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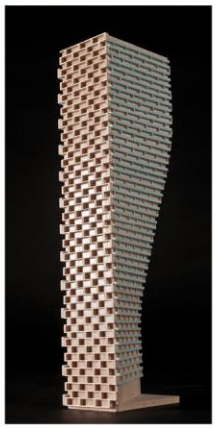
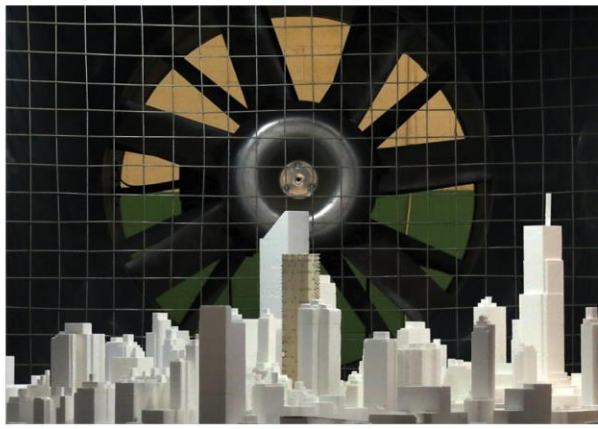
TRANSPORTATION NOISE ASSESSMENT

1531 St. Laurent Boulevard
Ottawa, Ontario

REPORT: 23-136 – Transportation Noise





July 15, 2024

PREPARED FOR

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EXECUTIVE SUMMARY

This report describes a transportation noise assessment for the proposed development located at 1531 St. Laurent Boulevard in Ottawa, Ontario. The development comprises two Towers, labelled Tower A (25-storeys) and Tower B (20-storeys), located west and east on the study site, respectively, including four levels of shared underground parking. The primary sources of transportation noise include St. Laurent Boulevard, Belfast Road, as well as the VIA Rail corridor. As rail or LRT systems are not within 75 m of the proposed development, ground vibration impacts on the site are not expected. Figure 1 illustrates a complete site plan with the surrounding context.

The assessment is based on (i) theoretical noise prediction methods that conform to the Ministry of the Environment, Conservation and Parks (MECP) and City of Ottawa requirements; (ii) noise level criteria as specified by the City of Ottawa's Environmental Noise Control Guidelines (ENCG); (iii) future vehicular traffic volumes based on the City of Ottawa's Official Plan roadway classifications, (iv) railway traffic volumes based on VIA Rail Canada Inc. operating schedule; and (v) architectural drawings provided by Figurr Architects Collective in March 2024.

The results of the current analysis indicate that noise levels will range between 51 and 73 dBA during the daytime period (07:00-23:00) and between 52 and 65 dBA during the nighttime period (23:00-07:00). The highest noise level (73 dBA) occurs at the west facade of Building A which is nearest and most exposed to St. Laurent Boulevard.

Building components with a higher Sound Transmission Class (STC) rating will be required for Buildings A and B where exterior noise levels exceed 65 dBA, as outlined in Section 5.2. The results of the analysis also indicate that Buildings A and B will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

Noise levels at the Level 4 and Level 6 terraces are expected to exceed 55 dBA during the daytime period without a noise barrier. Further analysis investigated the noise mitigating impact of installing perimeter guards from 1.1m to 2.5m above the walking surface as outlined in Table 5. Results of the investigation proved that noise levels can be reduced to 55 or below 60 dBA with an appropriate barrier height. The

preferred barrier heights for the amenity spaces are outlined in Table 5. Where OLA noise levels are between 55 and 60 dBA, a Type B Warning Clause will be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

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

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained by Katasa Groupe Development to undertake a transportation noise study to satisfy Site Plan Control application submission requirements for the proposed mixed-use residential development located at 1531 St. Laurent Boulevard in Ottawa, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior and interior noise levels generated by local transportation noise sources.

Our work is based on theoretical noise calculation methods conforming to the City of Ottawa[1] noise guidelines, and Ministry of the Environment, Conservation and Parks (MECP)[2] guidelines. Noise calculations were based on architectural drawings provided by Figurr Architects Collective in March 2024, and railway traffic volumes based on VIA Rail Canada Inc. operating schedule.

2. TERMS OF REFERENCE

The subject site is located at 1531 St. Laurent Boulevard in Ottawa; situated at the southeast intersection of St. Laurent Boulevard and Belfast Road, on a parcel of land bounded by St. Laurent Boulevard to the west, Belfast Road to the north, Lagan Way to the east, and low-rise commercial buildings to the south. The proposed development comprises two towers, Tower A and Tower B, situated to the west and east of the subject site, respectively. Tower A rises to 25 storeys, inclusive of a six-storey podium, and Tower B rises to 20 storeys, inclusive of a four-storey podium. Both towers are topped with a mechanical penthouse (MPH) and share four-below-grade parking levels.

The ground floor of Tower A comprises a nominally rectangular planform with its long axis oriented along St. Laurent Boulevard and includes a residential main entrance at the northwest corner, shared building support spaces and surface parking to the east, a garbage room to the south, and retail spaces to the west. Access to the shared underground parking levels is provided by a ramp at the southeast corner of Tower A, accessed via a drive aisle extending from Belfast Road to Lagan Way. The ground floor of Tower B comprises a nominally 'L'-shaped planform and includes a residential main entrance to the west, a kid's room to the

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

north, residential units to the east, and shared building support spaces throughout the remainder of the level. Tower A steps back from the south elevation at Level 7 and from the east and south elevations at the MPH Level, and Tower B steps back from the east elevation at Level 5 and from the north elevation at the MPH Level, accommodating common amenity terraces. The Level 5 amenity terrace serving Tower B includes a pool area to the north.

The primary sources of transportation noise include St. Laurent Boulevard, Belfast Road, as well as the VIA Rail corridor. As rail or LRT systems are not within 75 m of the proposed development, ground vibration impacts on the site are not expected. Figure 1 illustrates a complete site plan with surrounding context.

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

3. OBJECTIVES

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

4. METHODOLOGY

4.1 Background

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

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

4.2 Transportation Traffic Noise

4.2.1 Criteria for Transportation Traffic Noise

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

TABLE 1: INDOOR SOUND LEVEL CRITERIA [3]

Type of Space	Time Period	Road L_{eq} (dBA)	Rail L_{eq} (dBA)
General offices, reception areas, retail stores, etc.	07:00 – 23:00	50	45
Living/dining/den areas of **residences**, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	23:00 – 07:00	45	40
Sleeping quarters of **residences**, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40	35

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. An open window is considered to provide a 10 dBA reduction in noise while a standard closed window is capable of providing a minimum 20 dBA noise reduction[4]. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation[5].

Due to the characteristics of rail noise which occur over short periods (i.e. whistles, brake squealing), and a significant low frequency component produced by the movement of the locomotive along the track, road and rail traffic noise require separate analyses, particularly when assessing indoor sound levels. In order to account for the special characteristics of railway sound, the indoor sound level criteria are more stringent by 5 dB as compared to the roadway traffic criteria. This difference typically results in requirements for upgraded glazing elements to provide better noise attenuation from the building envelope. Interior noise level criteria include the influence from rail crossings and warning whistle bursts.

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

For designated Outdoor Living Areas (OLAs), the sound level limit is 55 dBA during the daytime period. An excess above the limit, between 55 dBA and 60 dBA, is acceptable only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons. Noise levels at the OLA must not exceed 60 dBA in all cases. The development includes a parkland area at the center which is not identified as a noise-sensitive OLA as per NPC-300 and was omitted from the assessment.

4.2.2 Theoretical Transportation Noise Predictions

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

Roadway and railway traffic noise calculations were performed by treating each roadway segment as separate line sources of noise, and by using existing and proposed 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 for all sources was taken to be 92%/8%, respectively.
- The ground surface was modelled as reflective where pavement, concrete, and compact soil are present (hard ground). For railway noise, the ground surface was modelled as absorptive to account for the blockage from low-rise commercial buildings situated between the railway corridor and the development.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Massing associated with the study site and existing surrounding buildings were included as potential noise screening elements.
- Noise receptors were strategically placed at 14 locations around the study area (see Figure 2).
- Receptor distances and exposure angles, used in STAMSON calculations, are illustrated in Figures 3-5.
- The VIA Rail corridor was modeled as a diesel train with 1 locomotive and an average of 4 cars per train travelling at a maximum speed of 150 km/hr.

4.2.1 Transportation Traffic Volumes

The ENCG dictates that noise calculations should consider future sound levels based on a roadway's classification at the mature state of development. Therefore, traffic volumes are based on the roadway classifications outlined in the City of Ottawa's Official Plan (OP) and Transportation Master Plan[6] which provide additional details on future roadway expansions. Average Annual Daily Traffic (AADT) volumes are then based on data in Table B1 of the ENCG for each roadway classification. For railway volumes, the data was projected to 2033 at an annual rate of 2.5% per year. Table 2 summarizes the AADT values used for each roadway and VIA Rail line included in this assessment.

TABLE 2: TRANSPORTATION TRAFFIC DATA

Segment	Railway Traffic Data	Speed Limit (km/h)	Traffic Volumes
St. Laurent Boulevard	4-Lane Urban Arterial Divided (4-UAD)	70	**35,000**
Belfast Road	2-Lane Urban Arterial (2-UAU)	50	**8,000**
VIA Rail	Passenger Rail	150	**18/4***

*Projected 2033 AADT daytime/nighttime rail traffic volumes based on the VIA Rail operating schedule.

4.3 Indoor Noise Calculations

The difference between outdoor and indoor noise levels is the noise attenuation provided by the building envelope. According to common industry practice, complete walls and individual wall elements are rated according to the Sound Transmission Class (STC). The STC ratings of common residential walls built in conformance with the Ontario Building Code (2020) typically exceed STC 35, depending on exterior cladding, thickness and interior finish details. For example, brick veneer walls can achieve STC 50 or more. Standard commercially sided exterior metal stud walls have around STC 45. Standard good quality double-glazed non-operable windows can have STC ratings ranging from 25 to 40, depending on the window manufacturer, pane thickness and inter-pane spacing. As previously mentioned, the windows are the known weak point in a partition.

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

As per Section 4.2, when daytime noise levels from road sources at the plane of the window exceed 65 dBA, calculations must be performed to evaluate the sound transmission quality of the building components to ensure acceptable indoor noise levels. The calculation procedure[7] considers:

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

Based on published research[8], exterior walls possess specific sound attenuation characteristics that are used as a basis for calculating the required STC ratings of windows in the same partition. As a guideline, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factors).

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

5. RESULTS AND DISCUSSION

5.1 Transportation Noise Levels

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

TABLE 3: EXTERIOR NOISE LEVELS DUE TO ROAD AND RAIL TRAFFIC (STAMSON 5.04)

Receptor Number	Receptor Height Above Grade/Roof (m)	Receptor Location	Transportation Noise Level (dBA)	
			Day	Night
BUILDING A				
1	75	POW – Level 24 - North Facade	70	63
2	75	POW – Level 24 - East Facade	60	52
3	75	POW – Level 24 - South Facade	68	61
4	75	POW – Level 24 - West Facade	73	65
13	22	OLA – Level 6 Terrace	56	N/A*
14	79	OLA – Mechanical Penthouse Amenity	51	N/A*
BUILDING B				
5	10	POW – Level 3 - West Facade	64	57
6	10	POW – Level 3 - North Facade	68	61
7	59	POW – Level 19 – North Façade	68	60
8	59	POW – Level 19 - East Facade	59	52
9	59	POW – Level 19 – South Façade	65	57
10	59	POW – Level 19 – West Façade	63	56
11	14	OLA – Level 4 Terrace	63	N/A*
12	62	OLA – Mechanical Penthouse Amenity	52	N/A*

*Noise levels during the nighttime are not considered for OLAs as per ENCG.

The results of the current analysis indicate that noise levels will range between 51 and 73 dBA during the daytime period (07:00-23:00) and between 52 and 65 dBA during the nighttime period (23:00-07:00). The highest noise level (73 dBA) occurs at the west facade of Building A which is nearest and most exposed to St. Laurent Boulevard.

5.2 Noise Control Measures

The noise levels predicted due to transportation sources exceed the criteria listed in NPC-300 for building components. As discussed in Section 4.3, the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels + safety factor). Detailed STC calculations should be completed prior to building permit application for each unit type. The STC requirements for the windows are summarized below in Table 4 for various units within the development (see Figure 6). Where specific updated building components are not identified for these blocks, bedroom/living room/retail windows are to satisfy Ontario Building Code (OBC 2020) requirements.

TABLE 4: NOISE CONTROL REQUIREMENTS

Location	Façade	Floor Number	Min. Window STC (Bedroom/Living Room/Retail)	Exterior Wall STC*	Warning Clauses	A/C or FAH
Building A	West, North, South	1-25	36/31/26	45	Type D	A/C
Building B	North	1-20	31/26/21	45	Type D	A/C

*Exterior walls of the first row of dwellings next to railway tracks are to be built to a minimum of brick veneer or masonry equivalent construction[9]

A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing. We have not specified any particular window configurations, as there are several manufacturers and various combinations of window components that will offer the necessary sound attenuation rating. However, it is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The

[9] Adapted from Paragraph 3 of Section C7.2.3 of NPC-300

requirements for STC ratings assume that the remaining components of the building are constructed and installed according to the minimum standards of the Ontario Building Code. The specified STC requirements also apply to swinging and/or sliding patio doors. All specified building components will require review by a qualified acoustical engineer for conformance to the recommendations of this report prior to the building permit application.

Results of the calculations also indicate that Buildings A and B will require air conditioning (or a similar mechanical system), which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized in Section 6.

5.2.1 Noise Barrier Calculation

Noise levels at the Level 6 and Level 4 terraces are expected to exceed 55 dBA during the daytime period without a noise barrier. If these areas are to be used as outdoor living areas, noise control measures are required to reduce noise levels as close as possible to 55 dBA but not exceeding 60 dBA. Further analysis investigated the noise mitigating impact of installing perimeter guards from 1.1m to 2.5m above the walking surface as outlined in Table 5.

Results of the investigation proved that noise levels can be reduced to 55 or below 60 dBA with an appropriate barrier height. The preferred barrier heights for the amenity spaces are associated to the noise levels in **bold** font. Noise levels at the Level 6 OLA can be reduced to 55 dBA by implementing a 1.1 m tall barrier surrounding the east, south, and west perimeters. Reducing noise levels to 55 dBA at the Level 4 OLA would require excessive barrier heights that would not be administratively and financially feasible. Therefore, a 2 m tall barrier surrounding east and south perimeter was selected as a practical option. Where OLA noise levels are between 55 and 60 dBA, a Type B Warning Clause will be required on all Lease, Purchase and Sale Agreements, as summarized in Section 6. Figure 7 illustrates the barrier requirements.

TABLE 5: RESULTS OF NOISE BARRIER INVESTIGATION

Receptor Number	Receptor Height Above Grade (m)	Receptor Location	Daytime L_{eq} Noise Levels (dBA)				
			No Barrier	With 1.1 m Barrier	With 1.5 m Barrier	With 2 m Barrier	With 2.5 m Barrier
R11	22	Building B – OLA – Level 4 Terrace	63	59	57	**56**	55
R13	14	Building A – OLA - Level 6 Terrace	56	**54**	54	53	53

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 51 and 73 dBA during the daytime period (07:00-23:00) and between 52 and 65 dBA during the nighttime period (23:00-07:00). The highest noise level (73 dBA) occurs at the west facade of Building A which is nearest and most exposed to St. Laurent Boulevard.

Building components with a higher Sound Transmission Class (STC) rating will be required for Buildings A and B where exterior noise levels exceed 65 dBA, as outlined in Section 5.2. The results of the analysis also indicate that Buildings A and B will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. Warning Clauses will also be required to be placed on all Lease, Purchase and Sale Agreements, as summarized below.

Type D

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

Noise levels at the Level 6 and Level 4 terraces are expected to exceed 55 dBA during the daytime period without a noise barrier. Further analysis investigated the noise mitigating impact of installing perimeter guards from 1.1m to 2.5m above the walking surface as outlined in Table 5. Results of the investigation proved that noise levels can be reduced to 55 or below 60 dBA with an appropriate barrier height. Noise levels at the Level 6 OLA can be reduced to 55 dBA by implementing a 1.1 m tall barrier surrounding the east, south, and west perimeters. Reducing noise levels to 55 dBA at the Level 4 OLA would require excessive barrier heights that would not be administratively and financially feasible. Therefore, a 2 m tall barrier surrounding east and south perimeter was selected as a practical option. Where OLA noise levels are between 55 and 60 dBA, a Type B Warning Clause will be required on all Lease, Purchase and Sale Agreements, as summarized below.

Type B:

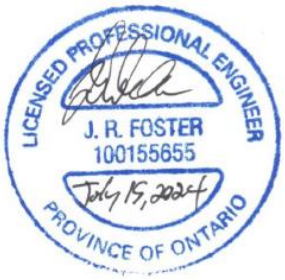
> *"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits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

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

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

Sincerely,

Gradient Wind Engineering Inc.



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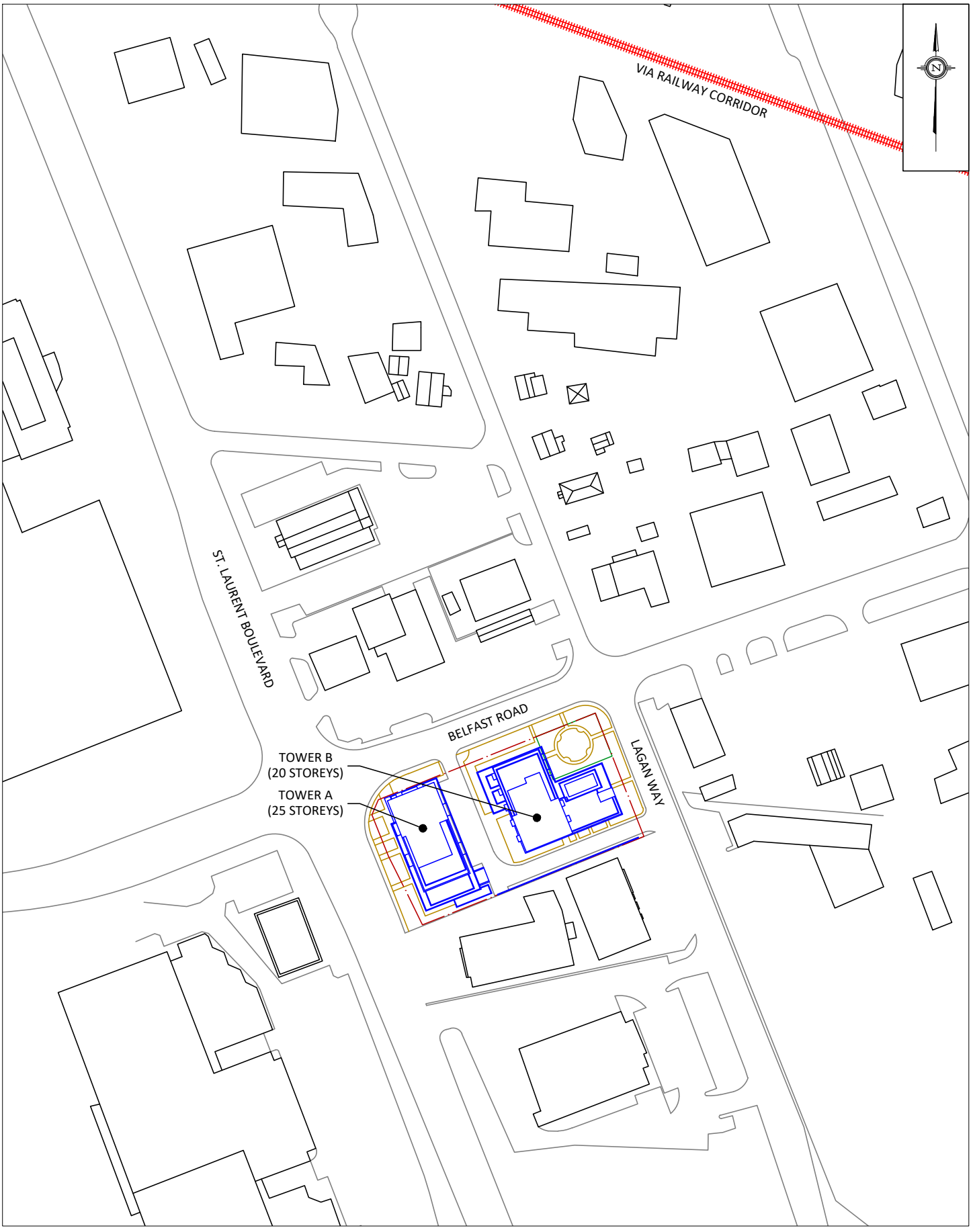

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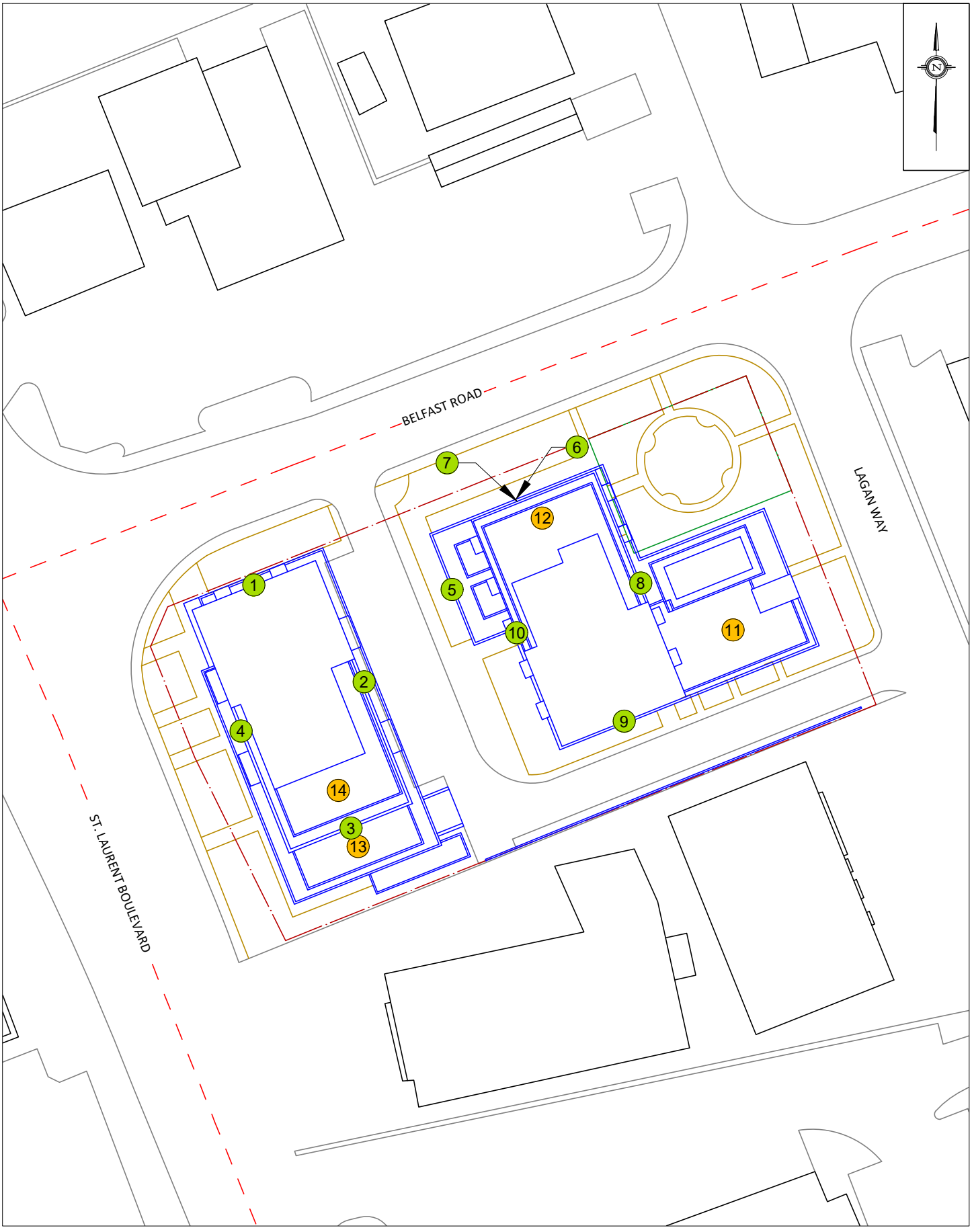
PROJECT	1531 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY
SCALE	1:2000
DRAWING NO.	23-136-NOISE- FIG1
DATE	JULY 15, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 1:
PROPOSED SITE PLAN AND SURROUNDING CONTEXT



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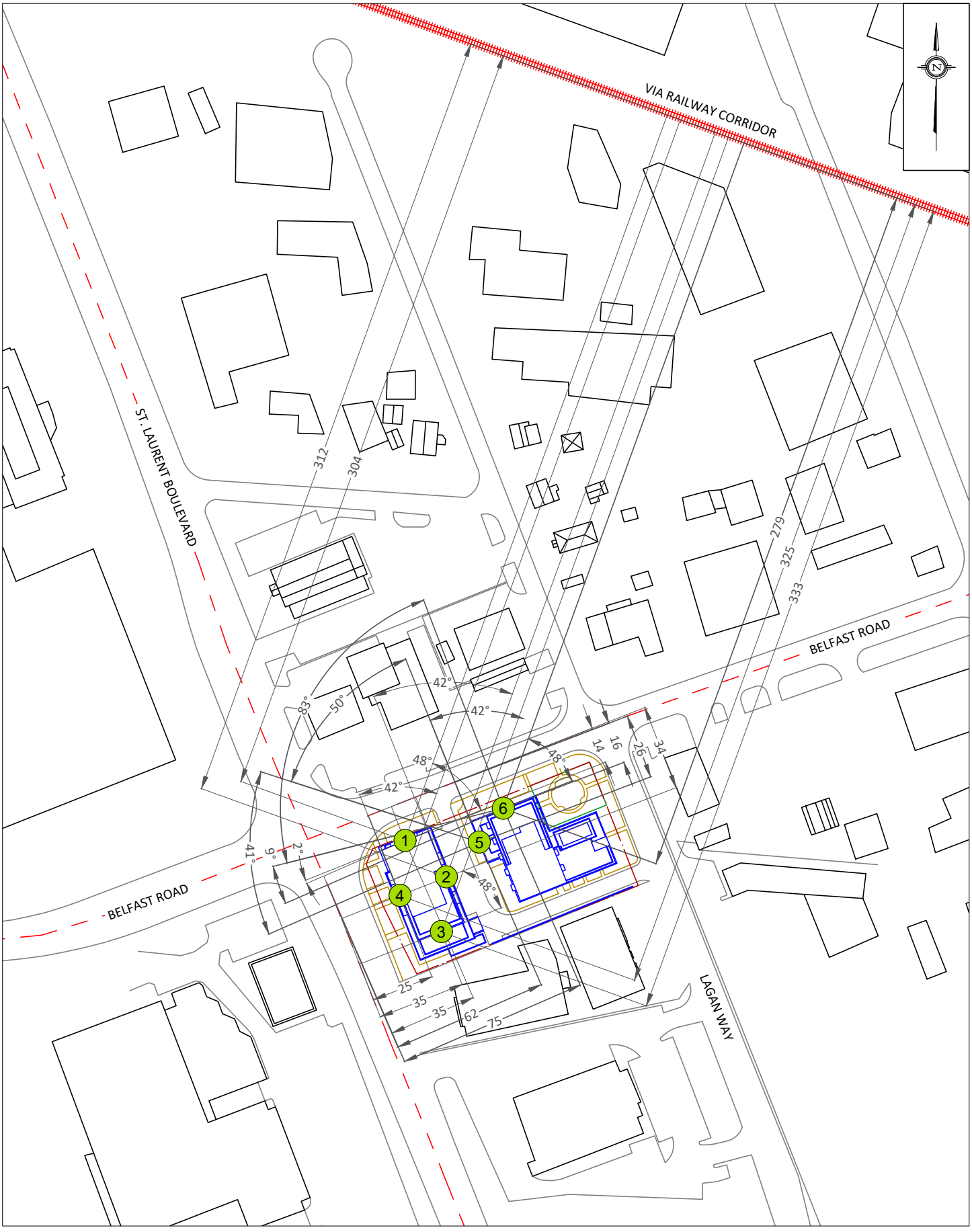
PROJECT	1531 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY		DESCRIPTION
SCALE	1:750	DRAWING NO. 23-136-NOISE- FIG2	FIGURE 2: RECEPTOR LOCATIONS
DATE	JULY 15, 2024	DRAWN BY B.P.	



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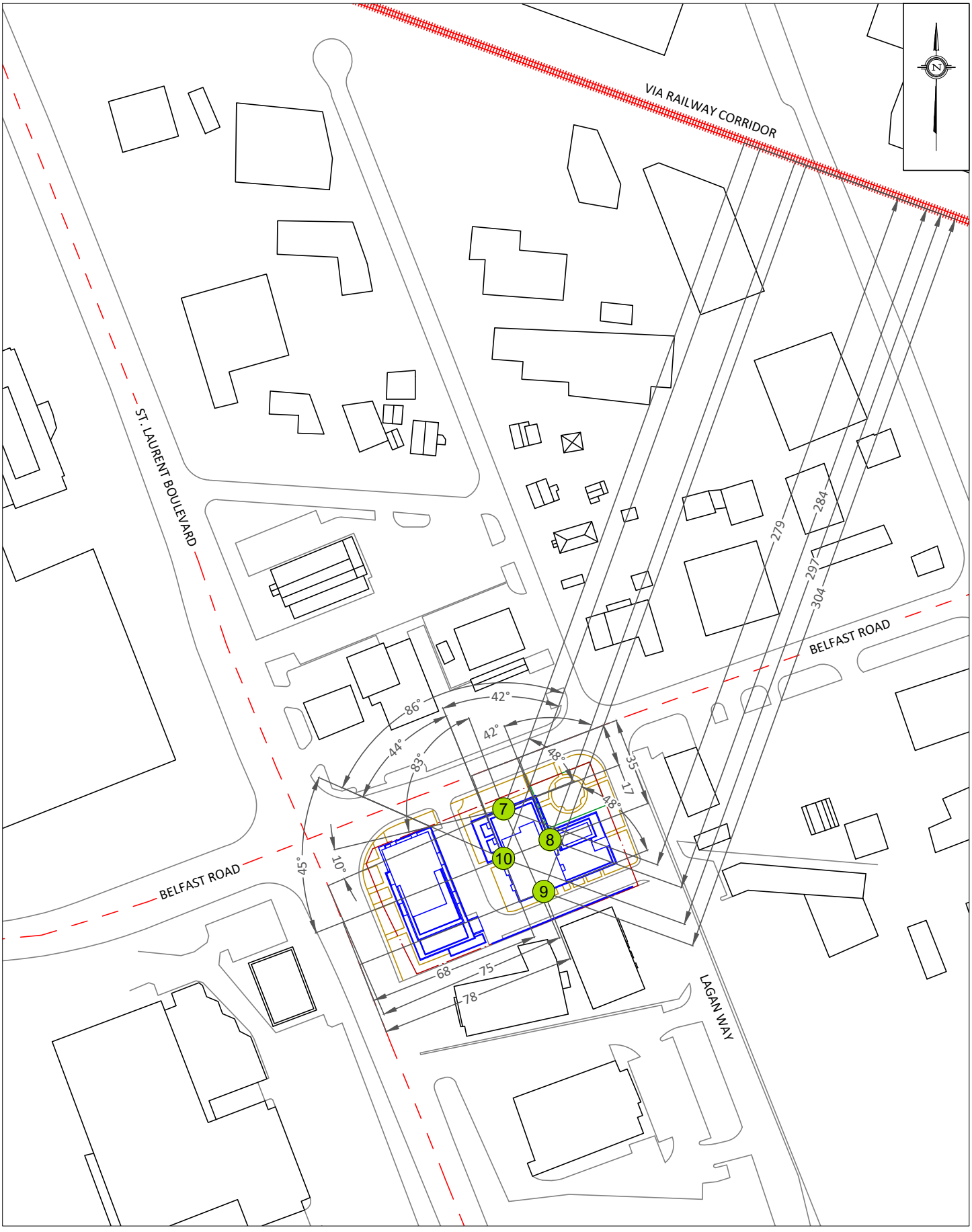
PROJECT	1531 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY		
SCALE	1:2000	DRAWING NO.	23-136-NOISE- FIG3
DATE	JULY 15, 2024	DRAWN BY	B.P.

DESCRIPTION

FIGURE 3:
STAMSON 5.04 INPUT DATA:
RECEPTORS 1-6



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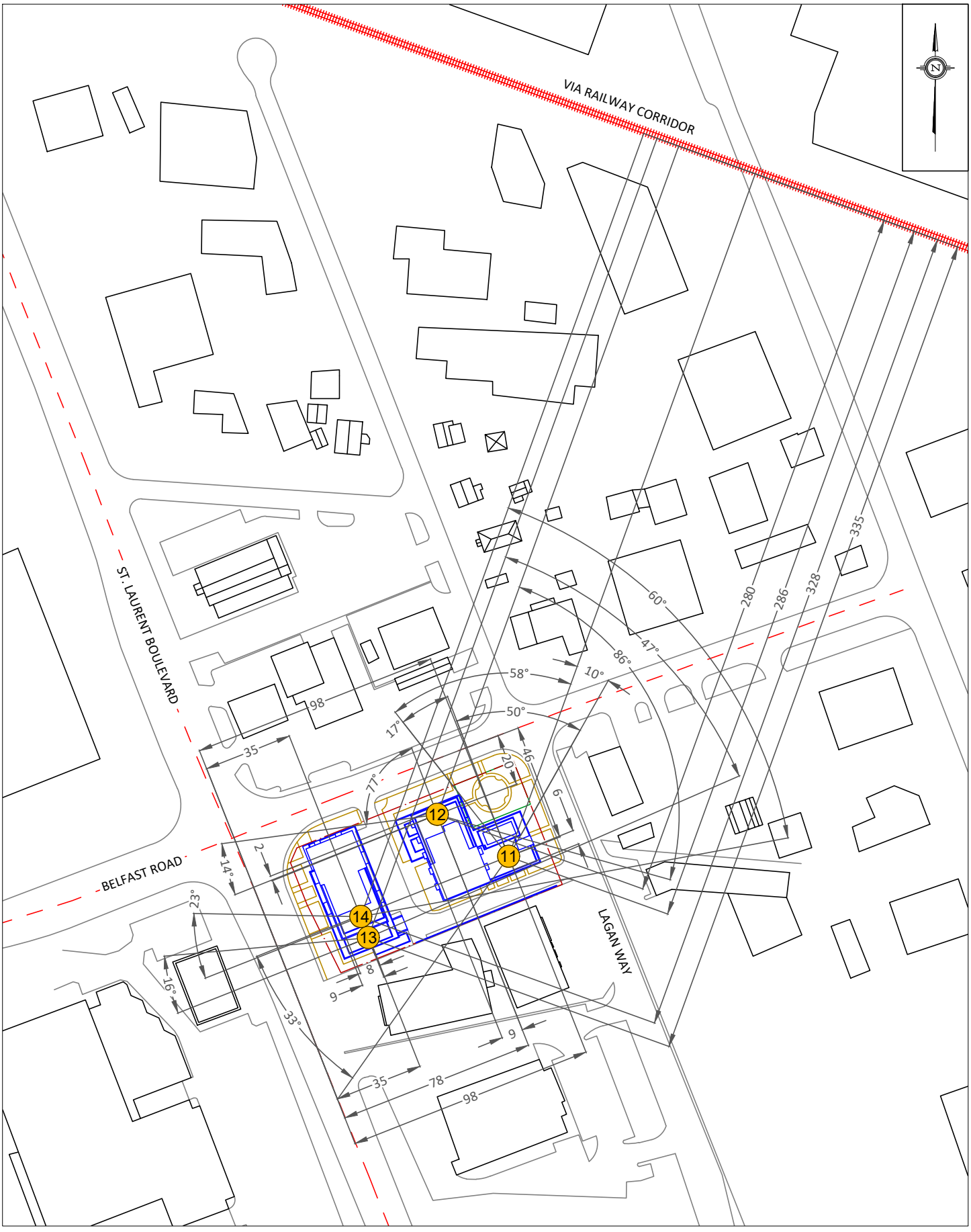
SCALE	1:1500
DRAWING NO.	23-136-NOISE- FIG4
DATE	JULY 15, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 4:
STAMSON 5.04 INPUT DATA:
RECEPTORS 7-10



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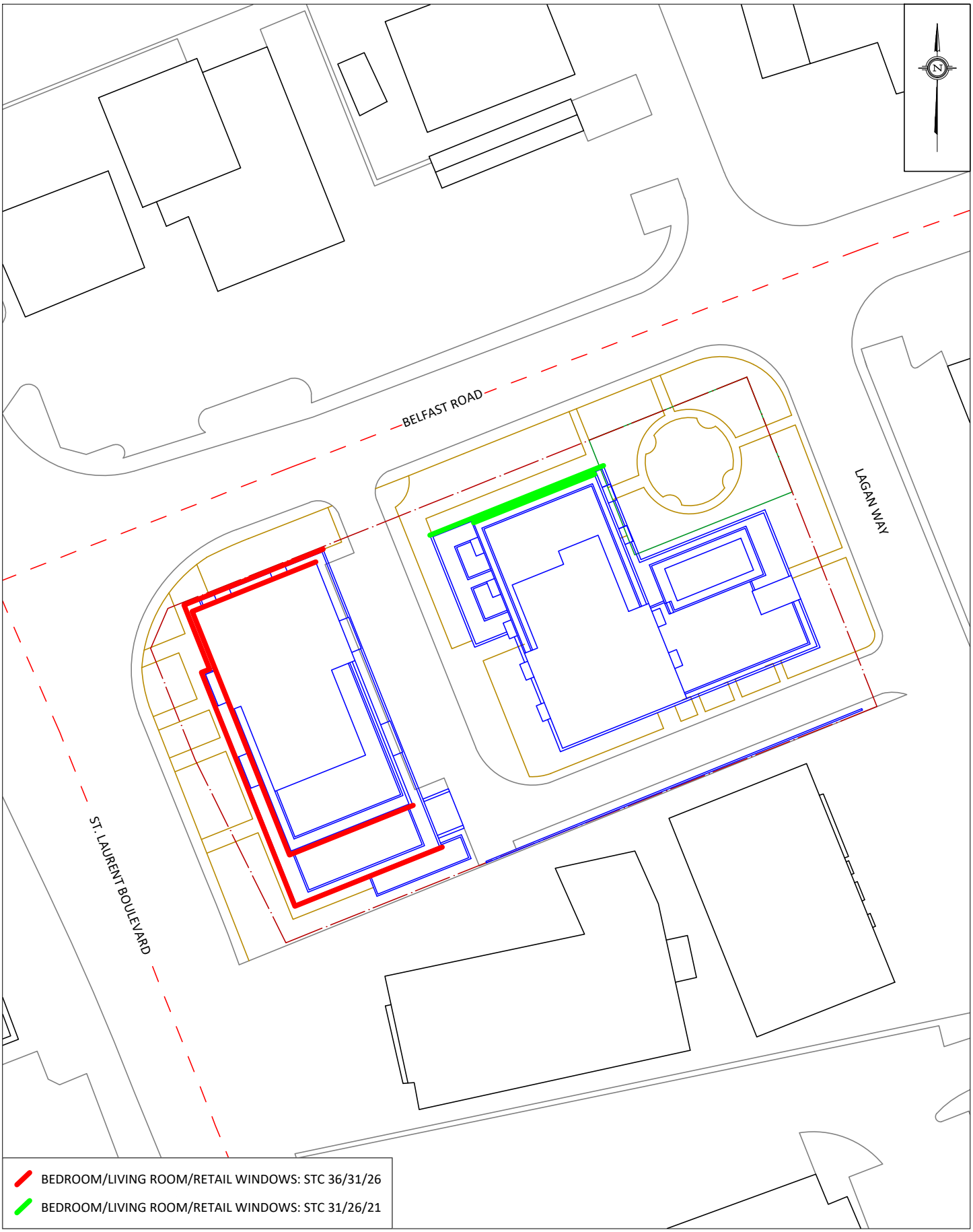
SCALE	1:2000
DRAWING NO.	23-136-NOISE- FIG5
DATE	JULY 15, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 5:
STAMSON 5.04 INPUT DATA:
RECEPTORS 11-14



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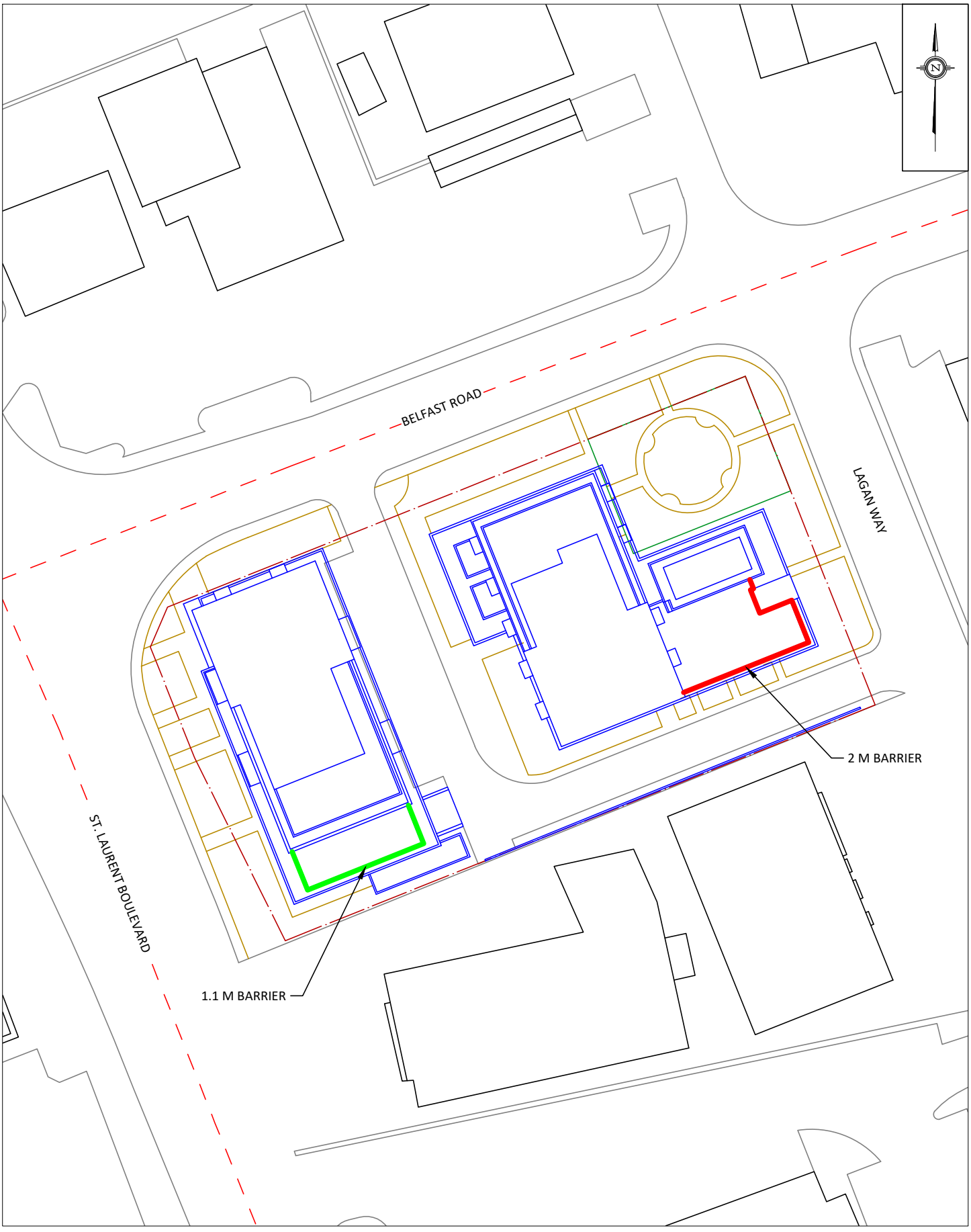
PROJECT	1531 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY
SCALE	1:750
DRAWING NO.	23-136-NOISE- FIG6
DATE	JULY 15, 2024
DRAWN BY	B.P.

DESCRIPTION

FIGURE 6:
STC REQUIREMENTS



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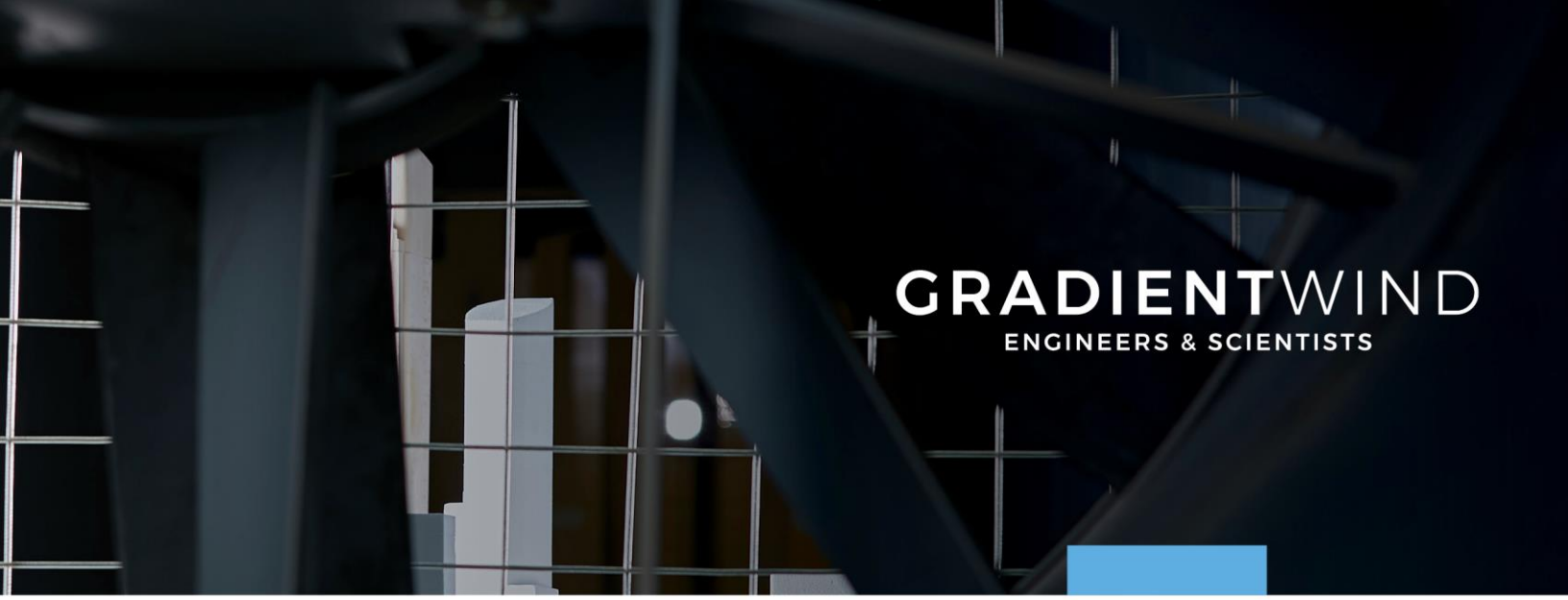
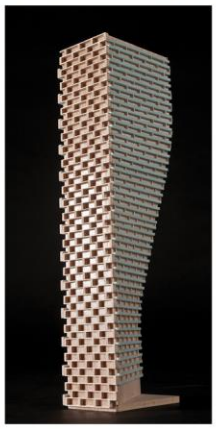
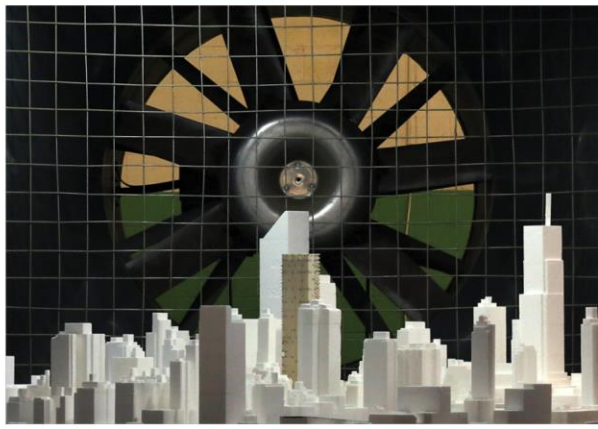
PROJECT	1531 ST. LAURENT BOULEVARD, OTTAWA PEDESTRIAN LEVEL WIND STUDY		DESCRIPTION
SCALE	1:750	DRAWING NO. 23-136-NOISE- FIG7	FIGURE 7: BARRIER REQUIREMENTS
DATE	JULY 15, 2024	DRAWN BY B.P.	







APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:07:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R1.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -90.00 deg	48.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 304.00 / 304.00 m	
Receiver height	: 75.00 / 75.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 48.12 + 0.00) = 48.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	68.49	-13.07	-1.15	0.00	-6.15	0.00	48.12

WHEEL (0.00 + 41.20 + 0.00) = 41.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	61.57	-13.07	-1.15	0.00	-6.15	0.00	41.20

Segment Leq : 48.92 dBA

Total Leq All Segments: 48.92 dBA

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

LOCOMOTIVE (0.00 + 44.60 + 0.00) = 44.60 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  64.97 -13.07  -1.15   0.00  -6.15   0.00  44.60
-------------------------------------------------------------------------

WHEEL (0.00 + 37.68 + 0.00) = 37.68 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  58.05 -13.07  -1.15   0.00  -6.15   0.00  37.68
-------------------------------------------------------------------------

Segment Leq : 45.40 dBA

Total Leq All Segments: 45.40 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :   2.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 65.75 + 0.00) = 65.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  65.75   0.00   0.00   0.00   0.00   0.00   0.00  65.75
-------------------------------------------------------------------------------

Segment Leq : 65.75 dBA
```

```
Results segment # 2: STLAURENT (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 68.21 + 0.00) = 68.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     2     90   0.00  75.00   0.00  -3.68  -3.11   0.00   0.00   0.00  68.21
-------------------------------------------------------------------------------

Segment Leq : 68.21 dBA

Total Leq All Segments: 70.16 dBA

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

Source height = 1.50 m

ROAD (0.00 + 58.16 + 0.00) = 58.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  58.16   0.00   0.00   0.00   0.00   0.00   0.00  58.16
-------------------------------------------------------------------------------

Segment Leq : 58.16 dBA

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

Source height = 1.50 m

ROAD (0.00 + 60.61 + 0.00) = 60.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     2     90   0.00  67.40   0.00  -3.68  -3.11   0.00   0.00   0.00  60.61
-------------------------------------------------------------------------------

Segment Leq : 60.61 dBA

Total Leq All Segments: 62.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.19
                           (NIGHT): 62.65
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:18:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R2.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -42.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 304.00 / 304.00 m	
Receiver height	: 75.00 / 75.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 47.93 + 0.00) = 47.93 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	90	0.00	68.49	-13.07	-1.35	0.00	-6.15	0.00	47.93

WHEEL (0.00 + 41.01 + 0.00) = 41.01 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	90	0.00	61.57	-13.07	-1.35	0.00	-6.15	0.00	41.01

Segment Leq : 48.73 dBA

Total Leq All Segments: 48.73 dBA

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

LOCOMOTIVE (0.00 + 44.41 + 0.00) = 44.41 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -42     90   0.00  64.97 -13.07  -1.35   0.00  -6.15   0.00  44.41
-------------------------------------------------------------------------

WHEEL (0.00 + 37.48 + 0.00) = 37.48 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -42     90   0.00  58.05 -13.07  -1.35   0.00  -6.15   0.00  37.48
-------------------------------------------------------------------------

Segment Leq : 45.21 dBA

Total Leq All Segments: 45.21 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: BELFAST RD (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.19 + 0.00) = 59.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.75   0.00  -3.55  -3.01   0.00   0.00   0.00  59.19
-------------------------------------------------------------------------------

Segment Leq : 59.19 dBA

Total Leq All Segments: 59.19 dBA

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

Source height = 1.50 m

ROAD (0.00 + 51.59 + 0.00) = 51.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  58.16   0.00  -3.55  -3.01   0.00   0.00   0.00  51.59
-------------------------------------------------------------------------------

Segment Leq : 51.59 dBA

Total Leq All Segments: 51.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.56
                           (NIGHT): 52.49
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:22:04
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R3.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	48.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	4 / 4	
House density	60 %	
Surface	2	(Reflective ground surface)
Receiver source distance	333.00 / 333.00 m	
Receiver height	75.00 / 75.00 m	
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 41.08 + 0.00) = 41.08 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	68.49	-13.46	-6.32	0.00	-7.62	0.00	41.08

WHEEL (0.00 + 34.16 + 0.00) = 34.16 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	61.57	-13.46	-6.32	0.00	-7.62	0.00	34.16

Segment Leq : 41.88 dBA

Total Leq All Segments: 41.88 dBA

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

LOCOMOTIVE (0.00 + 37.56 + 0.00) = 37.56 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.00  64.97 -13.46  -6.32   0.00  -7.62   0.00  37.56
-------------------------------------------------------------------------

WHEEL (0.00 + 30.64 + 0.00) = 30.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.00  58.05 -13.46  -6.32   0.00  -7.62   0.00  30.64
-------------------------------------------------------------------------

Segment Leq : 38.36 dBA

Total Leq All Segments: 38.36 dBA

Road data, segment # 1: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 68.31 + 0.00) = 68.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  75.00   0.00  -3.68  -3.01   0.00   0.00   0.00  68.31
-------------------------------------------------------------------------------

Segment Leq : 68.31 dBA

Total Leq All Segments: 68.31 dBA

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

Source height = 1.50 m

ROAD (0.00 + 60.71 + 0.00) = 60.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  67.40   0.00  -3.68  -3.01   0.00   0.00   0.00  60.71
-------------------------------------------------------------------------------

Segment Leq : 60.71 dBA

Total Leq All Segments: 60.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.32
                           (NIGHT): 60.74
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:24:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R4.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -90.00 deg	-42.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 325.00 / 325.00 m	
Receiver height	: 75.00 / 75.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 43.26 + 0.00) = 43.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-42	0.00	68.49	-13.36	-5.74	0.00	-6.13	0.00	43.26

WHEEL (0.00 + 36.34 + 0.00) = 36.34 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-42	0.00	61.57	-13.36	-5.74	0.00	-6.13	0.00	36.34

Segment Leq : 44.06 dBA

Total Leq All Segments: 44.06 dBA

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

LOCOMOTIVE (0.00 + 39.74 + 0.00) = 39.74 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -42   0.00  64.97 -13.36  -5.74   0.00  -6.13   0.00  39.74
-------------------------------------------------------------------------

WHEEL (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    -42   0.00  58.05 -13.36  -5.74   0.00  -6.13   0.00  32.82
-------------------------------------------------------------------------

Segment Leq : 40.54 dBA

Total Leq All Segments: 40.54 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  34.00 / 34.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :  75.00 / 75.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 59.19 + 0.00) = 59.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  65.75   0.00  -3.55  -3.01   0.00   0.00   0.00  59.19
-------------------------------------------------------------------------------

Segment Leq : 59.19 dBA
```

```
Results segment # 2: STLAURENT (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 72.78 + 0.00) = 72.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  75.00   0.00  -2.22   0.00   0.00   0.00   0.00  72.78
-------------------------------------------------------------------------------

Segment Leq : 72.78 dBA

Total Leq All Segments: 72.97 dBA

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

Source height = 1.50 m

ROAD (0.00 + 51.59 + 0.00) = 51.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  58.16   0.00  -3.55  -3.01   0.00   0.00   0.00  51.59
-------------------------------------------------------------------------------

Segment Leq : 51.59 dBA

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

Source height = 1.50 m

ROAD (0.00 + 65.18 + 0.00) = 65.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  67.40   0.00  -2.22   0.00   0.00   0.00   0.00  65.18
-------------------------------------------------------------------------------

Segment Leq : 65.18 dBA

Total Leq All Segments: 65.37 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 72.97
                           (NIGHT): 65.38
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:36:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R5.te Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: BELFAST RD (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
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: BELFAST RD (day/night)

Angle1 Angle2 : -50.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 26.00 / 26.00 m
Receiver height : 10.00 / 10.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: STLAURENT (day/night)

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 70 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): 35000
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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :  41.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  62.00 / 62.00  m
Receiver height           :  10.00 / 10.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 57.80 + 0.00) = 57.80 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -50      0   0.00  65.75   0.00  -2.39  -5.56   0.00   0.00   0.00  57.80
-------------------------------------------------------------------------------

Segment Leq : 57.80 dBA

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

Source height = 1.50 m

ROAD (0.00 + 63.18 + 0.00) = 63.18 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    41     90   0.00  75.00   0.00  -6.16  -5.65   0.00   0.00   0.00  63.18
-------------------------------------------------------------------------------

Segment Leq : 63.18 dBA

Total Leq All Segments: 64.29 dBA

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

Source height = 1.50 m

ROAD (0.00 + 50.21 + 0.00) = 50.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -50      0   0.00  58.16   0.00  -2.39  -5.56   0.00   0.00   0.00  50.21
-------------------------------------------------------------------------------

Segment Leq : 50.21 dBA
```

```
Results segment # 2: STLAURENT (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 55.58 + 0.00) = 55.58 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    41     90   0.00  67.40   0.00  -6.16  -5.65   0.00   0.00   0.00  55.58
-------------------------------------------------------------------------------

Segment Leq : 55.58 dBA

Total Leq All Segments: 56.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.29
                           (NIGHT): 56.69
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:41:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R6.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -90.00 deg	48.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 279.00 / 279.00 m	
Receiver height	: 10.00 / 10.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 48.47 + 0.00) = 48.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	68.49	-12.70	-1.15	0.00	-6.17	0.00	48.47

WHEEL (0.00 + 41.55 + 0.00) = 41.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	61.57	-12.70	-1.15	0.00	-6.17	0.00	41.55

Segment Leq : 49.27 dBA

Total Leq All Segments: 49.27 dBA

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

LOCOMOTIVE (0.00 + 44.95 + 0.00) = 44.95 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  64.97 -12.70  -1.15   0.00  -6.17   0.00  44.95
-------------------------------------------------------------------------

WHEEL (0.00 + 38.03 + 0.00) = 38.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  58.05 -12.70  -1.15   0.00  -6.17   0.00  38.03
-------------------------------------------------------------------------

Segment Leq : 45.75 dBA

Total Leq All Segments: 45.75 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           : -83.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  16.00 / 16.00  m
Receiver height           :  10.00 / 10.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :   9.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  75.00 / 75.00  m
Receiver height           :  10.00 / 10.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 65.30 + 0.00) = 65.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -83     90   0.00  65.75   0.00  -0.28  -0.17   0.00   0.00   0.00  65.30
-------------------------------------------------------------------------------

Segment Leq : 65.30 dBA
```

```
Results segment # 2: STLAURENT (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.54 + 0.00) = 64.54 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     9     90   0.00  75.00   0.00  -6.99  -3.47   0.00   0.00   0.00  64.54
-------------------------------------------------------------------------------

Segment Leq : 64.54 dBA

Total Leq All Segments: 67.95 dBA

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

Source height = 1.50 m

ROAD (0.00 + 57.70 + 0.00) = 57.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -83     90   0.00  58.16   0.00  -0.28  -0.17   0.00   0.00   0.00  57.70
-------------------------------------------------------------------------------

Segment Leq : 57.70 dBA

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

Source height = 1.50 m

ROAD (0.00 + 56.94 + 0.00) = 56.94 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     9     90   0.00  67.40   0.00  -6.99  -3.47   0.00   0.00   0.00  56.94
-------------------------------------------------------------------------------

Segment Leq : 56.94 dBA

Total Leq All Segments: 60.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.01
                           (NIGHT): 60.50
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:46:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R7.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -90.00 deg	48.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 279.00 / 279.00 m	
Receiver height	: 59.00 / 59.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 48.47 + 0.00) = 48.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	68.49	-12.70	-1.15	0.00	-6.17	0.00	48.47

WHEEL (0.00 + 41.55 + 0.00) = 41.55 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	48	0.00	61.57	-12.70	-1.15	0.00	-6.17	0.00	41.55

Segment Leq : 49.27 dBA

Total Leq All Segments: 49.27 dBA

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

LOCOMOTIVE (0.00 + 44.95 + 0.00) = 44.95 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  64.97 -12.70  -1.15   0.00  -6.17   0.00  44.95
-------------------------------------------------------------------------

WHEEL (0.00 + 38.03 + 0.00) = 38.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     48   0.00  58.05 -12.70  -1.15   0.00  -6.17   0.00  38.03
-------------------------------------------------------------------------

Segment Leq : 45.75 dBA

Total Leq All Segments: 45.75 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           : -83.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  17.00 / 17.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 2: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :  10.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  78.00 / 78.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 65.03 + 0.00) = 65.03 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -83     90   0.00  65.75   0.00  -0.54  -0.17   0.00   0.00   0.00  65.03
-------------------------------------------------------------------------------

Segment Leq : 65.03 dBA
```

```
Results segment # 2: STLAURENT (day)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.31 + 0.00) = 64.31 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    10     90   0.00  75.00   0.00  -7.16  -3.52   0.00   0.00   0.00  64.31
-------------------------------------------------------------------------------

Segment Leq : 64.31 dBA

Total Leq All Segments: 67.70 dBA

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

Source height = 1.50 m

ROAD (0.00 + 57.44 + 0.00) = 57.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -83     90   0.00  58.16   0.00  -0.54  -0.17   0.00   0.00   0.00  57.44
-------------------------------------------------------------------------------

Segment Leq : 57.44 dBA

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

Source height = 1.50 m

ROAD (0.00 + 56.72 + 0.00) = 56.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    10     90   0.00  67.40   0.00  -7.16  -3.52   0.00   0.00   0.00  56.72
-------------------------------------------------------------------------------

Segment Leq : 56.72 dBA

Total Leq All Segments: 60.11 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.76
                           (NIGHT): 60.26
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:49:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R8.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -42.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 3 / 3	
House density	: 60 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 284.00 / 284.00 m	
Receiver height	: 59.00 / 59.00 m	
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 48.21 + 0.00) = 48.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	90	0.00	68.49	-12.77	-1.35	0.00	-6.16	0.00	48.21

WHEEL (0.00 + 41.29 + 0.00) = 41.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-42	90	0.00	61.57	-12.77	-1.35	0.00	-6.16	0.00	41.29

Segment Leq : 49.01 dBA

Total Leq All Segments: 49.01 dBA

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

LOCOMOTIVE (0.00 + 44.69 + 0.00) = 44.69 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -42     90   0.00  64.97 -12.77  -1.35   0.00  -6.16   0.00  44.69
-------------------------------------------------------------------------

WHEEL (0.00 + 37.76 + 0.00) = 37.76 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -42     90   0.00  58.05 -12.77  -1.35   0.00  -6.16   0.00  37.76
-------------------------------------------------------------------------

Segment Leq : 45.49 dBA

Total Leq All Segments: 45.49 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: BELFAST RD (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 59.06 + 0.00) = 59.06 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  65.75   0.00  -3.68  -3.01   0.00   0.00   0.00  59.06
-------------------------------------------------------------------------------

Segment Leq : 59.06 dBA

Total Leq All Segments: 59.06 dBA

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

Source height = 1.50 m

ROAD (0.00 + 51.47 + 0.00) = 51.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  58.16   0.00  -3.68  -3.01   0.00   0.00   0.00  51.47
-------------------------------------------------------------------------------

Segment Leq : 51.47 dBA

Total Leq All Segments: 51.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.47
                           (NIGHT): 52.45
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 15:52:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R9.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	48.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	4 / 4	
House density	60 %	
Surface	2	(Reflective ground surface)
Receiver source distance	304.00 / 304.00 m	
Receiver height	59.00 / 59.00 m	
Topography	1	(Flat/gentle slope; no barrier)

No Whistle
Reference angle : 0.00

Results segment # 1: VIA (day)

LOCOMOTIVE (0.00 + 41.46 + 0.00) = 41.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	68.49	-13.07	-6.32	0.00	-7.65	0.00	41.46

WHEEL (0.00 + 34.53 + 0.00) = 34.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	61.57	-13.07	-6.32	0.00	-7.65	0.00	34.53

Segment Leq : 42.26 dBA

Total Leq All Segments: 42.26 dBA

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

LOCOMOTIVE (0.00 + 37.93 + 0.00) = 37.93 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.00  64.97 -13.07  -6.32   0.00  -7.65   0.00  37.93
-------------------------------------------------------------------------

WHEEL (0.00 + 31.01 + 0.00) = 31.01 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.00  58.05 -13.07  -6.32   0.00  -7.65   0.00  31.01
-------------------------------------------------------------------------

Segment Leq : 38.73 dBA

Total Leq All Segments: 38.73 dBA

Road data, segment # 1: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  78.00 / 78.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.50 m

ROAD (0.00 + 64.82 + 0.00) = 64.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  75.00   0.00  -7.16  -3.01   0.00   0.00   0.00  64.82
-------------------------------------------------------------------------------

Segment Leq : 64.82 dBA

Total Leq All Segments: 64.82 dBA

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

Source height = 1.50 m

ROAD (0.00 + 57.23 + 0.00) = 57.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.00  67.40   0.00  -7.16  -3.01   0.00   0.00   0.00  57.23
-------------------------------------------------------------------------------

Segment Leq : 57.23 dBA

Total Leq All Segments: 57.23 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.84
                           (NIGHT): 57.29
```

```
STAMSON 5.0          NORMAL REPORT          Date: 17-04-2024 16:00:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R10.te                    Time Period: Day/Night 16/8 hours
Description:

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
--------------------------------------------
Angle1   Angle2           : -44.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :  45.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  68.00 / 68.00  m
Receiver height           :  59.00 / 59.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 55.95 + 0.00) = 55.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -44      0   0.00  65.75   0.00  -3.68  -6.12   0.00   0.00   0.00  55.95
-------------------------------------------------------------------------------

Segment Leq : 55.95 dBA

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

Source height = 1.50 m

ROAD (0.00 + 62.41 + 0.00) = 62.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    45     90   0.00  75.00   0.00  -6.56  -6.02   0.00   0.00   0.00  62.41
-------------------------------------------------------------------------------

Segment Leq : 62.41 dBA

Total Leq All Segments: 63.29 dBA

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

Source height = 1.50 m

ROAD (0.00 + 48.36 + 0.00) = 48.36 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -44      0   0.00  58.16   0.00  -3.68  -6.12   0.00   0.00   0.00  48.36
-------------------------------------------------------------------------------

Segment Leq : 48.36 dBA
```

```
Results segment # 2: STLAURENT (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 54.81 + 0.00) = 54.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    45     90   0.00  67.40   0.00  -6.56  -6.02   0.00   0.00   0.00  54.81
-------------------------------------------------------------------------------

Segment Leq : 54.81 dBA

Total Leq All Segments: 55.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.29
                           (NIGHT): 55.70
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 16:38:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R11.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -58.00 deg 10.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 3 / 3
House density	: 60 %
Surface	: 2 (Reflective ground surface)
Receiver source distance	: 286.00 / 286.00 m
Receiver height	: 14.00 / 14.00 m
Topography	: 2 (Flat/gentle slope; with barrier)
No Whistle	
Barrier angle1	: -58.00 deg Angle2 : 10.00 deg
Barrier height	: 15.50 m
Barrier receiver distance	: 6.00 / 6.00 m
Source elevation	: 0.00 m
Receiver elevation	: 0.00 m
Barrier elevation	: 0.00 m
Reference angle	: 0.00

Rail data, segment # 2: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

```
Data for Segment # 2: VIA (day/night)
-------------------------------------
Angle1   Angle2           :  10.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 286.00 / 286.00 m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  10.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 40.33 + 0.00) = 40.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  68.49 -12.80  -4.23   0.00  -6.16   0.00  45.30
   -58     10   0.00  68.49 -12.80  -4.23   0.00   0.00 -11.13  40.33
-------------------------------------------------------------------

WHEEL (0.00 + 33.09 + 0.00) = 33.09 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  61.57 -12.80  -4.23   0.00  -6.16   0.00  38.38
   -58     10   0.00  61.57 -12.80  -4.23   0.00   0.00 -11.44  33.09
-------------------------------------------------------------------

Segment Leq : 41.08 dBA
```

```
Results segment # 2: VIA (day)
------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 52.17 + 0.00) = 52.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  68.49 -12.80  -3.52   0.00   0.00  -0.73  51.43*
    10     90   0.00  68.49 -12.80  -3.52   0.00   0.00   0.00  52.17
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 45.24 + 0.00) = 45.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  61.57 -12.80  -3.52   0.00   0.00  -0.84  44.40*
    10     90   0.00  61.57 -12.80  -3.52   0.00   0.00   0.00  45.24
-------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 52.97 dBA

Total Leq All Segments: 53.24 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 36.80 + 0.00) = 36.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  64.97 -12.80  -4.23   0.00  -6.16   0.00  41.78
   -58     10   0.00  64.97 -12.80  -4.23   0.00   0.00 -11.13  36.80
-------------------------------------------------------------------
```

```
WHEEL (0.00 + 29.57 + 0.00) = 29.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -58     10   0.00  58.05 -12.80  -4.23   0.00  -6.16   0.00  34.85
   -58     10   0.00  58.05 -12.80  -4.23   0.00   0.00 -11.44  29.57
-------------------------------------------------------------------------

Segment Leq : 37.55 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 48.64 + 0.00) = 48.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    10     90   0.00  64.97 -12.80  -3.52   0.00   0.00  -0.73  47.91*
    10     90   0.00  64.97 -12.80  -3.52   0.00   0.00   0.00  48.64
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 41.72 + 0.00) = 41.72 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    10     90   0.00  58.05 -12.80  -3.52   0.00   0.00  -0.84  40.88*
    10     90   0.00  58.05 -12.80  -3.52   0.00   0.00   0.00  41.72
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 49.44 dBA

Total Leq All Segments: 49.71 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

```
    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
---------------------------------------------
Angle1   Angle2           : -17.00 deg   50.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -17.00 deg   Angle2 : 50.00 deg
Barrier height            :  15.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   -33.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  98.00 / 98.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -33.00 deg
Barrier height            :  12.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 3: BELFAST 2 (day/night)
---------------------------------------------
Car traffic volume  :  1600/800   veh/TimePeriod
Medium truck volume :   320/160   veh/TimePeriod
Heavy truck volume  :   160/80    veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: BELFAST 2 (day/night)
-------------------------------------------
Angle1   Angle2           :  50.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  50.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: BELFAST RD (day)
-------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       14.00 !       12.37 !        12.37

ROAD (0.00 + 39.93 + 0.00) = 39.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -17     50   0.00  65.75   0.00  -4.87  -4.29   0.00   0.00 -16.66  39.93
-------------------------------------------------------------------------------

Segment Leq : 39.93 dBA

Results segment # 2: STLAURENT (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 !       14.00 !       13.23 !        13.23

ROAD (0.00 + 61.85 + 0.00) = 61.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -33   0.00  75.00   0.00  -8.15  -4.99   0.00   0.00  -3.67  58.18*
   -90    -33   0.00  75.00   0.00  -8.15  -4.99   0.00   0.00   0.00  61.85
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 61.85 dBA
```

```
Results segment # 3: BELFAST 2 (day)
-----------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       14.00 !       12.39 !        12.39

ROAD (0.00 + 51.66 + 0.00) = 51.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    50     90   0.00  68.08   0.00  -4.87  -6.53   0.00   0.00  -5.02  51.66
-------------------------------------------------------------------------------

Segment Leq : 51.66 dBA

Total Leq All Segments: 62.27 dBA

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       14.00 !       12.37 !        12.37

ROAD (0.00 + 32.34 + 0.00) = 32.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -17     50   0.00  58.16   0.00  -4.87  -4.29   0.00   0.00 -16.66  32.34
-------------------------------------------------------------------------------

Segment Leq : 32.34 dBA
```

```
Results segment # 2: STLAURENT (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 !       14.00 !       13.23 !        13.23

ROAD (0.00 + 54.25 + 0.00) = 54.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -33   0.00  67.40   0.00  -8.15  -4.99   0.00   0.00  -3.67  50.58*
   -90    -33   0.00  67.40   0.00  -8.15  -4.99   0.00   0.00   0.00  54.25
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 54.25 dBA

Results segment # 3: BELFAST 2 (night)
---------------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
---------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       14.00 !       12.39 !        12.39

ROAD (0.00 + 51.66 + 0.00) = 51.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    50     90   0.00  68.08   0.00  -4.87  -6.53   0.00   0.00  -5.02  51.66
-------------------------------------------------------------------------------

Segment Leq : 51.66 dBA

Total Leq All Segments: 56.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.78
                           (NIGHT): 57.06
```

STAMSON 5.0 NORMAL REPORT Date: 18-04-2024 33:42:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R11B3.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	: -58.00 deg 10.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 3 / 3
House density	: 60 %
Surface	: 2 (Reflective ground surface)
Receiver source distance	: 286.00 / 286.00 m
Receiver height	: 14.00 / 14.00 m
Topography	: 2 (Flat/gentle slope; with barrier)
No Whistle	
Barrier angle1	: -58.00 deg Angle2 : 10.00 deg
Barrier height	: 15.50 m
Barrier receiver distance	: 6.00 / 6.00 m
Source elevation	: 0.00 m
Receiver elevation	: 0.00 m
Barrier elevation	: 0.00 m
Reference angle	: 0.00

Rail data, segment # 2: VIA (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

```
Data for Segment # 2: VIA (day/night)
-------------------------------------
Angle1   Angle2           :  10.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 286.00 / 286.00 m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  10.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 40.33 + 0.00) = 40.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  68.49 -12.80  -4.23   0.00  -6.16   0.00  45.30
   -58     10   0.00  68.49 -12.80  -4.23   0.00   0.00 -11.13  40.33
-------------------------------------------------------------------

WHEEL (0.00 + 33.09 + 0.00) = 33.09 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  61.57 -12.80  -4.23   0.00  -6.16   0.00  38.38
   -58     10   0.00  61.57 -12.80  -4.23   0.00   0.00 -11.44  33.09
-------------------------------------------------------------------

Segment Leq : 41.08 dBA
```

```
Results segment # 2: VIA (day)
------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 46.02 + 0.00) = 46.02 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  68.49 -12.80  -3.52   0.00   0.00  -6.15  46.02
-------------------------------------------------------------------

WHEEL (0.00 + 38.88 + 0.00) = 38.88 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  61.57 -12.80  -3.52   0.00   0.00  -6.36  38.88
-------------------------------------------------------------------

Segment Leq : 46.79 dBA

Total Leq All Segments: 47.82 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 36.80 + 0.00) = 36.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  64.97 -12.80  -4.23   0.00  -6.16   0.00  41.78
   -58     10   0.00  64.97 -12.80  -4.23   0.00   0.00 -11.13  36.80
-------------------------------------------------------------------

WHEEL (0.00 + 29.57 + 0.00) = 29.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -58     10   0.00  58.05 -12.80  -4.23   0.00  -6.16   0.00  34.85
   -58     10   0.00  58.05 -12.80  -4.23   0.00   0.00 -11.44  29.57
-------------------------------------------------------------------

Segment Leq : 37.55 dBA
```

```
Results segment # 2: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       14.00 !       13.79 !        13.79
       0.50 !       14.00 !       13.72 !        13.72

LOCOMOTIVE (0.00 + 42.49 + 0.00) = 42.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  64.97 -12.80  -3.52   0.00   0.00  -6.15  42.49
-------------------------------------------------------------------

WHEEL (0.00 + 35.36 + 0.00) = 35.36 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    10     90   0.00  58.05 -12.80  -3.52   0.00   0.00  -6.36  35.36
-------------------------------------------------------------------

Segment Leq : 43.26 dBA

Total Leq All Segments: 44.29 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
---------------------------------------------
Angle1   Angle2           : -17.00 deg   50.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -17.00 deg   Angle2 : 50.00 deg
Barrier height            :  15.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
---------------------------------------------
Angle1   Angle2           : -90.00 deg   -33.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  98.00 / 98.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -33.00 deg
Barrier height            :  14.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Road data, segment # 3: BELFAST 2 (day/night)
----------------------------------------------
Car traffic volume  :  1600/800   veh/TimePeriod
Medium truck volume :   320/160   veh/TimePeriod
Heavy truck volume  :   160/80    veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: BELFAST 2 (day/night)
----------------------------------------------
Angle1   Angle2           :  50.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.00 / 46.00  m
Receiver height           :  14.00 / 14.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  50.00 deg   Angle2 : 90.00 deg
Barrier height            :  14.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       14.00 !       12.37 !        12.37

ROAD (0.00 + 39.93 + 0.00) = 39.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -17     50   0.00  65.75   0.00  -4.87  -4.29   0.00   0.00 -16.66  39.93
-------------------------------------------------------------------------------

Segment Leq : 39.93 dBA
```

```
Results segment # 2: STLAURENT (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 !       14.00 !       13.23 !        13.23

ROAD (0.00 + 54.45 + 0.00) = 54.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -33   0.00  75.00   0.00  -8.15  -4.99   0.00   0.00  -7.40  54.45
-------------------------------------------------------------------------------

Segment Leq : 54.45 dBA

Results segment # 3: BELFAST 2 (day)
-----------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       14.00 !       12.39 !        12.39

ROAD (0.00 + 47.78 + 0.00) = 47.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    50     90   0.00  68.08   0.00  -4.87  -6.53   0.00   0.00  -8.90  47.78
-------------------------------------------------------------------------------

Segment Leq : 47.78 dBA

Total Leq All Segments: 55.42 dBA
```

```
Results segment # 1: BELFAST RD (night)
---------------------------------------

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       14.00 !       12.37 !        12.37

ROAD (0.00 + 32.34 + 0.00) = 32.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -17     50   0.00  58.16   0.00  -4.87  -4.29   0.00   0.00 -16.66  32.34
-------------------------------------------------------------------------------

Segment Leq : 32.34 dBA

Results segment # 2: STLAURENT (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 !       14.00 !       13.23 !        13.23

ROAD (0.00 + 46.85 + 0.00) = 46.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -33   0.00  67.40   0.00  -8.15  -4.99   0.00   0.00  -7.40  46.85
-------------------------------------------------------------------------------

Segment Leq : 46.85 dBA
```

```
Results segment # 3: BELFAST 2 (night)
--------------------------------------

Source height = 1.67 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.67 !       14.00 !       12.39 !        12.39

ROAD (0.00 + 47.78 + 0.00) = 47.78 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    50     90   0.00  68.08   0.00  -4.87  -6.53   0.00   0.00  -8.90  47.78
-------------------------------------------------------------------------------

Segment Leq : 47.78 dBA

Total Leq All Segments: 50.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.12
                           (NIGHT): 51.37
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 16:54:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R12.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	-90.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	3 / 3	
House density	60 %	
Surface	2	(Reflective ground surface)
Receiver source distance	280.00 / 280.00 m	
Receiver height	62.00 / 62.00 m	
Topography	2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	-90.00 deg	Angle2 : 90.00 deg
Barrier height	62.65 m	
Barrier receiver distance	2.00 / 2.00 m	
Source elevation	0.00 m	
Receiver elevation	0.00 m	
Barrier elevation	0.00 m	
Reference angle	0.00	

Results segment # 1: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	62.00	61.59	61.59
0.50	62.00	61.56	61.56

LOCOMOTIVE (0.00 + 46.06 + 0.00) = 46.06 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.49	-12.71	0.00	0.00	-6.17	0.00	49.61
-90	90	0.00	68.49	-12.71	0.00	0.00	0.00	-9.72	46.06

```
WHEEL (0.00 + 39.02 + 0.00) = 39.02 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  61.57 -12.71   0.00   0.00  -6.17   0.00  42.69
   -90     90   0.00  61.57 -12.71   0.00   0.00   0.00  -9.84  39.02
-------------------------------------------------------------------------

Segment Leq : 46.84 dBA

Total Leq All Segments: 46.84 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       62.00 !       61.59 !        61.59
       0.50 !       62.00 !       61.56 !        61.56

LOCOMOTIVE (0.00 + 42.54 + 0.00) = 42.54 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  64.97 -12.71   0.00   0.00  -6.17   0.00  46.09
   -90     90   0.00  64.97 -12.71   0.00   0.00   0.00  -9.72  42.54
-------------------------------------------------------------------------

WHEEL (0.00 + 35.49 + 0.00) = 35.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  58.05 -12.71   0.00   0.00  -6.17   0.00  39.17
   -90     90   0.00  58.05 -12.71   0.00   0.00   0.00  -9.84  35.49
-------------------------------------------------------------------------

Segment Leq : 43.32 dBA

Total Leq All Segments: 43.32 dBA

Road data, segment # 1: BELFAST RD (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

```
    24 hr Traffic Volume (AADT or SADT):   8000
    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: BELFAST RD (day/night)
---------------------------------------------
Angle1   Angle2           : -77.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :  62.00 / 62.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -77.00 deg   Angle2 : 90.00 deg
Barrier height            :  62.65 m
Barrier receiver distance :   2.00 / 2.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: STLAURENT (day/night)
---------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
-------------------------------------------
Angle1   Angle2           :  14.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  78.00 / 78.00  m
Receiver height           :  62.00 / 62.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  14.00 deg   Angle2 : 90.00 deg
Barrier height            :  62.65 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       62.00 !       55.95 !        55.95

ROAD (0.00 + 47.16 + 0.00) = 47.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -77     90   0.00  65.75   0.00  -1.25  -0.33   0.00   0.00 -17.02  47.16
-------------------------------------------------------------------------------

Segment Leq : 47.16 dBA
```

```
Results segment # 2: STLAURENT (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 !       62.00 !       55.02 !        55.02

ROAD (0.00 + 48.09 + 0.00) = 48.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    14     90   0.00  75.00   0.00  -7.16  -3.74   0.00   0.00 -16.00  48.09
-------------------------------------------------------------------------------
Segment Leq : 48.09 dBA

Total Leq All Segments: 50.66 dBA

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       62.00 !       55.95 !        55.95

ROAD (0.00 + 39.56 + 0.00) = 39.56 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -77     90   0.00  58.16   0.00  -1.25  -0.33   0.00   0.00 -17.02  39.56
-------------------------------------------------------------------------------

Segment Leq : 39.56 dBA
```

```
Results segment # 2: STLAURENT (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 !       62.00 !       55.02 !        55.02

ROAD (0.00 + 40.49 + 0.00) = 40.49 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    14     90   0.00  67.40   0.00  -7.16  -3.74   0.00   0.00 -16.00  40.49
-------------------------------------------------------------------------------

Segment Leq : 40.49 dBA

Total Leq All Segments: 43.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.17
                           (NIGHT): 46.20
```

STAMSON 5.0 NORMAL REPORT Date: 17-04-2024 17:00:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R13.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	47.00 deg 90.00 deg
Wood depth	0 (No woods.)
No of house rows	4 / 4
House density	60 %
Surface	2 (Reflective ground surface)
Receiver source distance	335.00 / 335.00 m
Receiver height	22.00 / 22.00 m
Topography	2 (Flat/gentle slope; with barrier)
No Whistle	
Barrier angle1	47.00 deg Angle2 : 90.00 deg
Barrier height	20.50 m
Barrier receiver distance	9.00 / 9.00 m
Source elevation	0.00 m
Receiver elevation	0.00 m
Barrier elevation	0.00 m
Reference angle	0.00

Results segment # 1: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	22.00	21.52	21.52
0.50	22.00	21.42	21.42

LOCOMOTIVE (0.00 + 41.16 + 0.00) = 41.16 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
47	90	0.00	68.49	-13.49	-6.22	0.00	-7.62	0.00	41.16
47	90	0.00	68.49	-13.49	-6.22	0.00	0.00	-3.68	45.11*
47	90	0.00	68.49	-13.49	-6.22	0.00	0.00	0.00	48.78

* Bright Zone !

```
WHEEL (0.00 + 34.24 + 0.00) = 34.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  61.57 -13.49  -6.22   0.00  -7.62   0.00  34.24
    47     90   0.00  61.57 -13.49  -6.22   0.00   0.00  -3.95  37.91*
    47     90   0.00  61.57 -13.49  -6.22   0.00   0.00   0.00  41.86
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 41.96 dBA

Total Leq All Segments: 41.96 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       22.00 !       21.52 !        21.52
       0.50 !       22.00 !       21.42 !        21.42

LOCOMOTIVE (0.00 + 37.64 + 0.00) = 37.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  64.97 -13.49  -6.22   0.00  -7.62   0.00  37.64
    47     90   0.00  64.97 -13.49  -6.22   0.00   0.00  -3.68  41.58*
    47     90   0.00  64.97 -13.49  -6.22   0.00   0.00   0.00  45.26
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 30.72 + 0.00) = 30.72 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  58.05 -13.49  -6.22   0.00  -7.62   0.00  30.72
    47     90   0.00  58.05 -13.49  -6.22   0.00   0.00  -3.95  34.39*
    47     90   0.00  58.05 -13.49  -6.22   0.00   0.00   0.00  38.34
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 38.44 dBA

Total Leq All Segments: 38.44 dBA
```

```
Road data, segment # 1: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   16.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  22.00 / 22.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 16.00 deg
Barrier height            :  20.50 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       22.00 !       16.73 !        16.73

ROAD (0.00 + 55.93 + 0.00) = 55.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     16   0.00  75.00   0.00  -3.68  -2.30   0.00   0.00 -13.09  55.93
-------------------------------------------------------------------------------

Segment Leq : 55.93 dBA

Total Leq All Segments: 55.93 dBA

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       22.00 !       16.73 !        16.73

ROAD (0.00 + 48.33 + 0.00) = 48.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     16   0.00  67.40   0.00  -3.68  -2.30   0.00   0.00 -13.09  48.33
-------------------------------------------------------------------------------

Segment Leq : 48.33 dBA

Total Leq All Segments: 48.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.10
                           (NIGHT): 48.75
```

STAMSON 5.0 NORMAL REPORT Date: 18-04-2024 33:49:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R13B1.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	47.00 deg 90.00 deg
Wood depth	0 (No woods.)
No of house rows	4 / 4
House density	60 %
Surface	2 (Reflective ground surface)
Receiver source distance	335.00 / 335.00 m
Receiver height	22.00 / 22.00 m
Topography	2 (Flat/gentle slope; with barrier)
No Whistle	
Barrier angle1	47.00 deg Angle2 : 90.00 deg
Barrier height	21.60 m
Barrier receiver distance	9.00 / 9.00 m
Source elevation	0.00 m
Receiver elevation	0.00 m
Barrier elevation	0.00 m
Reference angle	0.00

Results segment # 1: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	22.00	21.52	21.52
0.50	22.00	21.42	21.42

LOCOMOTIVE (0.00 + 41.16 + 0.00) = 41.16 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
47	90	0.00	68.49	-13.49	-6.22	0.00	-7.62	0.00	41.16
47	90	0.00	68.49	-13.49	-6.22	0.00	0.00	-5.01	43.78

```
WHEEL (0.00 + 34.24 + 0.00) = 34.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  61.57 -13.49  -6.22   0.00  -7.62   0.00  34.24
    47     90   0.00  61.57 -13.49  -6.22   0.00   0.00  -5.03  36.83
-------------------------------------------------------------------------

Segment Leq : 41.96 dBA

Total Leq All Segments: 41.96 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       22.00 !       21.52 !        21.52
       0.50 !       22.00 !       21.42 !        21.42

LOCOMOTIVE (0.00 + 37.64 + 0.00) = 37.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  64.97 -13.49  -6.22   0.00  -7.62   0.00  37.64
    47     90   0.00  64.97 -13.49  -6.22   0.00   0.00  -5.01  40.25
-------------------------------------------------------------------------

WHEEL (0.00 + 30.72 + 0.00) = 30.72 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    47     90   0.00  58.05 -13.49  -6.22   0.00  -7.62   0.00  30.72
    47     90   0.00  58.05 -13.49  -6.22   0.00   0.00  -5.03  33.30
-------------------------------------------------------------------------

Segment Leq : 38.44 dBA

Total Leq All Segments: 38.44 dBA
```

```
Road data, segment # 1: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   16.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  22.00 / 22.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 16.00 deg
Barrier height            :  21.60 m
Barrier receiver distance :   9.00 / 9.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       22.00 !       16.73 !        16.73

ROAD (0.00 + 54.13 + 0.00) = 54.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     16   0.00  75.00   0.00  -3.68  -2.30   0.00   0.00 -14.89  54.13
-------------------------------------------------------------------------------

Segment Leq : 54.13 dBA

Total Leq All Segments: 54.13 dBA

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

Source height = 1.50 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !       22.00 !       16.73 !        16.73

ROAD (0.00 + 46.53 + 0.00) = 46.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     16   0.00  67.40   0.00  -3.68  -2.30   0.00   0.00 -14.89  46.53
-------------------------------------------------------------------------------

Segment Leq : 46.53 dBA

Total Leq All Segments: 46.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.39
                           (NIGHT): 47.16
```

STAMSON 5.0 NORMAL REPORT Date: 18-04-2024 14:16:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: R14.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. DIESEL	18.0/4.0	150.0	1.0	4.0	Diesel	No

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

Angle1 Angle2	60.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	4 / 4	
House density	60 %	
Surface	2	(Reflective ground surface)
Receiver source distance	328.00 / 328.00 m	
Receiver height	79.00 / 79.00 m	
Topography	2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	60.00 deg	Angle2 : 90.00 deg
Barrier height	79.50 m	
Barrier receiver distance	8.00 / 8.00 m	
Source elevation	0.00 m	
Receiver elevation	0.00 m	
Barrier elevation	0.00 m	
Reference angle	0.00	

Results segment # 1: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	79.00	77.17	77.17
0.50	79.00	77.09	77.09

LOCOMOTIVE (0.00 + 39.40 + 0.00) = 39.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
60	90	0.00	68.49	-13.40	-7.78	0.00	-7.63	0.00	39.68
60	90	0.00	68.49	-13.40	-7.78	0.00	0.00	-7.91	39.40

```
WHEEL (0.00 + 32.34 + 0.00) = 32.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    60     90   0.00  61.57 -13.40  -7.78   0.00  -7.63   0.00  32.76
    60     90   0.00  61.57 -13.40  -7.78   0.00   0.00  -8.05  32.34
-------------------------------------------------------------------------

Segment Leq : 40.18 dBA

Total Leq All Segments: 40.18 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       79.00 !       77.17 !        77.17
       0.50 !       79.00 !       77.09 !        77.09

LOCOMOTIVE (0.00 + 35.88 + 0.00) = 35.88 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    60     90   0.00  64.97 -13.40  -7.78   0.00  -7.63   0.00  36.16
    60     90   0.00  64.97 -13.40  -7.78   0.00   0.00  -7.91  35.88
-------------------------------------------------------------------------

WHEEL (0.00 + 28.82 + 0.00) = 28.82 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    60     90   0.00  58.05 -13.40  -7.78   0.00  -7.63   0.00  29.24
    60     90   0.00  58.05 -13.40  -7.78   0.00   0.00  -8.05  28.82
-------------------------------------------------------------------------

Segment Leq : 36.66 dBA

Total Leq All Segments: 36.66 dBA
```

```
Road data, segment # 1: STLAURENT (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   veh/TimePeriod  *
Posted speed limit  :    70 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):  35000
    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: STLAURENT (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   23.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.00 / 35.00  m
Receiver height           :  79.00 / 79.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 23.00 deg
Barrier height            :  79.50 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: STLAURENT (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 !       79.00 !       61.28 !        61.28

ROAD (0.00 + 50.93 + 0.00) = 50.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     23   0.00  75.00   0.00  -3.68  -2.02   0.00   0.00 -18.37  50.93
-------------------------------------------------------------------------------

Segment Leq : 50.93 dBA

Total Leq All Segments: 50.93 dBA

Results segment # 1: STLAURENT (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 !       79.00 !       61.28 !        61.28

ROAD (0.00 + 43.33 + 0.00) = 43.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     23   0.00  67.40   0.00  -3.68  -2.02   0.00   0.00 -18.37  43.33
-------------------------------------------------------------------------------

Segment Leq : 43.33 dBA

Total Leq All Segments: 43.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 51.28
                           (NIGHT): 44.18
```