Skate Park at Memorial Playing Fields, Steyning

Noise Assessment

Steyning Parish Council

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ATKINS

Plan Design Enable

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1. Introduction

1.1. Atkins Acoustics, Noise and Vibration were commissioned by Steyning Parish Council to undertake a noise impact assessment for a proposed skate park at Memorial Playing Fields, Steyning.

1.2. A noise survey was undertaken for this assessment on Friday 2nd September. This date was chosen so as to coincide with a visitation of a mobile skate-ramp to the playing fields, allowing ambient and background noise levels to be measured, for comparative purposes, both with and without the mobile skate-ramp in place.

2. Study Area

2.1. The skate park is proposed on the west side of the Memorial Playing field, in the location of the existing concreted area, which currently includes a basketball hoop installation. This area is adjacent to the western boundary of the playing fields. A plan view of the location can be seen in Figure 5.1 in section 5. A play area with swings, climbing frames etc is installed at the playing fields approximately 70m to the east of this area.

2.2. Immediately to the west of the playing fields are some allotment gardens, beyond which are fields. The north of the playing fields is flanked by fields to the west, and residential properties on Mill Road to the east. The east and south of the playing fields are flanked by residential properties on Charlton Street and Newham Lane respectively.

2.3. The proposed skate park would be located approximately 62m from residential properties on Mill Road, and approximately 80m from residential properties on Newham Lane.

3. Methodology, Guidance and Legislation.

3.1. Skate park noise typically primarily consists of two types of noise; noise emanating from the interaction between the skateboards wheels and the skate park surface – hereafter referred to as rolling noise – this is typically experienced as a continuous rumbling type noise; and noise emanating from impacts of the skateboard wheels, or more commonly deck, against the skate park surface – hereafter referred to as impact noise – this is typically experienced as transient impulsive noises, and generally arises from the performance of tricks, whether successfully completed or failed.

3.2. Other sources of noise emanating from skate parks typically include voices from the users of the facility.

3.3. No specific standards are currently in existence that explicitly detail the methodology and approach to be undertaken when considering the potential and magnitude of noise impact from skate parks. Therefore such installations must be assessed using the most appropriate approximations for suitable standards.

3.4. Given the nature of the noise sources, such appropriate approximations typically used for skate park noise assessment include BS4142:1997 *Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas* (BS4142), Chartered Institute of Environmental Health: Clay Target Shooting – Guidance on the Control of Noise (CIEH), and World Health Organisation - Guidelines for Community Noise 1999 (WHO). This is also the approach adopted and recommended by a number of acoustic consultancies who have used this methodology successfully for a number of potentially sensitive skate park projects, corroborated by case law history.

BS4142

3.5. Although BS4142 refers strictly to industrial noise, the methodology is commonly adopted for assessing the likely impact of many other types of environmental noise.

3.6. BS4142 details a methodology by which the magnitude of the rating noise level induced at nearby noise sensitive receivers, by an industrial noise source for example, may be compared with the magnitude of the existing background noise level at the same noise sensitive receivers. Depending on the magnitude of the difference between the two, BS4142 allows generalised conclusions to then be drawn regarding the likelihood of complaints

3.7. BS4142 considers the specific noise level $L_{Aeq,1\text{-}Hour}$ of the noise source of interest. An acoustic correction feature of +5dB should be added if the noise is tonal or intermittent in character, this is then called the rating level. The rating level, as calculated at the point of interest, should then be compared to the existing background noise level, L_{A90}, at this point of interest. If the rating level at the point of interest is 10dB or greater below the existing background level L_{A90}, then this is a positive indication that complaints are unlikely. If the rating level exceeds the existing background level by 5dB then this is considered to be of marginal significance. If the rating level exceeds the existing background level by +10dB or greater then this is considered as a positive indication that complaints are likely.

3.8. This methodology is adopted and applied to skate park noise by comparing the $L_{Aeq,T}$ of the skate boarding activity, corrected for the impulsive character and for distance, with the existing background noise level at the nearby noise sensitive receivers. It is typically taken that the rating level L_{Aeq} induced at the nearby noise sensitive receivers should not exceed the existing background noise level L_{A90}. Although some local authorities may choose to seek rating <10dB below background yielding a positive indication that complaints are unlikely.

CIEH

3.9. *Chartered Institute of Environmental Health: Clay Target Shooting – Guidance on the Control of Noise* details the methodology by which noise from clay target shooting may be assessed. The noise generated by clay target shooting is impulsive in nature, and occurs regularly throughout the duration of the activity. This is similar to the noise profile produced by skate park activity, specifically the impulsive noises generated by the undertaking and landing of tricks.

3.10. These guidelines detail a method of assessment for the noise impact arising from clay target shooting activity. This is assessed by the derivation of the mean of a number of Shooting Noise Levels (SNL) - a logarithmic average of the 25 highest shot levels, from the shoot in question, over a 30 minute period at the nearby noise sensitive receivers - which may then be compared to empirical limits indicating the likelihood of annoyance. It is noted that "*at shooting noise levels below the mid 50's dB(A) there is little evidence of significant levels of annoyance at any site, whereas for levels in the mid to high 60's, significant annoyance varies considerably from site to site*" and that "*planning permission should not usually be granted for a major shoot if the mean SNL exceeds 55dB where the background level is less than 45dB".*

3.11. This methodology is adopted and applied to skate park noise by comparing the logarithmic average of the 25 highest L_{AMax} levels measured of the skate boarding activity, corrected for distance if necessary, with the criteria as set out in CIEH, and with the existing background noise levels as measured at the location of interest. It is typically taken that the equivalent SNL should not exceed 55-60dB(A) at the location of interest for a positive indication that significant annoyance will not occur.

WHO Guidelines

3.12. Who guidelines state that for outdoor areas during a daytime period few people are highly annoyed at L_{Aeq} levels of below 55dB(A), and few people are moderately annoyed at L_{Aeq} levels of below 50dB(A). The guidelines also state that evening and night-time noise levels should be 5-10dB lower respectively. Daytime period is typically taken to be from 07:00 – 23:00 and night-time period as 23:00 – 07:00. Although not defined with the WHO guidelines evening period is typically taken to be 18:00 – 23:00.

3.13. These guidelines are typically adopted and applied to skate park noise with the criteria that noise levels at nearby noise sensitive receivers during the daytime (07:00 – 18:00) should not exceed 55dB(A), and during evening (18:00 – 23:00) should not exceed 50dB(A).

4. Mobile Skate-Ramp Visit

4.1. A mobile skate-ramp was installed at the approximate location of the proposed skate park facility at Memorial Playing fields between 12pm and 2pm on Friday 2nd September. The mobile ramp consisted of portable metal frames and wooden decking, installed on the existing concrete section on the west of the playing field, with a <1m high linear transition ramp and deck located at either end of the concrete section, and a <1m high linear transition box ramp located in between.

4.2. Noise level measurements were undertaken close to the boundaries of the residential properties to the north and south of the playing field, and also close to the installed mobile skate-ramp facility. These survey locations are shown in Figure 5.1 in Section 5. Given the limited time over which the mobile skate-ramp would be installed (<2hours active skating time), noise level measurements of 10mins in duration were taken, so as to allow a number of measurements to be taken at each location. The equipment used to undertake the noise level measurements is summarised in table 5.1 in section 5.

4.3. A summary of the noise level measurements undertaken during the mobile skate-ramp visit is given in table 4.1 below.

Table 4.1 – Noise Level Measurements During Mobile Skate-Ramp Visit

Start Time	$L_{Aeq,}$ (dB)	$L_{AF(max),}$ (dB)	$L_{90,}$ (dB)
Location 1 – Near Boundary for Properties on Newham Lane			
12:02	44.0	56.8	35.5
12:15	40.0	55.1	34.2
13:15	44.0	57.6	37.1
Location 2 – Near to Mobile Skate Ramp Installation (~7m)			
12:28	59.8	78.7	44.2
13:03	62.2	78.1	47.3
13:45	61.1	79.5	47.8
Location 3 – Near Boundary for Properties on Mill Road			
12:43	47.7	67.6	38.0
13:30	48.7	63.8	40.7

4.4. It was noted that during the mobile skate-ramp visit, that users of the mobile ramps predominantly consisted of young pre-teen or early-teen scooter users, although a young bmx user and a young skateboard user were present for a short period. Throughout the visit, little tricking was observed, and usage mainly consisted of a user smoothly scooting from one end to the other. Therefore the majority of noise emanating from the mobile skate-ramp use was due to rolling noise and transition noise between the decks, ramps and concrete bottom.

4.5. It is considered that the usage of the mobile skate ramp was light in comparison to what Atkins has previously observed at permanent skate ramp installations.

4.6. Throughout these measurements, especially those undertaken at the residential property boundaries, a significant noise contribution was emanating from the play area within the playing fields, with young people and children talking, laughing and shouting to each other.

4.7. It was observed that thought these measurements that although the significant noise levels were not induced at nearby residential properties, the skating activity was discernable at these locations. There appeared to be a variation in local residents opinion as to whether this was of any note or not.

5. Baseline Conditions

5.1. A baseline noise survey in the vicinity of the proposed skate park was undertaken on the afternoon of Friday 2nd September, following the departure of the mobile skate-ramp facility.

5.2. The grounds of the Memorial Playing Fields, in which the skate park is to be located, is open 24 hours a day, however it is understood that skating will not occur during night-time hours, and that skating will only occur during daytime and early evening hours.

5.3. The survey measurement locations are shown in figure 5.1 below.

Figure 5.1 – Noise Level Measurement Locations

5.4. Locations 1 and 3 were selected so as to be representative of the ambient and background noise levels at the nearby noise sensitive receivers. Location 2 was used to undertake source noise level measurements during the mobile skate-ramp visit, as reported in section 4.

5.5. The equipment used for the survey is shown in table 5.1 below.

Table 5.1– Equipment used for Skate Park Noise Survey

Item	Manufacturer	Model	Serial Number
Sound Level Meter	Norsonic	118	13474
Microphone	Norsonic	1225	57531
Preamplifier	Norsonic	1206	30626
Calibrator	Norsonic	1251	31009

5.6. All noise level measurements taken were 15mins in duration.

5.7. Throughout these measurements, a significant noise contribution was emanating from the play area within the playing fields, with young people and children talking, laughing and shouting to each other. It was noted that during the daytime hours the play area was predominantly frequented by young children and pre-teen and early-teens, and as the early evening hours approached the demographic change to predominantly teenagers.

Location 1 – Properties at Newham Lane

5.8. Noise level measurements were taken at location1, representative of properties at Newham Lane. These noise level measurements are summarised in Table 5.2 below.

Table 5.2 - Noise Levels measured at Location 1, Properties at Newham Lane

Start Time	$L_{Aeq,}$ (dB)	$L_{AF(max),}$ (dB)	$L_{90,}$ (dB)
14:36	45.7	62.1	38.6
15:24	43.4	59.4	36.9
16:04	48.3	74.9	36.1
17:06	46	64.5	36.9
Average	**46.2**		**37.1**
Max		**74.9**	
18:00	39.6	58.3	33.7
19:00	44.3	61.9	36.3
Average	**42.6**		**35.0**
Max		**61.9**	

Location 3 – Properties at Mill Road

5.9. Noise level measurements were taken at location 3, representative of properties at Mill Road. These noise level measurements are summarised in Table 5.3 below.

Table 5.3 - Noise Levels measured at Location 3, Properties at Mill Road

Start Time	$L_{Aeq,}$ (dB)	$L_{AF(max),}$ (dB)	$L_{90,}$ (dB)
14:17	54.0	73.3	40.5
14:56	50.9	72.9	40.5
15:43	47.1	70.6	39.0
16:45	49.2	68.4	40.3
17:40	56.6	85.3	37.7
Average	**52.5**		**39.6**
Max		**85.3**	
18:36	45.5	62.2	35.6
19:24	51.6	69.9	37.3
Average	**49.5**		**36.5**
Max		**69.9**	

6. Source Noise Data

6.1. As noted within section 4, the mobile skate-ramp was a small scale installation, and predominantly attracted young and pre-teen scooter users, with comparatively little tricking undertaken. It is considered that this is not representative of typical permanent installation skate-park activity, which typically attracts a greater density and diversity of users, commonly including skateboards, bmx bikes, in-line skate and scooter users. It is also noted that the undertaking of tricks, such as ollies and grinds, are typically significantly more common than was experienced with the mobile skate-ramp installation. As skaters become older and more proficient the undertaking of tricks is considered more likely. Similarly, with the increased density of trick performance comes an increased density of trick failure, which can be the cause of significant impact noise, for example following a jump when the skateboard lands with the top side of the deck downwards without its skater in contact with the board. With this in mind, it is considered more appropriate to use skate-park source noise data previously obtained by Atkins.

6.2. Table 6.1 below presents skate park noise level measurements previously undertaken by Atkins at a concrete skate park, similar in construction to that which is proposed for installation at Memorial Playing Fields, Steyning. The noise levels presented in the table are representative of typical skateboarding activity that would be expected to be experienced during an approximate 30 minute period of moderate use within the park. A comparatively small number of users would be undertaking skateboarding activity at any given moment, with the remainder of users typically conversing with each other. All noise level measurements were undertaken over brief durations (comprising of the lead up to, the performance of, and the ending of the trick or activity in question), to ensure that the L_{Aeq} and L_{Amax} noise levels measured were attributable to the trick or activity being observed, and were not impacted by other activities.

Table 6.1 – Noise Level Measurements undertaken at Concrete Skate Park

Comments	Average Measurement Distance m	L_{Aeq} dB(A)	L_{Amax} dB(A)
Bike Falling Over	2	70.4	84.1
Bike Falling Over	2	67.3	81.2
Up and Down Bowl	2	72.8	90.0
Laps of Bowl	2	68.9	83.9
Ollie on to side of bowl and fall off	3	78.6	96.9
Ollie on to side of bowl and fall off	3	75.7	86.8
board kicked up and stomped down	3	79.9	95.2
Ollie on to side of bowl and skate off	5	72.9	84.3
Laps of Bowl	2.5	71.2	81.6
Laps of Bowl	2.5	69.6	81.7
Laps of Bowl & Jump	2.5	71.5	87.1

Laps of Bowl & Jump	2.5	72.3	84.1
Ollie next to barrier	4	69.4	81.0
Ollie on flat	2	76.6	89.6
Skating around bowl	2.5	66.3	77.4
Small Ramp with board landing on top of ramp	1	77.6	86.8
Skating around bowl	3	66.9	75.7
skating on larger concrete ramp	1	66.6	74.5
skating on larger concrete ramp	1	66.1	77.8
skating on larger concrete ramp	1	67.1	72.1
Small jump on large ramp	1.5	69.7	80.8
grind front of board on concrete upright section of small ramp box	1	82.0	100.3
grind front of board on concrete upright section of small ramp box	1	85.2	95.4
grind front of board on concrete upright section of small ramp box	6	73.0	81.1
grind front of board on concrete upright section of small ramp box	6	70.7	79.7
skate by and ollie onto rail	4	72.9	84.3
skate by	1	68.4	75.7
skate by and ollie onto rail/ramp lip	2	75.7	90.7
skate by and ollie onto rail/ramp lip	2	71.5	81.0
skate by	1	65.6	77.1
skate by and failed ollie	1.5	73.9	86.9
failed ollie	1	78.1	91.0
failed ollie	1	79.1	94.0
skate by and small ollie	1	69.5	87.7
skate by and small ollie	1	73.8	87.0
skate by and ollie	1	77.4	89.6

6.3. For calculation purposes these measurements are summarised into three assessment noise levels: an average – representative of general typical skate park activity, a maximum – representative of the maximum likely to occur during the performance of high impact tricks or grinds , and an equivalent SNL, all normalised to 1m. These assessment noise levels are presented in Table 6.2 below.

Table 6.2 – Calculation Noise Levels for Typical Skate Park Activity

Noise Level Type	**Noise Level dB normalised to 1m**
Average of Ambient Skate Park Noise – General Skate Park Activity , L_{Aeq}	**82.1**
Maximum of Ambient Skate Park Noise – maximum predicted due to Performance of High Impact Tricks, L_{Aeq}	89.4
Equivalent SNL	**97.5**

7. Impact Assessment for Nearby Residential Properties

Impact Assessment at Location 1, Newham Lane

7.1. Table 7.1 below details the calculation for the noise level predicted to be induced at properties on Newham Lane due to skate park activity.

Table 7.1 – Noise levels predicted to be induced at Nearest Newham Lane Properties

Detail	dB(A)
Average of Ambient Skate Park Noise L_{Aeq} at 1m	82.1
Maximum of Ambient High Impact Trick Noise L_{Aeq} at 1m	89.4
Distance correction for 80m	-38.1
Average of Ambient Skate Park Noise L_{Aeq} at Nearest Newham Lane Properties	**44.0**
Maximum of Ambient High Impact Trick Noise L_{Aeq} at Nearest Newham Lane Properties	51.3

7.2. Table 7.1 above shows that noise levels induced at Newham Lane are predicted to fall within WHO guidelines for daytime period (07:00-18:00), but the maximum noise levels that can be induced by skating activity are predicted to exceed the WHO guidelines for evening and night-time periods.

7.3. Table 7.2 below details the calculation for the equivalent SNL to be induced at the nearby residential receivers due to skate park activity.

Table 7.2 – Equivalent SNL predicted to be induced at nearby residential receivers from skate park activity

Equivalent SNL Assessment	dB(A)
Equivalent SNL at 1m	97.5
Distance correction for 80m	-38.1
Equivalent SNL at Newham Lane	**59.4**

7.4. It is shown in table 7.2 above that the SNL predicted to be induced at Newham Lane is just within the recommended limits of an SNL limit of 55-60dB. It is therefore predicted that significant annoyance is unlikely to occur, but it should be borne in mind that annoyance is both variable and subjective, and annoyance is still possible.

7.5. The tables below predict the BS4142 style calculations for daytime and evening periods.

Daytime

7.6. Table 7.3 below details the BS4142 style calculation for the impact assessment for the nearby residential receivers during daytime period.

Table 7.3 – BS4142 style assessment for skate park noise levels at Newham Lane for daytime period

Detail	**dB(A)**
Background Noise Level at Newham Lane	
Daytime Average L_{A90}	37.1
Skate Noise Levels	
Average of Ambient Skate Park Noise L_{Aeq} at1m	82.1
Maximum of Ambient High Impact Trick Noise L_{Aeq} at1m	89.4
Skate Rating Noise Level (with +5dB Acoustic Feature Correction)	
Average of Ambient Skate Park Rating Noise L_{Aeq} at1m	87.1
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at1m	94.4
Distance Correction to Newham Lane	
Distance correction for 80m	-38.1
Skate Rating Noise at Newham Lane	
Average of Ambient Skate Park Rating Noise L_{Aeq} at Newham Lane	49.0
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Newham Lane	56.3
Impact at Newham Lane (compared with existing ambient)	
Excess of Average of Ambient **Skate Rating Noise L_{Aeq} at Newham Lane, over existing background L_{A90} (rounded to 1dB)**	**12**
Excess of Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Newham Lane, over existing background L_{A90} (rounded to 1dB)	19

7.7. It is shown in table 7.3 above that, in general, skate park activity is predicted to induce a rating noise level of +12dB above typical background noise levels for properties at Newham Lane during the daytime period. The maximum impact predicted due to the performance of high impact tricks is +19dB above typical background noise levels for properties at Newham Lane during the daytime period.

7.8. The table shows that the noise levels that can occur during skating activity yield a positive indication that complaints are likely during the daytime period.

Evening

7.9. Table 7.4 below details the BS4142 style calculation for the impact assessment for the nearby residential receivers during evening period.

Table 7.4 – BS4142 style assessment for skate park noise levels at Newham Lane for evening period

Detail	**dB(A)**
Background Noise Level at Newham Lane	
Daytime Average L_{A90}	35.0
Skate Noise Levels	
Average of Ambient Skate Park Noise L_{Aeq} at1m	82.1
Maximum of Ambient High Impact Trick Noise L_{Aeq} at1m	89.4
Skate Rating Noise Level (with +5dB Acoustic Feature Correction)	
Average of Ambient Skate Park Rating Noise L_{Aeq} at1m	87.1
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at1m	94.4
Distance Correction to Newham Lane	
Distance correction for 80m	-38.1
Skate Rating Noise at Newham Lane	
Average of Ambient Skate Park Rating Noise L_{Aeq} at Newham Lane	49.0
Maximum of Ambient High Impact Trick Performance Rating Noise L_{Aeq} at Newham Lane	56.3
Impact at Newham Lane (compared with existing ambient)	
Excess of Average of Ambient **Skate Rating Noise L_{Aeq} at Newham Lane, over existing background L_{A90} (rounded to 1dB)**	**14**
Excess of Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Newham Lane, over existing background L_{A90} (rounded to 1dB)	21

7.10. It is shown in table 7.3 above that, in general, skate park activity is predicted to induce a rating noise level of +14dB above typical background noise levels for properties at Newham Lane during the evening period. The maximum impact predicted due to the performance of high impact tricks is +21dB above typical background noise levels for properties at Newham Lane during the evening period.

7.11. The table shows that the noise levels that can occur during skating activity yield a positive indication that complaints are likely during the evening period.

Impact Assessment at Mill Road

7.12. Table 7.5 below details the calculation for the noise level predicted to be induced at properties on Mill Road due to skate park activity.

Table 7.5 – Noise levels predicted to be induced at Nearest Mill Road Properties

Detail	dB(A)
Average of Ambient Skate Park Noise L_{Aeq} at 1m	82.1
Maximum of Ambient High Impact Trick Noise Level L_{Aeq} at 1m	89.4
Distance correction for 62m	-35.8
Average of Ambient Skate Park Noise L_{Aeq} at Nearest Mill Road Properties	**46.2**
Maximum of Ambient High Impact Trick Noise L_{Aeq} at Nearest Mill Road Properties	53.6

7.13. Table 7.5 above shows that noise levels induced at Mill Road are predicted to fall within WHO guidelines for daytime period (07:00-18:00), but the maximum noise levels that can be induced by skating activity are predicted to exceed the WHO guidelines for evening and night-time periods.

7.14. Table 7.6 below details the calculation for the equivalent SNL to be induced at the nearby residential receivers due to skate park activity.

Table 7.6 – Equivalent SNL predicted to be induced at nearby residential receivers from skate park activity

Equivalent SNL Assessment	dB(A)
Equivalent SNL at 1m	97.5
Distance correction for 62m	-35.8
Equivalent SNL at Mill Road	61.7

7.15. It is shown in table 7.6 above that the recommended SNL criteria is predicted to be exceeded at Mill Road, indicating that annoyance is likely.

7.16. The tables below predict the BS4142 style calculations for daytime and evening periods.

Daytime

7.17. Table 7.7 below details the BS4142 style calculation for the impact assessment for the nearby residential receivers during daytime period.

Table 7.7 – BS4142 style assessment for skate park noise levels at Mill Road for daytime period

Detail	**dB(A)**
Background Noise Level at Mill Road	
Daytime Average L_{A90}	39.6
Skate Noise Levels	
Average of Ambient Skate Park Noise L_{Aeq} at1m	82.1
Maximum of Ambient High Impact Trick Noise L_{Aeq} at1m	89.4
Skate Rating Noise Level (with +5dB Acoustic Feature Correction)	
Skate Park Rating Noise Average L_{Aeq} at1m	87.1
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at1m	94.4
Distance Correction to Mill Road	
Distance correction for 62m	-35.8
Skate Rating Noise at Mill Road	
Average of Ambient Skate Park Rating Noise L_{Aeq} at Mill Road	51.2
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Mill Road	58.6
Impact at Mill Road (compared with existing ambient)	
Excess of Average of Ambient Skate Rating Noise L_{Aeq} at Mill Road, over existing background L_{A90} (rounded to 1dB)	**12**
Excess of Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Mill Road, over existing background L_{A90} (rounded to 1dB)	19

It is shown in table 7.3 above that, in general, skate park activity is predicted to induce a rating noise level of +12dB above typical background noise levels for properties at Mill Road during the daytime period. The maximum impact predicted due to the performance of high impact tricks is +19dB above typical background noise levels for properties at Mill Road during the daytime period.

The table shows that the noise levels that can occur during skating activity yield a positive indication that complaints are likely during the daytime period.

Evening

Table 7.8 below details the BS4142 style calculation for the impact assessment for the nearby residential receivers during evening period.

Table 7.8 – BS4142 style assessment for skate park noise levels at Mill Road for evening period

Detail	**dB(A)**
Background Noise Level at Mill Road	
Daytime Average L_{A90}	36.5
Skate Noise Levels	
Average of Ambient Skate Park Noise L_{Aeq} at1m	82.1
Maximum of Ambient High Impact Trick Noise L_{Aeq} at1m	89.4
Skate Rating Noise Level (with +5dB Acoustic Feature Correction)	
Average of Ambient Skate Park Rating Noise L_{Aeq} at1m	87.1
Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at1m	94.4
Distance Correction to Mill Road	
Distance correction for 62m	-35.8
Skate Rating Noise at Mill Road	
Average of Ambient Skate Park Rating Noise L_{Aeq} at Mill Road	51.2
Maximum of Ambient High Impact Trick Performance Rating Noise L_{Aeq} at Mill Road	58.6
Impact at Mill Road (compared with existing ambient)	
Excess of Average of Ambient Skate Rating Noise L_{Aeq} at Mill Road, over existing background L_{A90} (rounded to 1dB)	**15**
Excess of Maximum of Ambient High Impact Trick Rating Noise L_{Aeq} at Mill Road, over existing background L_{A90} (rounded to 1dB)	22

It is shown in table 7.8 above that, in general, skate park activity is predicted to induce a rating noise level of +15dB above typical background noise levels for properties at Mill Road during the evening period. The maximum impact predicted due to the performance of high impact tricks is +22dB above typical background noise levels for properties at Mill Road during the evening period.

The table shows that the noise levels that can occur during skating activity yield a positive indication that complaints are likely during the evening period.

8. Mitigation Measures

8.1. Chapter 7 above show that the development of the skate park has the potential to impact on the amenity of nearby noise sensitive receivers.

8.2. It is possible to reduce, but not necessarily eliminate, these impacts by employing a combination of a number of mitigation measures, including control of hours of operation, and appropriate earth bunding around the development.

8.3. Carefully designed bunding, likely to be at least some 1.5m in height (above the highest surface within the park) and surrounding the extents of skate park, would offer some attenuation. Access to the park could be via a gap in the bunding on the west side of the park in order to minimise adverse impact of breaks within this bunding. However, it cannot be categorically said that this would be enough for the park to be operational during both daytime and early evening hours without causing annoyance, and notable exceedance of BS4142 and WHO criteria would likely still occur during late evening and night time hours.

8.4. Control of the hours of operation of the skate park, making the skate park not accessible for skating during late evening and night-time hours, would also be recommended to ensure that late evening and night-time noise was not a problem.

8.5. Should the skatepark be developed, then we would recommend that acoustic advice is sought with regards to the design requirements of mitigation measures. We would also recommend that a detailed acoustic impact assessment, including mitigation specifications, is carried out to assess any residual impacts.

9. Conclusions

The skate park has the potential to impact on the amenity of nearby noise sensitive receivers.

Any skate-park installed at this location should include the provision of mitigation measures in an effort to minimise these impacts. In summary it is recommended that such mitigation measures would include:

- Skate park access is limited. No late evening or night-time access possible (for example park to close by 8:30pm).
- Carefully designed earth bunding required around the park, at least 1.5m higher that the highest point within the park.

With all mitigation measures in place it is likely that some residual skate park activity will still be audible at the nearby noise sensitive receivers due to the nature of the activity being significantly different in nature to the existing noise climate.