

## Non - technical Summary of acoustics reports relating to a proposed concrete Skate Park Monkton Park, Chippenham

This summary has been produced by officers of the Public Protection Service to aid understanding of the acoustic reports. In this document no commentary is provided on the reports. The reports considered are:

1. Mach Acoustics: Monkton Park, Chippenham - Skate Park  
Noise Impact Assessment 27 June 2013
2. Hoare Lea: Monkton Park Skate Park – Assessment of Noise Impact v1.3 5/07/2013

In addition to the Hoare Lea report an e-mail discussion considering an alternative mitigation option using a combination of sinking the facility and barriers has also been considered.

### Mach Acoustics Report

This Company carried out surveys at four residential properties to determine the existing noise climate at two properties in Sadlers Mead, one in Monkton Hill and one in St Marys Street. Each of these surveys were for 24 hours.

The existing noise climate can be characterised by taking the background level, which may be thought of as the lowest level of noise experienced; and as the ambient noise level, which may be considered as an average noise level. Technical definitions are contained in the report.

A further survey was undertaken at Monkton Park offices for daytime levels only. The surveys were undertaken in dry conditions with no wind in one hour periods.

The existing noise climate was characterized for the purpose of the assessment by taking the lowest 1 hour period, both background levels and ambient levels are provided in the table below.

Measurement Location	Time Period	Lowest Measured Background Noise Level $L_{A90}$	Average Ambient Noise Level $L_{Aeq}$
Monkton Hill	08:00 – 22:00 hours	40 dB	57 dB
No. 8 Sadlers Mead	08:00 – 22:00 hours	37 dB	49 dB
No. 40 Sadlers Mead	08:00 – 22:00 hours	41 dB	49 dB
St Marys Street	08:00 – 22:00 hours	38 dB	48 dB

The report also recorded the range of maximum levels recorded during the daytime periods at each location measured as the maximum level (LAMax)

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Measurement Location	Time Period	Maximum Noise Level Range $L_{Amax}$	Highest Measured Noise Level $L_{Amax}$
Monkton Hill	08:00 – 22:00 hours	55 - 79 dB	79 dB
No. 8 Sadlers Mead	08:00 – 22:00 hours	47 - 78 dB	78 dB
No. 40 Sadlers Mead	08:00 – 22:00 hours	49 - 77dB	77 dB
St Marys Street	08:00 – 22:00 hours	45 – 76 dB	76 dB

The Company then considered the documentary guidance on the assessment of such sources, particularly using the British Standard 4142:1997. This is a method primarily for assessing whether industrial noise is likely to give rise to complaints, but it is also used as a planning tool. The method involves comparing the “rating level” of the source to the “background levels” at sensitive properties. The difference between the rating level and the background level indicates the likelihood of complaints and can be used to set a criterion for assessing whether unreasonable disturbance would be caused by the facility in question. In this case, on instructions, Mach acoustics have identified a criterion whereby the “Rating level of the skatepark, which is the specific noise from the source as an equivalent continuous noise level, plus a 5 dB character correction should not exceed the measured background levels.

The consultant also considered guidance on maximum noise levels, in order to address the impact noise of skate boarding. The report notes WHO guidance but then identifies the criteria adopted by the CIEH guidance on clay pigeon shooting and adopts a design criteria of a maximum noise level of 55 dB, measured or predicted as  $L_{Amax}$ .

Mach obtained source noise by observing and measuring at a skate park in Horfield, Bristol, and another at St Georges, Bristol. In each case measurements were made at the edge of a park whilst in use, over a one hour period. This data was used to obtain a source level of  $L_{Aeq} = 82$  dB at 1 metre from the source and  $L_{Amax} = 104$  dB, again at 1 metre from the source.

Mach then calculated noise levels at the addresses used for obtaining background noise levels using CadnaA commercial software. This software carries out the calculations in accordance with the relevant international standard ISO9613-2:1996 “Acoustics – Attenuation of sound during propagation outdoors.” This type of modelling takes into account the effects of screening from buildings, reflection from nearby buildings, the effects of ground absorption, all calculations are assessed as downwind for all directions the effects of light winds blowing from source to receiver as well as a wide range of other factors.

Mach used aerial photographs of the site and contoured cross-sections (supplied by the Council) in this model. Four scenarios were modelled including one with no mitigation, then with various barrier combinations, including the effect of sinking the facility into the ground. The results are shown below, firstly in terms of the assessment in accordance with British Standard 4142:1997:

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Noise Level	Monkton Hill	No.8 Sadlers Mead	No.22 Sadlers Mead	No.40 Sadlers Mead	St Mary's St
Existing background noise level $L_{A90}$	40	37	37	41	38
BS4142 Criteria, 5dB penalty	35	32	32	36	33
<b>No Mitigation</b>					
Calculated $L_{Aeq}$	28	36	32	28	30
BS4142 Criteria	-7	+4	0	-8	-3
<b>4.4m Barrier</b>					
Calculated $L_{Aeq}$	28	32	32	28	32
BS4142 Criteria	-7	0	0	-8	-1
<b>-1.5m Skate Park 1.9m Barrier</b>					
Calculated $L_{Aeq}$	28	32	32	28	29
BS4142 Criteria	-7	0	0	-8	-4
<b>-2m Skate Park 1.4m Barrier</b>					
Calculated $L_{Aeq}$	28	32	32	28	28
BS4142 Criteria	-7	0	0	-8	-5

Secondly, in terms of the maximum noise levels:

Scenario	Monkton Hill	No.8 Sadlers Mead	No. 22 Sadlers Mead	No.40 Sadlers Mead	St Mary's St
<b>No Mitigation</b>	50	58	54	50	52
<b>4.4m Barrier</b>	50	54	54	49	54
<b>-1.5m Skate Park 1.9m Barrier</b>	50	54	54	49	51
<b>-2m Skate Park 1.4m Barrier</b>	50	54	54	49	50

The report concludes that with appropriate mitigation the proposed facility can meet both the criterion set using the British Standard 4142;1997 methodology and the maximum levels derived from the CIEH guidelines on clay pigeon shooting.

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### Hoare Lea

Hoare Lea were asked to provide an independent assessment of the proposal, using the same criterion using British Standard 4142:1997, background noise levels (as measured by Mach acoustics) and the same cross-section data supplied to Mach. Hoare Lea did not identify the CIEH guidance for clay pigeon shooting as appropriate guidance. Hoare Lea was asked to use or obtain their own source data and carry out their own calculations.

Hoare Lea obtained their source data by measuring a series of individual bypasses of riders performing a variety of tricks at approximately 3 metres from the sound level meter. Having chosen a reasonable worst case from their measurements the consultant has then calculated for five simultaneous riders. Hoare Lea's source data for 5 simultaneous riders is for source level of LAeq = 72.5 dB at 3 metres from the source and LMax = 88.5 dB, again at 3 metres from the source.

Hoare Lea concluded that the proposal would be acceptable when set against the BS4142:1997 criteria with the use of a barrier of 4.2 metres on the Sadlers Mead side of the facility, partly returning down the North side, and a 1.6 m barrier on the St Marys Street side:

Scenario	Calculated Sound Pressure Level at Location, dB(A)			
	R1	R2	R3	R4
Single user, no screening, LAeq	39.7	36.2	32.1	34.7
Five users, no screening, LAeq	46.5	43.3	39.0	41.4
Single/Multiple user, no screening, LMax	57.9	54.5	50.4	52.8
Single user, screening, LAeq	28.6	26.1	22.2	28.4
Five users, screening, LAeq	35.0	31.9	31.1	35.0
Single/Multiple user, screening, LMax	44.6	41.6	39.1	45.8

In subsequent e-mail discussions, the consultant has identified that a combination of sinking the park by 2.5 metres and a 2.1 metre barrier on the Sadlers Mead side, partly returned down the North side, would also be acceptable. This would provide the required barrier without the need for a fence.

The report concludes that with appropriate mitigation the proposed facility can meet the criteria identified.

### Conclusion

Each consultant has worked independently and has concluded that, with appropriate mitigation, the proposed facility would be acceptable in acoustic terms.