

THEATRE SQUARE PROJECT ENVIRONMENTAL MONITORING REPORT

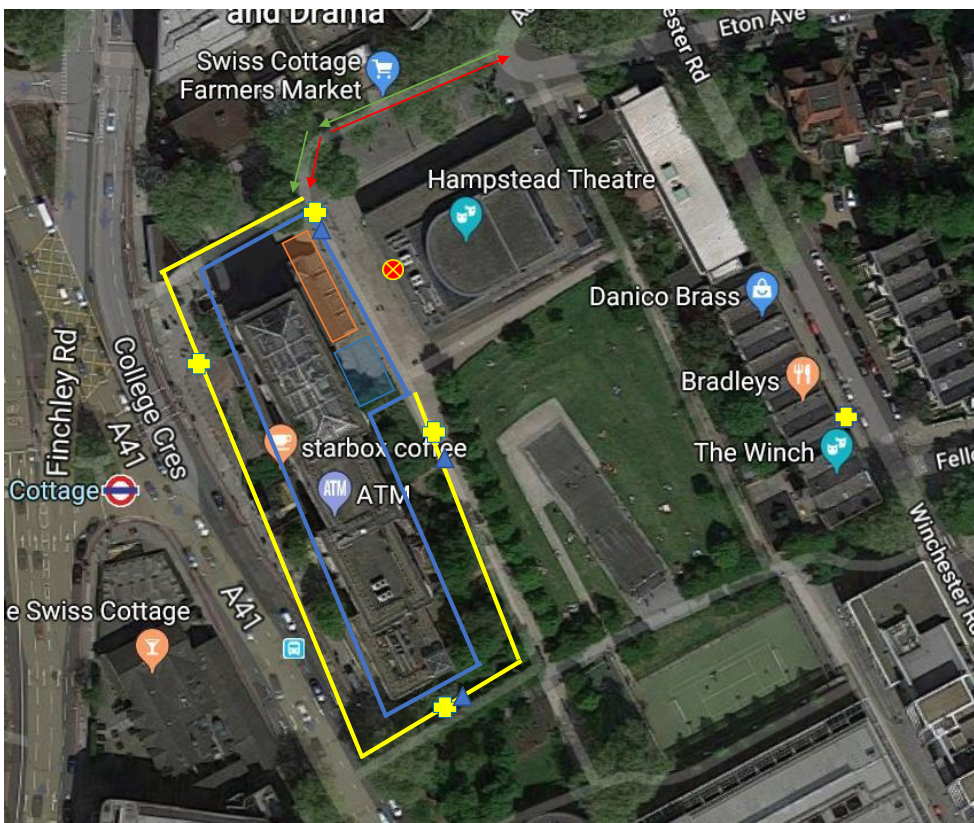
REPORT PREPARED BY JOHN F HUNT LTD

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Report Date:	22.3.16	Authorised by:	Gabriel Stetco
Core Site Working Periods:	Weekdays – 08:00 hrs to 18:00 hrs Saturdays – 08:00 hrs to 13:00 hrs	Monitoring Period:	1.03.19 – 15.03.19

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Parameter	Trigger (Amber)	Action (Red)
Noise Level	75 dB(A) Laeq 1hr	80 dB(A) Laeq 1hr
	70 dB (A) Laeq (08:00 – 18:00)	75 dB (A) Laeq (08:00 – 18:00)

Parameter	Receptor	Trigger (Amber)	Action (Red)
Vibration Level	Occupied Residential / Educational	0.8mm/s PPV	1mm/s PPV
	Occupied Commercial	2.8mm/s PPV	3mm/s PPV
	Other unoccupied buildings	4.8mm/s PPV	5mm/s PPV

Parameter	Trigger (Amber)	Action (Red)
Environmental Dust Units PM10	150ug/m3 15 min	250ug/m3 15 min

3. Assessment Criteria

3.1. Noise Criteria

British Standard BS 5228-1:2009: 2014 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise, provides guideline levels for assessing the effects of noise on humans. These guidelines are presented below in Table 3.1.1.

Table E.1 Example threshold of significant effect at dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00–07.00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3 Applied to residential receptors only.

^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

^{D)} 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Table 3.1.1: Guidance on the effects of noise levels on human receptors inside buildings.

3.2. Air Quality Criteria

Authority	Pollutant	Objective	Measured as	Relevance
EC/UK Air Quality Standard	PM10	250µg/m3 . Exceeded < 35 times/annum	15-minute intervals	Air quality in relation to public health

Table 3.2.1: Environmental Dust Standards.

Measured levels exceeding 250µg/m³ are considered to represent a significant impact to the surrounding environment over a 15-minute mean. Therefore, it is important to assess any methods of work that represent a risk and implement dust suppression techniques accordingly.

For the purposes of monitoring and managing dust levels from the site, Amber and Red site action levels have been adopted. An Amber site action level of 200µg/m³ will be used to provide early warning of dust levels which may result in complaints occupants from neighbouring buildings, while a Red site action level of 250µg/m³ has been adopted.

Receptor	Receptor Type	S/N Monitoring Location	Site Action Level	
			15-minute Intervals Dust (µg/m ³)	
			Amber	Red
Residential Properties	Residential	807 – Winchester Rd	150	250
Market	Commercial	828 – Site Boundary	150	250
Theatre	Commercial	828 – Site Boundary	150	250

Table 3.3.2: Construction dust assessment criteria.

3.3. Vibration Criteria

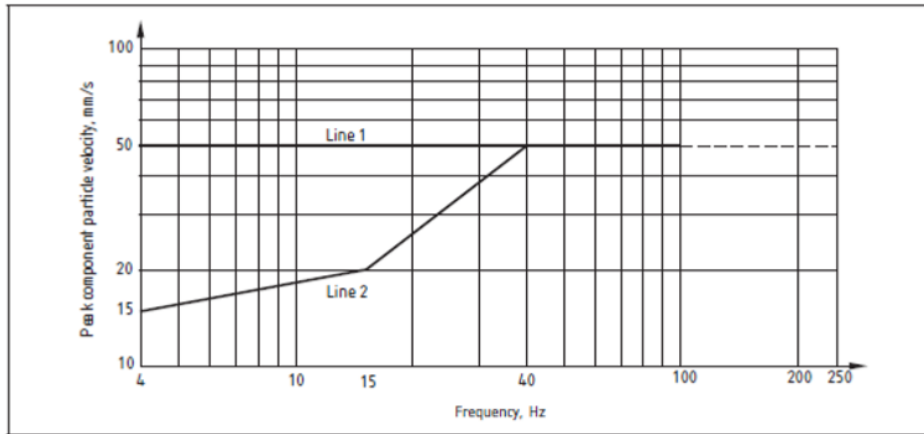
A.1. Vibration Criteria

British Standard BS 5228-2:2009: 2014 Code of practice for noise and vibration control on construction and open sites – Part 2 Vibration, provides guideline PPVs for assessing the effects of vibration on humans. These guideline PPVs are presented below in Table A.1.1.

Vibration Level	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if <u>prior warning</u> and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Table A.1.1: Guidance on the effects of vibration levels on human receptors inside buildings.

Figure B.1 Transient vibration guide values for cosmetic damage



Receptor	Receptor Type	S/N Monitoring Location	Site Action Level	
			PPV [mm/s]	
			Amber	Red
Theatre	Commercial	828 – Site Boundary	1	2

4. Actions to be taken following site action level exceedance

4.1. Amber Exceedance

Where an Amber exceedance occurs due to site activity, the site manager will monitor site emissions relevant to the alert and where necessary review methods of working. The site manager will also assess whether remaining work could continue to exceed the Amber threshold and if so, modify working methods, where practicable.

4.2. Red Exceedance

Where a Red exceedance occurs due to site activity, the site manager will stop the relevant activity whilst alternative construction methodology options are investigated, and where practicable adopted. If effective remedial action is not obvious, the site will consider an alternative technique or additional mitigation measures.

5. Complaints

Where a complaint is received, an investigation will be undertaken to establish whether the vibration is due to site activity. Where this is established, the site manager will adopt the process set out above for the receipt of an Amber exceedance. Where a complaint is received, details of the complaint, measured PPV mms-1 levels, the source and remedial action taken will be logged

Date	Complaint Details	Site Activity and Action Taken

Table 5.1: Complaints received during monitoring period.

6. Results

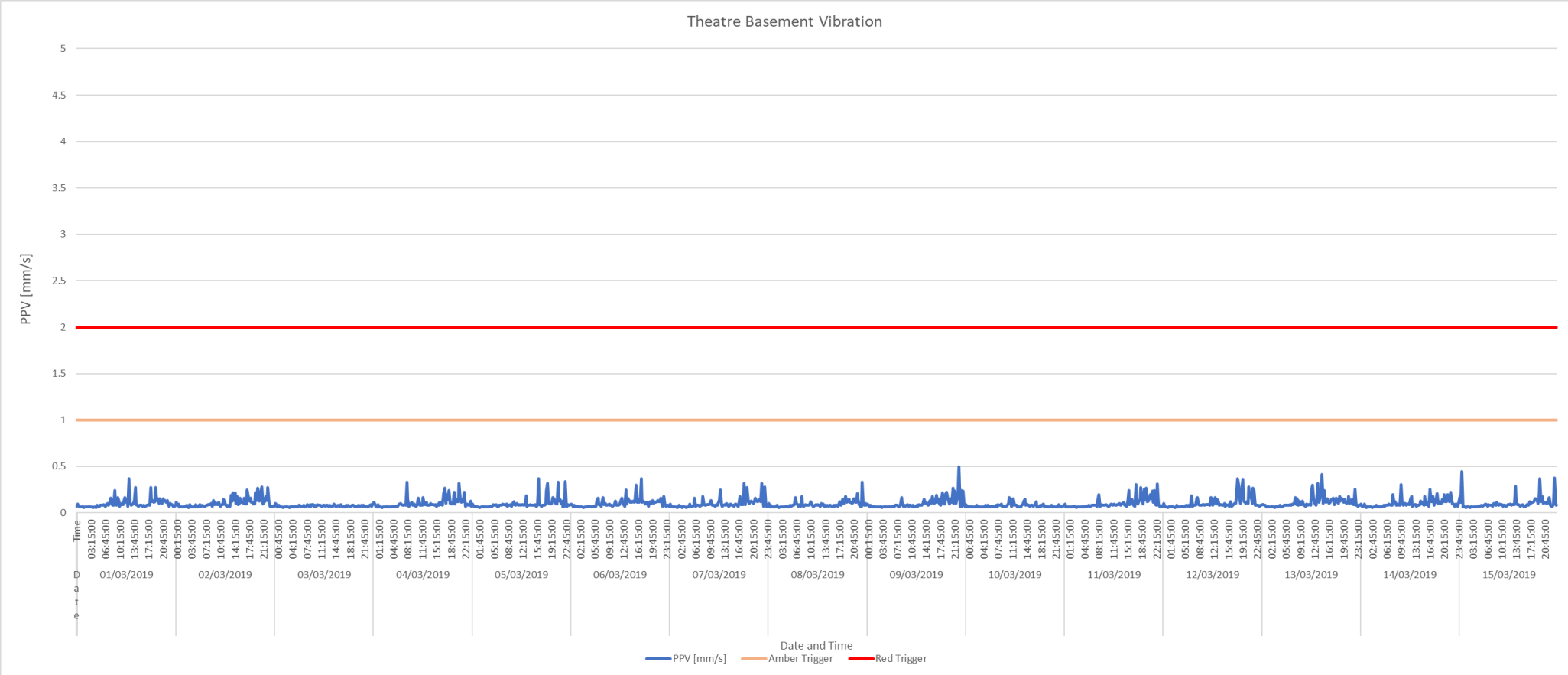


Figure 1. Vibration Data – No Exceedances

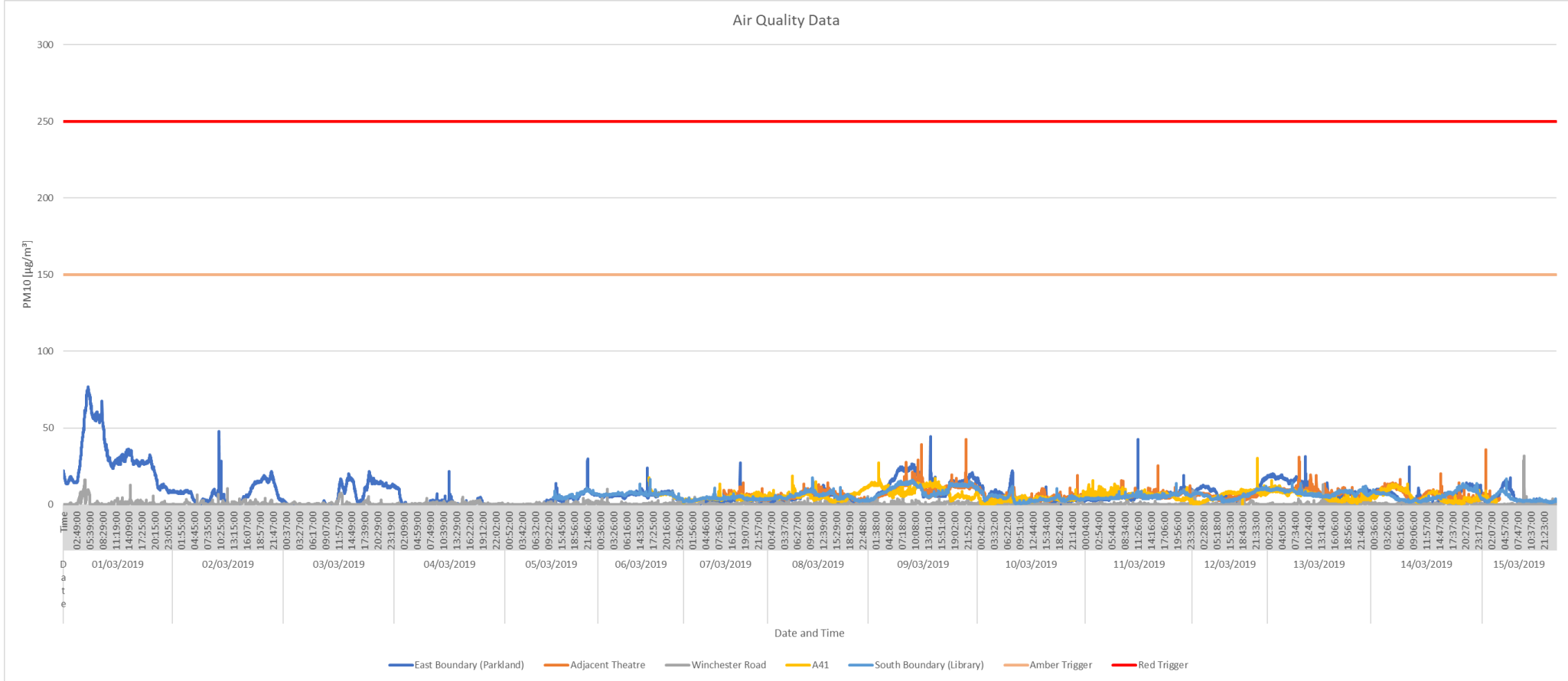


Figure 2. Air Quality Data – No Exceedances

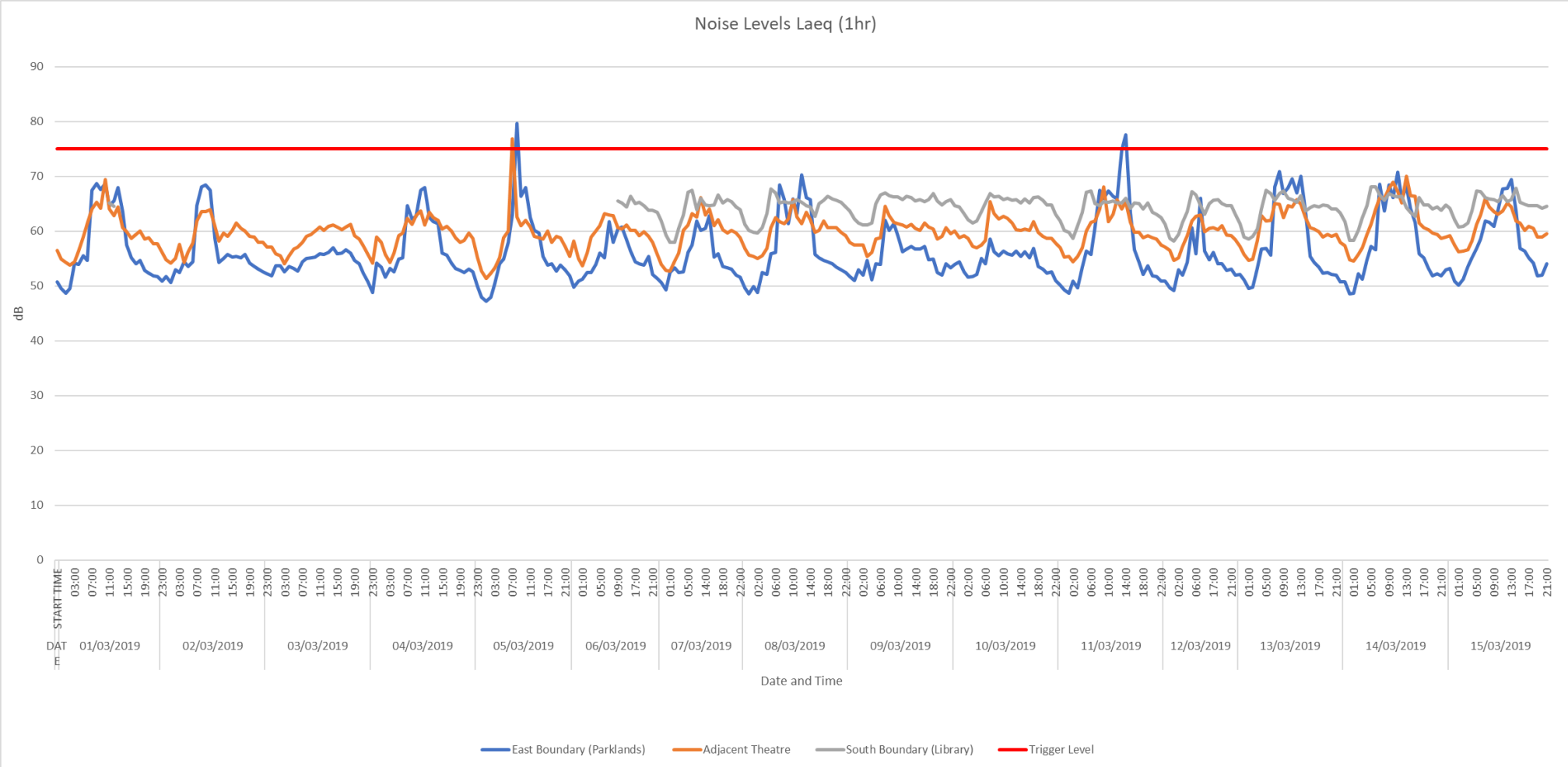


Figure 3. Noise Data – 3 hourly exceedances – No day average exceedance

East Boundary (Parklands) LAeq (08:00 – 18:00)

SUN	MON	TUE	WED	THU	FRI	SAT
					1 66.2 dB(A)	2 65.8 dB(A)
3 55.7 dB(A)	4 63.7 dB(A)	5 72.0 dB(A)	6 59.8 dB(A)	7 60.7 dB(A)	8 65.9 dB(A)	9 59.8 dB(A)
10 56.2 dB(A)	11 70.6 dB(A)	12 59.9 dB(A)	13 67.5 dB(A)	14 66.7 dB(A)	15 64.8 dB(A)	16 64.6 dB(A)

Figure 4. Noise Data – Working Day Laeq (Average)

Notes: On the 5th and 11th we saw hourly exceedances over 75dB (A), however from Figure 4 we can see that on these days, both working times average was under 75dB at 72dB and 70.6dB respectively

Adjacent Theatre LAeq (08:00 – 18:00)

SUN	MON	TUE	WED	THU	FRI	SAT
					1 64.4 dB(A)	2 62.9 dB(A)
3 60.1 dB(A)	4 62.1 dB(A)	5 69.5 dB(A)	6 61.7 dB(A)	7 63.3 dB(A)	8 62.4 dB(A)	9 62.5 dB(A)
10 62.2 dB(A)	11 64.2 dB(A)	12 60.8 dB(A)	13 63.9 dB(A)	14 67.0 dB(A)	15 63.7 dB(A)	16 63.6 dB(A)

Figure 5. Noise Data – Working Day Laeq (Average)

Notes: On the 5th we saw hourly exceedances over 75dB (A), however from Figure 5 we can see that on these days, both working times average was under 75dB at 69.5dB.