Vibration Monitoring Report

Borehole works at Jaðarsbraut, Akranes

Project	Vibration monitoring during borehole works at Jaðarsbraut, Akranes
Client	Veitur / Verkís
Measurement location	Jaðarsbraut 37, Akranes
Sensor	VSEW mk4, sensor ID 21098
Monitoring period	30 October – 17 November 2026
Project ID	16558
Version and date	1.0 – 17 November 2026
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1. Summary

Baseline measurements were low and stable, at about 0.14 mm/s vertically, until 8 November. From Monday 9 November, recurring episodes of elevated vibration were recorded. All episodes occurred within normal working hours and are consistent with construction activity near the sensor.

The highest recorded value was **0.80 mm/s** (vertical) on 16 November. This is below DIN 4150-3 and BS 7385-2 guideline values.

2. Project and measurement location

The monitoring was carried out for Veitur/Verkís to record ground vibration from borehole works at Jaðarsbraut in Akranes. Vibration was measured at the building Jaðarsbraut 37.

The sensor was mounted on the corner of Jaðarsbraut 37 by the garage, marked A in Figure 1. It is about 33.75 m from the borehole. The sensor is fixed to the outer wall with a steel bracket, close to ground and foundation level, and is powered from a battery box on the ground below (Figure 2).

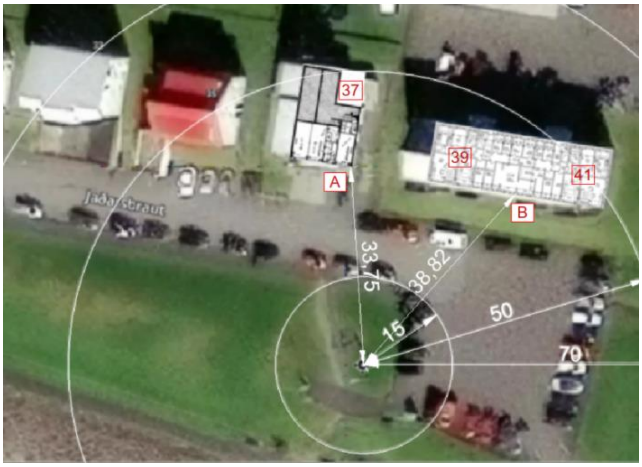


Figure 1. Site plan. A: sensor position at Jaðarsbraut 37, 33.75 m from the borehole.



Figure 2. Sensor 21098 on the corner of Jaðarsbraut 37 by the garage, with the battery box below.

The sensor records vibration in three directions:

Axis	Direction
X	Horizontal, pointing south, towards the borehole
Y	Horizontal, pointing east, along the building wall
Z	Vertical

Table 1. Sensor axis orientation.

3. Measurement equipment and settings

Measurements were made with a VSEW mk4 vibration logger (firmware FW17), configured as follows:

Setting	Value
Signal type	Velocity
Values recorded	Peak maximum and minimum per axis (X, Y, Z)
Measurement interval	30 s
Sampling frequency	1 kHz
Time constant	Fast (125 ms)
Frequency range (band-pass)	0.8 Hz high-pass, 100 Hz low-pass
Weighting filters	5.6 Hz high-pass and ISO 2631 slope filter: off
Compliance standard	DIN 4150-3

Table 2. Logger configuration.

4. Data handling and excluded periods

The analysis covers the period from 30 October 12:00 to 17 November at 08:00.

The periods below were excluded. During battery changes, handling of the sensor produced short peaks of up to 19 mm/s. These do not represent ground vibration and were removed; they appear as blank intervals in the figures.

Period	Duration	Reason
4 Nov 16:33 – 16:46	13 min	Battery change
11 Nov 18:06 – 18:16	10 min	Battery change
15 Nov 19:45 – 16 Nov 13:08	17 h 23 min	No data: battery depleted due to cold.
16 Nov 13:12 – 13:15	3 min	Battery change

Table 3. Periods excluded from the analysis.

5. Results

Baseline measurement was from 30 October to 8 November. The first episode of elevated vibration began on Monday 9 November at 14:30. Between 9 and 16 November, 13 episodes were recorded, totaling about 9 hours and 20 minutes.

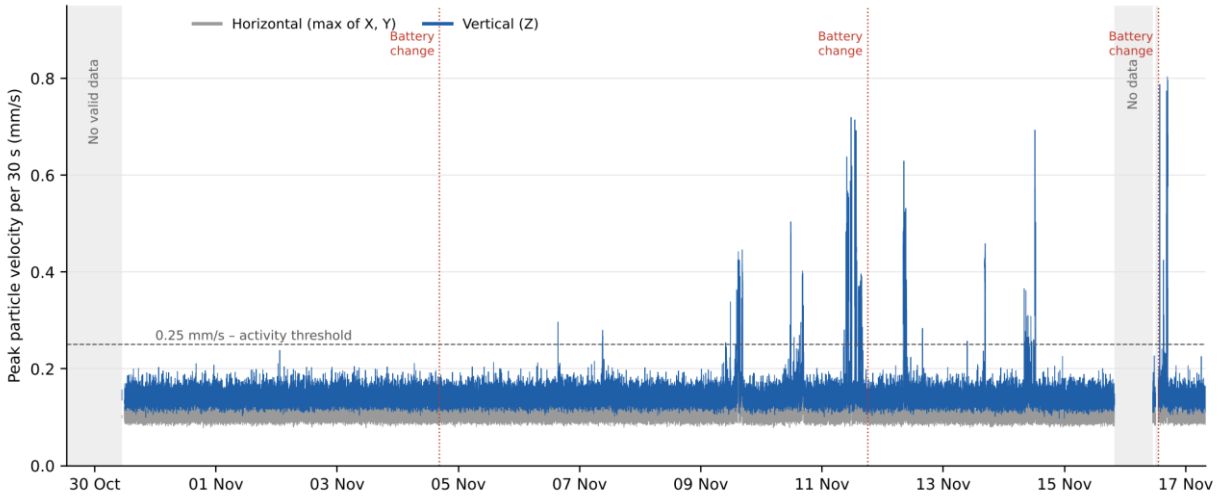


Figure 3. Peak vibration per 30 seconds, vertical (Z) and horizontal (X, Y). Grey areas indicate missing data; red lines mark battery changes, where data was removed.

All episodes occurred between 08:10 and 17:00. They took place on weekdays, apart from a short episode on Saturday 14 November (12:20–12:40). No elevated vibration was recorded at night or on Sundays.

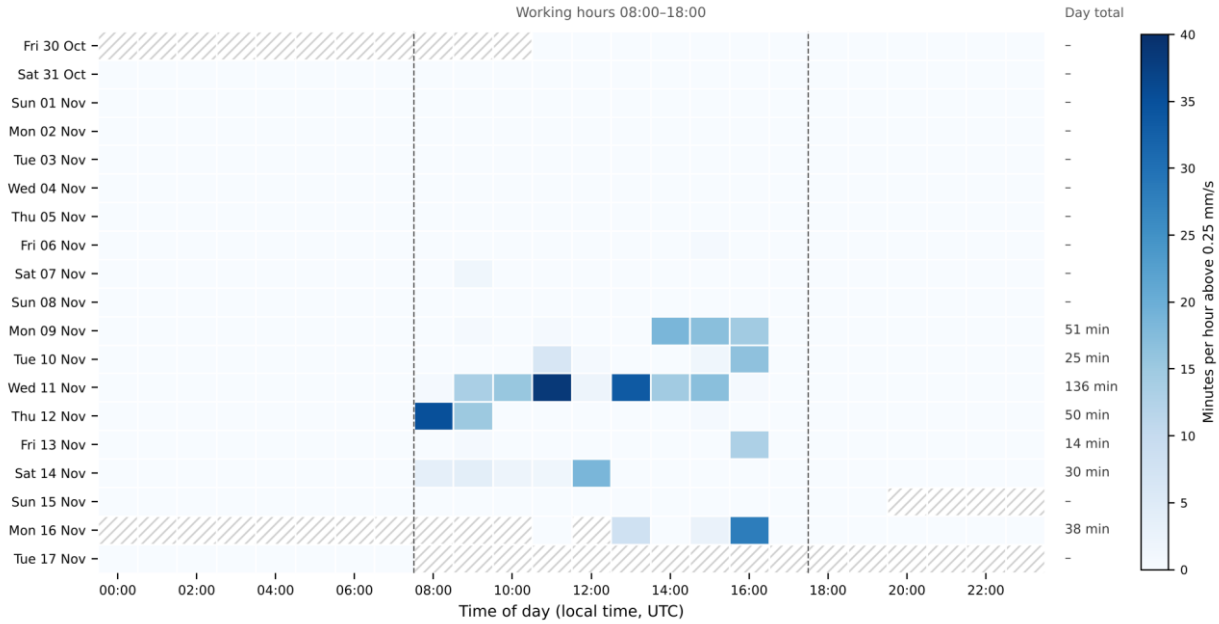


Figure 4. Minutes per hour with vertical vibration above 0.25 mm/s, by day and time of day. Gray cells: no data.

Date	Time of peak	Vertical peak (mm/s)	Horizontal peak (mm/s)
Mon 9 Nov	16:24	0.45	0.21
Tue 10 Nov	11:38	0.50	0.17
Wed 11 Nov	11:31	0.72	0.23
Thu 12 Nov	08:25	0.63	0.26
Fri 13 Nov	16:35	0.46	0.19
Sat 14 Nov	12:20	0.69	0.28
Mon 16 Nov	16:48	0.80	0.43

Table 4. Highest recorded values on days with elevated vibration. Background level: 0.14 mm/s vertical, 0.10 mm/s horizontal.

6. Assessment against limit values

The results are compared with DIN 4150-3 (Germany) and BS 7385-2 (United Kingdom), the two most widely used standards for vibration effects on buildings. Figure 5 shows the highest measured value next to their lowest limits for houses.

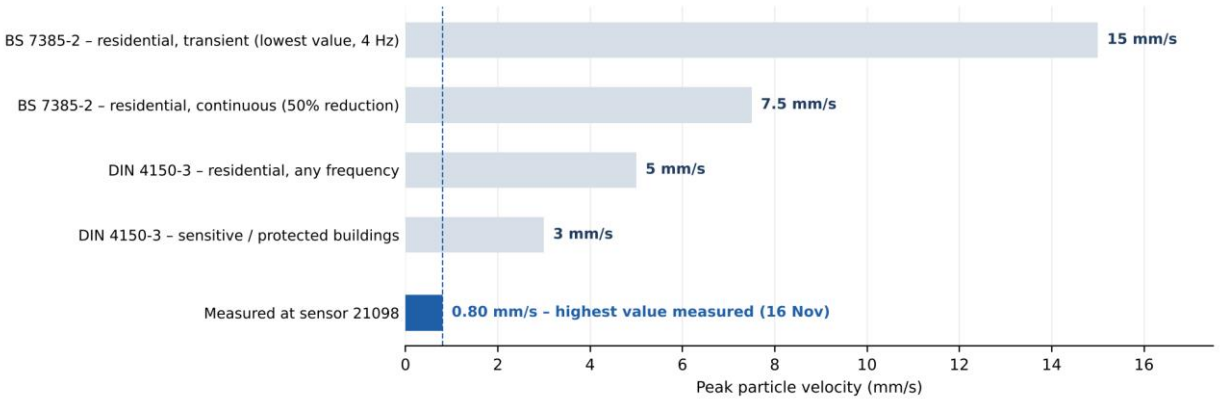


Figure 5. Highest measured value compared with the lowest guideline values for residential buildings.

DIN 4150-3 – Vibrations in buildings, effects on structures

For houses, the lowest guideline value is **5 mm/s**. It applies at the lowest frequencies, and the limit only increases at higher frequencies. Because every value measured is below 5 mm/s, the standard is met whatever the frequency of the vibration. The highest value, 0.80 mm/s, is 16% of this limit.

BS 7385-2 – Guide to damage levels from ground borne vibration

For houses, the lowest guide value for cosmetic damage (such as fine cracks in plaster) is **15 mm/s** at 4 Hz, rising to 50 mm/s at 40 Hz and above. For vibration that continues over longer periods, such as drilling, the values may be halved to 7.5 mm/s. Below 4 Hz the limit is a ground movement of 0.6 mm; at 0.80 mm/s the movement is less than 0.2 mm even at the lowest frequency the sensor measures. The measured values therefore meet BS 7385-2 at all frequencies.

BS 5228-2 – How people feel vibration

The British code of practice for construction sites, BS 5228-2, also describes how people react to vibration. Vibration of 0.3 mm/s may just be felt in homes, and at 1.0 mm/s complaints become likely unless residents are informed in advance. The highest values recorded (0.6–0.8 mm/s on the busiest days) fall between these two levels. Neighbors may occasionally notice the work, even though there is no risk to their buildings.

7. Conclusion

- Vibration from construction activity began on 9 November and has been limited to working hours.
- The highest value recorded was 0.80 mm/s, which complies with DIN 4150-3 (5 mm/s for residential buildings at any frequency) and with BS 7385-2 (15 mm/s at 4 Hz).