

# Sound Advice

A C O U S T I C S L T D

REPORT REFERENCE:

SA - 7513

## ENVIRONMENTAL VIBRATION IMPACT ASSESSMENT

British Standard 6472 & 7385

CLIENT:

KS4 Consulting

SITE:

81 – 88 Beresford Street

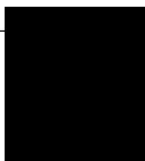
London

SE18 6BG

SURVEY DATES:

10<sup>th</sup> – 14<sup>th</sup> November 2023

Report By



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## 1 EXECUTIVE SUMMARY

### 1.1 Instruction

Sound Advice Acoustics Ltd have been instructed by KS4 Consulting to undertake a background vibration survey to BS 7385, 'Evaluation And Measurement For Vibration In Buildings', to determine the impact of existing vibration levels on the proposed accommodation scheme at 81 – 88 Beresford Street, London, SE18 6BG.

### 1.2 Scope of Report

The measurements will be undertaken in accordance with BS 7385 'Evaluation And Measurement For Vibration In Buildings' to determine the existing background vibration levels to determine the impact of existing buses, HGV's and other heavy goods traffic using this road and the cross rail below.

- Existing background vibration levels within the area;
- Assess the potential vibration levels affecting the premises;
- Make assessments and conclusions based on the findings of this survey.

### 1.3 Summary of Results

#### Background Vibration Levels

The following vibration levels have been assessed over a typical period between 10<sup>th</sup> and 14<sup>th</sup> November 2023. The following table summarises these results:-

Time Period	Vibration Dose Value m/s <sup>1.75</sup>			Peak Particle Velocity mm/s
	L	T	V	Resultant Vector
10 <sup>th</sup> November 2023 – 16 Hr	0.039	0.035	0.039	.750mm/s
10 <sup>th</sup> – 11 <sup>th</sup> November 2023 – 8 Hr	0.033	0.030	0.032	.350mm/s
11 <sup>th</sup> November 2023 – 16 Hr	0.039	0.036	0.039	.350mm/s
11 <sup>th</sup> – 12 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.032	.350mm/s
12 <sup>th</sup> November 2023 – 16 Hr	0.039	0.036	0.039	.725mm/s
12 <sup>th</sup> – 13 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.032	.350mm/s
13 <sup>th</sup> November 2023 – 16 Hr	0.038	0.036	0.039	.725mm/s
13 <sup>th</sup> – 14 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.033	.725mm/s

Table 3 Summary of daily VDV and PPV

#### 1.4 Conclusions

The results of this ambient vibration survey indicate that with the exception of the three isolated incidents the vibration events may be perceptible but there is likely to be no concern of adverse comments from the occupants of the existing property and no concern of cosmetic damage to buildings arising from vibration.

The results of the vibration levels measured, which would have a firm foundation, are below the range associated with 'low probability of adverse comment' and below the limit at which cosmetic damage to buildings is likely. Consequently, vibration of these magnitudes is not considered to cause any adverse comments from existing residents.

## 2 INTRODUCTION

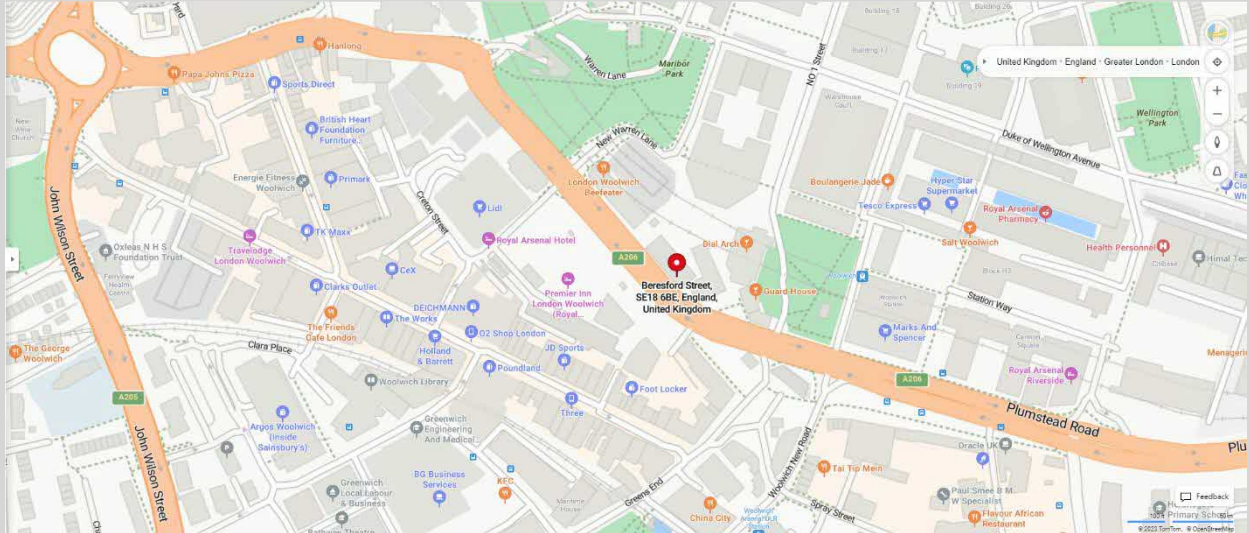
Sound Advice Acoustics Ltd have been instructed by KS4 Consulting to undertake a background vibration survey to BS 7385, 'Evaluation and Measurement For Vibration In Buildings', to determine the impact of existing vibration levels on the proposed accommodation scheme at 81 – 88 Beresford Street, London, SE18 6BG.

It is understood that at the North West corner of the site, the Cross Rail runs adjacent to the boundary of the site and that it has been requested that an assessment was undertaken, to provide calculations to demonstrate that there will be no future complaints with regards to the vibration, from the train line for future occupiers of the proposed building.

### 3 SITE LOCATION

#### Position of Site in Wider Area

The site is located in Woolwich. The dominant vibration source is road traffic and rail.



## 4 VIBRATION ASSESSMENT

### 4.1 ASSESSMENT CRITERIA

Ground borne vibration needs to be assessed with regard to the likelihood of disturbance to humans and damage to building structure. With regard to human disturbance, vibration criteria are specified in terms of Vibration Dose Values (VDV) in accordance with BS 64721. The following table shows the VDV with various degrees of adverse comment, which may be expected in residential buildings.

For residential buildings	Low probability of adverse comment	Adverse comment possible	Adverse comment probable
16 hr day 07:00 to 23:00	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Table 1      Vibration Dose Values (given in m/s <sup>1.75</sup> )			

The vibration dose reflects the accumulated acceleration vibration value over a given time period, integrated by time on a root mean quad basis, hence the unit m/s<sup>1.75</sup>.

Human beings have different sensitivity to vibration in different directions, and it is relevant to consider vibration in all three axes together as a resultant value.

In terms of the likelihood of damage to buildings, vibration is measured in peak particle velocity (ppv) mm/s and assessed in accordance with BS 73852. In this particular case, the main sources of vibration are trains and these are considered to cause transient vibration. The BS7385 standard states that for transient vibration, guide values at which cosmetic damage could occur to residential buildings are 15 mm/s at 4 Hz, rising to 20 mm/s at 15 Hz and rising further to 50 mm/s at 40 Hz and above for new buildings. These limits can be reduced by 50% for older buildings.

<sup>1</sup> BS 6472:., Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)

<sup>1</sup> BS 7385:., Evaluation and measurement for vibration in buildings

## 4.2 MEASUREMENTS

### 4.2.1 Instrumentation

Vibration levels were recorded using a two-channel Vibrock V901 seismometer, serial number 1006, which was connected with two tri-axial transducers for measuring peak particle velocity and vibration dose value, simultaneously, at one chosen location. The vibration measuring equipment has a current calibration certificate.

### 4.2.2 Measurement locations

The site is exposed to vibration of trains on the North West corner of the site. One representative measurement location was selected in the basement of the existing building.

The measurement sensors were placed on the concrete floor of the basement. Although it was not possible to establish the thickness of this slab, it is considered that this slab would be well adhered to the sub-soil.

### 4.2.3 Measurement Procedure

Ambient ground borne vibration levels were measured continuously for about 96 hours at Location 1 from approximately 07:00 hrs on Friday 10<sup>th</sup> November to approximately 07:00 hrs on Tuesday 14<sup>th</sup> November. This period is considered to represent both the periods when the ambient conditions are quietest, i.e. night-time, and periods of peak railway traffic through daytime. Some attended measurements were made prior to leaving the equipment at Location 1 to record the vibration in terms of the peak particle velocity (ppv) and vibration dose value (vdv) at this location.



4.3 RESULTS & ASSESSMENT OF VIBRATION MEASUREMENTS

The vibration monitor was set to record ppv and vdv and left unattended for the duration of the survey. Full measurement results are given in the tables below.

10 <sup>th</sup> November 2023 – DAYTIME									
Ev 160	Vibration Dose Value						Peak Particle Velocity		
16 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.039	0.035	0.039				.750mm/s	12:48:50	10/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.02	0.017	0.019	0.02	0.017	0.019	.350mm/s	07:03:10	10/11/2023
Hour 2	0.02	0.017	0.019	0.023	0.021	0.023	.350mm/s	08:01:50	10/11/2023
Hour 3	0.02	0.017	0.019	0.026	0.023	0.025	.350mm/s	09:09:50	10/11/2023
Hour 4	0.02	0.017	0.019	0.028	0.025	0.027	.350mm/s	10:08:20	10/11/2023
Hour 5	0.02	0.017	0.019	0.029	0.026	0.029	.350mm/s	11:01:50	10/11/2023
Hour 6	0.019	0.017	0.019	0.031	0.027	0.03	.750mm/s	12:48:50	10/11/2023
Hour 7	0.019	0.017	0.019	0.032	0.028	0.031	.350mm/s	13:14:00	10/11/2023
Hour 8	0.019	0.017	0.019	0.033	0.029	0.033	.350mm/s	14:07:30	10/11/2023
Hour 9	0.019	0.017	0.019	0.034	0.03	0.034	.350mm/s	15:00:30	10/11/2023
Hour 10	0.019	0.017	0.019	0.035	0.031	0.034	.350mm/s	16:02:10	10/11/2023
Hour 11	0.019	0.017	0.019	0.036	0.032	0.035	.350mm/s	17:04:00	10/11/2023
Hour 12	0.019	0.017	0.019	0.037	0.033	0.036	.350mm/s	18:04:00	10/11/2023
Hour 13	0.019	0.017	0.019	0.037	0.033	0.037	.350mm/s	19:02:40	10/11/2023
Hour 14	0.019	0.017	0.019	0.038	0.034	0.037	.350mm/s	20:01:30	10/11/2023
Hour 15	0.019	0.017	0.019	0.039	0.035	0.038	.350mm/s	21:01:40	10/11/2023
Hour 16	0.019	0.017	0.019	0.039	0.035	0.039	.350mm/s	22:07:00	10/11/2023

10<sup>th</sup> – 11<sup>th</sup> November 2023 – NIGHT TIME

Ev 161	Vibration Dose Value						Peak Particle Velocity		
	X	Y	Z	X	Y	Z	Max	Time	Date
8 Hour	0.033	0.030	0.032				.350mm/s	23:10:30	10/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.020	0.017	.0019	0.020	0.017	0.019	.350mm/s	23:10:30	17/02/2016
Hour 2	0.020	0.017	0.019	0.023	0.021	0.023	.350mm/s	00:09:00	17/02/2016
Hour 3	0.020	0.017	0.019	0.026	0.023	0.025	.350mm/s	01:02:00	17/02/2016
Hour 4	0.020	0.018	0.019	0.030	0.026	0.027	.350mm/s	02:00:10	17/02/2016
Hour 5	0.020	0.018	0.019	0.030	0.026	0.029	.350mm/s	03:02:30	17/02/2016
Hour 6	0.020	0.018	0.019	0.031	0.028	0.030	.350mm/s	04:06:30	17/02/2016
Hour 7	0.020	0.018	0.019	0.032	0.029	0.031	.350mm/s	05:01:00	17/02/2016
Hour 8	0.020	0.018	0.019	0.033	0.030	0.032	.350mm/s	06:03:40	17/02/2016

11 <sup>th</sup> November 2023 – DAYTIME									
Ev 162	Vibration Dose Value						Peak Particle Velocity		
16 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.039	0.036	0.039				.350mm/s	07:09:10	11/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.019	0.017	0.019	0.019	0.017	0.019	.350mm/s	07:09:10	11/11/2023
Hour 2	0.019	0.018	0.019	0.023	0.021	0.023	.350mm/s	08:02:20	11/11/2023
Hour 3	0.019	0.018	0.019	0.026	0.023	0.025	.350mm/s	09:05:10	11/11/2023
Hour 4	0.019	0.018	0.019	0.027	0.025	0.027	.350mm/s	10:01:50	11/11/2023
Hour 5	0.019	0.018	0.019	0.029	0.026	0.029	.350mm/s	11:01:50	11/11/2023
Hour 6	0.019	0.018	0.019	0.03	0.028	0.03	.350mm/s	12:12:50	11/11/2023
Hour 7	0.019	0.018	0.019	0.032	0.029	0.031	.350mm/s	13:01:50	11/11/2023
Hour 8	0.019	0.018	0.019	0.033	0.03	0.032	.350mm/s	14:05:40	11/11/2023
Hour 9	0.019	0.018	0.019	0.034	0.031	0.033	.350mm/s	15:04:00	11/11/2023
Hour 10	0.019	0.018	0.019	0.035	0.032	0.034	.350mm/s	16:05:10	11/11/2023
Hour 11	0.019	0.018	0.019	0.036	0.032	0.035	.350mm/s	17:00:20	11/11/2023
Hour 12	0.019	0.018	0.019	0.036	0.033	0.036	.350mm/s	18:01:40	11/11/2023
Hour 13	0.019	0.018	0.019	0.037	0.034	0.037	.350mm/s	19:00:40	11/11/2023
Hour 14	0.019	0.018	0.019	0.038	0.034	0.037	.350mm/s	20:01:40	11/11/2023
Hour 15	0.019	0.018	0.019	0.038	0.035	0.038	.350mm/s	21:08:30	11/11/2023
Hour 16	0.019	0.018	0.019	0.039	0.036	0.039	.350mm/s	22:04:50	11/11/2023
11 <sup>th</sup> – 12 <sup>th</sup> November 2023 – NIGHT TIME									
Ev 163	Vibration Dose Value						Peak Particle Velocity		
8 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.033	0.03	0.032				.350mm/s	23:01:40	11/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.02	0.018	0.019	0.02	0.018	0.019	.350mm/s	23:01:40	11/11/2023
Hour 2	0.02	0.018	0.019	0.023	0.021	0.023	.350mm/s	00:14:20	12/11/2023
Hour 3	0.02	0.018	0.019	0.026	0.023	0.025	.350mm/s	01:07:50	12/11/2023
Hour 4	0.02	0.018	0.019	0.028	0.025	0.027	.350mm/s	02:01:10	12/11/2023
Hour 5	0.02	0.018	0.019	0.03	0.027	0.029	.350mm/s	03:16:40	12/11/2023
Hour 6	0.02	0.018	0.019	0.031	0.028	0.03	.350mm/s	04:01:00	12/11/2023
Hour 7	0.02	0.018	0.019	0.032	0.029	0.031	.350mm/s	05:05:30	12/11/2023
Hour 8	0.02	0.018	0.019	0.033	0.03	0.032	.350mm/s	06:02:00	12/11/2023

12 <sup>th</sup> November 2023 – DAYTIME									
Ev 164	Vibration Dose Value						Peak Particle Velocity		
16 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.039	0.036	0.039				.725mm/s	09:01:20	12/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.019	0.018	0.019	0.019	0.018	0.019	.350mm/s	07:13:40	12/11/2023
Hour 2	0.019	0.018	0.019	0.023	0.021	0.023	.350mm/s	08:00:10	12/11/2023
Hour 3	0.019	0.018	0.019	0.025	0.023	0.025	.725mm/s	09:01:20	12/11/2023
Hour 4	0.019	0.018	0.019	0.027	0.025	0.027	.350mm/s	10:06:20	12/11/2023
Hour 5	0.019	0.018	0.019	0.029	0.027	0.029	.350mm/s	11:02:00	12/11/2023
Hour 6	0.019	0.018	0.019	0.03	0.028	0.03	.350mm/s	12:00:30	12/11/2023
Hour 7	0.019	0.018	0.019	0.031	0.029	0.031	.350mm/s	13:07:30	12/11/2023
Hour 8	0.019	0.018	0.019	0.032	0.03	0.032	.350mm/s	14:05:00	12/11/2023
Hour 9	0.019	0.018	0.019	0.033	0.031	0.033	.350mm/s	15:04:00	12/11/2023
Hour 10	0.019	0.018	0.019	0.034	0.032	0.034	.350mm/s	16:02:20	12/11/2023
Hour 11	0.019	0.018	0.019	0.035	0.032	0.035	.350mm/s	17:01:20	12/11/2023
Hour 12	0.019	0.018	0.019	0.036	0.033	0.036	.350mm/s	18:03:30	12/11/2023
Hour 13	0.019	0.018	0.019	0.037	0.034	0.037	.350mm/s	19:00:20	12/11/2023
Hour 14	0.019	0.018	0.019	0.037	0.034	0.037	.350mm/s	20:02:30	12/11/2023
Hour 15	0.019	0.018	0.019	0.038	0.035	0.038	.350mm/s	21:09:00	12/11/2023
Hour 16	0.019	0.018	0.019	0.039	0.036	0.039	.350mm/s	22:25:00	12/11/2023
12 <sup>th</sup> – 13 <sup>th</sup> November 2023 – NIGHT TIME									
Ev 165	Vibration Dose Value						Peak Particle Velocity		
8 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.033	0.03	0.032				.350mm/s	23:02:10	12/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.019	0.017	0.019	0.019	0.017	0.019	.350mm/s	23:02:10	12/11/2023
Hour 2	0.019	0.018	0.019	0.023	0.021	0.023	.350mm/s	00:08:10	13/11/2023
Hour 3	0.019	0.018	0.019	0.026	0.023	0.025	.350mm/s	01:04:00	13/11/2023
Hour 4	0.019	0.018	0.019	0.028	0.025	0.027	.350mm/s	02:00:20	13/11/2023
Hour 5	0.019	0.018	0.019	0.029	0.026	0.029	.350mm/s	03:02:00	13/11/2023
Hour 6	0.019	0.018	0.019	0.031	0.028	0.03	.350mm/s	04:00:30	13/11/2023
Hour 7	0.019	0.018	0.019	0.032	0.029	0.031	.350mm/s	05:01:30	13/11/2023
Hour 8	0.019	0.018	0.019	0.033	0.03	0.032	.350mm/s	06:00:10	13/11/2023

13 <sup>th</sup> November 2023 – DAYTIME									
Ev 166	Vibration Dose Value						Peak Particle Velocity		
16 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.038	0.036	0.039				.725mm/s	22:13:50	13/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.019	0.017	0.019	0.019	0.017	0.019	.350mm/s	07:01:00	13/11/2023
Hour 2	0.019	0.017	0.019	0.023	0.021	0.023	.350mm/s	08:01:50	13/11/2023
Hour 3	0.019	0.018	0.019	0.025	0.023	0.026	.350mm/s	09:04:40	13/11/2023
Hour 4	0.019	0.018	0.019	0.027	0.025	0.028	.350mm/s	10:01:40	13/11/2023
Hour 5	0.019	0.018	0.019	0.029	0.026	0.029	.350mm/s	11:00:40	13/11/2023
Hour 6	0.019	0.018	0.019	0.03	0.028	0.031	.350mm/s	12:02:20	13/11/2023
Hour 7	0.019	0.018	0.019	0.031	0.029	0.032	.350mm/s	13:05:30	13/11/2023
Hour 8	0.019	0.018	0.019	0.032	0.03	0.033	.350mm/s	14:07:00	13/11/2023
Hour 9	0.019	0.018	0.019	0.033	0.031	0.034	.350mm/s	15:06:20	13/11/2023
Hour 10	0.019	0.018	0.019	0.034	0.032	0.035	.350mm/s	16:04:10	13/11/2023
Hour 11	0.019	0.018	0.019	0.035	0.032	0.036	.350mm/s	17:04:40	13/11/2023
Hour 12	0.019	0.018	0.019	0.036	0.033	0.036	.350mm/s	18:06:00	13/11/2023
Hour 13	0.019	0.018	0.019	0.036	0.034	0.037	.350mm/s	19:03:40	13/11/2023
Hour 14	0.019	0.018	0.019	0.037	0.034	0.038	.350mm/s	20:08:50	13/11/2023
Hour 15	0.019	0.018	0.019	0.038	0.035	0.038	.350mm/s	21:00:20	13/11/2023
Hour 16	0.019	0.018	0.019	0.038	0.036	0.039	.725mm/s	22:13:50	13/11/2023
13 <sup>th</sup> – 14 <sup>th</sup> November 2023 – NIGHT TIME									
Ev 167	Vibration Dose Value						Peak Particle Velocity		
8 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
	0.033	0.03	0.033				.725mm/s	03:34:30	14/11/2023
1 Hour	X	Y	Z	X	Y	Z	Max	Time	Date
Hour 1	0.019	0.018	0.019	0.019	0.018	0.019	.350mm/s	23:01:30	13/11/2023
Hour 2	0.019	0.018	0.019	0.023	0.021	0.023	.350mm/s	00:03:00	14/11/2023
Hour 3	0.019	0.018	0.019	0.025	0.023	0.025	.350mm/s	01:00:20	14/11/2023
Hour 4	0.019	0.018	0.019	0.027	0.025	0.027	.350mm/s	02:10:00	14/11/2023
Hour 5	0.019	0.018	0.019	0.029	0.027	0.029	.725mm/s	03:34:30	14/11/2023
Hour 6	0.019	0.018	0.019	0.03	0.028	0.03	.350mm/s	04:01:50	14/11/2023
Hour 7	0.019	0.018	0.019	0.032	0.029	0.031	.350mm/s	05:01:30	14/11/2023
Hour 8	0.019	0.018	0.019	0.033	0.03	0.033	.350mm/s	06:02:20	14/11/2023

The vdv results are summarised in the table below for the daytime and night-time periods.

Time Period	Vibration Dose Value m/s <sup>1.75</sup>			Peak Particle Velocity mm/s
	L	T	V	Resultant Vector
10 <sup>th</sup> November 2023 – 16 Hr	0.039	0.035	0.039	.750mm/s
10 <sup>th</sup> – 11 <sup>th</sup> November 2023 – 8 Hr	0.033	0.030	0.032	.350mm/s
11 <sup>th</sup> November 2023 – 16 Hr	0.039	0.036	0.039	.350mm/s
11 <sup>th</sup> – 12 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.032	.350mm/s
12 <sup>th</sup> November 2023 – 16 Hr	0.039	0.036	0.039	.725mm/s
12 <sup>th</sup> – 13 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.032	.350mm/s
13 <sup>th</sup> November 2023 – 16 Hr	0.038	0.036	0.039	.725mm/s
13 <sup>th</sup> – 14 <sup>th</sup> November 2023 – 8 Hr	0.033	0.03	0.033	.725mm/s

Table 3 Summary of daily VDV and PPV

#### 4.4 IMPLICATIONS

The above table demonstrates that from Friday to Tuesday no detrimental or structural vibration levels have been measured and therefore the probability of building damage is low.

## 5 CONCLUSION

The results of this ambient vibration survey indicate that the vibration events may be perceptible but there is likely to be no concern of adverse comments from the occupants of the proposed property and no concern of cosmetic damage to buildings arising from vibration.

The results of the vibration levels measured, which would have a firm foundation, are below the range associated with 'low probability of adverse comment' and below the limit at which cosmetic damage to buildings is likely. Consequently, vibration of these magnitudes is not considered to cause any adverse comments from proposed residents.

#END OF REPORT#