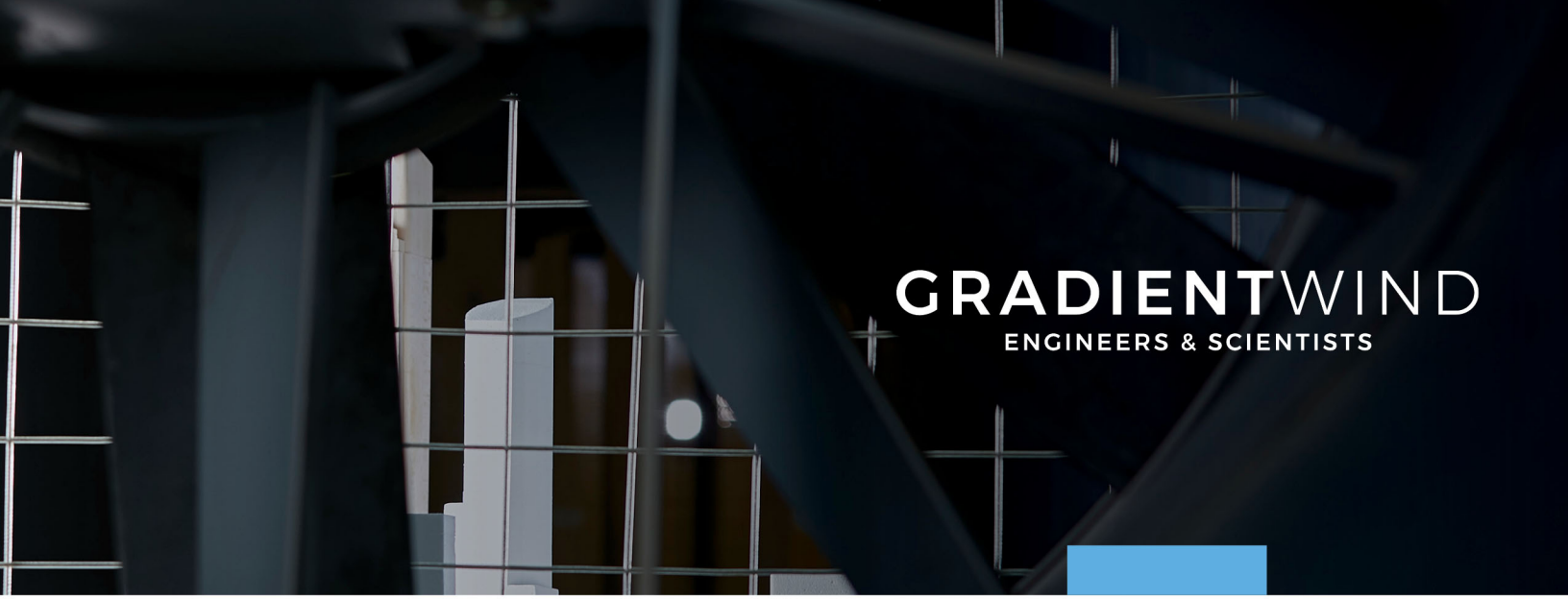
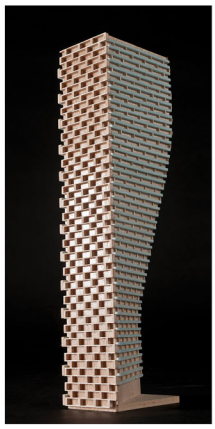


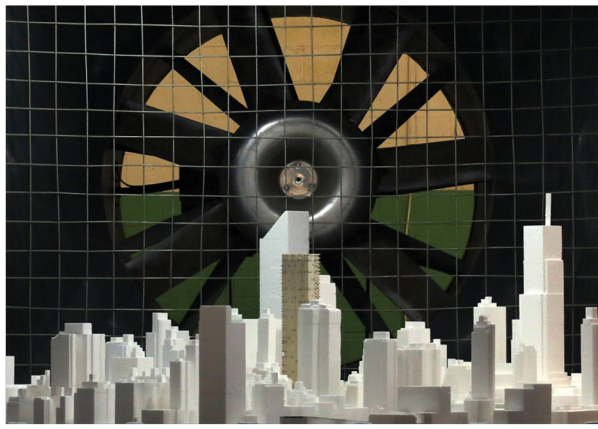
GRADIENTWIND
ENGINEERS & SCIENTISTS

TRANSPORTATION NOISE FEASIBILITY AND GROUND VIBRATIONS ASSESSMENT

70 Fountain Street East
Guelph, Ontario

Report: 25-203 – Transportation Noise Feasibility and Ground Vibrations





December 19, 2025

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EXECUTIVE SUMMARY

This report describes a transportation noise feasibility and ground vibration assessment undertaken in support of a Zoning By-Law Amendment (ZBA) application for a proposed mixed-use development located at 70 Fountain Street East in Guelph, Ontario. The primary sources of transportation noise affecting the site include roadway traffic along Wyndham Street South and rail traffic associated with the GO Transit Guelph Subdivision. As the site is located within 75 metres (m) of the existing GO Transit and Via rail corridor, a ground vibration impact assessment was undertaken following procedures outlined in the Federal Transit Administration (FTA) protocol. Figure 1 illustrates the site location and surrounding context.

The assessment is based on: (i) theoretical noise prediction methods that conform to the requirements of the Ministry of the Environment, Conservation and Parks (MECP), including NPC-300; (ii) roadway and railway traffic volumes derived from roadway and rail classifications and available transportation data; (iii) architectural drawings provided by Hariri Pontarini Architects in November 2025; and (iv) ground-borne vibration criteria specified in the FTA protocol.

The results of the current analysis indicate that predicted exterior noise levels at plane of window (POW) receptors on proposed development are expected to range between 59 and 65 dBA during the daytime period (07:00–23:00) and between 52 and 59 dBA during the nighttime period (23:00–07:00), depending on façade orientation and proximity to transportation sources. The highest noise levels are predicted to occur at the south façade that is directly exposed to Wyndham Street. Predicted noise levels at the rooftop terrace were found to be 50 dBA.

The results indicate that upgraded building components may be required where predicted transportation noise levels exceed the applicable MECP criteria for building components. Results also indicate that a provision to include central air conditioning be added. However, the development's nature as a 24-storey mixed-use development will likely mean that the building will be constructed with central air conditioning installed. This would allow occupants to maintain acceptable indoor acoustic conditions while keeping windows closed. Detailed mitigation measures, including minimum window sound transmission class (STC) ratings, would be addressed as part of a detailed transportation noise assessment at the Site Plan

Application (SPA) stage. Appropriate warning clauses may also be required in Lease, Purchase, and Sale Agreements.

Estimated vibration levels at the building foundation nearest to the GO Transit rail corridor are predicted to be 0.027 mm/s RMS (61 dBV), based on the FTA protocol and the offset distance to the nearest rail track centerline of 53 m. As the predicted vibration levels are below the applicable FTA and MECP vibration criteria, adverse vibration impacts are not expected. Correspondingly, ground-borne noise levels associated with rail operations are also expected to be acceptable.

With respect to stationary noise impacts, it is recommended that a stationary noise assessment be undertaken once detailed mechanical equipment information becomes available. This future assessment would evaluate noise impacts from rooftop mechanical equipment and emergency generators serving the proposed development on surrounding noise-sensitive receptors, and would include recommendations for mitigation measures, if required, to ensure compliance with applicable MECP criteria. Stationary noise impacts can typically be mitigated through appropriate equipment selection, placement, and, where necessary, the incorporation of acoustic treatments such as noise screens or silencers.

TABLE OF CONTENTS

1. INTRODUCTION

Gradient Wind Engineering Inc. (Gradient Wind) was retained to undertake a transportation noise and ground vibration feasibility assessment in support of a Zoning By-Law Amendment (ZBA) application for a proposed mixed-use development located at 70 Fountain Street East in Guelph, Ontario. This report summarizes the methodology, results, and recommendations related to the assessment of exterior noise levels and ground vibration generated by nearby transportation sources, including roadway and rail traffic.

This assessment is based on theoretical noise and vibration calculation methods conforming to the Ministry of the Environment, Conservation and Parks (MECP) guidelines, including NPC-300, STEAM, and ORNAMENT in accordance with the city of Guelph's noise control guidelines. Noise and vibration calculations were based on architectural drawings provided by Hariri Pontarini in November 2025, with future traffic volumes corresponding to rail data received from Metrolinx, and road data received from the City of Guelph.

2. TERMS OF REFERENCE

The subject site is located at 70 Fountain Street East, on a parcel of land situated on Wyndham Street South between Farquhar Street and Fountain Street East in Guelph, Ontario. The site occupies an urban block within Guelph's downtown area and is characterized by frontage along Wyndham Street South, with access to Fountain Street East and Farquhar Street. Surrounding land uses include a mix of commercial, residential, and transportation-related infrastructure.

The proposed development comprises a 24-storey mixed-use building, inclusive of a stepped 8-storey podium. At grade, two levels of underground parking are proposed, with vehicular access provided via a driveway fronting Fountain Street East, while additional parking access along the north and east elevations of the ground floor is provided from Farquhar Street. Retail space is proposed along the south elevation fronting Wyndham Street South, with a residential lobby and loading space located to the west. Level 2 rises uniformly from the ground floor and consists primarily of residential space with an indoor amenity located to the north. At Level 3, the podium steps back from the north elevation to accommodate a private terrace. Residential space continues from Levels 6 through 8, above which the building steps back at Level 9 to the typical tower floorplate, incorporating private terraces to the southeast. The tower rises to Level

24 and includes a mechanical penthouse level, comprising indoor amenity and mechanical space to the north and an outdoor amenity terrace to the south.

The development site is located within a dense urban environment, surrounded predominantly by low- and mid-rise buildings in all directions, with surface parking areas interspersed throughout the immediate vicinity. The Guelph Central Train Station is 53 metres (m) away from the nearest point of the development to the track centerline and represents a notable transportation feature within the surrounding context. The broader surrounding area consists primarily of low-rise suburban and commercial land uses.

The primary sources of transportation noise affecting the proposed development include roadway traffic along Wyndham Street South, as well as rail traffic associated with the Guelph Central GO rail corridor to the northwest. These sources were considered representative of the dominant contributors to exterior noise levels at the site under future conditions.

3. OBJECTIVES

The principal objectives of this study are to (i) calculate the future noise levels on the study building produced by local transportation sources, (ii) predict vibration levels on the study building produced from the Guelph Central GO rail corridor, and (iii) explore potential noise mitigation where required.

4. METHODOLOGY

4.1 Background

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that particular source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Measurement of noise is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10^{-5} Pascals). The 'A' suffix refers to a weighting scale, which better represents how the noise is perceived by the human ear. With this scale, a doubling of power results in a 3 dBA increase in measured noise levels and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

4.2 Roadway Traffic Noise

4.2.1 Criteria for Roadway Traffic Noise

For vehicle traffic, the equivalent sound energy level, L_{eq}, provides a measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of a 16-hour (L_{eq16}) daytime (07:00-23:00)/8-hour (L_{eq8}) nighttime (23:00-07:00) split to assess its impact on residential buildings. Table 1 presents the recommended indoor noise limit range of the NPC-300 guidelines.

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

Type of Space	Time Period	L_{eq} (dBA)	
		Road	Rail
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[2]. 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 normally triggers the need for central air

[1] Adapted from Table C-2, Part C, Section 3.2.3 of NPC-300
[2] Burberry, P.B. (2014). Mitchell's Environment and Services. Routledge, Page 125

conditioning (or similar systems). Where noise levels exceed 65 dBA daytime and 59 dBA nighttime building components will require higher levels of sound attenuation[3].

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 (as shown in Table 1). 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. For this site, whistle bursts were not considered as there is an anti-whistling by-law in effect at the only at the adjacent Guelph Central Station.

For designated Outdoor Living Areas (OLAs), the sound level limit is 55 dBA during the daytime period. An excess above the limit is acceptable only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons.

4.2.2 Transportation Traffic Volumes

Traffic volumes used in this assessment were obtained from the City of Guelph and are based on observed traffic counts collected at the intersection of Wyndham Street South and Fountain Street East. The available traffic data include classified vehicle counts (cars and trucks) recorded over a 12-hour daytime period from 06:00 to 18:00. The traffic volume data provided by the city are included in Appendix C.

Based on roadway classifications outlined in the City of Guelph Transportation Master Plan, Fountain Street East and Farquhar Street are classified as local roads[4]. As such, these roadways are not considered dominant contributors to transportation noise at the subject site and were therefore excluded from the noise modelling. Wyndham Street South, which carries higher traffic volumes and functions as a more significant transportation corridor, was identified as the primary roadway noise source and was included in the assessment. Traffic data was acquired from City of Guelph's staff.

[3] MECP, Environmental Noise Guidelines, NPC 300 – Part C, Section 7.1.3
[4] City of Guelph, Transportation Master Plan, City of Guelph, Ontario.

As specified in Guelph's noise control guidelines, all methods outlined in ORNAMENT and STEAM were followed when modelling roadway traffic noise and railway traffic noise respectively[5]. Road traffic volume calculations were completed as outlined in ORNAMENT Appendix D: Road Traffic Volume Calculation[6]. To facilitate assessment in accordance with NPC-300 requirements the total number of vehicles recorded on Wyndham Street South over the 12-hour count period was extrapolated to represent a 16-hour daytime period (07:00–23:00). A 90/10 day/night traffic split, as defined in the ORNAMENT methodology for regional roads, was then applied to estimate nighttime traffic volumes (23:00–07:00) for use in the noise calculations. A 2% growth rate was applied over 10 years from the anticipated construction completion date of the project (assumed to be 3 years from the release of this report) to obtain future traffic volumes for both road and rail traffic. The traffic data provided counted 13% trucks passing the site on Wyndham Street throughout the day, a conservative modelling of 6% heavy trucks and 7% medium trucks was applied to account for the total 13%. Where vehicle classifications were not subdivided by axle class, conservative ORNAMENT default distributions were applied. Table 2 summarizes the roadway traffic volumes used in the noise modelling for this study.

TABLE 2: ROADWAY TRAFFIC DATA

Segment	Roadway Class	Speed Limit (km/h)	Projected (2038) AADT Traffic Volume
Wyndham Street	2-Lane Urban Arterial	50	**7,018**

With regard to railway noise, the rail corridor adjacent to the subject site is operated primarily by Metrolinx. Railway traffic data used in this assessment were obtained directly from Metrolinx and are based on existing rail operations. VIA Rail data was not received in adequate time to complete this analysis, however research showed that two VIA Rail trains pass the nearby station daily. One train departs at 12:26 eastbound and the other at 18:49 westbound. To account for these trains, two VIA Rail trains were modelled and Gradient Wind's past experience to fill out the rest of the VIA Rail data until VIA provides the up to date data.

[5] City of Guelph, Noise Control Guidelines, City of Guelph, Ontario.
[6] Ontario Ministry of the Environment, Conservation and Parks, ORNAMENT – Ontario Road Noise Analysis Method for Environment and Transportation, Ontario.

In accordance with NPC-300 and STEAM, railway noise calculations were completed using the available rail traffic information provided by Metrolinx, including the number of trains, train consist characteristics, and operating conditions. A future growth factor of 2.5% over 10 years was applied in accordance with Guelph noise control guidelines and STEAM[7]. No whistling was assumed as Guelph by-laws prohibit whistling of trains in their downtown area as it is deemed a whistle cessation or quiet zone.

The railway traffic data provided by Metrolinx are included in Appendix C. Table 3 summarizes the railway traffic parameters used in the assessment, including the number of trains, train consist characteristics, operating speeds, and number of locomotives.

TABLE 3: RAILWAY TRAFFIC DATA

Train Type (Operator)	Locomotive Type	Cars	Speed Limit (km/h)	Future Number of Locomotives	
				Day (07:00-23:00)	Night (23:00-07:00)
GO (Metrolinx)	1 Diesel Locomotive	8	72 km/h	74	15
	2 Diesel Locomotive	8	72 km/h	10	0
Via Rail	1 Diesel Locomotive*	5*	72 km/h*	2**	0**

* VIA rail data based off Gradient Wind's past experience until VIA rail provides up to date information.
**Based off publicly available VIA rail schedules at Guelph central station.

4.2.3 Theoretical Roadway Traffic Noise Predictions

The impact of transportation noise sources on the development was determined by computer modelling. Transportation noise source modelling is based on the United States Federal Highway Administration's Traffic Noise Model (TNM) to represent the roadway line sources. The TNM model is also being accepted in the updated Environmental Guide for Noise of Ontario, 2022 by the Ministry of Transportation (MTO)[8] as

[7] Ontario Ministry of the Environment, Conservation and Parks, STEAM – Simplified Transportation Emissions Assessment Model for Rail Noise, Ontario.
[8] Ministry of Transportation Ontario, "*Environmental Guide for Noise*", February 2022

well as the revised NPC-300 noise guidelines. This computer program can represent three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing.

A set of comparative calculations were performed in the current Ontario traffic noise prediction model STAMSON for comparisons to Predictor simulation results (see Section 4.2.4 and Figure A1). The STAMSON model is, however, older and requires each receptor to be calculated separately. STAMSON also does not accurately account for building reflections and multiple screening elements, and curved road geometry. A total of 6 receptor locations were identified around the site, as illustrated in Figure 2.

Roadway noise calculations were performed by treating each road 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 2, theoretical noise predictions were based on the following parameters:

- The day/night split for all streets was taken to be 90%/10%, respectively.
- Truck traffic on all roadways was taken to comprise 6% heavy trucks and 7% medium trucks, as a conservative estimate.
- Default ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Noise receptors were strategically placed at 6 locations around the study area (see Figure 2).
- A future growth factor of 2% over 10 years from the completion of construction was applied to the data.
- OLA Receptors were positioned 1.5 m above the walkable surface

4.2.4 Theoretical Railway Traffic Noise Predictions

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

represent noise from the rail line within the Predictor model, a sample STAMSON calculation was conducted with the following parameters (see Appendix A):

Transportation noise calculations were performed in accordance with the City of Guelph's noise control guidelines, following ORNAMENT methodology for roadway noise modelling, and STEAM for railway noise modelling. In addition to the traffic volumes summarized in Tables 2 and 3, theoretical noise predictions were based on the following parameters:

- A future growth factor of 2.5% over 10 years from the completion of construction was applied to the data.
- Rail lines were assumed to be welded.
- Default ground surfaces were taken to be reflective due to the presence of hard (paved) ground.
- Topography was assumed to be a flat/gentle slope surrounding the study building.
- Noise receptors were strategically placed at 6 locations around the study area (see Figure 2).
- Whistle bursts were not considered as there is an anti-whistling by-law in effect at the only at-grade crossing located at the Guelph Central Station.

The noise generated from both on-road and railway traffic were combined for all receptor locations identified in Figure 2. The combined outdoor noise levels from both road and rail were compared to the appropriate NPC-300 criteria.

4.3 Ground Vibration and Ground-borne Noise

Rail systems and heavy vehicles on roadways can produce perceptible levels of ground vibrations, especially when they are in close proximity to residential neighbourhoods or vibration-sensitive buildings. Similar to sound waves in air, vibrations in solids are generated at a source, propagated through a medium, and intercepted by a receiver. In the case of ground vibrations, the medium can be uniform, or more often, a complex layering of soils and rock strata. Also, similar to sound waves in air, ground vibrations produce perceptible motions and regenerated noise known as 'ground-borne noise' when the vibrations encounter a hollow structure such as a building. Ground-borne noise and vibrations are generated when there is excitation of the ground, such as from a train or subway. Repetitive motion of the wheels on the track or rubber tires passing over an uneven surface causes vibration to propagate through the soil. When

they encounter a building, vibrations pass along the structure of the building beginning at the foundation and propagating to all floors. Air inside the building excited by the vibrating walls and floors represents regenerated airborne noise. Characteristics of the soil and the building are imparted to the noise, thereby creating a unique noise signature.

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

4.3.1 Ground Vibration Criteria

In the United States, the Federal Transportation Authority (FTA) has set vibration criteria for sensitive land uses next to transit corridors. Similar standards have been developed by the MECP. These standards indicate that the appropriate criteria for residences is 0.10 mm/s RMS for vibrations. For main line railways, a document titled *Guidelines for New Development in Proximity to Railway Operations*[9], indicates that vibration conditions should not exceed 0.14 mm/s RMS averaged over a one second time-period at the first floor and above of the proposed building. The Federal Transportation Authority (FTA) criterion was adopted as the appropriate standard for this study. As the main vibration source is due to the GO Transit rail corridor which has frequent events, the 0.10 mm/s RMS (72 dBV) vibration criteria and 35 dBA ground borne noise criteria were adopted for this study.

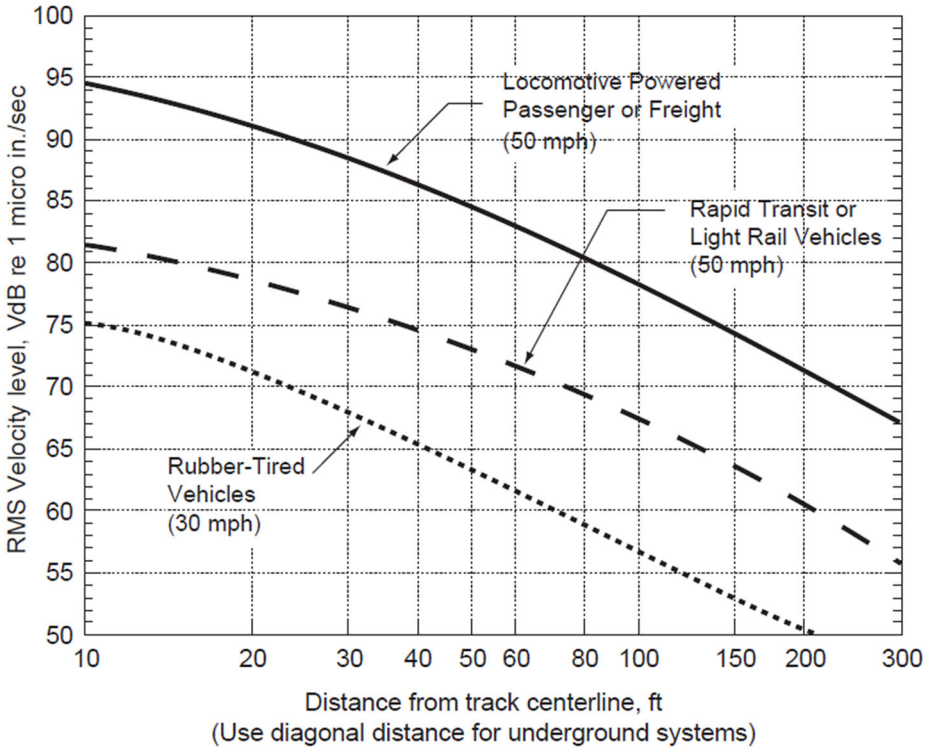
[9] Dialog and J.E. Coulter Associates Limited, prepared for The Federation of Canadian Municipalities and The Railway Association of Canada, May 2013

4.3.2 Theoretical Ground Vibration Prediction Procedure

Potential vibration impacts of the trains were predicted using the Federal Transit Authority's (FTA) *Transit Noise and Vibration Impact Assessment*[10] protocol. The FTA general vibration assessment is based on an upper bound generic set of curves that show vibration level attenuation with distance. These curves, illustrated in the figure on the following page, are based on ground vibration measurements at various transit systems throughout North America. Vibration levels at points of reception are adjusted by various factors to incorporate known characteristics of the system being analyzed, such as operating speed of vehicle, conditions of the track, construction of the track and geology, as well as the structural type of the impacted building structures. The vibration impact on the building was determined using a set of curves for Rapid Transit at a speed of 50 mph. Adjustment factors were considered based on the following information:

- The maximum operating speed of the rail line is 72 km/h (45 mph) at peak.
- The conservative offset distance between the development and the closest track is 53 m.
- The vehicles are assumed to have soft primary suspensions.
- Tracks are welded and in good condition.
- Soil conditions do not efficiently propagate vibrations.
- Type of transit structure is a Station.
- The building's foundation coupling is large masonry on piles.
- The subject site is situated approximately 53 m southwest of the Guelph Central rail corridor.

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



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

5. RESULTS

5.1 Transportation Traffic Noise Levels

The results of the transportation traffic noise calculations from STAMSON 5.04 are summarized in Table 4 below. Roadway noise and railway noise are presented separately because NPC-300 applied limitations differently for the two different source types. Total noise is the combination of both road and rail noise and will be the focus of this report.

TABLE 4: EXTERIOR NOISE LEVELS DUE TO ROADWAY AND RAILWAY SOURCES

Receptor Number	Receptor Height (m)	Receptor Location	Roadway Noise Level (dBA)		Railway Noise Level (dBA)		Total Noise Level (dBA)	
			Day	Night	Day	Night	Day	Night
R1	7.5	POW - South Façade - 3rd Storey	64	58	55	51	65	59
R2	7.5	POW - West Façade - 3rd Storey	58	52	58	51	61	55
R3	7.5	POW - Northeast Corner - 3rd Storey	45	39	62	58	63	58
R4	28.5	POW - North Façade - 10th Storey	39	33	64	57	64	57
R5	7.5	POW - East Façade 3rd Storey	58	52	45	40	59	52
R6	85	OLA - Rooftop Terrace	45	N/A	48	N/A	50	N/A

N/A: Noise levels during the nighttime are not considered for OLAs

The results of the current analysis indicate that total transportation noise levels will range between 59 and 65 dBA during the daytime period (07:00-23:00) and between 52 and 59 dBA during the nighttime period (23:00-07:00) for POW receptors. The highest noise level (65 dBA) occurs at the south façade, which is nearest and most exposed to Wyndham Street. Figures 3-6 illustrate daytime and nighttime noise levels across the buildings' facades.

Table 5 below provides a comparison between STAMSON and CadnaA. Noise levels calculated in STAMSON 5.04 were found to have good correlation with CadnaA and variability between the two programs was within an acceptable level of ±1-3 dBA. CadnaA analysis was included to aid in visualizing POW sound levels up the façades of the subject site, as shown in Figures 3-6.

TABLE 5: RESULTS OF STAMSON/CANDAA CORRELATION

Receptor Number	Receptor Height (m)	Receptor Location	STAMSON Total Noise Level (dBA)		CadnaA Total Noise Level (dBA)		Deviation (dBA)	
			Day	Night	Day	Night	Day	Night
R1	7.5	POW - South Façade - 3rd Storey	65	59	63	57	1.7	1.9
R2	7.5	POW - West Façade - 3rd Storey	61	55	59	54	2.2	0.9
R5	7.5	POW - East Façade 3rd Storey	59	52	58	51	1.0	0.9

5.2 Noise Control Measures

The results indicate that upgraded building components will be required due to excesses in railway noise. Additionally, a provision to include central air condition at the occupant's discretion will be required due to several receptors exceeding 55 dBA. However, due to the development's nature as a 24-storey mixed-use building, it is assumed that air conditioning will be installed. This will allow occupants to keep windows closed and maintain a comfortable living environment. Detailed mitigation measures would be the subject of a detailed noise assessment during the site plan approval stage. Warning Clauses will also be required in all Lease, Purchase and Sale Agreements, as summarized in Section 6.

5.3 Ground Vibrations and Ground-Borne Noise Levels

Estimated vibration levels at the foundation nearest to the GO Transit rail corridor are expected to be 0.027 mm/s RMS (61 dBV), based on the FTA protocol and an offset distance of 53 m to the nearest track centerline. Details of the calculation are provided in Appendix A. Since predicted vibration levels do not exceed the criterion of 0.10 mm/s RMS at the foundation, concerns due to vibration impacts on the site are not expected. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

6. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range between 59 and 65 dBA during the daytime period (07:00-23:00) and between 52 and 59 dBA during the nighttime period (23:00-07:00) for POW receptors. The highest noise level (65 dBA) occurs at the south façade, which is nearest and most

exposed to Wyndham Street. The rooftop terrace was found to have a predicted daytime noise level of 50 dBA due to the transportation noise.

The results indicate that upgraded building components will be required due to excesses in railway noise. Noise at receptors exceeding 55 dBA but not 65 dBA invokes a provision to install air conditioning. However, due to the nature of the development as a 24-storey mixed-use building, it is assumed that central air conditioning will be installed. This will allow occupants to keep windows closed and maintain a comfortable living environment. Detailed mitigation measured would be the subject of a detailed noise assessment during the site plan approval stage. The installation of central air conditioning requires the following Type D Warning Clause in all Lease, Purchase and Sale Agreements:

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."*

Furthermore, a GO/Metrolinx Warning Clause will be required in all Lease, Purchase and Sale Agreements, as well as agreements registered on title, because the development is with 300 m of the GO Transit rail corridor.

GO/Metrolinx Warning Clause:

> *"Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of way in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."*

Estimated vibration levels at the foundation nearest to the GO Transit rail corridor are expected to be 0.027 mm/s RMS (61 dBV), based on the FTA protocol and an offset distance of 53 m to the nearest track centerline. Details of the calculation are provided in Appendix A. Since predicted vibration levels do not exceed the criterion of 0.10 mm/s RMS at the foundation, concerns due to vibration impacts on the site are not expected. As vibration levels are acceptable, correspondingly, regenerated noise levels are also expected to be acceptable.

With regards to stationary noise impacts, it is recommended that a stationary noise study be conducted once mechanical plans for the proposed building become available. This study would assess impacts of stationary noise from rooftop mechanical units serving the proposed building on surrounding noise-sensitive areas. This study will include recommendations for any noise control measures that may be necessary to ensure noise levels fall below ENCG and NPC-300 limits. Noise impacts can generally be minimized by judicious selection and placement of the equipment. Where necessary noise screens and silencers can be placed into the design.

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

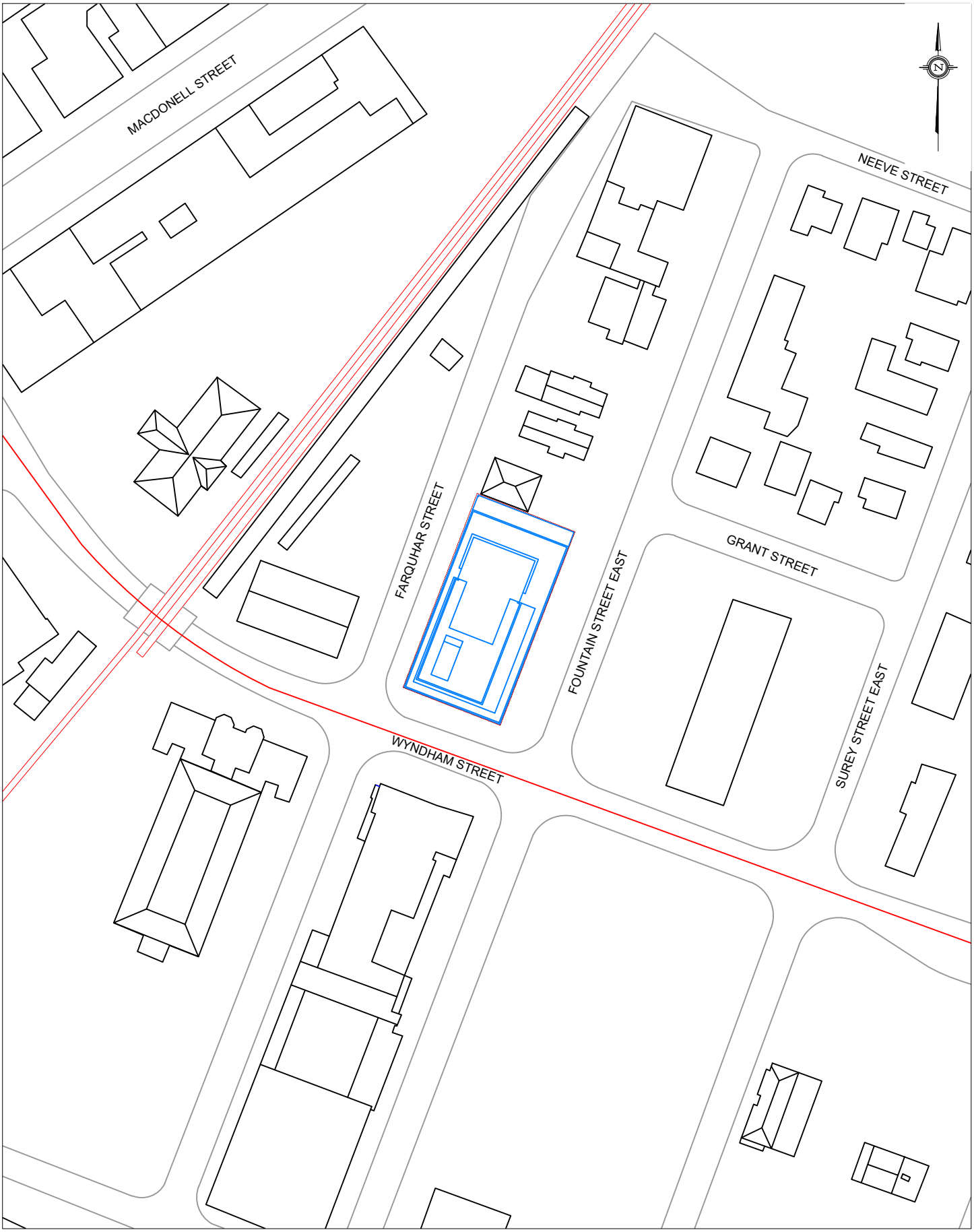
Sincerely,

Gradient Wind Engineering Inc.

Nick Cunnington-Bourbonniere, M.A.Sc.
Jr. Acoustic, Environmental Noise, and Vibration Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File #25-203



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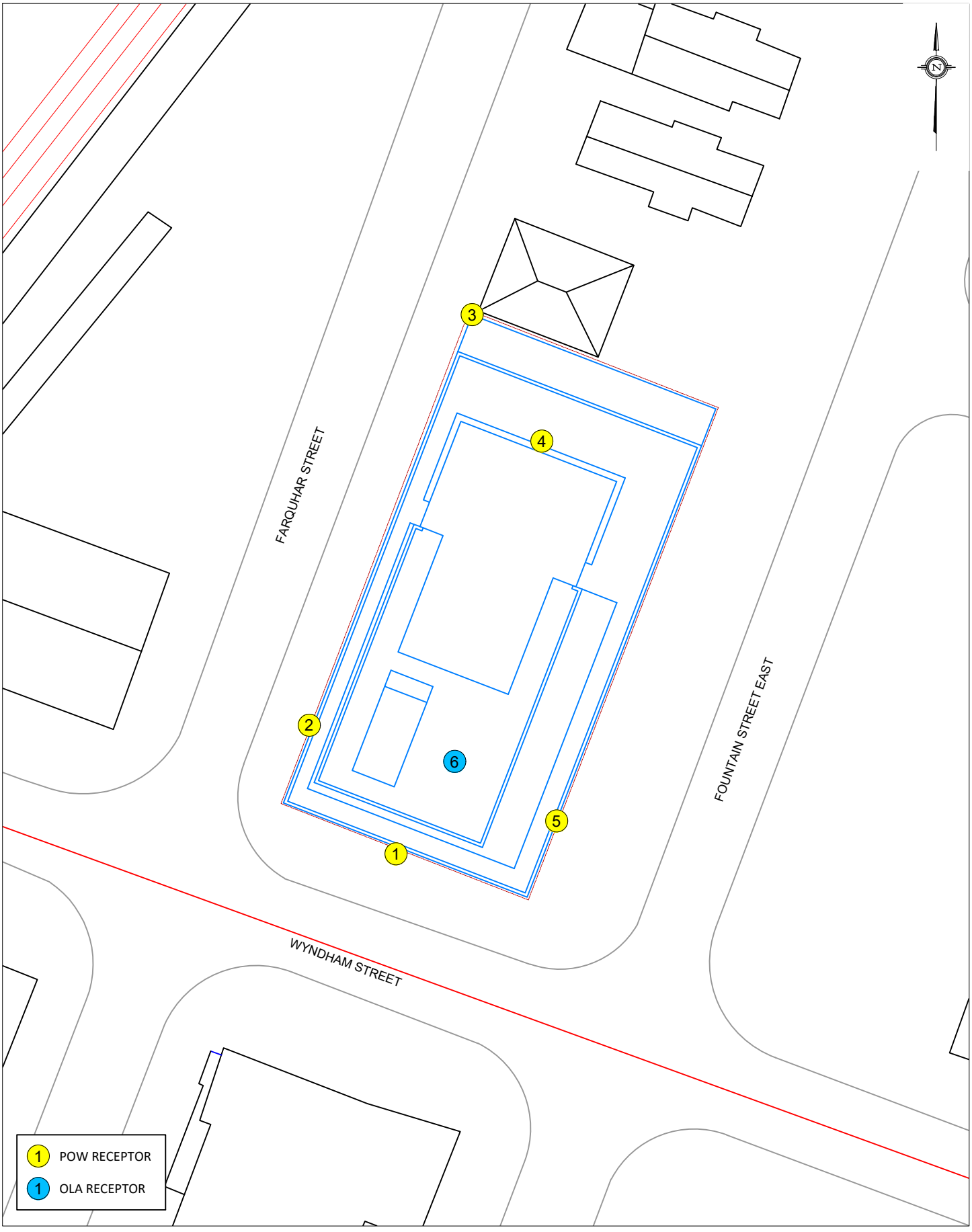
PROJECT	70 FOUNTAIN STREET, GUELPH TRANSPORTATION NOISE FEASIBILITY AND GROUND VIBRATIONS STUDY
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW25-203-1
DATE	DECEMBER 19, 2025
DRAWN BY	N.C.B.

DESCRIPTION

FIGURE 1:
SITE PLAN AND SURROUNDING CONTEXT



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PROJECT	70 FOUNTAIN STREET, GUELPH TRANSPORTATION NOISE FEASIBILITY AND GROUND VIBRATIONS STUDY		DESCRIPTION
SCALE	1:750 (APPROX.)	DRAWING NO.	GW25-203-2
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE 2:
RECEPTOR LOCATIONS

FIGURE 3: DAYTIME TRANSPORTATION NOISE LEVELS AT SOUTH FAÇADE

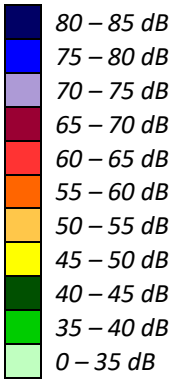
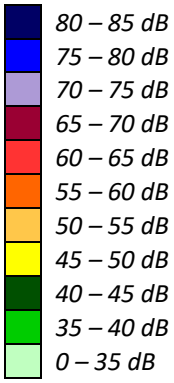


FIGURE 4: NIGHTTIME TRANSPORTATION NOISE LEVELS AT SOUTH FAÇADE



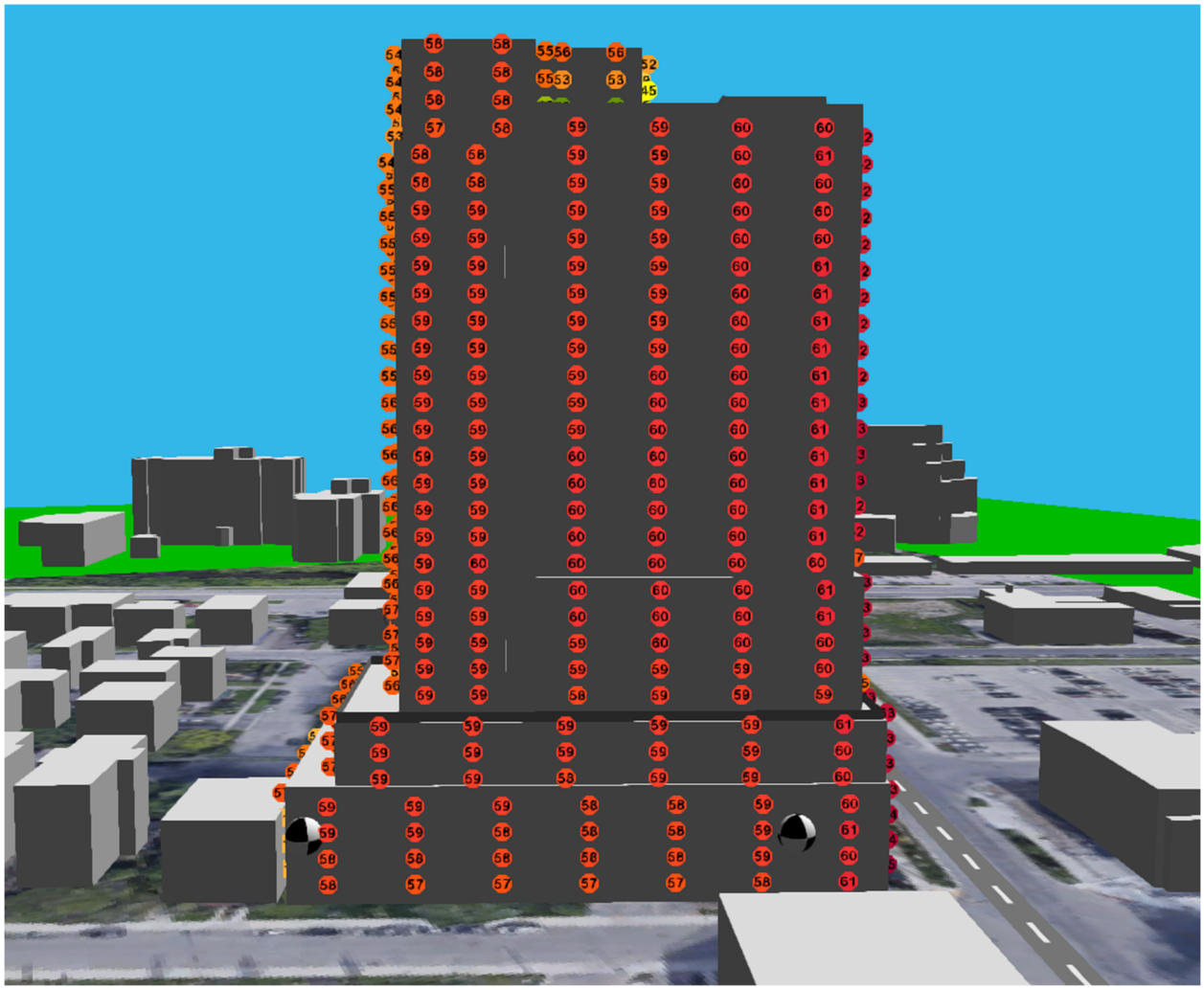
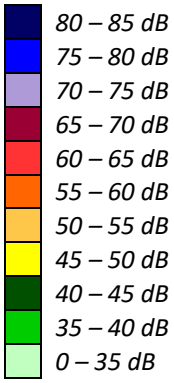


FIGURE 5: DAYTIME TRANSPORTATION NOISE LEVELS AT WEST FAÇADE



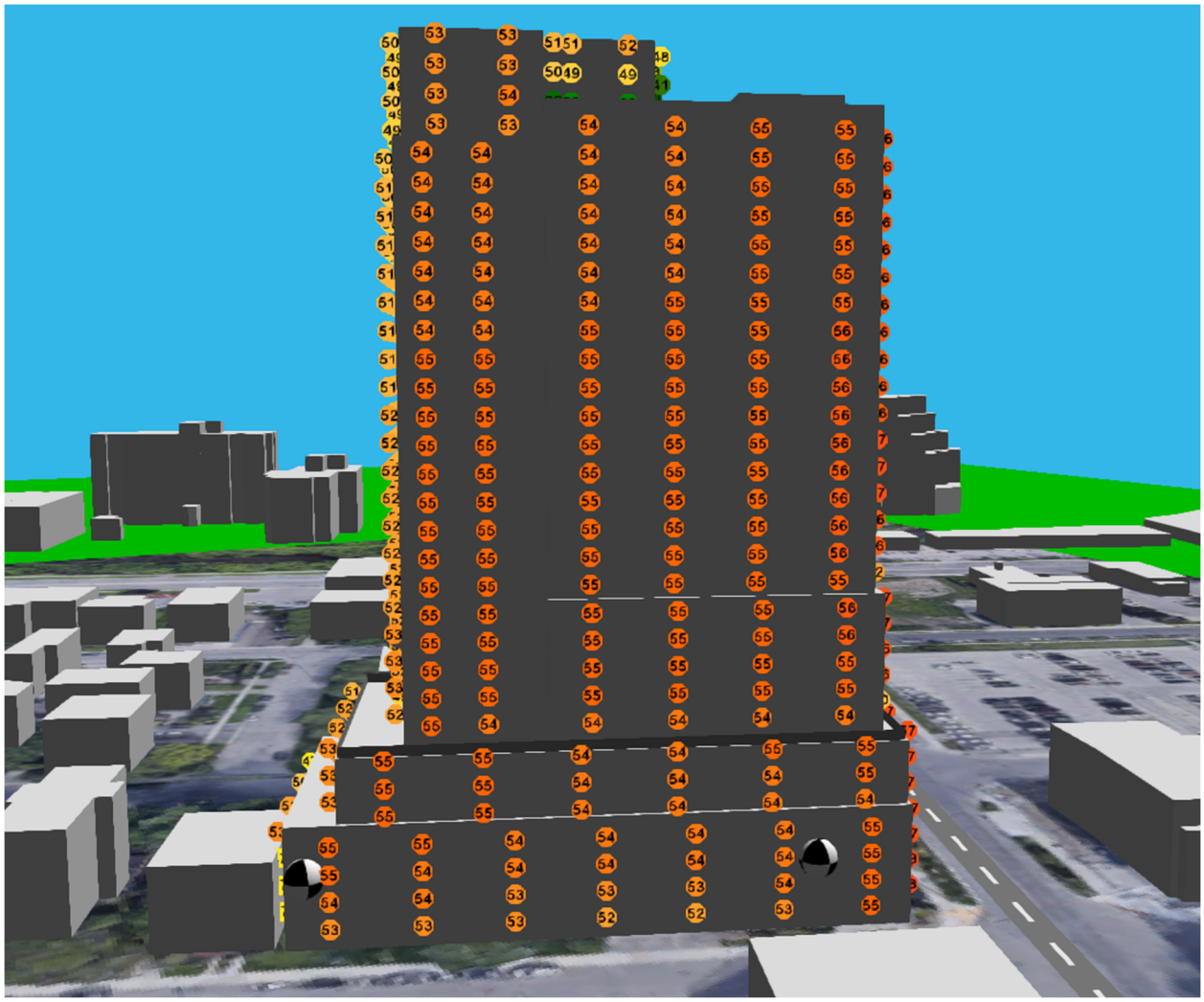


FIGURE 6: NIGHTTIME TRANSPORTATION NOISE LEVELS AT WEST FAÇADE

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

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APPENDIX A

STAMSON 5.04 – INPUT AND OUTPUT DATA

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

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 16:01:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r1.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 1

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1.	77.0/21.2	72.0	1.0	8.0	Diesel	Yes

Data for Segment # 1: 1-DIESEL (day/night)

Angle1 Angle2	: -90.00 deg	-17.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 87.22 / 87.22	m
Receiver height	: 7.50 / 7.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -90.00 deg	Angle2 : -37.00 deg
Barrier height	: 8.00	m
Barrier receiver distance	: 69.07 / 69.07	m
Source elevation	: 1.50	m
Receiver elevation	: 0.00	m
Barrier elevation	: 0.00	m
Reference angle	: 0.00	

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  11.0/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   8.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   -17.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  87.22 / 87.22  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : -37.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  69.07 / 69.07  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   -17.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  87.22 / 87.22  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : -37.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  69.07 / 69.07  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: 1-DIESEL (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	5.92	5.92
0.50	7.50	3.14	3.14

LOCOMOTIVE (0.00 + 50.74 + 50.60) = 53.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.00	71.10	-7.65	-5.31	0.00	0.00	-7.40	50.74
-37	-17	0.41	71.10	-10.74	-9.76	0.00	0.00	0.00	50.60

WHEEL (0.00 + 37.71 + 41.07) = 42.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.03	62.43	-7.87	-5.45	0.00	0.00	-11.39	37.71
-37	-17	0.51	62.43	-11.54	-9.81	0.00	0.00	0.00	41.07

Segment Leq : 54.01 dBA

Results segment # 2: 2-DIESEL (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	5.92	5.92
0.50	7.50	3.14	3.14

LOCOMOTIVE (0.00 + 44.70 + 44.56) = 47.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.00	65.06	-7.65	-5.31	0.00	0.00	-7.40	44.70
-37	-17	0.41	65.06	-10.74	-9.76	0.00	0.00	0.00	44.56

WHEEL (0.00 + 29.71 + 33.08) = 34.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.03	54.43	-7.87	-5.45	0.00	0.00	-11.39	29.71
-37	-17	0.51	54.43	-11.54	-9.81	0.00	0.00	0.00	33.08

Segment Leq : 47.86 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.92 !         5.92
       0.50 !        7.50 !        3.14 !         3.14

LOCOMOTIVE (0.00 + 35.90 + 35.76) = 38.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.00  56.26  -7.65  -5.31   0.00   0.00  -7.40  35.90
-------------------------------------------------------------------------
   -37    -17   0.41  56.26 -10.74  -9.76   0.00   0.00   0.00  35.76
-------------------------------------------------------------------------

WHEEL (0.00 + 21.55 + 24.92) = 26.56 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.03  46.27  -7.87  -5.45   0.00   0.00 -11.39  21.55
-------------------------------------------------------------------------
   -37    -17   0.51  46.27 -11.54  -9.81   0.00   0.00   0.00  24.92
-------------------------------------------------------------------------

Segment Leq : 39.09 dBA

Total Leq All Segments: 55.06 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.92 !         5.92
       0.50 !        7.50 !        3.14 !         3.14

LOCOMOTIVE (0.00 + 48.15 + 48.01) = 51.09 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.00  68.51  -7.65  -5.31   0.00   0.00  -7.40  48.15
-------------------------------------------------------------------------
   -37    -17   0.41  68.51 -10.74  -9.76   0.00   0.00   0.00  48.01
-------------------------------------------------------------------------

WHEEL (0.00 + 35.11 + 38.48) = 40.13 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.03  59.84  -7.87  -5.45   0.00   0.00 -11.39  35.11
-------------------------------------------------------------------------
   -37    -17   0.51  59.84 -11.54  -9.81   0.00   0.00   0.00  38.48
-------------------------------------------------------------------------

Segment Leq : 51.42 dBA
```

Results segment # 2: 2-DIESEL (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	5.92	5.92
0.50	7.50	3.14	3.14

LOCOMOTIVE (0.00 + -20.36 + -20.50) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.00	0.00	-7.65	-5.31	0.00	0.00	-7.40	-20.36
-37	-17	0.41	0.00	-10.74	-9.76	0.00	0.00	0.00	-20.50

WHEEL (0.00 + -24.72 + -21.36) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-37	0.03	0.00	-7.87	-5.45	0.00	0.00	-11.39	-24.72
-37	-17	0.51	0.00	-11.54	-9.81	0.00	0.00	0.00	-21.36

Segment Leq : 0.00 dBA

```
Results segment # 3: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.92 !         5.92
       0.50 !        7.50 !        3.14 !         3.14

LOCOMOTIVE (0.00 + -20.36 + -20.50) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.00   0.00  -7.65  -5.31   0.00   0.00  -7.40 -20.36
-------------------------------------------------------------------------
   -37    -17   0.41   0.00 -10.74  -9.76   0.00   0.00   0.00 -20.50
-------------------------------------------------------------------------

WHEEL (0.00 + -24.72 + -21.36) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -37   0.03   0.00  -7.87  -5.45   0.00   0.00 -11.39 -24.72
-------------------------------------------------------------------------
   -37    -17   0.51   0.00 -11.54  -9.81   0.00   0.00   0.00 -21.36
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 51.42 dBA
```

```
Road data, segment # 1: Wyndham (day/night)
-------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.57 m

ROAD (0.00 + 64.45 + 0.00) = 64.45 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  65.59   0.00   0.00  -1.13   0.00   0.00   0.00  64.45
-------------------------------------------------------------------------------

Segment Leq : 64.45 dBA

Total Leq All Segments: 64.45 dBA

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

Source height = 1.56 m

ROAD (0.00 + 57.91 + 0.00) = 57.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  59.05   0.00   0.00  -1.13   0.00   0.00   0.00  57.91
-------------------------------------------------------------------------------

Segment Leq : 57.91 dBA

Total Leq All Segments: 57.91 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.92
                           (NIGHT): 58.79
```

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 16:03:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r2.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 2

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1.	77.2/11.0	72.0	1.0	8.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

No	Train type: Name	Unadj. Trains	Annual % Increase	Years of Growth
1.		56.0/8.0	2.50	13.00

Data for Segment # 1: 1-DIESEL (day/night)

Angle1 Angle2	: -48.00 deg	73.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 0 / 0		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 71.00 / 71.00	m	
Receiver height	: 7.50 / 7.50	m	
Topography	: 2	(Flat/gentle slope; with barrier)	
No Whistle			
Barrier angle1	: -38.00 deg	Angle2 : 36.00 deg	
Barrier height	: 8.00	m	
Barrier receiver distance	: 50.00 / 50.00	m	
Source elevation	: 1.50	m	
Receiver elevation	: 0.00	m	
Barrier elevation	: 0.00	m	
Reference angle	: 0.00		

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  16.5/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !  12.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
------------------------------------------
Angle1   Angle2           : -48.00 deg   73.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  71.00 / 71.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -38.00 deg   Angle2 : 36.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  50.00 / 50.00  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -48.00 deg   73.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  71.00 / 71.00  m
Receiver height           :   7.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -38.00 deg   Angle2 : 36.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  50.00 / 50.00  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: 1-DIESEL (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	6.09	6.09
0.50	7.50	3.63	3.63

LOCOMOTIVE (48.52 + 51.34 + 53.73) = 56.46 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.41	71.11	-9.49	-13.11	0.00	0.00	0.00	48.52
-38	36	0.00	71.11	-6.75	-3.86	0.00	0.00	-9.16	51.34
36	73	0.41	71.11	-9.49	-7.90	0.00	0.00	0.00	53.73

WHEEL (38.99 + 36.29 + 44.09) = 45.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.51	62.44	-10.20	-13.25	0.00	0.00	0.00	38.99
-38	36	0.03	62.44	-6.95	-3.87	0.00	0.00	-15.32	36.29
36	73	0.51	62.44	-10.20	-8.15	0.00	0.00	0.00	44.09

Segment Leq : 56.82 dBA

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.09 !         6.09
       0.50 !        7.50 !        3.63 !         3.63

LOCOMOTIVE (44.23 + 47.05 + 49.44) = 52.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -48    -38   0.41  66.82  -9.49 -13.11   0.00   0.00   0.00  44.23
-------------------------------------------------------------------------
   -38     36   0.00  66.82  -6.75  -3.86   0.00   0.00  -9.16  47.05
-------------------------------------------------------------------------
    36     73   0.41  66.82  -9.49  -7.90   0.00   0.00   0.00  49.44
-------------------------------------------------------------------------

WHEEL (32.75 + 30.05 + 37.85) = 39.54 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -48    -38   0.51  56.20 -10.20 -13.25   0.00   0.00   0.00  32.75
-------------------------------------------------------------------------
   -38     36   0.03  56.20  -6.95  -3.87   0.00   0.00 -15.32  30.05
-------------------------------------------------------------------------
    36     73   0.51  56.20 -10.20  -8.15   0.00   0.00   0.00  37.85
-------------------------------------------------------------------------

Segment Leq : 52.40 dBA
```

Results segment # 3: VIA (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	6.09	6.09
0.50	7.50	3.63	3.63

LOCOMOTIVE (33.66 + 36.48 + 38.87) = 41.61 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.41	56.26	-9.49	-13.11	0.00	0.00	0.00	33.66
-38	36	0.00	56.26	-6.75	-3.86	0.00	0.00	-9.16	36.48
36	73	0.41	56.26	-9.49	-7.90	0.00	0.00	0.00	38.87

WHEEL (22.83 + 20.13 + 27.93) = 29.61 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.51	46.27	-10.20	-13.25	0.00	0.00	0.00	22.83
-38	36	0.03	46.27	-6.95	-3.87	0.00	0.00	-15.32	20.13
36	73	0.51	46.27	-10.20	-8.15	0.00	0.00	0.00	27.93

Segment Leq : 41.88 dBA

Total Leq All Segments: 58.26 dBA

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.09 !         6.09
       0.50 !        7.50 !        3.63 !         3.63

LOCOMOTIVE (43.07 + 45.88 + 48.28) = 51.01 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -48    -38   0.41  65.66  -9.49 -13.11   0.00   0.00   0.00  43.07
-------------------------------------------------------------------
   -38     36   0.00  65.66  -6.75  -3.86   0.00   0.00  -9.16  45.88
-------------------------------------------------------------------
    36     73   0.41  65.66  -9.49  -7.90   0.00   0.00   0.00  48.28
-------------------------------------------------------------------

WHEEL (33.54 + 30.84 + 38.64) = 40.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -48    -38   0.51  56.99 -10.20 -13.25   0.00   0.00   0.00  33.54
-------------------------------------------------------------------
   -38     36   0.03  56.99  -6.95  -3.87   0.00   0.00 -15.32  30.84
-------------------------------------------------------------------
    36     73   0.51  56.99 -10.20  -8.15   0.00   0.00   0.00  38.64
-------------------------------------------------------------------

Segment Leq : 51.37 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.09 !         6.09
       0.50 !        7.50 !        3.63 !         3.63

LOCOMOTIVE (-22.59 + -19.77 + -17.38) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -48    -38   0.41   0.00  -9.49 -13.11   0.00   0.00   0.00 -22.59
-------------------------------------------------------------------
   -38     36   0.00   0.00  -6.75  -3.86   0.00   0.00  -9.16 -19.77
-------------------------------------------------------------------
    36     73   0.41   0.00  -9.49  -7.90   0.00   0.00   0.00 -17.38
-------------------------------------------------------------------

WHEEL (-23.44 + -26.15 + -18.35) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -48    -38   0.51   0.00 -10.20 -13.25   0.00   0.00   0.00 -23.44
-------------------------------------------------------------------
   -38     36   0.03   0.00  -6.95  -3.87   0.00   0.00 -15.32 -26.15
-------------------------------------------------------------------
    36     73   0.51   0.00 -10.20  -8.15   0.00   0.00   0.00 -18.35
-------------------------------------------------------------------

Segment Leq : 0.00 dBA
```

Results segment # 3: VIA (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	4.50	5.20	5.20
0.50	4.50	2.74	2.74

LOCOMOTIVE (-23.32 + -22.48 + -18.21) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.50	0.00	-10.09	-13.23	0.00	0.00	0.00	-23.32
-38	36	0.01	0.00	-6.85	-3.87	0.00	0.00	-11.77	-22.48
36	73	0.50	0.00	-10.09	-8.12	0.00	0.00	0.00	-18.21

WHEEL (-24.18 + -28.40 + -19.17) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-48	-38	0.60	0.00	-10.80	-13.37	0.00	0.00	0.00	-24.18
-38	36	0.12	0.00	-7.56	-3.90	0.00	0.00	-16.94	-28.40
36	73	0.60	0.00	-10.80	-8.37	0.00	0.00	0.00	-19.17

Segment Leq : 0.00 dBA

Total Leq All Segments: 51.37 dBA

```
Road data, segment # 1: Wyndham (day/night)
------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : -69.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :   8.24 / 8.24   m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.57 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.57 !        7.50 !        5.98 !         5.98

ROAD (0.00 + 46.81 + 57.84) = 58.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -69   0.00  65.59   0.00  -2.04  -9.33   0.00   0.00  -7.41  46.81
-------------------------------------------------------------------------------
   -69      0   0.48  65.59   0.00  -3.02  -4.73   0.00   0.00   0.00  57.84
-------------------------------------------------------------------------------

Segment Leq : 58.17 dBA

Total Leq All Segments: 58.17 dBA

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

Source height = 1.56 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.56 !        7.50 !        5.98 !         5.98

ROAD (0.00 + 40.26 + 51.30) = 51.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -69   0.00  59.05   0.00  -2.04  -9.33   0.00   0.00  -7.41  40.26
-------------------------------------------------------------------------------
   -69      0   0.48  59.05   0.00  -3.02  -4.73   0.00   0.00   0.00  51.30
-------------------------------------------------------------------------------

Segment Leq : 51.63 dBA

Total Leq All Segments: 51.63 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 61.23
                           (NIGHT): 54.51
```

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 16:05:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r3.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 3

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1.	77.2/16.5	72.0	1.0	8.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.		56.0/12.0	2.50	13.00

Data for Segment # 1: 1-DIESEL (day/night)

Angle1 Angle2	: -90.00 deg	72.00 deg	
Wood depth	: 0	(No woods.)	
No of house rows	: 0 / 0		
Surface	: 1	(Absorptive ground surface)	
Receiver source distance	: 53.30 / 53.30	m	
Receiver height	: 7.50 / 7.50	m	
Topography	: 2	(Flat/gentle slope; with barrier)	
No Whistle			
Barrier angle1	: -90.00 deg	Angle2 : -21.00 deg	
Barrier height	: 8.00	m	
Barrier receiver distance	: 35.42 / 35.42	m	
Source elevation	: 1.50	m	
Receiver elevation	: 0.00	m	
Barrier elevation	: 0.00	m	
Reference angle	: 0.00		

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  11.0/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   8.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   72.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  53.30 / 53.30  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  35.42 / 35.42  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   72.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  53.30 / 53.30  m
Receiver height           :   7.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : -21.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  35.42 / 35.42  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: 1-DIESEL (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	6.17	6.17
0.50	7.50	3.85	3.85

LOCOMOTIVE (0.00 + 53.76 + 60.09) = 61.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-21	0.00	71.11	-5.51	-4.16	0.00	0.00	-7.68	53.76
-21	72	0.41	71.11	-7.74	-3.29	0.00	0.00	0.00	60.09

WHEEL (0.00 + 40.76 + 50.74) = 51.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-21	0.03	62.44	-5.67	-4.28	0.00	0.00	-11.73	40.76
-21	72	0.51	62.44	-8.31	-3.39	0.00	0.00	0.00	50.74

Segment Leq : 61.43 dBA

Results segment # 2: 2-DIESEL (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	6.17	6.17
0.50	7.50	3.85	3.85

LOCOMOTIVE (0.00 + 47.71 + 54.04) = 54.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-21	0.00	65.06	-5.51	-4.16	0.00	0.00	-7.68	47.71
-21	72	0.41	65.06	-7.74	-3.29	0.00	0.00	0.00	54.04

WHEEL (0.00 + 32.76 + 42.73) = 43.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-21	0.03	54.43	-5.67	-4.28	0.00	0.00	-11.73	32.76
-21	72	0.51	54.43	-8.31	-3.39	0.00	0.00	0.00	42.73

Segment Leq : 55.22 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.17 !         6.17
       0.50 !        7.50 !        3.85 !         3.85

LOCOMOTIVE (0.00 + 38.90 + 45.23) = 46.14 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.00  56.26  -5.51  -4.16   0.00   0.00  -7.68  38.90
-------------------------------------------------------------------------
   -21     72   0.41  56.26  -7.74  -3.29   0.00   0.00   0.00  45.23
-------------------------------------------------------------------------

WHEEL (0.00 + 24.59 + 34.57) = 34.99 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.03  46.27  -5.67  -4.28   0.00   0.00 -11.73  24.59
-------------------------------------------------------------------------
   -21     72   0.51  46.27  -8.31  -3.39   0.00   0.00   0.00  34.57
-------------------------------------------------------------------------

Segment Leq : 46.46 dBA

Total Leq All Segments: 62.47 dBA
```

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.17 !         6.17
       0.50 !        7.50 !        3.85 !         3.85

LOCOMOTIVE (0.00 + 50.07 + 56.40) = 57.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.00  67.42  -5.51  -4.16   0.00   0.00  -7.68  50.07
-------------------------------------------------------------------------
   -21     72   0.41  67.42  -7.74  -3.29   0.00   0.00   0.00  56.40
-------------------------------------------------------------------------

WHEEL (0.00 + 37.07 + 47.05) = 47.46 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.03  58.75  -5.67  -4.28   0.00   0.00 -11.73  37.07
-------------------------------------------------------------------------
   -21     72   0.51  58.75  -8.31  -3.39   0.00   0.00   0.00  47.05
-------------------------------------------------------------------------

Segment Leq : 57.74 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.17 !         6.17
       0.50 !        7.50 !        3.85 !         3.85

LOCOMOTIVE (0.00 + -17.35 + -11.02) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.00   0.00  -5.51  -4.16   0.00   0.00  -7.68 -17.35
-------------------------------------------------------------------------
   -21     72   0.41   0.00  -7.74  -3.29   0.00   0.00   0.00 -11.02
-------------------------------------------------------------------------

WHEEL (0.00 + -21.68 + -11.70) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.03   0.00  -5.67  -4.28   0.00   0.00 -11.73 -21.68
-------------------------------------------------------------------------
   -21     72   0.51   0.00  -8.31  -3.39   0.00   0.00   0.00 -11.70
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA
```

```
Results segment # 3: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.16 !         5.16
       0.50 !        4.50 !        2.84 !         2.84

LOCOMOTIVE (0.00 + -19.48 + -11.60) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.01   0.00  -5.59  -4.22   0.00   0.00  -9.67 -19.48
-------------------------------------------------------------------------
   -21     72   0.50   0.00  -8.23  -3.37   0.00   0.00   0.00 -11.60
-------------------------------------------------------------------------

WHEEL (0.00 + -23.88 + -12.28) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -21   0.12   0.00  -6.17  -4.60   0.00   0.00 -13.11 -23.88
-------------------------------------------------------------------------
   -21     72   0.60   0.00  -8.81  -3.47   0.00   0.00   0.00 -12.28
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 57.74 dBA
```

```
Road data, segment # 1: Wyndham (day/night)
-------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -20.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  78.30 / 78.30  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.57 m

ROAD (0.00 + 45.39 + 0.00) = 45.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -20      0   0.48  65.59   0.00 -10.61  -9.58   0.00   0.00   0.00  45.39
-------------------------------------------------------------------------------

Segment Leq : 45.39 dBA

Total Leq All Segments: 45.39 dBA

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

Source height = 1.56 m

ROAD (0.00 + 38.85 + 0.00) = 38.85 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -20      0   0.48  59.05   0.00 -10.61  -9.58   0.00   0.00   0.00  38.85
-------------------------------------------------------------------------------

Segment Leq : 38.85 dBA

Total Leq All Segments: 38.85 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 62.56
                           (NIGHT): 57.80
```

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 16:06:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r4.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 4

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1.	77.2/11.0	72.0	1.0	8.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.		56.0/8.0	2.50	13.00

Data for Segment # 1: 1-DIESEL (day/night)

Angle1 Angle2	: -17.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 70.00 / 70.00	m
Receiver height	: 28.50 / 28.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: 66.00 deg	Angle2 : 90.00 deg
Barrier height	: 8.00	m
Barrier receiver distance	: 20.00 / 20.00	m
Source elevation	: 1.50	m
Receiver elevation	: 0.00	m
Barrier elevation	: 0.00	m
Reference angle	: 0.00	

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  16.5/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !  12.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
------------------------------------------
Angle1   Angle2           : -17.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :  28.50 / 28.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  66.00 deg   Angle2 : 90.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  20.00 / 20.00  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -17.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :  28.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  66.00 deg   Angle2 : 90.00 deg
Barrier height            :   8.00 m
Barrier receiver distance :  20.00 / 20.00  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       28.50 !       21.93 !        21.93
       0.50 !       28.50 !       20.93 !        20.93

LOCOMOTIVE (61.06 + 55.67 + 0.00) = 62.16 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  71.11  -6.69  -3.36   0.00   0.00   0.00  61.06
-------------------------------------------------------------------------
    66     90   0.00  71.11  -6.69  -8.75   0.00   0.00  -0.06  55.61*
    66     90   0.00  71.11  -6.69  -8.75   0.00   0.00   0.00  55.67
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (52.39 + 47.00 + 0.00) = 53.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  62.44  -6.69  -3.36   0.00   0.00   0.00  52.39
-------------------------------------------------------------------------
    66     90   0.00  62.44  -6.69  -8.75   0.00   0.00  -0.07  46.92*
    66     90   0.00  62.44  -6.69  -8.75   0.00   0.00   0.00  47.00
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 62.71 dBA
```

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       28.50 !       21.93 !        21.93
       0.50 !       28.50 !       20.93 !        20.93

LOCOMOTIVE (56.77 + 51.38 + 0.00) = 57.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  66.82  -6.69  -3.36   0.00   0.00   0.00  56.77
-------------------------------------------------------------------------
    66     90   0.00  66.82  -6.69  -8.75   0.00   0.00  -0.06  51.32*
    66     90   0.00  66.82  -6.69  -8.75   0.00   0.00   0.00  51.38
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (46.14 + 40.76 + 0.00) = 47.25 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  56.20  -6.69  -3.36   0.00   0.00   0.00  46.14
-------------------------------------------------------------------------
    66     90   0.00  56.20  -6.69  -8.75   0.00   0.00  -0.07  40.68*
    66     90   0.00  56.20  -6.69  -8.75   0.00   0.00   0.00  40.76
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 58.23 dBA
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       28.50 !       21.93 !        21.93
       0.50 !       28.50 !       20.93 !        20.93

LOCOMOTIVE (46.20 + 40.82 + 0.00) = 47.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  56.26  -6.69  -3.36   0.00   0.00   0.00  46.20
-------------------------------------------------------------------------
    66     90   0.00  56.26  -6.69  -8.75   0.00   0.00  -0.06  40.75*
    66     90   0.00  56.26  -6.69  -8.75   0.00   0.00   0.00  40.82
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (36.22 + 30.83 + 0.00) = 37.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  46.27  -6.69  -3.36   0.00   0.00   0.00  36.22
-------------------------------------------------------------------------
    66     90   0.00  46.27  -6.69  -8.75   0.00   0.00  -0.07  30.76*
    66     90   0.00  46.27  -6.69  -8.75   0.00   0.00   0.00  30.83
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 47.73 dBA

Total Leq All Segments: 64.13 dBA
```

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       28.50 !       21.93 !        21.93
       0.50 !       28.50 !       20.93 !        20.93

LOCOMOTIVE (55.61 + 50.22 + 0.00) = 56.71 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  65.66  -6.69  -3.36   0.00   0.00   0.00  55.61
-------------------------------------------------------------------------
    66     90   0.00  65.66  -6.69  -8.75   0.00   0.00  -0.06  50.16*
    66     90   0.00  65.66  -6.69  -8.75   0.00   0.00   0.00  50.22
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (46.94 + 41.55 + 0.00) = 48.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00  56.99  -6.69  -3.36   0.00   0.00   0.00  46.94
-------------------------------------------------------------------------
    66     90   0.00  56.99  -6.69  -8.75   0.00   0.00  -0.07  41.47*
    66     90   0.00  56.99  -6.69  -8.75   0.00   0.00   0.00  41.55
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 57.26 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       28.50 !       21.93 !        21.93
       0.50 !       28.50 !       20.93 !        20.93

LOCOMOTIVE (-10.05 + -15.44 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00   0.00  -6.69  -3.36   0.00   0.00   0.00 -10.05
-------------------------------------------------------------------------
    66     90   0.00   0.00  -6.69  -8.75   0.00   0.00  -0.06 -15.50*
    66     90   0.00   0.00  -6.69  -8.75   0.00   0.00   0.00 -15.44
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (-10.05 + -15.44 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.00   0.00  -6.69  -3.36   0.00   0.00   0.00 -10.05
-------------------------------------------------------------------------
    66     90   0.00   0.00  -6.69  -8.75   0.00   0.00  -0.07 -15.51*
    66     90   0.00   0.00  -6.69  -8.75   0.00   0.00   0.00 -15.44
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 0.00 dBA
```

```
Results segment # 3: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.79 !         4.79
       0.50 !        4.50 !        3.79 !         3.79

LOCOMOTIVE (-13.79 + -23.29 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.50   0.00 -10.00  -3.78   0.00   0.00   0.00 -13.79
-------------------------------------------------------------------------
    66     90   0.01   0.00  -6.79  -8.87   0.00   0.00  -7.62 -23.29
-------------------------------------------------------------------------

WHEEL (-14.57 + -25.93 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -17     66   0.60   0.00 -10.70  -3.87   0.00   0.00   0.00 -14.57
-------------------------------------------------------------------------
    66     90   0.12   0.00  -7.49  -9.70   0.00   0.00  -8.74 -25.93
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 57.26 dBA
```

```
Road data, segment # 1: Wyndham (day/night)
------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  66.21 / 66.21  m
Receiver height           :  28.50 / 28.50  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :   0.50 / 0.50   m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.57 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.57 !       28.50 !       28.31 !        28.31

ROAD (0.00 + 39.29 + 0.00) = 39.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  65.59   0.00  -6.45   0.00   0.00   0.00 -19.85  39.29
-------------------------------------------------------------------------

Segment Leq : 39.29 dBA

Total Leq All Segments: 39.29 dBA

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

Source height = 1.56 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.56 !       28.50 !       28.31 !        28.31

ROAD (0.00 + 32.75 + 0.00) = 32.75 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  59.05   0.00  -6.45   0.00   0.00   0.00 -19.85  32.75
-------------------------------------------------------------------------

Segment Leq : 32.75 dBA

Total Leq All Segments: 32.75 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.15
                           (NIGHT): 57.28
```

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 16:08:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r5.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 5

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1.	77.2/16.5	72.0	1.0	8.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.		56.0/12.0	2.50	13.00

Data for Segment # 1: 1-DIESEL (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth		: 0	(No woods.)
No of house rows		: 0 / 0	
Surface		: 1	(Absorptive ground surface)
Receiver source distance		: 101.00 / 101.00 m	
Receiver height		: 7.50 / 7.50 m	
Topography		: 2	(Flat/gentle slope; with barrier)
No Whistle			
Barrier angle1		: -90.00 deg	Angle2 : 90.00 deg
Barrier height		: 83.50 m	
Barrier receiver distance		: 0.50 / 0.50 m	
Source elevation		: 1.50 m	
Receiver elevation		: 0.00 m	
Barrier elevation		: 0.00 m	
Reference angle		: 0.00	

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  11.0/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   8.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 101.00 / 101.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :   0.50 / 0.50   m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 101.00 / 15.00  m
Receiver height           :   7.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :   0.50 / 10.00  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        7.49 !         7.49
       0.50 !        7.50 !        7.47 !         7.47

LOCOMOTIVE (0.00 + 42.96 + 0.00) = 42.96 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  71.11  -8.28   0.00   0.00   0.00 -19.87  42.96
-------------------------------------------------------------------------

WHEEL (0.00 + 34.29 + 0.00) = 34.29 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  62.44  -8.28   0.00   0.00   0.00 -19.87  34.29
-------------------------------------------------------------------------

Segment Leq : 43.51 dBA
```

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        7.49 !         7.49
       0.50 !        7.50 !        7.47 !         7.47

LOCOMOTIVE (0.00 + 36.91 + 0.00) = 36.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  65.06  -8.28   0.00   0.00   0.00 -19.87  36.91
-------------------------------------------------------------------------

WHEEL (0.00 + 26.28 + 0.00) = 26.28 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  54.43  -8.28   0.00   0.00   0.00 -19.87  26.28
-------------------------------------------------------------------------

Segment Leq : 37.27 dBA
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        7.49 !         7.49
       0.50 !        7.50 !        7.47 !         7.47

LOCOMOTIVE (0.00 + 28.11 + 0.00) = 28.11 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.26  -8.28   0.00   0.00   0.00 -19.87  28.11
-------------------------------------------------------------------------

WHEEL (0.00 + 18.12 + 0.00) = 18.12 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  46.27  -8.28   0.00   0.00   0.00 -19.87  18.12
-------------------------------------------------------------------------

Segment Leq : 28.52 dBA

Total Leq All Segments: 44.55 dBA
```

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        7.49 !         7.49
       0.50 !        7.50 !        7.47 !         7.47

LOCOMOTIVE (0.00 + 39.27 + 0.00) = 39.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  67.42  -8.28   0.00   0.00   0.00 -19.87  39.27
-------------------------------------------------------------------------

WHEEL (0.00 + 30.60 + 0.00) = 30.60 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  58.75  -8.28   0.00   0.00   0.00 -19.87  30.60
-------------------------------------------------------------------------

Segment Leq : 39.82 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        7.49 !         7.49
       0.50 !        7.50 !        7.47 !         7.47

LOCOMOTIVE (0.00 + -28.15 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00  -8.28   0.00   0.00   0.00 -19.87 -28.15
-------------------------------------------------------------------------

WHEEL (0.00 + -28.15 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00  -8.28   0.00   0.00   0.00 -19.87 -28.15
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA
```

```
Results segment # 3: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        5.17 !         5.17
       0.50 !        4.50 !        2.83 !         2.83

LOCOMOTIVE (0.00 + -19.91 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00   0.00   0.00   0.00   0.00 -19.91 -19.91
-------------------------------------------------------------------------

WHEEL (0.00 + -19.91 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00   0.00   0.00   0.00   0.00 -19.91 -19.91
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 39.82 dBA
```

```
Road data, segment # 1: Wyndham (day/night)
-------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

Source height = 1.57 m

ROAD (0.00 + 58.43 + 0.00) = 58.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.48  65.59   0.00  -3.02  -4.14   0.00   0.00   0.00  58.43
-------------------------------------------------------------------------------

Segment Leq : 58.43 dBA

Total Leq All Segments: 58.43 dBA

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

Source height = 1.56 m

ROAD (0.00 + 51.88 + 0.00) = 51.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90      0   0.48  59.05   0.00  -3.02  -4.14   0.00   0.00   0.00  51.88
-------------------------------------------------------------------------------

Segment Leq : 51.88 dBA

Total Leq All Segments: 51.88 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 58.60
                           (NIGHT): 52.14
```

STAMSON 5.0 NORMAL REPORT Date: 17-12-2025 15:58:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 70fnt_r6.te Time Period: Day/Night 16/8 hours
Description: 70 Fountain: Receptor 6

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1.	77.2/11.0	72.0	1.0	8.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

No	Train type: Name	Unadj. Trains	Annual % Increase	Years of Growth
1.		56.0/8.0	2.50	13.00

Data for Segment # 1: 1-DIESEL (day/night)

Angle1 Angle2	: -90.00 deg	90.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 85.70 / 85.70	m
Receiver height	: 85.00 / 85.00	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -90.00 deg	Angle2 : 90.00 deg
Barrier height	: 83.50	m
Barrier receiver distance	: 15.30 / 15.30	m
Source elevation	: 1.50	m
Receiver elevation	: 0.00	m
Barrier elevation	: 0.00	m
Reference angle	: 0.00	

```
Rail data, segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !  16.5/0.0   !  72.0 !  2.0 !  8.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !  12.0/0.0   !    2.50  !   13.00  !

Data for Segment # 2: 2-DIESEL (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.70 / 85.70  m
Receiver height           :  85.00 / 85.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :  15.30 / 15.30  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Rail data, segment # 3: VIA (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1.             !   2.8/0.0   !  72.0 !  1.0 !  5.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1.                !   2.0/0.0   !    2.50  !   13.00  !

Data for Segment # 3: VIA (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  85.70 / 15.00  m
Receiver height           :  85.00 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :  15.30 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       85.00 !       70.81 !        70.81
       0.50 !       85.00 !       70.18 !        70.18

LOCOMOTIVE (0.00 + 46.32 + 0.00) = 46.32 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  71.11  -7.57   0.00   0.00   0.00 -17.22  46.32
-------------------------------------------------------------------------

WHEEL (0.00 + 37.53 + 0.00) = 37.53 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  62.44  -7.57   0.00   0.00   0.00 -17.35  37.53
-------------------------------------------------------------------------

Segment Leq : 46.86 dBA
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       85.00 !       70.81 !        70.81
       0.50 !       85.00 !       70.18 !        70.18

LOCOMOTIVE (0.00 + 42.03 + 0.00) = 42.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  66.82  -7.57   0.00   0.00   0.00 -17.22  42.03
-------------------------------------------------------------------------

WHEEL (0.00 + 31.28 + 0.00) = 31.28 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.20  -7.57   0.00   0.00   0.00 -17.35  31.28
-------------------------------------------------------------------------

Segment Leq : 42.38 dBA
```

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       85.00 !       70.54 !        70.54
       0.50 !       85.00 !       69.91 !        69.91

LOCOMOTIVE (0.00 + 31.41 + 0.00) = 31.41 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.26  -7.57   0.00   0.00   0.00 -17.28  31.41
-------------------------------------------------------------------------

WHEEL (0.00 + 21.31 + 0.00) = 21.31 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  46.27  -7.57   0.00   0.00   0.00 -17.39  21.31
-------------------------------------------------------------------------

Segment Leq : 31.81 dBA

Total Leq All Segments: 48.28 dBA
```

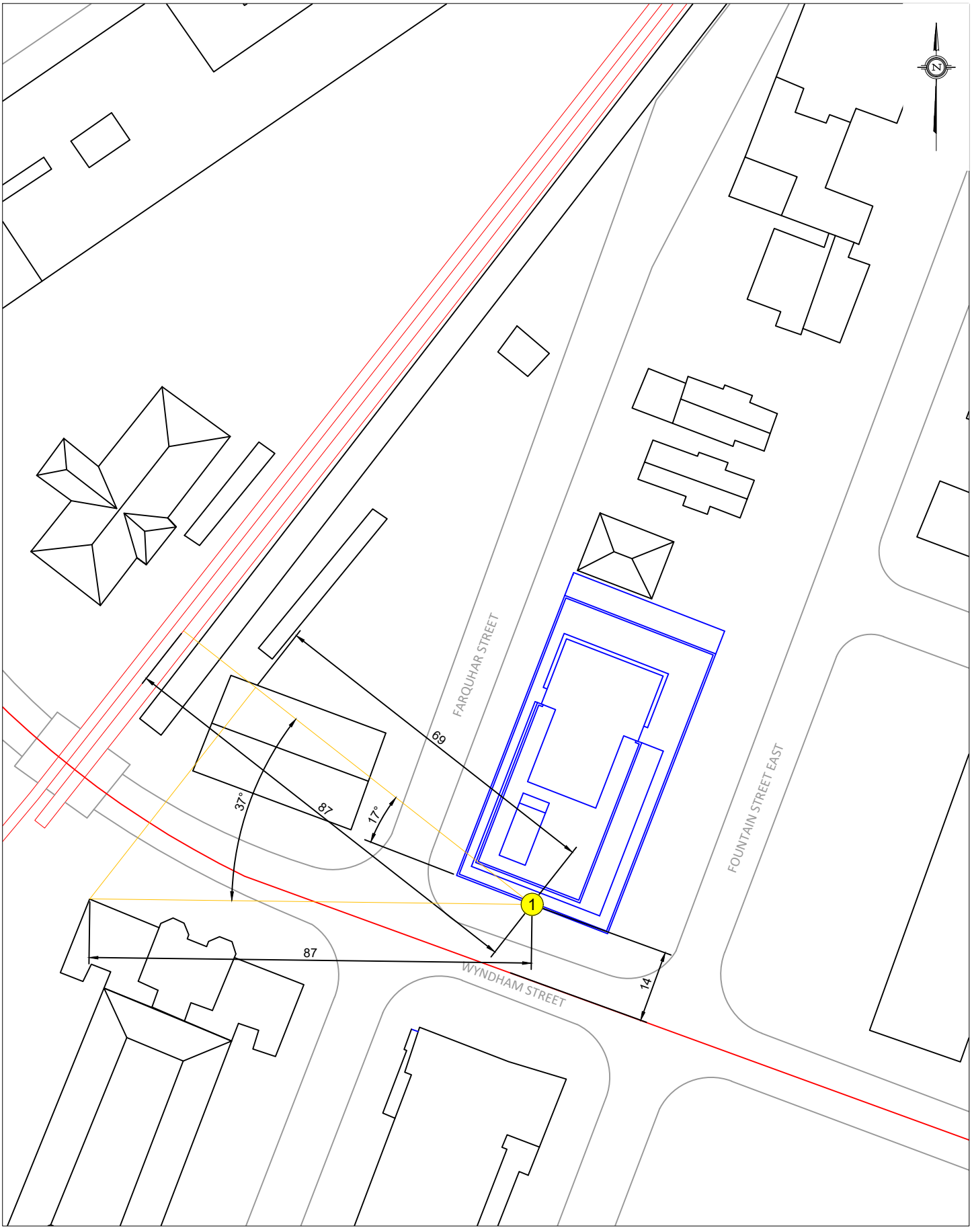
```
Results segment # 1: 1-DIESEL (night)
-----------------------------------

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       85.00 !       70.81 !        70.81
       0.50 !       85.00 !       70.18 !        70.18

LOCOMOTIVE (0.00 + 40.87 + 0.00) = 40.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  65.66  -7.57   0.00   0.00   0.00 -17.22  40.87
-------------------------------------------------------------------------

WHEEL (0.00 + 32.07 + 0.00) = 32.07 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  56.99  -7.57   0.00   0.00   0.00 -17.35  32.07
-------------------------------------------------------------------------

Segment Leq : 41.41 dBA
```

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

Barrier height for grazing incidence
-------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !       85.00 !       70.81 !        70.81
       0.50 !       85.00 !       70.18 !        70.18

LOCOMOTIVE (0.00 + -24.79 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00  -7.57   0.00   0.00   0.00 -17.22 -24.79
-------------------------------------------------------------------------

WHEEL (0.00 + -24.91 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00  -7.57   0.00   0.00   0.00 -17.35 -24.91
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA
```

```
Results segment # 3: VIA (night)
--------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        4.50 !        4.17 !         4.17
       0.50 !        4.50 !        1.83 !         1.83

LOCOMOTIVE (0.00 + -19.91 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00   0.00   0.00   0.00   0.00 -19.91 -19.91
-------------------------------------------------------------------------

WHEEL (0.00 + -19.91 + 0.00) = 0.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00   0.00   0.00   0.00   0.00   0.00 -19.91 -19.91
-------------------------------------------------------------------------

Segment Leq : 0.00 dBA

Total Leq All Segments: 41.41 dBA
```

```
Road data, segment # 1: Wyndham (day/night)
------------------------------------------
Car traffic volume  :  5495/611   veh/TimePeriod  *
Medium truck volume :   442/49    veh/TimePeriod  *
Heavy truck volume  :   379/42    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):   5425
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   6.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wyndham (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  26.00 / 66.21  m
Receiver height           :  85.00 / 85.00  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  83.50 m
Barrier receiver distance :   9.00 / 49.21  m
Source elevation          :   1.50 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

Source height = 1.57 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.57 !       85.00 !       56.64 !        56.64

ROAD (0.00 + 45.21 + 0.00) = 45.21 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  65.59   0.00  -2.39   0.00   0.00   0.00 -17.99  45.21
-------------------------------------------------------------------------------

Segment Leq : 45.21 dBA

Total Leq All Segments: 45.21 dBA

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

Source height = 1.56 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.56 !       85.00 !       24.10 !        24.10

ROAD (0.00 + 33.09 + 0.00) = 33.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  59.05   0.00  -6.45   0.00   0.00   0.00 -19.50  33.09
-------------------------------------------------------------------------------

Segment Leq : 33.09 dBA

Total Leq All Segments: 33.09 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 50.02
                           (NIGHT): 42.01
```



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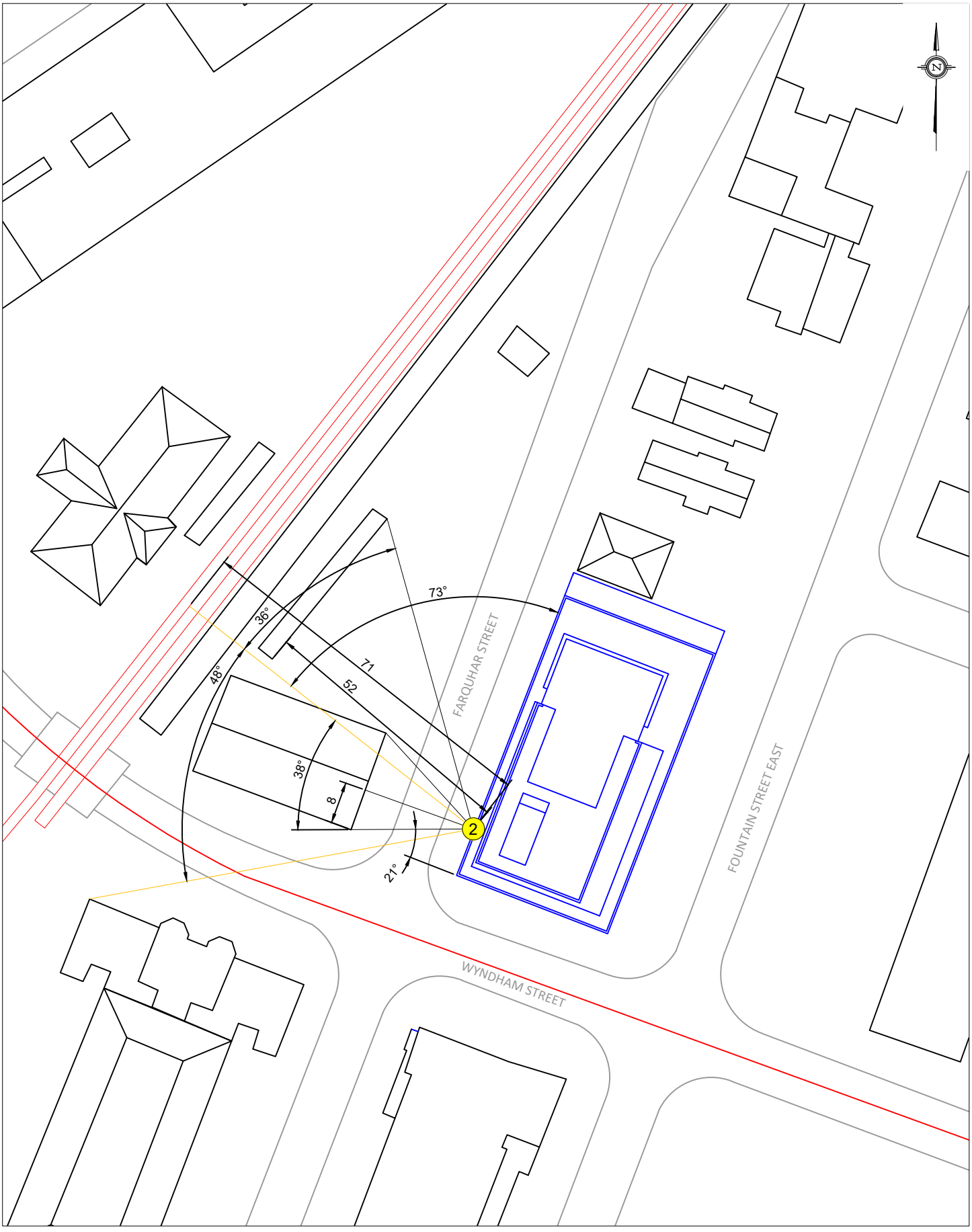
PROJECT	70 FOUNTAIN STREET, GUELPH ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A1
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A1:
STAMSON INPUT PARAMETERS (RECEPTOR 1)



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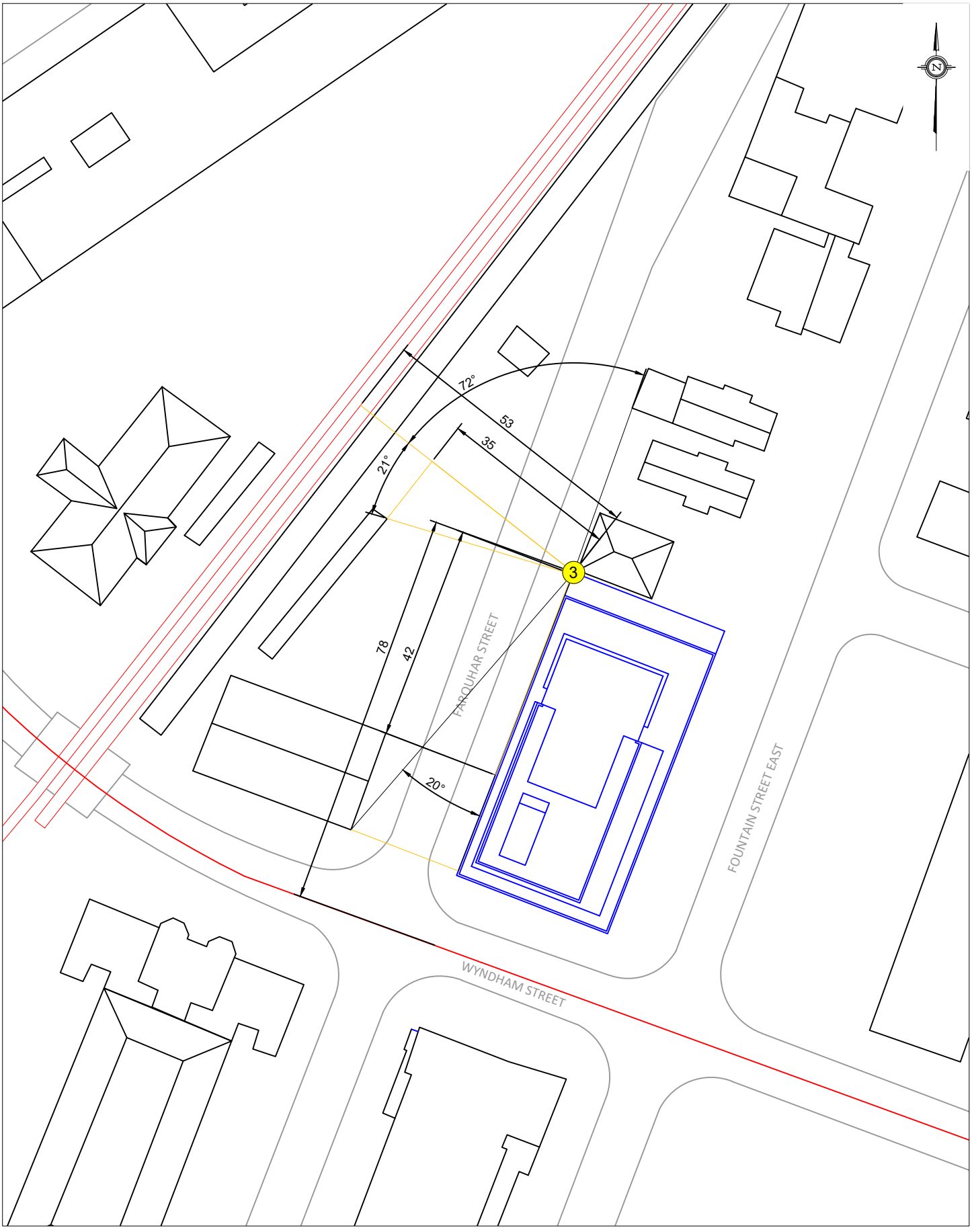
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A2
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A2:
STAMSON INPUT PARAMETERS (RECEPTOR 2)



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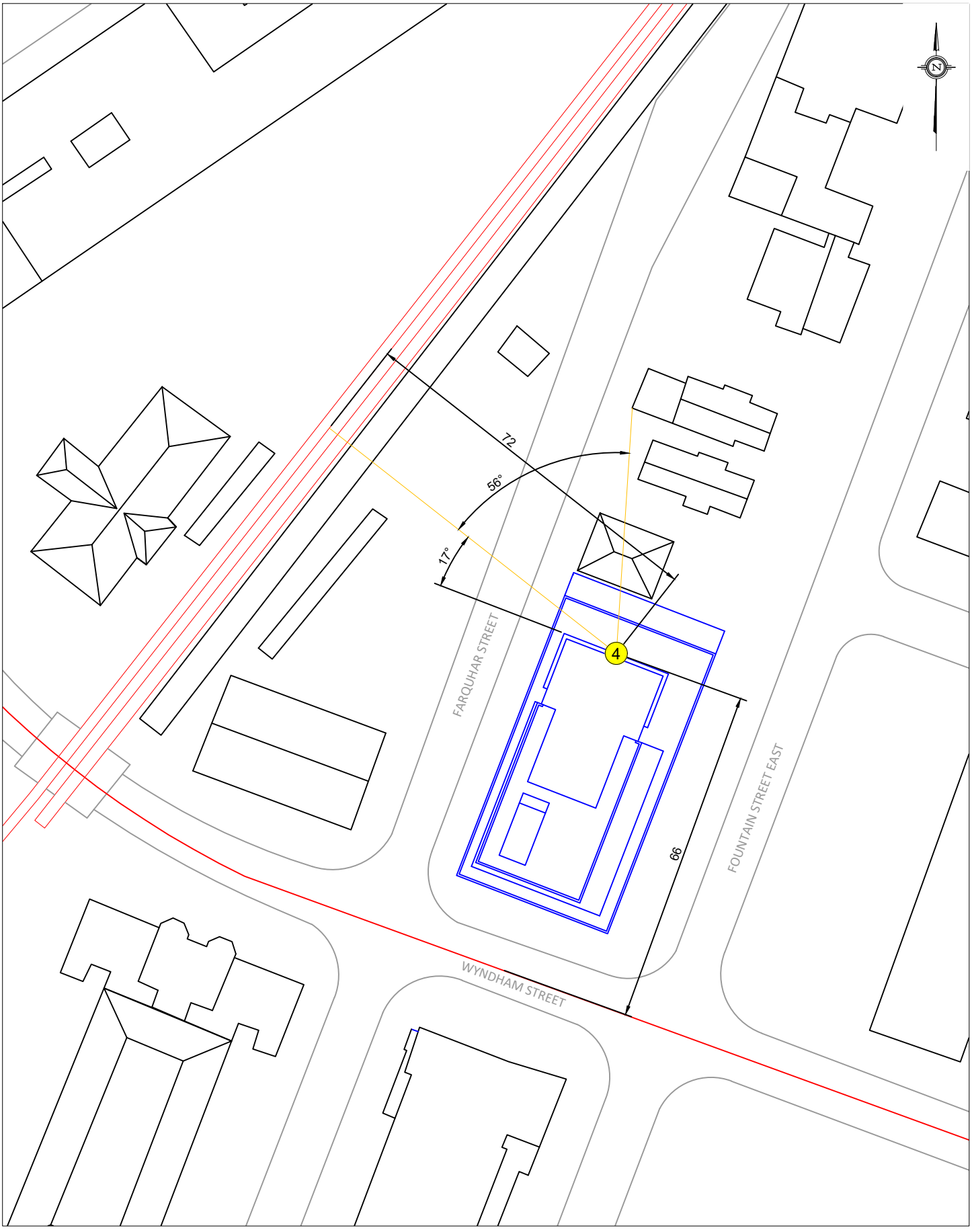
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A3
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A3:
STAMSON INPUT PARAMETERS (RECEPTOR 3)



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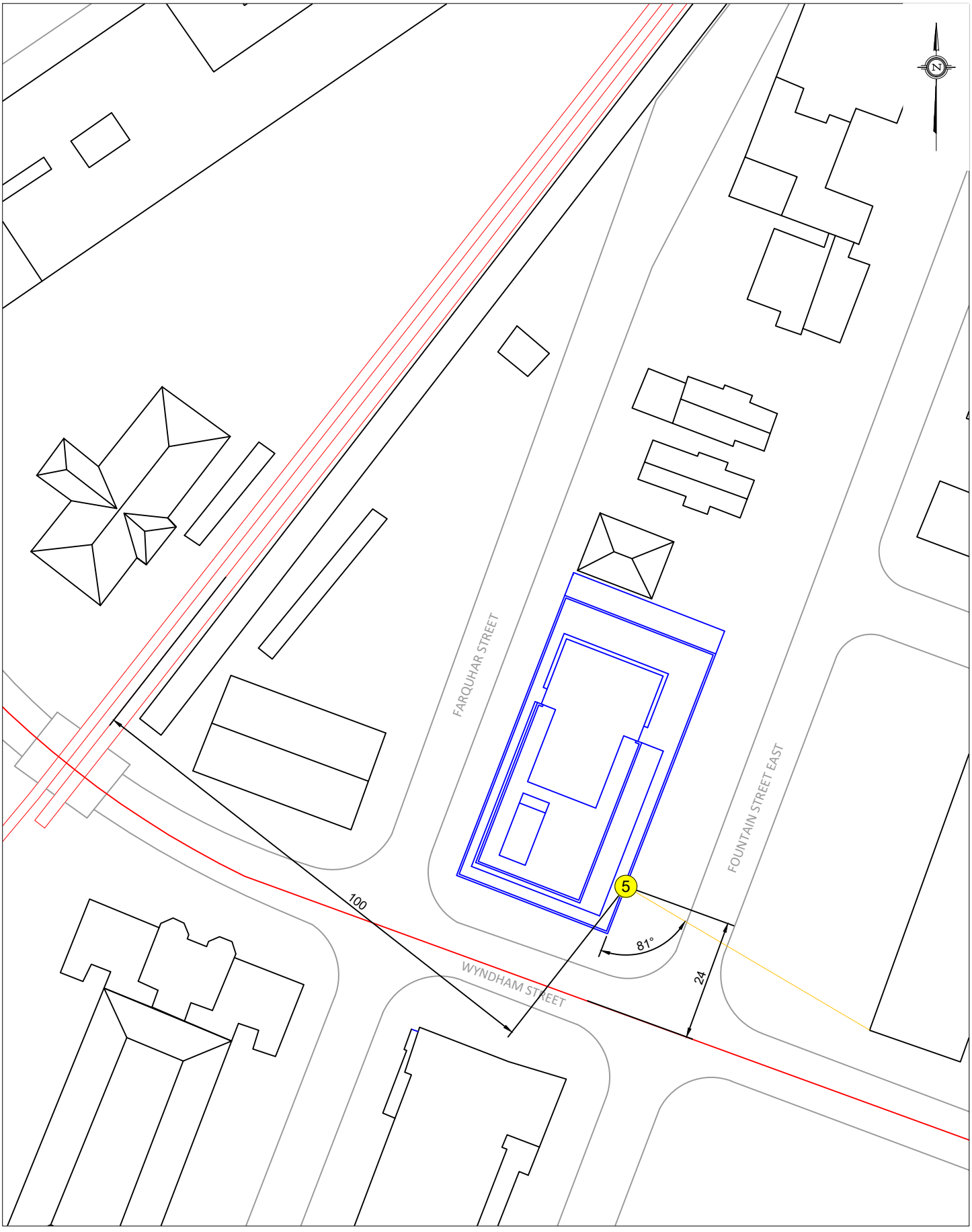
PROJECT	70 FOUNTAIN STREET, GUELPH ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A4
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A4:
STAMSON INPUT PARAMETERS (RECEPTOR 4)



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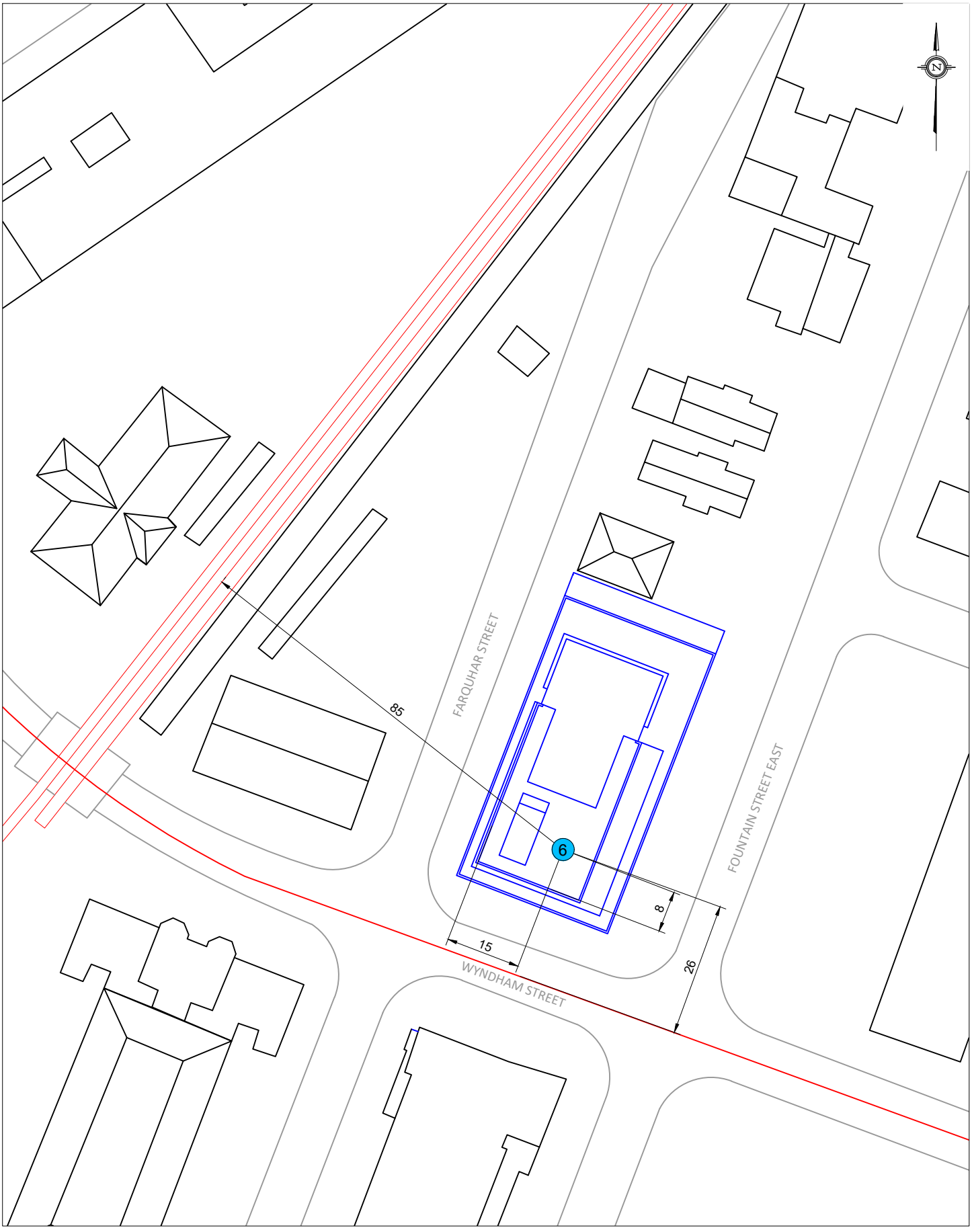
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A5
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A:
STAMSON INPUT PARAMETERS (RECEPTOR 5)



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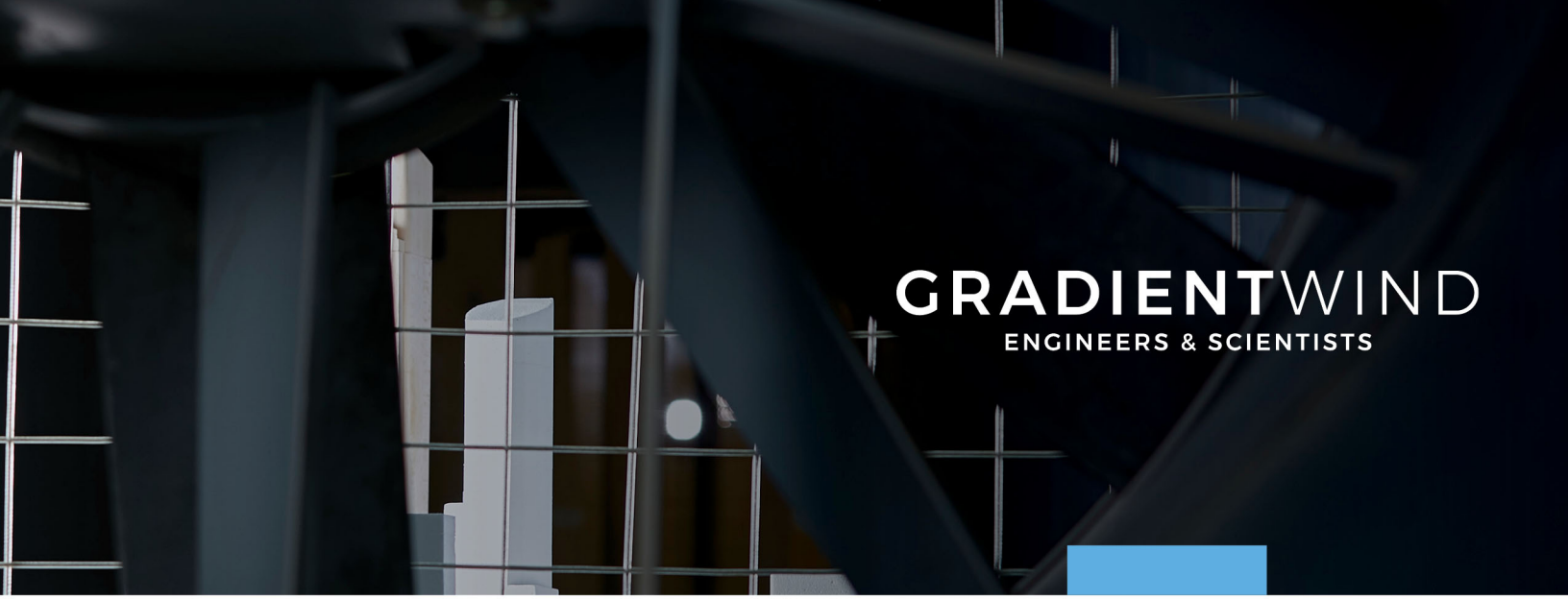
PROJECT	70 FOUNTAIN STREET, GUELPH ROADWAY TRAFFIC NOISE ASSESSMENT		DESCRIPTION
SCALE	1:1000 (APPROX.)	DRAWING NO.	GW25-203-A6
DATE	DECEMBER 19, 2025	DRAWN BY	N.C.B.

FIGURE A6:
STAMSON INPUT PARAMETERS (RECEPTOR 6)



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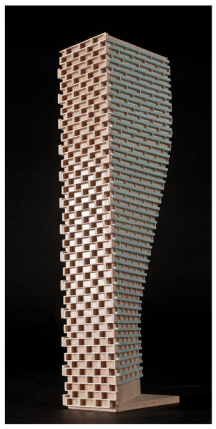

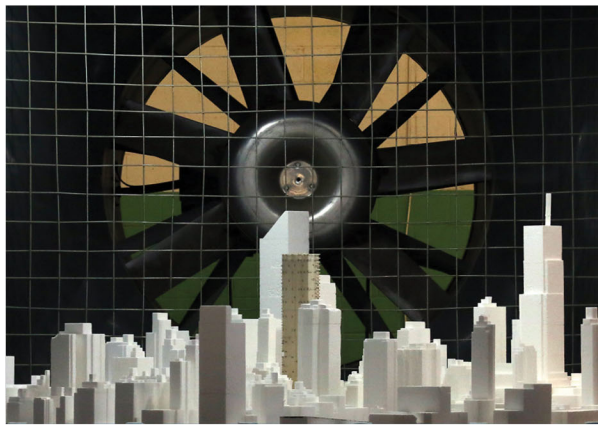

APPENDIX B

FTA VIBRATION CALCULATIONS

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GW25-203 17-Dec-25

Possible Vibration Impacts 70 Fountain St E, Guelph
Perdicted using FTA General Assesment

Vehicle Speed 72 km/h 45 mph

	Distance from C/L	
	(m)	(ft)
Go Rail	53	173.9

	Vibration		
From FTA Manual Fig 10-1			
Vibration Levels at distance from track	72.5	dBV re 1 micro in/sec	
Adjustment Factors FTA Table 10-1			
Speed reference 50 mph	-1	Speed Limit of 72 km/h (45 mph)	
Vehicle Parameters	0	Assume soft primary suspension	
Track Condition	0	N/A	
Track Treatments	0	N/A	
Type of Transit Structure	-5	N/A	
Vibration Propagation	0	Inefficient propagation of vibrations through soil	
Vibration Levels at Fdn	67		0.054
Coupling to Building Foundation	-10	Large Masonry on Piles	
Floor to Floor Attenuation	-2.0	Ground Floor Unoccupied	
Amplification of Floor and Walls	6		
Total Vibration Level	60.6	dBV or	0.027 mm/s
Noise Level in dBA	25.6	dBA	

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

Source Factor	Adjustment to Propagation Curve			Comment
		Reference Speed		
	Vehicle Speed	50 mph	30 mph	
Speed	60 mph	+1.6 dB	+6.0 dB	Vibration level is approximately proportional to $20\log(speed/speed_{ref})$, see Eq. 6-4.
	50 mph	0.0 dB	+4.4 dB	
	40 mph	-1.9 dB	+2.5 dB	
	30 mph	-4.4 dB	0.0 dB	
	20 mph	-8.0 dB	-3.5 dB	
Vehicle Parameters (not additive, apply greatest value only)				
Vehicle with stiff primary suspension	+8 dB			Transit vehicles with stiff primary suspensions have been shown to create high vibration levels. Include this adjustment when the primary suspension has a vertical resonance frequency greater than 15 Hz.
Resilient Wheels	0 dB			Resilient wheels do not generally affect ground-borne vibration except at frequencies greater than about 80 Hz.
Worn Wheels or Wheels with Flats	+10 dB			Wheel flats or wheels that are unevenly worn can cause high vibration levels.
Track Conditions (not additive, apply greatest value only)				
Worn or Corrugated Track	+10 dB			Corrugated track is a common problem. Mill scale* on new rail can cause higher vibration levels until the rail has been in use for some time. If there are adjustments for vehicle parameters and the track is worn or corrugated, only include one adjustment.
Special Trackwork within 200 ft	+10 dB (within 100 ft) +5 dB (between 100 and 200 ft)			Wheel impacts at special trackwork will greatly increase vibration levels. The increase will be less at greater distances from the track. Do not include an adjustment for special trackwork more than 200 ft away.
Jointed Track	+5 dB			Jointed track can cause higher vibration levels than welded track.
Uneven Road Surfaces	+5 dB			Rough roads or expansion joints are sources of increased vibration for rubber-tire transit.
Track Treatments (not additive, apply greatest value only)				
Floating Slab Trackbed	-15 dB			The reduction achieved with a floating slab trackbed is strongly dependent on the frequency characteristics of the vibration.
Ballast Mats	-10 dB			Actual reduction is strongly dependent on frequency of vibration.
High-Resilience Fasteners	-5 dB			Slab track with track fasteners that are very compliant in the vertical direction can reduce vibration at frequencies greater than 40 Hz.

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

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

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

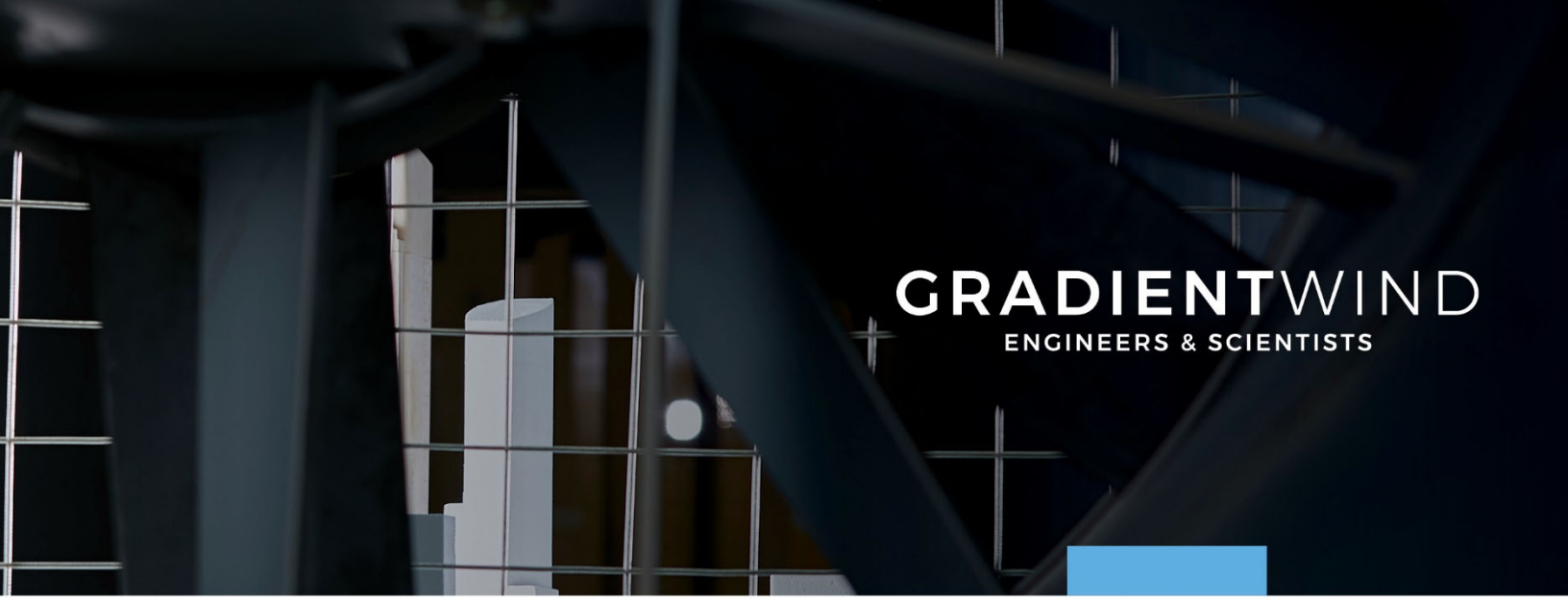
Table 6-13 Receiver Adjustment Factors for Generalized Predictions of GB Vibration and Noise

Receiver Factor	Adjustment to Propagation Curve		Comment
Floor-to-floor attenuation	1 to 5 floors above grade	-2 dB/floor	This factor accounts for dispersion and attenuation of the vibration energy as it propagates through a building starting with the first suspended floor.*
	5 to 10 floors above grade	-1 dB/floor	
Amplification due to resonances of floors, walls, and ceilings	+6 dB		The actual amplification will vary greatly depending on the type of construction. The amplification is lower near the wall/floor and wall/ceiling intersections.

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

Table 6-14 Conversion to Ground-borne Noise

Conversion to Ground-borne Noise			
Noise Level in dBA	Peak frequency of ground vibration:		Use these adjustments to estimate the A-weighted sound level given the average vibration velocity level of the room surfaces. See text for guidelines for selecting low-, mid-, or high-frequency characteristics. Use the high-frequency adjustment for subway tunnels in rock or if the dominant frequencies of the vibration spectrum are known to be 60 Hz or greater.
	Low frequency (<30 Hz)	-50 dB	
	Mid Frequency (peak 30 to 60 Hz)	-35 dB	
	High frequency (>60 Hz)	-20 dB	



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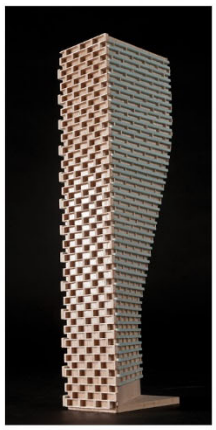

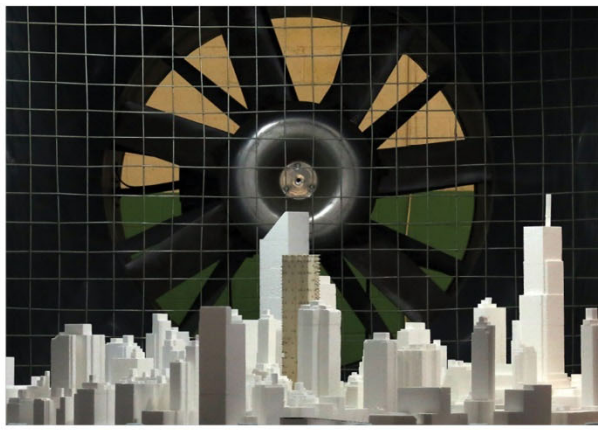

APPENDIX C

SUPPORTING DOCUMENTATION

127 WALGREEN ROAD, OTTAWA, ON, CANADA K0A 1L0 | 613 836 0934
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Good morning,

Further to your request dated December 1, 2025, the subject lands (70 Fountain Street East, Guelph) are located within 300 metres of the Metrolinx Guelph Subdivision (which carries Kitchener GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains only. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 8 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 76 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives		1 Diesel Locomotive	2 Diesel Locomotives
Day (0700-2300)	56	8	Night (2300-0700)	12	0

The current track design speed near the subject lands is 45 mph (72 km/h).

There are *anti-whistling by-laws* in affect near the subject lands at Glasgow Street, Yorkshire Street, Edinburgh Road, and Alma Street at railway crossing.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Best Regards,

Jenna Auger (She/Her)
Project Analyst, Adjacent Construction Review (ACR)
Development & Real Estate Management
T: (416)-881-0579
20 Bay Street | Toronto | Ontario | M5J 2W3

METROLINX

Wyndham St S @ Fountain St E

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

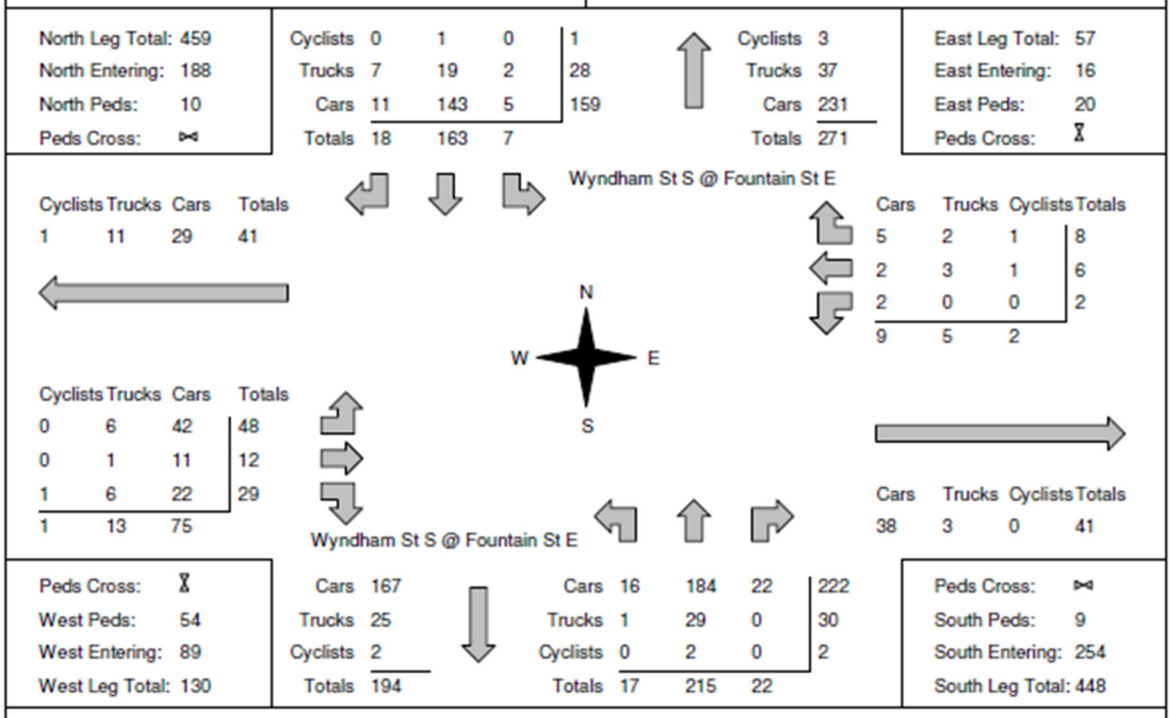
One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Guelph
Site #: 0000000000
Intersection: Wyndham St S @ Fountain St E &
TFR File #: 1
Count date: 23-Apr-2024

Weather conditions:
Cloudy
Person(s) who counted:
Tania

**** Non-Signalized Intersection ****

Major Road: Wyndham St S @ Fountain St E run



Comments

Wyndham St S @ Fountain St E

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

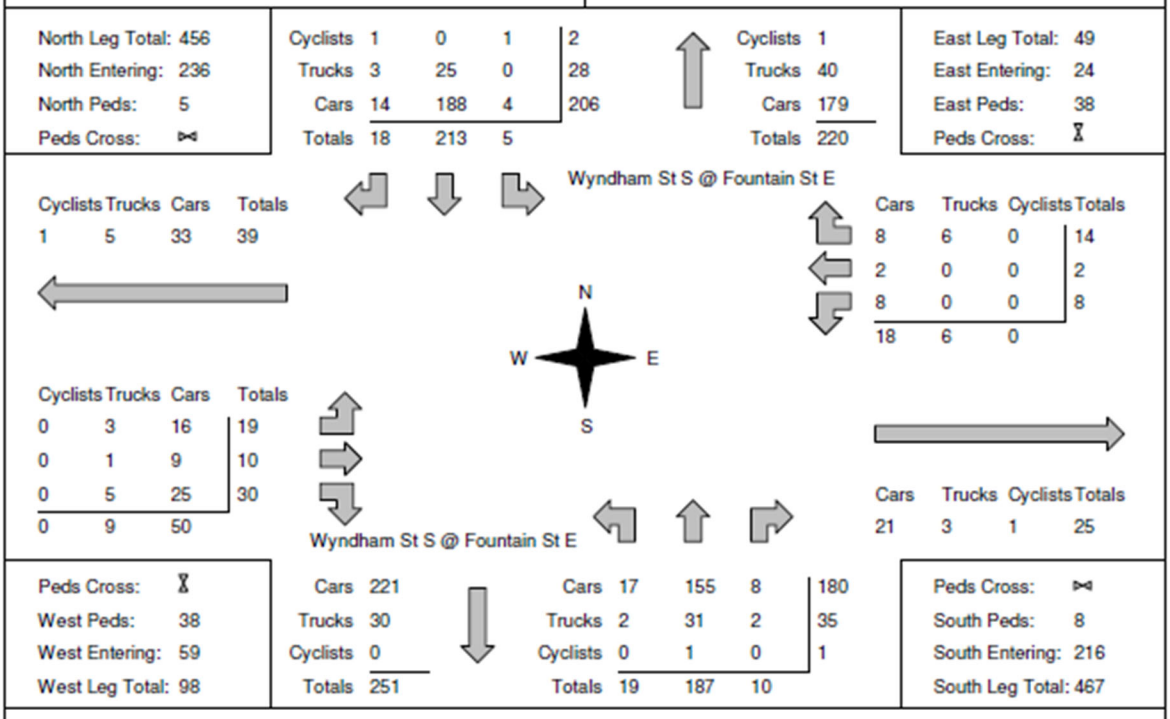
One Hour Peak
From: 11:45:00
To: 12:45:00

Municipality: Guelph
Site #: 0000000000
Intersection: Wyndham St S @ Fountain St E &
TFR File #: 1
Count date: 23-Apr-2024

Weather conditions:
Cloudy
Person(s) who counted:
Tania

**** Non-Signalized Intersection ****

Major Road: Wyndham St S @ Fountain St E run



Comments

Wyndham St S @ Fountain St E

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

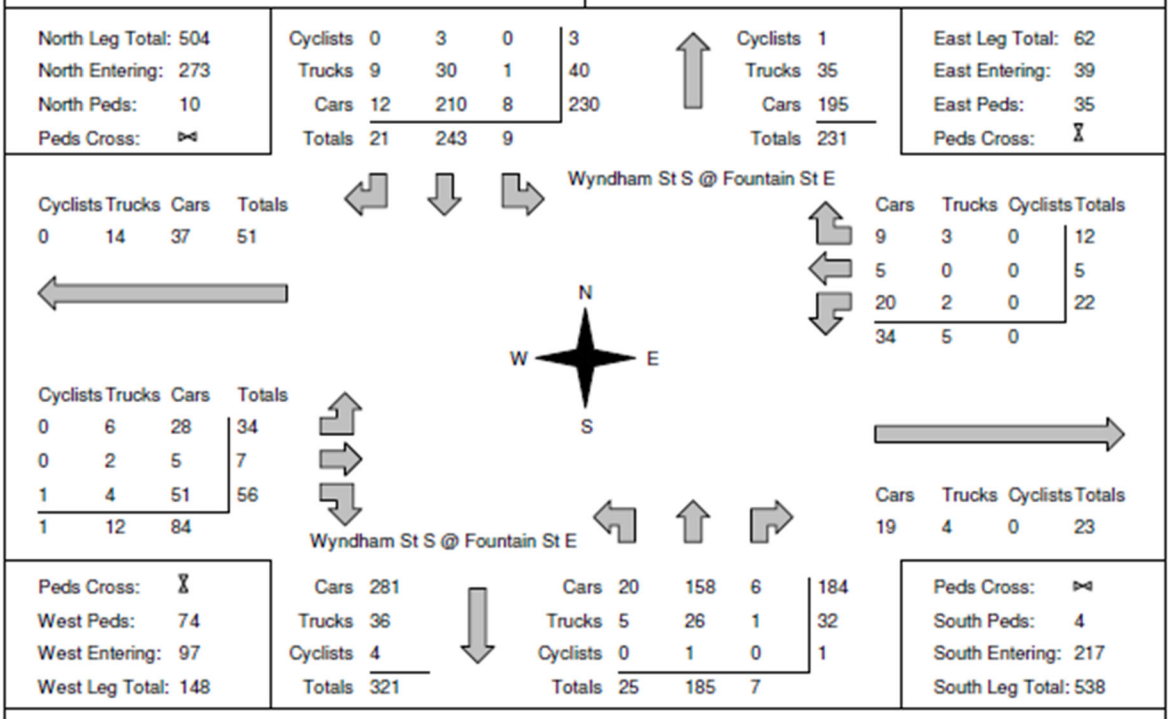
One Hour Peak
From: 16:00:00
To: 17:00:00

Municipality: Guelph
Site #: 0000000000
Intersection: Wyndham St S @ Fountain St E &
TFR File #: 1
Count date: 23-Apr-2024

Weather conditions:
Cloudy
Person(s) who counted:
Tania

**** Non-Signalized Intersection ****

Major Road: Wyndham St S @ Fountain St E run



Comments

Wyndham St S @ Fountain St E

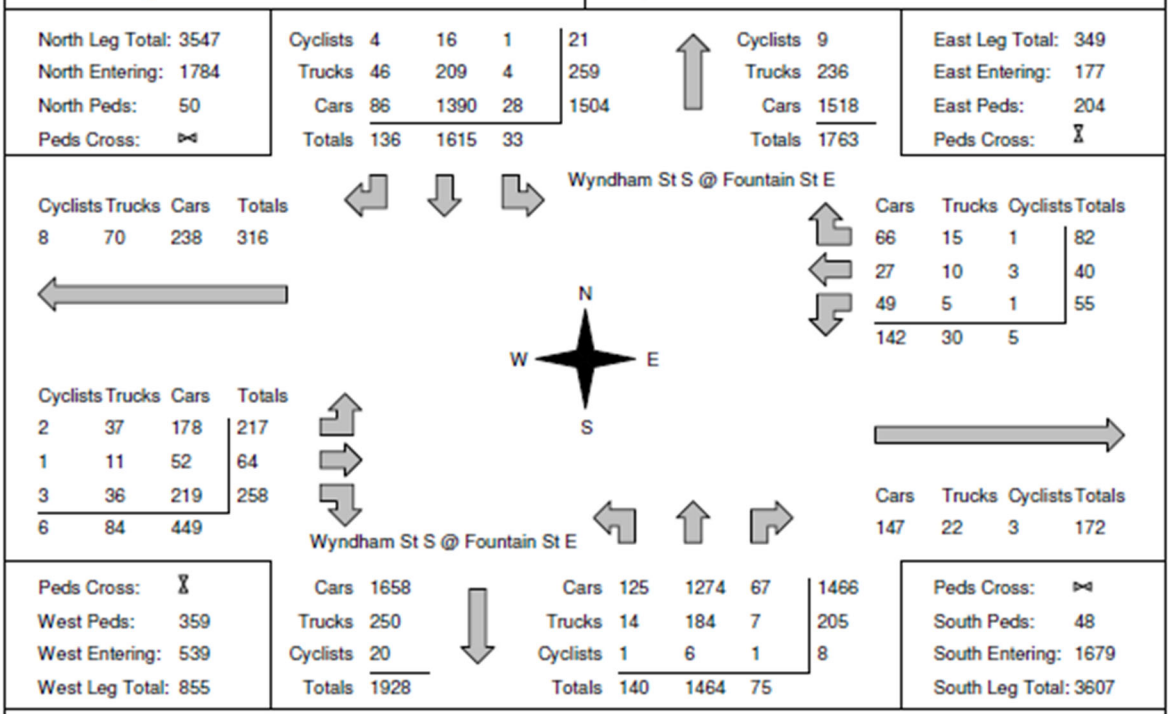
Total Count Diagram

Municipality: Guelph
Site #: 0000000000
Intersection: Wyndham St S @ Fountain St E &
TFR File #: 1
Count date: 23-Apr-2024

Weather conditions: Cloudy
Person(s) who counted: Tania

**** Non-Signalized Intersection ****

Major Road: Wyndham St S @ Fountain St E run



Comments

Wyndham St S @ Fountain St E
Traffic Count Summary

Intersection: Wyndham St S @ Fountain St E & | Count Date: 23-Apr-2024 | Municipality: Guelph

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	1	157	12	170	5	355
9:00:00	7	163	18	188	10	442
11:00:00	0	0	0	0	0	0
12:00:00	7	168	13	188	3	406
13:00:00	4	194	19	217	5	434
14:00:00	1	201	18	220	1	422
15:00:00	0	0	0	0	0	0
16:00:00	3	223	16	242	9	421
17:00:00	9	243	21	273	10	490
18:00:00	1	266	19	286	7	493
Totals:	33	1615	136	1784	50	3463

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	11	165	9	185	6
9:00:00	17	215	22	254	9
11:00:00	0	0	0	0	0
12:00:00	18	189	11	218	8
13:00:00	14	193	10	217	8
14:00:00	23	173	6	202	4
15:00:00	0	0	0	0	0
16:00:00	15	159	5	179	3
17:00:00	25	185	7	217	4
18:00:00	17	185	5	207	6
Totals:	140	1464	75	1679	48

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	1	7	4	12	2	46
9:00:00	2	6	8	16	20	105
11:00:00	0	0	0	0	0	0
12:00:00	5	7	11	23	29	81
13:00:00	9	3	12	24	37	86
14:00:00	4	3	13	20	22	77
15:00:00	0	0	0	0	0	0
16:00:00	7	2	12	21	26	95
17:00:00	22	5	12	39	35	136
18:00:00	5	7	10	22	33	90
Totals:	55	40	82	177	204	716

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	14	6	14	34	30
9:00:00	48	12	29	89	54
11:00:00	0	0	0	0	0
12:00:00	23	8	27	58	30
13:00:00	22	10	30	62	45
14:00:00	24	6	27	57	39
15:00:00	0	0	0	0	0
16:00:00	33	5	36	74	40
17:00:00	34	7	56	97	74
18:00:00	19	10	39	68	47
Totals:	217	64	258	539	359

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	33	81	47	54	39	57	77	47