ACOUSTIC CONSULTANTS LTD

Westmead Climb and Skate Park
Westmead Lane, Chippenham

Noise Impact Assessment

Reference: 7412/DO/PR
February 2019

Westmead Climb and Skate Park
Westmead Lane, Chippenham

Noise Impact Assessment

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Issue Number:
Revision C

Date:
8 February 2019

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1. Introduction

Chippenham Borough Lands Charity appointed Acoustic Consultants Limited to undertake an environmental noise assessment for the proposed Westmead Skate and Climb facility off Westmead Lane in Chippenham. The assessment considered the impact of environmental noise on the nearby noise-sensitive residential properties.

The assessment includes the prediction and assessment of noise emission from the proposed external skating area and provides noise criteria for fixed plant associated with the development.

2. The Site

The project includes the construction of new buildings and facilities on the north west of open grass land located to the South of Westmead Lane and to the West of Avenue La Fleche in Chippenham. The proposals comprise two buildings with different climbing environments and associated café and ancillary spaces. To the west of these buildings is to be an external concrete bowl type skating area.

The site is bordered by grassland to the South and East with commercial buildings directly to the north and the river Avon to the West.

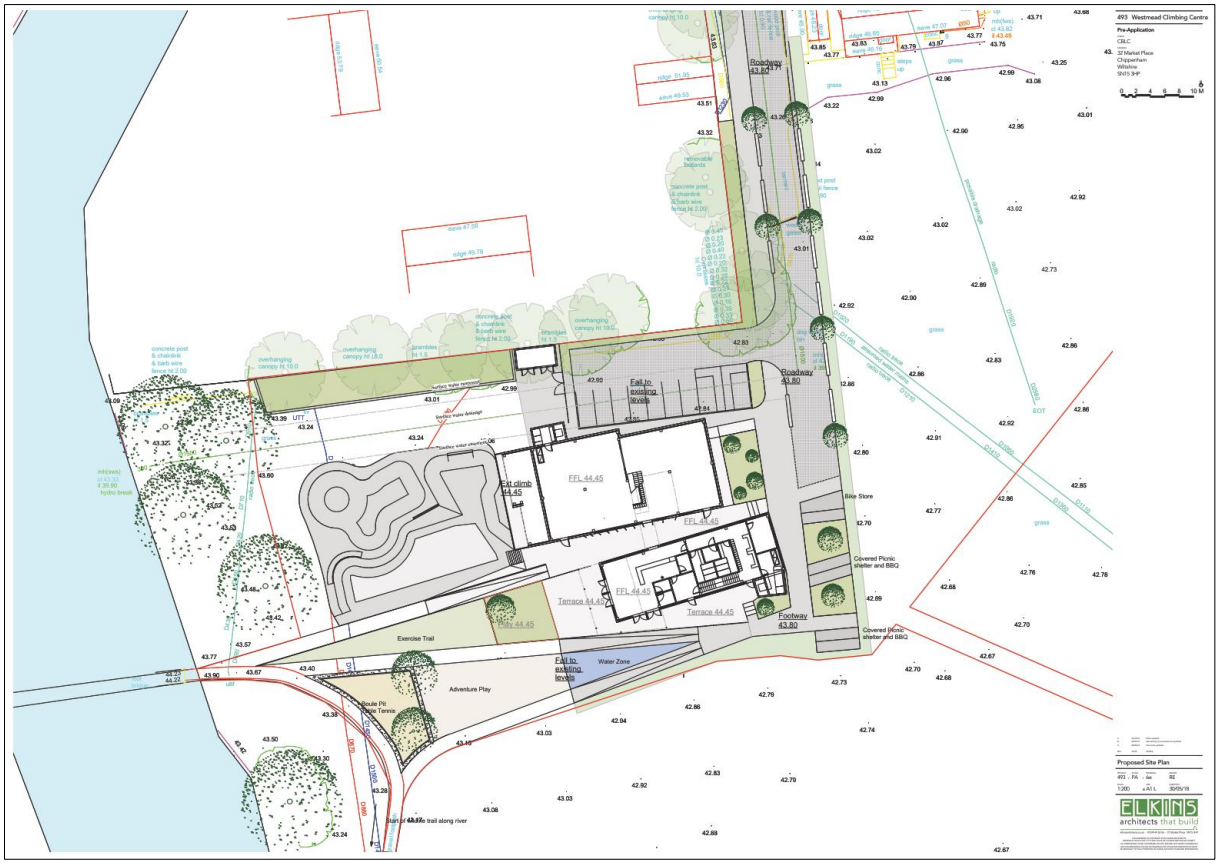
The nearest noise sensitive receptors are the houses to the East on The Paddocks and to the West on Charter Road.

The existing noise climate in the area is determined primarily by road traffic on the A4 Avenue La Fleche.

The skating bowl is to be artificially lit, the proposed opening hours of the facility are until 22:00 hours.

The proposed site is shown on Figure 1 below:

Figure 1: Proposed site plan



3. Planning and Noise

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and revised in July 2018. Section 15 entitled 'Conserving and enhancing the natural environment' addresses noise as a requirement of planning. Paragraph 170 states:

"170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."

Paragraph 180 states:

"180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[1]
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and
c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation. "

The document does not prescribe any assessment methodology or criteria to assess the adverse effect of noise.

[1] *See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010*

3.2. Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion and applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long term vision of Government noise policy. This long term vision is supported by three noise policy aims as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

avoid significant adverse impacts on health and quality of life;
mitigate and minimise adverse impacts on health and quality of life; and
where possible, contribute to the improvement of health and quality of life."

The NPSE introduces the concept of "Significant adverse" and "Adverse" impacts of noise which relate to the noise policy aims. These are applied as follows:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. With regard to where there is potential for noise impact it states the following in relation to the second noise policy aim:

"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and

minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur."

The NPSE does not provide any assessment criteria for the noted effect levels and each case must be considered on its merits. The NPSE does, however, emphasise that in dealing with noise Local Planning Authorities are required to take a balanced approach in considering the benefits of development as against any adverse effects which arise. Paragraph 2.18 of the NPSE is particularly relevant in this respect and states:

"There is a need to integrate consideration of the economic and social benefits of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors."

The planning need is outside the scope of noise and acoustics and will need to be addressed by others.

3.3. National Planning Practice Guidance, Noise (NPPG)

The National Planning Practice Guidance (NPPG) on noise referred to here is based on the current version (January 2015) as provided on the Planning Guidance Website.

It states that *"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."*

It provides generic guidance on how to determine the noise impact and what factors could be a concern. It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation.

Paragraph 5 of the NPPG provides a table identifying the effect level and examples of effect relating to the impact effect levels provided in the NPSE. The table is duplicated below:

Table 1: NPPG Noise – Perception of Effect Levels

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

The table does not provide any objective assessment which equates to the noted effect levels.

The NPPG identifies that where noise is audible it is not necessarily intrusive. The effect and impact on people is based primarily on the level of noise.

The Noise Policy Statement for England (NPSE) states that noise levels above the Lowest Observed Adverse Effect Level are acceptable in planning where reduced to a minimum when taken into account against all other planning considerations.

Section 4 of this report identifies guidance which is considered to provide noise criteria equivalent to effect levels below the Lowest Observed Adverse Effect Level. This is where the perception of noise is “not noticeable” or “noticeable but not intrusive” as indicated in Table 1 above.

4. Relevant Noise Guidance

The site will generate recreational noise as well as noise from fixed plant serving the building. Noise from recreational use will be primarily from the external skating activities, the use of the building is for climbing which is a quiet activity and as such noise emission from internal activities is expected to be negligible.

The following sections identify criteria which is considered appropriate for the assessment of recreational and fixed plant noise.

4.1. World Health Organisation 'Guidelines for Community Noise'

The World Health Organisation 'Guidelines for Community Noise' published in 1999 gives the following description of community noise.

"Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood. Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; sport events including motor sports; playgrounds; car parks; and domestic animals such as barking dogs."

This includes "*sport events*" and "playgrounds" which in our view would cover skate parks.

For noise levels internally and externally to dwellings it states:

"In Dwellings. The effect of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 LAeq for continuous noise and 45 LAmax for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from façades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedrooms open. This value was obtained by assuming the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq. The maximum sound pressure level should be measured with the sound pressure meter set at "fast"."

Based on the same methodology used to determine the night time noise level (with a 15 dB(A) for an open window) outside a residential property, the daytime noise level about 1 metre from façades of living spaces should not exceed 50 dB L_{Aeq}.

Table 4.1 of the document provides guidelines for community noise in specific environments, suggesting noise levels at which adverse health and annoyance effects are likely. The relevant noise criteria are as follows:

Table 2: WHO Noise Criteria

Specific Environment	Critical Health Effect	$L_{eq(T)}$ dB(A)
Outdoor living area	Serious annoyance, daytime and evening	55
	Moderate annoyance, daytime and evening	50
Dwelling indoors	Speech intelligibility & moderate annoyance, daytime & evening	35

According to the WHO guidance, moderate annoyance is caused by noise levels exceeding 50 $L_{Aeq(T)}$ dB externally and 35 $L_{Aeq(T)}$ dB internally. With relation to the adverse effect level we would consider this the threshold of the Lowest Observed Adverse Effect Level.

Therefore, where noise levels from the proposed development do not exceed 50 $L_{Aeq(T)}$ dB externally and 35 $L_{Aeq(T)}$ dB internally, the effect is below the Lowest Observed Adverse Effect Level, and will have no adverse effect. The noise level of the skate park may be noticeable but not intrusive and is considered acceptable in planning terms.

The equivalent noise level is determined over a specific time period. The World Health Organisation guidelines for residential development are typically equivalent noise levels calculated over a 16-hour daytime period.

In our opinion, a 16-hour assessment period may not truly reflect the noise impact as it takes into account times of use and non-use. We would propose an alternative, more stringent but appropriate assessment time period of one hour, $L_{Aeq\ (T)}$ where it is assumed T is a period of continuous skate park use. In reality the use of skate park is intermittent and skaters often pause

between runs so this assessment is expected to present a worst-case where the real world impact is less.

The WHO criteria were reviewed in a report by the National Physical Laboratory (reference CMAM16) which states:

"Exceedance of the WHO guideline values does not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher levels of noise exposure are reached."

Therefore, it is not necessarily the case that where these levels are exceeded the noise will adversely affect nearby residential properties. The proposed criteria is a conservative and stringent noise criteria.

4.2. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

British Standard 8233:2014 entitled 'Guidance on sound insulation and noise reduction for buildings' came into effect on 28th February 2014 and supersedes British Standard 8233:1999.

Table 4 of the British Standard provides internal ambient noise levels for dwellings from noise sources 'without a specific character' and are based on existing guidelines issued by the World Health Organisation in 1999. The British Standard provides no definition of noise 'without a specific character'.

No reference of guidance on sporting or recreational uses is given in the British Standard, unlike the WHO Guidelines. As such, we propose that the definition of community noise is applicable to the proposed noise limits. The British Standard 8233:2014 provides the same guidance levels as the World Health Organisation document.

4.3. Comparative Assessment

The criteria set out in section 4.1 is an absolute level in a dwelling or external amenity area. As such, it does not consider existing noise levels on or around the site. However, for certain applications it may be more suitable to consider a comparative assessment as part of the overall impact assessment.

For example, this would be a site where the existing noise levels already exceed the WHO guideline values. This existing noise for example, could be due to transportation noise or other sporting facilities.

The Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment, Version 1.2 published in November 2014 categorises the significance of a change in noise level this is summarised as follows and taken from Table 7-14 of the guidance:

Table 3: IEMA Impact from the Change in Sound Levels (Table 7-14)

Long-term impact classification	Short-term impact classification	Sound Level Change LpT
Negligible	Negligible	> 0 dB and < 1 dB
	Minor	> 1 dB and < 3 dB
Minor	Moderate	> 3 dB and < 5 dB
Moderate	Major	> 5 dB and < 10 dB
Major		> 10 dB

Where noise from the proposed development does not exceed the existing noise climate, the increase in noise will be no more than 3 decibels. It is expected there will be no observed effect on nearby residential properties. This would be applicable where noise levels currently exceed the WHO guidelines which would be used as a lower limit. The noise levels are both measured in the LAeq(T) parameter over the same time period, T.

4.4. Proposed Assessment Methodology for Recreational Use

It is proposed to assess the development against the WHO guidelines. Where the predicted noise level of the recreational use is below the WHO guidelines threshold for the onset of 'moderate annoyance' in terms of the NPPG, the development will have 'no observed adverse effect'.

It is considered that where the proposal exceeds the WHO guidelines but does not increase the existing evening noise climate by more than 3 decibels, there will be no adverse impact on the nearby noise sensitive residential properties and by more than 3-6 decibels, there will be no significant adverse impact on the nearby noise sensitive residential properties. It is our opinion that this would also fall within the Lowest Observed Adverse Effect Level of the NPPG.

The NPPG states that the perception of 'No Observed Adverse Effect' is 'noticeable and not intrusive' and gives an example outcome as follows:

"Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life."

The 'No Observed Adverse Effect' level falls below the Lowest Observed Adverse Effect Level of the NPPG.

4.5. British Standard 4142:2014

The British Standard 4142:2014 entitled 'Method for rating and assessing industrial and commercial sound' describes methods for rating and assessing sound of an industrial and/or commercial nature by comparing the Rating level of the noise under assessment against the Background Noise Level.

The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound upon people who might be inside or outside a dwelling or other premises used for residential purposes. The principle is that of establishing the 'difference' between the 'rating level' and the 'background sound level'.

The 'rating level' is the 'specific sound level' of the source over a period of one hour during the day (07:00 to 23:00 hours) and over a period of 15 minutes during the night (23:00 to 07:00 hours). Section 9 entitled 'Rating Level' states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level."

An acoustic character correction should be added to the 'specific sound level' if it exhibits any tonality, impulsivity, other specific characteristics and/or intermittency at the assessment location. The value of the character correction varies, dependent on the prominence of the character of the sound source at the assessment location.

In Section 11 of the Standard, entitled 'Assessment of the Impacts', it states:

"Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following.

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

As such, where the assessment difference is 0 dB or less, the impact is likely to be low depending on the context. This is the criteria we have used in our assessment.

Based on the initial assessment outcomes of British Standard 4142, and depending on context, it is our opinion that the NOEL, LOAEL and SOAEL levels stated in the Noise Policy Statement for England would generally fall within the following categories when considered in conjunction with the effect levels of the NPPG Noise.

- NOEL – The No Observed Effect Level is considered to apply where the rating level does not exceed the background sound level (less than or equal to 0dB) would fall within the No Effect level or No Observed Adverse Effect level of the NPPG Noise.

- LOAEL – The Lowest Observed Adverse Effect Level is considered to fall between a difference of 0dB (where according to British Standard 4142:2014 the impact is low) and 5dB (where according to British Standard 4142:2014 there is a likely indication of adverse impact).

- SOAEL – The Significant Observed Adverse Effect Level is considered to fall between a difference of 5dB (where according to British Standard 4142:2014 there is a likely indication of adverse impact) and 10dB (where according to British Standard 4142:2014 there is a likely indication of significant adverse impact). A difference in excess of 10dB is expected to result in an unacceptable adverse effect and therefore exceeds the significant observed adverse effect level.

With regard to use of BS4142:2014 for assessing recreational activities within section 1 'Scope', paragraph 1.3 the British Standard states:

"The standard is not intended to be applied to the rating and assessment of sound from:
a) recreational activities, including all forms of motorsport."

Whilst a comparison with Background Noise Levels could be undertaken, there is no way of determining the impact on noise-sensitive properties or the likelihood of complaints from this noise type. It is therefore not considered appropriate to use the British Standard for the assessment of this type of activity.

5. Noise Levels of Skate Park Activity

Noise emission levels have been identified from the TÜV Thüringen Analagentechnik GmbH report entitled "Sonic study of skating obstacles, Skate-Park Rodgausee, Measurement of Skate Stone skating obstacles" dated 21st August 2000. This is based on three skateboarders using various obstacles of the skate park simultaneously. According to the report, the noise level from the skate park is 55 LAeq decibels at 25 metres.

Acoustic Consultants undertook noise monitoring at an existing Skate Park in Somerton, Somerset on the 13th May 2008 to determine noise levels from Skate Park activities. The most significant source of noise was due to the impact of the wheels on the concrete obstacles.

A total of seven skateboarders were measured using various obstacles continuously for the 10-minute measurement period. The Environmental Health Officers criteria called for no less than 10 skateboarders but it was not possible to arrange for this to happen at the Somerton site.

It is our opinion that this will not significantly affect the measured noise levels. During the measurement period the skateboarders were using the obstacles constantly, queuing to use the obstacles. As such, increasing the number of users would not increase the frequency the obstacles were used.

Measurements were taken at 5 metres from the Skate Park to ensure that the Skate Park was the primary source of noise. The measured noise level was 68 dB $L_{Aeq,T}$ free-field.

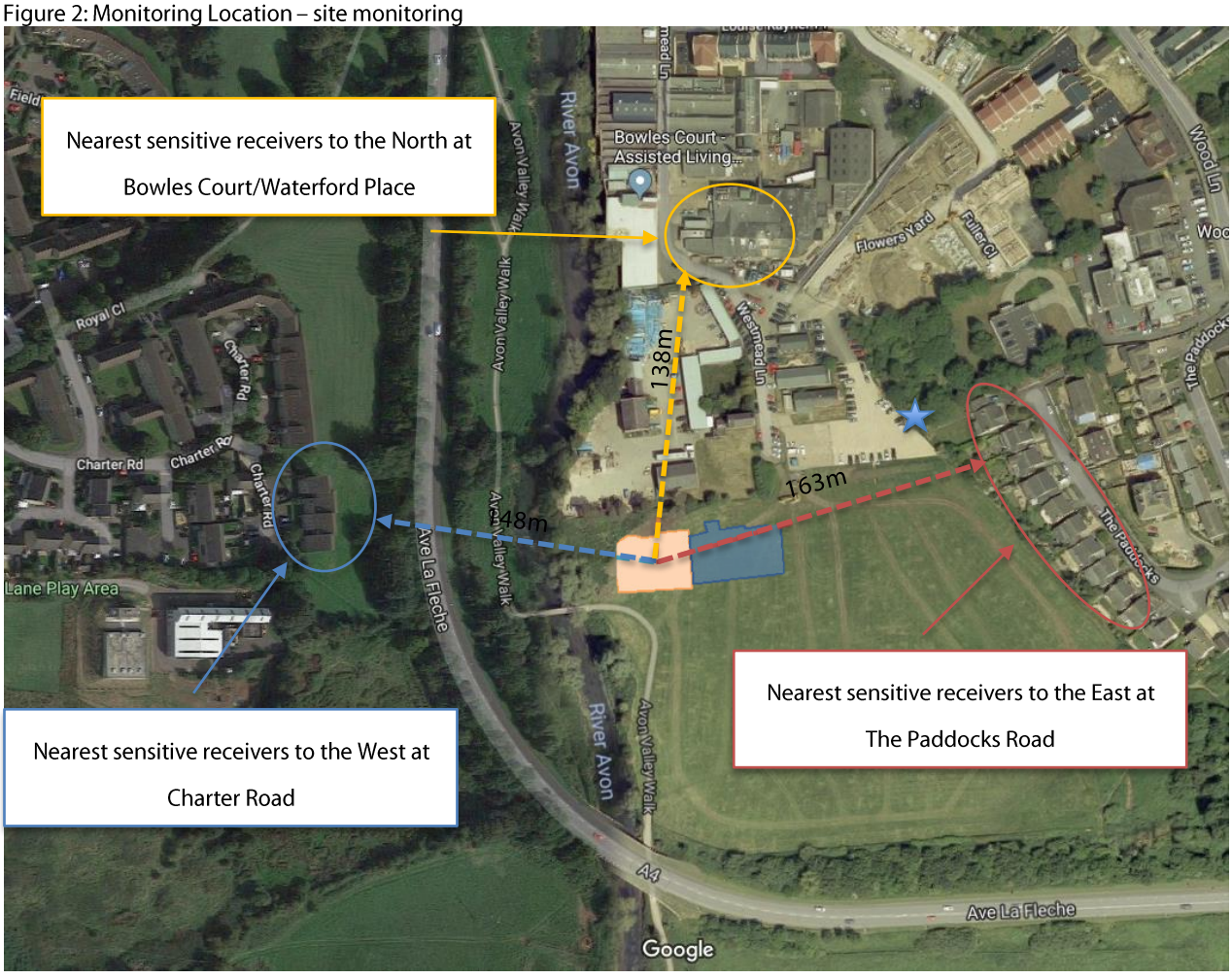
6. Site Noise Monitoring

An attended site noise survey was undertaken on the 8th and 9th October 2018 at a monitoring location considered representative of the noise sensitive properties in the area; see Figure 2 below.

The nearest noise sensitive receivers are understood to be dwellings located to the west on 'Charter Road' and at approximately 148 metres from skatepark, dwellings to the north on 'Bowles Court/Waterford Place' and at approximately 138 metres from skatepark and dwelling to the east on 'The paddocks' road approx. 163 metres from the skatepark.

Although the dwellings located to the north and west are considered to be closer to the proposed skate park than the dwellings located to the east, they are considered to be closer to the Ave La Fleche Road and therefore likely to have higher levels or road traffic noise.

Figure 2: Monitoring Location – site monitoring



The measurements were undertaken generally in accordance with British Standard 7445. During the monitoring exercise, the main noise source was road traffic along the A4, Avenue La Fleche.

Sound pressure levels were measured using a Class 1 sound level meter, with a half-inch condenser microphone, using the 'fast' setting. The equipment is checked regularly using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2005, and in accordance with British Standard EN 10012:2003, and traceable to the National Standards.

This equipment was checked and calibrated as noted below and the certificates are available for inspection. Table 9 provides the equipment and calibration status.

Table 4: Equipment and Calibration Status

Equipment Description / Manufacturer / Type	Serial number	Date of calibration	Calibration Certification Number
SLM, NTI, XL2	A2A-13617-E0	13/09/2018	FL-18-082
Pre-Amp, NTI, MA220	7727	13/09/2018	FL-18-082
Microphone, NTI, MC230A	A16151	13/09/2018	FL-18-082
Calibrator, Larson Davis, CAL200	12605	16/04/2018	283673

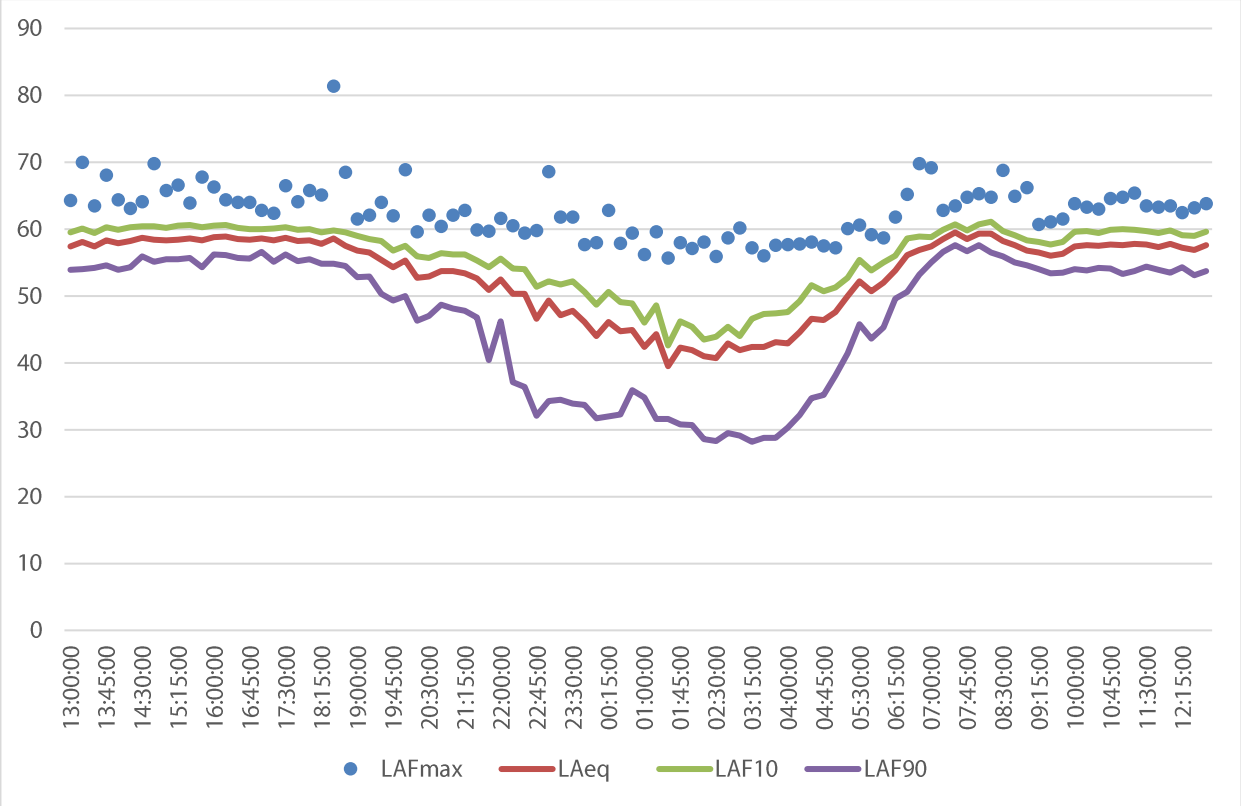
The measurement system was checked before and after use with the noted calibrator and no significant drift was detected.

The weather conditions throughout the survey were dry, with an air temperature of 12 degrees Celsius and a South Easterly wind of less than 5 metres per second.

The equipment was set up in a free-field position on a tripod 1.5 metres above the ground. To the East of the site close to the houses on The Paddocks. This survey location was chosen as these houses are expected to experience lower noise levels from road traffic than those to the West of the site and will therefore provide the more onerous criteria. The monitoring location is shown below in Figure 3.

The following chart provides the measurement data between 18:00 hours and 22:00 hours:

Chart 1: Measured noise levels



The facility is expected to operate until 22:00 hours. The following table provide the typical background sound levels for opening hours (07:00 to 22:00 hours) and other times (22:00 hours to 07:00 hours).

Table 5: Measured noise levels

Time Period	Typical Background Sound Level (dB)
07:00 to 22:00 hours	43dB $L_{A90(1\ hour)}$
22:00 hours to 07:00 hours	29dB $L_{A90(15\ minutes)}$

The following table provides the equivalent noise level from 13:00 hours to the closing time of the site (22:00 hours) for comparison with the predicted noise level of the skate park.

Table 6: Measured noise levels

Time	$L_{Aeq,1\ hour}$ (dB)	Time	$L_{Aeq,1\ hour}$ (dB)
13:00	58	19:00	56
14:00	58	20:00	54
15:00	58	21:00	53
16:00	59	-	-
17:00	58	-	-
18:00	58	-	-

7. Skate Park Noise Emission Prediction

To determine noise levels across the site, noise modelling has been undertaken using computer modelling package Cadna:A by DataKustik and the measured data noted above. The software predicts industrial noise using the general method of calculation from 'ISO 9613-1'. The modelling parameters are as follows:

A noise model has been generated of the development site and surrounding area.

The topography of the area has been determined from height points provided by Environment Agency Lidar data.

The location of surrounding buildings has been determined from data provided by Open Street Map.

The proposed site layout has been taken from the Elkins Architects drawing Proposed Site Plan 493/PA/6b dated 30/05/18.

The ground is generally considered to be soft and absorbent, the height of existing residential buildings has been assumed to be 6 metres and the height of the proposed buildings has been determined from the site elevation drawings.

Third-order reflections are calculated.

The noise source has been included as an area source over the location of the skate bowl. The bowl will be sunk into the ground but as the details of this are not available, we have placed the noise source 0.1 metres above the existing ground level. It is expected that noise within the sunken bowl will be lower at the noise sensitive properties than that at ground level but to ensure that this attenuation is not over estimated we have not included this within the model.

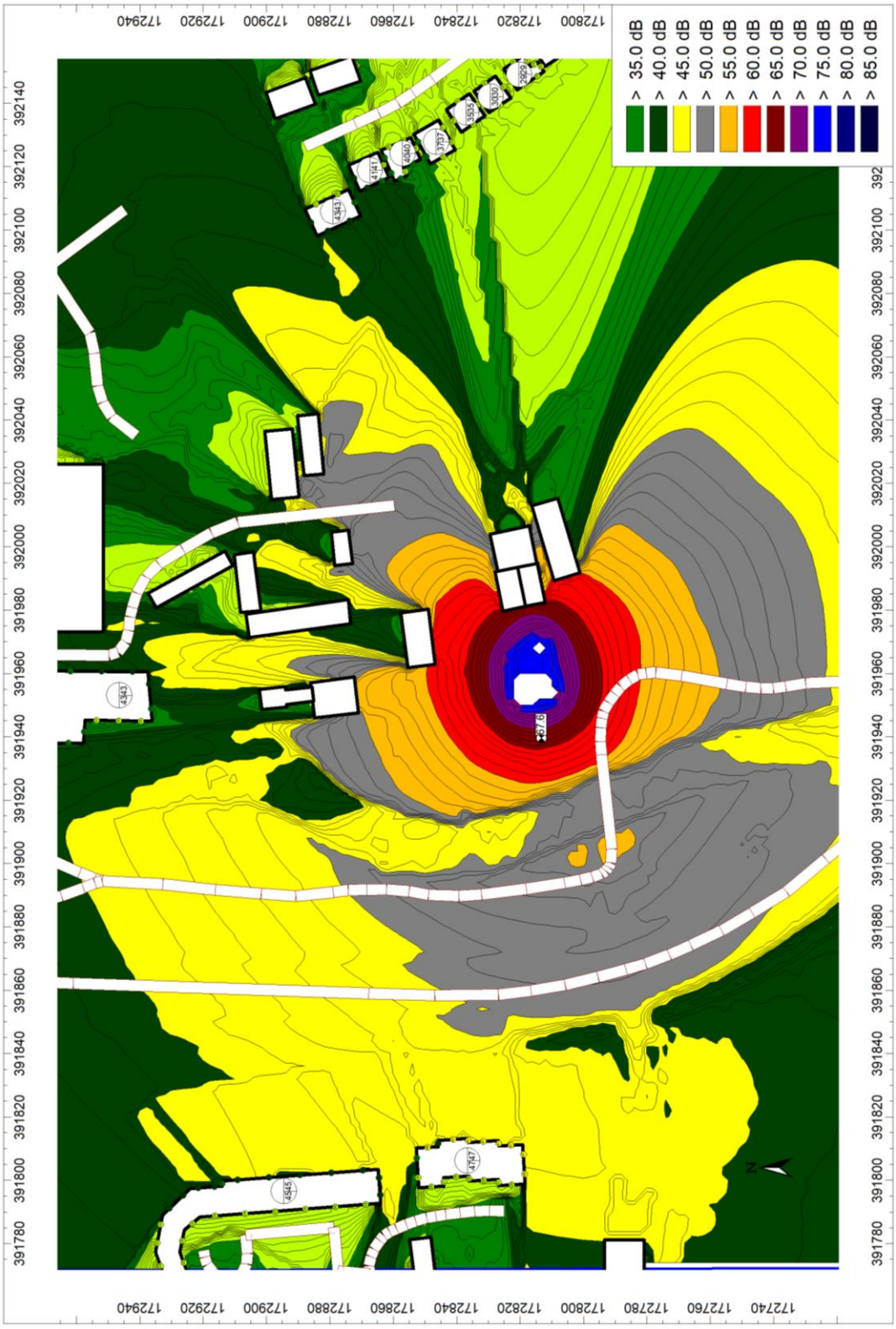
The sound reduction provided by the boundary fences around the gardens is not considered in the modelling as it cannot be demonstrated that the construction complies with the requirements of ISO 9613.

The noise map in section 7 shows noise emission from the skate park predicted at ground floor level (1.5 metres above the ground), which is typical of a 'daytime' habitable room in a house and external amenity areas.

8. Predicted Noise Level Assessment

The following figure shows the predicted noise emission from the proposed external skating area. Residential noise sensitive receivers are marked in beige.

Figure 3: Predicted Skate Park Noise Emission (1.5 metres above the ground).



The highest predicted noise level at the residential properties to the West is 47 dB $L_{Aeq\ (1\ hour)}$ and 43 dB $L_{Aeq\ (1\ hour)}$ on both East and North residential properties.

The predicted noise levels are below the proposed criterion of 50 dB $L_{Aeq\ (1\ hour)}$ derived from WHO1999 as being the threshold for the onset of moderate community annoyance.

The World Health Organisation provides a sound reduction through an open window of 15 dB(A) which results in a predicted internal equivalent noise level of 33 dB $L_{Aeq\ (1\ hour)}$. The World Health Organisation guidance states *"To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35 dB LAeq."* British Standard 8233:2014 provides the same noise criteria for a bedroom during the daytime period.

The predicted noise level of 47 dB in gardens is below the criteria at which moderate community annoyance in outside living areas (such as gardens) can occur, stated in World Health Organisation 1999 as 50 dB $L_{Aeq\ (1\ hour)}$.

On the basis of the above, the proposals are considered acceptable in terms of noise.

9. Impact on Existing Noise Climate

The impact of noise from the proposed skate park on the existing noise climate has been assessed using the IEMA guidelines. The following table gives the predicted noise level, representative existing noise level, overall change and IEMA classification at the noise sensitive locations.

Table 7: Measured noise levels

Time	Existing Equivalent Noise Level, dBA	Predicted Equivalent Noise Level, dBA	Change, dB	Long-term Classification
13:00	58	47	0.3	Negligible
14:00	58	47	0.3	Negligible
15:00	58	47	0.3	Negligible
16:00	59	47	0.3	Negligible
17:00	58	47	0.3	Negligible
18:00	58	47	0.3	Negligible
19:00	56	47	0.5	Negligible
20:00	54	47	0.8	Negligible
21:00	53	47	1.0	Negligible

On the basis of the IEMA guidelines the proposals result in a negligible increase in the overall noise climate. This is considered acceptable in noise impact terms and indicates noise from the skate park is likely to be inaudible or barely audible over the existing noise climate.

It is also pertinent to note that the predicted noise levels, in addition to having a negligible impact on the existing noise climate, are at a level which is considered to be below the onset of community annoyance.

10. Plant Noise Limits

Noise from fixed plant affecting nearby noise-sensitive receivers will need to be suitably limited so as to avoid creating an adverse impact on residential occupiers. The following noise limits are to be applied to plant associated with the development and should be determined at the nearby noise-sensitive residential properties.

These limits are based on the survey results, British Standard 4142:2014, guidance of the NPPG. In addition, the Local Authority also advised that plant noise levels should be at least 5dB below background noise at the nearest noise sensitive receiver.

Based on the measured data we would advise that plant noise is designed to achieve the following maximum cumulative 'free-field' rating sound levels at the nearest noise sensitive receivers:

- 07:00 to 22:00 hrs - 38 dB $L_{Ar\ (1\ hour)}$
- 22:00 to 07:00 hrs - 24 dB $L_{Ar\ (1\ hour)}$

With plant meeting the above limits the plant rating sound level will normally result in a 'difference' of -5dB at the façade of the noise-sensitive dwellings. A 'difference' of -5dB would normally be considered acceptable in planning and is considered to be below the LOAEL (Lowest Observed Adverse Effect Level) of the NPPG.

The rating sound level should include for any reasonable corrections for character, i.e. tonality, intermittency, impulsivity and other sound characteristics.

11. Limitations

The report limits itself to addressing solely on the environmental noise aspects as included herein. We provide advice only in relation to noise and acoustics. It is recommended that appropriate expert advice is sought on all the ramifications (e.g. CDM, structural, condensation, fire, legal, etc.) associated with any proposals in this report or as advised and concerning the appointment.

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

It should be noted that noise predictions are based on the current information as we understand it and on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event, subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

12. Summary and Conclusions

Chippenham Borough Lands Charity appointed Acoustic Consultants Limited to undertake an environmental noise assessment for the proposed Westmead Skate and Climb facility off Westmead Lane in Chippenham. The assessment considered the impact of environmental noise on the nearby noise-sensitive residential properties.

The project includes the construction of new buildings and facilities to the north west of open grass land located to the South of Westmead Lane and to the West of Avenue La Fleche in Chippenham. The proposals comprise two buildings with different climbing environments and associated café and ancillary spaces. To the west of these buildings is to be an external concrete bowl type skating area.

The nearest noise sensitive receptors are the houses to the East on 'The Paddocks' and to the West on 'Charter Road 'and to the North on Bowles Court/Waterford Place'

The site will generate recreational noise as well as noise from fixed plant serving the building. Noise from recreational use will be primarily from the external skating activities, the use of the building is for climbing which is a quiet activity and as such, noise emission from internal activities is expected to be negligible.

A noise model has been generated of the development site. The highest predicted noise level of skate park activity at the residential properties to the West is 47 dB $L_{Aeq\,(1\ hour)}$ and to the East and North is 43 dB $L_{Aeq\,(1\ hour)}$.

The predicted noise levels are below the proposed criterion of 50 dB $L_{Aeq\,(1\ hour)}$ derived from WHO1999 as being the threshold for the onset of moderate community annoyance.

On the basis of the above, the proposals are considered acceptable in terms of noise. On the basis of the IEMA guidelines the proposals result in a negligible increase in the overall noise climate. This is considered acceptable in noise impact terms and indicates noise from the skate park is likely to be inaudible or barely audible over the existing noise climate.

With regards to planning policy, we would expect that the development would potentially be noticeable but not intrusive and would result in 'no observed adverse effect'. This is defined in the NPPG as *'Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life'.*

This falls below the 'lowest observed adverse effect level' of the NPPG: Noise and therefore complies with the aims of the Noise Policy Statement for England (NPSE) requirements.

Noise limits have also been provided for fixed plant associated with the development based on British Standard 4142:2014, existing background noise climate and Local Authority criteria. With noise from proposed plant not exceeding the recommended criteria it is expected to have No Observed Effect. This falls below the 'lowest observed adverse effect level' of the NPPG: Noise and therefore complies with the aims of the Noise Policy Statement for England (NPSE) requirements.



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