.63 m

ROAD (0.00 + 53.24 + 0.00) = 53.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    71     90    0.00  69.24   0.00  -6.23  -9.77   0.00   0.00   0.00
53.24
-------------------------------------------------------------------------------
--

Segment Leq : 53.24 dBA

Total Leq All Segments: 56.23 dBA
```

```
Results segment # 1: Scott St1 (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 !       66.15 !       15.86 !        15.86

ROAD (0.00 + 21.13 + 0.00) = 21.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    10     18    0.00  60.88   0.00  -6.23 -13.52   0.00   0.00 -20.00
21.13
-------------------------------------------------------------------------------
--

Segment Leq : 21.13 dBA


Results segment # 2: Scott St2 (night)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 45.52 + 0.00) = 45.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    18     40    0.00  60.88   0.00  -6.23  -9.13   0.00   0.00   0.00
45.52
-------------------------------------------------------------------------------
--

Segment Leq : 45.52 dBA
```

```
Results segment # 3: Scott St3 (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 !       66.15 !       17.92 !        17.92

ROAD (0.00 + 27.01 + 0.00) = 27.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    40     71    0.00  60.88   0.00  -6.23  -7.64   0.00   0.00 -20.00
27.01
-------------------------------------------------------------------------------
--

Segment Leq : 27.01 dBA


Results segment # 4: Scott St4 (night)
-------------------------------------

Source height = 1.63 m

ROAD (0.00 + 45.64 + 0.00) = 45.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    71     90    0.00  61.64   0.00  -6.23  -9.77   0.00   0.00   0.00
45.64
-------------------------------------------------------------------------------
--

Segment Leq : 45.64 dBA

Total Leq All Segments: 48.63 dBA
```

```
RT/Custom data, segment # 1: Conf.Line1 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line1 (day/night)
-------------------------------------------
Angle1   Angle2           :  10.00 deg   18.00 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           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  10.00 deg   Angle2 : 18.00 deg
Barrier height            : 111.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  49.00 / 49.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


RT/Custom data, segment # 2: Conf.Line2 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 2: Conf.Line2 (day/night)
-------------------------------------------
Angle1   Angle2           :  18.00 deg   40.00 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           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  18.00 deg   Angle2 : 40.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  90.00 / 90.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
RT/Custom data, segment # 3: Conf.Line3 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 3: Conf.Line3 (day/night)
-------------------------------------------
Angle1   Angle2           :  40.00 deg   71.00 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           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  40.00 deg   Angle2 : 71.00 deg
Barrier height            : 123.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  47.00 / 47.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


RT/Custom data, segment # 4: Conf.Line4 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 4: Conf.Line4 (day/night)
-------------------------------------------
Angle1   Angle2           :  71.00 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           :  66.15 / 66.15  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            :  71.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  90.00 / 90.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line1 (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 !       66.15 !       30.46 !        30.46

RT/Custom (0.00 + 21.81 + 0.00) = 21.81 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    10     18   0.00  63.44  -8.11 -13.52   0.00   0.00 -20.00  21.81
-----------------------------------------------------------------------

Segment Leq : 21.81 dBA


Results segment # 2: Conf.Line2 (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 !       66.15 !        0.60 !         0.60

RT/Custom (0.00 + 46.20 + 0.00) = 46.20 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    18     40   0.00  63.44  -8.11  -9.13   0.00   0.00  -4.26  41.94*
    18     40   0.00  63.44  -8.11  -9.13   0.00   0.00   0.00  46.20
-----------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 46.20 dBA
```

```
Results segment # 3: Conf.Line3 (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 !       66.15 !       31.92 !        31.92

RT/Custom (0.00 + 27.69 + 0.00) = 27.69 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    40     71   0.00  63.44  -8.11  -7.64   0.00   0.00 -20.00  27.69
-----------------------------------------------------------------------

Segment Leq : 27.69 dBA


Results segment # 4: Conf.Line4 (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 !       66.15 !        0.60 !         0.60

RT/Custom (0.00 + 45.57 + 0.00) = 45.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    71     90   0.00  63.44  -8.11  -9.77   0.00   0.00  -4.87  40.70*
    71     90   0.00  63.44  -8.11  -9.77   0.00   0.00   0.00  45.57
-----------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.57 dBA

Total Leq All Segments: 48.95 dBA
```

```
Results segment # 1: Conf.Line1 (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 !       66.15 !       30.46 !        30.46

RT/Custom (0.00 + 15.28 + 0.00) = 15.28 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    10     18   0.00  56.91  -8.11 -13.52   0.00   0.00 -20.00  15.28
-----------------------------------------------------------------------

Segment Leq : 15.28 dBA


Results segment # 2: Conf.Line2 (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 !       66.15 !        0.60 !         0.60

RT/Custom (0.00 + 39.67 + 0.00) = 39.67 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
    18     40   0.00  56.91  -8.11  -9.13   0.00   0.00  -4.26  35.41*
    18     40   0.00  56.91  -8.11  -9.13   0.00   0.00   0.00  39.67
-----------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 39.67 dBA
```

```
Results segment # 3: Conf.Line3 (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 !       66.15 !       31.92 !        31.92

RT/Custom (0.00 + 21.16 + 0.00) = 21.16 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    40     71   0.00  56.91  -8.11  -7.64   0.00   0.00 -20.00  21.16
-------------------------------------------------------------------------

Segment Leq : 21.16 dBA


Results segment # 4: Conf.Line4 (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 !       66.15 !        0.60 !         0.60

RT/Custom (0.00 + 39.03 + 0.00) = 39.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    71     90   0.00  56.91  -8.11  -9.77   0.00   0.00  -4.87  34.17*
    71     90   0.00  56.91  -8.11  -9.77   0.00   0.00   0.00  39.03
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 39.03 dBA

Total Leq All Segments: 42.41 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 56.97
                           (NIGHT): 49.56
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 15:48:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Scott 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: Scott 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  :  79.00 / 79.00  m
Receiver height           :  61.60 / 61.60  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  69.00 m
Barrier receiver distance :   0.10 / 0.10   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (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 !       61.60 !       61.52 !        61.52

ROAD (0.00 + 42.28 + 0.00) = 42.28 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  -7.22   0.00   0.00   0.00 -18.98
42.28
-------------------------------------------------------------------------------
--

Segment Leq : 42.28 dBA

Total Leq All Segments: 42.28 dBA
```

```
Results segment # 1: Scott St (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 !       61.60 !       61.52 !        61.52

ROAD (0.00 + 34.68 + 0.00) = 34.68 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  -7.22   0.00   0.00   0.00 -18.98
34.68
-------------------------------------------------------------------------------
--

Segment Leq : 34.68 dBA

Total Leq All Segments: 34.68 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (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  : 112.00 / 112.00 m
Receiver height           :  61.60 / 61.60  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  69.00 m
Elevation                 :   0.00 m
Barrier receiver distance :   0.10 / 0.10   m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       61.60 !       61.54 !        61.54

RT/Custom (0.00 + 35.78 + 0.00) = 35.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  63.44  -8.73   0.00   0.00   0.00 -18.92  35.78
-------------------------------------------------------------------------

Segment Leq : 35.78 dBA

Total Leq All Segments: 35.78 dBA


Results segment # 1: Conf.Line (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 !       61.60 !       61.54 !        61.54

RT/Custom (0.00 + 29.25 + 0.00) = 29.25 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.91  -8.73   0.00   0.00   0.00 -18.92  29.25
-------------------------------------------------------------------------

Segment Leq : 29.25 dBA

Total Leq All Segments: 29.25 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 43.16
                           (NIGHT): 35.77
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 15:58:33
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   11.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :  61.60 / 61.60  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.60 + 0.00) = 59.60 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     11   0.00  68.48   0.00  -6.37  -2.51   0.00   0.00   0.00
59.60
-------------------------------------------------------------------------
--

Segment Leq : 59.60 dBA

Total Leq All Segments: 59.60 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 52.01 + 0.00) = 52.01 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     11   0.00  60.88   0.00  -6.37  -2.51   0.00   0.00   0.00
52.01
-------------------------------------------------------------------------
--

Segment Leq : 52.01 dBA

Total Leq All Segments: 52.01 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   11.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  98.00 / 98.00  m
Receiver height           :  61.60 / 61.60  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 11.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  91.00 / 91.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       61.60 !        0.22 !         0.22

RT/Custom (0.00 + 52.78 + 0.00) = 52.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     11   0.00  63.44  -8.15  -2.51   0.00   0.00  -4.92  47.86*
   -90     11   0.00  63.44  -8.15  -2.51   0.00   0.00   0.00  52.78
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 52.78 dBA

Total Leq All Segments: 52.78 dBA
```

```
Results segment # 1: Conf.Line (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 !       61.60 !        0.22 !         0.22

RT/Custom (0.00 + 46.24 + 0.00) = 46.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     11   0.00  56.91  -8.15  -2.51   0.00   0.00  -4.92  41.32*
   -90     11   0.00  56.91  -8.15  -2.51   0.00   0.00   0.00  46.24
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 46.24 dBA

Total Leq All Segments: 46.24 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 60.42
                           (NIGHT): 53.03
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 16:30:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
------------------------------------------
Angle1   Angle2           : -73.00 deg   35.00 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           :  19.60 / 19.60  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -73.00 deg   Angle2 : 35.00 deg
Barrier height            :  18.10 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.60 !       13.30 !        13.30

ROAD (0.00 + 47.13 + 0.00) = 47.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -73     35   0.00  68.48   0.00  -1.86  -2.22   0.00   0.00 -17.28
47.13
-------------------------------------------------------------------------------
--

Segment Leq : 47.13 dBA

Total Leq All Segments: 47.13 dBA
```

```
Results segment # 1: Scott St (night)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.60 !       13.30 !        13.30

ROAD (0.00 + 39.53 + 0.00) = 39.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -73     35   0.00  60.88   0.00  -1.86  -2.22   0.00   0.00 -17.28
39.53
-------------------------------------------------------------------------------
--

Segment Leq : 39.53 dBA

Total Leq All Segments: 39.53 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -73.00 deg   35.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  57.00 / 57.00  m
Receiver height           :  19.60 / 19.60  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -73.00 deg   Angle2 : 35.00 deg
Barrier height            :  18.10 m
Elevation                 :   0.00 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       19.60 !       16.22 !        16.22

RT/Custom (0.00 + 45.09 + 0.00) = 45.09 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -73     35   0.00  63.44  -5.80  -2.22   0.00   0.00 -10.33  45.09
-------------------------------------------------------------------

Segment Leq : 45.09 dBA

Total Leq All Segments: 45.09 dBA


Results segment # 1: Conf.Line (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 !       19.60 !       16.22 !        16.22

RT/Custom (0.00 + 38.56 + 0.00) = 38.56 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -73     35   0.00  56.91  -5.80  -2.22   0.00   0.00 -10.33  38.56
-------------------------------------------------------------------

Segment Leq : 38.56 dBA

Total Leq All Segments: 38.56 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 49.24
                           (NIGHT): 42.08
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 18:04:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott St1 (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: Scott St1 (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   -60.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -60.00 deg
Barrier height            : 111.00 m
Barrier receiver distance :  26.00 / 26.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Scott St2 (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 # 2: Scott St2 (day/night)
--------------------------------------------
Angle1   Angle2           : -60.00 deg   81.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 81.00 deg
Barrier height            : 123.00 m
Barrier receiver distance :  30.00 / 30.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Scott St3 (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 # 3: Scott St3 (day/night)
--------------------------------------------
Angle1   Angle2           :  81.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  81.00 deg   Angle2 : 90.00 deg
Barrier height            :   9.00 m
Barrier receiver distance :  16.00 / 16.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St1 (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 !       10.50 !        5.30 !         5.30

ROAD (0.00 + 36.16 + 0.00) = 36.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -60   0.00  68.48   0.00  -4.77  -7.78   0.00   0.00 -19.76
36.16
-------------------------------------------------------------------------------
--

Segment Leq : 36.16 dBA


Results segment # 2: Scott St2 (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 !       10.50 !        4.50 !         4.50

ROAD (0.00 + 42.65 + 0.00) = 42.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -60     81   0.00  68.48   0.00  -4.77  -1.06   0.00   0.00 -20.00
42.65
-------------------------------------------------------------------------------
--

Segment Leq : 42.65 dBA
```

```
Results segment # 3: Scott St3 (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 !       10.50 !        7.30 !         7.30

ROAD (0.00 + 45.18 + 0.00) = 45.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    81     90   0.00  68.48   0.00  -4.77 -13.01   0.00   0.00  -5.51
45.18
-------------------------------------------------------------------------------
--

Segment Leq : 45.18 dBA

Total Leq All Segments: 47.44 dBA


Results segment # 1: Scott St1 (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 !       10.50 !        5.30 !         5.30

ROAD (0.00 + 28.57 + 0.00) = 28.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90    -60   0.00  60.88   0.00  -4.77  -7.78   0.00   0.00 -19.76
28.57
-------------------------------------------------------------------------------
--

Segment Leq : 28.57 dBA
```

```
Results segment # 2: Scott St2 (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 !       10.50 !        4.50 !         4.50

ROAD (0.00 + 35.05 + 0.00) = 35.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -60     81   0.00  60.88   0.00  -4.77  -1.06   0.00   0.00 -20.00
35.05
-------------------------------------------------------------------------------
--

Segment Leq : 35.05 dBA


Results segment # 3: Scott St3 (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 !       10.50 !        7.30 !         7.30

ROAD (0.00 + 37.59 + 0.00) = 37.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
    81     90   0.00  60.88   0.00  -4.77 -13.01   0.00   0.00  -5.51
37.59
-------------------------------------------------------------------------------
--

Segment Leq : 37.59 dBA

Total Leq All Segments: 39.85 dBA
```

```
RT/Custom data, segment # 1: Conf.Line1 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line1 (day/night)
-------------------------------------------
Angle1   Angle2          : -90.00 deg   -60.00 deg
Wood depth               :      0        (No woods.)
No of house rows         :      0 / 0
Surface                  :      2        (Reflective ground surface)
Receiver source distance :  79.00 / 79.00  m
Receiver height          :  10.50 / 10.50  m
Topography               :      4        (Elevated; with barrier)
Barrier angle1           : -90.00 deg   Angle2 : -60.00 deg
Barrier height           : 111.00 m
Elevation                :   0.00 m
Barrier receiver distance :  26.00 / 26.00  m
Source elevation         :  -5.00 m
Receiver elevation       :   0.00 m
Barrier elevation        :   0.00 m
Reference angle          :   0.00
```

```
RT/Custom data, segment # 2: Conf.Line2 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 2: Conf.Line2 (day/night)
-------------------------------------------
Angle1   Angle2           : -60.00 deg   81.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  79.00 / 79.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -60.00 deg   Angle2 : 81.00 deg
Barrier height            : 123.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  30.00 / 30.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
RT/Custom data, segment # 3: Conf.Line3 (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 3: Conf.Line3 (day/night)
-------------------------------------------
Angle1   Angle2          :  81.00 deg   90.00 deg
Wood depth               :      0        (No woods.)
No of house rows         :      0 / 0
Surface                  :      2        (Reflective ground surface)
Receiver source distance :  79.00 / 79.00  m
Receiver height          :  10.50 / 10.50  m
Topography               :      4        (Elevated; with barrier)
Barrier angle1           :  81.00 deg   Angle2 : 90.00 deg
Barrier height           :   9.00 m
Elevation                :   0.00 m
Barrier receiver distance :  16.00 / 16.00  m
Source elevation         :  -5.00 m
Receiver elevation       :   0.00 m
Barrier elevation        :   0.00 m
Reference angle          :   0.00
```

```
Results segment # 1: Conf.Line1 (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 !       10.50 !        5.56 !         5.56

RT/Custom (0.00 + 28.71 + 0.00) = 28.71 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
   -90    -60   0.00  63.44  -7.22  -7.78   0.00   0.00 -19.74  28.71
-----------------------------------------------------------------------

Segment Leq : 28.71 dBA


Results segment # 2: Conf.Line2 (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 !       10.50 !        4.80 !         4.80

RT/Custom (0.00 + 35.16 + 0.00) = 35.16 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----------------------------------------------------------------------
   -60     81   0.00  63.44  -7.22  -1.06   0.00   0.00 -20.00  35.16
-----------------------------------------------------------------------

Segment Leq : 35.16 dBA
```

```
Results segment # 3: Conf.Line3 (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 !       10.50 !        7.46 !         7.46

RT/Custom (0.00 + 37.86 + 0.00) = 37.86 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    81     90   0.00  63.44  -7.22 -13.01   0.00   0.00  -5.35  37.86
-------------------------------------------------------------------------

Segment Leq : 37.86 dBA

Total Leq All Segments: 40.06 dBA


Results segment # 1: Conf.Line1 (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 !       10.50 !        5.56 !         5.56

RT/Custom (0.00 + 22.17 + 0.00) = 22.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -60   0.00  56.91  -7.22  -7.78   0.00   0.00 -19.74  22.17
-------------------------------------------------------------------------

Segment Leq : 22.17 dBA
```

```
Results segment # 2: Conf.Line2 (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 !       10.50 !        4.80 !         4.80

RT/Custom (0.00 + 28.63 + 0.00) = 28.63 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -60     81   0.00  56.91  -7.22  -1.06   0.00   0.00 -20.00  28.63
-------------------------------------------------------------------------

Segment Leq : 28.63 dBA


Results segment # 3: Conf.Line3 (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 !       10.50 !        7.46 !         7.46

RT/Custom (0.00 + 31.33 + 0.00) = 31.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    81     90   0.00  56.91  -7.22 -13.01   0.00   0.00  -5.35  31.33
-------------------------------------------------------------------------

Segment Leq : 31.33 dBA

Total Leq All Segments: 33.53 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 48.17
                           (NIGHT): 40.76
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 18:20:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r16.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   26.00 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           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 26.00 deg
Barrier height            :  18.00 m
Barrier receiver distance :  11.00 / 11.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.50 !       10.89 !        10.89

ROAD (0.00 + 47.90 + 0.00) = 47.90 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     26   0.00  68.48   0.00  -1.86  -1.91   0.00   0.00 -16.81
47.90
-------------------------------------------------------------------------------
--

Segment Leq : 47.90 dBA

Total Leq All Segments: 47.90 dBA
```

```
Results segment # 1: Scott St (night)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.50 !       10.89 !        10.89

ROAD (0.00 + 40.31 + 0.00) = 40.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     26   0.00  60.88   0.00  -1.86  -1.91   0.00   0.00 -16.81
40.31
-------------------------------------------------------------------------------
--

Segment Leq : 40.31 dBA

Total Leq All Segments: 40.31 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   26.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           :  19.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 26.00 deg
Barrier height            :  18.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  11.00 / 11.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       19.50 !       14.70 !        14.70

RT/Custom (0.00 + 43.90 + 0.00) = 43.90 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     26   0.00  63.44  -5.64  -1.91   0.00   0.00 -11.99  43.90
-------------------------------------------------------------------------

Segment Leq : 43.90 dBA

Total Leq All Segments: 43.90 dBA
```

```
Results segment # 1: Conf.Line (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 !        1.50 !        0.30 !         0.30

RT/Custom (0.00 + 30.06 + 0.00) = 30.06 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     26   0.00  56.91  -5.64  -1.91   0.00   0.00 -19.30  30.06
-------------------------------------------------------------------------

Segment Leq : 30.06 dBA

Total Leq All Segments: 30.06 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 49.36
                           (NIGHT): 40.70
```

```
STAMSON 5.0        NORMAL REPORT        Date: 28-02-2022 18:23:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r17.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   27.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  64.00 / 64.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 27.00 deg
Barrier height            :  18.00 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.50 !       15.56 !        15.56

ROAD (0.00 + 50.45 + 0.00) = 50.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     27   0.00  68.48   0.00  -6.30  -1.87   0.00   0.00  -9.86
50.45
-------------------------------------------------------------------------------
--

Segment Leq : 50.45 dBA

Total Leq All Segments: 50.45 dBA
```

```
Results segment # 1: Scott St (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       19.50 !       15.56 !        15.56

ROAD (0.00 + 42.85 + 0.00) = 42.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
--
   -90     27   0.00  60.88   0.00  -6.30  -1.87   0.00   0.00  -9.86
42.85
-------------------------------------------------------------------------------
--

Segment Leq : 42.85 dBA

Total Leq All Segments: 42.85 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   27.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  96.00 / 96.00  m
Receiver height           :  19.50 / 1.50   m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 27.00 deg
Barrier height            :  18.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  14.00 / 14.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !       19.50 !       16.00 !        16.00

RT/Custom (0.00 + 44.85 + 0.00) = 44.85 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     27   0.00  63.44  -8.06  -1.87   0.00   0.00  -8.66  44.85
-------------------------------------------------------------------------

Segment Leq : 44.85 dBA

Total Leq All Segments: 44.85 dBA


Results segment # 1: Conf.Line (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 !        1.50 !        0.62 !         0.62

RT/Custom (0.00 + 27.88 + 0.00) = 27.88 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     27   0.00  56.91  -8.06  -1.87   0.00   0.00 -19.10  27.88
-------------------------------------------------------------------------

Segment Leq : 27.88 dBA

Total Leq All Segments: 27.88 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 51.51
                           (NIGHT): 42.99
```

```
STAMSON 5.0        NORMAL REPORT        Date: 01-03-2022 12:15:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r18.te               Time Period: Day/Night 16/8 hours
Description:


Road data, segment # 1: Scott 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: Scott St (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   10.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           : 109.40 / 109.40 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Scott St (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.26 + 0.00) = 64.26 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     10   0.00  68.48   0.00  -1.66  -2.55   0.00   0.00   0.00
64.26
-------------------------------------------------------------------------
--

Segment Leq : 64.26 dBA

Total Leq All Segments: 64.26 dBA


Results segment # 1: Scott St (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.67 + 0.00) = 56.67 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
--
   -90     10   0.00  60.88   0.00  -1.66  -2.55   0.00   0.00   0.00
56.67
-------------------------------------------------------------------------
--

Segment Leq : 56.67 dBA

Total Leq All Segments: 56.67 dBA
```

```
RT/Custom data, segment # 1: Conf.Line (day/night)
-------------------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    70 km/h

Data for Segment # 1: Conf.Line (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   10.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           : 109.40 / 109.40 m
Topography                :      4       (Elevated; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 10.00 deg
Barrier height            :   0.00 m
Elevation                 :   0.00 m
Barrier receiver distance :  48.00 / 48.00  m
Source elevation          :  -5.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Conf.Line (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 !      109.40 !       10.00 !        10.00

RT/Custom (0.00 + 55.24 + 0.00) = 55.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     10   0.00  63.44  -5.64  -2.55   0.00   0.00  -0.06  55.19*
   -90     10   0.00  63.44  -5.64  -2.55   0.00   0.00   0.00  55.24
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 55.24 dBA

Total Leq All Segments: 55.24 dBA
```

```
Results segment # 1: Conf.Line (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 !      109.40 !       10.00 !        10.00

RT/Custom (0.00 + 48.71 + 0.00) = 48.71 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     10   0.00  56.91  -5.64  -2.55   0.00   0.00  -0.06  48.65*
   -90     10   0.00  56.91  -5.64  -2.55   0.00   0.00   0.00  48.71
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 48.71 dBA

Total Leq All Segments: 48.71 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 64.77
                           (NIGHT): 57.31
```

APPENDIX B

FTA VIBRATION CALCULATIONS

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

Train Speed 70 km/h 43 mph

	Distance from	
	(m)	(ft)
LRT	43.0	141.1

Vibration

From FTA Manual Fig 10-1

Vibration Levels at distance from track	65	dBV re 1 micro in/sec

Adjustment Factors FTA Table 10-1

Speed reference 50 mph	-1	Operating Speed 43 mph
Vehicle Parameters	0	Assume Soft primary suspension, Wheels run true
Track Condition	0	Good condition
Track Treatments	0	none
Type of Transit Structure	0	Open cut
Efficient vibration Propagation	2	Propagation through rock
Vibration Levels at Fdn	66	0.049
Coupling to Building Foundation	0	Fondation in rock
Floor to Floor Attenuation	0	More than 10 floors above grade
Amplification of Floor and Walls	4	
Total Vibration Level	69.79	dBV or 0.078 mm/s
Noise Level in dBA	34.79	dBA

Table 10-1. Adjustment Factors for Generalized Predictions of Ground-Borne Vibration and Noise

Factors Affecting Vibration Source

Source Factor	Adjustment to Propagation Curve			Comment
Speed		Reference Speed		Vibration level is approximately proportional to 20*log(speed/speed$_{ref}$). Sometimes the variation with speed has been observed to be as low as 10 to 15 log(speed/speed$_{ref}$).
	Vehicle Speed	50 mph	30 mph	
	60 mph	+1.6 dB	+6.0 dB	
	50 mph	0.0 dB	+4.4 dB	
	40 mph	-1.9 dB	+2.5 dB	
	30 mph	-4.4 dB	0.0 dB	
	20 mph	-8.0 dB	-3.5 dB	
Vehicle Parameters (not additive, apply greatest value only)				
Vehicle with stiff primary suspension	+8 dB			Transit vehicles with stiff primary suspensions have been shown to create high vibration levels. Include this adjustment when the primary suspension has a vertical resonance frequency greater than 15 Hz.
Resilient Wheels	0 dB			Resilient wheels do not generally affect ground-borne vibration except at frequencies greater than about 80 Hz.
Worn Wheels or Wheels with Flats	+10 dB			Wheel flats or wheels that are unevenly worn can cause high vibration levels. This can be prevented with wheel truing and slip-slide detectors to prevent the wheels from sliding on the track.
Track Conditions (not additive, apply greatest value only)				
Worn or Corrugated Track	+10 dB			If both the wheels and the track are worn, only one adjustment should be used. Corrugated track is a common problem. Mill scale on new rail can cause higher vibration levels until the rail has been in use for some time.
Special Trackwork	+10 dB			Wheel impacts at special trackwork will significantly increase vibration levels. The increase will be less at greater distances from the track.
Jointed Track or Uneven Road Surfaces	+5 dB			Jointed track can cause higher vibration levels than welded track. Rough roads or expansion joints are sources of increased vibration for rubber-tire transit.
Track Treatments (not additive, apply greatest value only)				
Floating Slab Trackbed	-15 dB			The reduction achieved with a floating slab trackbed is strongly dependent on the frequency characteristics of the vibration.
Ballast Mats	-10 dB			Actual reduction is strongly dependent on frequency of vibration.
High-Resilience Fasteners	-5 dB			Slab track with track fasteners that are very compliant in the vertical direction can reduce vibration at frequencies greater than 40 Hz.

Table 10-1. Adjustment Factors for Generalized Predictions of Ground-Borne Vibration and Noise (Continued)

Factors Affecting Vibration Path

Path Factor	Adjustment to Propagation Curve	Comment
Resiliently Supported Ties	-10 dB	Resiliently supported tie systems have been found to provide very effective control of low-frequency vibration.
Track Configuration (not additive, apply greatest value only)		
Type of Transit Structure	Relative to at-grade tie & ballast: Elevated structure -10 dB Open cut 0 dB	The general rule is the heavier the structure, the lower the vibration levels. Putting the track in cut may reduce the vibration levels slightly. Rock-based subways generate higher-frequency vibration.
	Relative to bored subway tunnel in soil: Station -5 dB Cut and cover -3 dB Rock-based - 15 dB	
Ground-borne Propagation Effects		
Geologic conditions that promote efficient vibration propagation	Efficient propagation in soil +10 dB	Refer to the text for guidance on identifying areas where efficient propagation is possible.
	Propagation in rock layer: Dist. / Adjust. 50 ft +2 dB 100 ft +4 dB 150 ft +6 dB 200 ft +9 dB	The positive adjustment accounts for the lower attenuation of vibration in rock compared to soil. It is generally more difficult to excite vibrations in rock than in soil at the source.
Coupling to building foundation	Wood Frame Houses -5 dB 1-2 Story Masonry -7 dB 3-4 Story Masonry -10 dB Large Masonry on Piles -10 dB Large Masonry on Spread Footings -13 dB Foundation in Rock 0 dB	The general rule is the heavier the building construction, the greater the coupling loss.

Factors Affecting Vibration Receiver

Receiver Factor	Adjustment to Propagation Curve	Comment
Floor-to-floor attenuation	1 to 5 floors above grade: -2 dB/floor 5 to 10 floors above grade: -1 dB/floor	This factor accounts for dispersion and attenuation of the vibration energy as it propagates through a building.
Amplification due to resonances of floors, walls, and ceilings	+6 dB	The actual amplification will vary greatly depending on the type of construction. The amplification is lower near the wall/floor and wall/ceiling intersections.
Conversion to Ground-borne Noise		
Noise Level in dBA	Peak frequency of ground vibration: Low frequency (<30 Hz): -50 dB Typical (peak 30 to 60 Hz): -35 dB High frequency (>60 Hz): -20 dB	Use these adjustments to estimate the A-weighted sound level given the average vibration velocity level of the room surfaces. See text for guidelines for selecting low, typical or high frequency characteristics. Use the high-frequency adjustment for subway tunnels in rock or if the dominant frequencies of the vibration spectrum are known to be 60 Hz or greater.