

OWNER/AUTHORIZED AGENT STATEMENT

I am the owner of the property, or the owner's agent, and that I understand and agree with the noise attenuation measures proposed in study entitled "Noise and Vibration Feasibility Study, Proposed Residential Development, 1128 and 1134 Printery Road, St. Jacobs, ON" dated August 19, 2025.

The application has been designed to avoid the use of berms or walls as noise attenuation features where feasible. Where berms or walls are recommended, the Noise Study provides economic, planning and engineering justification.

If the application is changed in a way that may affect the noise level calculations, I will have a revised noise study submitted to the Township of Woolwich.

Name Kevin Searle

Signature 

Title owner

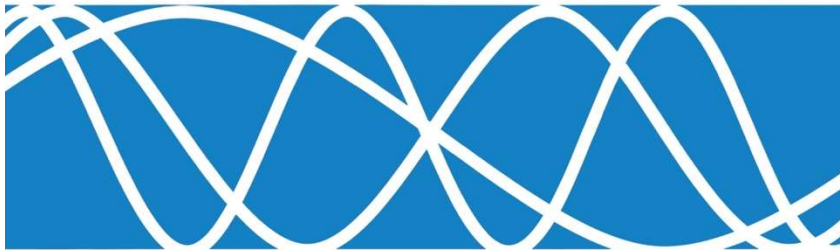
Company KSB Printery Inc

Date Aug 19, 2025

Noise and Vibration Feasibility Study

Proposed Residential Development 1128 and 1134 Printery Road, St. Jacobs, ON

August 19, 2025
HGC Project #: 02500400



Prepared for:

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Version Control
Noise and Vibration Feasibility Study,
1128 and 1134 Printery Road,
St. Jacobs, Ontario.

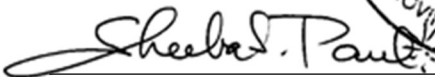
Ver.	Date	Version Description	Prepared By
1.0	August 19, 2025	Noise and Vibration Feasibility Study in support of the approvals process.	A. Rogers/ S. Paul

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Howe Gastmeier Chapnik Limited

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1 INTRODUCTION AND SUMMARY

Howe Chapnik Gastmeier Limited (HGC Noise Vibration Acoustics) was retained by KBS Printery Road Inc. to conduct a Noise and Vibration Feasibility Study for a proposed residential development located at 1128 and 1134 Printery Road in St. Jacobs, in the Regional Municipality of Waterloo (RMOW), Ontario. The purpose of this study is to determine the impact of environmental noise and vibration from the surrounding area in accordance with the guidelines of the Ministry of Environment, Conservation and Parks (MECP), the RMOW Noise Policy Implementation Guideline, and the Township of Woolwich. Note that the Township of Woolwich has devolved land use approvals from the RMOW to the Township as of January 1, 2025. The site proposes five, 2-storey townhouse buildings (29 units total). This study has been prepared as part of the approvals process, specifically for a plan of condominium and zoning bylaw amendment applications.

The primary traffic noise sources at the proposed development site were determined to be road traffic on King Street North and rail traffic on the Canadian National Railway (CN) Guelph Subdivision Fergus Spur rail line to the west, which also carries Waterloo Central Railway (WCR). A secondary source of traffic noise at the proposed development is Printery Road. Relevant traffic data was obtained from the RMOW, the Township of Woolwich, CN, and WCR. The traffic data was used to predict future traffic sound levels at the locations of the proposed building façades and in the outdoor living areas. The predicted sound levels were evaluated with respect to the guidelines of the MECP, the RMOW, the Township of Woolwich, and the railway authorities.

The sound level predictions indicate that with suitable noise control measures integrated into the design of the buildings, it is feasible to achieve MECP guideline sound levels. A central air conditioning system, upgraded glazing constructions, and brick veneer or a masonry equivalent exterior façade construction are required for the closest townhouse block to King Street North. The other dwellings in the development are required to be designed with a



provision for the installation of central air conditioning in the future, at the occupant's discretion. Associated acoustical requirements are specified in this report. Noise warning clauses are also required to inform future occupants of the sound level excesses, the proximity to the railway line, and the proximity to commercial uses.

Ground-borne vibration measurements were performed for five train pass-bys at the location of the nearest proposed dwelling façade, approximately 60 m to the CN Guelph Subdivision Fergus Spur rail line right of way. Measured vibration levels were found to be within the applicable criteria and vibration mitigation is not required.

A computer model of the area was created to predict the sound levels at the facades of the proposed buildings due to off-site stationary noise sources from existing commercial uses in the area. The results indicate that the sound emissions of the nearby stationary noise sources are expected to be within the MECP guideline sound levels at the proposed development. Mitigation for existing stationary noise sources is not required.

In summary, with suitable controls integrated into the building plans and the development site, the proposed development is anticipated to meet the MECP guidelines and is feasible from a noise and vibration perspective. Details of the assessment leading to this conclusion are provided herein.

2 SITE DESCRIPTION AND NOISE SOURCES

A key plan for the site is attached as Figure 1 [1]. The site is located on the south side of Printery Road, east of King Street North, specifically at 1128 and 1134 Printery Road in St. Jacobs, Ontario. A site plan prepared by GSP Group dated August 13, 2024, is provided as Figure 2, which also shows the sound level prediction locations and the vibration measurement location. The proposed development will include five, 2-storey townhouse buildings (29 units total). The noise sensitive spaces in the development include all façades of the townhouse

buildings, the rear yards of each unit, and the common outdoor amenity area on the east side of the site.

HGC personnel visited the site in July 2025 to observe the acoustical environment, measure background sound levels, identify significant noise sources within the vicinity, and perform ground-borne vibration measurements of train pass-bys. The weather conditions were fair during the site visits. This area is considered Class 2 in terms of its acoustical environment. Road traffic on King Street North and rail traffic on the CN Guelph Subdivision Fergus Spur rail line were confirmed to be the dominant traffic noise sources.

The site is currently occupied by two dwellings as well as a barn which will be removed for the proposed development. The CN Guelph Subdivision Fergus Spur rail line is southwest of the proposed development site. South and west of the site are agricultural lands. East, south, and north of the site are existing residential dwellings. North of the site, across Printery Road is a print shop. To the northwest, across King Street North, there is a landscaping supply store with a storage yard, north of which is a home improvement store with a storage yard. The significant surrounding stationary noise sources are assessed in Section 6. Noise from these surrounding uses were not observed during the site visit. Nevertheless, due to the proximity of the site to the existing commercial uses, it is recommended that a noise warning clause to identify that such uses may be audible at times be included in the tenancy agreements, as described in Section 7.

3 TRAFFIC NOISE ASSESSMENT

3.1 Traffic Noise Criteria

Guidelines for acceptable levels of traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", release date October 21, 2013 [2] and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A-

weighted decibels [dBA]. The Railway Association of Canada/Federation of Canadian Municipalities "Report Research Phase 3: Proximity Guidelines and Best Practices" dated November 2006 [3] and Guidelines for New Development in Proximity to Railway Operations dated May 2013 [4], as well as the RMOW Noise Policy Implementation Guideline [5] were also reviewed.

Table 1: MECP Traffic Noise Criteria [dBA]

Space	Daytime L_{EQ} (16 hour) Road / Rail	Nighttime L_{EQ} (8 hour) Road / Rail
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA / 40 dBA	45 dBA / 40 dBA
Inside Bedrooms	45 dBA / 40 dBA	40 dBA / 35 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is a noise sensitive space intended for the quiet enjoyment of the outdoor environment and is readily accessible from the building. OLAs include backyard and side yard areas of single family, semi-detached and townhouse dwellings, gardens, terraces and patios, balconies and elevated terraces (e.g. rooftops) that are not enclosed with a minimum depth of 4 meters.

The guidelines in the MECP publication allow the daytime sound levels in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively practical.

Indoor guidelines are 5 dBA more stringent for rail noise than for road noise, to account for the low frequency (rumbling) character of locomotive sound, and its greater potential to transmit through exterior wall/window assemblies.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom

or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to traffic noise.

Warning clauses are required to notify future residents of possible excesses when nighttime sound levels exceed 50 dBA at the plane of the bedroom/living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom/living/dining room window due to traffic.

MECP guidelines recommend brick veneer or a masonry equivalent construction from the foundation to the rafters as a minimum construction for any dwellings which are within 100 m of the right-of-way of the railway, where the 24-hour L_{EQ} is greater than 60 dBA. CN typically requires brick veneer or a masonry equivalent construction for the first row of dwellings regardless of the setback and sound level.

The railways also provide minimum requirements for safety as well as sound and vibration for proposed residential developments located adjacent to their rights-of-way. These refer to minimum required setbacks, berms, fencing and warning clauses. The reader is referred to a copy of CN requirements for a new development adjacent to a spur rail line, which is included in Appendix A.

3.2 Ground-Borne Vibration from Rail Traffic

CN guidelines require measurements of ground-borne vibration when residential dwelling units are to be located within 75 m of a rail line. The CN Guelph

Subdivision Fergus Spur railway line right-of-way to the west is approximately 60 m from the nearest proposed building.

Vibration is typically measured in terms of oscillatory velocity or acceleration. The CN guidelines are given in terms of ground-borne velocity. In this report, vibration levels are quoted in terms of RMS velocity levels (L_v) in units of decibels [dB] relative to 1 mm/s (i.e., 1 mm/s = 0 dB). The CN guideline limit is 0.14 mm/s, which is equivalent to -17 dB re 1 mm/s. For ease of reference, this limit of -17 dB re 1 mm/s is identified on velocity plots in this report.

CN limits for acceptable ground-borne vibration are also presented as a curve of maximum allowable vibratory acceleration levels, in units of decibels relative to the acceleration due to gravity (dB re 1g), versus one-third octave band frequency. The CN spectral criteria have been overlaid on the graphs of measured vibration for easy reference.

3.3 Road Traffic Data

Road traffic data for King Street North and Printery Road was obtained from RMOW personnel (see Appendix B). The traffic data was provided in terms of forecasted annual average daily traffic (AADT) volumes. A day/night split of 90/10 and a posted speed limit of 50 km/h were applied for both roadways. A commercial vehicle percentage of 5%, split into 2% medium trucks and 3% heavy trucks was applied for King Street North. A commercial vehicle percentage of 5%, split into 3% medium trucks and 2% heavy trucks was applied for Printery Road. Table 2 below summarizes the road traffic volume data used in this study.

Table 2: Projected Road Traffic Data

Roadway	AADT	Day / Night Split [%]	Trucks Percentage (%)		Speed Limit [km/h]
			Medium	Heavy	
King Street North	10,700	90 / 10	2	3	50
Printery Road	3,100	90 / 10	3	2	50

3.4 Rail Traffic Data

Rail traffic data for the CN Guelph Subdivision Fergus Spur rail line located to the southwest of the site was obtained from CN personnel, and is attached in Appendix C. The WCR also operates a heritage train for tourism purposes on the rail line. WCR rail traffic data was obtained from train schedules online. CN operates freight trains on the rail line during the nighttime hours. The rail line is classified as a spur line. The maximum permissible train speed in the area of the site is 24 km/h (15 mi/h) for freight trains and 48 km/h (30 mi/h) for passenger trains. The rail traffic data was provided as current train volumes. For the purposes of this study, traffic volumes were grown at a conservative rate of 2.5% per year, and average future volumes that will exist in ten years (2035) were then calculated, as required by MECP guidelines. In conformance with CN assessment requirements, the maximum speeds, maximum number of cars, and locomotives per train were used in the traffic noise analysis to yield a worst-case estimate of train noise. The rail volumes and other inputs used in the analysis are summarized in Table 3.

Table 3: 2035 Projected Rail Traffic Data

Type of Train	Number of Trains Day/Night	Number of Locomotives	Number of Cars	Max Speed (KPH)
CN Freight	0 / 3.8	4	140	24
WCR Passenger	20.5 / 0	1	6	48

3.5 Traffic Noise Predictions

To assess the levels of traffic noise which will impact the site in the future, predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. This modeling software was used to predict the future road traffic sound levels (L_{EQ}) at various locations. STAMSON output is provided in Appendix D. The results of these predictions, without mitigation, are summarized in Table 4.

Table 4: Maximum Traffic Sound Level Predictions [dBA]

Prediction Location	Description	Daytime L_{EQ} (16 hour) Road/Rail/Total	Nighttime L_{EQ} (8 hour) Road/Rail/Total
[A]	Northwest Building	61 / 64 / 66	54 / 63 / 64
[B]	Middle North Building	51 / 59 / 60	44 / 58 / 59
[C]	Northeast Building	47 / 55 / 56	40 / 55 / 55
[D]	Southwest Building	49 / 58 / 59	43 / 58 / 58
[E]	Southeast Building	45 / 56 / 56	<40 / 55 / 55
[F]	Northwest Building, West Unit, Rear Yard	59 / 52 / 60	--
[G]	Northwest Building, 4 th Unit from the West, Rear Yard	54 / 49 / 55	--
[H]	Northeast Building, North Unit, Rear Yard	56 / <45 / 56	--
[I]	Common Outdoor Amenity Area	<45 / <45 / 45	--

3.6 Traffic Noise Recommendations

The sound level predictions indicate that the future traffic sound levels are expected to exceed the MECP guidelines at the noise sensitive receptors of the proposed development. Recommendations are provided in the following sections.

3.6.1 Outdoor Living Areas

The predicted daytime sound level in the rear yard of the unit in the west building nearest to King Street North (Prediction Location [F]) is 60 dBA, greater than the MECP limit of 55 dBA but not exceeding the limit by more than 5 dBA. According to MECP guidelines, this excess may be addressed by including a warning clause in sale and lease agreements for the development. In order to further reduce the sound level in this rear yard to within 55 dBA, a 1.8 m high noise barrier is needed.

The predicted daytime sound level in the rear yard of the 4th unit from King Street North in the west building (Prediction Location [G]) is within the MECP limit of 55 dBA. Noise mitigation is not required for this area.



The predicted daytime sound level in the rear yard of the unit closest to Printery Road in the northeast building (Prediction Location [F]) is 56 dBA, greater than the MECP limit of 55 dBA but not exceeding the limit by more than 5 dBA. According to MECP guidelines, this excess may be addressed by including a warning clause in sale and lease agreements for the development. In order to further reduce the sound level in this rear yard within 55 dBA, a 1.8 m high noise barrier could be included.

There is a common outdoor amenity area on the east site of the development (Prediction Location [I]). The predicted daytime sound level in this area is less than the MECP limit of 55 dBA. Noise mitigation is not required for this area.

The preliminary locations of the acoustic barriers that could be included to further reduce the sound level in the rear yards nearest to the roadways are shown in Figure 3. An acoustic barrier may be any combination of an acoustic wall on top of an earth berm. The acoustic wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m². The walls may be constructed from a variety of materials such as glass, wood, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks. If wood is chosen as the acoustic barrier material, the thickness must be a minimum of 54 mm. The heights and extents of the barriers should be chosen to reduce the sound levels in the OLA's to below 60 dBA and as close to 55 dBA as is technically, administratively and economically feasible, subject to the approval of the municipality respecting any applicable fence height by-laws.

3.6.2 CN Minimum Distance Setback Requirements

For noise control and safety reasons, CN policies stipulate that the minimum required setback between a new dwelling and a Spur Line right-of-way is to be a minimum of 15 metres. The nearest façade of the proposed buildings is approximately 60 m to the CN Guelph Subdivision Fergus Spur right-of-way and thus, meets the CN minimum distance setback requirement.



3.6.3 Indoor Living Areas and Ventilation Requirements

The predicted future sound levels at the building façades of the northwest townhouse block (Prediction Location [A]) will be greater than 65 dBA during the daytime and/or 60 dBA during the nighttime hours. To address these excesses, the MECP guidelines recommend that this building be equipped with a central air conditioning system, so that the windows can be closed.

For all other buildings in the development, the predicted future sound levels at the building façades will be between 56 and 65 dBA during the daytime hours and/or between 51 and 60 dBA during the nighttime hours. To address these excesses, the MECP guidelines recommend that the dwelling units in these buildings be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. The installation of central air conditioning will meet and exceed this requirement.

Figure 4 shows the ventilation requirements for the development. Window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable units are those housed in their own insulated closet with an access door for maintenance. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300. Associated warning clauses are also recommended.

3.6.4 Building Façade Constructions

Predicted sound levels at the building facades were used to determine sound insulation requirements of the building envelopes. The required acoustic insulation of the wall and window components was determined using methods developed by the National Research Council (NRC) [6].

Detailed glazing requirements for different facades and spaces could be considered in value engineering, when detailed floor plans and building elevations are available.

Exterior Wall Constructions

According to MECP and CN guidelines, the first row of dwellings with exposure to the railway line which have sound levels exceeding 60 dBA during both nighttime and daytime hours due to rail traffic, will require brick veneer or masonry equivalent exterior walls from foundation to rafters as a minimum construction. This applies to the west and south façades of the proposed building as shown in Figure 5.

Exterior Doors

There may be swing doors and some glazed sliding patio doors for entry onto the balconies from living/dining/bedrooms. The glazing areas on the doors are to be counted as part of the total window glazing area. If exterior swing doors are to be used, they shall be insulated metal doors equipped with head, jamb and threshold weather seals.

Acoustical Requirements for Glazing

At the time of this report, detailed floor plans and elevations are under development. Assuming a typical window to floor area of 50% (30% fixed and 20% operable) for the living/dining rooms and 40% (30% fixed and 10% operable) for the bedrooms in the development, the minimum acoustical requirement for the basic window glazing, including glass in fixed sections, swing or sliding doors, and operable windows, is provided in Table 5.

Table 5: Required Minimum Glazing STC for Specific Building Façades

Location	Minimum Glazing STC
Northwest Building, Prediction Location [A]	STC-33
All Other Buildings	OBC

Noted: OBC – meeting the minimum requirements of the Ontario Building Code

Note that acoustic performance varies with manufacturer's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required. Acoustical test data for the selected assemblies should be

requested from the suppliers, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Further Analysis

When detailed floor plans and building elevations are available for the units in the proposed development, the glazing requirements should be refined based on actual window to floor area ratios. Larger windows in small rooms will result in large window to floor area ratios and higher STC ratings.

4 VIBRATION ASSESSMENT

CN requires an assessment of ground-borne vibration through measurement if building foundations are to be located within 75 metres of the railway right-of-way, which is the case for the proposed buildings. The vibration measurements were conducted using a Svantek 977 Sound Level Meter outfitted with a Wilcoxon Research type 793V velocity transducer correctly field calibrated before and after the measurements on July 10, 2025 and July 15, 2025. The weather conditions were fair. Measurements were performed at the anticipated location of the closest future building façade, at approximately 65 m from the railway tracks, indicated as [V1] in Figure 2.

The results of the measurements are presented in Figures E1 to E5 in Appendix E. Table 6 shows the maximum RMS vibration velocity measurement during each of the train pass bys.

Table 6: Summary of Peak Vibration Measurements of Train Pass-bys

Train Pass-by	Measured Vibration Level (mm/s) [V1]	Criteria (mm/s)
1 (Freight)	0.05	0.14
2 (Freight)	0.05	
3 (Passenger)	0.04	
4 (Passenger)	0.04	
5 (Passenger)	0.04	

The upper curve, Figures E1a to E5a, shows RMS vibration velocity as a function of time for the train pass-by. Vibration levels were found to be within the CN limit of 0.14 mm/s during the train pass-bys.

The lower curves, Figures E1b to E5b, show the maximum measured acceleration as a spectrum of level in dB re g versus one-third octave frequency compared to the CN criteria curve. These figures show that the highest levels, relative to the criteria, occurred between the frequencies of 16 Hz to 25 Hz, but remained within the CN criteria. No further mitigation for vibration is required.

5 MECP GUIDELINES FOR LAND USE COMPATIBILITY BETWEEN INDUSTRIAL/ COMMERCIAL FACILITIES AND SENSITIVE LAND USES

MECP Guidelines D-1, 'Land Use Compatibility' [7] and D-6 'Compatibility Between Industrial/Commercial Facilities and Sensitive Land Uses' [8] were prepared to address the potential incompatibility of industrial land uses and noise sensitive land uses in relation to land use approvals under the Planning Act. They recommend that studies be conducted to investigate the feasibility of providing sufficient mitigation when noise sensitive land uses are proposed within the potential zone of influence of an existing industry/commercial facility. The mitigation can be provided at the source, or can be incorporated on the development lands where the industrial/commercial facility is operating in compliance with legislated Ministry requirements.

In planning a sensitive land use near an existing industrial/commercial area, guideline D-6 suggests certain potential zones of influence for the industry, depending on the characterization of that industry (Class I, Class II and Class III). The guidelines also recommend minimum separation distances when the actual influence areas may be less, subject to site specific studies performed in accordance with guideline NPC-300, "Environmental Noise Guideline



Stationary and Transportation Sources – Approval and Planning”. The distance setback is generally measured from the property line of the facility to the property line of the neighbouring noise sensitive use, although locations on the industrial property on which noise producing activities are not permitted such as parking areas and driveways may be included.

The MECP recognizes that these minimum separation distances may not always be viable in cases of redevelopment, infilling and mixed-use areas such as this, where the zoning or official plan has left no available land buffer. In those instances, the overall feasibility of the proposal is based on the anticipated noise impacts from the industrial/commercial use based on detailed technical noise studies.

5.1 Existing Adjacent Commercial and Industrial Facilities

North of the site is St. Jacobs Printery Ltd. The noise sources associated with this facility include rooftop mechanical equipment. The facility operates during the daytime hours only.

Northwest of the site is Creative Landscape Depot. Noise sources associated with this facility include forklift activity in the yard as well as truck movements throughout the yard. The facility operates during the daytime hours only.

North of the landscaping supply store is Fairway Lumber Home Building Centre. The noise sources associated with this facility include forklift activity in the yard and truck movements throughout the yard. The facility operates during the daytime hours only.

6 STATIONARY SOURCE ASSESSMENT

Noise sources associated with industrial and commercial facilities are assessed separately from traffic sources under MECP guidelines. These facilities are considered to be Stationary Sources of Sound and criteria for their assessment are contained in the following section.

6.1 Criteria Governing Stationary Noise Sources

An industrial or commercial facility is classified in MECP guidelines as a stationary source of sound (as opposed to sources such as traffic or construction, for example) for noise assessment purposes. The proposed development is located in an urban acoustical environment classified as Class 2 according to MECP guidelines, which can be characterized by the background sound level being dominated by traffic and human activity.

The façade of a residence, or any associated usable outdoor area, is considered a sensitive point of reception. NPC-300 stipulates that the exclusionary minimum sound level limit for a stationary noise source in an urban Class 2 area is 50 dBA during daytime (07:00 to 19:00) and evening (19:00 to 23:00) hours, and 45 dBA during nighttime hours (23:00 to 07:00). If the background sound levels due to road traffic exceed the exclusionary minimum limits, then the background sound level becomes the criterion. The background sound level is defined as the sound level that is present when the stationary source under consideration is not operating, and may include traffic noise and natural sounds. To ensure a conservative assessment, the exclusionary minimum limits were used for the current analysis.

Commercial activities such as the occasional movement of customer vehicles, occasional deliveries, and garbage collection are not of themselves considered to be significant noise sources in the MECP guidelines. Accordingly, these sources have not been considered in this study. Noise from safety equipment (e.g., back-up beepers), as well as emergency facilities (e.g., fire stations) are also exempt from consideration.

The MECP guidelines stipulate that the sound level impact during a “predicable worst case hour” be considered. This is defined to be an hour when a typically busy “planned and predictable mode of operation” occurs at the subject facility or facilities, coincident with a period of minimal background sound. Compliance with MECP criteria generally results in acceptable levels of sound at residential



receptors although there may still be residual audibility during periods of low background sound.

6.2 Assessment of Existing Stationary Noise Sources on Proposed Residential Development

6.2.1 Existing Stationary Source Noise Predictions

Predictive noise modelling was used to assess the sound impact of the nearby stationary sources at the most critically impacted façades of the proposed buildings in accordance with MECP guidelines. The noise prediction model was constructed based on a review of the proposed site plan, site visits, satellite aerial photos and estimates of sound emission levels of stationary sources taken from similar past HGC project files. Sound level measurements were conducted during the site visit for the exhaust fan associated with the print shop.

Table 7: Existing Source Sound Power Levels [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]								Overall [dBA]
	63	125	250	500	1k	2k	4k	8k	
Lennox 5-Ton HVAC (KGB060)	--	67	72	77	76	73	68	61	80
Lennox 10-Ton HVAC (KGB120)	--	92	88	87	83	78	72	67	88
Exhaust Fan	93	82	72	74	70	63	57	53	81
Forklift	99	95	91	91	91	88	82	76	95
Medium Truck Movement	108	90	92	90	94	91	84	77	97

The above data were inputted into a predictive computer model. The software used for this purpose (Cadna/A version 2025, build: 209.5501) is a computer implementation of ISO Standard 9613-2.2 "Acoustics – Attenuation of Sound During Propagation Outdoors" [9]. The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers. Additional information about the computer modelling package is provided in Appendix F.

The following information and assumptions were used in the analysis.

- Rooftop HVAC units were assumed to be Lennox KGB120 10-Ton units at a height of 1.5 m above the roof.
- Sound level measurements of the print shop's exhaust fan were conducted during the site visit.
- Sound data for the other sources above was obtained from past HGC project files of similar facilities, which were either originally obtained from the manufacturer or measured at similar facilities.
- Location of stationary noise sources are shown in Figure 6. The rooftop HVAC unit and exhaust fan noise sources are shown as green crosses. The truck movement noise sources are shown as green lines. The forklift noise sources are shown as green hatched areas.

In this impact assessment, we have considered typical worst-case (busiest hour) scenarios for each time period to be as follows:

Assumed day/evening worst-case scenario:

- Rooftop HVAC units and exhaust fans operate continuously.
- The forklifts operate continuously.
- 2 medium trucks drive through the landscape supply store yard.
- 4 medium trucks drive through the Home Building Centre yard.

Assumed night worst-case scenario:

- Rooftop HVAC units operate for 15 minutes out of an hour (outside of business hours).
- Exhaust fans do not operate (outside of business hours).
- No noise created from the landscaping supply store or Home Building Centre yard (outside of business hours).

6.2.2 Results

The unmitigated sound levels due to existing stationary noise sources at the façades of the proposed buildings are summarized in Table 8 and presented graphically in Figures 7 and 8. A Cadna/A output table is included in Appendix F for a location on the north façade of the northwest building.

Table 8: Predicted Sound Levels from Existing Stationary Noise Sources on the Proposed Buildings [dBA]

Location	Daytime (07:00-23:00)	Nighttime (23:00-07:00)	Criteria	Criteria Met
Northwest Building	50	43	50 / 45	✓
2 nd Building from King St	50	42	50 / 45	✓
All Other Buildings	<50	<45	50 / 45	✓

The results of the calculations indicate that the predicted sound levels due to the operation of the nearby stationary sources of noise are expected to be within the applicable MECP limits at the façades of the proposed buildings during an assumed worst-case operational scenario. Mitigation is not required for steady stationary noise sources in the area.

The acoustic recommendations may be subject to modifications if the site plan is changed significantly, operating scenarios are significantly different to those assumed in the assessment, additional information is obtained for nearby stationary noise sources or there is a significant increase in background sound levels.

7 WARNING CLAUSES

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all units with anticipated traffic sound level excesses. Examples are provided below.

Suggested wording for future dwellings with sound level excesses.

Type A:

Purchasers/tenants are advised that sound levels due to increasing road and rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

Suggested wording for future dwellings requiring the provision for adding air conditioning is given below.

Type C:

This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments 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.

Suitable wording for future dwellings requiring central air conditioning systems is given below.

Type D:

This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks. (Note: the location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

Suitable wording to inform future residents of the nearby commercial facilities and that sounds from these facilities may at times be audible.

Type E:

Purchasers/tenants are advised that due to the proximity of the nearby commercial facilities, noise from the facilities may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

CN's standard warning clause which is required for all residential developments located within 300 m of their main line is given below.

Type H:

Warning: Canadian National Railway Company or its assigns or successors in interest has or have a right-of-way within 300 metres from the land subject hereof. These may be alteration to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be

responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way.

8 SUMMARY OF RECOMMENDATIONS

The following list and Table 9 summarize the recommendations made in this report.

1. Central air conditioning systems are required for the proposed townhouse block closest to King Street North. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300.
2. All other buildings are required to be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. The installation of central air conditioning will meet and exceed this requirement.
3. Brick veneer or a masonry equivalent exterior wall construction is required for the west and south facades of the closest townhouse block to King Street North, as shown in Figure 5.
4. Upgraded glazing constructions are required for the closest building to King Street North. Details are provided in Section 3.6.3.
5. Warning clauses are required in the property and tenancy agreements and offers of purchase and sale in order to inform future owners/tenants of the sound level excesses, the proximity to the commercial uses, and the proximity to the railway.

The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.



Table 9: Summary of Noise Control Requirements and Noise Warning Clauses

Location	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Minimum Glazing STC	Exterior Wall Construction
Northwest Building	--	Central A/C	A, D, E, F	STC-33	Brick Veneer or Masonry Equivalent (West and South Facades)
All Other Buildings	--	Provision for Central A/C	A, C, E, F	OBC	--
All OLAs	--	--	--	--	--

Note:

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.

8.1 Implementation

To ensure that the noise recommendations outlined above are fully implemented, it is recommended that:

1. Prior to the issuance of occupancy permits for this development, the City's building inspector or a Professional Engineer qualified to perform acoustical engineer services in the Province of Ontario should certify that the noise control measures have been properly incorporated, installed, and constructed.



9 REFERENCES

1. *Google Earth, August 10, 2018, St. Jacobs, ON Canada, 43°31'40"N, 80°33'16"W, "earth.google.com/web", Accessed July 28, 2025.*
2. *Ontario Ministry of the Environment Publication NPC-300, Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, August 2013.*
3. *Earth Tech Canada Inc., The Railway Association of Canada/The Federation of Canadian Municipalities, Proximity Guidelines Research Assignment, Report Research Phase 3: Proximity Guidelines and Best Practices, Markham, ON, November 2006.*
4. *J.E. Coulter Associates Ltd., The Railway Association of Canada/The Federation of Canadian Municipalities, Guidelines for New Developments in Proximity to Railway Operations, Ottawa, ON, May 2013.*
5. *Regional Municipality of Waterloo Noise Policy Implementation Guideline, October 22, 2019.*
6. *J.D. Quirt, Division of Building Research, National Research Council of Canada, Acoustic Insulation Factor: A Rating for the Insulation of Buildings Against Outdoor Noise, June 1980.*
7. *Ontario Ministry of the Environment Publication Guideline D1, Land Use Compatibility, July 1995.*
8. *Ontario Ministry of the Environment Publication Guideline D6, Compatibility Between Industrial Facilities and Sensitive Land Uses, July 1995.*
9. *International Organization for Standardization, Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: Engineering Method for the Prediction of Sound Pressure Levels Outdoors, ISO-9613-2.2, Switzerland, January 2024.*



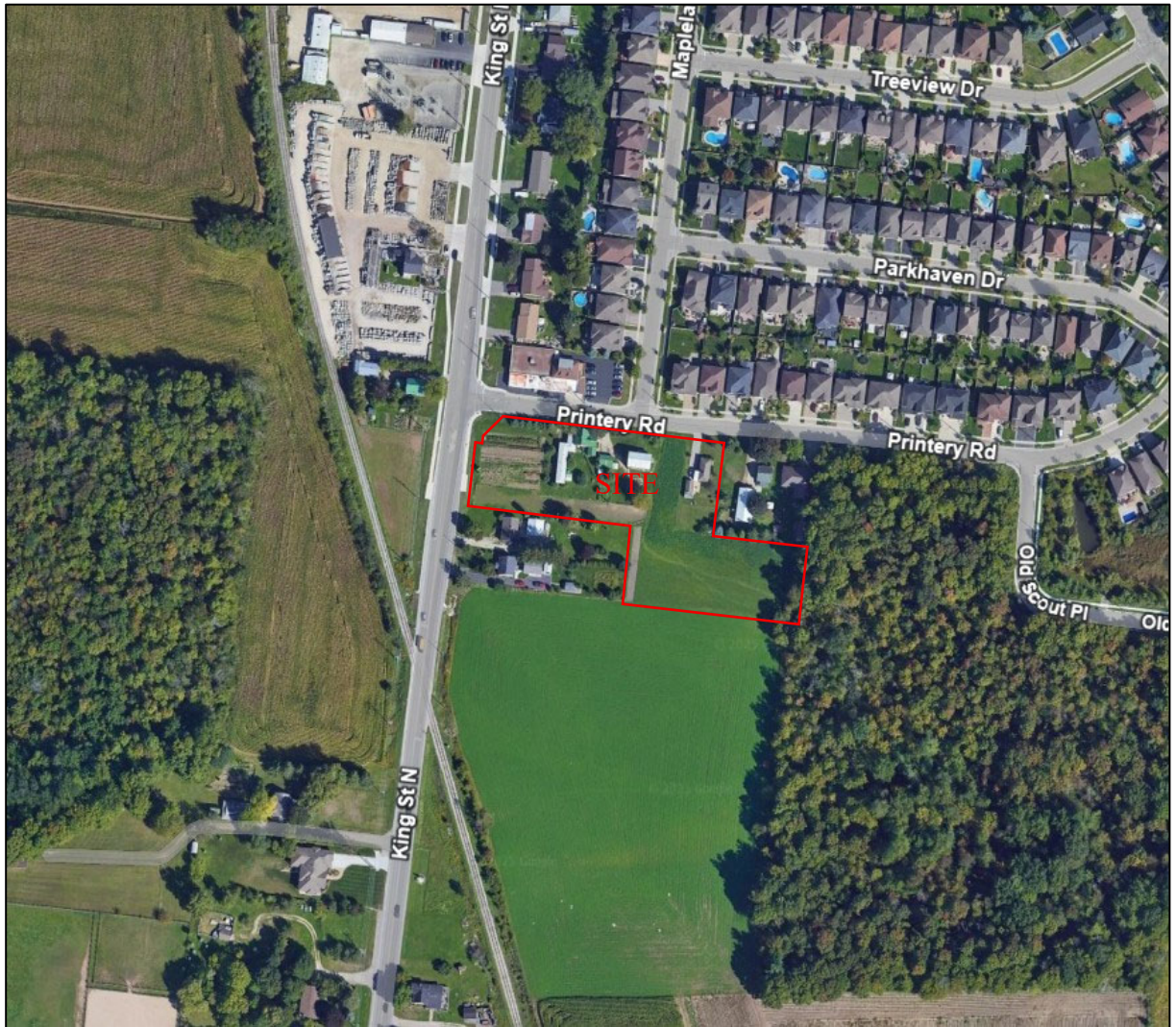


Figure 1 – Key Plan



NOISE



VIBRATION

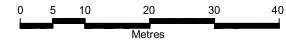


ACOUSTICS



DEVELOPMENT CONCEPT 1128 & 1134 Printery Road, St. Jacobs

Site Area: 9,915m²
Units: 29 Units
Unit Size : 92.8m²



NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.



Figure 2 - Proposed Site Plan Showing Prediction Locations and Vibration Measurement Location



Locations of 1.8 m high acoustic barriers that could be included to reduce the sound level in the rear yards to within 55 dBA.



Site Area: 9,915m²
Units: 29 Units
Unit Size : 92.8m²

0 5 10 20 30 40
Metres

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

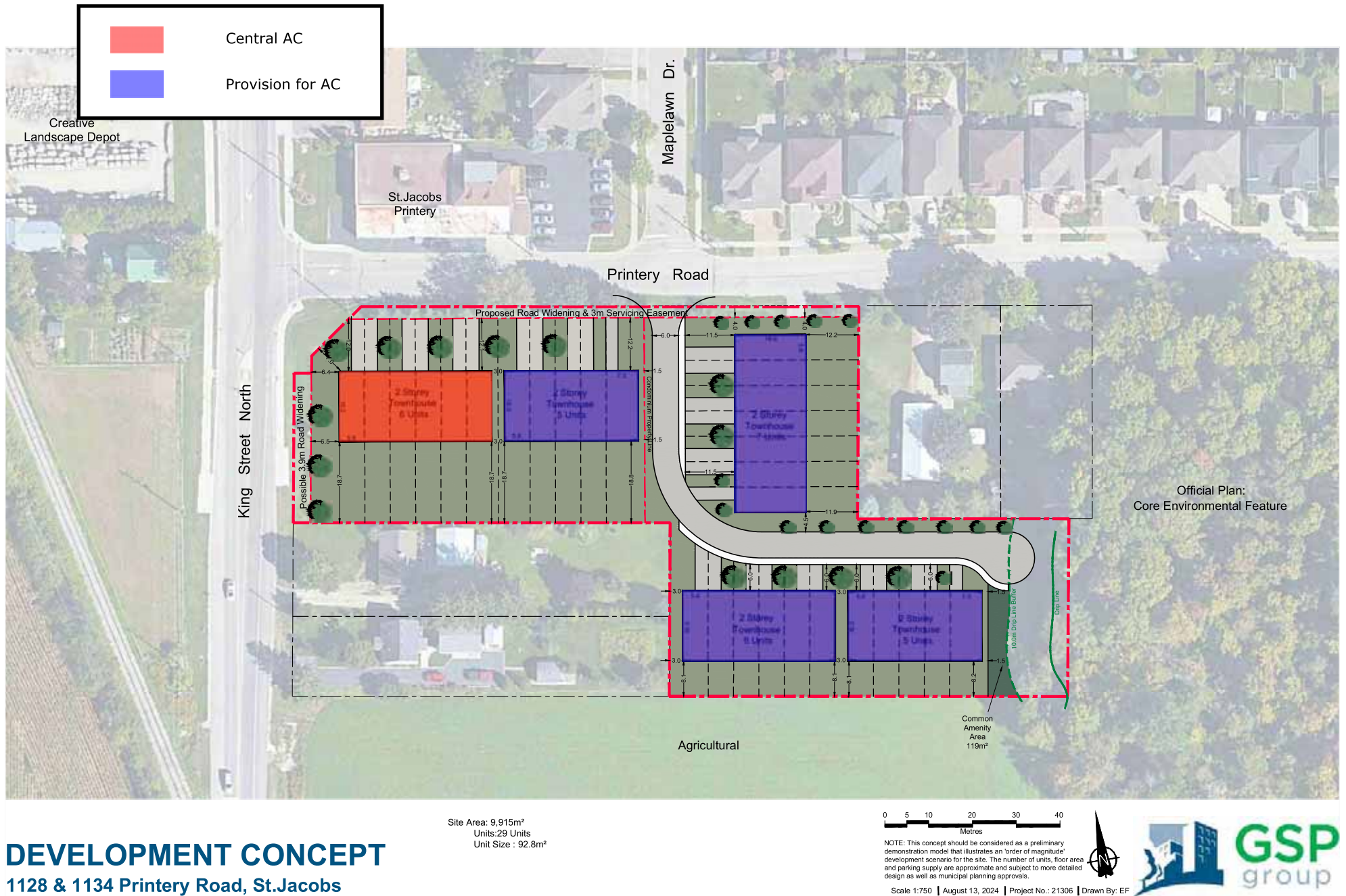
Scale 1:750 | August 13, 2024 | Project No.: 21306 | Drawn By: EF



DEVELOPMENT CONCEPT

1128 & 1134 Printery Road, St. Jacobs

Figure 3 - Proposed Site Plan Showing Potential Acoustic Barrier Locations



 Facade Requiring Brick or Masonry
Equivalent Exterior Wall Construction



Site Area: 9,915m²
Units: 29 Units
Unit Size : 92.8m²

0 5 10 20 30 40
Metres

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

Scale 1:750 | August 13, 2024 | Project No.: 21306 | Drawn By: EF



DEVELOPMENT CONCEPT

1128 & 1134 Printery Road, St. Jacobs

Figure 5 - Proposed Site Plan Showing Facades Requiring Brick or Masonry Equivalent Construction



Figure 6 - Locations of Existing Stationary Noise Sources



Figure 7 - Impact of Existing Stationary Noise, Daytime



Figure 8 - Impact of Existing Stationary Noise, Nighttime

Appendix A

Rail Guidelines



NOISE



VIBRATION



ACOUSTICS

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Canadian
National
Railway
Properties Inc.

Propriétés
ferroviaires du
Canadien
National Inc.



277 Front Street West
Floor 8
Toronto, Ontario
M5V 2X7

Telephone: (416) 217-6961
Facsimile: (416) 217-6743

277, rue Front ouest
8^e étage
Toronto (Ontario)
M5V 2X7

Téléphone: (416) 217-6961
Télécopieur: (416) 217-6743

SPUR LINE REQUIREMENTS

- A. Safety setback of dwellings from the railway rights-of-way to be a minimum of 15 metres.
- B. The Owner shall install and maintain a chain link fence of minimum 1.83 metre height along the mutual property line.
- C. The following clause should be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sale or Lease of each dwelling unit within 300m of the railway right-of-way: "Warning: Canadian National Railway Company or its assigns or successors in interest has or have a rights-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way."
- D. Any proposed alterations to the existing drainage pattern affecting railway property must receive prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway.

April 1996

Appendix B

Road Traffic Data



NOISE



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Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location

1134 Printery Road, Woolwich

2. Current AADT (2025)

Printery Road

King St N

24009200

3. Forecast AADT (2035)

Printery Road

King St N

310010700

4. Commercial Vehicle Rates

% Medium Trucks

% Heavy Trucks

3%

2%

2%

3%

5. Posted Speed Limit

Printery Road

King St N

50 km/h

50 km/h north of 50 m south of the railway tracks
80 km/h south of 50 m south of the railway tracks

6. Day/Night Splits

Regional Standard 90/10 Day/Night Split

7. Expiry

Dec 31 2027

8. Notes

This forecast is intended for the purpose of carrying out a noise study for 1134 Printery Road, Woolwich, only. As Printery Road is under the jurisdiction of Township of Woolwich, Township of Woolwich should verify the forecast for this segment. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Appendix C

Rail Traffic Data



NOISE



VIBRATION



ACOUSTICS

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Train Count Data

TRANSMITTAL

To: **HGC NOISE**
Destinataire : **VIBRATION**
ACOUSTICS
2000 Argentia Road,
Plaza One, Suite 203,
Mississauga, Ontario,
Canada L5N 1P7

Project : GPH-49.74(6.90)-Printery Rd, St. Jacobs ON

Att'n: Andrew Rogers

Routing: arogers@hgcacoustics.com

From: Gabriella Safatly
Expéditeur :

Date: 2025/06/27

Cc: Adjacent Development
CN via e-mail

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

Re: Train Traffic Data – CN Guelph Subdivision- Printery Road in Waterloo, ON

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **\$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at permits.gld@cn.ca.

Sincerely,

Gabriella Safatly
For Adrian Tena-Russell
Manager Public Works – Eastern Region

Date: 2025/06/27 **Project Number:** GPH-49.74(6.90)- Printery Rd, St. Jacobs ON

Dear Andrew:

Re: Train Traffic Data – CN Guelph Subdivision- Printery Road in Waterloo, ON

The following is provided in response to the request for information regarding rail traffic in the vicinity of 1134 Printery Road in Waterloo at approximately Mile 49.74 (6.90) on CN's Guelph Subdivision- Fergus Spur.

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

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

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

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	15	4
Way Freight	0	25	15	4
Passenger	0	10	15	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	3	140	15	4
Way Freight	0	25	15	4
Passenger	0	10	15	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Guelph Subdivision- Waterloo Industrial Spur.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are Two (2) at-grade crossings in the immediate vicinity of the study area at, Mile 62.45(6.84) King St N Xing and Mile 62.45(7.28) Henry St. Xing. Anti-whistling bylaws are not in effect at these crossings. Please note that engine warning whistles will be sounded in cases of emergency, as a safety and warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 263,000 lbs.

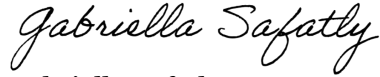
The Single Industrial spur track is considered to be continuously welded rail throughout the study area. Typically, CN crews operate within these limits from Monday to Friday between 2300 and 0500 hrs.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and

environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

A handwritten signature in black ink that reads "Gabriella Safatly". The script is cursive and fluid.

Gabriella Safatly
For Adrian Tena-Russell
Manager Public Works – Eastern Region

Appendix D

STAMSON Output



NOISE



VIBRATION



ACOUSTICS

www.hgcacoustics.com

STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 11:54:52
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: wl.te Time Period: Day/Night 16/8 hours
 Description: **West facade of northwest building, Prediction Location [A].**

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CN Freight	! 0.0/1.9	! 0.0/1.9	! 24.0	! 4.0	!140.0	!Diesel!	Yes
2. WCR Pass	! 10.2/0.0	! 10.2/0.0	! 48.0	! 1.0	! 6.0	!Diesel!	Yes

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

Angle1 Angle2 : -90.00 deg 70.00 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 : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Whistle Angle : 55 deg Track 1
 Reference angle : 0.00

Results segment # 1: CN Guelph (day)

LOCOMOTIVE (0.00 + 51.25 + 0.00) = 51.25 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 70 0.50 62.68 -10.00 -1.42 0.00 0.00 0.00 51.25

WHEEL (0.00 + 40.54 + 0.00) = 40.54 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 70 0.60 52.82 -10.70 -1.58 0.00 0.00 0.00 40.54

LEFT WHISTLE (0.00 + 63.02 + 0.00) = 63.02 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -77 55 0.50 74.96 -10.00 -1.94 0.00 0.00 0.00 63.02

RIGHT WHISTLE (0.00 + 52.48 + 0.00) = 52.48 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 55 70 0.50 74.96 -10.00 -12.47 0.00 0.00 0.00 52.48

Segment Leq : 63.67 dBA

Total Leq All Segments: 63.67 dBA

Results segment # 1: CN Guelph (night)

LOCOMOTIVE (0.00 + 55.51 + 0.00) = 55.51 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 70 0.50 66.94 -10.00 -1.42 0.00 0.00 0.00 55.51

WHEEL (0.00 + 44.64 + 0.00) = 44.64 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 70 0.60 56.92 -10.70 -1.58 0.00 0.00 0.00 44.64



```

-----
LEFT WHISTLE (0.00 + 61.72 + 0.00) = 61.72 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-77      55    0.50  73.66 -10.00 -1.94  0.00  0.00  0.00  61.72
-----

```

```

-----
RIGHT WHISTLE (0.00 + 51.18 + 0.00) = 51.18 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
55      70    0.50  73.66 -10.00 -12.47  0.00  0.00  0.00  51.18
-----

```

Segment Leq : 63.01 dBA

Total Leq All Segments: 63.01 dBA

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

```

-----
Car traffic volume : 9149/1017 veh/TimePeriod
Medium truck volume : 193/21 veh/TimePeriod
Heavy truck volume : 289/32 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

Data for Segment # 1: King (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 : 22.00 / 22.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Results segment # 1: King (day)

Source height = 1.32 m

```

-----
ROAD (0.00 + 60.91 + 0.00) = 60.91 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90      90    0.58  64.84  0.00 -2.62 -1.31  0.00  0.00  0.00  60.91
-----

```

Segment Leq : 60.91 dBA

Total Leq All Segments: 60.91 dBA

Results segment # 1: King (night)

Source height = 1.32 m

```

-----
ROAD (0.00 + 54.36 + 0.00) = 54.36 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90      90    0.58  58.29  0.00 -2.62 -1.31  0.00  0.00  0.00  54.36
-----

```

Segment Leq : 54.36 dBA

Total Leq All Segments: 54.36 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.52
(NIGHT): 63.57



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 11:56:01
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s2.te Time Period: Day/Night 16/8 hours
 Description: **South facade of middle north building, Prediction Location [B].**

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CN Freight	! 0.0/1.9	! 0.0/1.9	! 24.0	! 4.0	!140.0	!Diesel!	Yes
2. WCR Pass	! 10.2/0.0	! 10.2/0.0	! 48.0	! 1.0	! 6.0	!Diesel!	Yes

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

Angle1	Angle2	: -20.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	109.00 / 109.00 m	
Receiver height	:	4.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Whistle Angle	:	40 deg	Track 1
Reference angle	:	0.00	

Results segment # 1: CN Guelph (day)

LOCOMOTIVE (0.00 + 46.70 + 0.00) = 46.70 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.50	62.65	-12.88	-3.08	0.00	0.00	0.00	46.70

WHEEL (0.00 + 35.80 + 0.00) = 35.80 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.60	52.80	-13.78	-3.23	0.00	0.00	0.00	35.80

LEFT WHISTLE (0.00 + 57.15 + 0.00) = 57.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	40	0.50	74.93	-12.88	-4.91	0.00	0.00	0.00	57.15

RIGHT WHISTLE (0.00 + 53.74 + 0.00) = 53.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
40	77	0.50	74.93	-12.88	-8.32	0.00	0.00	0.00	53.74

Segment Leq : 59.06 dBA

Total Leq All Segments: 59.06 dBA

Results segment # 1: CN Guelph (night)

LOCOMOTIVE (0.00 + 50.98 + 0.00) = 50.98 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.50	66.94	-12.88	-3.08	0.00	0.00	0.00	50.98

WHEEL (0.00 + 39.91 + 0.00) = 39.91 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.60	56.92	-13.78	-3.23	0.00	0.00	0.00	39.91



```

-----
LEFT WHISTLE (0.00 + 55.87 + 0.00) = 55.87 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-20      40    0.50  73.66 -12.88 -4.91  0.00  0.00  0.00  55.87
-----

```

```

-----
RIGHT WHISTLE (0.00 + 52.46 + 0.00) = 52.46 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
 40      77    0.50  73.66 -12.88 -8.32  0.00  0.00  0.00  52.46
-----

```

Segment Leq : 58.44 dBA

Total Leq All Segments: 58.44 dBA

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

```

-----
Car traffic volume : 9149/1017 veh/TimePeriod
Medium truck volume : 193/21 veh/TimePeriod
Heavy truck volume : 289/32 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

-----
Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 60.00 / 60.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Results segment # 1: King (day)

Source height = 1.32 m

```

-----
ROAD (0.00 + 51.03 + 0.00) = 51.03 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
 0      90    0.58  64.84  0.00 -9.49 -4.32  0.00  0.00  0.00  51.03
-----

```

Segment Leq : 51.03 dBA

Total Leq All Segments: 51.03 dBA

Results segment # 1: King (night)

Source height = 1.32 m

```

-----
ROAD (0.00 + 44.48 + 0.00) = 44.48 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
 0      90    0.58  58.29  0.00 -9.49 -4.32  0.00  0.00  0.00  44.48
-----

```

Segment Leq : 44.48 dBA

Total Leq All Segments: 44.48 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.69
(NIGHT): 58.61



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 11:57:08
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w3.te Time Period: Day/Night 16/8 hours
 Description: **West facade of northeast building, Prediction Location [C].**

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CN Freight	! 0.0/1.9	! 0.0/1.9	! 24.0	! 4.0	!140.0	!Diesel!	Yes
2. WCR Pass	! 10.2/0.0	! 10.2/0.0	! 48.0	! 1.0	! 6.0	!Diesel!	Yes

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

Angle1 Angle2 : -55.00 deg 10.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 157.00 / 157.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Whistle Angle : 20 deg Track 1
 Reference angle : 0.00

Results segment # 1: CN Guelph (day)

LOCOMOTIVE (0.00 + 42.71 + 0.00) = 42.71 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.50 62.68 -15.25 -4.72 0.00 0.00 0.00 42.71

WHEEL (0.00 + 31.72 + 0.00) = 31.72 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.60 52.82 -16.32 -4.78 0.00 0.00 0.00 31.72

LEFT WHISTLE (0.00 + 54.99 + 0.00) = 54.99 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.00 74.96 0.00 -4.72 0.00 0.00 0.00 54.99

Segment Leq : 55.26 dBA

Total Leq All Segments: 55.26 dBA

Results segment # 1: CN Guelph (night)

LOCOMOTIVE (0.00 + 46.97 + 0.00) = 46.97 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.50 66.94 -15.25 -4.72 0.00 0.00 0.00 46.97

WHEEL (0.00 + 35.82 + 0.00) = 35.82 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.60 56.92 -16.32 -4.78 0.00 0.00 0.00 35.82

LEFT WHISTLE (0.00 + 53.69 + 0.00) = 53.69 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -55 10 0.00 73.66 0.00 -4.72 0.00 0.00 0.00 53.69



Segment Leq : 54.59 dBA

Total Leq All Segments: 54.59 dBA

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

 Car traffic volume : 9149/1017 veh/TimePeriod
 Medium truck volume : 193/21 veh/TimePeriod
 Heavy truck volume : 289/32 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

 Angle1 Angle2 : -55.00 deg 10.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 115.00 / 115.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

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

 Car traffic volume : 2651/305 veh/TimePeriod
 Medium truck volume : 84/9 veh/TimePeriod
 Heavy truck volume : 56/6 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Printery (day/night)

 Angle1 Angle2 : 60.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 54.00 / 54.00 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: King (day)

 Source height = 1.32 m

ROAD (0.00 + 46.13 + 0.00) = 46.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	10	0.58	64.84	0.00	-13.94	-4.77	0.00	0.00	0.00	46.13

Segment Leq : 46.13 dBA

Results segment # 2: Printery (day)

 Source height = 1.19 m

ROAD (0.00 + 37.61 + 0.00) = 37.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
60	90	0.66	58.75	0.00	-9.23	-11.90	0.00	0.00	0.00	37.61

Segment Leq : 37.61 dBA



Total Leq All Segments: 46.70 dBA

Results segment # 1: King (night)

Source height = 1.32 m

ROAD (0.00 + 39.59 + 0.00) = 39.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-55	10	0.58	58.29	0.00	-13.94	-4.77	0.00	0.00	0.00	39.59

Segment Leq : 39.59 dBA

Results segment # 2: Printery (night)

Source height = 1.17 m

ROAD (0.00 + 31.93 + 0.00) = 31.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
60	90	0.58	52.17	0.00	-8.79	-11.45	0.00	0.00	0.00	31.93

Segment Leq : 31.93 dBA

Total Leq All Segments: 40.28 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.83
(NIGHT): 54.75



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 11:59:18
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w4.te Time Period: Day/Night 16/8 hours
 Description: **West facade of southwest building, Prediction Location [D].**

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CN Freight	! 0.0/1.9	! 0.0/1.9	! 24.0	! 4.0	!140.0	!Diesel!	Yes
2. WCR Pass	! 10.2/0.0	! 10.2/0.0	! 48.0	! 1.0	! 6.0	!Diesel!	Yes

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

Angle1 Angle2 : -90.00 deg 35.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 130.00 / 130.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Whistle Angle : 10 deg Track 1
 Reference angle : 0.00

Results segment # 1: CN Guelph (day)

LOCOMOTIVE (0.00 + 46.22 + 0.00) = 46.22 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 35 0.50 62.68 -14.02 -2.44 0.00 0.00 0.00 46.22

WHEEL (0.00 + 35.25 + 0.00) = 35.25 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 35 0.60 52.82 -15.01 -2.57 0.00 0.00 0.00 35.25

LEFT WHISTLE (0.00 + 56.92 + 0.00) = 56.92 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -71 10 0.50 74.96 -14.02 -4.01 0.00 0.00 0.00 56.92

RIGHT WHISTLE (0.00 + 52.17 + 0.00) = 52.17 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 10 35 0.50 74.96 -14.02 -8.76 0.00 0.00 0.00 52.17

Segment Leq : 58.46 dBA

Total Leq All Segments: 58.46 dBA

Results segment # 1: CN Guelph (night)

LOCOMOTIVE (0.00 + 50.48 + 0.00) = 50.48 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 35 0.50 66.94 -14.02 -2.44 0.00 0.00 0.00 50.48

WHEEL (0.00 + 39.34 + 0.00) = 39.34 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 35 0.60 56.92 -15.01 -2.57 0.00 0.00 0.00 39.34



```

-----
LEFT WHISTLE (0.00 + 55.62 + 0.00) = 55.62 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-71      10    0.50  73.66 -14.02 -4.01  0.00  0.00  0.00  55.62
-----

```

```

RIGHT WHISTLE (0.00 + 50.87 + 0.00) = 50.87 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
10       35    0.50  73.66 -14.02 -8.76  0.00  0.00  0.00  50.87
-----

```

Segment Leq : 57.83 dBA

Total Leq All Segments: 57.83 dBA

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

```

-----
Car traffic volume : 9149/1017 veh/TimePeriod
Medium truck volume : 193/21 veh/TimePeriod
Heavy truck volume : 289/32 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

-----
Angle1 Angle2 : -90.00 deg 35.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 103.00 / 103.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Results segment # 1: King (day)

Source height = 1.32 m

```

ROAD (0.00 + 49.12 + 0.00) = 49.12 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90      35    0.58  64.84  0.00 -13.18 -2.54  0.00  0.00  0.00  49.12
-----

```

Segment Leq : 49.12 dBA

Total Leq All Segments: 49.12 dBA

Results segment # 1: King (night)

Source height = 1.32 m

```

ROAD (0.00 + 42.57 + 0.00) = 42.57 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90      35    0.58  58.29  0.00 -13.18 -2.54  0.00  0.00  0.00  42.57
-----

```

Segment Leq : 42.57 dBA

Total Leq All Segments: 42.57 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.94
(NIGHT): 57.96



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 12:00:35
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s5.te Time Period: Day/Night 16/8 hours
 Description: **South facade of southeast building, Prediction Location [E].**

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

Train Type	! Trains ! (Left)	! Trains ! (Right)	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng ! type	!Cont !weld
1. CN Freight	! 0.0/1.9	! 0.0/1.9	! 24.0	! 4.0	!140.0	!Diesel!	Yes
2. WCR Pass	! 10.2/0.0	! 10.2/0.0	! 48.0	! 1.0	! 6.0	!Diesel!	Yes

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

Angle1	Angle2	: -20.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	168.00 / 168.00 m	
Receiver height	:	4.50 / 4.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Whistle Angle	:	0 deg	Track 1
Reference angle	:	0.00	

Results segment # 1: CN Guelph (day)

LOCOMOTIVE (0.00 + 43.89 + 0.00) = 43.89 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.50	62.65	-15.69	-3.08	0.00	0.00	0.00	43.89

WHEEL (0.00 + 32.79 + 0.00) = 32.79 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.60	52.80	-16.79	-3.23	0.00	0.00	0.00	32.79

LEFT WHISTLE (0.00 + 49.66 + 0.00) = 49.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	0	0.50	74.93	-15.69	-9.59	0.00	0.00	0.00	49.66

RIGHT WHISTLE (0.00 + 54.42 + 0.00) = 54.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	67	0.50	74.93	-15.69	-4.83	0.00	0.00	0.00	54.42

Segment Leq : 55.97 dBA

Total Leq All Segments: 55.97 dBA

Results segment # 1: CN Guelph (night)

LOCOMOTIVE (0.00 + 48.17 + 0.00) = 48.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.50	66.94	-15.69	-3.08	0.00	0.00	0.00	48.17

WHEEL (0.00 + 36.91 + 0.00) = 36.91 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.60	56.92	-16.79	-3.23	0.00	0.00	0.00	36.91



```

-----
LEFT WHISTLE (0.00 + 48.38 + 0.00) = 48.38 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-20      0    0.50  73.66 -15.69 -9.59  0.00  0.00  0.00  48.38
-----

```

```

-----
RIGHT WHISTLE (0.00 + 53.14 + 0.00) = 53.14 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
  0      67    0.50  73.66 -15.69 -4.83  0.00  0.00  0.00  53.14
-----

```

Segment Leq : 55.38 dBA

Total Leq All Segments: 55.38 dBA

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

```

-----
Car traffic volume : 9149/1017 veh/TimePeriod
Medium truck volume : 193/21 veh/TimePeriod
Heavy truck volume : 289/32 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

-----
Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 141.00 / 141.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

```

Results segment # 1: King (day)

Source height = 1.32 m

```

-----
ROAD (0.00 + 45.19 + 0.00) = 45.19 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
  0      90    0.58  64.84  0.00 -15.33 -4.32  0.00  0.00  0.00  45.19
-----

```

Segment Leq : 45.19 dBA

Total Leq All Segments: 45.19 dBA

Results segment # 1: King (night)

Source height = 1.32 m

```

-----
ROAD (0.00 + 38.64 + 0.00) = 38.64 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
  0      90    0.58  58.29  0.00 -15.33 -4.32  0.00  0.00  0.00  38.64
-----

```

Segment Leq : 38.64 dBA

Total Leq All Segments: 38.64 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.32
(NIGHT): 55.47



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 12:02:00
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w_ola.te Time Period: 16 hours
 Description: **Rear yard OLA of northwest building, west unit, Prediction Location [F].**

Rail data, segment # 1: CN Guelph

Train Type	! Trains !	! Speed ! (km/h)	!# loc !	!# Cars !	! Eng type !	!Cont !weld
1. CN Freight	0.0/3.8	24.0	4.0	140.0	Diesel	Yes
2. WCR Pass	20.5/0.0	48.0	1.0	6.0	Diesel	Yes

Data for Segment # 1: CN Guelph

Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 65.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

Results segment # 1: CN Guelph

LOCOMOTIVE (0.00 + 51.25 + 0.00) = 51.25 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 90 0.58 62.68 -10.09 -1.33 0.00 0.00 0.00 51.25

WHEEL (0.00 + 40.80 + 0.00) = 40.80 dBA
 Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
 -90 90 0.66 52.82 -10.57 -1.46 0.00 0.00 0.00 40.80

Segment Leq : 51.62 dBA

Total Leq All Segments: 51.62 dBA

Road data, segment # 1: King

Car traffic volume : 9149 veh/TimePeriod
 Medium truck volume : 193 veh/TimePeriod
 Heavy truck volume : 289 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: King

Angle1 Angle2 : -90.00 deg 70.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 26.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: King

Source height = 1.32 m



ROAD (0.00 + 59.21 + 0.00) = 59.21 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	70	0.66	64.84	0.00	-3.97	-1.66	0.00	0.00	0.00	59.21

Segment Leq : 59.21 dBA

Total Leq All Segments: 59.21 dBA

TOTAL Leq FROM ALL SOURCES: 59.91



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 12:02:52
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w4_ola.te Time Period: 16 hours
 Description: **Rear yard OLA of northwest building, 4th unit from the west, Prediction Location [G].**

Rail data, segment # 1: CN Guelph

Train Type	! Trains !	! Speed ! (km/h)	!# loc !	!# Cars !	! Eng type !	!Cont !weld
1. CN Freight	0.0/3.8	24.0	4.0	140.0	Diesel	Yes
2. WCR Pass	20.5/0.0	48.0	1.0	6.0	Diesel	Yes

Data for Segment # 1: CN Guelph

Angle1	Angle2	: -90.00 deg	45.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	81.00 m	
Receiver height	:	1.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
No Whistle	:		
Reference angle	:	0.00	

Results segment # 1: CN Guelph

LOCOMOTIVE (0.00 + 48.87 + 0.00) = 48.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.58	62.68	-11.61	-2.20	0.00	0.00	0.00	48.87

WHEEL (0.00 + 38.38 + 0.00) = 38.38 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	52.82	-12.16	-2.29	0.00	0.00	0.00	38.38

Segment Leq : 49.24 dBA

Total Leq All Segments: 49.24 dBA

Road data, segment # 1: King

Car traffic volume	: 9149 veh/TimePeriod
Medium truck volume	: 193 veh/TimePeriod
Heavy truck volume	: 289 veh/TimePeriod
Posted speed limit	: 50 km/h
Road gradient	: 0 %
Road pavement	: 1 (Typical asphalt or concrete)

Data for Segment # 1: King

Angle1	Angle2	: -90.00 deg	25.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	43.00 m	
Receiver height	:	1.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: King

Source height = 1.32 m



ROAD (0.00 + 54.18 + 0.00) = 54.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	25	0.66	64.84	0.00	-7.59	-3.07	0.00	0.00	0.00	54.18

Segment Leq : 54.18 dBA

Total Leq All Segments: 54.18 dBA

TOTAL Leq FROM ALL SOURCES: 55.39



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 12:04:12
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n_ola.te Time Period: 16 hours
 Description: **Rear yard OLA of northeast building, north unit, Prediction Location [H].**

Road data, segment # 1: Printery

 Car traffic volume : 2651 veh/TimePeriod
 Medium truck volume : 84 veh/TimePeriod
 Heavy truck volume : 56 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Printery

 Angle1 Angle2 : -65.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 17.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Printery

 Source height = 1.19 m
 ROAD (0.00 + 56.09 + 0.00) = 56.09 dBA
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

 -65 90 0.66 58.75 0.00 -0.90 -1.76 0.00 0.00 0.00 56.09

Segment Leq : 56.09 dBA

Total Leq All Segments: 56.09 dBA

TOTAL Leq FROM ALL SOURCES: 56.09



STAMSON 5.0 NORMAL REPORT Date: 18-08-2025 12:05:00
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: e_ola.te Time Period: 16 hours
 Description: **Common outdoor amenity area, Prediction Location [I].**

Rail data, segment # 1: CN Guelph_S

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng type !	!Cont !weld
1. CN Freight	! 0.0/3.8 !	! 24.0 !	! 4.0 !	!140.0 !	!Diesel!	! Yes
2. WCR Pass	! 20.5/0.0 !	! 48.0 !	! 1.0 !	! 6.0 !	!Diesel!	! Yes

Data for Segment # 1: CN Guelph_S

Angle1	Angle2	: -90.00 deg	-30.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	189.00 m	
Receiver height	:	1.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
No Whistle			
Reference angle	:	0.00	

Rail data, segment # 2: CN Guelph_B

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng type !	!Cont !weld
1. CN Freight	! 0.0/1.0 !	! 24.0 !	! 4.0 !	!140.0 !	!Diesel!	! Yes
2. WCR Pass	! 20.5/1.0 !	! 48.0 !	! 1.0 !	! 6.0 !	!Diesel!	! Yes

Data for Segment # 2: CN Guelph_B

Angle1	Angle2	: -30.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	189.00 m	
Receiver height	:	1.50 m	
Topography	:	2	(Flat/gentle slope; with barrier)
No Whistle			
Barrier angle1	:	-30.00 deg	Angle2 : 90.00 deg
Barrier height	:	6.00 m	
Barrier receiver distance	:	4.10 m	
Source elevation	:	0.00 m	
Receiver elevation	:	0.00 m	
Barrier elevation	:	0.00 m	
Reference angle	:	0.00	

Results segment # 1: CN Guelph_S

LOCOMOTIVE (0.00 + 38.37 + 0.00) = 38.37 dBA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-30	0.58	62.68	-17.44	-6.86	0.00	0.00	0.00	38.37

WHEEL (0.00 + 27.48 + 0.00) = 27.48 dBA									
Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-30	0.66	52.82	-18.27	-7.08	0.00	0.00	0.00	27.48

Segment Leq : 38.71 dBA



Results segment # 2: CN Guelph_B

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
4.00 !	1.50 !	1.55 !	1.55
0.50 !	1.50 !	1.48 !	1.48

LOCOMOTIVE (0.00 + 30.45 + 0.00) = 30.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.22	62.68	-13.48	-2.21	0.00	0.00	-16.53	30.45

WHEEL (0.00 + 19.17 + 0.00) = 19.17 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.33	52.82	-14.63	-2.39	0.00	0.00	-16.63	19.17

Segment Leq : 30.76 dBA

Total Leq All Segments: 39.36 dBA

Road data, segment # 1: King_S

Car traffic volume : 9149 veh/TimePeriod
 Medium truck volume : 193 veh/TimePeriod
 Heavy truck volume : 289 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: King_S

Angle1 Angle2 : -90.00 deg -50.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 176.00 m
 Receiver height : 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Road data, segment # 2: King_Bar

Car traffic volume : 9149 veh/TimePeriod
 Medium truck volume : 193 veh/TimePeriod
 Heavy truck volume : 289 veh/TimePeriod
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: King_Bar

Angle1 Angle2 : -50.00 deg 70.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 176.00 m
 Receiver height : 1.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -50.00 deg Angle2 : 70.00 deg
 Barrier height : 6.00 m
 Barrier receiver distance : 3.80 m
 Source elevation : 0.00 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m



Reference angle : 0.00

Road data, segment # 3: Print_Bar

```
-----
Car traffic volume : 2651 veh/TimePeriod
Medium truck volume : 84 veh/TimePeriod
Heavy truck volume : 56 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 3: Print_Bar

```
-----
Angle1 Angle2 : -90.00 deg -20.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 87.00 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -20.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 7.40 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00
```

Road data, segment # 4: Print_N

```
-----
Car traffic volume : 2651 veh/TimePeriod
Medium truck volume : 84 veh/TimePeriod
Heavy truck volume : 56 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 4: Print_N

```
-----
Angle1 Angle2 : -20.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 87.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: King_S

Source height = 1.32 m

ROAD (0.00 + 37.22 + 0.00) = 37.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-50	0.66	64.84	0.00	-17.75	-9.87	0.00	0.00	0.00	37.22

Segment Leq : 37.22 dBA

Results segment # 2: King_Bar

Source height = 1.32 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	! Barrier Top (m)
-----	-----	-----	-----



1.32 ! 1.50 ! 1.50 ! 1.50

ROAD (0.00 + 29.37 + 0.00) = 29.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	70	0.31	64.84	0.00	-13.96	-2.06	0.00	0.00	-19.45	29.37

Segment Leq : 29.37 dBA

Results segment # 3: Print_Bar

Source height = 1.19 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.19 !	1.50 !	1.47 !	1.47

ROAD (0.00 + 29.65 + 0.00) = 29.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-20	0.31	58.75	0.00	-10.00	-5.14	0.00	0.00	-13.96	29.65

Segment Leq : 29.65 dBA

Results segment # 4: Print_N

Source height = 1.19 m

ROAD (0.00 + 42.77 + 0.00) = 42.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	90	0.66	58.75	0.00	-12.67	-3.31	0.00	0.00	0.00	42.77

Segment Leq : 42.77 dBA

Total Leq All Segments: 44.15 dBA

TOTAL Leq FROM ALL SOURCES: 45.39



Appendix E

Measured Vibration Velocity Levels and Acceleration Spectrums



NOISE



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**Figure E1a: Pass-by 1 [V1]
Measured Vibratory Velocity Level**

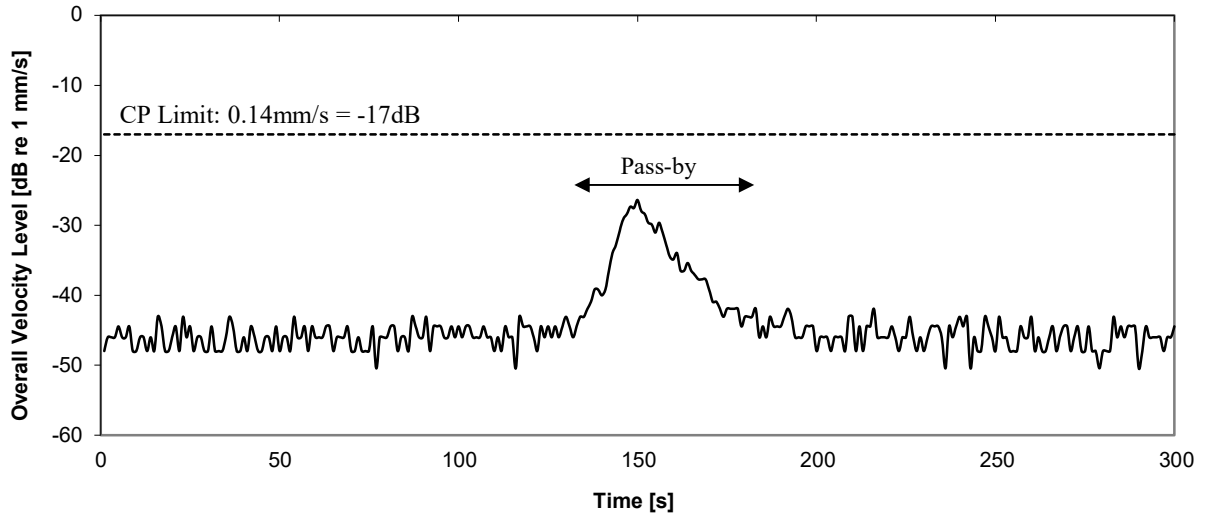


**Figure E1b: Pass-by 1 [V1]
Acceleration Spectrum @ Peak Level (1 sec. Duration)**

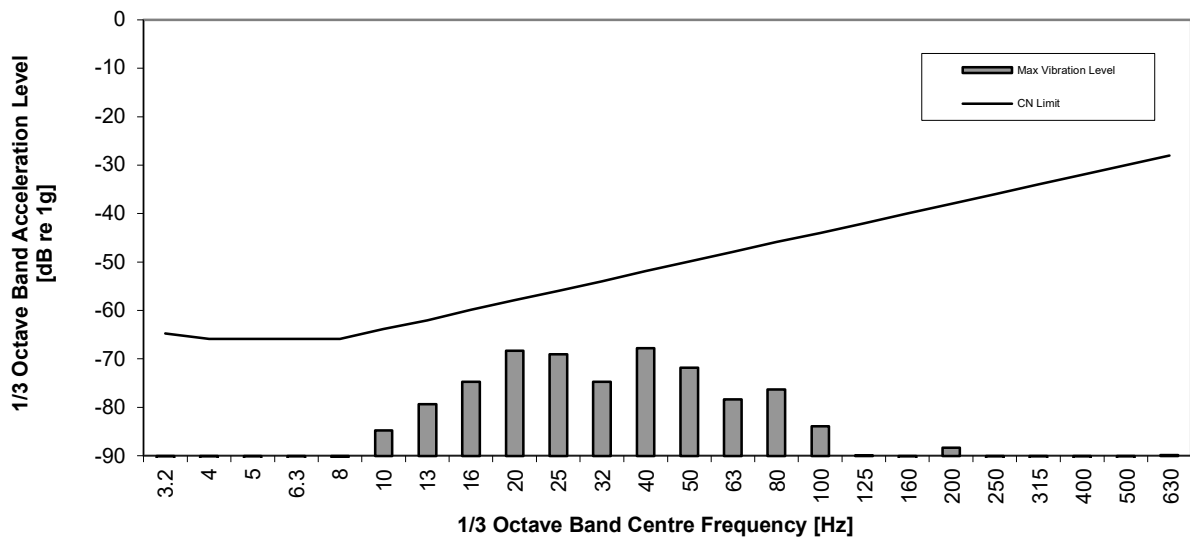


**Figure E2a: Pass-by 2 [V1]
Measured Vibratory Velocity Level**

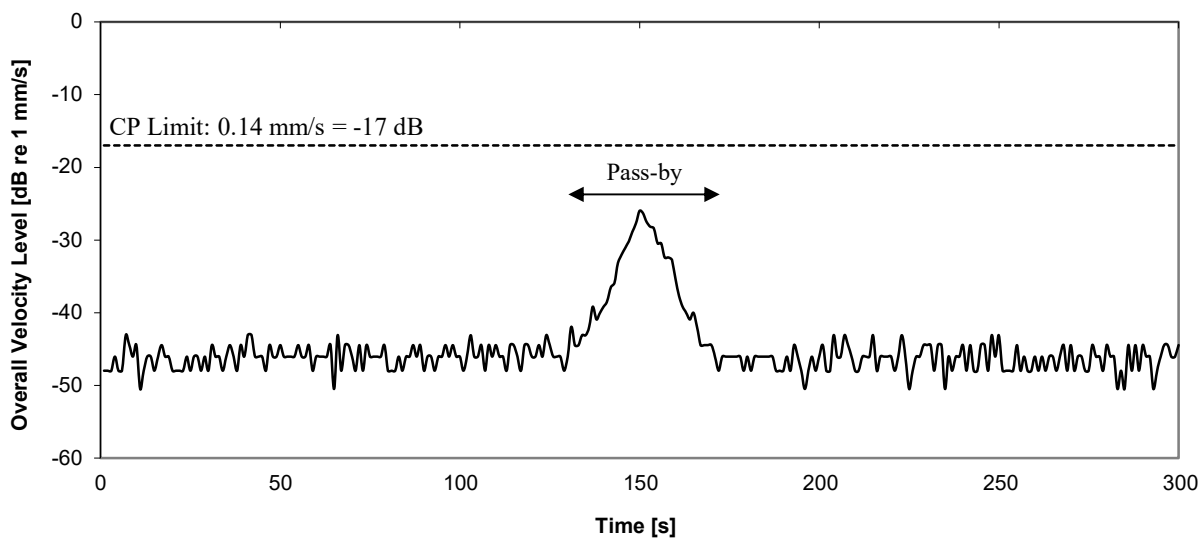


**Figure E2b: Pass-by 2 [V1]
Acceleration Spectrum @ Peak Level (1 sec. Duration)**

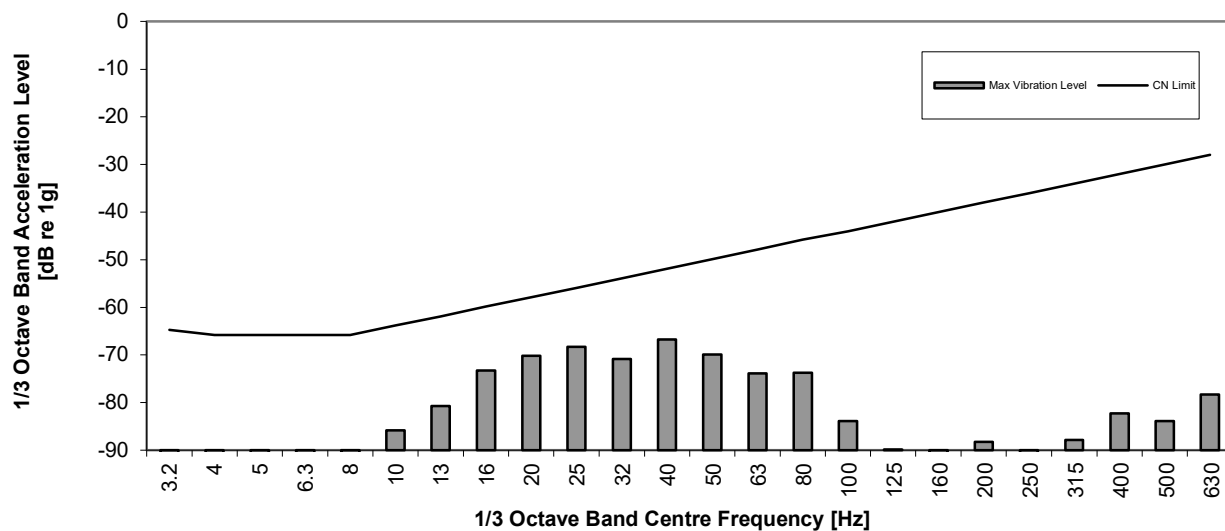


Figure E3a: Pass-by 3 [V1]
Measured Vibratory Velocity Level

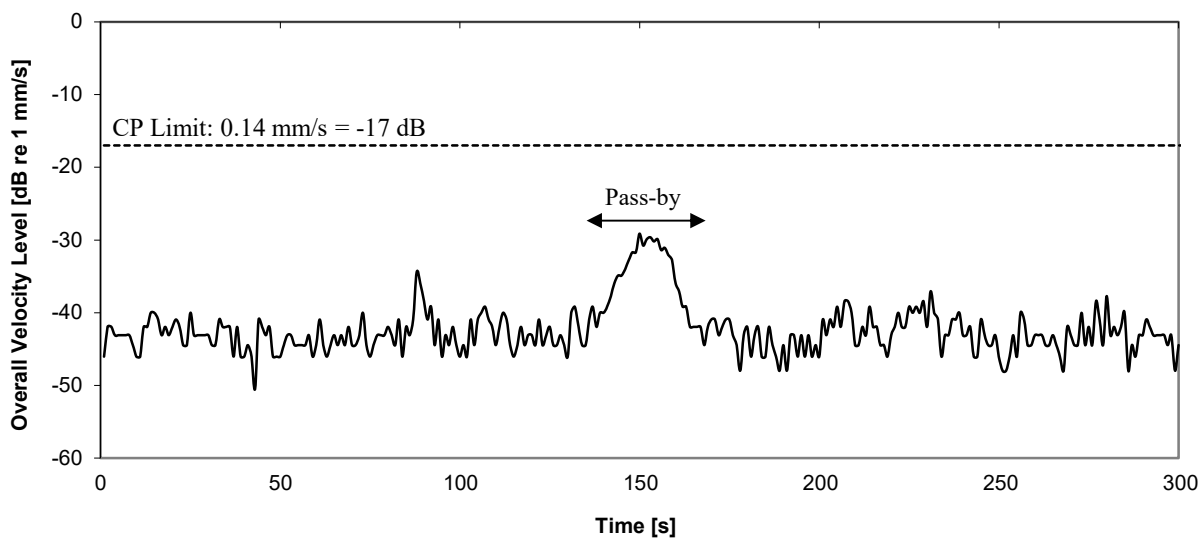


Figure E3b: Pass-by 3 [V1]
Acceleration Spectrum @ Peak Level (1 sec. Duration)

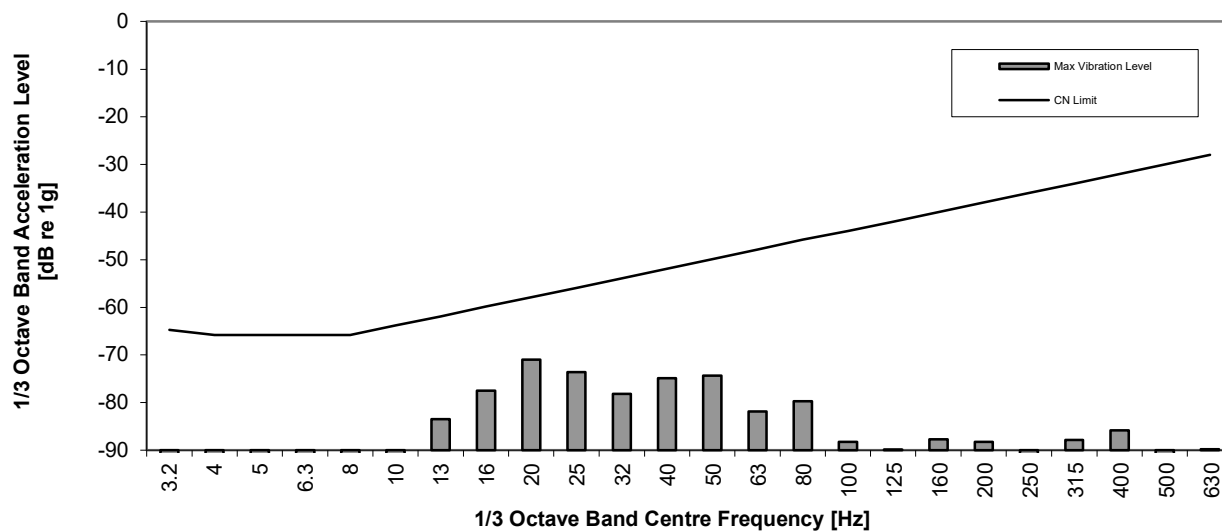


**Figure E4a: Pass-by 4 [V1]
Measured Vibratory Velocity Level**

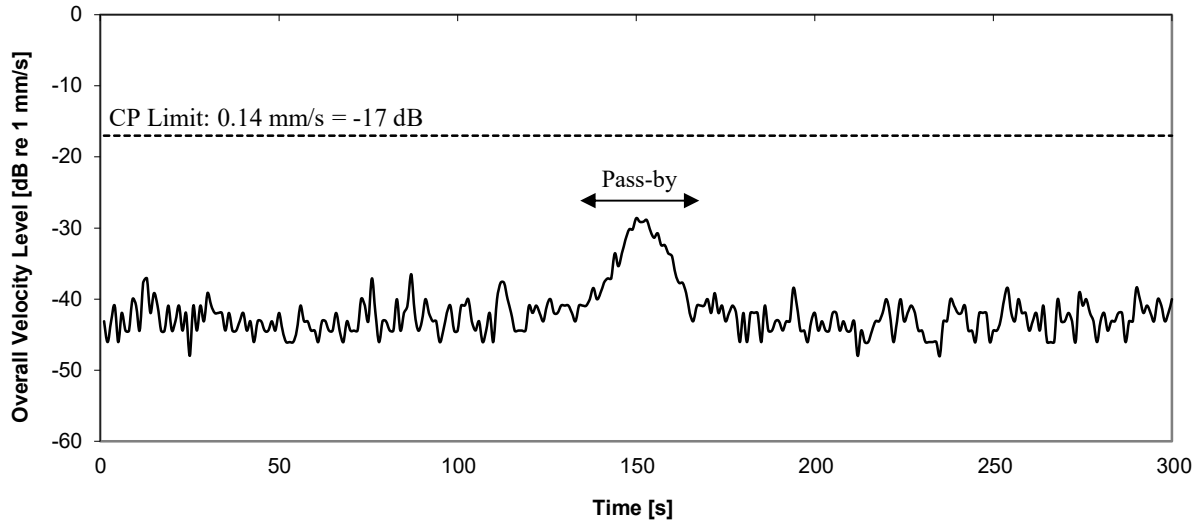


**Figure E4b: Pass-by 4 [V1]
Acceleration Spectrum @ Peak Level (1 sec. Duration)**

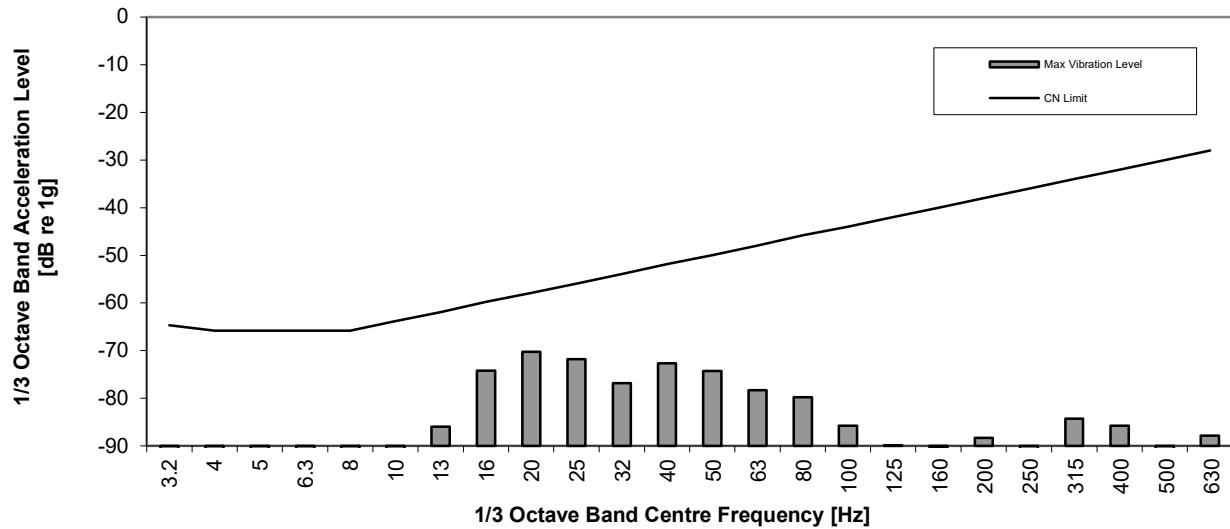


Figure E5a: Pass-by 5 [V1]
Measured Vibratory Velocity Level

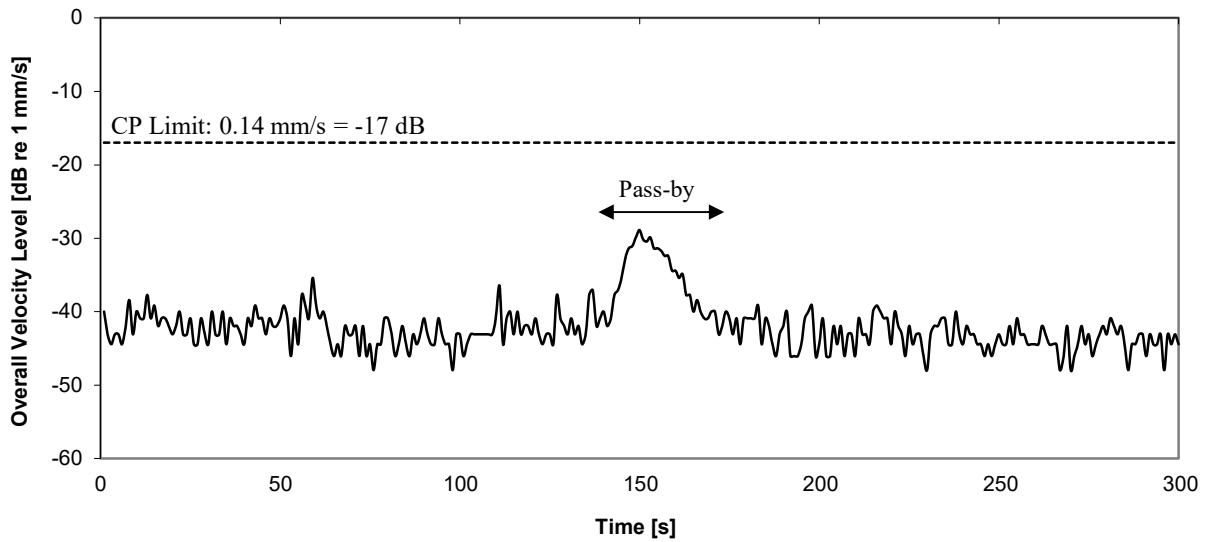
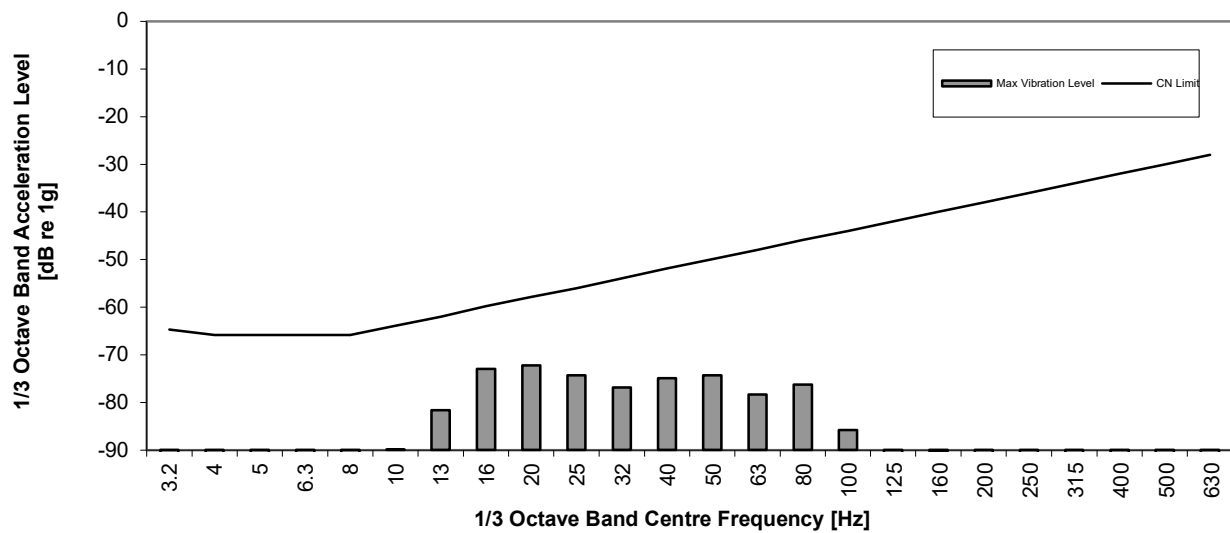


Figure E5b: Pass-by 5 [V1]
Acceleration Spectrum @ Peak Level (1 sec. Duration)



Appendix F

Cadna/A Model Parameters and Output Table



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The predictive model used for this Assessment (*Cadna-A version 2025, Build 209.5501*) is based on methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors", which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as buildings. This modeling technique is acceptable to the MECP.

The subject site and surrounding area were modelled based on observations during the site visit. Foliage was not included in the modelling. Ground attenuation was assumed to be spectral for all sources, with a ground factor (G) of 0.25 for paved areas, 0.5 for gravel areas, and 0.9 for grass areas. The temperature and relative humidity were assumed to be 10° C and 70%, respectively. The reference times were Daytime 07:00 to 19:00, Evening 19:00 to 23:00 and Nighttime 23:00 to 07:00. All buildings in the model had an absorption coefficient alpha of 0.2.

The predictive modelling considered one order of reflection, the sufficiency of which was verified through an iterative convergence analysis, using successively increasing orders of reflection.

The rooftop HVAC equipment and exhaust fan were modeled as point sources of sound, shown as green crosses in Figure 6. The truck movements were modeled as line sources of sound, shown as green lines in Figure 6. The forklift activity was modeled as area sources of sound, shown as green hatched areas in Figure 6.



NorthFacadeNorthwestBuilding		North Facade, Northwest Building			17535968	4819541	4.5														
Src ID	Src Name	X	Y	Z	LxD	LxN	Adiv	K0	Dc	Agnd	Abar	Aatm	Afol	Ahaus	CmetD	CmetN	RefID	RefN	LrD	LrN	
CreativeLandscapeDepot	Medium Truck Movement	17535842	4819635	2.5	86	--	52.5	0	0.0	-1.2	0.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	33	--	
CreativeLandscapeDepot	Forklift	17536266	4819502	1.5	95	--	52.9	0	0.0	-0.4	2.4	0.8	0.0	0.0	0.0	0.0	0.5	0.5	40	--	
HomeBuildingCentre	Medium Truck Movement	17535928	4819830	2.5	89	--	60.1	0	0.0	-1.4	4.2	1.7	0.0	0.0	0.0	0.0	0.9	0.9	25	--	
HomeBuildingCentre	Forklift	17535440	4819884	1.5	95	--	60.1	0	0.0	-0.7	4.5	1.7	0.0	0.0	0.0	0.0	0.6	0.6	30	--	
StJacobsPrintery	1-Fan	17535966	4819577	4.5	80	74	42.0	0	0.0	-1.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	39	33	
StJacobsPrintery	2-Fan	17535966	4819586	5.5	88	82	44.4	0	0.0	-1.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	45	39	
StJacobsPrintery	2-Fan	17535970	4819577	4.5	88	82	42.4	0	0.0	-1.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	47	41	
StJacobsPrintery	Exhaust Fan	17535970	4819576	4.5	81	--	41.7	0	0.0	-1.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	40	--	



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Appendix G

Consultant's Statutory Declaration



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CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	
	)	And in the Matter of an
	)	Application for a Proposed
	)	Residential Development at
	)	1128 and 1134 Printery Road,
	)	St. Jacobs, in the Regional
	)	Municipality of Waterloo

I, Sheeba Paul in the City of Brampton, in the Region of Peel,

SOLEMNLY DECLARE THAT:

1. I am a Professional Engineer employed by HGC Noise Vibration Acoustics which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as Proposed Residential Development at 1128 and 1134 Printery Road, St. Jacobs, in the Regional Municipality of Waterloo.
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled Noise and Vibration Feasibility Study, Proposed Residential Development, 1128 and 1134 Printery Road, St. Jacobs, ON and dated August 19, 2025 is the best available information as of the date of the study.
5. The noise level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment, Conservation and Parks Guidelines, Region of Waterloo policies, any applicable policy or guidelines of the Township of Woolwich, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.
7. I acknowledge that this study may be subject to a peer review conducted at my cost.

8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath.

Sworn (or Affirmed or Declared) remotely by
Sheeba Paul stated as being located in the
City of Brampton, in the Province of Ontario,
before me, Kazuki Takahashi, at the City of
Markham in the Province of Ontario, on
August 19, 2025, in accordance with
O. Reg 431/20, Administering Oath or
Declaration Remotely.

)
)
)
)
)

Sheeba Paul


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