

Vibration Assessment

Gravesham Borough Council



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1. Introduction

Clover Acoustics Ltd has been commissioned by Planning Potential Ltd on behalf of [REDACTED] to carry out a vibration assessment at a proposed residential development at 2 Vale Road, Northfleet, Gravesend, Kent, DA11 8BZ.

A vibration survey has sampled typical 24-hour period in order to establish the existing background vibration levels. The survey was conducted at one monitoring location commencing on Thursday 11th January 2018.

The purpose of this report is to demonstrate that due consideration for vibration affecting the proposed residential scheme has been made and to assess the significance of any vibration impact from the adjacent rail source.

2. Assessment Methodology

BS6472-1:2008 - Guide to evaluation of human exposure to vibration in buildings

Ground-borne vibration from rail traffic has been assessed following the guidance from BS6472-1:2008 "Guide to evaluation of human exposure to vibration in buildings - Part 1 Vibration sources other than blasting". This standard provides a method for measuring and assessing building vibration with respect to human response. Table 1 advises the following criteria for the assessment of vibration effects.

BS6472-1 Table 1 - Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings			
Place and time	Low probability of adverse comment $m \cdot s^{-1.75}$	Adverse comment possible $m \cdot s^{-1.75}$	Adverse comment probable $m \cdot s^{-1.75}$
Residential buildings 16h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

3. Site Description

The site is currently occupied by a truck sales yard which is to be relocated. The current proposal is to develop 11 residential dwellings. The site is located off Vale Road to the west of Gravesend town centre. To the east boundary of site is Vale Road and to the south railway line.

Subjectively the potential source affecting site is the southern rail line and anticipated as the likeliest source for ground-borne vibration. The majority of road traffic observed consisted of occasional cars. Figure 1 shows the proposed site location.



Figure 1 – Site Location

4. Survey Information

Measurement Instrumentation

The measurement instrumentation used on the survey was as follows:

Equipment	Manufacturer & Type	Serial Number	Calibration Certificate
Vibration Monitor	Vibroek V901	1481	07171481

Measurements Locations

It was not possible to measure within the buildings as they are yet to be constructed. Measurements were therefore taken at ground level at locations representative of the proposed façade location overlooking the railway. Measurements were made in each of the three orthogonal axes. Figure 2 shows the proposed development layout with approximate monitoring locations.



Figure 2 – Proposed Development Layout

Monitoring Location



5. Survey Results

Vibration Monitoring

Monitoring was carried out between Thursday 11th and Friday 12th January 2018 commencing at 23:00 hrs to capture typical rail traffic movements. Hourly vibration dose values are presented below with calculated Daytime 16-hour and night-time 8-hour vibration dose values.

Monitoring Position 1 – Night-time						
Hour Start	Measured VDV m/s ^{-1.75}			Total VDV m/s ^{-1.75}		
	VDV,x	VDV,y	VDV,z	VDV,x	VDV,y	VDV,z
23:00	0.015	0.015	0.024	0.015	0.015	0.024
00:00	0.014	0.015	0.021	0.017	0.018	0.027
01:00	0.015	0.015	0.021	0.019	0.02	0.029
02:00	0.015	0.015	0.021	0.021	0.021	0.031
03:00	0.014	0.015	0.021	0.022	0.023	0.033
04:00	0.014	0.015	0.021	0.023	0.024	0.034
05:00	0.015	0.015	0.023	0.024	0.025	0.036
06:00	0.015	0.015	0.025	0.025	0.026	0.038

The highest night-time vibration dose value occurred on the z axis at 0.038 m/s^{-1.75}. These levels are below to the BS6472-1:2008 guideline values for “low probability of adverse comment” which were determined at the site boundary approximately 15 meters from the nearest railway line.

Monitoring Position 1 - Daytime						
Hour Start	Measured VDV m/s ^{-1.75}			Total VDV m/s ^{-1.75}		
	VDV,x	VDV,y	VDV,z	VDV,x	VDV,y	VDV,z
07:00	0.015	0.015	0.025	0.015	0.015	0.025
08:00	0.015	0.015	0.026	0.018	0.018	0.030
09:00	0.015	0.015	0.024	0.020	0.020	0.033
10:00	0.015	0.015	0.024	0.021	0.022	0.035
11:00	0.015	0.015	0.024	0.023	0.023	0.037
12:00	0.015	0.015	0.024	0.024	0.024	0.038
13:00	0.015	0.015	0.026	0.024	0.025	0.040
14:00	0.015	0.015	0.025	0.025	0.026	0.042
15:00	0.014	0.015	0.023	0.026	0.027	0.043
16:00	0.015	0.015	0.023	0.027	0.027	0.044
17:00	0.015	0.015	0.023	0.027	0.028	0.045
18:00	0.015	0.015	0.026	0.028	0.029	0.046
19:00	0.015	0.015	0.024	0.028	0.029	0.047
20:00	0.015	0.015	0.025	0.029	0.030	0.048
21:00	0.015	0.015	0.024	0.030	0.030	0.049
22:00	0.015	0.015	0.025	0.030	0.031	0.049

The highest daytime vibration dose value occurred on the z axis at 0.049 m/s^{-1.75}. These levels are below to the BS6472-1:2008 guideline values for “low probability of adverse comment” which were determined at the site boundary approximately 15 meters from the nearest railway line.

6. Conclusion

An attended vibration survey has been carried out at the site of a proposed residential development at 2 Vale Road, Northfleet, Gravesend, Kent, DA11 8BZ. The survey was conducted at one monitoring locations commencing on Thursday 11th January 2018.

The data collected shows the vibration levels monitored were low. The vibration dose values show levels from the nearby rail source are below the “low probability of adverse comment” criteria for day time and night time periods from BS6472-1:2008.



Acoustic Consultant

7. Appendix

Photo Appendix

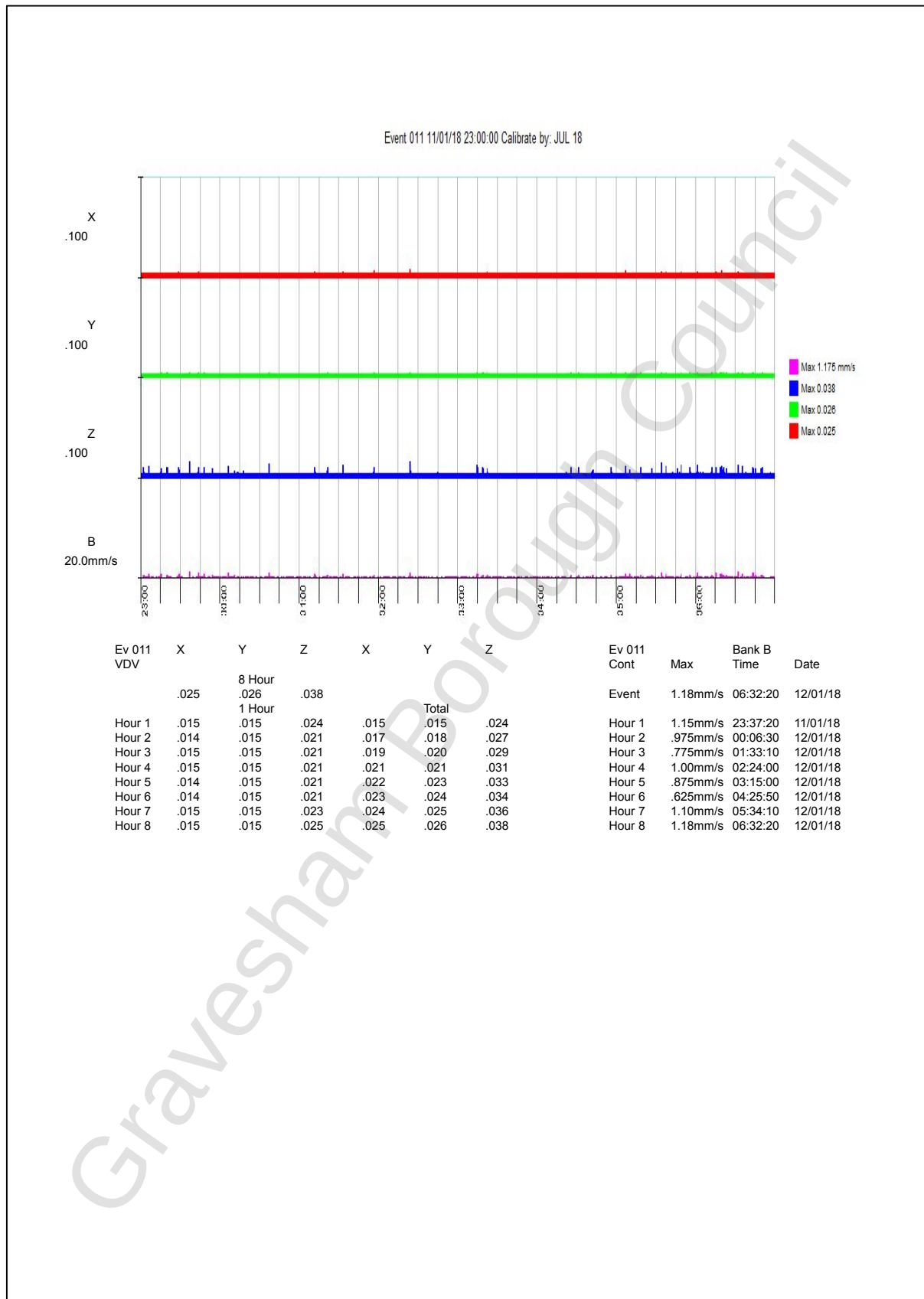


Figure 3 – View towards railway line cutting from site boundary

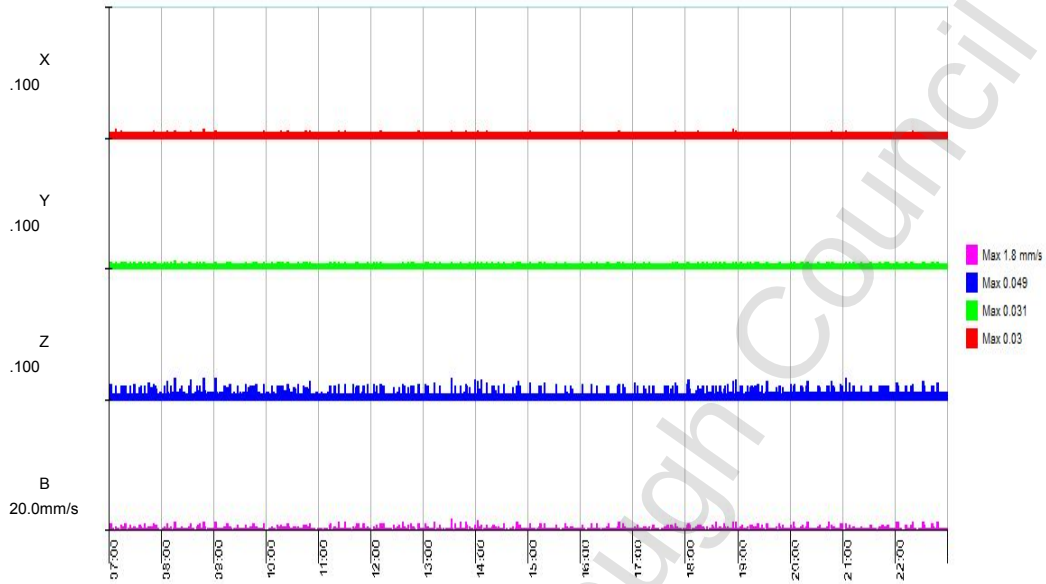


Figure 4 – View of railway line adjacent site

Data Appendix



Event 012 12/01/18 07:00:00 Calibrate by: JUL 18



Ev 012	X	Y	Z	X	Y	Z	Ev 012	Max	Bank B	Date
VDV							Cont		Time	
	.030	.031	.049				Event	1.80mm/s	13:32:00	12/01/18
		16 Hour								
		1 Hour				Total				
Hour 1	.015	.015	.025	.015	.015	.025	Hour 1	1.03mm/s	07:51:40	12/01/18
Hour 2	.015	.015	.026	.018	.018	.030	Hour 2	1.20mm/s	08:16:20	12/01/18
Hour 3	.015	.015	.024	.020	.020	.033	Hour 3	1.13mm/s	09:01:50	12/01/18
Hour 4	.015	.015	.024	.021	.022	.035	Hour 4	1.08mm/s	10:51:00	12/01/18
Hour 5	.015	.015	.024	.023	.023	.037	Hour 5	1.28mm/s	11:30:20	12/01/18
Hour 6	.015	.015	.024	.024	.024	.038	Hour 6	1.30mm/s	12:37:30	12/01/18
Hour 7	.015	.015	.026	.024	.025	.040	Hour 7	1.80mm/s	13:32:00	12/01/18
Hour 8	.015	.015	.025	.025	.026	.042	Hour 8	1.48mm/s	14:02:10	12/01/18
Hour 9	.014	.015	.023	.026	.027	.043	Hour 9	1.10mm/s	15:43:30	12/01/18
Hour 10	.015	.015	.023	.027	.027	.044	Hour 10	1.30mm/s	16:43:50	12/01/18
Hour 11	.015	.015	.023	.027	.028	.045	Hour 11	1.03mm/s	17:48:50	12/01/18
Hour 12	.015	.015	.026	.028	.029	.046	Hour 12	1.28mm/s	18:58:10	12/01/18
Hour 13	.015	.015	.024	.028	.029	.047	Hour 13	1.10mm/s	19:34:00	12/01/18
Hour 14	.015	.015	.025	.029	.030	.048	Hour 14	1.23mm/s	20:20:50	12/01/18
Hour 15	.015	.015	.024	.030	.030	.049	Hour 15	1.05mm/s	21:04:30	12/01/18
Hour 16	.015	.015	.025	.030	.031	.049	Hour 16	1.23mm/s	22:03:10	12/01/18