

**21 August 2013**

**By email:** Victoria.Welsh@wiltshire.gov.uk; John.Freegard@wiltshire.gov.uk

Dear Victoria,

## **REVIEW OF CLARKE SAUNDERS ASSOCIATES LETTER**

Thank you again for your time today and I am sorry for not getting back to you sooner. I have now taken the time to review Jamie Duncan of Clarke Saunders Associates' letter dated 16<sup>th</sup> July 2013.

Overall, I feel that Jamie has somewhat rushed out a response, missing the key points. His approach appears to illustrate an eagerness to please his client, rather than a fair and considerate review.

For convenience, I have copied Jamie's letter below and added comments. Some elements of MACH Acoustics report have also been included, in blue text.

*Dear Sir*

### **AS7531 MONKTON PARK SKATEPARK, CHIPPENHAM Noise Impact of Proposed Skatepark**

*Further to our recent conversation and following our receipt of the two separate noise impact assessments undertaken by Mach Acoustics and Hoare Lea Acoustics, we are pleased to provide our comments and observations regarding noise from the site in relation to local receivers.*

This is the first example of a rushed response; the above statement clearly indicates that the scope is to review both MACH Acoustics and Hoare Lea's reports and comment on to local receivers. However the letter is titled 'Noise Impact of Proposed Skatepark' which is misleading, as this has not been undertaken in any real detail by CSA, and has also been by CSA later in Jamie's letter that only a brief has been undertaken.

#### *Mach Acoustics Report*

*We have undertaken a review of the report submitted by Mach Acoustics and found several notable concerns regarding the predicted noise impact from the new skatepark.*

*The report uses CadnaA noise mapping software to predict noise levels across the surrounding area and notes that the 'key advantage of using this type of modelling is its accuracy'. However, the accuracy of the model is determined entirely by the quality of the input data and parameters, which in this instance appear to be strewn with errors.*

This is clearly an example of where Jamie is trying to please his client. The word 'strewn' suggests repeated errors in the modelling, however only one error is raised. If Jamie had spent more time reading the report, he would have found that this was not in fact an error.

The source noise levels used for the calculations were based on measurements undertaken at a distance of 5m from the skateboard noise source, and are understood to be  $L_{eq}$  82dB(A) and  $L_{max}$  104dB(A). These have then been calculated back to a sound power level at source ( $L_w$ ) and are summarised in Appendix C of the report. Undertaking this calculation using standard noise propagation theory for a point source would involve adding the distance loss propagation ( $r=5m$ ),  $20\log(r)$ , [14dB] and then adding the hemispherical radiation correction of 8dB. Using the terminology of the report, this would result in a sound power of  $L_{Weq}$  104dB(A) and  $L_{Wmax}$  126dB(A), 10dB greater than those used by Mach Acoustics in the calculations.

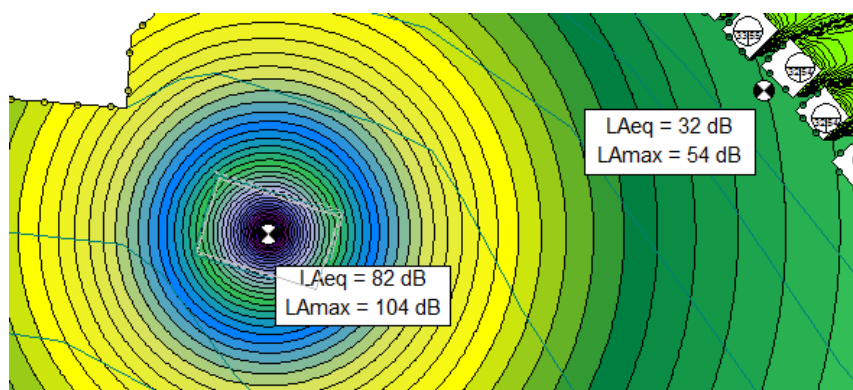
Figure 11 provided the noise levels measured at 1 meter from the edge of the two different skate parks. Please see below.

*To determine the noise impact of the proposed skate park at the nearest noise sensitive locations, MACH Acoustics have undertaken a series of measurements at existing skate parks. The following figures show noise levels measured at 1 metre from the perimeter of two concrete based skate parks. The sound level meter was set to measure 1 minute consecutive time samples.*

The next paragraph then states that this figure has been corrected to the centre of the skate park, a distance taken to be 5m from the measurement location.

*Figures 11 and 12 above show that the average noise levels measured at each skate park remain relatively constant when there is activity at the skate parks. Based on the location of the microphone during each skate park survey, calculations have been carried out to determine the noise levels at the centre of each skate park which was estimated to be approximately 5 metres distance from the microphone location. This calculated level can be defined as the reference source noise level. The following table summarises the calculated noise levels at the centre of each skate park*

The results are 82 dB  $L_{Aeq}$  and 104 dB  $L_{Amax}$  at the centre of the park. Figure 13 shows the noise map used to assess the spread of noise from the skate park. This illustration shows clearly that the sound pressure level in the centre of the park is equal to these values. For convenience, I have cropped the image and expanded it below.



There is therefore no need to add a 5m distance loss (-14 dB) as suggested by Jamie. The sound power levels given in Appendix C were calculated by Cadna. Appendix C shows a sound pressure to sound power conversion of 12 dB, this is more onerous than Jamie's 8 dB correction.

*This would obviously have a similar effect (10 dB higher) on the predicted noise levels at all receivers, with maximum event noise levels at many receivers in the mid-60dB range and are likely to give rise to significant disturbance when assessed under the CIEH guidelines.*

This is an extension of the incorrect statement made above, therefore we have no further comment.

*The BS4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas results would initially appear to be less affected. However, the Mach Acoustics report makes one large assumption that we would consider to be incorrect. The minimum background noise level, L90, used for the assessment is based upon the assumed operational hours of 08:00 and 22:00 hours. However, from our extensive experience of assessing noise from skatepark applications and indeed noise problems leading to their removal, skateparks are often used much later at night than this, and often can be used into the early hours of the morning in the summer months, unless they are actively secured to stop access at the end of every evening. Background noise levels at 8 Sadlers Mead are shown on the time history as falling to 30dB(A) between 00:00 – 00:30.*

This is clearly a statement looking to please the client. ‘Mach Acoustics report makes one **large** assumption that we would consider to be incorrect’. As stated on a number of occasions, my three boys and I very much enjoy a variety of sports, including surfing, kite surfing, sailing, windsurfing, BMX/scooter riding, mountain biking and many other sports requiring hand-eye coordination. I have never managed to do any of these in the dark. With respect to out of hours noise, there is nothing to prevent a member of the public sitting in the park directly outside one of the sensitive receivers.

If the calculations are undertaken using the correct sound power level calculated previously of Lw 104dB(A), this would result rating levels of +10dB at Sadlers Mead (or +17dB if using the lower background noise level measured during the night-time). Both of these would be a positive indication that ‘complaints are likely’ when assessed in accordance with BS4142.

This statement has been shown to be down to not studying MACH Acoustics report with more than just a rushed approach.

Another point to highlight is that on page 20 of the report, it is stated that as the (incorrectly) calculated maximum noise levels are more than -5dB lower than existing measured maxima, then “this is a positive indication that impulsive noise from activity at the skatepark will not be audible over the existing maximum noise level climate at the residential properties”. This statement is entirely incorrect, as maximum noise events from skateboarding can still be audible 10-15dB below the existing noise level due to the entirely different noise character of the source.

Here we are in agreement, but the wording is again misleading, ‘entirely incorrect’. If an exact level could be provided relating to inaudibility, Jamie would not have provided a range. MACH Acoustics report should have indicated that noise is not likely to be intrusive, however whichever word we used it would have been wrong as what we hear is subjective. We do however take Jamie’s point on board.

*It should be noted that the noise levels measured by Mach Acoustics are quite a lot higher than measurements undertaken by us [CSA] at several sites.*

After stating that our modelling was ‘strewn with errors’ but only highlighting one error (which was in fact not an error), Jamie then goes on to state that the sound levels MACH Acoustics has used are ‘a lot’ lower than CSA are accustomed to using. This raises the issue as to why Jamie did not question his results. If MACH were using higher source levels, why would CSA, who are stated to have been using lower levels, predict higher levels at the residences.

CSA’s sound pressure levels are clearly higher than MACH Acoustics’, this is shown in both of our reports. The above contradiction comes when using CSA’s method of converting sound pressure to sound power and

then back to sound pressure. Using CSA's conversion method, including a distance loss, results in MACH Acoustics levels being significantly higher than CSA's levels. If you don't include for a distance loss, then MACH Acoustics levels are within +2 dB of Hoare Lea's levels and -5 dB below CSA.

Additionally, we feel that this point should have been raised earlier in the letter, rather than stating that MACH Acoustics are under predicting noise levels.

#### *Hoare Lea Report*

*It is understood that HLA were provided with the background noise level of L90 36dB(A) and asked to undertake an additional assessment to support the Mach Acoustics report. To ensure a robust assessment, HLA used 35dB(A) as the background noise level for the assessment. However, as stated earlier, the background noise level could drop to 30dB(A) or less, which would alter the finding of the report dramatically.*

Only if you skate in the dark.

*Review of noise levels measured by HLA showed average noise levels at 3m of Leq 69dB(A) and Lmax 88dB(A). These are considerably lower than those measured by Mach Acoustics at a greater distance, and are approximately 7dB less than would be expected from our [CSA] library data at a distance of 3m.*

Translating Hoare Lea's figures to 1m levels, it is seen that Hoare Lea's levels are within 2 dB of MACH Acoustics' source levels.

#### *Conclusions*

*As previously shown, there are many issues with the input data in both reports that result in an inaccurate assessment of likely noise levels at nearby receivers.*

CSA has only published a single figure for skate park noise, which is considerably higher than both MACH Acoustics and Hoare Lea's figures. CSA's figure is stated to be at 40 meters from the park. If this is the measurement location, then it should not be relied upon, as it is highly likely to be affected by other noise sources. The 3 measurement levels presented by MACH and Hoare Lea are within a few dBs of each other, however CSA's figure is significantly different. This, along with the 40m statement would lend me to doubt CSA's levels.

The above statement also contradicts Jamie's statement below, more care should have been taken.

It should be noted that the noise levels measured by Mach Acoustics are quite a lot higher than measurements undertaken by us [CSA] at several sites.

#### *Mach Acoustics*

- *Calculated power levels for the average and maximum events incorrect;*
- *Average levels used were Lw 94dB, should be Lw 104dB;*
- *Maximum levels used were Lw 116dB, should be Lw 126dB;*
- *No reference made to late night use which would have a much higher noise impact;*
- *Statement that maximum events will not be audible at houses as they are lower than existing maximum events is incorrect because of different characters of noise.*

The stated '*...Lw 94dB, should be Lw 104dB... , ...Lw 116 dB should be Lw 126 dB...*' far exceeds both CSA's and Hoare Lea's measured levels. This should have been picked up by CSA before they sent out the letter. If Jamie had not made this error then CSA's letter would show very different conclusions.

The last point made above is fair.

*Hoare Lea Acoustics*

- *Source noise levels considerably lower than library data measured by CSA at many sites;*
- *Average levels used were 69dB(A) @3m;*
- *Maximum levels used were 88dB(A) @3m;*
- *Both the above levels would be lower than expected by CSA and considerably less than those measured by Mach Acoustics;*
- *Maximum levels compared against a criterion for average external anonymous noise sources.*

Again, if Jamie had not made the distance correction, he would have found that MACH Acoustics and Hoare Lea are using very similar levels, which in turn may have led him to question CSA's library containing results from many sites. It would also be useful to see other results rather than just a single result. MACH Acoustics published two sets, with tight correlation which each other.

To illustrate the likelihood of complaint for the park in its proposed location, we [CSA] have undertaken our own brief noise impact assessment using library data, the same night-time background noise level of L90 37dB(A) and the distance to the nearest receiver used by HLA of 97m.

The methodology used for the assessment has been accepted by the court in the landmark case in relation to skateboard noise, Richardson vs. Devizes Town Council and have been adopted by a number of local authorities and other acoustic consultants (including Mach acoustics). The results of the noise impact assessment with no mitigation shows a rating level of +14dB in accordance with BS4142, and maximum levels of Lmax 64dB(A) at nearby receivers (calculations attached ref: AS7531/C1). It should be noted that if the skatepark were to be used later at night, the rating level could increase to +21dB(A).

This shows that noise levels would need to be mitigated by at least 14dB to reach a level at which the 0dB desired by the Council, and at which complaints are not likely, which is considered in practice to be very difficult to be achieved, and hence this location does not appear to be suitable in terms of noise for the proposed skatepark.

Jamie has criticised the use of Cadna but is happy to review things based upon 'our own **brief** noise impact assessment'. The conclusion of this brief assessment is that noise levels are 14 dB over background noise levels and 21 dB for those riding 'between 00:00 – 00:30'. Firstly, CSA have stated that their library of data is 7 dB over Hoare Lea's data. They have not stated where the receiver location is taken to be. MACH Acoustics has assessed all locations by mapping the sound over the site and surrounding areas. The calculations provided by CSA are very brief and basic, the Cadna mapping used by MACH Acoustics is based upon a provided section of the land, see Appendix B. Using this topographical data, the Cadna model includes 7 dB losses for ground absorption. Combining these two figures shows that noise levels do not exceed background levels, which if we are looking at the same position as CSA, it can be concluded that our results are identical.

Yours Sincerely,

  
**MACH ACOUSTICS**