

January 27, 2025

Curtis Thompson
Elevate Living
800 Niagara Street, Unit E2
Welland, ON L3C 5Z4

Via Email: curtis@elevateliving.ca

RE: Rail Vibration Impact Study, Proposed 3-Storey Apartment Development
547 King Street, Port Colborne, Ontario
HGC Project #: 02501023

Dear Curtis,

HGC Noise Vibration Acoustics was retained by Elevate Living to conduct a rail vibration impact study for a proposed 3-storey residential development to be located at 547 King Street in Port Colborne, Region Municipality of Niagara, Ontario. This vibration study has been prepared for submission as part of the approval process by the municipality and the railway. It follows the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and Canadian National Railway (CN) with regard to the impact of ground-borne vibration from train pass-bys.

Ground-borne vibration measurements were performed at the location of the nearest proposed residential façade to the railway right-of-way for six train pass-bys. Measured vibration levels were found to be within the target criteria during all train pass-bys. Vibration mitigation is not required for the development.

1 DESCRIPTION OF THE SITE

A key plan showing the location of the proposed site is indicated in Figure 1. The development is located at 547 King Street, in the City of Port Colborne, Ontario. A proposed concept plan prepared by Elevate Living, dated October 17, 2025, is

attached as Figure 2. The proposed development will consist of one 3-storey apartment building with associated at-grade parking spaces. The vibration measurement location is also shown on Figure 2 for reference.

The primary source of vibration is rail traffic on the Trillium Railway line, located approximately 45 m east of the closest proposed residential building façade, measured to the railway right of way. The rail line is used by freight trains and is considered a spur line (Harbour Spur). To the north, south and west of the site are residential dwellings and apartment buildings. There are some commercial buildings, including offices, located near the subject site along King Street.

2 CRITERIA GROUND-BORNE VIBRATION FROM RAIL TRAFFIC

The Trillium Railway, Harbour Spur, operates on tracks that are leased from Canadian National (CN), making CN's criteria applicable to this site. The Railway Association of Canada/Federation of Canadian Municipalities "Report Research Phase 3: Proximity Guidelines and Best Practices" dated November 2006 and Guidelines for New Development in Proximity to Railway Operations dated May 2013 were also reviewed. CN provides guidance and vibration criteria for residential developments adjacent to their railway right-of-way. CN guidelines require measurements of ground-borne vibration when a residential development is to be located within 75 m of a rail line. The Trillium railway line right-of-way to the east is approximately 45 m from the closest residential façade of the proposed development. The CN main line requirements are attached.

Vibration is typically measured in terms of oscillatory velocity or acceleration. The CN limits for acceptable ground-borne vibration are an RMS velocity of 0.14 mm/s (-17 dB re 1 mm/s) between the frequencies of 4 and 200 Hz.

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 ASSESSMENT OF GROUND-BORNE VIBRATION FROM RAIL TRAFFIC

HGC personnel visited the site on January 6, 8, and 20, 2026, in order to conduct vibration measurements. Measurements of ground-borne rail vibration were conducted at one location, approximately 45 m from the property line (railway right of way), as indicated with [V1] in Figure 2. The vibration measurements were conducted using a Svantek SV977 Sound and Vibration Meter outfitted with a Wilcoxon Research type 793V velocity transducer that was correctly field calibrated before and after the measurements. The automatic vibration monitor measured the vibration levels due to rail pass-bys from January 6, 2026, to January 15, 2026.

Ground-borne vibration was measured for six train pass-bys. The plots are attached in Appendix A. Table 1 shows the maximum RMS vibration velocity measurements during each of the train pass-bys.

Table 1: Peak Vibration Measurements of Train Pass-bys

Train Pass-by	Measured Vibration Level (mm/s)	Criteria (mm/s)
1	0.10	
2	0.09	
3	0.05	
4	0.02	0.14
5	0.03	
6	0.02	

The results indicate that the measured vibration levels for all of the pass-bys are below the applicable criteria, and vibration mitigation measures are not required for the development site.

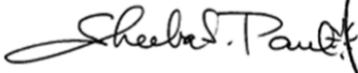
4 SUMMARY

The measured levels of ground-borne vibration are within the CN vibration limits at the location of the nearest proposed residential building façade of the proposed 547 King Street development in Port Colborne, during all of the train pass-bys. Vibration mitigation measures are not required.

We trust the above is sufficient for your current purposes. If we can be of further assistance, please call.

**Best regards,
Howe Gastmeier Chapnik Limited**


Elise Jaklic, BEng


Sheeba Paul, MEng, PEng



Limitations

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Any conclusions and/or recommendations herein reflect the judgment of HGC based on information available at the time of preparation and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.

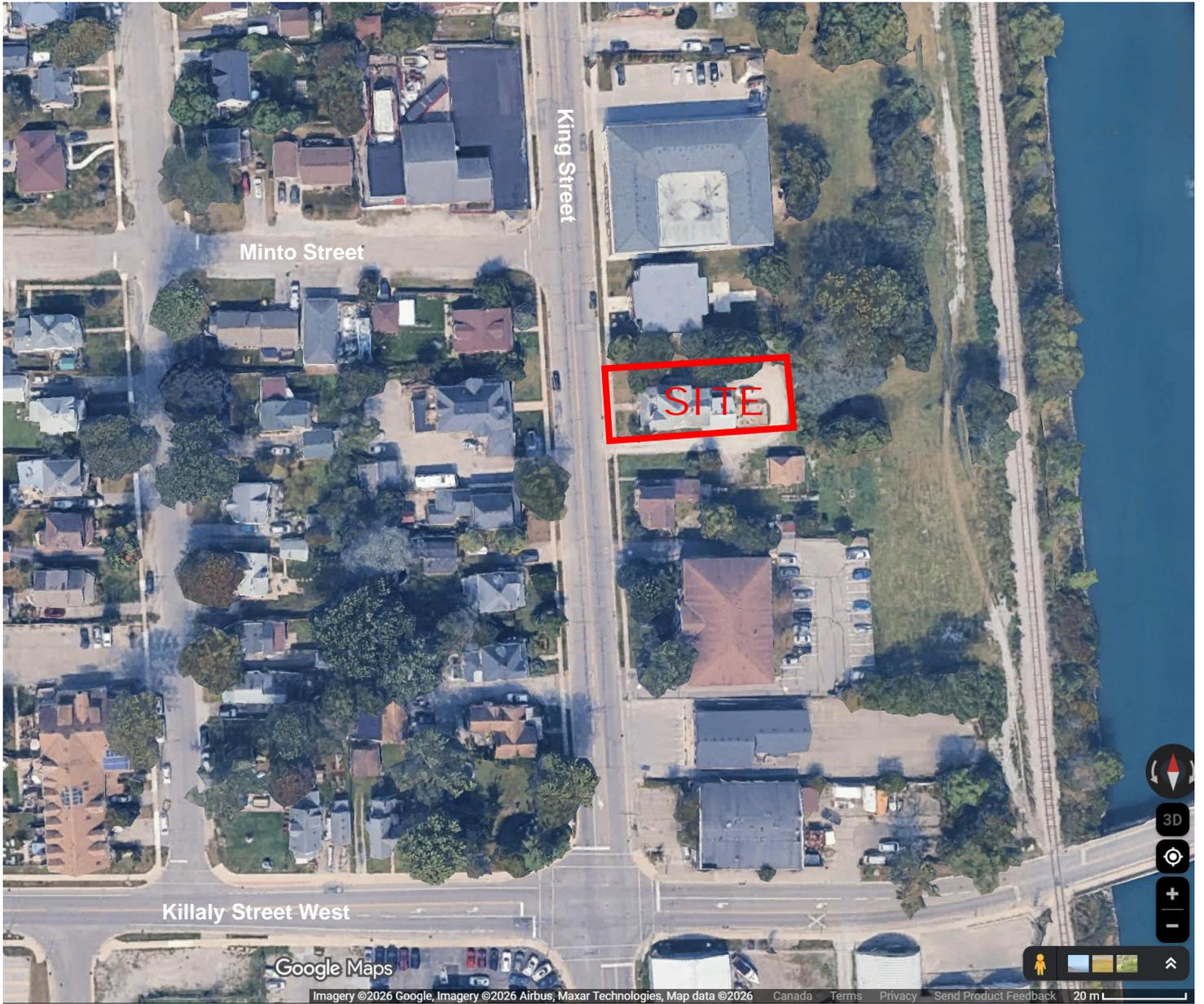


Figure 1: Key Plan

APPENDIX A

Detailed Plots of Acceleration Spectra



NOISE

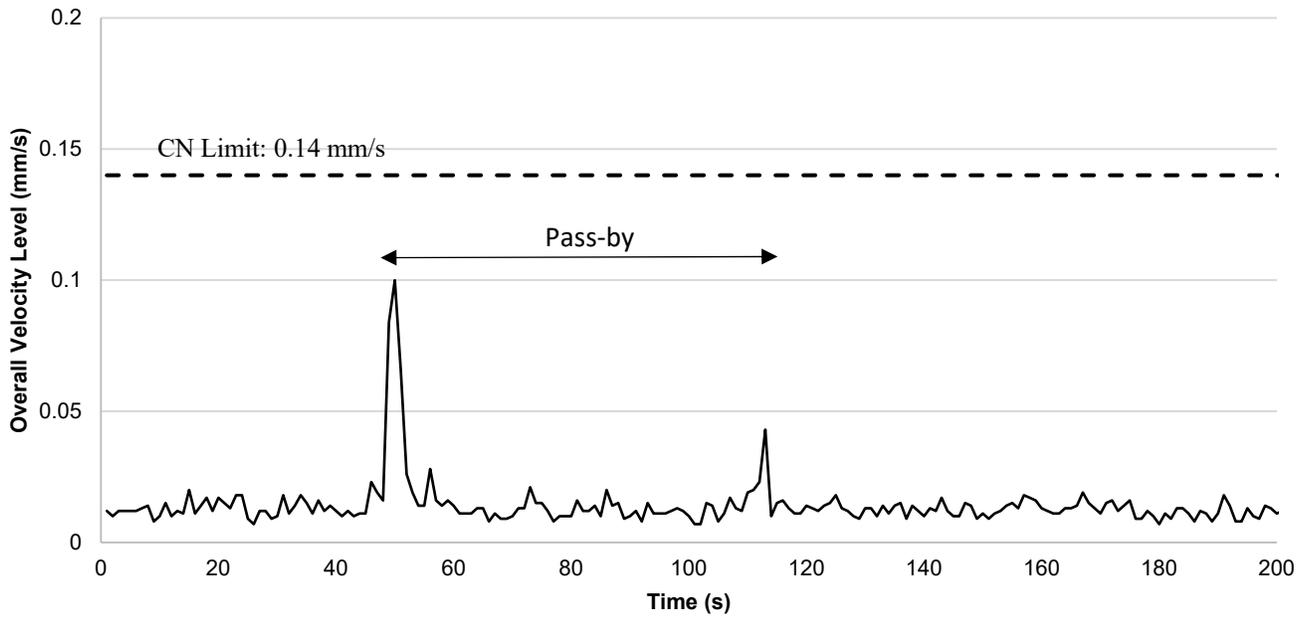


VIBRATION

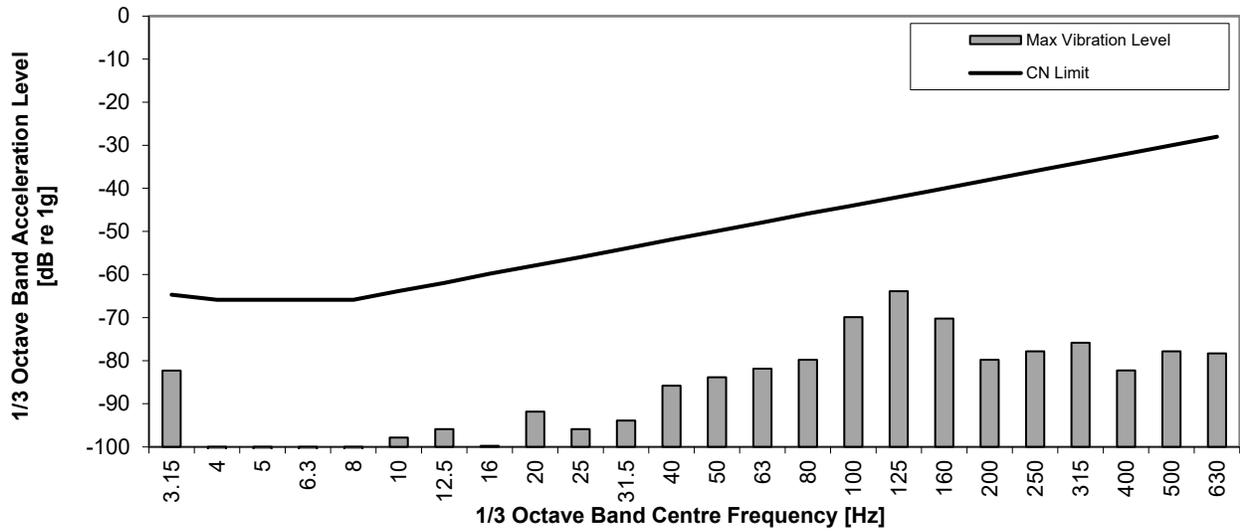


ACOUSTICS

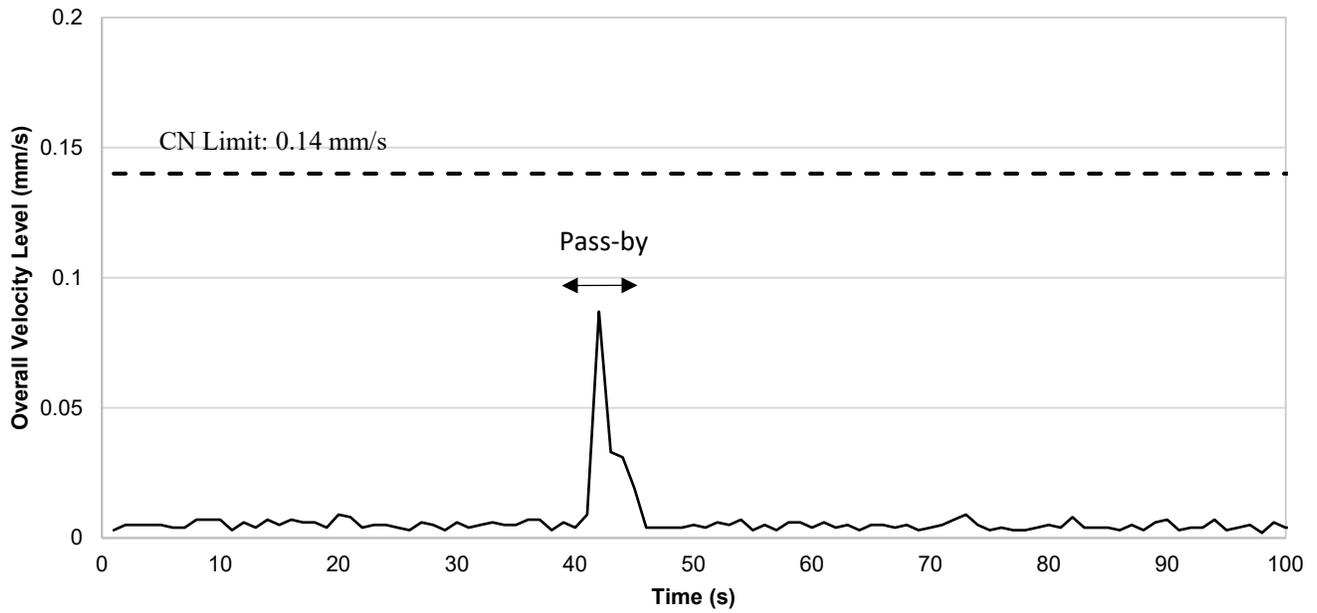
**Pass-by 1 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



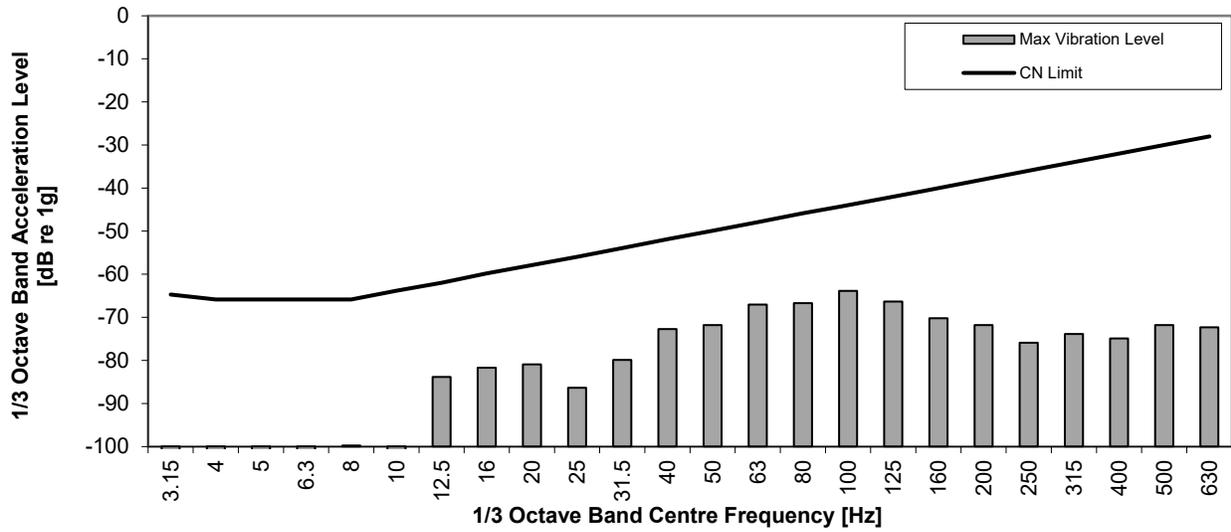
**Pass-by 1 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



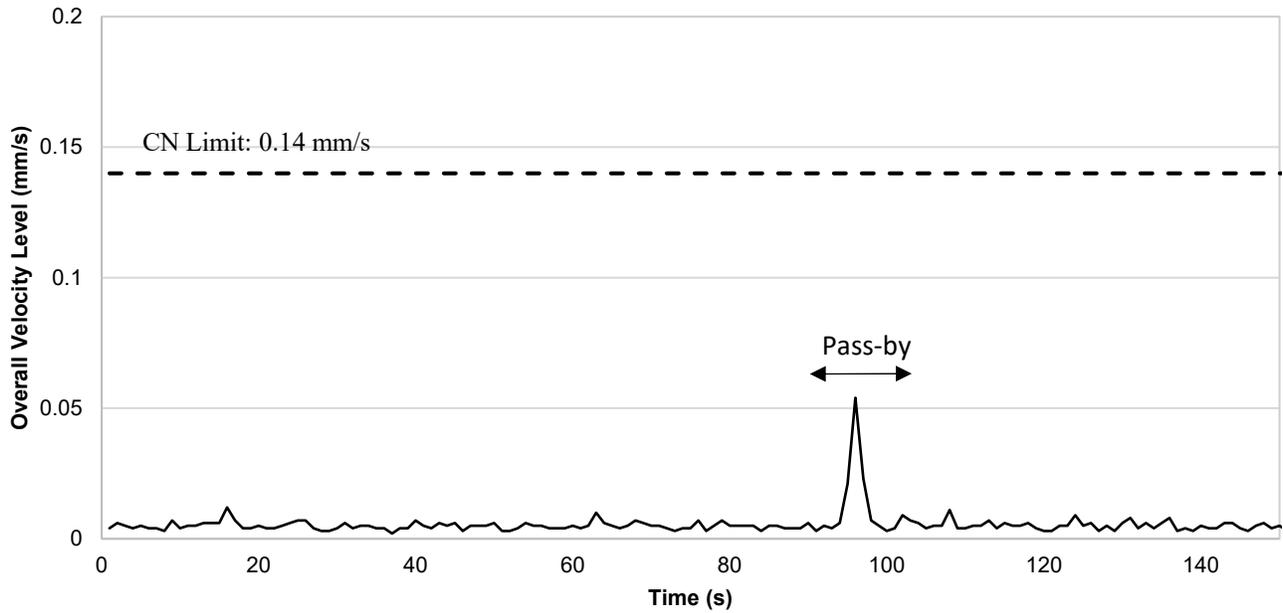
**Pass-by 2 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



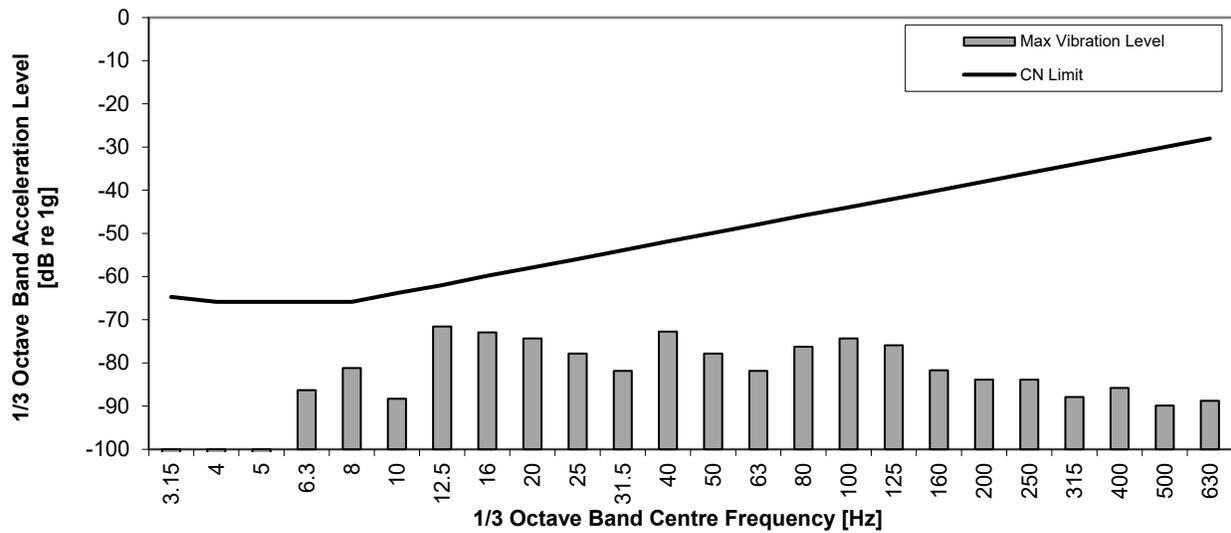
**Pass-by 2 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



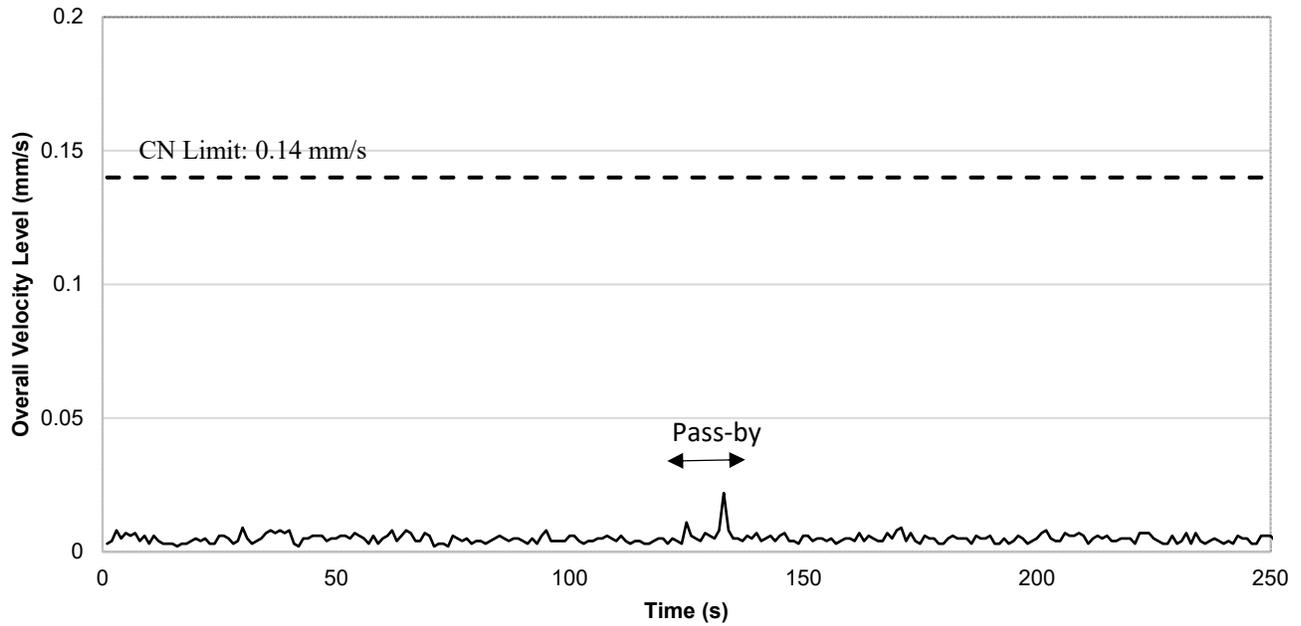
**Pass-by 3 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



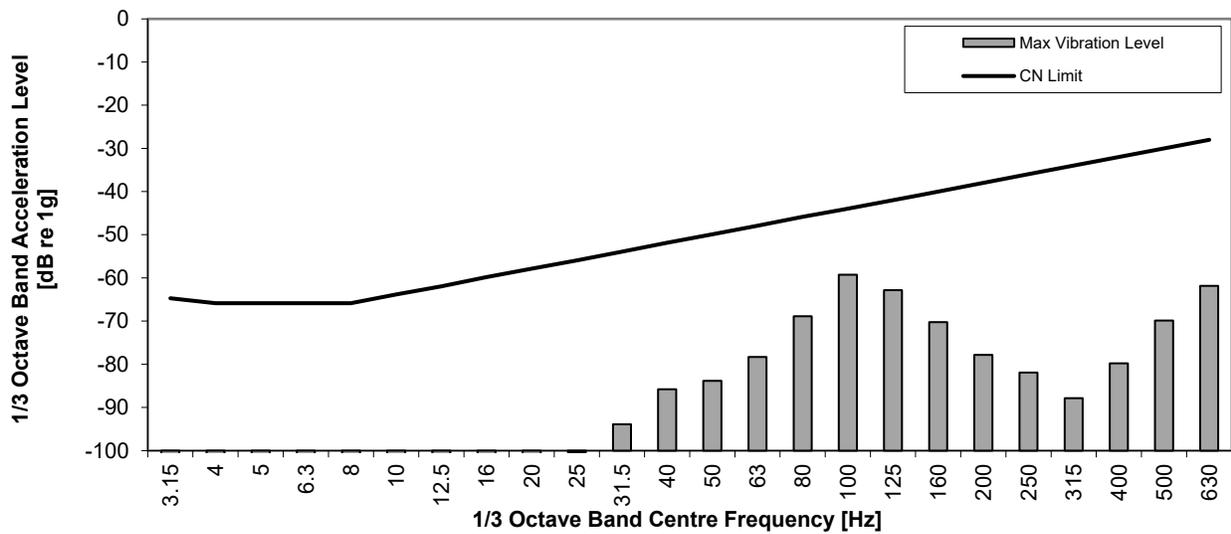
**Pass-by 3 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



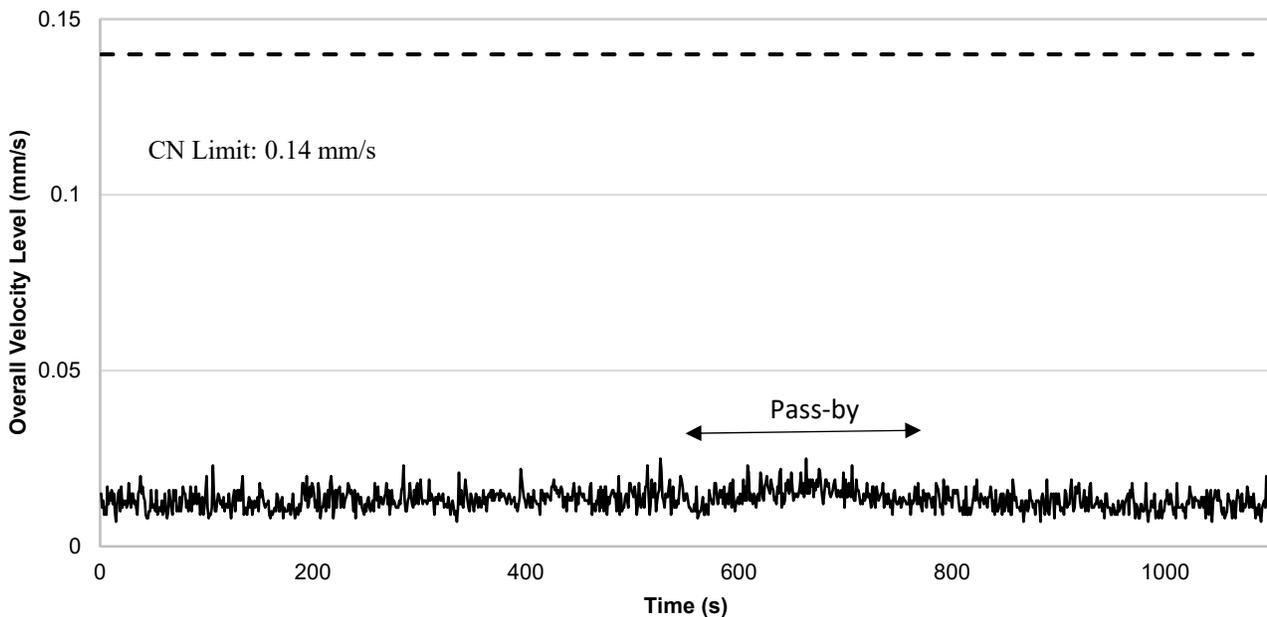
**Pass-by 4 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



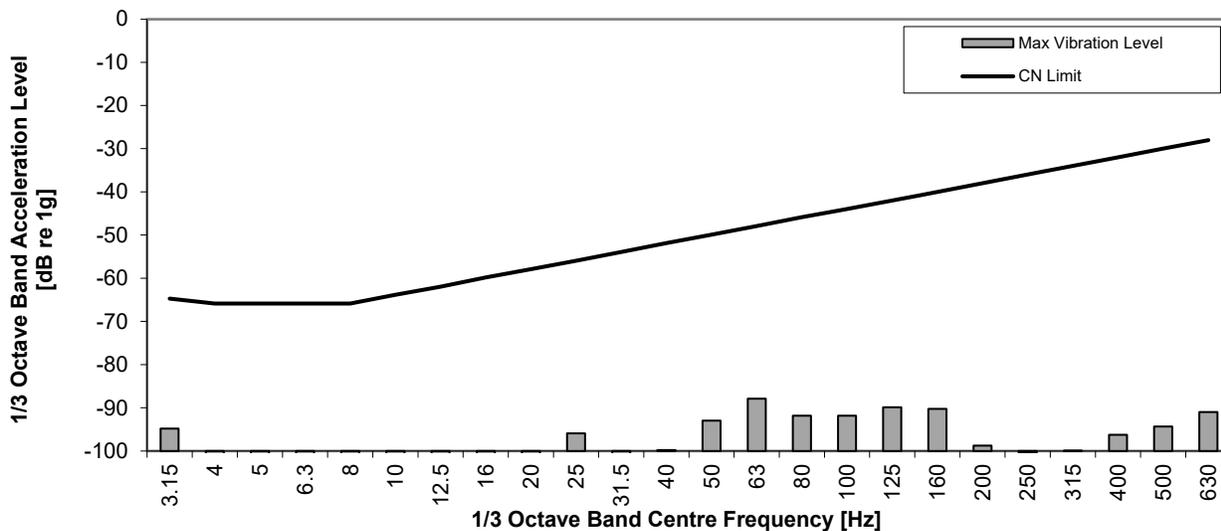
**Pass-by 4 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



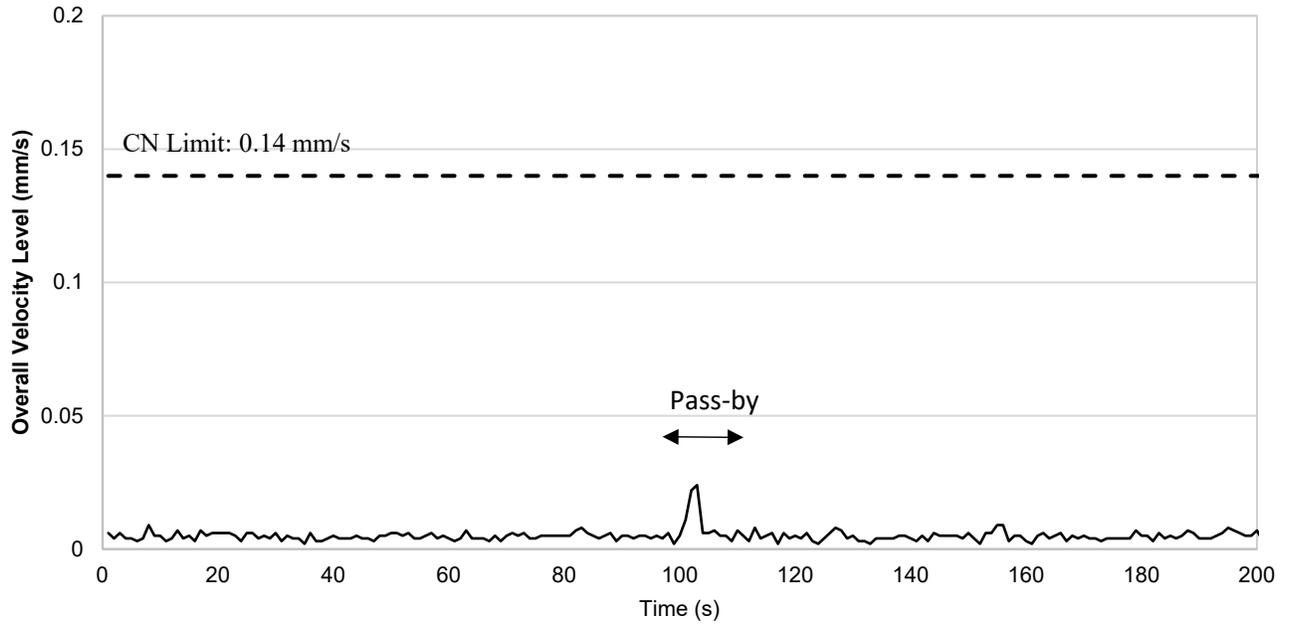
**Pass-by 5 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



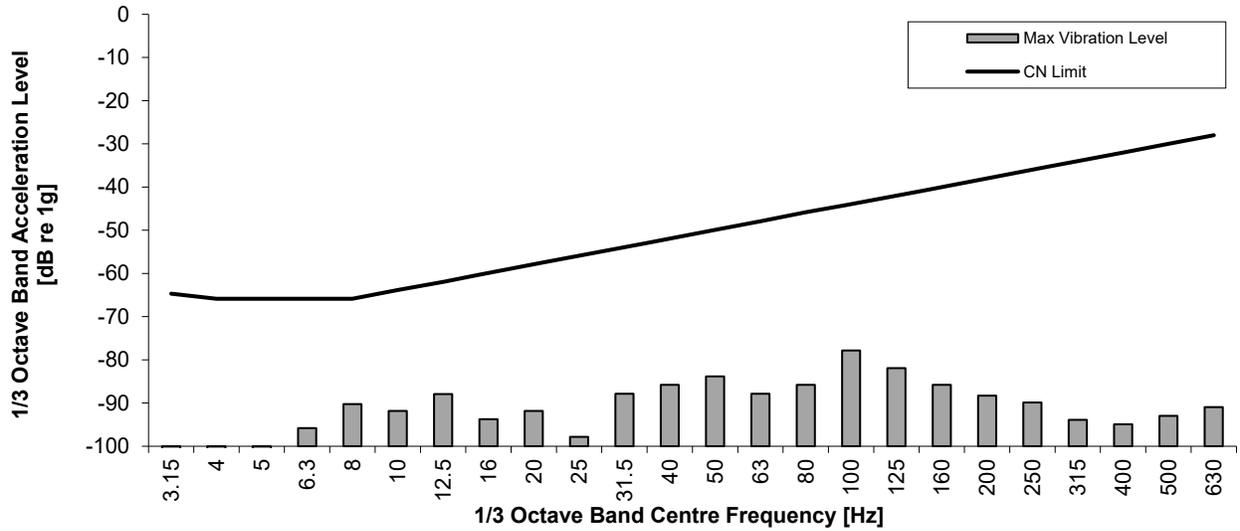
**Pass-by 5 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



**Pass-by 6 at 45 m from ROW at V1
Measured Vibratory Velocity Level**



**Pass-by 6 at V1
Acceleration Spectrum @ Peak Level (1 sec. Duration)**



APPENDIX B

CN Requirements



NOISE



VIBRATION



ACOUSTICS



PRINCIPAL MAIN LINE REQUIREMENTS

- A. Safety setback of dwellings from the railway rights-of-way to be a minimum of 30 metres in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of-way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1.
- B. The Owner shall engage a consultant to undertake an analysis of noise. At a minimum, a noise attenuation barrier shall be adjoining and parallel to the railway rights-of-way, having returns at the ends, and a minimum total height of 5.5 metres above top-of-rail. Acoustic fence to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre of surface area. Subject to the review of the noise report, the Railway may consider other measures recommended by an approved Noise Consultant.
- C. Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ± 3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling.
- D. The Owner shall install and maintain a chain link fence of minimum 1.83 metre height along the mutual property line.
- E. 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."
- F. 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.
- G. The Owner shall through restrictive covenants to be registered on title and all agreements of purchase and sale or lease provide notice to the public that the safety berm, fencing and vibration isolation measures implemented are not to be tampered with or altered and further that the Owner shall have sole responsibility for and shall maintain these measures to the satisfaction of CN.
- H. The Owner enter into an Agreement stipulating how CN's concerns will be resolved and will pay CN's reasonable costs in preparing and negotiating the agreement.
- I. The Owner may be required to grant CN an environmental easement for operational noise and vibration emissions, registered against the subject property in favour of CN.

March 2002