March 3, 2026

Habitat for Humanity
Attn: Erin O'Connor
3 Iber Road
Stittsville, ON K2S 1E6

Dear Mr. O'Connor:

Re: Transportation Noise and Vibration Assessment
40 Beechcliffe Street, Ottawa, ON
GWE File No.: 25-077 – Transportation Noise R2

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Habitat for Humanity to undertake a transportation noise and vibration assessment for the proposed residential development at 40 Beechcliffe Street in Ottawa, Ontario. This report summarizes the methodology, results and recommendations related to a transportation noise and vibration assessment. Gradient Wind's scope of work involved assessing exterior noise and vibration levels generated by local roadway, railway, and future light rail transit (LRT) traffic to ensure appropriate noise control measures and mitigation are provided for the development. The transportation noise assessment was performed on the basis of theoretical noise calculation methods conforming to the City of Ottawa[1] and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Our study was based on site grade drawings prepared by David Schaeffer Engineering Ltd. dated February 2026, railway data provided by CN Rail, and future traffic volumes corresponding to the City of Ottawa's Official Plan (OP). The LRT traffic volumes were based on the City of Ottawa's Environmental Assessment Report for the Barrhaven LRT project.

[1] City of Ottawa – Environmental Noise Control Guidelines, January 2016
[2] Ministry of the Environment and Climate Change (MOECC) – Environmental Noise Guideline, Publication NPC-300, August 2013

2. TERMS OF REFERENCE

The focus of this transportation noise and vibration assessment is a proposed residential townhouse development comprising eight two-storey townhouse blocks with three to five units per block. Each unit contains a rear backyard and a 2 m high berm spanning the townhouse blocks to the east, ending just before Unit 4 on Block 1. An additional berm is located to the north rising to a maximum height of 2.5 m. The site is bound by Woodroffe Avenue to the east, Knoxdale Road to the south, the Canadian National Rail (CN) railway to the north, and Beechcliffe Street to the west. The major source of traffic noise affecting the development is Woodroffe Avenue to the east, Knoxdale Road to the south, the CN railway to the north, and the upcoming Barrhaven LRT to the east. As per City of Ottawa's Official Plan, the CN railway and the upcoming Barrhaven light rail line are situated within 75 m from the nearest property line. As a result, a ground vibration impact assessment from the railway and light rail system on the proposed development was conducted following the procedures outlined in the Federal Transit Authorities (FTA) protocol. As noted in the City of Ottawa Transportation Master Plan (2025)[3] Part 2, the Barrhaven LRT is planned for completion in 2046 based on current funding assumptions. Figure 1 and Figure 2 illustrate a complete site plan with surrounding context. The latest approved site plan is provided in Appendix C.

3. OBJECTIVES

The main goals of this work are to: (i) calculate the future noise levels on the study buildings produced by local roadway, railway, and future LRT traffic, (ii) ensure that exterior noise levels do not exceed the ENCG objective limit, as specified in Section 4.2.1 of this report, and (iii) predict vibration levels on the study site produced from the CN railway and future LRT system.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to

[3] City of Ottawa Transportation Master Plan Update, March 2025

reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Transportation Noise

4.2.1 Criteria for Transportation Noise

For 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, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00) / 8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings.

Predicted noise levels at the plane of window (POW) and outdoor living area (OLA) dictate the action required to achieve the recommended indoor and OLA sound levels, as specified in the ENCG. When noise levels at these areas meet or exceed the ENCG objective limit of 55 dBA, specific outdoor, ventilation and Warning Clause requirements may apply. In addition, where noise levels exceed 65 dBA, upgraded building components must be designed to ensure indoor sound level limits can be met.

4.2.2 Roadway, LRT, and Railway Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[4] which provides additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. Table 1 (below) summarizes the AADT values used for the roadway, LRT lines, and railway included in this assessment.

Rail traffic was obtained from CN Rail and projected 10 years into the future with a 2.5% growth rate. CN also provided the maximum speed limit and train configuration for the Beachburg Subdivision. See Appendix C for rail traffic data.

A proposed future LRT system is anticipated to be built adjacent to the site on an overhead guideway. Information about the LRT system is based on the Environmental Assessment Report. The anticipated traffic volume is assumed based on the current Confederation LRT in Ottawa.

TABLE 1A: ROADWAY AND LRT TRAFFIC DATA

Roadway	Roadway Class	Speed Limit (km/h)	Official Plan AADT
Woodroffe Avenue	4-Lane Urban Arterial-Divided (4-UAD)	60	**35,000**
Knoxdale Road	4-Lane Major Collector (4-UMCU)	40	**24,000**
Barrhaven LRT	Light Rail Transit	40*	**540/60***

* - Daytime/nighttime volumes. Operational speed considered as trains move in and out of the Knoxdale Station.

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

TABLE 1B: RAIL TRAFFIC DATA

Segment	Train Type	Locomotive / cars	Speed Limit (km/h)	Current Trains per period Day / Night	Projected Trains per period Day / Night
CN / Arnprior-Nepean Railway	Freight	4 / 6	40	1 / 0	**2 / 0***

***Train count during the daytime was rounded up to account for potential future growth

4.2.3 Theoretical Roadway and LRT Traffic Noise Predictions

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

Roadway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise, and by using existing building locations as noise barriers. In addition to the traffic volumes summarized in Table 1, theoretical noise predictions were based on the following parameters:

- Truck traffic on all roadways was taken to comprise 5% heavy trucks and 7% medium trucks, as per ENCG requirements for noise level predictions
- The day/night split was taken to be 92% / 8% respectively for all streets
- Absorptive intermediate ground surfaces are used
- Receptor heights were placed at a height of 1.5 m (above grade) and 4.5 m (above grade) to represent the backyard outdoor living area, and second floor plane of window, respectively.
- Knoxdale Road was only considered as a source of traffic noise for receptors 5 and 6 that are near the roadway. The remaining receptors are located greater than 240 m away from Knoxdale road
- The study site topography was modelled using the grading plan prepared by David Schaeffer Engineering Ltd. in June 2025. The Berm located to the north of the proposed development, near the CN railway tracks, was modelled using the grading plan provided by David Schaeffer Engineering Ltd. in December 2025.
- The Barrhaven LRT transit corridor was treated as a 4-car SRT using the RT Custom feature in STAMSON. The 4-car SRT was chosen as it is similar to the current 4-car train configuration used on the Confederation Line.

- An LRT speed of 40 km/h was used. This is conservative as the Knoxdale station is located directly east of the development where the trains would be operating at lower speeds coming in and out of the station.
- The Barrhaven LRT is proposed to be on an elevated guideway and will have a 2 m high noise screen along this section of track on the westside of the guideway.
- Seven noise receptors were strategically placed throughout the development (Figure 3)

4.2.4 Theoretical Railway Traffic Noise Predictions

When an area is influenced by road and rail traffic, the criteria requires the outdoor noise impact from each source to be examined for comparison to respective criterion. Calculations were performed for receptors in close proximity to the railway with the assistance of the MECP rail and road noise analysis program STAMSON 5.04, which incorporates the calculation model '*Sound from Trains Environment Analysis Method*' (STEAM). The impact from railway noise is then combined with roadway predictions using a logarithmic addition at each point of reception and compared to the relevant criteria.

Similar to the roadway traffic noise calculations, the railway line was treated as a single line source of noise, and existing and proposed building locations were used as noise barriers. In addition to the railway volumes summarized in Table 1, theoretical noise predictions were also based on the following parameters:

- For the CN rail, the freight train consists of 4 locomotives and 6 cars with a speed of 40 km/h.
- Whistle events were not considered because there are no level crossings in the area.
- Rail lines are welded.

The noise generated from both on-road and railway traffic were combined for the 7 receptor locations identified in Figure 3.

4.3 Ground Vibration and Ground-borne Noise

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, 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. Also, similar to sound waves in air, ground vibrations 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 or subway. Repetitive motion of the 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 unique noise signature.

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 units of ground vibration measures are millimeters per second (mm/s), or inch 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.

4.3.1 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*[5], which indicate that vibration 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 buildings.

4.3.2 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*[6] 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.

For the CN railway, the vibration impact on the nearest buildings were determined using a set of curves for Locomotive Powered Freight at a speed of 50 mph. Adjustment factors were considered based on the following information:

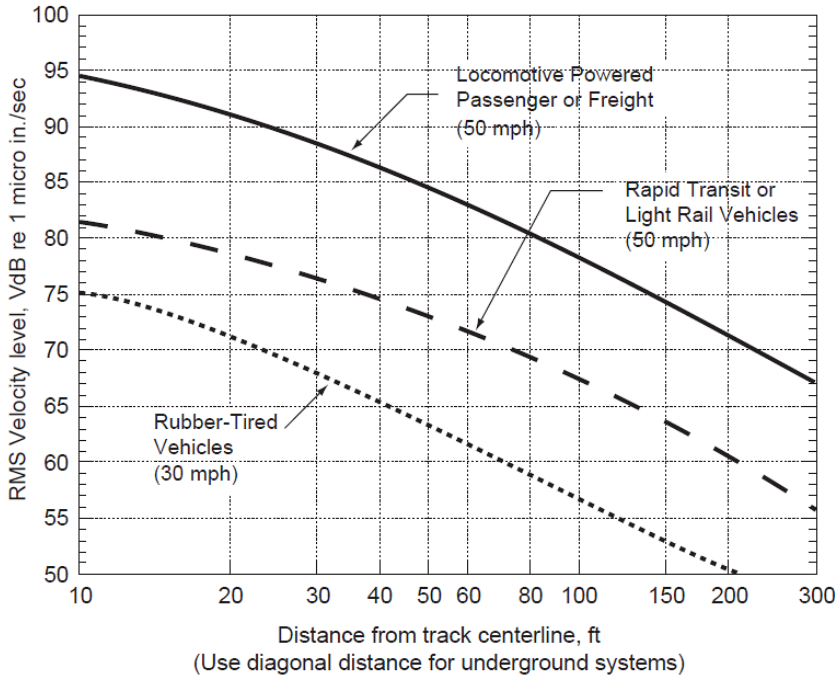
- The maximum speed of the train is 25 mph (40 km/h).
- The offset distance between the development property line and the closest track is 42 m.
- The vehicles are assumed to have soft primary suspensions.
- Tracks are welded and in good condition.
- Soil conditions do not efficiently propagate vibrations.
- Type of transit structure is open cut.

[5] Dialog and J.E. Coulter Associates Limited, prepared for The Federation of Canadian Municipalities and The Railway Association of Canada, May 2013
[6] John A. Volpe National Transportation Systems Center, Transit Noise and Vibration Impact Assessment, Federal Transit Administration, September 2018

- The building's foundation supports wood frame houses.

For the upcoming Barrhaven LRT, the vibration impact on the buildings were determined using a set of curves for Rapid Transit at a speed of 50 mph. Adjustment factors were considered based on the following information:

- The operating speed of the LRT is conservatively modelled at 25 mph (40 km/h) as the trains enter and leave the Knoxdale station.
- The offset distance between the development property line and the closest track is 8 m.
- The vehicles are assumed to have soft primary suspensions.
- Tracks are not welded, though in otherwise good condition.
- Soil conditions do not efficiently propagate vibrations.
- Type of transit structure is elevated.
- The building's foundation supports wood frame houses.



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

5. RESULTS AND CONCLUSIONS

The results of the roadway traffic noise calculations are summarized in Table 2 below. A complete set of input and output data from all STAMSON 5.04 calculations are available in Appendix A and Figures A1 to A7.

TABLE 2: EXTERIOR NOISE LEVELS DUE TO TRANSPORTATION SOURCES

Receptor Number	Receptor Location	Roadway Noise Level (dBA)		Railway Noise Level (dBA)		LRT Noise Level (dBA)		Total Noise Level (dBA)	
		Day	Night	Day	Night	Day	Night	Day	Night
1 / POW	East Façade located north of development	61	54	46	0	40	34	62	54
2 / POW	North Façade located north of development	58	50	48	0	37	30	58	51
3 / OLA	Backyard located north of development	56	N/A	47	N/A	39	N/A	57	N/A
4 / POW	East Façade located nearest to LRT	61	54	40	0	39	33	61	54
5 / OLA	Backyard located nearest to LRT	60	N/A	39	N/A	39	N/A	60	N/A
6 / POW	East Façade located south of development	62	55	34	0	39	32	62	55
7 / OLA	Backyard located south of development	62	N/A	32	N/A	38	N/A	62	N/A

N/A: Nighttime noise levels at OLAs are not considered as per ENCG

The results of the current study indicate that noise levels will range between 57 and 62 dBA during the daytime period (07:00-23:00) and between 51 and 55 dBA during the nighttime period (23:00-07:00). The highest noise levels occur along the east façade of the units which is most exposed to Woodroffe Avenue and the future Barrhaven LRT. Noise levels exceed the ENCG objective limit of 55 dBA and 50 dBA during the daytime and nighttime respectively. As such, the development will require forced air heating systems with provisions for central air conditioning, as a minimum requirement. If air conditioning is installed it will allow occupants to keep windows closed and maintain a comfortable living environment. It should be noted that air conditioning is being provided as a standard for all townhomes. Additionally, A Type D

warning clause will be required to be placed on all Lease, Purchase and Sale Agreements, as summarized below:

TYPE D:

> *"This dwelling 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 City of Ottawa and the Ministry of the Environment."*

Daytime noise levels from roadway and railway sources fall below 65 dBA and 60 dBA, respectively. Furthermore, nighttime noise levels fall below 60 dBA and 55 dBA for roadway and railway sources. As such, standard building components that conform to the Ontario Building Code (OBC 2024) will be sufficient to attenuate indoor noise levels below ENCG criteria.

Noise levels at the outdoor living area are expected to exceed 60 dBA during the daytime. Therefore, taller noise screens may be needed in the backyard area to reduce the noise level to 55 dBA. The berm ends before reaching the backyard of Unit 4 in Block 1, which are represented by receptor 6, resulting in an expected daytime noise level of 62 dBA. A barrier investigation determined that a solid noise wall with a height of 1.85 m surrounding the Unit 4, Block 1 backyard and integrated with the berm is required to reduce the sound level to 58 dBA. Figure 4 outlines the exact location of the noise barrier. A Type B warning clause will be required on all Lease, Purchase, and Sale Agreements, as noted below:

TYPE B:

> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road, rail and LRT traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment."*

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

"The Owner hereby acknowledges and agrees:

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

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

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

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

The Transferee covenants with the Transferor and the Lessee covenants with the Lessor that the above clauses verbatim shall be included in all subsequent lease

agreements, agreements of purchase and sale and deeds conveying the lands described herein, which covenants shall run with the lands and are for the benefit of the owner of the adjacent road.'"

As the proposed development is located within 300 metres of a CN railway, a CN Warning Clause is required to be included in all Lease, Purchase and Sale Agreements as summarized below.

CN Warning Clause:

*"**Warning**: Canadian National Railway Company or its assigns or successors in interest has or have a rights-of-way within 300 meters from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way."*

For the CN railway carrying Freight trains, estimated vibration levels at the nearest foundation are expected to be 0.08 mm/s RMS (70 dBA), based on the FTA protocol and a conservative offset distance of 42 m to the nearest track centerline. Estimated vibration levels at the foundation nearest to the upcoming Barrhaven LRT are expected to be 0.06mm/s RMS (67 dBV), based on the FTA protocol and an offset distance of 8 m to the nearest track centerline. Details of the calculations are provided in Appendix B. Since predicted vibration levels do not exceed the criterion of 0.14 mm/s RMS at the foundation, concerns due to vibration impacts on the site are not expected. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

Table 3 outlines the required mitigation measures and warning clauses for each unit of the development.

TABLE 3: MITIGATION AND WARNING CLAUSE REQUIREMENTS

Block	Unit	Ventilation Requirement	Noise Barrier Requirement	Warning Clause Requirement
Block 1	Unit 1-3	Air Conditioning	**None**	**Type B, Type D, LRT, CN**
Block 1	Unit 4	Air Conditioning	**1.85 metres tall as shown in Figure 4**	**Type B, Type D, LRT, CN**
Block 2-8	All	Air Conditioning	**None**	**Type B, Type D, LRT, CN**

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.

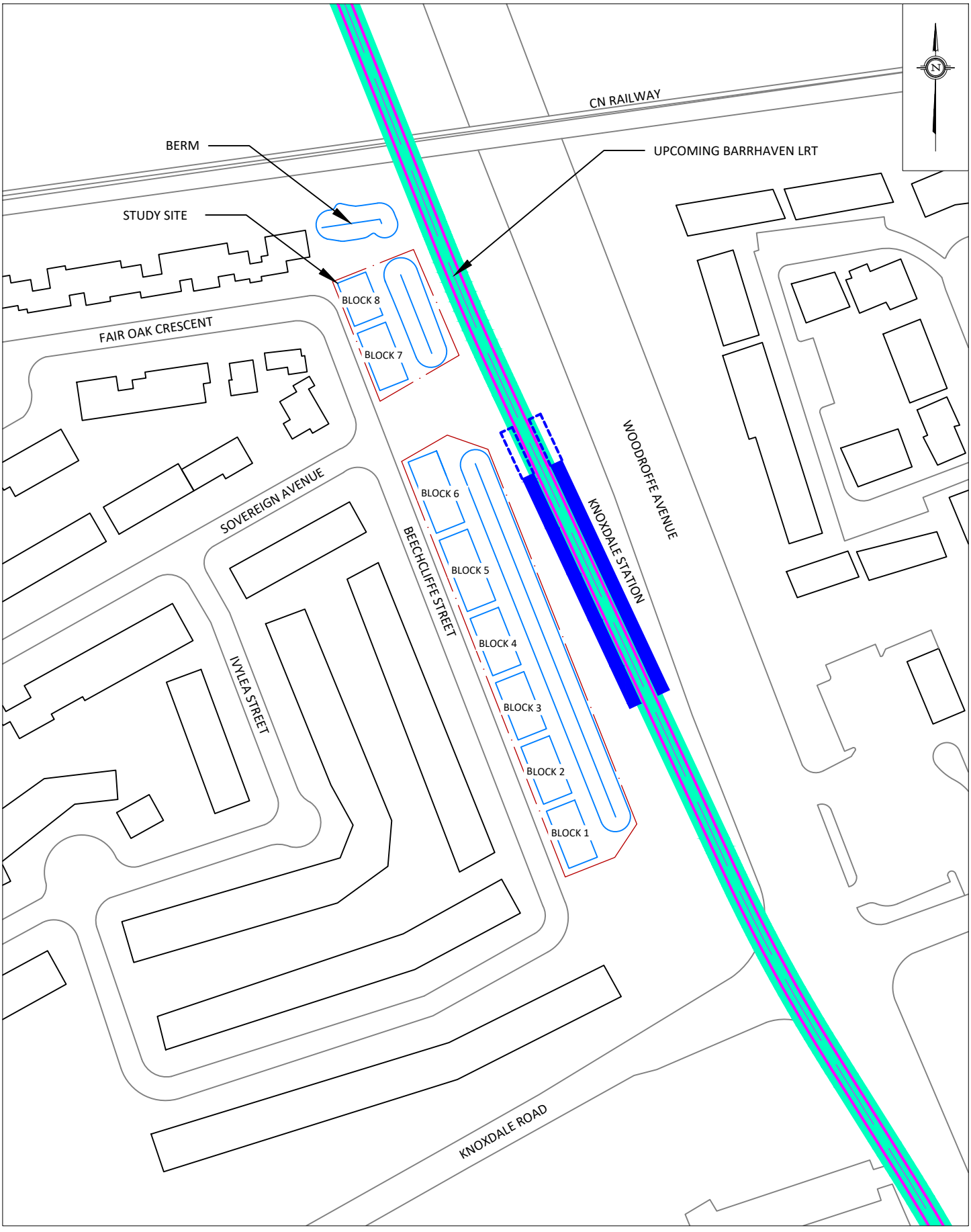
Sincerely,

Gradient Wind Engineering Inc.

Doryan Saavedra, B.Eng.
Junior Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #25-077 – Transportation Noise

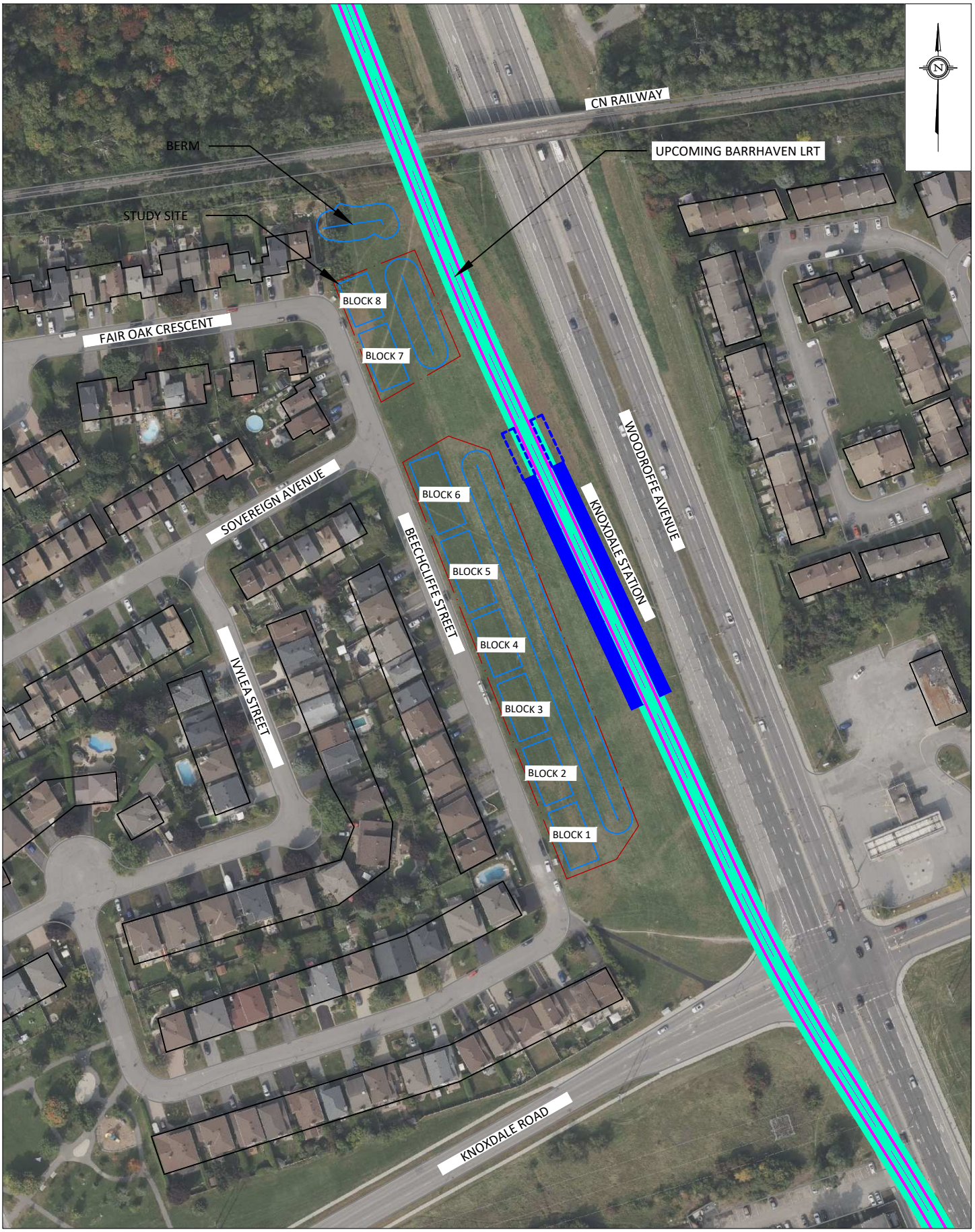


GRADIENTWIND
ENGINEERS & SCIENTISTS
127 WALGREEN ROAD, OTTAWA, ON
613 836 0934 • GRADIENTWIND.COM

PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000
DRAWING NO.	25-077-1
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE 1:
PROPERTY LINE AND SURROUNDING CONTEXT



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PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:2000
DRAWING NO.	25-077-2
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE 2:
PROPERTY LINE AND SURROUNDING CONTEXT WITH SATELLITE IMAGERY

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PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000	DRAWING NO. 25-077-3	FIGURE 3: RECEPTOR LOCATIONS
DATE	FEBRUARY 27, 2026	DRAWN BY T.K.	

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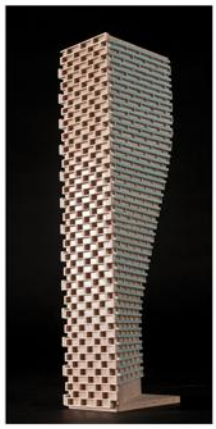
PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	25-077-4
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE 4:
ADDITIONAL NOISE BARRIER REQUIREMENTS



APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:12:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description: POW Receptor 1

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  51.06 / 51.06  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -14.00 deg   Angle2 : 20.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  23.00 / 23.00  m
Source elevation          :  90.00 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.60 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.12 !        93.72
       0.50 !        4.50 !        3.54 !        92.14

LOCOMOTIVE (0.00 + 41.62 + 43.24) = 45.52 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     20   0.34  56.84  -7.16  -7.26   0.00   0.00   0.00  42.43*
   -14     20   0.50  56.84  -7.95  -7.27   0.00   0.00   0.00  41.62
-------------------------------------------------------------------------
    20     90   0.50  56.84  -7.95  -5.65   0.00   0.00   0.00  43.24
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 27.23 + 28.60) = 30.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     20   0.45  43.02  -7.71  -7.27   0.00   0.00  -2.25  25.79*
   -14     20   0.60  43.02  -8.51  -7.28   0.00   0.00   0.00  27.23
-------------------------------------------------------------------------
    20     90   0.60  43.02  -8.51  -5.91   0.00   0.00   0.00  28.60
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.67 dBA

Total Leq All Segments: 45.67 dBA
```

```
Results segment # 1: CN (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.12 !        93.72
       0.50 !        4.50 !        3.54 !        92.14

LOCOMOTIVE (0.00 + -15.23 + -13.60) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     20   0.34   0.00  -7.16  -7.26   0.00   0.00   0.00 -14.42*
   -14     20   0.50   0.00  -7.95  -7.27   0.00   0.00   0.00 -15.23
-------------------------------------------------------------------------
    20     90   0.50   0.00  -7.95  -5.65   0.00   0.00   0.00 -13.60
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + -15.79 + -14.43) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     20   0.45   0.00  -7.71  -7.27   0.00   0.00  -2.25 -17.23*
   -14     20   0.60   0.00  -8.51  -7.28   0.00   0.00   0.00 -15.79
-------------------------------------------------------------------------
    20     90   0.60   0.00  -8.51  -5.91   0.00   0.00   0.00 -14.43
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  69.84 / 69.84  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  13.00 deg   Angle2 : 71.00 deg
Barrier height            :   1.92 m
Barrier receiver distance :  12.40 / 12.40  m
Source elevation          :  88.49 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.99 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  81.64 / 81.64  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  13.00 deg   Angle2 : 71.00 deg
Barrier height            :   1.92 m
Barrier receiver distance :  12.40 / 12.40  m
Source elevation          :  88.49 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.99 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        3.88 !        92.87

ROAD (56.63 + 54.37 + 45.70) = 58.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     13   0.57  70.67   0.00 -10.49  -3.54   0.00   0.00   0.00  56.63
-------------------------------------------------------------------------------
    13     71   0.45  70.67   0.00  -9.72  -5.63   0.00   0.00  -0.01  55.30*
    13     71   0.57  70.67   0.00 -10.49  -5.80   0.00   0.00   0.00  54.37
-------------------------------------------------------------------------------
    71     90   0.57  70.67   0.00 -10.49 -14.48   0.00   0.00   0.00  45.70
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 58.87 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        3.97 !        92.96

ROAD (55.57 + 53.31 + 44.64) = 57.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     13   0.57  70.67   0.00 -11.55  -3.54   0.00   0.00   0.00  55.57
-------------------------------------------------------------------------------
    13     71   0.45  70.67   0.00 -10.71  -5.63   0.00   0.00  -0.00  54.33*
    13     71   0.57  70.67   0.00 -11.55  -5.80   0.00   0.00   0.00  53.31
-------------------------------------------------------------------------------
    71     90   0.57  70.67   0.00 -11.55 -14.48   0.00   0.00   0.00  44.64
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 57.81 dBA

Total Leq All Segments: 61.38 dBA
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        3.88 !        92.87

ROAD (49.04 + 46.78 + 38.10) = 51.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     13   0.57  63.07   0.00 -10.49  -3.54   0.00   0.00   0.00  49.04
-------------------------------------------------------------------------------
    13     71   0.45  63.07   0.00  -9.72  -5.63   0.00   0.00  -0.01  47.71*
    13     71   0.57  63.07   0.00 -10.49  -5.80   0.00   0.00   0.00  46.78
-------------------------------------------------------------------------------
    71     90   0.57  63.07   0.00 -10.49 -14.48   0.00   0.00   0.00  38.10
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 51.28 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        3.97 !        92.96

ROAD (47.97 + 45.71 + 37.04) = 50.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     13   0.57  63.07   0.00 -11.55  -3.54   0.00   0.00   0.00  47.97
-------------------------------------------------------------------------------
    13     71   0.45  63.07   0.00 -10.71  -5.63   0.00   0.00  -0.00  46.73*
    13     71   0.57  63.07   0.00 -11.55  -5.80   0.00   0.00   0.00  45.71
-------------------------------------------------------------------------------
    71     90   0.57  63.07   0.00 -11.55 -14.48   0.00   0.00   0.00  37.04
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 50.21 dBA

Total Leq All Segments: 53.79 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  29.13 / 29.13  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  26.21 / 26.21  m
Source elevation          :  99.45 m
Receiver elevation        :  88.99 m
Barrier elevation         :  99.45 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.15 !        99.30

RT/Custom (0.00 + 40.17 + 0.00) = 40.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.48  58.58  -4.27  -1.14   0.00   0.00 -13.00  40.17
-------------------------------------------------------------------------

Segment Leq : 40.17 dBA

Total Leq All Segments: 40.17 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.15 !        99.30

RT/Custom (0.00 + 33.64 + 0.00) = 33.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.48  52.04  -4.27  -1.14   0.00   0.00 -13.00  33.64
-------------------------------------------------------------------------

Segment Leq : 33.64 dBA

Total Leq All Segments: 33.64 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.53
                           (NIGHT): 53.83
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:11:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description: POW Receptor 2

Rail data, segment # 1: CN 1 (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN 1 (day/night)

Angle1 Angle2	: -90.00 deg	-44.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 49.00 / 49.00	m
Receiver height	: 4.50 / 4.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -90.00 deg	Angle2 : -44.00 deg
Barrier height	: 6.00	m
Barrier receiver distance	: 20.00 / 20.00	m
Source elevation	: 90.00	m
Receiver elevation	: 88.99	m
Barrier elevation	: 89.00	m
Reference angle	: 0.00	

```
Rail data, segment # 2: CN 2 (day/night)
----------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. Freight     !   2.0/0.0   !  40.0 !  4.0 !  6.0 !Diesel! Yes

Data for Segment # 2: CN 2 (day/night)
--------------------------------------
Angle1   Angle2           : -44.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  49.00 / 49.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -44.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  20.00 / 20.00  m
Source elevation          :  90.00 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.61 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.70 !        93.70
       0.50 !        4.50 !        3.27 !        92.27

LOCOMOTIVE (0.00 + 38.17 + 0.00) = 38.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -44   0.14  56.84  -5.84  -6.63   0.00   0.00  -6.21  38.17
-------------------------------------------------------------------------

WHEEL (0.00 + 20.91 + 0.00) = 20.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -44   0.24  43.02  -6.37  -7.13   0.00   0.00  -8.61  20.91
-------------------------------------------------------------------------

Segment Leq : 38.25 dBA

Results segment # 2: CN 2 (day)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.09 !        93.70
       0.50 !        4.50 !        3.66 !        92.27

LOCOMOTIVE (0.00 + 47.04 + 0.00) = 47.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     90   0.34  56.84  -6.91  -1.90   0.00   0.00  -0.20  47.83*
   -44     90   0.50  56.84  -7.69  -2.11   0.00   0.00   0.00  47.04
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 32.55 + 0.00) = 32.55 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     90   0.45  43.02  -7.45  -2.05   0.00   0.00  -2.08  31.43*
   -44     90   0.60  43.02  -8.23  -2.25   0.00   0.00   0.00  32.55
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.19 dBA

Total Leq All Segments: 47.71 dBA
```

```
Results segment # 1: CN 1 (night)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.70 !        93.70
       0.50 !        4.50 !        3.27 !        92.27

LOCOMOTIVE (0.00 + -18.67 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -44   0.14   0.00  -5.84  -6.63   0.00   0.00  -6.21 -18.67
-------------------------------------------------------------------------

WHEEL (0.00 + -22.12 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -44   0.24   0.00  -6.37  -7.13   0.00   0.00  -8.61 -22.12
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Results segment # 2: CN 2 (night)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.09 !        93.70
       0.50 !        4.50 !        3.66 !        92.27

LOCOMOTIVE (0.00 + -9.80 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     90   0.34   0.00  -6.91  -1.90   0.00   0.00  -0.20  -9.02*
   -44     90   0.50   0.00  -7.69  -2.11   0.00   0.00   0.00  -9.80
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + -10.47 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     90   0.45   0.00  -7.45  -2.05   0.00   0.00  -2.08 -11.59*
   -44     90   0.60   0.00  -8.23  -2.25   0.00   0.00   0.00 -10.47
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  73.00 / 73.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -44.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  20.00 / 20.00  m
Source elevation          :  88.49 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.61 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.00 / 85.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  20.00 / 20.00  m
Source elevation          :  88.49 m
Receiver elevation        :  88.99 m
Barrier elevation         :  88.61 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        3.92 !        92.53

ROAD (0.00 + 51.33 + 53.50) = 55.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -44   0.42  70.67   0.00  -9.76  -7.93   0.00   0.00  -3.24  49.73*
   -90    -44   0.57  70.67   0.00 -10.79  -8.55   0.00   0.00   0.00  51.33
-------------------------------------------------------------------------------
   -44      0   0.57  70.67   0.00 -10.79  -6.37   0.00   0.00   0.00  53.50
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 55.56 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        4.06 !        92.67

ROAD (0.00 + 54.52 + 0.00) = 54.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.42  70.67   0.00 -10.70  -4.03   0.00   0.00  -1.32  54.62*
   -90      0   0.57  70.67   0.00 -11.83  -4.31   0.00   0.00   0.00  54.52
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 54.52 dBA

Total Leq All Segments: 58.08 dBA
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        3.92 !        92.53

ROAD (0.00 + 43.73 + 45.91) = 47.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -44   0.42  63.07   0.00  -9.76  -7.93   0.00   0.00  -3.24  42.14*
   -90    -44   0.57  63.07   0.00 -10.79  -8.55   0.00   0.00   0.00  43.73
-------------------------------------------------------------------------------
   -44      0   0.57  63.07   0.00 -10.79  -6.37   0.00   0.00   0.00  45.91
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.96 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        4.06 !        92.67

ROAD (0.00 + 46.93 + 0.00) = 46.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.42  63.07   0.00 -10.70  -4.03   0.00   0.00  -1.32  47.02*
   -90      0   0.57  63.07   0.00 -11.83  -4.31   0.00   0.00   0.00  46.93
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 46.93 dBA

Total Leq All Segments: 50.49 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  32.00 / 32.00  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 0.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  29.00 / 29.00  m
Source elevation          :  99.45 m
Receiver elevation        :  88.99 m
Barrier elevation         :  99.45 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.11 !        99.34

RT/Custom (0.00 + 36.80 + 0.00) = 36.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.48  58.58  -4.87  -4.15   0.00   0.00 -12.76  36.80
-------------------------------------------------------------------------

Segment Leq : 36.80 dBA

Total Leq All Segments: 36.80 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.11 !        99.34

RT/Custom (0.00 + 30.27 + 0.00) = 30.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.48  52.04  -4.87  -4.15   0.00   0.00 -12.76  30.27
-------------------------------------------------------------------------

Segment Leq : 30.27 dBA

Total Leq All Segments: 30.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.49
                           (NIGHT): 50.53
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:28:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description: OLA Receptor 3

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -59.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  50.72 / 50.72  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -40.00 deg   Angle2 : 14.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  22.00 / 22.00  m
Source elevation          :  90.00 m
Receiver elevation        :  88.83 m
Barrier elevation         :  88.60 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        3.32 !        91.92
       0.50 !        1.50 !        1.80 !        90.40

LOCOMOTIVE (37.58 + 43.07 + 43.10) = 46.66 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -59    -40   0.58  56.84  -8.39 -10.88   0.00   0.00   0.00  37.58
-------------------------------------------------------------------------
   -40     14   0.44  56.84  -7.59  -5.35   0.00   0.00  -3.49  40.41*
   -40     14   0.58  56.84  -8.39  -5.39   0.00   0.00   0.00  43.07
-------------------------------------------------------------------------
    14     90   0.58  56.84  -8.39  -5.36   0.00   0.00   0.00  43.10
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (23.22 + 23.60 + 28.72) = 30.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -59    -40   0.66  43.02  -8.78 -11.02   0.00   0.00   0.00  23.22
-------------------------------------------------------------------------
   -40     14   0.54  43.02  -8.15  -5.38   0.00   0.00  -5.90  23.60
-------------------------------------------------------------------------
    14     90   0.66  43.02  -8.78  -5.52   0.00   0.00   0.00  28.72
-------------------------------------------------------------------------

Segment Leq : 46.77 dBA

Total Leq All Segments: 46.77 dBA
```

```
Results segment # 1: CN (night)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        3.32 !        91.92
       0.50 !        1.50 !        1.80 !        90.40

LOCOMOTIVE (-19.27 + -13.78 + -13.75) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -59    -40   0.58   0.00  -8.39 -10.88   0.00   0.00   0.00 -19.27
-------------------------------------------------------------------
   -40     14   0.44   0.00  -7.59  -5.35   0.00   0.00  -3.49 -16.43*
   -40     14   0.58   0.00  -8.39  -5.39   0.00   0.00   0.00 -13.78
-------------------------------------------------------------------
    14     90   0.58   0.00  -8.39  -5.36   0.00   0.00   0.00 -13.75
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (-19.80 + -19.43 + -14.31) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -59    -40   0.66   0.00  -8.78 -11.02   0.00   0.00   0.00 -19.80
-------------------------------------------------------------------
   -40     14   0.54   0.00  -8.15  -5.38   0.00   0.00  -5.90 -19.43
-------------------------------------------------------------------
    14     90   0.66   0.00  -8.78  -5.52   0.00   0.00   0.00 -14.31
-------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S1 (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S1 (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   -63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  66.85 / 66.85  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -63.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  22.00 / 22.00  m
Source elevation          :  88.49 m
Receiver elevation        :  88.83 m
Barrier elevation         :  88.61 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe S2 (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe S2 (day/night)
----------------------------------------------
Angle1   Angle2           : -63.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  66.85 / 66.85  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -63.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.92 m
Barrier receiver distance :   9.40 / 9.40   m
Source elevation          :  88.49 m
Receiver elevation        :  88.83 m
Barrier elevation         :  88.99 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Woodroffe N1 (day/night)
------------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 3: Woodroffe N1 (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   -63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  78.65 / 78.65  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -63.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  22.00 / 22.00  m
Source elevation          :  88.49 m
Receiver elevation        :  88.83 m
Barrier elevation         :  88.61 m
Reference angle           :   0.00
```

```
Road data, segment # 4: Woodroffe N2 (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 4: Woodroffe N2 (day/night)
----------------------------------------------
Angle1   Angle2           : -63.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  78.65 / 78.65  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -63.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.92 m
Barrier receiver distance :   9.40 / 9.40   m
Source elevation          :  88.49 m
Receiver elevation        :  88.83 m
Barrier elevation         :  88.99 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S1 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.61 !        90.22

ROAD (0.00 + 43.82 + 0.00) = 43.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -63   0.51  70.67   0.00  -9.80 -11.73   0.00   0.00  -5.32  43.82
-------------------------------------------------------------------------------

Segment Leq : 43.82 dBA

Results segment # 2: Woodroffe S2 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.29 !        90.28

ROAD (0.00 + 53.16 + 0.00) = 53.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -63     90   0.54  70.67   0.00 -10.03  -1.65   0.00   0.00  -5.84  53.16
-------------------------------------------------------------------------------

Segment Leq : 53.16 dBA

Results segment # 3: Woodroffe N1 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.62 !        90.23

ROAD (0.00 + 42.78 + 0.00) = 42.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -63   0.51  70.67   0.00 -10.87 -11.73   0.00   0.00  -5.29  42.78
-------------------------------------------------------------------------------

Segment Leq : 42.78 dBA
```

```
Results segment # 4: Woodroffe N2 (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.30 !        90.29

ROAD (0.00 + 52.10 + 0.00) = 52.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -63     90   0.54  70.67   0.00 -11.12  -1.65   0.00   0.00  -5.80  52.10
-------------------------------------------------------------------------------

Segment Leq : 52.10 dBA

Total Leq All Segments: 56.15 dBA

Results segment # 1: Woodroffe S1 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.61 !        90.22

ROAD (0.00 + 36.22 + 0.00) = 36.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -63   0.51  63.07   0.00  -9.80 -11.73   0.00   0.00  -5.32  36.22
-------------------------------------------------------------------------------

Segment Leq : 36.22 dBA
```

```
Results segment # 2: Woodroffe S2 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.29 !        90.28

ROAD (0.00 + 45.56 + 0.00) = 45.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -63     90   0.54  63.07   0.00 -10.03  -1.65   0.00   0.00  -5.84  45.56
-------------------------------------------------------------------------------

Segment Leq : 45.56 dBA

Results segment # 3: Woodroffe N1 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.62 !        90.23

ROAD (0.00 + 35.19 + 0.00) = 35.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -63   0.51  63.07   0.00 -10.87 -11.73   0.00   0.00  -5.29  35.19
-------------------------------------------------------------------------------

Segment Leq : 35.19 dBA
```

```
Results segment # 4: Woodroffe N2 (night)
-----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.30 !        90.29

ROAD (0.00 + 44.51 + 0.00) = 44.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -63     90   0.54  63.07   0.00 -11.12  -1.65   0.00   0.00  -5.80  44.51
-------------------------------------------------------------------------------

Segment Leq : 44.51 dBA

Total Leq All Segments: 48.56 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  26.13 / 26.13  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  23.21 / 23.21  m
Source elevation          :  99.45 m
Receiver elevation        :  88.83 m
Barrier elevation         :  99.45 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.58 !        98.87

RT/Custom (0.00 + 39.36 + 0.00) = 39.36 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  58.58  -3.78  -1.30   0.00   0.00 -14.13  39.36
-------------------------------------------------------------------------

Segment Leq : 39.36 dBA

Total Leq All Segments: 39.36 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.58 !        98.87

RT/Custom (0.00 + 32.82 + 0.00) = 32.82 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  52.04  -3.78  -1.30   0.00   0.00 -14.13  32.82
-------------------------------------------------------------------------

Segment Leq : 32.82 dBA

Total Leq All Segments: 32.82 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.71
                           (NIGHT): 48.67
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:12:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description: POW Receptor 4

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 124.91 / 124.91 m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  -4.00 deg   Angle2 : 4.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :  12.35 / 12.35  m
Source elevation          :  90.00 m
Receiver elevation        :  88.75 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.73 !        93.32
       0.50 !        4.50 !        4.39 !        92.98

LOCOMOTIVE (30.50 + 29.56 + 38.65) = 39.71 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -4   0.50  56.84 -13.76 -12.58   0.00   0.00   0.00  30.50
-------------------------------------------------------------------------
    -4      4   0.38  56.84 -12.72 -13.52   0.00   0.00   0.00  30.60*
    -4      4   0.50  56.84 -13.76 -13.52   0.00   0.00   0.00  29.56
-------------------------------------------------------------------------
     4     90   0.50  56.84 -13.76  -4.44   0.00   0.00   0.00  38.65
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (15.71 + 14.77 + 23.66) = 24.76 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -4   0.60  43.02 -14.73 -12.59   0.00   0.00   0.00  15.71
-------------------------------------------------------------------------
    -4      4   0.49  43.02 -13.68 -13.52   0.00   0.00   0.00  15.82*
    -4      4   0.60  43.02 -14.73 -13.52   0.00   0.00   0.00  14.77
-------------------------------------------------------------------------
     4     90   0.60  43.02 -14.73  -4.64   0.00   0.00   0.00  23.66
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 39.85 dBA

Total Leq All Segments: 39.85 dBA
```

```
Results segment # 1: CN (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.73 !        93.32
       0.50 !        4.50 !        4.39 !        92.98

LOCOMOTIVE (-26.34 + -27.29 + -18.20) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -4   0.50   0.00 -13.76 -12.58   0.00   0.00   0.00 -26.34
-------------------------------------------------------------------------
    -4      4   0.38   0.00 -12.72 -13.52   0.00   0.00   0.00 -26.24*
    -4      4   0.50   0.00 -13.76 -13.52   0.00   0.00   0.00 -27.29
-------------------------------------------------------------------------
     4     90   0.50   0.00 -13.76  -4.44   0.00   0.00   0.00 -18.20
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (-27.32 + -28.25 + -19.37) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -4   0.60   0.00 -14.73 -12.59   0.00   0.00   0.00 -27.32
-------------------------------------------------------------------------
    -4      4   0.49   0.00 -13.68 -13.52   0.00   0.00   0.00 -27.21*
    -4      4   0.60   0.00 -14.73 -13.52   0.00   0.00   0.00 -28.25
-------------------------------------------------------------------------
     4     90   0.60   0.00 -14.73  -4.64   0.00   0.00   0.00 -19.37
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  69.34 / 69.34  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :  12.35 / 12.35  m
Source elevation          :  88.49 m
Receiver elevation        :  88.75 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  81.15 / 81.15  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  30.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :  12.35 / 12.35  m
Source elevation          :  88.49 m
Receiver elevation        :  88.75 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        4.08 !        92.67

ROAD (57.49 + 53.41 + 0.00) = 58.92 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     30   0.57  70.67   0.00 -10.44  -2.74   0.00   0.00   0.00  57.49
-------------------------------------------------------------------------------
    30     90   0.46  70.67   0.00  -9.69  -6.47   0.00   0.00  -0.56  53.95*
    30     90   0.57  70.67   0.00 -10.44  -6.82   0.00   0.00   0.00  53.41
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 58.92 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        4.16 !        92.75

ROAD (56.42 + 52.34 + 0.00) = 57.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     30   0.57  70.67   0.00 -11.51  -2.74   0.00   0.00   0.00  56.42
-------------------------------------------------------------------------------
    30     90   0.46  70.67   0.00 -10.68  -6.47   0.00   0.00  -0.54  52.98*
    30     90   0.57  70.67   0.00 -11.51  -6.82   0.00   0.00   0.00  52.34
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 57.85 dBA

Total Leq All Segments: 61.43 dBA
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        4.08 !        92.67

ROAD (49.89 + 45.81 + 0.00) = 51.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     30   0.57  63.07   0.00 -10.44  -2.74   0.00   0.00   0.00  49.89
-------------------------------------------------------------------------------
    30     90   0.46  63.07   0.00  -9.69  -6.47   0.00   0.00  -0.56  46.35*
    30     90   0.57  63.07   0.00 -10.44  -6.82   0.00   0.00   0.00  45.81
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 51.33 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        4.16 !        92.75

ROAD (48.82 + 44.74 + 0.00) = 50.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     30   0.57  63.07   0.00 -11.51  -2.74   0.00   0.00   0.00  48.82
-------------------------------------------------------------------------------
    30     90   0.46  63.07   0.00 -10.68  -6.47   0.00   0.00  -0.54  45.38*
    30     90   0.57  63.07   0.00 -11.51  -6.82   0.00   0.00   0.00  44.74
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 50.25 dBA

Total Leq All Segments: 53.83 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -87.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  32.27 / 32.27  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  29.37 / 29.37  m
Source elevation          :  99.00 m
Receiver elevation        :  88.75 m
Barrier elevation         :  99.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.06 !        98.94

RT/Custom (0.00 + 39.49 + 0.00) = 39.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -87     90   0.48  58.58  -4.92  -1.15   0.00   0.00 -13.01  39.49
-------------------------------------------------------------------------

Segment Leq : 39.49 dBA

Total Leq All Segments: 39.49 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !       -0.06 !        98.94

RT/Custom (0.00 + 32.95 + 0.00) = 32.95 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -87     90   0.48  52.04  -4.92  -1.15   0.00   0.00 -13.01  32.95
-------------------------------------------------------------------------

Segment Leq : 32.95 dBA

Total Leq All Segments: 32.95 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.49
                           (NIGHT): 53.87
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:13:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description: OLA Receptor 5

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -19.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 124.21 / 124.21 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  -6.00 deg   Angle2 : 0.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :   9.35 / 9.35   m
Source elevation          :  90.00 m
Receiver elevation        :  88.32 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.54 !        90.13
       0.50 !        1.50 !        1.28 !        89.87

LOCOMOTIVE (30.81 + 23.21 + 37.95) = 38.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -19     -6   0.58  56.84 -14.55 -11.48   0.00   0.00   0.00  30.81
-------------------------------------------------------------------------
    -6      0   0.47  56.84 -13.51 -14.77   0.00   0.00  -5.35  23.21
-------------------------------------------------------------------------
     0     90   0.58  56.84 -14.55  -4.34   0.00   0.00   0.00  37.95
-------------------------------------------------------------------------

WHEEL (16.30 + 7.73 + 23.32) = 24.20 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -19     -6   0.66  43.02 -15.24 -11.49   0.00   0.00   0.00  16.30
-------------------------------------------------------------------------
    -6      0   0.58  43.02 -14.47 -14.78   0.00   0.00  -6.04   7.73
-------------------------------------------------------------------------
     0     90   0.66  43.02 -15.24  -4.47   0.00   0.00   0.00  23.32
-------------------------------------------------------------------------

Segment Leq : 38.99 dBA

Total Leq All Segments: 38.99 dBA
```

```
Results segment # 1: CN (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.54 !        90.13
       0.50 !        1.50 !        1.28 !        89.87

LOCOMOTIVE (-26.03 + -33.64 + -18.89) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -19     -6   0.58   0.00 -14.55 -11.48   0.00   0.00   0.00 -26.03
-------------------------------------------------------------------
    -6      0   0.47   0.00 -13.51 -14.77   0.00   0.00  -5.35 -33.64
-------------------------------------------------------------------
     0     90   0.58   0.00 -14.55  -4.34   0.00   0.00   0.00 -18.89
-------------------------------------------------------------------

WHEEL (-26.73 + -35.29 + -19.71) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -19     -6   0.66   0.00 -15.24 -11.49   0.00   0.00   0.00 -26.73
-------------------------------------------------------------------
    -6      0   0.58   0.00 -14.47 -14.78   0.00   0.00  -6.04 -35.29
-------------------------------------------------------------------
     0     90   0.66   0.00 -15.24  -4.47   0.00   0.00   0.00 -19.71
-------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  66.35 / 66.35  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  37.00 deg   Angle2 : 86.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :   9.35 / 9.35   m
Source elevation          :  88.49 m
Receiver elevation        :  88.32 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  78.15 / 78.15  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  37.00 deg   Angle2 : 86.00 deg
Barrier height            :   1.89 m
Barrier receiver distance :   9.35 / 9.35   m
Source elevation          :  88.49 m
Receiver elevation        :  88.32 m
Barrier elevation         :  88.59 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.25 !        89.84

ROAD (57.38 + 47.48 + 33.58) = 57.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     37   0.66  70.67   0.00 -10.72  -2.57   0.00   0.00   0.00  57.38
-------------------------------------------------------------------------------
    37     86   0.55  70.67   0.00  -9.99  -7.62   0.00   0.00  -5.58  47.48
-------------------------------------------------------------------------------
    86     90   0.66  70.67   0.00 -10.72 -26.36   0.00   0.00   0.00  33.58
-------------------------------------------------------------------------------

Segment Leq : 57.82 dBA

Results segment # 2: Woodroffe N (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.25 !        89.84

ROAD (56.20 + 46.39 + 32.40) = 56.65 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     37   0.66  70.67   0.00 -11.90  -2.57   0.00   0.00   0.00  56.20
-------------------------------------------------------------------------------
    37     86   0.55  70.67   0.00 -11.09  -7.62   0.00   0.00  -5.57  46.39
-------------------------------------------------------------------------------
    86     90   0.66  70.67   0.00 -11.90 -26.36   0.00   0.00   0.00  32.40
-------------------------------------------------------------------------------

Segment Leq : 56.65 dBA

Total Leq All Segments: 60.28 dBA
```

```
Results segment # 1: Woodroffe S (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.25 !        89.84

ROAD (49.78 + 39.88 + 25.99) = 50.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     37   0.66  63.07   0.00 -10.72  -2.57   0.00   0.00   0.00  49.78
-------------------------------------------------------------------------------
    37     86   0.55  63.07   0.00  -9.99  -7.62   0.00   0.00  -5.58  39.88
-------------------------------------------------------------------------------
    86     90   0.66  63.07   0.00 -10.72 -26.36   0.00   0.00   0.00  25.99
-------------------------------------------------------------------------------

Segment Leq : 50.22 dBA

Results segment # 2: Woodroffe N (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.25 !        89.84

ROAD (48.60 + 38.79 + 24.81) = 49.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     37   0.66  63.07   0.00 -11.90  -2.57   0.00   0.00   0.00  48.60
-------------------------------------------------------------------------------
    37     86   0.55  63.07   0.00 -11.09  -7.62   0.00   0.00  -5.57  38.79
-------------------------------------------------------------------------------
    86     90   0.66  63.07   0.00 -11.90 -26.36   0.00   0.00   0.00  24.81
-------------------------------------------------------------------------------

Segment Leq : 49.05 dBA

Total Leq All Segments: 52.68 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  29.28 / 29.28  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  26.37 / 26.37  m
Source elevation          :  99.00 m
Receiver elevation        :  88.32 m
Barrier elevation         :  99.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.46 !        98.54

RT/Custom (0.00 + 38.87 + 0.00) = 38.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  58.58  -4.56  -1.30   0.00   0.00 -13.84  38.87
-------------------------------------------------------------------------

Segment Leq : 38.87 dBA

Total Leq All Segments: 38.87 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.46 !        98.54

RT/Custom (0.00 + 32.34 + 0.00) = 32.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  52.04  -4.56  -1.30   0.00   0.00 -13.84  32.34
-------------------------------------------------------------------------

Segment Leq : 32.34 dBA

Total Leq All Segments: 32.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.35
                           (NIGHT): 52.72
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:14:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description: POW Receptor 6

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 286.12 / 286.12 m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  -9.00 deg   Angle2 : 41.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :  12.56 / 12.56  m
Source elevation          :  90.00 m
Receiver elevation        :  88.91 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.80 !        93.44
       0.50 !        4.50 !        4.64 !        93.28

LOCOMOTIVE (22.09 + 31.98 + 29.86) = 34.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -9   0.50  56.84 -19.14 -15.61   0.00   0.00   0.00  22.09
-------------------------------------------------------------------------
    -9     41   0.38  56.84 -17.72  -5.69   0.00   0.00   0.00  33.44*
    -9     41   0.50  56.84 -19.14  -5.72   0.00   0.00   0.00  31.98
-------------------------------------------------------------------------
    41     90   0.50  56.84 -19.14  -7.85   0.00   0.00   0.00  29.86
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (6.92 + 16.78 + 14.29) = 19.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -9   0.60  43.02 -20.49 -15.62   0.00   0.00   0.00   6.92
-------------------------------------------------------------------------
    -9     41   0.49  43.02 -19.07  -5.72   0.00   0.00   0.00  18.24*
    -9     41   0.60  43.02 -20.49  -5.75   0.00   0.00   0.00  16.78
-------------------------------------------------------------------------
    41     90   0.60  43.02 -20.49  -8.24   0.00   0.00   0.00  14.29
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 34.46 dBA

Total Leq All Segments: 34.46 dBA
```

```
Results segment # 1: CN (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.80 !        93.44
       0.50 !        4.50 !        4.64 !        93.28

LOCOMOTIVE (-34.75 + -24.86 + -26.99) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -9   0.50   0.00 -19.14 -15.61   0.00   0.00   0.00 -34.75
-------------------------------------------------------------------------
    -9     41   0.38   0.00 -17.72  -5.69   0.00   0.00   0.00 -23.41*
    -9     41   0.50   0.00 -19.14  -5.72   0.00   0.00   0.00 -24.86
-------------------------------------------------------------------------
    41     90   0.50   0.00 -19.14  -7.85   0.00   0.00   0.00 -26.99
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (-36.10 + -26.24 + -28.73) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14     -9   0.60   0.00 -20.49 -15.62   0.00   0.00   0.00 -36.10
-------------------------------------------------------------------------
    -9     41   0.49   0.00 -19.07  -5.72   0.00   0.00   0.00 -24.78*
    -9     41   0.60   0.00 -20.49  -5.75   0.00   0.00   0.00 -26.24
-------------------------------------------------------------------------
    41     90   0.60   0.00 -20.49  -8.24   0.00   0.00   0.00 -28.73
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  67.98 / 67.98  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -86.00 deg   Angle2 : -36.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :  12.56 / 12.56  m
Source elevation          :  88.49 m
Receiver elevation        :  88.91 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  79.82 / 79.82  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -86.00 deg   Angle2 : -36.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :  12.56 / 12.56  m
Source elevation          :  88.49 m
Receiver elevation        :  88.91 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Knoxdale (day/night)
---------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1546/134   veh/TimePeriod  *
Heavy truck volume  :  1104/96    veh/TimePeriod  *
Posted speed limit  :    40 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):  24000
    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: Knoxdale (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   4.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.43 / 80.43  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 4.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   0.01 / 0.01   m
Source elevation          :  88.42 m
Receiver elevation        :  88.91 m
Barrier elevation         :  88.66 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (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 !        4.50 !        4.14 !        92.78

ROAD (35.28 + 52.79 + 57.86) = 59.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -86   0.57  70.67   0.00 -10.30 -25.08   0.00   0.00   0.00  35.28
-------------------------------------------------------------------------------
   -86    -36   0.46  70.67   0.00  -9.58  -7.22   0.00   0.00  -0.38  53.50*
   -86    -36   0.57  70.67   0.00 -10.30  -7.57   0.00   0.00   0.00  52.79
-------------------------------------------------------------------------------
   -36     90   0.57  70.67   0.00 -10.30  -2.50   0.00   0.00   0.00  57.86
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 59.06 dBA

Results segment # 2: Woodroffe N (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 !        4.50 !        4.23 !        92.87

ROAD (34.18 + 51.69 + 56.77) = 57.96 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -86   0.57  70.67   0.00 -11.40 -25.08   0.00   0.00   0.00  34.18
-------------------------------------------------------------------------------
   -86    -36   0.46  70.67   0.00 -10.59  -7.22   0.00   0.00  -0.35  52.51*
   -86    -36   0.57  70.67   0.00 -11.40  -7.57   0.00   0.00   0.00  51.69
-------------------------------------------------------------------------------
   -36     90   0.57  70.67   0.00 -11.40  -2.50   0.00   0.00   0.00  56.77
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 57.96 dBA
```

```
Results segment # 3: Knoxdale (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 !        4.50 !        4.75 !        93.41

ROAD (0.00 + 53.22 + 0.00) = 53.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      4   0.57  68.73   0.00 -11.45  -4.06   0.00   0.00  -0.02  53.20*
   -90      4   0.57  68.73   0.00 -11.45  -4.06   0.00   0.00   0.00  53.22
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 53.22 dBA

Total Leq All Segments: 62.15 dBA

Results segment # 1: Woodroffe S (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 !        4.50 !        4.14 !        92.78

ROAD (27.68 + 45.19 + 50.27) = 51.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -86   0.57  63.07   0.00 -10.30 -25.08   0.00   0.00   0.00  27.68
-------------------------------------------------------------------------------
   -86    -36   0.46  63.07   0.00  -9.58  -7.22   0.00   0.00  -0.38  45.90*
   -86    -36   0.57  63.07   0.00 -10.30  -7.57   0.00   0.00   0.00  45.19
-------------------------------------------------------------------------------
   -36     90   0.57  63.07   0.00 -10.30  -2.50   0.00   0.00   0.00  50.27
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 51.46 dBA
```

```
Results segment # 2: Woodroffe N (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 !        4.50 !        4.23 !        92.87

ROAD (26.59 + 44.10 + 49.17) = 50.37 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -86   0.57  63.07   0.00 -11.40 -25.08   0.00   0.00   0.00  26.59
-------------------------------------------------------------------------------
   -86    -36   0.46  63.07   0.00 -10.59  -7.22   0.00   0.00  -0.35  44.91*
   -86    -36   0.57  63.07   0.00 -11.40  -7.57   0.00   0.00   0.00  44.10
-------------------------------------------------------------------------------
   -36     90   0.57  63.07   0.00 -11.40  -2.50   0.00   0.00   0.00  49.17
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 50.37 dBA

Results segment # 3: Knoxdale (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 !        4.50 !        4.75 !        93.41

ROAD (0.00 + 45.62 + 0.00) = 45.62 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      4   0.57  61.13   0.00 -11.45  -4.06   0.00   0.00  -0.02  45.60*
   -90      4   0.57  61.13   0.00 -11.45  -4.06   0.00   0.00   0.00  45.62
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 45.62 dBA

Total Leq All Segments: 54.55 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -87.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  42.29 / 42.29  m
Receiver height           :   4.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  39.36 / 39.36  m
Source elevation          :  98.00 m
Receiver elevation        :  88.91 m
Barrier elevation         :  98.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !        0.15 !        98.15

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
-------------------------------------------------------------------------
   -87     90   0.48  58.58  -6.66  -1.15   0.00   0.00 -12.20  38.56
-------------------------------------------------------------------------

Segment Leq : 38.56 dBA

Total Leq All Segments: 38.56 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        4.50 !        0.15 !        98.15

RT/Custom (0.00 + 32.03 + 0.00) = 32.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -87     90   0.48  52.04  -6.66  -1.15   0.00   0.00 -12.20  32.03
-------------------------------------------------------------------------

Segment Leq : 32.03 dBA

Total Leq All Segments: 32.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.18
                           (NIGHT): 54.58
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:14:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
Description: OLA Receptor 7

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Freight	2.0/0.0	40.0	4.0	6.0	Diesel	Yes

Data for Segment # 1: CN (day/night)

```
Angle1   Angle2           : -14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 285.47 / 285.47 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -10.00 deg   Angle2 : 33.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  90.00 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.61 !        90.25
       0.50 !        1.50 !        1.49 !        90.13

LOCOMOTIVE (19.98 + 26.52 + 29.37) = 31.50 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.58  56.84 -20.28 -16.59   0.00   0.00   0.00  19.98
-------------------------------------------------------------------
   -10     33   0.47  56.84 -18.86  -6.31   0.00   0.00  -5.16  26.52
-------------------------------------------------------------------
    33     90   0.58  56.84 -20.28  -7.19   0.00   0.00   0.00  29.37
-------------------------------------------------------------------

WHEEL (5.19 + 11.15 + 14.36) = 16.40 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.66  43.02 -21.24 -16.60   0.00   0.00   0.00   5.19
-------------------------------------------------------------------
   -10     33   0.58  43.02 -20.20  -6.33   0.00   0.00  -5.34  11.15
-------------------------------------------------------------------
    33     90   0.66  43.02 -21.24  -7.43   0.00   0.00   0.00  14.36
-------------------------------------------------------------------

Segment Leq : 31.63 dBA

Total Leq All Segments: 31.63 dBA
```

```
Results segment # 1: CN (night)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.61 !        90.25
       0.50 !        1.50 !        1.49 !        90.13

LOCOMOTIVE (-36.87 + -30.33 + -27.47) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.58   0.00 -20.28 -16.59   0.00   0.00   0.00 -36.87
-------------------------------------------------------------------
   -10     33   0.47   0.00 -18.86  -6.31   0.00   0.00  -5.16 -30.33
-------------------------------------------------------------------
    33     90   0.58   0.00 -20.28  -7.19   0.00   0.00   0.00 -27.47
-------------------------------------------------------------------

WHEEL (-37.84 + -31.87 + -28.67) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.66   0.00 -21.24 -16.60   0.00   0.00   0.00 -37.84
-------------------------------------------------------------------
   -10     33   0.58   0.00 -20.20  -6.33   0.00   0.00  -5.34 -31.87
-------------------------------------------------------------------
    33     90   0.66   0.00 -21.24  -7.43   0.00   0.00   0.00 -28.67
-------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth         :   0.00
    Number of Years of Growth           :   0.00
    Medium Truck % of Total Volume      :   7.00
    Heavy Truck  % of Total Volume      :   5.00
    Day (16 hrs) % of Total Volume      :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  64.99 / 64.99  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : -44.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  88.49 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  76.82 / 76.82  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : -44.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  88.49 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Knoxdale (day/night)
---------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1546/134   veh/TimePeriod  *
Heavy truck volume  :  1104/96    veh/TimePeriod  *
Posted speed limit  :    40 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):  24000
    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: Knoxdale (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   49.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.20 / 80.20  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 49.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   0.01 / 0.01   m
Source elevation          :  88.42 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.62 m
Reference angle           :   0.00
```

```
Results segment # 1: Woodroffe S (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (31.66 + 47.08 + 57.78) = 58.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  70.67   0.00 -10.57 -28.44   0.00   0.00   0.00  31.66
-------------------------------------------------------------------------------
   -87    -44   0.55  70.67   0.00  -9.86  -8.53   0.00   0.00  -5.19  47.08
-------------------------------------------------------------------------------
   -44     90   0.66  70.67   0.00 -10.57  -2.32   0.00   0.00   0.00  57.78
-------------------------------------------------------------------------------

Segment Leq : 58.14 dBA

Results segment # 2: Woodroffe N (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (30.45 + 45.96 + 56.57) = 56.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  70.67   0.00 -11.78 -28.44   0.00   0.00   0.00  30.45
-------------------------------------------------------------------------------
   -87    -44   0.55  70.67   0.00 -10.99  -8.53   0.00   0.00  -5.19  45.96
-------------------------------------------------------------------------------
   -44     90   0.66  70.67   0.00 -11.78  -2.32   0.00   0.00   0.00  56.57
-------------------------------------------------------------------------------

Segment Leq : 56.94 dBA
```

```
Results segment # 3: Knoxdale (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.50 !        90.12

ROAD (0.00 + 54.48 + 0.00) = 54.48 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     49   0.66  68.73   0.00 -12.09  -2.16   0.00   0.00  -0.04  54.44*
   -90     49   0.66  68.73   0.00 -12.09  -2.16   0.00   0.00   0.00  54.48
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 54.48 dBA

Total Leq All Segments: 61.54 dBA

Results segment # 1: Woodroffe S (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (24.06 + 39.48 + 50.18) = 50.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  63.07   0.00 -10.57 -28.44   0.00   0.00   0.00  24.06
-------------------------------------------------------------------------------
   -87    -44   0.55  63.07   0.00  -9.86  -8.53   0.00   0.00  -5.19  39.48
-------------------------------------------------------------------------------
   -44     90   0.66  63.07   0.00 -10.57  -2.32   0.00   0.00   0.00  50.18
-------------------------------------------------------------------------------

Segment Leq : 50.54 dBA
```

```
Results segment # 2: Woodroffe N (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (22.86 + 38.36 + 48.97) = 49.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  63.07   0.00 -11.78 -28.44   0.00   0.00   0.00  22.86
-------------------------------------------------------------------------------
   -87    -44   0.55  63.07   0.00 -10.99  -8.53   0.00   0.00  -5.19  38.36
-------------------------------------------------------------------------------
   -44     90   0.66  63.07   0.00 -11.78  -2.32   0.00   0.00   0.00  48.97
-------------------------------------------------------------------------------

Segment Leq : 49.34 dBA

Results segment # 3: Knoxdale (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.50 !        90.12

ROAD (0.00 + 46.88 + 0.00) = 46.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     49   0.66  61.13   0.00 -12.09  -2.16   0.00   0.00  -0.04  46.84*
   -90     49   0.66  61.13   0.00 -12.09  -2.16   0.00   0.00   0.00  46.88
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 46.88 dBA

Total Leq All Segments: 53.94 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  39.30 / 39.30  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  36.36 / 36.36  m
Source elevation          :  98.00 m
Receiver elevation        :  88.62 m
Barrier elevation         :  98.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.13 !        97.87

RT/Custom (0.00 + 37.87 + 0.00) = 37.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  58.58  -6.57  -1.30   0.00   0.00 -12.83  37.87
-------------------------------------------------------------------------

Segment Leq : 37.87 dBA

Total Leq All Segments: 37.87 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.13 !        97.87

RT/Custom (0.00 + 31.34 + 0.00) = 31.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  52.04  -6.57  -1.30   0.00   0.00 -12.83  31.34
-------------------------------------------------------------------------

Segment Leq : 31.34 dBA

Total Leq All Segments: 31.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.57
                           (NIGHT): 53.97
```

STAMSON 5.0 NORMAL REPORT Date: 26-02-2026 15:15:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7barr.te Time Period: Day/Night 16/8 hours
Description: OLA Receptor 7 With Barrier

```
Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1. Freight     !   2.0/0.0   !  40.0 !  4.0 !  6.0 !Diesel! Yes

Data for Segment # 1: CN (day/night)
------------------------------------
Angle1   Angle2           : -14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 285.47 / 285.47 m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -10.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  90.00 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.61 !        90.25
       0.50 !        1.50 !        1.49 !        90.13

LOCOMOTIVE (19.98 + 29.32 + 0.00) = 29.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.58  56.84 -20.28 -16.59   0.00   0.00   0.00  19.98
-------------------------------------------------------------------
   -10     90   0.47  56.84 -18.86  -3.55   0.00   0.00  -5.11  29.32
-------------------------------------------------------------------

WHEEL (5.19 + 13.86 + 0.00) = 14.41 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -14    -10   0.66  43.02 -21.24 -16.60   0.00   0.00   0.00   5.19
-------------------------------------------------------------------
   -10     90   0.58  43.02 -20.20  -3.72   0.00   0.00  -5.24  13.86
-------------------------------------------------------------------

Segment Leq : 29.92 dBA

Total Leq All Segments: 29.92 dBA
```

```
Results segment # 1: CN (night)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        1.50 !        1.61 !        90.25
       0.50 !        1.50 !        1.49 !        90.13

LOCOMOTIVE (-36.87 + -27.52 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14    -10   0.58   0.00 -20.28 -16.59   0.00   0.00   0.00 -36.87
-------------------------------------------------------------------------
   -10     90   0.47   0.00 -18.86  -3.55   0.00   0.00  -5.11 -27.52
-------------------------------------------------------------------------

WHEEL (-37.84 + -29.16 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -14    -10   0.66   0.00 -21.24 -16.60   0.00   0.00   0.00 -37.84
-------------------------------------------------------------------------
   -10     90   0.58   0.00 -20.20  -3.72   0.00   0.00  -5.24 -29.16
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA
```

```
Road data, segment # 1: Woodroffe S (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Woodroffe S (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  64.99 / 64.99  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  88.49 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 2: Woodroffe N (day/night)
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  17500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: Woodroffe N (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  76.82 / 76.82  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -87.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   9.58 / 9.58   m
Source elevation          :  88.49 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

```
Road data, segment # 3: Knoxdale (day/night)
---------------------------------------------
Car traffic volume  : 19430/1690  veh/TimePeriod  *
Medium truck volume :  1546/134   veh/TimePeriod  *
Heavy truck volume  :  1104/96    veh/TimePeriod  *
Posted speed limit  :    40 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):  24000
    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: Knoxdale (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   49.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.20 / 80.20  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 49.00 deg
Barrier height            :   1.85 m
Barrier receiver distance :   3.04 / 3.04   m
Source elevation          :  88.42 m
Receiver elevation        :  88.62 m
Barrier elevation         :  88.64 m
Reference angle           :   0.00
```

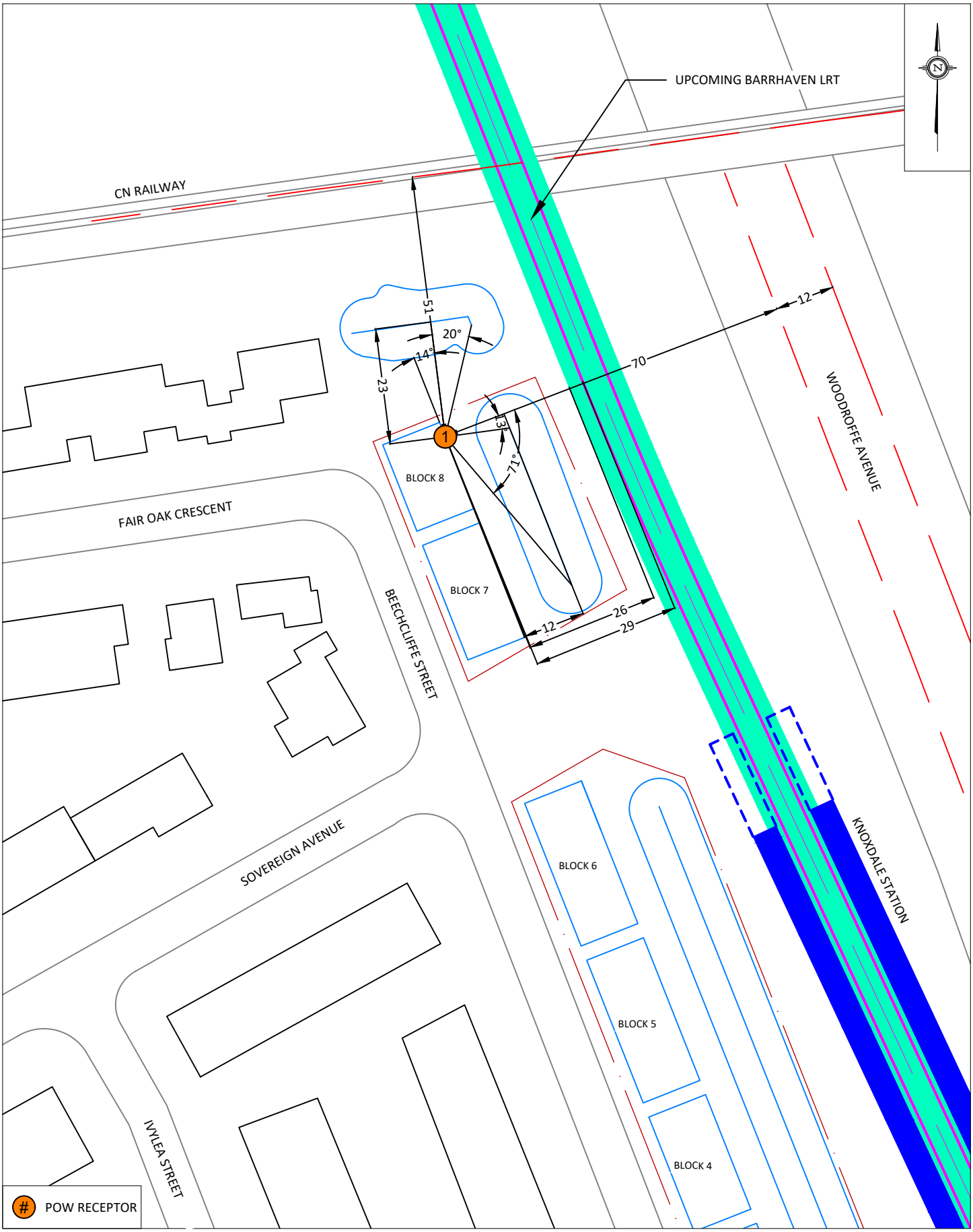
```
Results segment # 1: Woodroffe S (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (31.66 + 54.22 + 0.00) = 54.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  70.67   0.00 -10.57 -28.44   0.00   0.00   0.00  31.66
-------------------------------------------------------------------------------
   -87     90   0.55  70.67   0.00  -9.86  -1.28   0.00   0.00  -5.31  54.22
-------------------------------------------------------------------------------

Segment Leq : 54.24 dBA

Results segment # 2: Woodroffe N (day)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (30.45 + 53.10 + 0.00) = 53.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  70.67   0.00 -11.78 -28.44   0.00   0.00   0.00  30.45
-------------------------------------------------------------------------------
   -87     90   0.55  70.67   0.00 -10.99  -1.28   0.00   0.00  -5.29  53.10
-------------------------------------------------------------------------------

Segment Leq : 53.13 dBA
```

```
Results segment # 3: Knoxdale (day)
-----------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.47 !        90.11

ROAD (0.00 + 49.58 + 0.00) = 49.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     49   0.55  68.73   0.00 -11.28  -2.03   0.00   0.00  -5.85  49.58
-------------------------------------------------------------------------------

Segment Leq : 49.58 dBA

Total Leq All Segments: 57.50 dBA

Results segment # 1: Woodroffe S (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (24.06 + 46.62 + 0.00) = 46.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  63.07   0.00 -10.57 -28.44   0.00   0.00   0.00  24.06
-------------------------------------------------------------------------------
   -87     90   0.55  63.07   0.00  -9.86  -1.28   0.00   0.00  -5.31  46.62
-------------------------------------------------------------------------------

Segment Leq : 46.64 dBA
```

```
Results segment # 2: Woodroffe N (night)
----------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.46 !        90.10

ROAD (22.86 + 45.51 + 0.00) = 45.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -87   0.66  63.07   0.00 -11.78 -28.44   0.00   0.00   0.00  22.86
-------------------------------------------------------------------------------
   -87     90   0.55  63.07   0.00 -10.99  -1.28   0.00   0.00  -5.29  45.51
-------------------------------------------------------------------------------

Segment Leq : 45.53 dBA

Results segment # 3: Knoxdale (night)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.47 !        90.11

ROAD (0.00 + 41.98 + 0.00) = 41.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     49   0.55  61.13   0.00 -11.28  -2.03   0.00   0.00  -5.85  41.98
-------------------------------------------------------------------------------

Segment Leq : 41.98 dBA

Total Leq All Segments: 49.90 dBA
```

```
RT/Custom data, segment # 1: LRT (day/night)
-----------------------------------------
1 - 4-car SRT:
Traffic volume    :   540/60    veh/TimePeriod
Speed             :    40 km/h

Data for Segment # 1: LRT (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  39.30 / 39.30  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.00 m
Barrier receiver distance :  36.36 / 36.36  m
Source elevation          :  98.00 m
Receiver elevation        :  88.62 m
Barrier elevation         :  98.00 m
Reference angle           :   0.00
```

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.13 !        97.87

RT/Custom (0.00 + 37.87 + 0.00) = 37.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  58.58  -6.57  -1.30   0.00   0.00 -12.83  37.87
-------------------------------------------------------------------------

Segment Leq : 37.87 dBA

Total Leq All Segments: 37.87 dBA

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

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !       -0.13 !        97.87

RT/Custom (0.00 + 31.34 + 0.00) = 31.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.57  52.04  -6.57  -1.30   0.00   0.00 -12.83  31.34
-------------------------------------------------------------------------

Segment Leq : 31.34 dBA

Total Leq All Segments: 31.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.55
                           (NIGHT): 49.96
```



GRADIENTWIND
ENGINEERS & SCIENTISTS

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

PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	25-077-A1
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE A1:
STAMSON INPUT PARAMETERS
RECEPTOR 1

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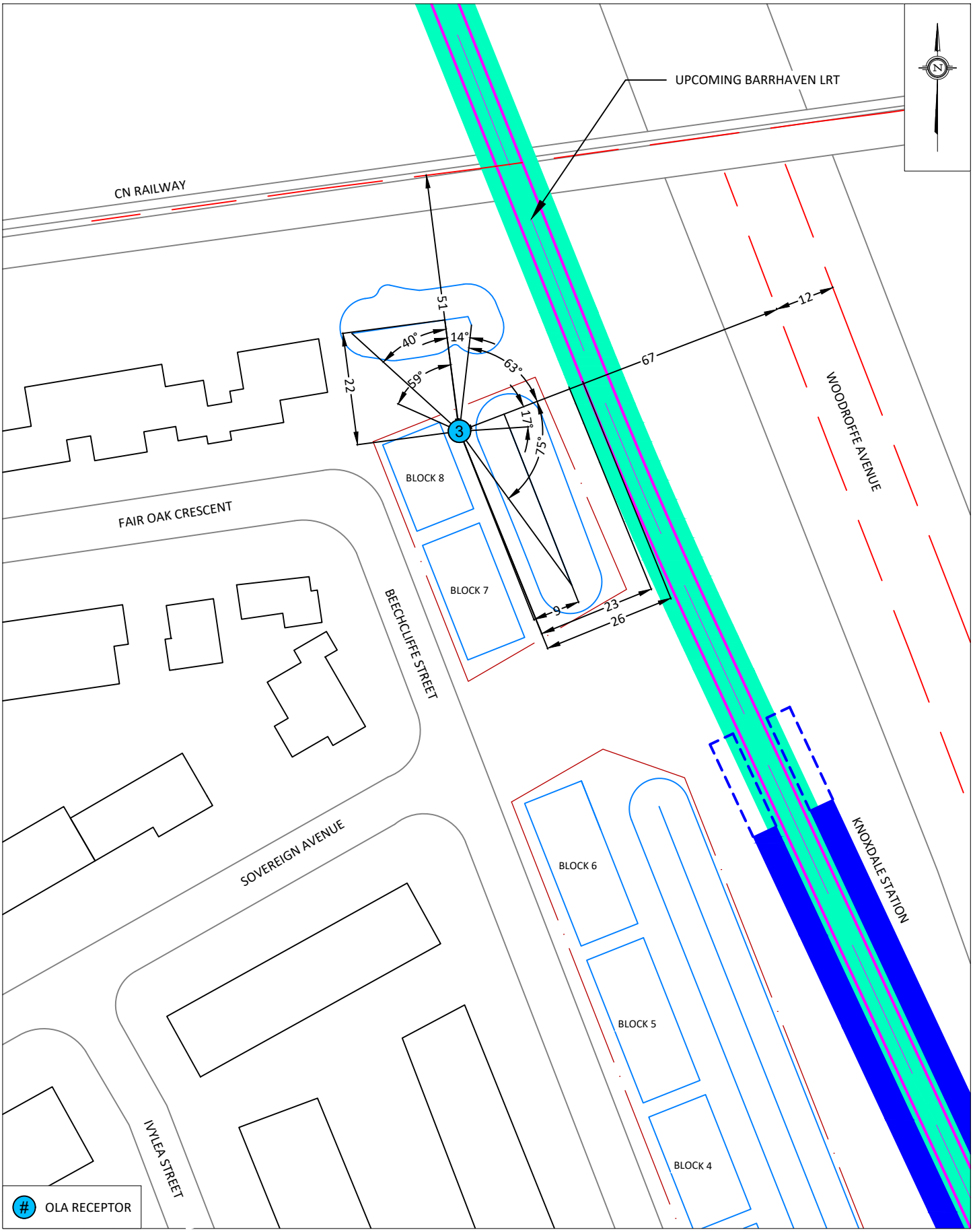
SCALE	1:1000
DRAWING NO.	25-077-A2
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE A2:
STAMSON INPUT PARAMETERS
RECEPTOR 2



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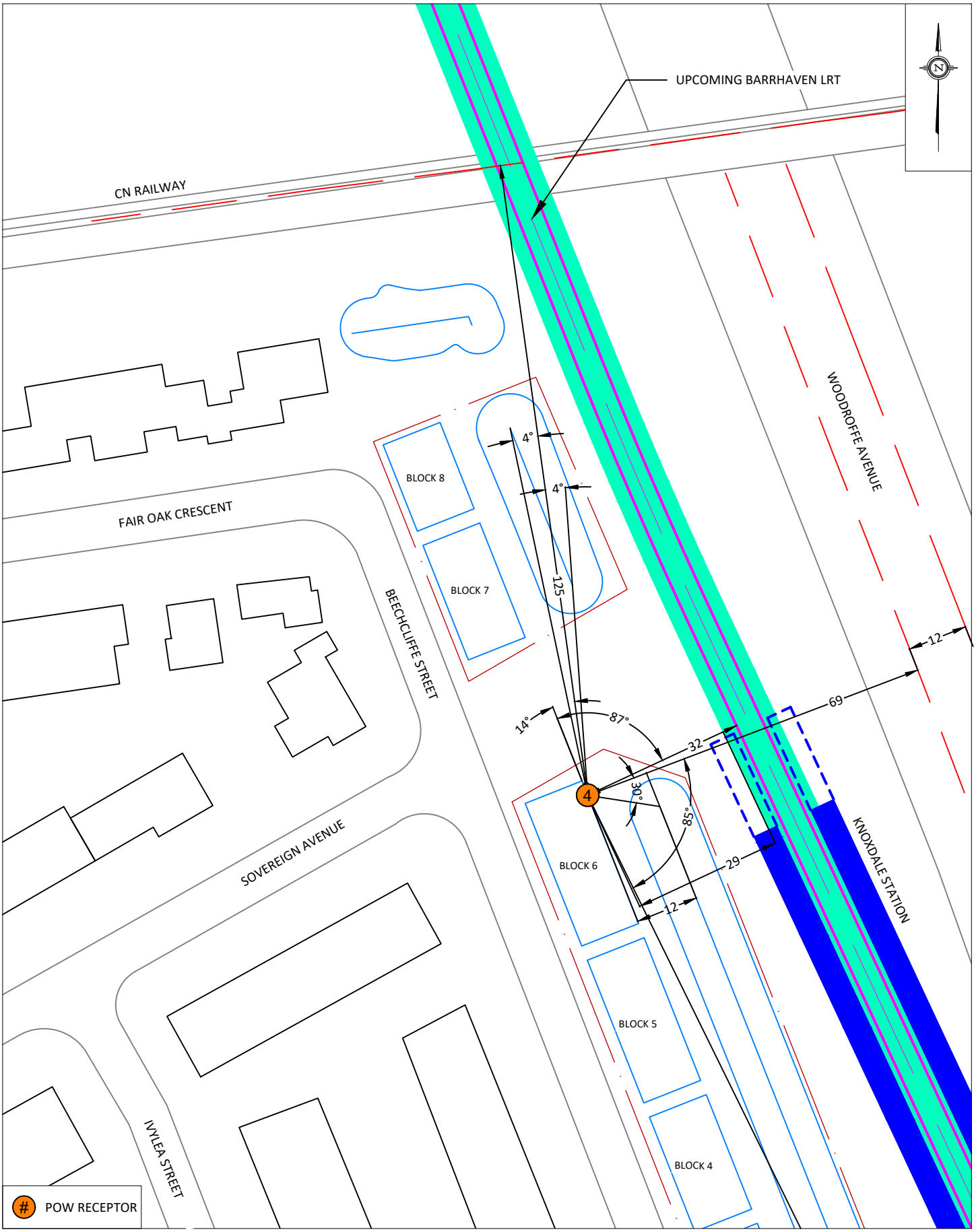
PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		
SCALE	1:1000	DRAWING NO.	25-077-A3
DATE	FEBRUARY 27, 2026	DRAWN BY	T.K.

DESCRIPTION

FIGURE A3:
STAMSON INPUT PARAMETERS
RECEPTOR 3



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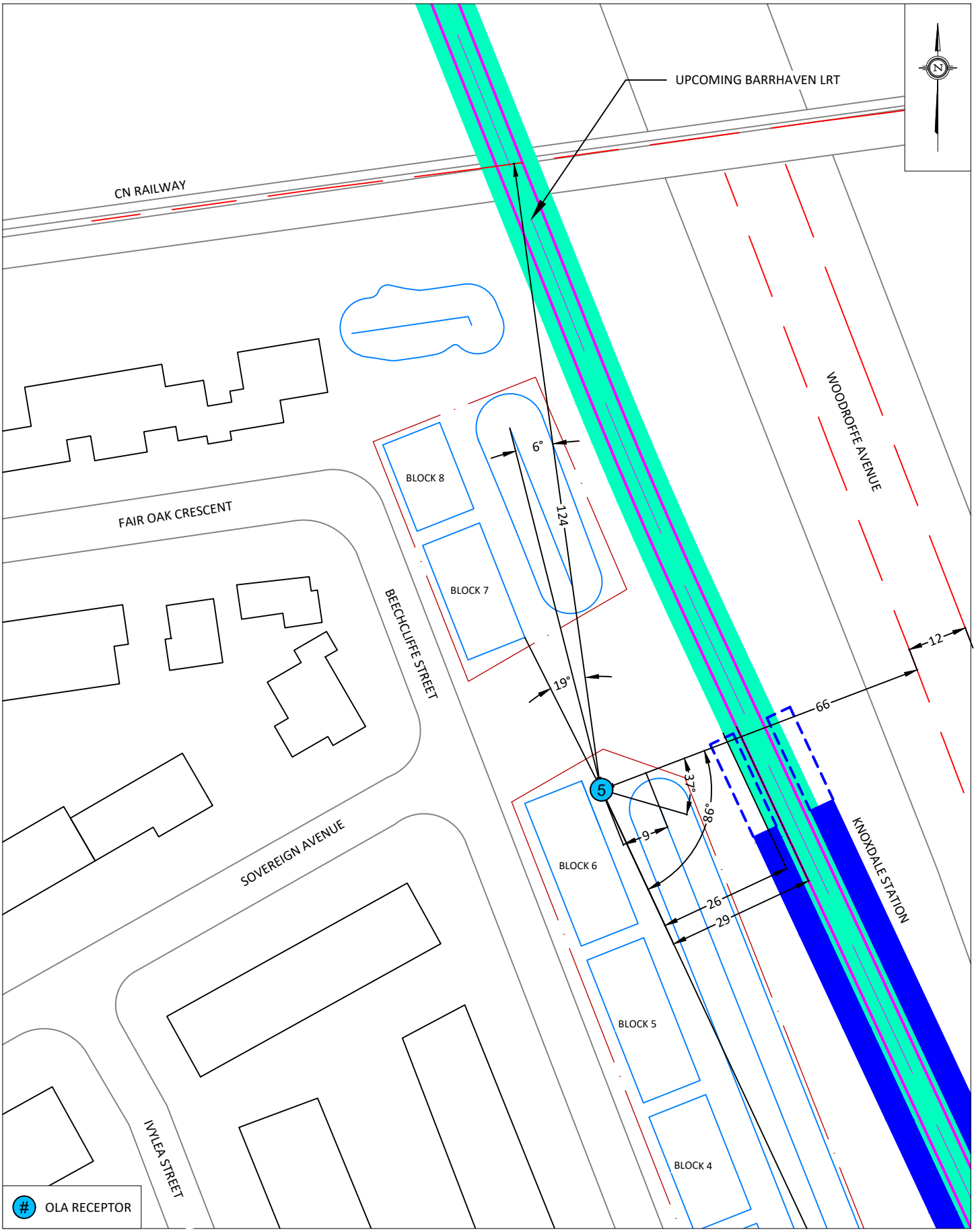
PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	25-077-A4
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE A4:
STAMSON INPUT PARAMETERS
RECEPTOR 4



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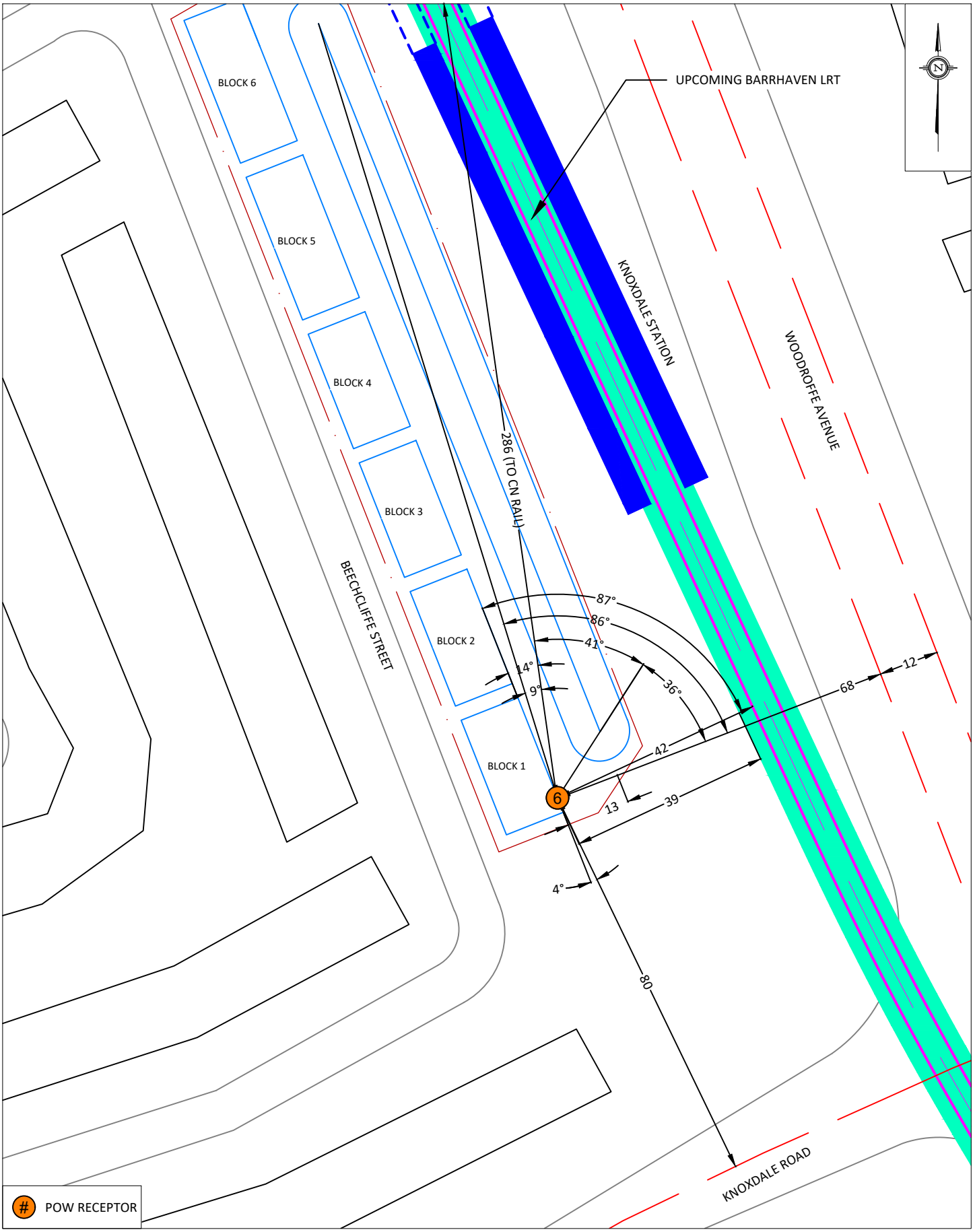
PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	25-077-A5
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE A5:
STAMSON INPUT PARAMETERS
RECEPTOR 5



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PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT		
SCALE	1:1000	DRAWING NO.	25-077-A6
DATE	FEBRUARY 27, 2026	DRAWN BY	T.K.

DESCRIPTION

FIGURE A6:
STAMSON INPUT PARAMETERS
RECEPTOR 6

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PROJECT	40 BEECHCLIFFE STREET, OTTAWA ROADWAY TRAFFIC NOISE ASSESSMENT
SCALE	1:1000
DRAWING NO.	25-077-A7
DATE	FEBRUARY 27, 2026
DRAWN BY	T.K.

DESCRIPTION

FIGURE A7:
STAMSON INPUT PARAMETERS
RECEPTOR 7

APPENDIX B

FTA VIBRATION CALCULATIONS

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

GW25-077 26-Feb-26

Possible Vibration Impacts from Freight Train
Predicted using FTA General Assesment

Vehicle Speed 40 km/h 25 mph

	Distance from C/L	
	(m)	(ft)
Freight	42	137.8

	Vibration		
From FTA Manual Fig 10-1			
Vibration Levels at distance from track	75.3	dBV re 1 micro in/sec	
Adjustment Factors FTA Table 10-1			
Speed reference 50 mph	-6	Train speed of 40 km/h	
Vehicle Parameters	0	Assume soft primary suspension	
Track Condition	0	Track is welded	
Track Treatments	0	N/A	
Type of Transit Structure	0	Open cut transit structure	
Vibration Propagation	0	Non efficient Propagation of Vibrations in Soil	
Vibration Levels at Fdn	69		0.074
Coupling to Building Foundation	-5	Wood frame houses	
Floor to Floor Attenuation	0	N/A	
Amplification of Floor and Walls	6		
Total Vibration Level	70.3	dBV or	0.083 mm/s
Noise Level in dBA	35.3	dBA	

GW25-077 26-Feb-26

Possible Vibration Impacts from LRT
Predicted using FTA General Assesment

Vehicle Speed 40 km/h 25 mph

	Distance from C/L	
	(m)	(ft)
LRT	8	26.2

		Vibration		
From FTA Manual Fig 10-1				
	Vibration Levels at distance from track	77.2	dBV re 1 micro in/sec	
Adjustment Factors FTA Table 10-1				
	Speed reference 50 mph	-6	LRT speed of 40 km/h	
	Vehicle Parameters	0	Assume soft primary suspension	
	Track Condition	5	Track is not welded	
	Track Treatments	0	N/A	
	Type of Transit Structure	-10	Elevated transit structure	
	Vibration Propagation	0	Non efficient Propagation of Vibrations in Soil	
	Vibration Levels at Fdn	66		0.052
	Coupling to Building Foundation	-5	Wood frame houses	
	Floor to Floor Attenuation	0	N/A	
	Amplification of Floor and Walls	6		
	Total Vibration Level	67.2	dBV or	0.058 mm/s
	Noise Level in dBA	32.2	dBA	

Table 6-11 Source Adjustment Factors for Generalized Predictions of GB Vibration and Noise

Source Factor	Adjustment to Propagation Curve			Comment
		Reference Speed		
	Vehicle Speed	50 mph	30 mph	
Speed	60 mph	+1.6 dB	+6.0 dB	Vibration level is approximately proportional to 20log(speed/speed$_{ref}$), see Eq. 6-4.
	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.
Track Conditions (not additive, apply greatest value only)				
Worn or Corrugated Track	+10 dB			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. If there are adjustments for vehicle parameters and the track is worn or corrugated, only include one adjustment.
Special Trackwork within 200 ft	+10 dB (within 100 ft) +5 dB (between 100 and 200 ft)			Wheel impacts at special trackwork will greatly increase vibration levels. The increase will be less at greater distances from the track. Do not include an adjustment for special trackwork more than 200 ft away.
Jointed Track	+5 dB			Jointed track can cause higher vibration levels than welded track.
Uneven Road Surfaces	+5 dB			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.

*Mill scale on a new rail is a slightly corrugated condition caused by certain steel mill techniques.

Table 6-12 Path Adjustment Factors for Generalized Predictions of GB Vibration and Noise

Path Factor	Adjustment to Propagation Curve		Comment
Resiliently Supported Ties (Low-Vibration Track, LVT)	-10 dB		Resiliently supported tie systems have been found to provide very effective control of low-frequency vibration.
Track Structure (not additive, apply greatest value only)			
Type of Transit Structure	Relative to at-grade tie & ballast:		In general, 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.
	Elevated structure	-10 dB	
	Open cut	0 dB	
	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.	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.
		50 ft / +2 dB	
		100 ft / +4 dB	
		150 ft / +6 dB	
		200 ft / +9 dB	
Coupling to building foundation	Wood-Frame Houses	-5 dB	In general, the heavier the building construction, the greater the coupling loss.
	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	

Table 6-13 Receiver Adjustment Factors for Generalized Predictions of GB Vibration and Noise

Receiver Factor	Adjustment to Propagation Curve		Comment
Floor-to-floor attenuation	1 to 5 floors above grade	-2 dB/floor	This factor accounts for dispersion and attenuation of the vibration energy as it propagates through a building starting with the first suspended floor.*
	5 to 10 floors above grade	-1 dB/floor	
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.

* Floor-to-floor attenuation adjustments for the first floor assume a basement.

APPENDIX C

SUPPORTING INFORMATION

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

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	Caivan 3713 Borrisokane Road Ottawa, ON K2J 4J4 C: 613-355-6706	*Project :*	BBG 8.59-40 Beechcliffe Avenue, ON
Att'n:	Susan Murphy	*Routing:*	susan.murphy@caivan.com
From: *Expéditeur :*	Ayda Asgari	*Date:*	17/02/2026
Cc:	Adjacent Development CN via e-mail		

☐ Urgent ☐ For Your Use ☐ For Review ■ For Your Information ☐ Confidential

Re: Train Traffic Data – CN Beachburg Subdivision on Beechcliffe Avenue in Nepean, ON

Please find attached the requested Train Traffic Data. The application fee in the amount of **$550.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at 905-669-3264.

Sincerely,
CN Design & Construction

Ayda Asgari
Utilities Coordinator
ayda.asgari@cn.ca

Date: 2026/02/17 Project Number: BBG 8.59-40 Beechcliffe Avenue, ON

Dear Susan:

Re: Train Traffic Data – CN Beachburg Subdivision on Beechcliffe Avenue in Nepean, ON

The following is provided in response to Susan's 2026/02/17 request for information regarding rail traffic in the vicinity of Beechcliffe Avenue at approximately Mile 8.59 on CN's Beachburg Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	-	-	-
Way Freight	1	6	65	4
Passenger	0	-	-	-

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	-	-	-
Way Freight	0	-	-	-
Passenger	0	-	-	-

*Note that the speed limit for this section of the track is 25 Mph.

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Beachburg Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. Anti-whistling bylaws are not in effect at this crossing. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 268,000 lbs.

The single mainline track is considered to be continuously welded rail throughout the study area. The presence of a switches located at Mile 7.53, may exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

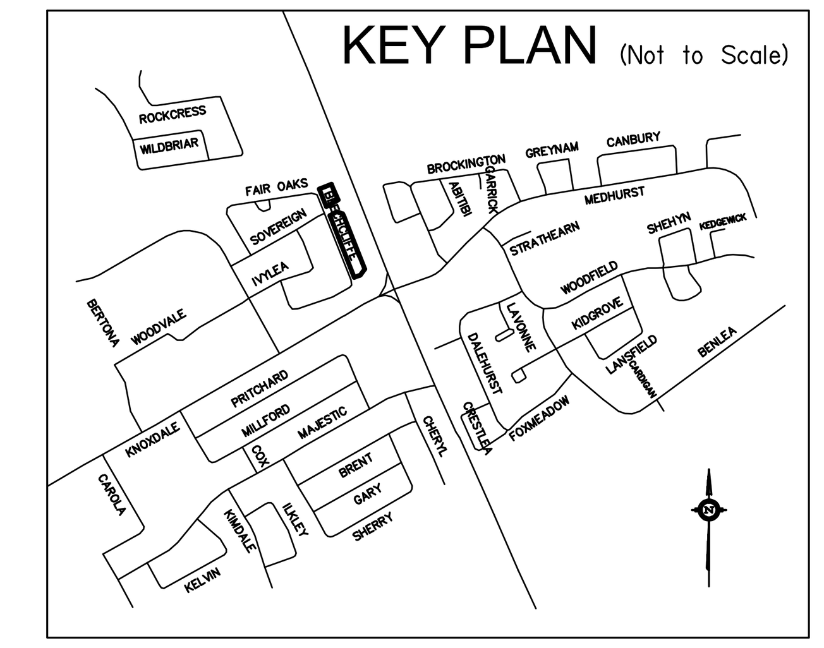
Ayda Asgari
Utilities Coordinator
ayda.asgari@cn.ca

Notes & Legend

Denotes

- ▽ " Service location
- FH " Fire Hydrant
- CB " Catch Basin
- RYCB " Rear Yard Catch Basin
- C/L " Centreline
- " Deciduous Tree

DEVELOPER
HABITAT FOR HUMANITY GREATER OTTAWA
3 IBER ROAD
UNIT 2
STITTSVILLE. ON.
K2S 1E6



"SUBJECT TO SITE PLAN CONTROL" PARCEL

TOTAL NUMBER OF UNITS = 26

SITE AREA = 5862.4 Sq. m.

SITE PLAN OF
HABITAT BEECHCLIFFE
40 BEECHCLIFFE STREET
BEING

ALL OF PART 6 AND
PART OF PARTS 1, 4 AND 11
EXPROPRIATION PLAN 4D-70
BLOCK 45
REGISTERED PLAN 4M-468
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebekk Ltd.
June 26, 2025

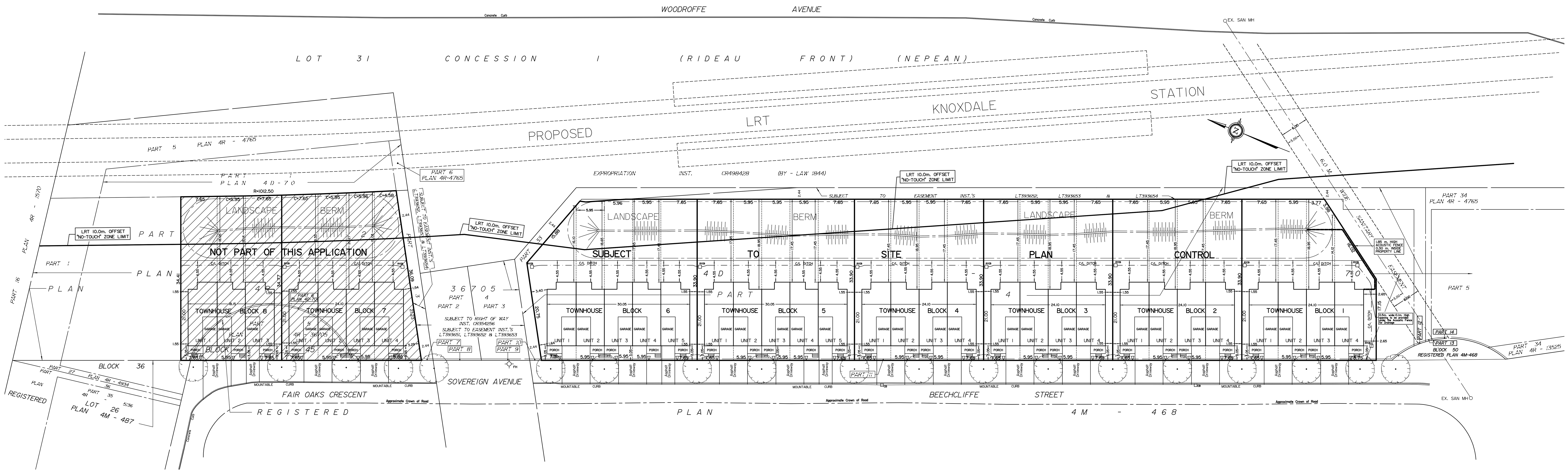
Scale 1 : 400

16 12 8 4 0 8 16 Metres

The intended plot size of this plan is 914.4 mm in width by 609.6 mm in height when plotted at a scale of 1:400.

Metric

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 25159-25 SP-Habitat Ottawa_Pt Blks 39,44,45 PL468 R D6 | FS

CITY OF OTTAWA: D07-12-25-0091 CITY PLAN No. 19322