RAILWAY VIBRATION STUDY

12 AND 26 PARK STREET EAST

PROPOSED RESIDENTIAL DEVELOPMENT
CITY OF MISSISSAUGA

JULY 28, 2026

PROJECT: R267210.0123

PREPARED FOR:
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Version History

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1.0	July 28, 2026	Final – Issued to Client

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EXECUTIVE SUMMARY

Trinity Consultants Canada Inc. – Valcoustics (Valcoustics) was retained to prepare a Railway Vibration Study for the proposed residential development to support the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications to the City of Mississauga and the Regional Municipality of Peel. The proposed development will consist of a twenty-six-storey residential building.

The significant source of ground-borne vibration with potential for impact at the proposed development is rail traffic on the Canadian National Railway (CN) Oakville Subdivision / GO Transit Lakeshore West rail line to the north of the subject site. All directions are based on the project north.

On-site vibration measurements were done to quantify the vibration magnitudes at the site. The measured ground-borne vibration velocity magnitudes due to the train movements were above the Federation of Canadian Municipalities (FCM) and the Railway Association of Canada (RAC) [Reference 1] vibration guideline limit at the building facade closest to the railway right-of-way (ROW) during all pass-bys. Thus, vibration mitigation measures are required for the proposed development.

1.0 INTRODUCTION

Valcoustics was retained to prepare a Railway Vibration Study to support the OPA and ZBA applications to the City of Mississauga and the Regional Municipality of Peel.

The ground-borne vibration due to the train pass-bys was measured on site and compared with the applicable vibration guidelines to determine the need for mitigation. The results are outlined herein.

1.1 SITE LOCATION AND SURROUNDING AREA

The subject site is located at 12 and 26 Park Street East and is bounded by:

- GO station parking with the CN Oakville Subdivision / GO Transit Lakeshore West rail corridor beyond, to the north;
- An existing residential high-rise building with Elizabeth St N, beyond, to the east;
- Park St E, with existing residential high-rise buildings beyond, to the south; and
- Existing residential high-rise buildings with Stavebank Rd beyond, to the west.

Figure 1 shows a Context Plan.

FIGURE 1 CONTEXT PLAN

1.2 PROPOSED DEVELOPMENT

The proposed development consists of a twenty-six (26) storey residential infill tower located to the north of the existing 12 and 26 Park Street East buildings. The first 3 floors of the site are

proposed to be parking, with Levels 4 through 26 being residential dwellings. The site of the proposed building is currently used as parking lots for 12 and 26 Park Street East.

This report was prepared using the architectural drawing set prepared by Kohn Partnership Architects Inc., dated February 25, 2026.

Appendix A contains the Site Plan from the drawing set.

1.3 SOURCES OF VIBRATION

The anticipated vibration source with potential to impact the development is rail traffic on the CN Oakville Subdivision / GO Transit Lakeshore West rail line. The corridor consists of way freight, passenger (VIA) and GO commuter trains.

Ground-borne vibration due to vehicle movements on surrounding roadways is not expected to create significant impact on the proposed development and thus, has not been considered further in the assessment. There are no other sources of vibration in the vicinity of the site.

2.0 VIBRATION GUIDELINES

The Federation of Canadian Municipalities and the Railway Association of Canada jointly developed “Guidelines for New Development in Proximity to Railway Operations”, dated May 2013 (herein referred to as the FCM/RAC guidelines). For residential developments, the FCM/RAC Guideline recommends a maximum vibration threshold of 0.14 mm/s root mean square (RMS, using a 1 second averaging time) between 4 Hz and 200 Hz (Reference 1).

The FCM/RAC guideline limit has been used to complete this study.

3.0 METHOD

One on-site measurement location was used to determine the potential impact of ground-borne vibration at the future residential dwellings due to trains on the through line.

3.1 MEASUREMENT LOCATIONS

Vibration measurements were done at one location on the subject site, which is labelled as Location A on Figure 2.

Location A represented the northern façade of the proposed building at the start of the residential portion of the building closest to the rail line. The location was approximately 36 m from the rail right of way.

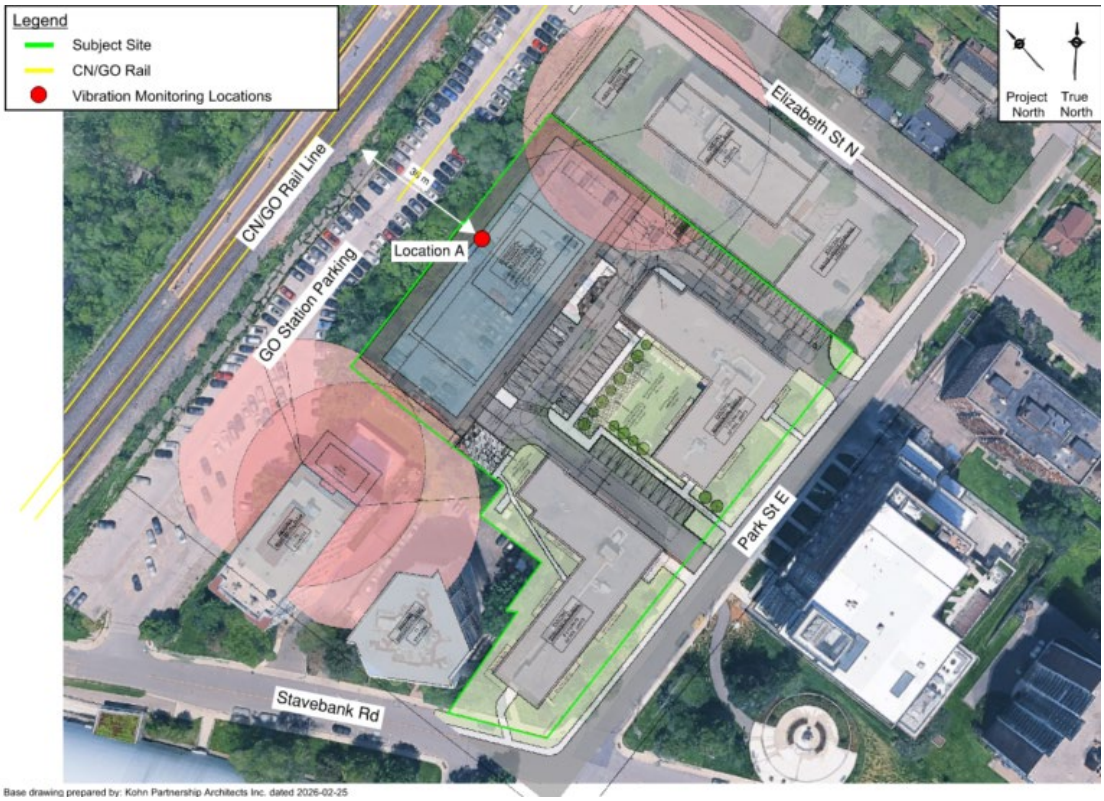

FIGURE 2 MONITORING LOCATION

3.2 TRANSDUCER PLACEMENT

Geophones were used to measure the vibration velocity produced by the train pass-bys. At each location, the geophone was placed into a small hole dug into the ground, approximately 300 mm below grade such that it was resting on compacted soil and was securely anchored with metal ground spikes.

3.3 DATA ACQUISITION

A total of eight (8) GO train pass-bys were monitored on May 27, 2026.

The vertical axis signal was recorded digitally at Location A, using a MetricPro Model MPV3C21 vibration data acquisition and analysis system. The monitor recorded vibration velocity, in mm/s.

The vibration data acquisition system recorded the ground-borne vibration continuously throughout the monitoring period. The system was set to monitor using a sampling rate of 1000 samples per second.

4.0 DATA ANALYSIS

Time histories of the vibration velocity produced by each train pass-by were plotted using an RMS (root-mean-square) averaging routine with a time constant of one second. The analysis procedure conforms with the FCM/RAC guidelines.

5.0 RESULTS

Table 1 summarizes the maximum measured overall vibration velocity (1-second RMS) for each train pass-by, as well as the train consist.

Appendix B contains the recorded time histories for the railway pass-bys at each measurement location.

The maximum overall vibration velocity magnitude at Location A was measured to be 0.31 mm/s.

TABLE 1: SUMMARY OF TRAIN PASS-BYS MEASURED ON 2026-05-27

Pass-by #	Train Type	Time/Period	Direction	# of Locomo-tives	# of Rail Cars	Maximum Vibration Velocity[1] (mm/s)
						Location A[2]
1 & 2	GO	11:46 to 11:50	Eastbound & Westbound	2	11	0.23
3	GO	12:13	Westbound	2	11	0.31
4 & 5	GO	12:43 – 12:50	Westbound & Eastbound	2	11	0.28
6	GO	13:14	Westbound	2	11	0.31
7 & 8	GO	13:43 – 13:48	Westbound & Eastbound	2	11	0.28

Notes:

(1) Maximum overall vibration velocity occurring for the entire pass-by, one second RMS averaging.

(2) See Figure 2.

6.0 MITIGATION

All the GO train pass-bys recorded during the monitoring period exceeded the limit. Therefore, vibration mitigation is required for the proposed development. It is premature to develop the vibration mitigation design at this stage, as the detailed building design has not yet been completed. Thus, these measures should be developed during the detailed design of the building and should be reviewed once finalized.

Potential mitigation options include:

- Perimeter and/or footing isolation of the underground parking structure;
- Acoustic isolation joints between the residential portion of the building and the underground parking structure;
- Increased setback of the underground structure from the railway; or
- A combination of these and other vibration isolation strategies.

7.0 CONCLUSION

The ground-borne vibration velocity magnitudes due to railway traffic on the adjacent CN/GO rail line, measured at the closest building facades of the proposed development to the railway exceeded the FCM/RAC Guideline limits for residential uses. Therefore, vibration mitigation measures are required and should be integrated into the detailed design of the development.

8.0 REFERENCES

1) "Guidelines for New Development in Proximity to Railway Operations", Prepared for The Federation of Canadian Municipalities and the Railway Association of Canada, May 2013.

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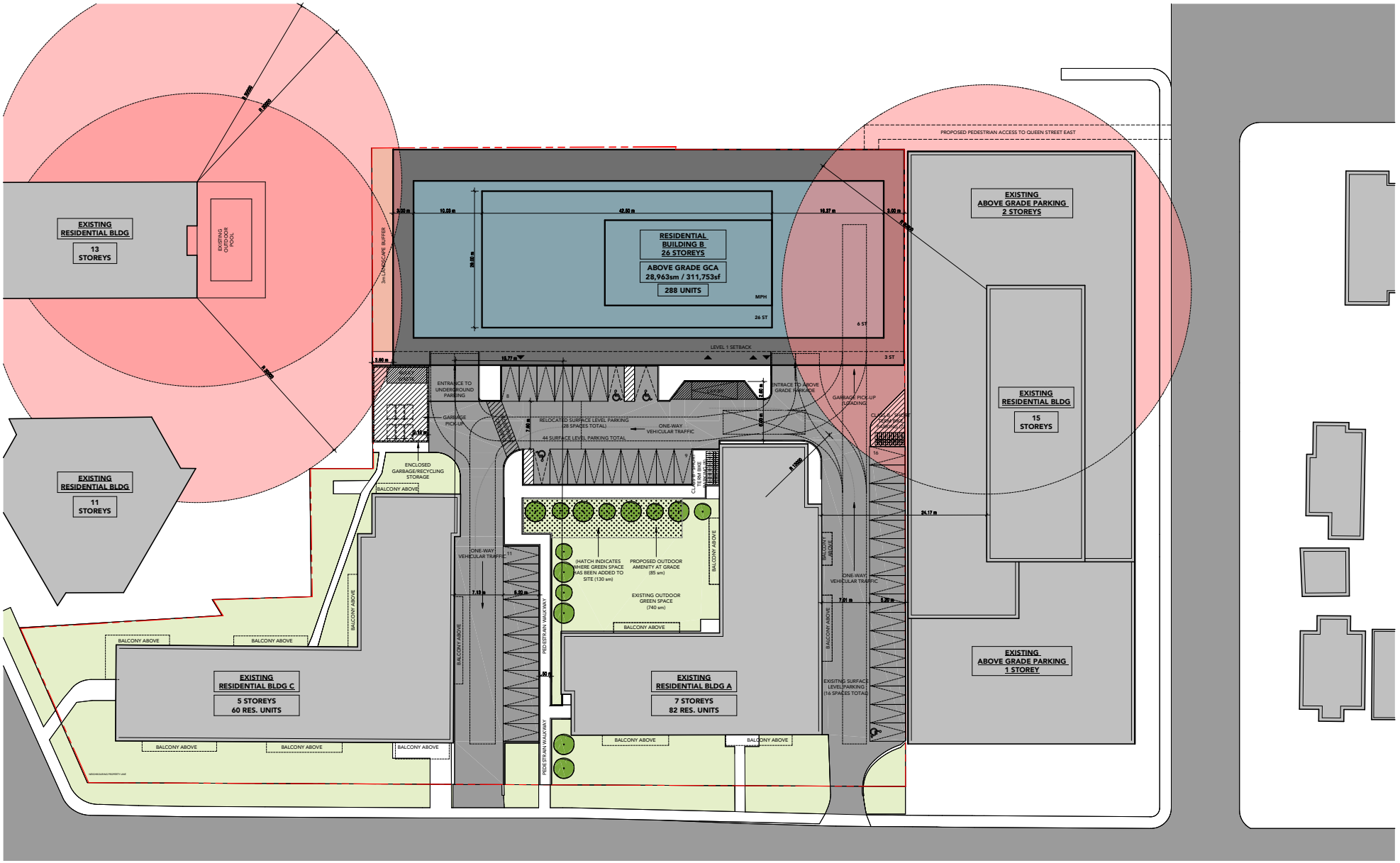
12 and 26 Park Street E, Mississauga - Vibration v1_0

APPENDIX A

SITE PLAN



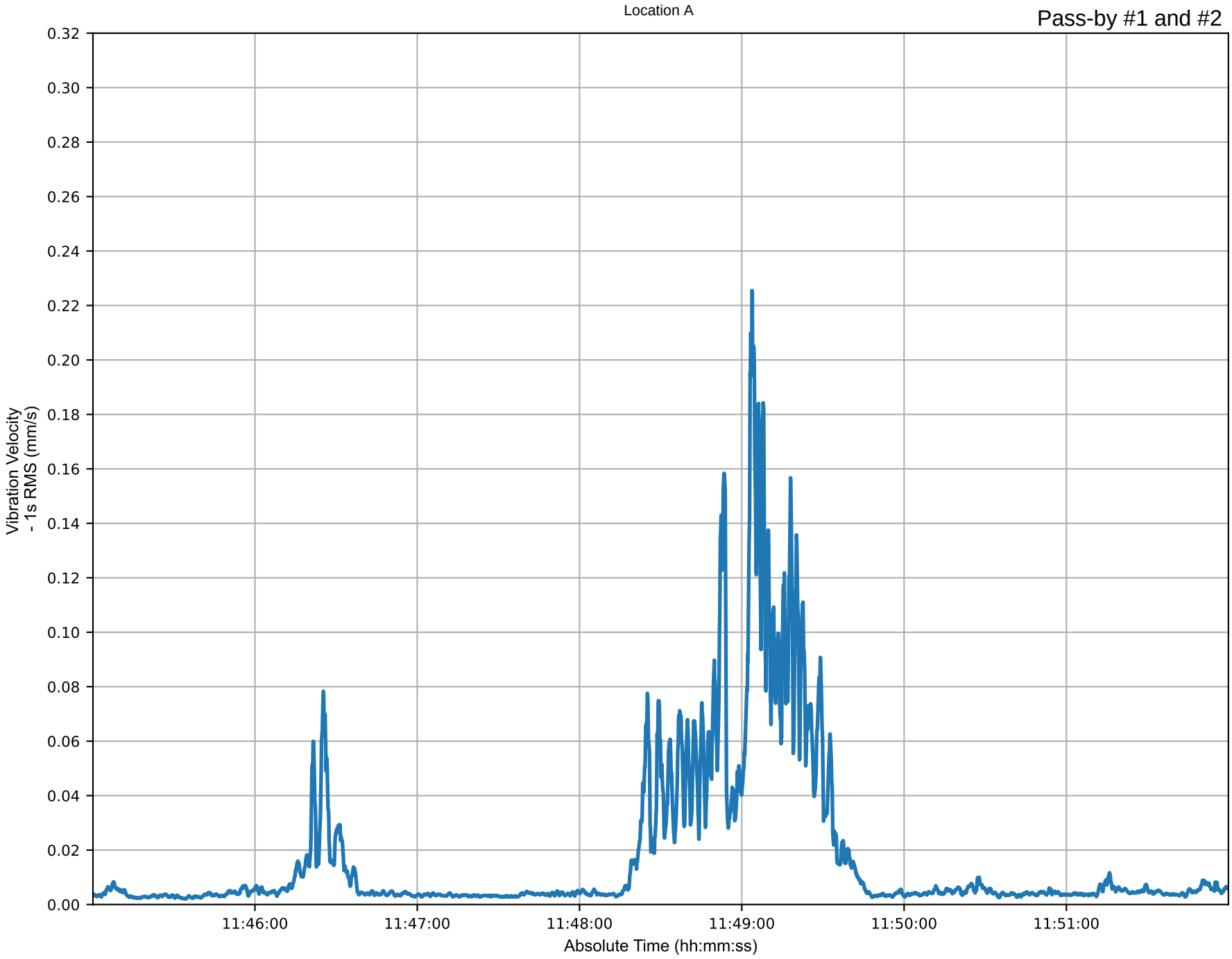
SITE PLAN
SCALE: 1 : 250
1
A1.01

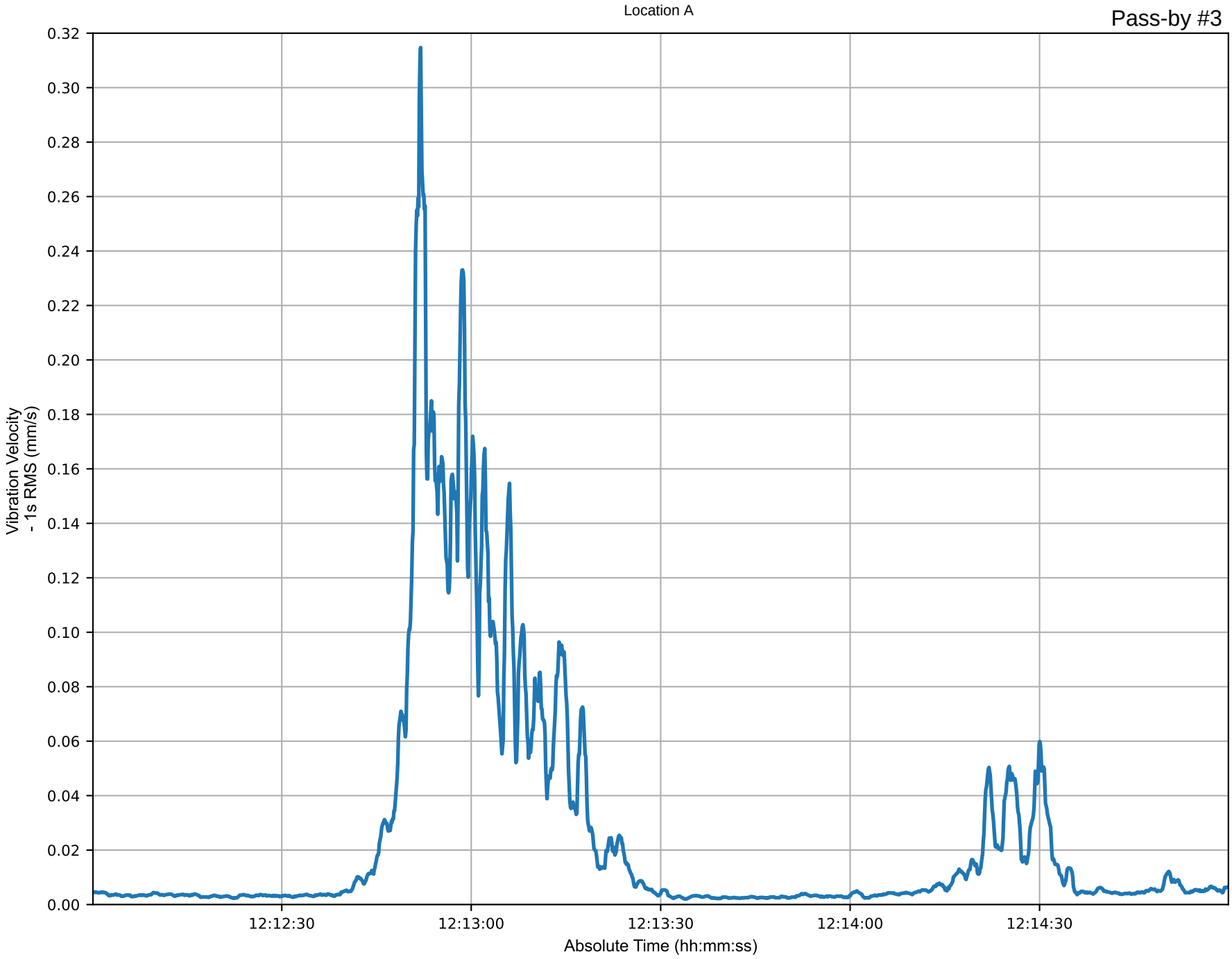
Base drawing prepared by: Kohn Partnership Architects Inc. dated 2026-02-25

APPENDIX B

VIBRATION VELOCITY TIME HISTORIES DUE TO RAILWAY TRAIN PASS-BYS

Trinity Consultants VALCOUSTICS CANADA

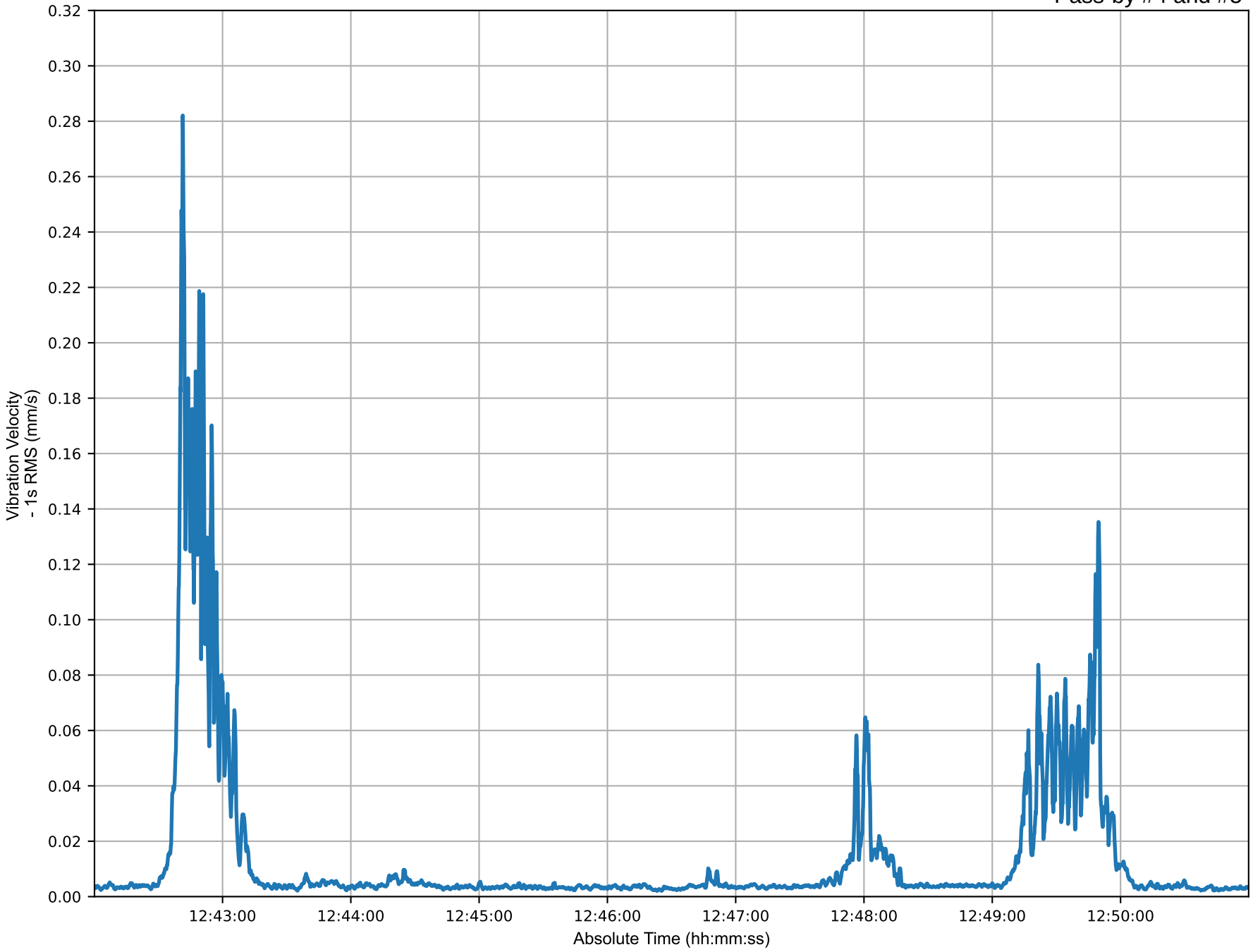


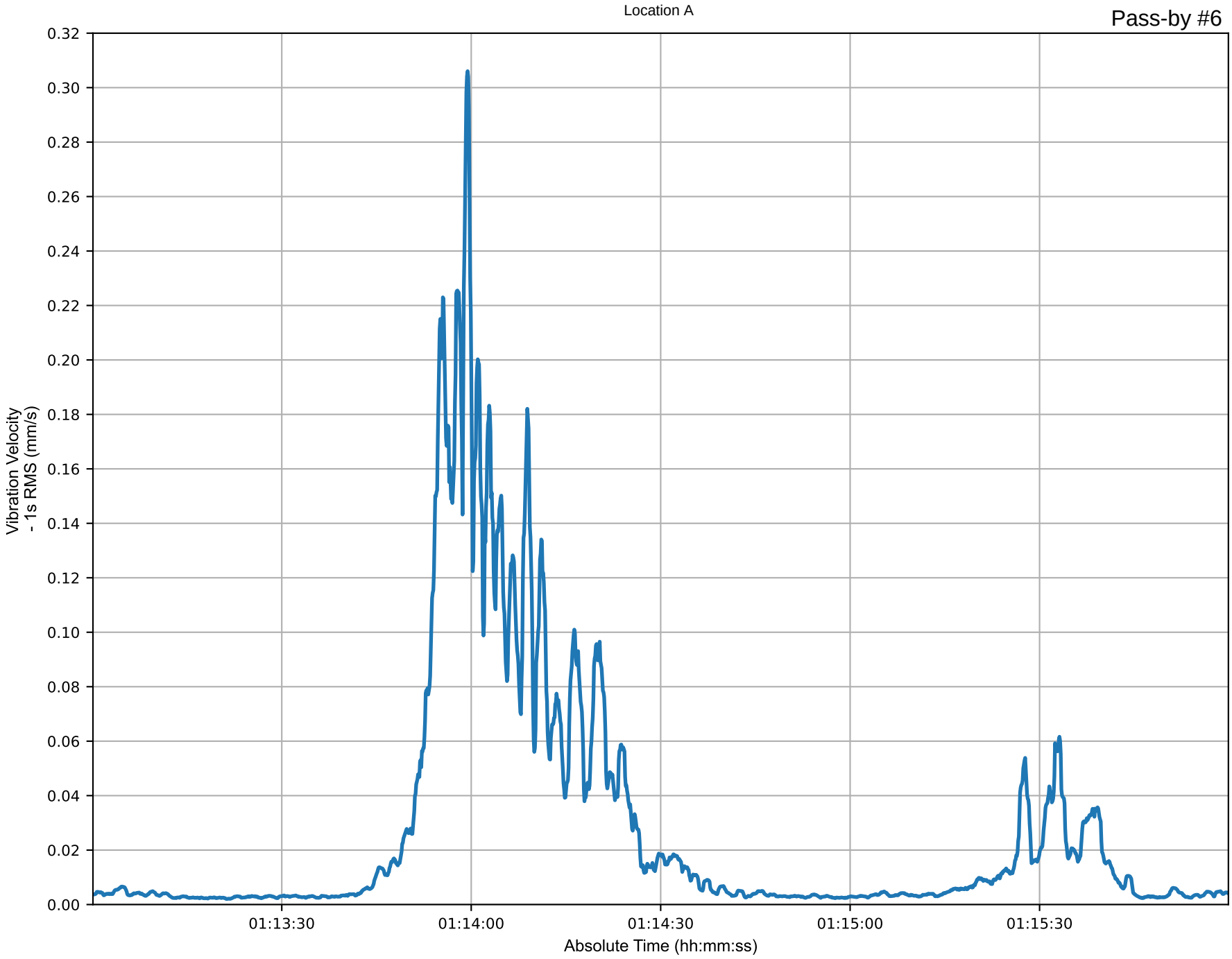

Location A
Pass-by #3
Vibration Velocity
- 1s RMS (mm/s)
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
12:12:30
12:13:00
12:13:30
12:14:00
12:14:30
Absolute Time (hh:mm:ss)

Trinity Consultants VALCOUSTICS CANADA

Location A

Pass-by #4 and #5




Location A
Pass-by #6
Vibration Velocity
- 1s RMS (mm/s)
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
01:13:30
01:14:00
01:14:30
01:15:00
01:15:30
Absolute Time (hh:mm:ss)

Trinity Consultants VALCOUSTICS CANADA