17 February 2026

Katherine F. Watkins, P.E.
Deputy City Manager
City of Cambridge
795 Massachusetts Avenue
Cambridge, MA 02139

Project 200609.05 – Vibration Monitoring, Riverview Condominiums, 221 Mt. Auburn Street, Cambridge, MA

Dear Ms. Watkins:

At your request, we installed vibration monitors at six properties abutting Riverview Condominiums (Riverview) to document vibrations during the Riverview building demolition. We understand that there has been a recent increase in neighborhood residents inquiring about vibrations potentially due to demolition activities and the potential impact on residential structures. The purpose of this letter is to provide additional context for our vibration monitoring threshold, typical vibrations recorded for the Riverview project, and vibration levels typically perceived by humans.

1. BACKGROUND

The City of Cambridge (City) started the controlled demolition of the Riverview structure on 17 December 2025. The City requested that Simpson Gumpertz & Heger Inc. (SGH) develop a vibration monitoring program to record vibration at abutting properties during the building demolition. Prior to demolition, SGH conducted preliminary surveys of directly abutting properties to determine monitoring locations. Based on these surveys, we selected six locations to install vibration monitors: 1, 7, and 11 Sparks Street, 38 Bradbury Street, 205 Mt. Auburn Street, and the Bradbury Building (see map in Figure 1 below). At each location, we installed a vibration monitor on the foundation wall or the basement-level slab-on-grade. We installed the vibration monitors approximately one month prior to the scheduled start of demolition to acquire typical ambient baseline vibration data at each monitoring location. Based on the baseline data and industry standards, we issued a letter on 12 December 2025 establishing a vibration threshold of 0.5 in./sec peak particle velocity (PPV) for the project, noting that any recorded vibrations exceeding the threshold would trigger an investigation into the cause and impact of the exceedance.

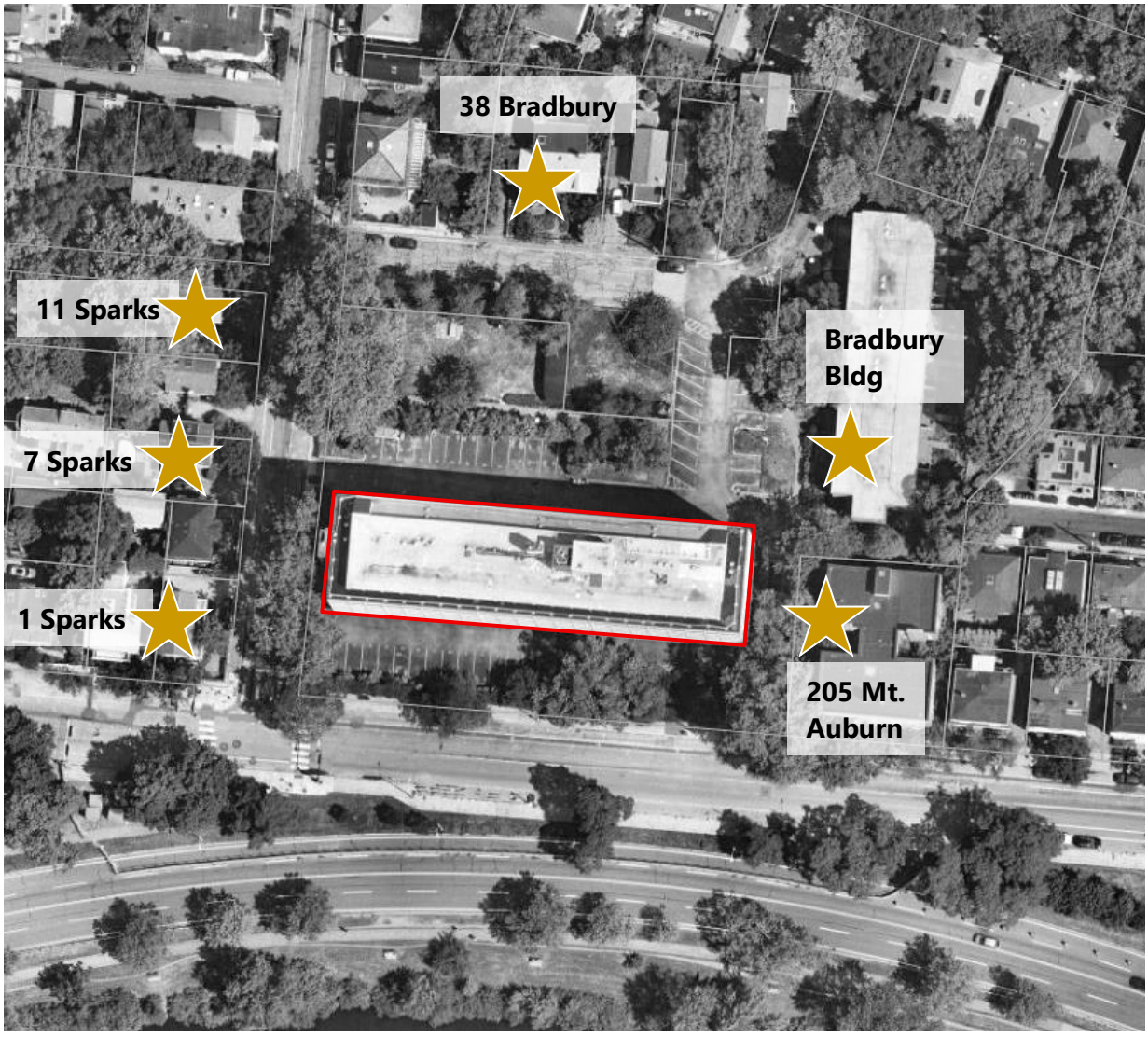

Figure 1

Aerial view of the Riverview Condominiums structure (outlined in red) and the abutting properties selected for vibration monitor installation (marked with yellow stars).

Since demolition started on 17 December, we have issued weekly reports summarizing the data recorded by the monitoring units. We understand that the City posts the reports, including our 12 December 2025 threshold letter, for public access. To date, there have been no triggering events from demolition activities; however, the City has noticed an increase in both new and recurring inquiries regarding vibrations in the area.

2. DISCUSSION

Structural vibration monitoring is typically used to correlate construction activities with damage to neighboring structures. The following subsections describe the trigger value we recommended for investigating vibrations and human perception of vibrations, compared with our typical daily measurements to date from demolition activities.

Recommended Trigger Value

On 12 December 2025, we issued a letter outlining our recommended vibration monitoring PPV trigger of 0.5 in./sec. This trigger value of the PPV is consistent with industry standards set by the US Bureau of Mines (USBM) Report of Investigation 8507/1980,[1] which is based on a 5% probability of "threshold damage" in residential structures at frequencies typical of construction and demolition activities.[2] Furthermore, we installed the vibration monitors at the foundation wall or the basement-level slab-on-grade to collect measurements representative of vibrations as they reach the structure, including the effects of local soil conditions on attenuation of the vibrations.

"Threshold damage" is indicative of loosening of paint, small plaster cracks at joints between elements, and lengthening of old cracks.[1,2] Figure 2 shows a plot of recommended limiting criteria from USBM RI8507 for PPV limits of ground vibrations as a function of vibration frequency for threshold damage. These criteria are widely accepted for limiting vibrations to mitigate the damage to structures. Note that construction and demolition vibrations typically occur in the range of 5 to 15 Hz during normal operation of many types of construction equipment, including heavily loaded trucks and large bulldozers comparable to the equipment in use at the Riverview site. As described in our 12 December 2025 letter, "threshold" damage is the lowest classification of damage, and is typically aesthetic damage affecting nonstructural components, such as plaster walls and ceilings, which are more sensitive to vibrations than the load-bearing structure. Exceedance of the vibration damage threshold levels does not confirm that damage has occurred or that vibration is the cause of observed damage, but only that vibration is a measurably probable cause of new damage. Vibrations below the 0.5 in./sec limit are unlikely to cause damage to residential structures.

[1] Siskind et al., Structure Response and Damage Produced by Ground Vibration From Surface Mine Blasting, Report of Investigations 8507, United States Bureau of Mines, Pittsburgh, PA, 1980.
[2] Kelley et al., "Vibration Damage Claims: Ingredients for a Successful Investigation," Journal of the Boston Society of Civil Engineers. 16(1), 2001.

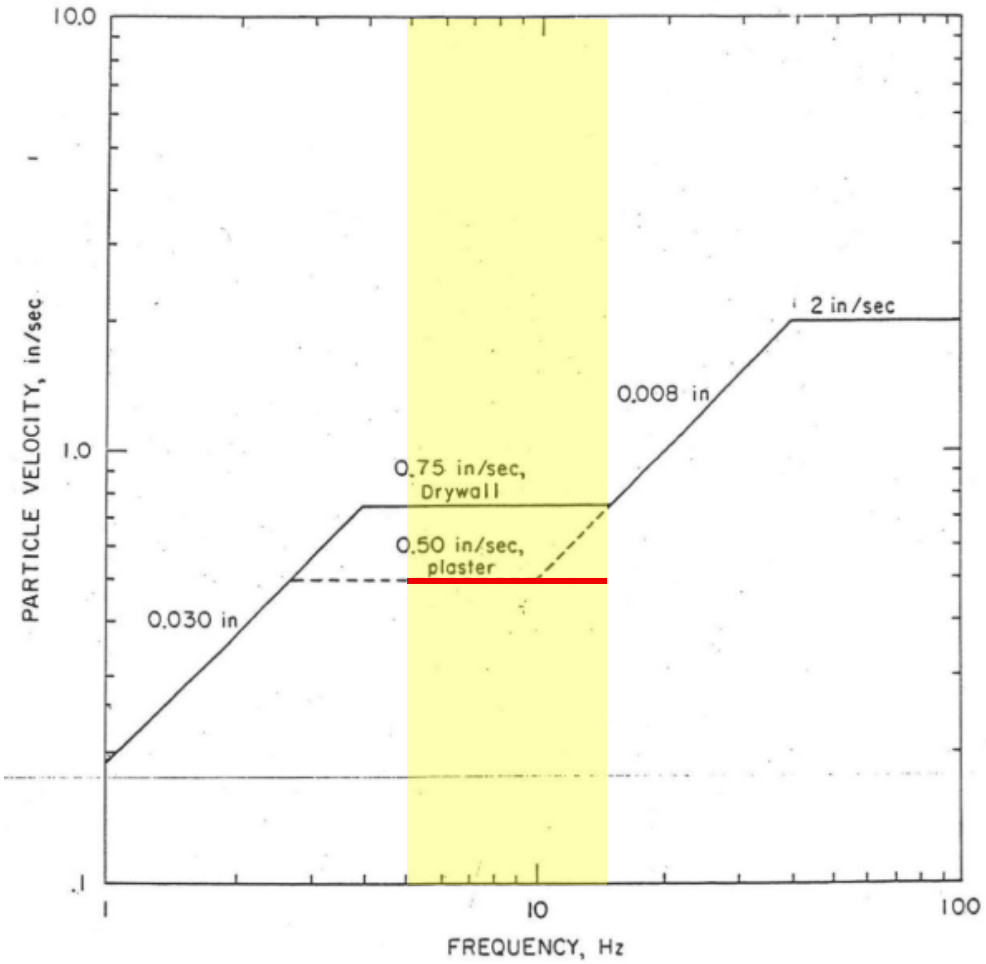

Figure 2

Recommended limiting vibration criteria of vibration for residential buildings using a combination of velocity and displacement.[1] The yellow region highlights the frequency range (5 to 15 Hz) where construction and demolition vibrations typically occur. The red line represents our 0.5 in./sec "trigger value" for threshold damage.

Human Response to Vibration

Wiss's "Construction Vibrations: State-of-the Art" article describes how sensitive the human body is to vibration.[3] Figure 3 relates construction vibrations to human response to steady-state vibrations. As shown in Figure 3, vibrations can become slightly perceptible to the human body at PPV measurements as low as 0.02 in./sec and distinctly perceptible at 0.03 in./sec.

[3] Wiss, John F., "Construction Vibrations: State-of-the-Art," Journal of the Geotechnical Engineering Division, American Society of Civil Engineers, 1981.

Since construction began on 17 December 2017, the maximum value recorded due to demolition activities[4] at any of our six vibration monitoring locations was 0.23 in./sec, and the average recorded daily maximum for all units is approximately 0.04 in./sec. Both the absolute maximum and daily maximum average values are well below our 0.5 in./sec trigger value for threshold damage, but well within the "distinctly" to "strongly perceptible" ranges of Figure 3 and industry literature. We provide our full set of vibration monitoring data in Appendix A, annotated with the varying perception ranges.

It is common for humans to perceive vibrations before the level of vibration reaches the threshold criteria.[3] However, structural damage is unlikely based on the recorded values throughout the duration of demolition activities thus far. All vibration monitoring locations maintained a peak particle velocity below the trigger value.

Vibrations recorded to date that exceed the ambient vibrations recorded prior to demolition have typically been associated with the operation of heavy equipment on site. The sixth and final phase of structural demolition operations began this week (the week of 9 February 2026) and will be followed by the trucking of debris from the site. During trucking operations, we anticipate increased equipment movement on site, including the use of multiple medium to large excavators and loaders, which may result in more frequent perceivable vibrations at neighboring properties. We will continue to monitor and report vibrations throughout the trucking phase of this project and provide updates on any significant increase in vibration levels. If construction activities cause vibrations greater than the set 0.5 in./sec trigger value, we will follow the protocol outlined in our letter dated 12 December 2025 to analyze the causes and potential impacts of the exceedance.

[4] The absolute maximum we have recorded is 4.51 in./sec due to handling of the units during battery replacement. This value is not associated with demolition activities or vibrations to the structure.

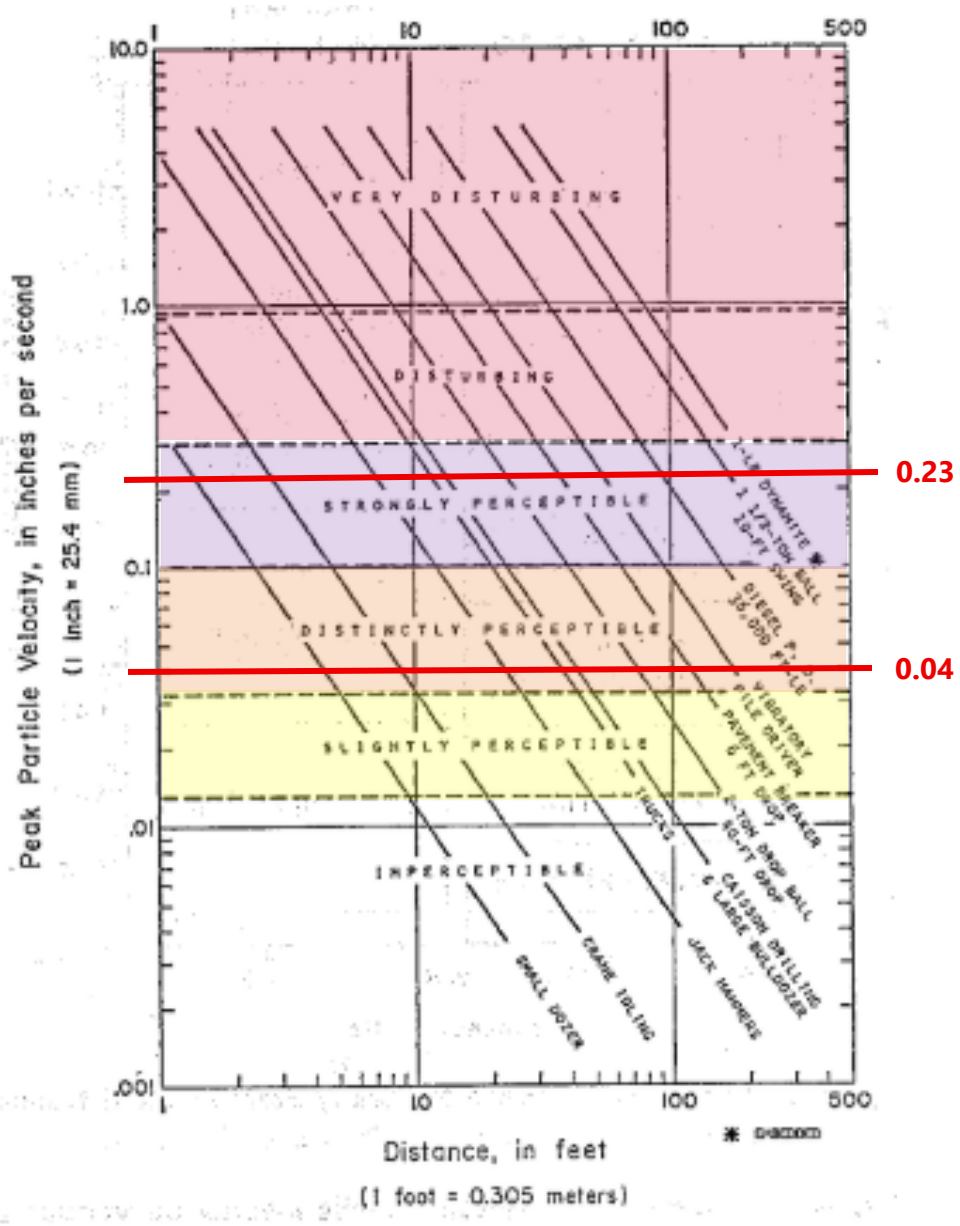

Figure 3

Construction vibration intensities related to human evaluation of vibrations.[3] The red lines indicate that our average daily maximum recorded value (0.04 in./sec) falls within the "distinctly perceptible" range, and our maximum recorded value (0.23 in./sec) falls in the "strongly perceptible" range.

3. CONCLUSION

Based on our review of vibration monitoring data to date and industry standards, we conclude the following:

- To date, vibrations due to demolition operations have remained below the peak particle velocity associated with a 5% probability of "threshold" damage.
- Vibrations due to demolition operations are consistent with the ranges classified as "distinctly perceptible" and "strongly perceptible" to humans; however, these ranges are significantly lower than the ranges that cause structural damage.

Sincerely yours,

John M. Porter, P.E.
Senior Principal
MA License No. 45684

Linda M. Seymour, Ph.D., P.E.
Consulting Engineer
MA License No. 60847

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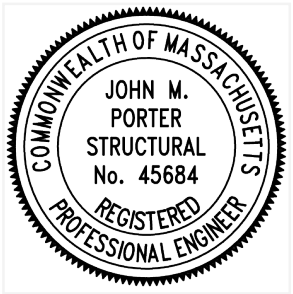

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APPENDIX A

Interval report

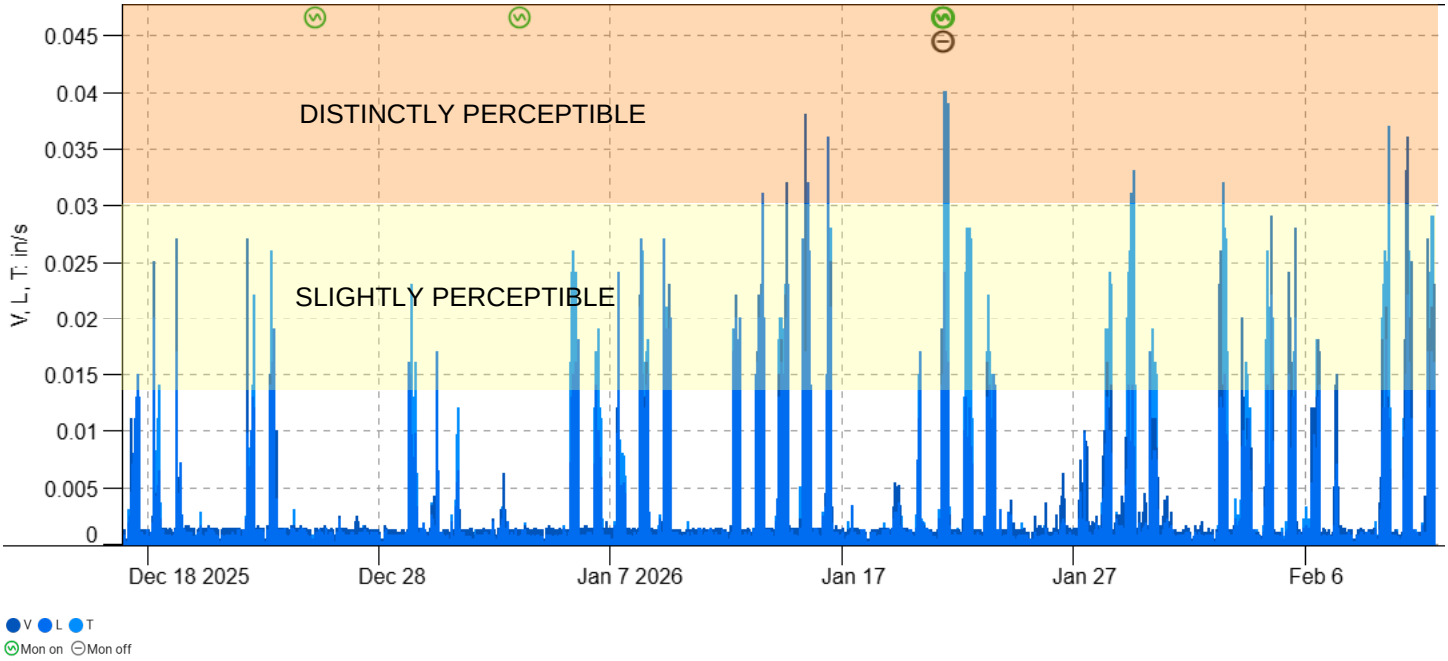
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv1
Description	Bradbury Building [22 Bradbury St.]
Sensor type	C22
Sensor serial no.	110294
Master(s) serial no.	110294
Latest calibration	2025-07-30
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!

Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Max V: 0.04 in/s, L: 0.04 in/s, T: 0.04 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00
Y-span	V: 0 - 0.04 in/s, L: 0 - 0.04 in/s, T: 0 - 0.04 in/s

	V	L	T
Max	0.04 in/s	0.04 in/s	0.04 in/s
Date	2026-01-15	2026-01-16	2026-01-21
Time	10:30:00	10:30:00	11:30:00

Interval report

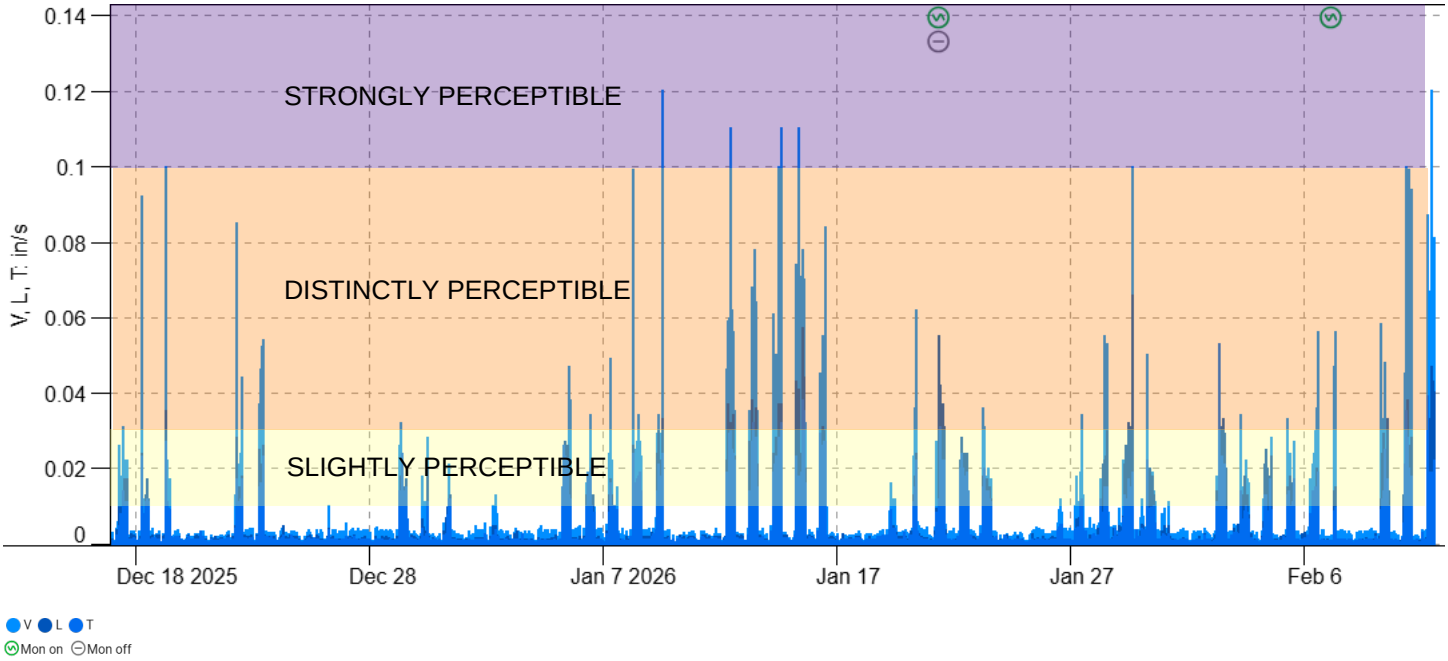
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv2
Description	205 Mt. Auburn St., Cambridge, MA
Sensor type	C22
Sensor serial no.	102013
Master(s) serial no.	102013
Latest calibration	2025-07-23
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!

Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Max V: 0.12 in/s, L: 0.07 in/s, T: 0.05 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00		
Y-span	V: 0 - 0.12 in/s, L: 0 - 0.07 in/s, T: 0 - 0.05 in/s		
	V	**L**	**T**
Max	0.12 in/s	0.07 in/s	0.05 in/s
Date	2026-01-09	2026-01-29	2026-02-02
Time	13:30:00	17:30:00	10:30:00

Interval report

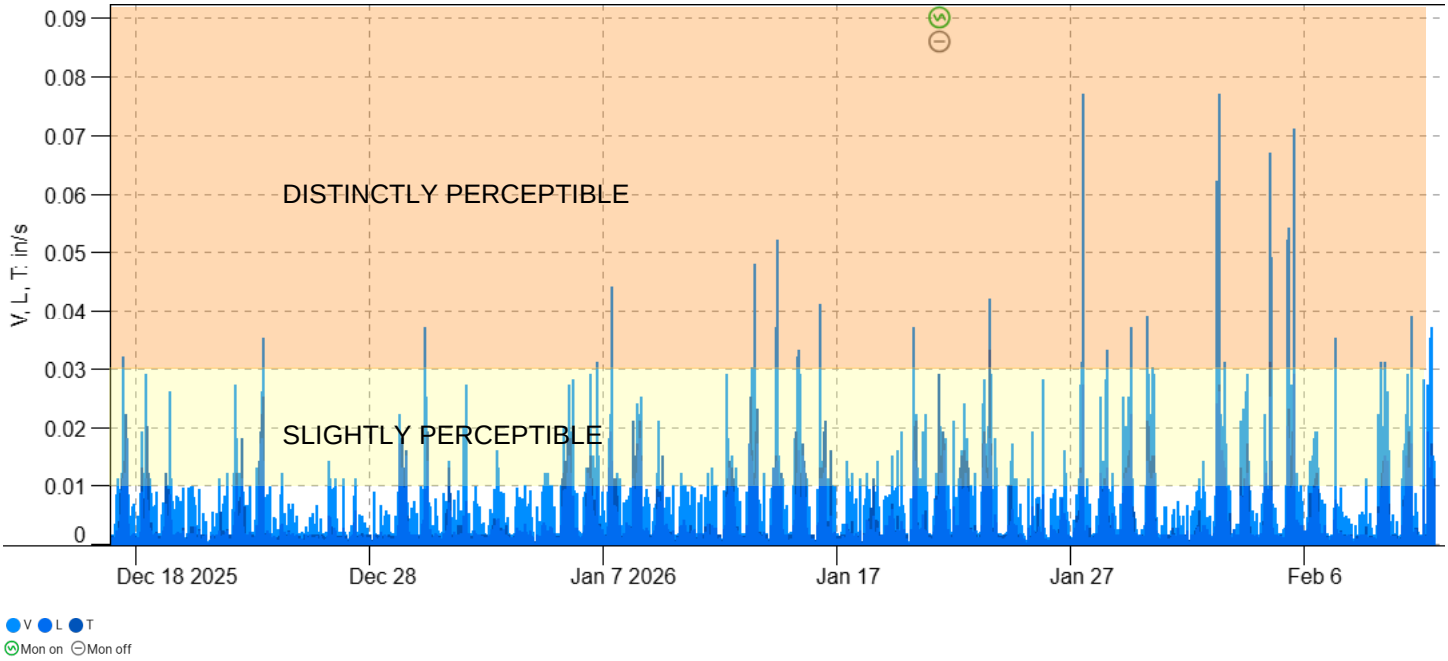
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv3
Description	38 Bradbury St., Cambridge, MA
Sensor type	C22
Sensor serial no.	103199
Master(s) serial no.	103199
Latest calibration	2025-06-09
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!

Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Max V: 0.08 in/s, L: 0.03 in/s, T: 0.03 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00
Y-span	V: 0 - 0.08 in/s, L: 0 - 0.03 in/s, T: 0 - 0.03 in/s

	V	L	T
Max	0.08 in/s	0.03 in/s	0.03 in/s
Date	2026-01-27	2026-02-05	2026-01-23
Time	13:30:00	14:30:00	14:30:00

Interval report

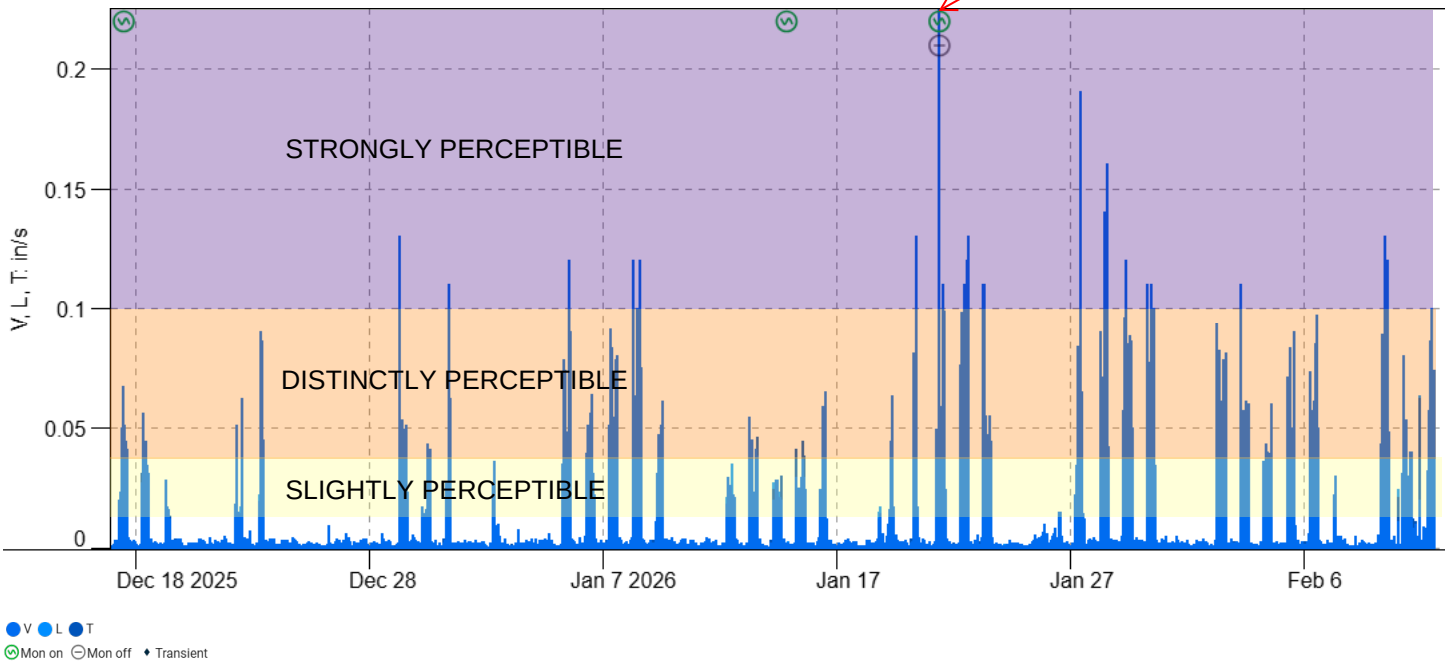
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv4
Description	1 Sparks St., Cambridge, MA
Sensor type	C22
Sensor serial no.	102403
Master(s) serial no.	102403
Latest calibration	2025-07-02
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!
Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Peak corresponds to handling of units for battery replacement.

Max V: 0.53 in/s, L: 1.08 in/s, T: 1.05 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00
Y-span	V: 0 - 0.53 in/s, L: 0 - 1.08 in/s, T: 0 - 1.05 in/s

	V	L	T
Max	0.53 in/s	1.08 in/s	1.05 in/s
Date	2026-01-21	2026-01-21	2026-01-21
Time	10:30:00	10:30:00	10:30:00

Interval report

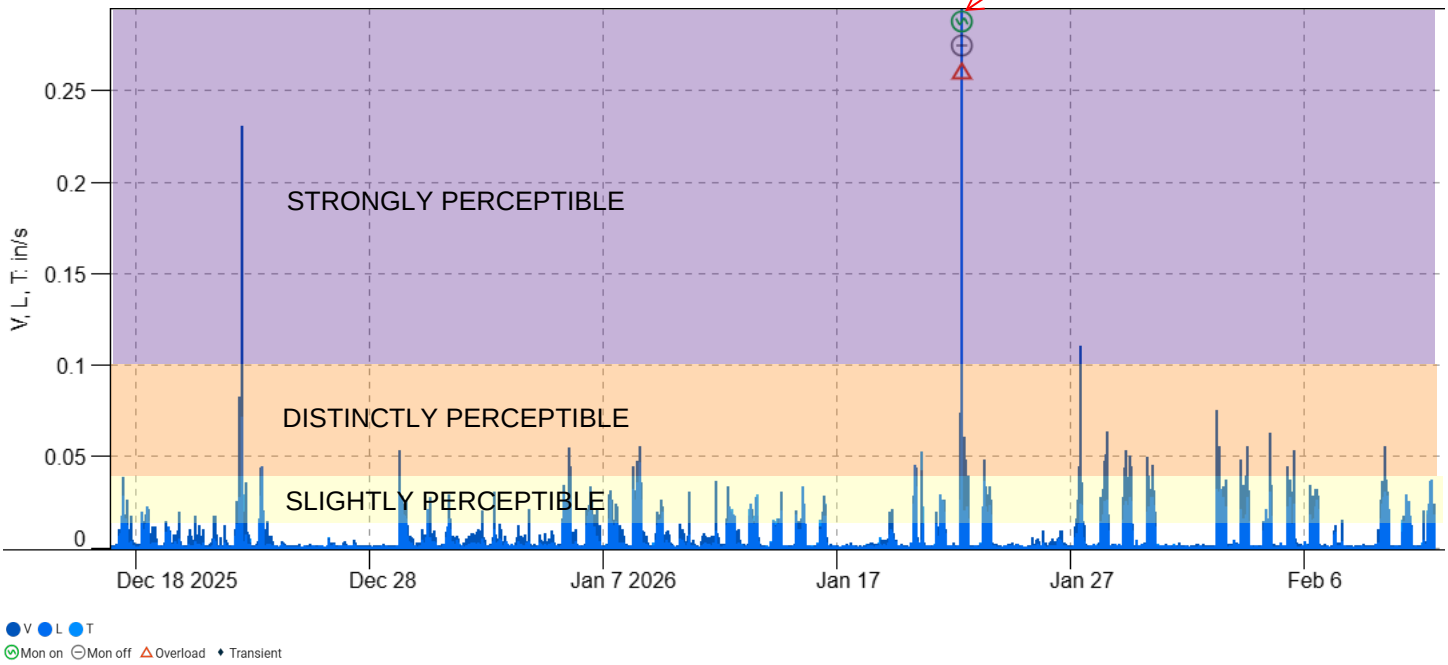
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv5
Description	7 Sparks St., Cambridge, MA
Sensor type	C22
Sensor serial no.	104002
Master(s) serial no.	104002
Latest calibration	2025-07-02
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!
Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Peak corresponds to handling of units for battery replacement.

Max V: 4.06 in/s, L: 3.88 in/s, T: 4.51 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00		
Y-span	V: 0 - 4.06 in/s, L: 0 - 3.88 in/s, T: 0 - 4.51 in/s		
	V	**L**	**T**
Max	4.06 in/s	3.88 in/s	4.51 in/s
Date	2026-01-22	2026-01-22	2026-01-22
Time	09:30:00	09:30:00	09:30:00

Interval report

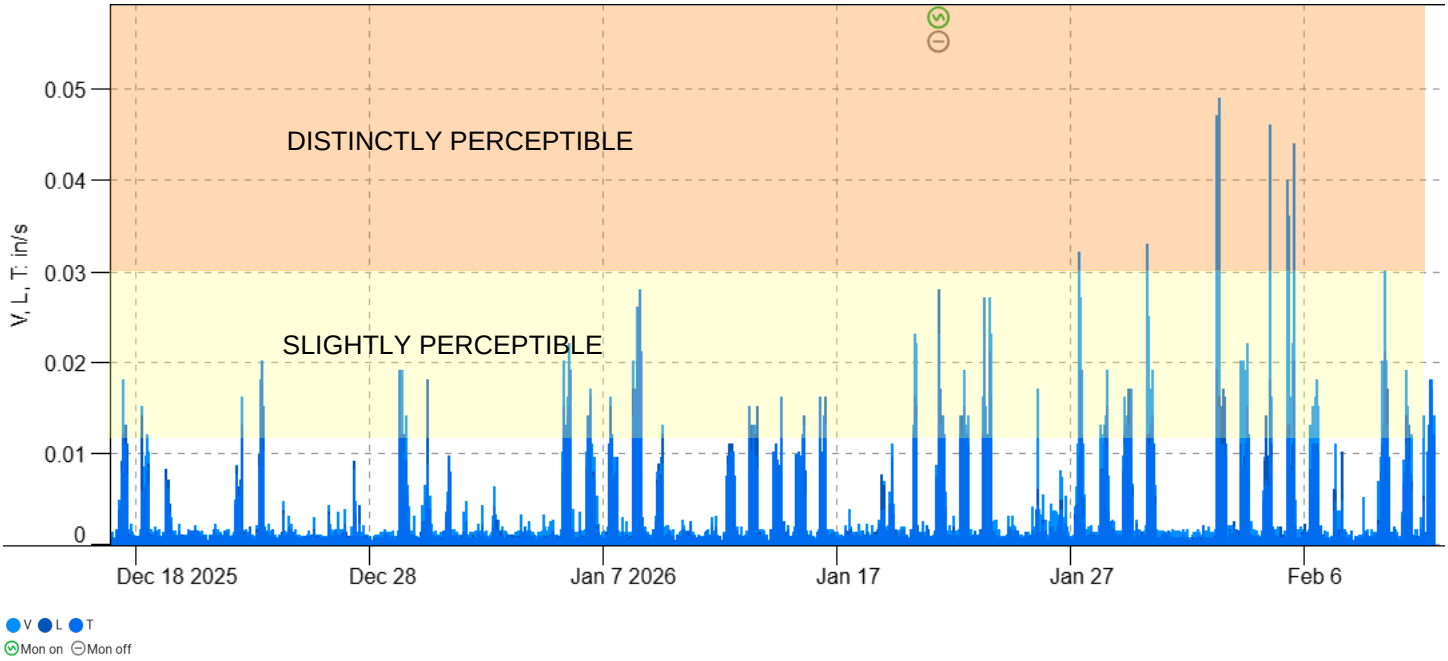
Project	Riverview Demo
Project maintainer	-
Time frame	2025-12-17 00:00 - 2026-02-12 00:00 (America/New_York)
Measuring point	Riv6
Description	11 Sparks St., Cambrdige, MA
Sensor type	C22
Sensor serial no.	110329
Master(s) serial no.	110329
Latest calibration	2025-07-02
Aggregate	max
Standard	(51B) ISEE Seismograph 1 in/s 2-250Hz
Unit	in/s
Quantity	Velocity
Interval time	5 minutes
Frequency weighting	OFF
Aggregated time	1 hour

NB!

Chart data is aggregated by 1 hour.

Highlighted regions correspond to ranges at which humans can perceive vibrations. See Figure 3 in the main report.

Max V: 0.05 in/s, L: 0.03 in/s, T: 0.03 in/s



X-span	2025-12-17 00:00 - 2026-02-12 00:00
Y-span	V: 0 - 0.05 in/s, L: 0 - 0.03 in/s, T: 0 - 0.03 in/s

	V	L	T
Max	0.05 in/s	0.03 in/s	0.03 in/s
Date	2026-02-02	2026-01-21	2026-01-08
Time	09:30:00	09:30:00	14:30:00