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Proposed Pickleball and Padel indoor courts, Land at Bourne Road, Spalding

Acoustic Assessment Report

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On behalf of
Racquet Space

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1.0 INTRODUCTION

1.1 Blue Tree Acoustics has been appointed by Racquet Space to carry out an acoustic assessment for a proposed indoor court facility for Pickleball and Padel activities, situated on land at Bourne Road, Spalding.

1.2 The development proposal is to create a facility for playing Pickleball and Padel on land currently used for agricultural purposes. The development site is situated to the north of Bourne Road, on the western outskirts of Spalding. Vehicular access to the site is proposed via a new entrance off Bourne Road.

1.3 The facility's proposed opening hours are understood to be Monday-Sunday between 0700-2300 hours, including Bank Holidays.

1.4 The surrounding area is mixed in character and primarily comprises agricultural land, with residential properties situated along Bourne Road.

1.5 The noise impact assessment has included:

a) Inspection of the development site and surroundings.

b) Review of outline architectural plans of the proposed development provided by the Client / Design Team.

c) Noise monitoring surveys undertaken around the site.

d) Consideration of relevant acoustic and planning practice guidance documents.

1.6 A glossary of technical terminology and parameters used in this report is provided in Appendix 1.

2.0 EXISTING SOUND SOURCES

Road

2.1 Bourne Road forms part of the A151 route between Spalding and Bourne, and is a busy traffic route with frequent passing goods vehicles and cars. There are existing houses situated along the southern side of Bourne Road, and more densely populated areas within Spalding around 500m or more to the east.

2.2 Distant, as well as local, road traffic noise is clearly discernible in the vicinity of the site.

Agricultural/commercial

2.3 In terms of non-residential use, the surrounding area is predominantly agricultural in nature and there will be sound generated from operation of agricultural machinery at times in the vicinity of the site.

2.4 Local and distant dog-barking was audible at times during the site surveys, possibly from a kennels.

3.0 NEW SOUND SOURCES

3.1 The development proposal is for construction of a new building on a plot of existing farmland to the north of Bourne Road, which will provide facilities for the playing of Pickleball and Padel. The building will have associated carparking, and there will be vehicular access off Bourne Road.

3.2 We understand that no external courts are proposed for the development. An indicative site plan is reproduced in Figure 2, which reflects the current proposal of indoor courts only.

3.3 We understand that the building will be subdivided internally to provide space at the western end for 4no Pickleball courts and space at the eastern end for 4no Padel courts. There will be a central entrance and reception space incorporating toilets, changing facilities, and a café/servery area.

3.4 The proposed construction of the building is yet to be finalised, but we understand that this will entail lightweight steel frame with insulated steel cladding panels. The main entrance will comprise glazed doors in the front elevation, with an internal entrance lobby behind, which incorporates a second set of doors. We understand that no windows are proposed in the building elevations, but that there will be rooflights. There are no proposals for mechanical building services or external plant.

3.5 We understand that the proposed hours of use will be daytime only, between 0700-2300 hours.

3.6 Sound generated from the playing of Pickleball and Padel typically includes that generated by bats or racquets striking the ball, rebound of the ball from the ground or perimeter structures, footwear interacting with the floor, and players' voices.

3.7 There is potential for sound generated by vehicles accessing the site and using the carparking areas, but this will be negligible in comparison with the existing traffic flows along Bourne Road.

3.8 There will potentially be noise produced at times during the construction of the development, but this will be restricted to daytime hours only and can be controlled by an appropriately worded planning Condition if needed.

4.0 SOUND LEVEL SURVEY

4.1 Environmental sound monitoring was undertaken by Blue Tree Acoustics in order to determine the prevailing ambient sound levels at the site during the proposed facility's hours of use.

4.2 Attended external sound level measurements were taken between 1700-2300 hours on Thursday 14/08/2025, and between 0800-1200 hours on Sunday 14/09/2025. As indicated in Figure 1, the measurements were taken at Location 1, an accessible location on the southern boundary of Bourne Road with nearby residential properties, opposite the proposed development site.

4.3 Measurements were taken in accordance with relevant guidance in acoustic standards and guidelines such as BS7445, BS8233, and IEMA Guidelines for Environmental Noise Impact Assessment.

4.4 The instrument used during the environmental noise surveys was 1no Rion NA-28 Type 1/ Class 1 integrating sound level meter. The meter was within a valid period of laboratory calibration. Calibration checks were carried out both before and after the measurements, with minimal variance observed and results being within 0.2dB of the stated reference value. A proprietary environmental windshield was fitted to the microphone. Measurements were made with the microphone mounted on a tripod at approximately 1.5m from local ground level. The measurement results are detailed in Appendix 2 and summarised in Table 1 below.

4.5 Weather conditions throughout the survey periods were suitably dry and calm. Archival data from a local weather station is presented in Appendix 4.

4.6 Measurements taken to establish ambient sound levels during the most sensitive proposed hours of use were made with the sound level meter set to log contiguous measurements of 15-minute duration. The dominant noise source at the measurement location was found to be local and distant road traffic.

Table 1: Representative sound levels at nearby residential properties

		dB L_{Aeq}	dB L_{Amax}	dB L_{A10}	dB L_{A90}
Thursday 14/08/2025	Average	69	88	71	37
	Range	64 - 73	83 - 96	62 - 76	23 - 46
Sunday 14/09/2025	Average	70	88	73	41
	Range	65 - 71	84 - 90	63 - 76	32 - 49

4.7 As can be seen from the above table, measured sound levels were broadly of similar magnitude during both survey visits.

Source sound level measurements

4.8 Measurements of typical Pickleball and Padel games were also taken at existing operational premises to obtain representative source sound level data for these activities.

4.9 Attended measurements of typical Pickleball sound levels were taken at an existing indoor facility in Spalding on Wednesday 10/09/2025. Attended measurements of typical Padel sound levels were taken at an existing indoor facility in Sheffield on Monday 22/09/2025.

4.10 The instruments used during these surveys were 2no Rion NA-28 Type 1/Class 1 integrating sound level meters. Each meter was within a valid period of laboratory calibration. Calibration checks of each meter were carried out both before and after the measurements, with minimal variance observed and results being within 0.2dB of the stated reference value. A proprietary environmental windshield was fitted to each microphone. Measurements were made with each microphone mounted on a tripod at approximately 1.5m from local ground level. The measurement results are presented in Appendix 2.

4.11 The measurement results indicate that broadly similar source sound levels were measured for both Pickleball and Padel, although it should be noted that measurements of each sport were taken under different room conditions and in different acoustic environments. Both sports demonstrated that sound energy was greatest in the mid-frequency bands, i.e. between 500Hz – 2kHz octave bands. This is considered attributable to a combination of bat/racquet noise and voices being prominent in these bands.

5.0 ACOUSTIC STANDARDS AND GUIDANCE

5.1 There is no specific guidance or legislation relating to the assessment of noise impact from sport and leisure activities.

5.2 We understand that there are also currently no objective noise criteria defined by the Local Authority in relation to this development proposal.

5.3 Relevant general UK planning guidance and standards are summarised below.

National Planning Policy Framework (NPPF)

5.4 First published in March 2012, and most recently updated in December 2024, the *National Planning Policy Framework* (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. Reference to noise is made at Paragraph 187 of the NPPF Section 15 'Conserving and enhancing the natural environment', stating that:

> *"187. 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"*

5.5 Noise is also referenced within the ground conditions and pollution subsection within Section 15 of the NPPF at Paragraph 198, which states:

> *"198. 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 [72],*
>
> *(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.*

[…]

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

5.6 Paragraph 200 of NPPF states:

> *“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”*

5.7 Department for Environment, Food and Rural Affairs, Noise Policy Statement for England (NPSE), 2010 states:

Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims

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.**

Guiding principles of sustainable development

Ensuring a Strong Healthy and Just Society – Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

Using Sound Science Responsibly – Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

Living Within Environmental Limits – Respecting the limits of the planet's environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

Achieving a Sustainable Economy – Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

Promoting Good Governance – Actively promoting effective, participative systems of governance in all levels of society – engaging people's creativity, energy and diversity.

Source: Securing the future – delivering UK sustainable development strategy, HM Government, March 2005.

5.8 The Noise Policy Statement for England Explanatory note states that:

Noise is an inevitable consequence of a mature and vibrant society. For some the noise of city life provides a desirable sense of excitement and exhilaration, but for others noise is an unwanted intrusion that adversely impacts on their quality of life, affecting their health and well being.

The management of noise has developed over many years as the types and character of noise sources have altered and as people's attitude to noise has changed. The Noise Abatement Act came into law in 1960 and the Report from the Committee on the Problem of Noise was published in 1963 (the Wilson report). Since then, examples of noise management can be found in many areas including reducing noise at source; the use of the land use and transport planning systems, compensation measures, the statutory nuisance and licensing regimes and other related legislation.

Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receivers and to 'minimise' noise. Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as reasonably practical. This concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of 'best practicable means' in summary statutory nuisance proceedings.

By describing clear policy vision and aims the NPSE provides the necessary clarity and direction to enable decisions to be made regarding what is an acceptable noise burden to place on society.

The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise). For the purposes of the NPSE, "noise" includes:

- *"environmental noise" which includes noise from transportation sources;*
- *"neighbour noise" which includes noise from inside and outside people's homes;*

  and
- *"neighbourhood noise" which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.*

The application of the NPSE should mean that noise is properly taken into account at the appropriate time. In the past, the opportunity for the cost effective management of noise has often been missed because the noise implications of a particular policy, development or other activity have not been considered at an early enough stage.

In addition, the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications.

In the longer term, the Government hopes that existing policies could be reviewed (on a prioritised basis), and revised if necessary, so that the policies and any noise management measures being adopted accord with the vision, aims and principles of the NPSE.

Noise management is a complex issue and at times requires complex solutions. Unlike air quality, there are currently no European or national noise limits which have to be met, although there can be specific local limits for specific developments. Furthermore, sound only becomes noise (often defined as 'unwanted sound') when it exists in the wrong place or at the wrong time such that it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance. Unlike many other pollutants, noise pollution depends not just on the physical aspects of the sound itself, but also the human reaction to it. Consequently, the NPSE provides a clear description of desired outcome from the noise management of a particular situation.

The guiding principles of Government policy on sustainable development should be used to assist in its implementation. The development of further principles specifically to underpin implementation of noise management policy will be kept under review as experience is gained from the application of the NPSE.

There are several key phrases within the NPSE vision and these are discussed below.

Health and quality of life

The World Health Organisation defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, and recognises the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being.

It can be argued that quality of life contributes to our standard of health. However, in the NPSE it has been decided to make a distinction between 'quality of life' which is a subjective measure that refers to people's emotional, social and physical well being and 'health' which refers to physical and mental well being.

It is recognised that noise exposure can cause annoyance and sleep disturbance both of which impact on quality of life. It is also agreed by many experts that annoyance and sleep disturbance can give rise to adverse health effects. The distinction that has been made between 'quality of life' effects and 'health' effects recognises that there is emerging evidence that long term exposure to some types of transport noise can additionally cause an increased risk of direct health effects. The Government intends to keep research on the health effects of long term exposure to noise under review in accordance with the principles of the NPSE.

Promote good health and good quality of life

This statement expresses the long term desired policy outcome, but in the use of 'promote' and 'good' recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.

Effective management of noise

This concept confirms that the policy applies to all types of 'noise' (environmental, neighbour and neighbourhood) and that the solution could be more than simply minimising the noise.

Within the context of Government policy on sustainable development

Sustainable development is a core principle underpinning all government policy. For the UK Government the goal of sustainable development is being pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment and a just society that promotes social inclusion, sustainable communities and personal wellbeing. The goal is pursued in ways that protect and enhance the physical and natural environment, and that use resources and energy as efficiently as possible.

There is a need to integrate consideration of the economic and social benefit 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 focussing solely on the noise impact without taking into account other related factors.

There are several key phrases within the NPSE aims and these are discussed below.

"Significant adverse" and "adverse"

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

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.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL . Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

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. This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

5.9 Unfortunately, the above guidance gives no objective, tangible standards or criteria that enable planning decisions to be made. In the absence of such guidance, quantification of noise impact in terms of guidance such as BS8233, which present noise limits and criteria based on World Health Organisation recommendations, can be considered as appropriately assessing the potential noise impact with regard to toxicology concepts and hence in line with the principles of the NPPF and NPSE. Therefore, if the recommendations of BS8233 and any associated Local Authority noise requirements are met, it can be considered as being below the level where there is no detectable adverse effect on health and quality of life due to noise, and this meets the NOEL (No Observed Effect Level) set out in the NPSE.

Planning Practice Guidance – Noise (PPG)

5.10 Published in March 2014 and updated in July 2019, the Department for Communities and Local Government (DCLG) 2019 *Planning Practice Guidance – Noise* (PPG) is a web-based resource to support the NPPF. In relation to planning and noise, the guidance states that noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment, including any permitted changes to that environment that have not yet commenced. It states that there may be opportunities to improve the acoustic environment when preparing plans or taking decisions about new development, and that good acoustic design must be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.

5.11 PPG advises that planning and decision-making need to consider:

a) whether or not a significant adverse effect is occurring or likely to occur;

b) whether or not an adverse effect is occurring or likely to occur; and

c) whether or not a good standard of amenity can be achieved.

5.12 This guidance also refers to the concepts of NOAEL, LOAEL, and SOAEL, and states, "*Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs.*"

5.13 The PPG noise exposure hierarchy is reproduced in the table below.

Table 2: PPG noise exposure hierarchy

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level (NOEL)			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level (NOAEL)			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

5.14 Whilst the guidance suggests that planning decisions must take account of the economic and social benefit of the activity causing or affected by the noise, the planning process should also be used to avoid SOAEL occurring and prevent unacceptable adverse effects.

5.15 It clarifies that noise can override other planning concerns where justified, but states that it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect on whether noise is likely to pose a concern.

5.16 PPG states that, *"the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation."* These factors include the absolute noise level of the source, the existing ambient and background noise climate, time of day, frequency of occurrence, duration, spectral content and general character of the noise, cumulative impacts, as well as the local arrangement of buildings, surfaces and green infrastructure, and the extent to which they reflect and absorb noise.

5.17 PPG provides some outline guidance on measures to address adverse noise effects, and also for identifying, protecting, and enhancing areas of tranquillity. As well as mitigation of noise from proposed new development, PPG also considers the 'agent of change' principle, and states the following with regard to addressing the risk of conflict between new development and existing businesses or facilities:

> *"Development proposed in the vicinity of existing businesses, community facilities or other activities may need to put suitable mitigation measures in place to avoid those activities having a significant adverse effect on residents or users of the proposed scheme. In these circumstances the applicant (or 'agent of change') will need to clearly identify the effects of existing businesses that may cause a nuisance (including noise, but also dust, odours, vibration and other sources of pollution) and the likelihood that they could have a significant adverse effect on new residents/users. In doing so, the agent of change will need to take into account not only the current activities that may cause a nuisance, but also those activities that businesses or other facilities are permitted to carry out, even if they are not occurring at the time of the application being made. The agent of change will also need to define clearly the mitigation being proposed to address any potential significant adverse effects that are identified. Adopting this approach may not prevent all complaints from the new residents/users about noise or*

other effects, but can help to achieve a satisfactory living or working environment, and help to mitigate the risk of a statutory nuisance being found if the new development is used as designed (for example, keeping windows closed and using alternative ventilation systems when the noise or other effects are occurring). It can be helpful for developers to provide information to prospective purchasers or occupants about mitigation measures that have been put in place, to raise awareness and reduce the risk of post-purchase/occupancy complaints."

5.18 PPG additionally mentions BS8233:2014, IEMA Guidelines for Environmental Noise Impact Assessment, and ProPG, but it also states, "*Some of these documents contain numerical criteria. These values are not to be regarded as fixed thresholds and as outcomes that have to be achieved in every circumstance."*

5.19 The NPPF, NPSE, and PPG advise that the effect of noise should be assessed on the basis of adverse and significant adverse effect, but they do not limit sound levels or provide any specific guidance on assessment methods. This lack of numeric limitation of sound levels is a direct consequence of the advice presented in the NPSE, which is that it is not possible to have *"a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations",* and that the sound level at which a significant adverse effect occurs is *"likely to be different for different noise sources, for different receptors and at different times."* In the absence of specific guidance within the national planning policy guidance for the assessment of environmental noise, it is considered appropriate to base assessment on any specific local planning policy requirements, relevant British Standards, or professional guidance.

5.20 On balance, quantification of noise impact in terms of guidance such as BS8233:2014, which presents noise limits and criteria based on World Health Organisation recommendations, can be considered as appropriately assessing the potential noise impact with regard to toxicology concepts, and hence in line with the principles of the NPPF, NPSE, and PPG. Therefore, if a development meets the recommendations of BS8233:2014 and any associated Local Authority noise requirements, it could be considered as being below the level where there are observed adverse effects on health and quality of life due to noise, and therefore below the LOAEL (Lowest Observed Adverse Effect Level) set out in the NPSE and PPG.

BS8233:2014

5.21 *British Standard 8233: 2014, 'Guidance on sound insulation and noise reduction for buildings'* (BS8233:2014) provides information on the design of internal acoustics in buildings. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.

5.22 BS8233:2014 provides guidance regarding indoor ambient noise criteria for residential accommodation, as presented below.

Table 3: BS8233:2014 Guidance criteria for indoor ambient noise levels

Activity	Location	0700-2300 hours	2300-0700 hours
Resting	Living rooms	35 dB $L_{Aeq\ (16\ hour)}$	-
Dining	Dining room/area	40 dB $L_{Aeq\ (16\ hour)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (16\ hour)}$	30 dB $L_{Aeq\ (8\ hour)}$

5.23 BS8233:2014 does not stipulate any criteria for maximum noise levels within rooms in terms of dB L_{Amax}, but does state that, *"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values."*

5.24 Other published guidance on implementing limiting L_{Amax} criteria in bedrooms (e.g. *ProPG: Planning and Noise*, and *WHO Community Noise Guidelines*) advises that individual noise events should not normally exceed 45dB L_{Amax} more than around 10no times per night, as this represents a threshold below which the effects of individual noise events on sleep can be regarded as negligible. ProPG also refers to the BS8233:2014 L_{Aeq} criteria set out above.

5.25 It is noted that BS8233:2014 also states that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved. This is also acknowledged in ProPG, which adds that, where internal L_{Aeq} levels exceed the target levels by more than 10dB, they are highly likely to be regarded as 'unacceptable' by most people, particularly if such levels occur more than occasionally.

5.26 The sound level criteria shown in Table 3 above are based on the existing guidelines issued by the WHO, and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern (for example, on a road serving a port with high levels of traffic at certain times of the night), an appropriate alternative period (e.g. 1 hour) may be used, but the level should be selected to ensure consistency with the levels recommended in the table. These levels are based on annual average data, and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

5.27 In addition, the BS8233:2014 guidance relating to gardens makes reference to external noise levels in gardens and balconies, etc., as follows:

> *"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*
>
> *Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space*."

IEMA 'Guidelines for Noise Impact Assessment'

5.28 The *Guidelines for Noise Impact Assessment* (2014) produced by the Institute of Environmental Management and Assessment (IEMA) are intended to set good practice standards for the scope, content, and methodology of noise impact assessments.

5.29 The guidelines address the key principles of noise impact assessment, and are applicable to all development proposals where noise effects are likely to occur, regardless of size. They define core methods and techniques used within the noise impact assessment process, and some concepts from the IEMA guidelines can be found in policy documents such as the PPG outlined above.

5.30 The guidelines advocate the early involvement of a competent noise assessor in the design of a project or development proposal. The aim of the noise impact assessment is to determine the effect of the expected change in the acoustic environment arising from the proposed development, and the guidelines state, "*In some cases, the conclusion about the degree of the impact will be clear and straightforward; but in others it is likely that, ultimately, a professional judgement will have to be made by the assessor. It must be remembered that the effects of noise are primarily subjective, and while it is desirable to include as much objectivity as possible into the assessment process in order to obtain consistency, there should be no concern in allowing professional judgement to come in the final analysis."*

5.31 Therefore, in assessing noise impact, the noise level threshold and significance should be determined by the assessor based upon the specific evidence, such as measured survey data and use of applicable acoustic standards and guidance, and also the potential subjective response to noise. The IEMA guidelines provide an example of how impact arising from a change in sound levels could be evaluated, as shown in the table below. It should be noted that the guidance stresses that such examples are provided to portray concepts, and cannot necessarily be transposed over to any development scheme.

Table 4: Example impact from change in sound levels

Long-term impact classification	Short-term impact classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16-hour day or 8-hour night
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

(Source: HS2 Phase 1 Environmental Statement)

5.32 When the impact of a scheme has been suitably described and assessed, the assessor is in a position to form a view about the magnitude of the impact and, where necessary, the significance of the effect.

5.33 Similarly to PPG, the IEMA guidance provides the following generic scale for describing a range of noise effects upon a receptor.

Table 5: IEMA Generic relationship between noise impact (Magnitude) and noise effect (Magnitude + Sensitivity), including the evaluation of effect significance

MAGNITUDE (Nature of Impact)		DESCRIPTION OF EFFECT (on a specific sensitive receptor)	SIGNIFICANCE (as required within EIA)
Substantial	BENEFICIAL	**Receptor perception = Marked change** Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect)
Moderate	BENEFICIAL	**Receptor perception = Noticeable improvement** Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Slight	BENEFICIAL	**Receptor perception = Just noticeable improvement** Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect) Less Likely to be Significant
Negligible		N/A = No discernible effect on the receptor	**Not Significant**
Slight	ADVERSE	**Receptor perception = Non-intrusive** Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect)
Moderate	ADVERSE	**Receptor perception = Intrusive** Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance[81]. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Substantial	ADVERSE	**Receptor perception = Disruptive** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. 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 character of the area.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect) More Likely to be Significant
Severe	ADVERSE	**Receptor perception = Physically Harmful** Significant 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.	Significant

Sport England Guidance

5.34 Sport England have produced a Design Guidance Note titled *'Artificial Grass Pitch (AGP) Acoustics – Planning Implications New Guidance for 2015'*. This document provides information on AGP noise emission derived from measurements of different sports sessions on different AGPs with participation by men, women, and children.

5.35 The guidance states that the most significant noise levels generated were found to be from the voices of players, with the exception of hockey where impact noises of balls hitting perimeter strikeboards and goal backboards were more noticeable. These characteristics may be considered similar to racquet sports. The guidance provides some information on sound levels generated by these sports, along with outline mitigation measures.

5.36 The Sport England guidance also makes reference to the NPPF in terms of planning context, and WHO Guidelines for Community Noise 1999 in terms of assessing AGP noise. Based on this, the guidance states that the AGP noise level outside a residential property during the daytime at about 1m distance from the façades of living spaces should not exceed 50dB L_{Aeq}. The document suggests that this avoids 'moderate annoyance', and would be suitable to reduce AGP noise ingress via open windows to within suitable levels inside dwellings, i.e. in line with WHO guidance and BS8233.

5.37 The guidance also notes that WHO noise criteria are typically defined in terms of 16-hour day periods, whereas consideration of impact in terms of $L_{Aeq,1hr}$ is suggested as being more appropriate for a typical AGP sports session.

6.0 SOUND IMPACT ASSESSMENT

6.1 Calculations have been undertaken to predict the breakout of Pickleball and Padel activities from the proposed new building to sensitive receptors in the surrounding area. The calculations are presented in Appendix 3, and have been based on the measured internal sound levels presented in Appendix 2. To provide a conservative assessment, it is assumed that the measured internal sound levels might occur throughout the court spaces.

6.2 This assessment of impact primarily focuses on receptors at Location 1, being representative of the houses nearest to the proposed development site. The neighbouring properties on Bourne Road might experience similar impact, but this will be of lesser magnitude as these are at slightly further distance. Other residential properties in the area are at greater distance and shielding from the development site, and therefore noise impact at those locations will be no worse than as assessed for the nearest residential properties. Given the proximity of the receptors and the nature of the proposal, it is unlikely that there would be significant influence on noise impact due to environmental effects such as temperature inversion or wind.

6.3 Based on the above, the operational sound levels from simultaneous use of the Pickleball and Padel courts in the new building are calculated to be 18dB L_{Aeq} at the nearby dwellings.

6.4 The calculation method is not wholly appropriate for predicting breakout of L_{Amax} sound levels. However, given that a key concern of Pickleball and Padel activities is impact sound from bats/racquets striking balls, then adapting the calculation method to consider maximum levels indicates that a sound level no greater than 28dB L_{Amax} is expected at the nearest residential property. Note that this is based on the highest measured L_{max} values in each octave band as a worst-case scenario, and that typical operational levels will be significantly lower than this.

6.5 A comparative assessment is appropriate in order to evaluate noise impact in quantitative terms. This involves comparison of ambient sound levels during the sporting activity with those in the absence of the sporting activity. This methodology is commonly employed in such circumstances.

6.6 As well as any change in noise level, the determination of impact should also consider factors such as the context of the assessment, time of day, frequency of event occurrence, the nature and spectral characteristics of the sound source, and the subjective character of the sound source and general noise climate.

6.7 Compared with the measured ambient sound levels summarised in Table 1, it can be seen that the predicted L_{Aeq} sound levels from the proposed Pickleball and Padel activities are notably lower than the prevailing ambient L_{Aeq} and background L_{A90} sound levels at all times, and therefore are of negligible impact. Factors such as spectral and subjective characteristics will as such be indistinguishable, and therefore also negligible. In terms of Table 5, an impact of negligible magnitude is of no discernible effect on the receptor, and is not significant.

6.8 Similarly, the predicted breakout of L_{Amax} sound levels is notably less than the prevailing L_{Aeq} sound levels at the receptors, and is also below the background L_{A90} sound level for the majority of the time. The prevailing L_{Amax} sound levels at the houses due to existing noise sources such as road traffic are around 60dB greater than those predicted from racquet sports activity within the proposed development. Therefore, impact in terms of L_{Amax} sound levels is also negligible.

6.9 Based on the above, the effects of the proposed development will be below the threshold of NOEL, and will have no adverse effect. The acoustic criteria defined in WHO guidelines and BS8233 for sound levels outside and inside dwellings will be easily satisfied at the nearest residential receptors. Therefore, the development can be considered suitable in terms of planning and noise.

6.10 Nonetheless, following the principles of good acoustic design, measures to mitigate and reduce sound impact should be implemented during the design and operation of the proposed development. Recommended mitigation measures include:

a) Internal music should only be played at background sound levels (e.g. <60dB L_{Aeq})

b) No external music or external loudspeakers.

c) Avoid hard, reflective surfaces inside the building and provide acoustic absorption to internal spaces wherever practicable (e.g. drapes to walls). This will also improve acoustic comfort for users of the building.

d) The court floor surfaces will naturally be as required for these racquet sports, but non-court floor surfaces are to be carpeted where possible.

e) Ensure all doors and windows/rooflights are kept closed.

f) Lobbied entrances to reduce sound egress when doors are opened (this is already proposed for the main entrance).

g) Ensure carparks are used appropriately (e.g. avoid idling vehicles and excessive revving/loud car stereos, etc.).

h) Install signage to encourage quiet and considerate behaviour by all users of the facility.

7.0 SUMMARY AND CONCLUSIONS

7.1 Blue Tree Acoustics has carried out a noise assessment on behalf of Racquet Space for a proposed indoor court facility for Pickleball and Padel activities, situated on land at Bourne Road, Spalding.

7.2 The assessment has included measurements of the prevailing ambient sound levels at the site during representative daytime and evening periods, including on a Sunday. Road traffic was found to be the dominant environmental sound source at the site during daytime.

7.3 Representative measurements of Pickleball and Padel games have been taken to provide source sound level data for the development's proposed activities.

7.4 Potential noise impact from the proposed development has been considered. Given the magnitude and character of the prevailing sound climate around the site, the acoustic impact from the proposed new development is expected to be of negligible magnitude, and will have no discernible effect on nearby residential amenity.

7.5 Good practice noise control measures have nonetheless been recommended for the development, to help mitigate impact and improve acoustic conditions.

7.6 The site can be considered suitable for the proposed development, as acceptable noise impact in accordance with planning guidelines and established acoustic criteria will be met.

8.0 DISCLAIMER

8.1 This document is limited to addressing the specific acoustic issues contained herein, and its content is based on drawings and information provided to date by our Client/their Design Team.

8.2 All findings, comments, recommendations, etc., in this document are for acoustic purposes only; any and all other considerations and requirements, e.g. structural, airflow, thermal, fire safety, CDM compliance, determination of whether materials are dangerous, hazardous, deleterious, etc. (non-exhaustively), are the responsibility of other such suitably qualified specialists to check and advise on.

8.3 All findings, comments, recommendations, etc., in this document have been prepared with reasonable skill and care by BTA, within the scope of our Client's brief and timescales. Calculations and estimates upon which BTA's findings are elaborated are based on reasonable assumptions and industry practice that, by their nature, involve uncertainties that could cause future onsite results to differ materially from those predicted. BTA does not guarantee or warrant any calculation or estimate made, especially those based on data measured by third parties or information provided by third parties to BTA or otherwise relied upon by third parties. Any third-party information required and/or provided for the purpose of completing this document should not be considered as verified by BTA.

8.4 BTA's work may occasionally involve provision of acoustic performance advice and acoustic design recommendations that others may choose to regard as a "specification" under CDM 2015 (and thus others may occasionally choose to regard BTA to be a "Designer" under CDM 2015). Notwithstanding this, it is always the responsibility of others (Principal Designer) to approve/incorporate into their final design – or not – their final specification selections; although these may be based on BTA's acoustic performance advice, as BTA neither has control over how or whether BTA's acoustic advice is incorporated into the final design by others, nor any power to enforce that any such final specification selections made by others based on BTA's advice are appropriate in any regard beyond their acoustic performance qualities, it also remains the responsibility of others under CDM 2015 to ensure that any ancillary (non-acoustic) considerations in the course of selection, installation, maintenance, etc. of final specifications are advised upon by such relevantly qualified specialists (non-acoustic, and therefore non-BTA), and that any safety precautions identified in the course of their consideration by others are taken by others (the Principal Designer, Designers, Contractors, Client, etc.).

8.5 Products and materials that perform well acoustically tend to be heavier than standard products. Use of these products and materials may increase the weight of the element, and the CDM

Principal Designer, Client, etc. must take care to ensure that this risk is mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe lifting and installation techniques, maintenance, etc. are used to reduce any remaining risk. Wherever BTA advises that works such as acoustic barriers are desirable to attenuate noise, care must be taken by the CDM Principal Designer, Client, etc. to ensure that the risks associated with constructing and maintaining bunds, walls, fences, etc. are mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe construction and installation techniques, maintenance, etc. are used to reduce any remaining risk.

8.6 This document has been prepared for the sole use, benefit, and information of our direct Client for the purposes agreed at the time of their formal instruction, and the information contained herein is the sole property of, and confidential to, our direct Client. The liability of BTA in respect of the information contained herein will not extend to any third party.

FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATION

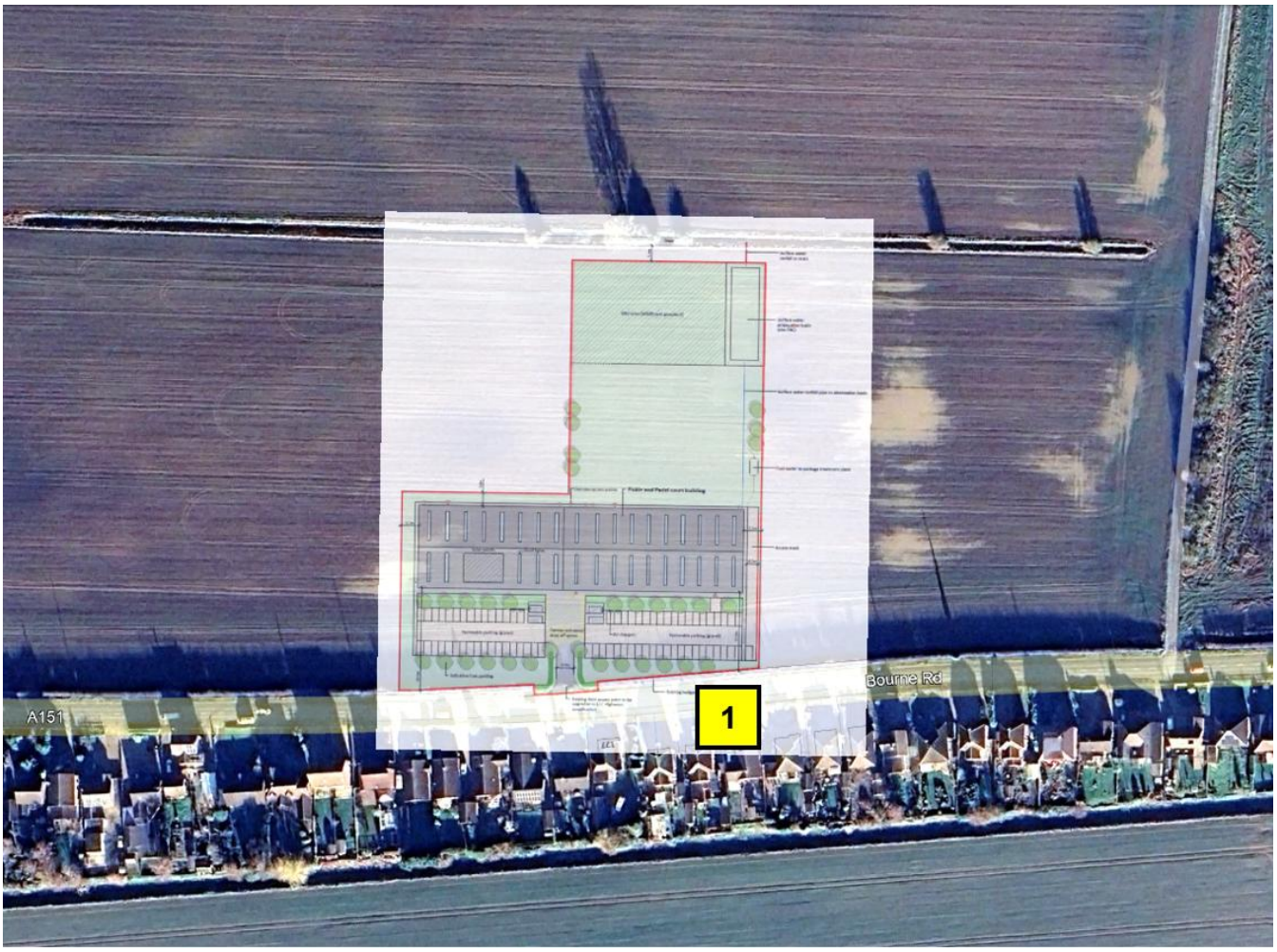


FIGURE 2 – INDICATIVE SITE LAYOUT PLAN



(Source: RDC drawing ref. 1648-1_FP_SP02 dated 08/10/2025)

APPENDIX 1 – TECHNICAL UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighing applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

NR Measured noise levels in each octave band are compared to the NR curve reference values. The overall NR value is the lowest NR curve that has not been exceeded.

$D_{nT,w}$ Weighted standardised level difference, a single figure generated by comparing the D_{nT} with a reference curve. The reference curve is shifted in 1dB steps until the sum of adverse deviation of the test curve, compared to the reference curve, is as large as possible, but no more than 32.0 dB. The value of the shifted reference curve at 500Hz is taken as the $D_{nT,w}$. N.B. As $D_{nT,w}$ for airborne transmission represents a level difference, an improvement generates a larger figure – used in airborne tests.

R_w Similar to the $D_{nT,w}$ term, but a measure of the airborne sound insulation performance of a separating element, when tested in laboratory conditions. As such the build is essentially perfect, and has no flanking noise routes. $D_{nT,w}$ values measured on site will always be of a significantly lower value than the R_w value for a structure.

APPENDIX 2 – SOUND LEVEL MEASUREMENT DATA

AP2.1 Environmental sound level measurement locations were suitably distant from acoustically reflecting surfaces and structures (other than the ground) to minimise the influence of reflections.

Chart AC1: Location 1 – Footpath on Bourne Road – Thursday 14/08/2025

Rion NA-28 sound level meter (S/N 00501389). All values dB(A), 15-minute duration, free-field.

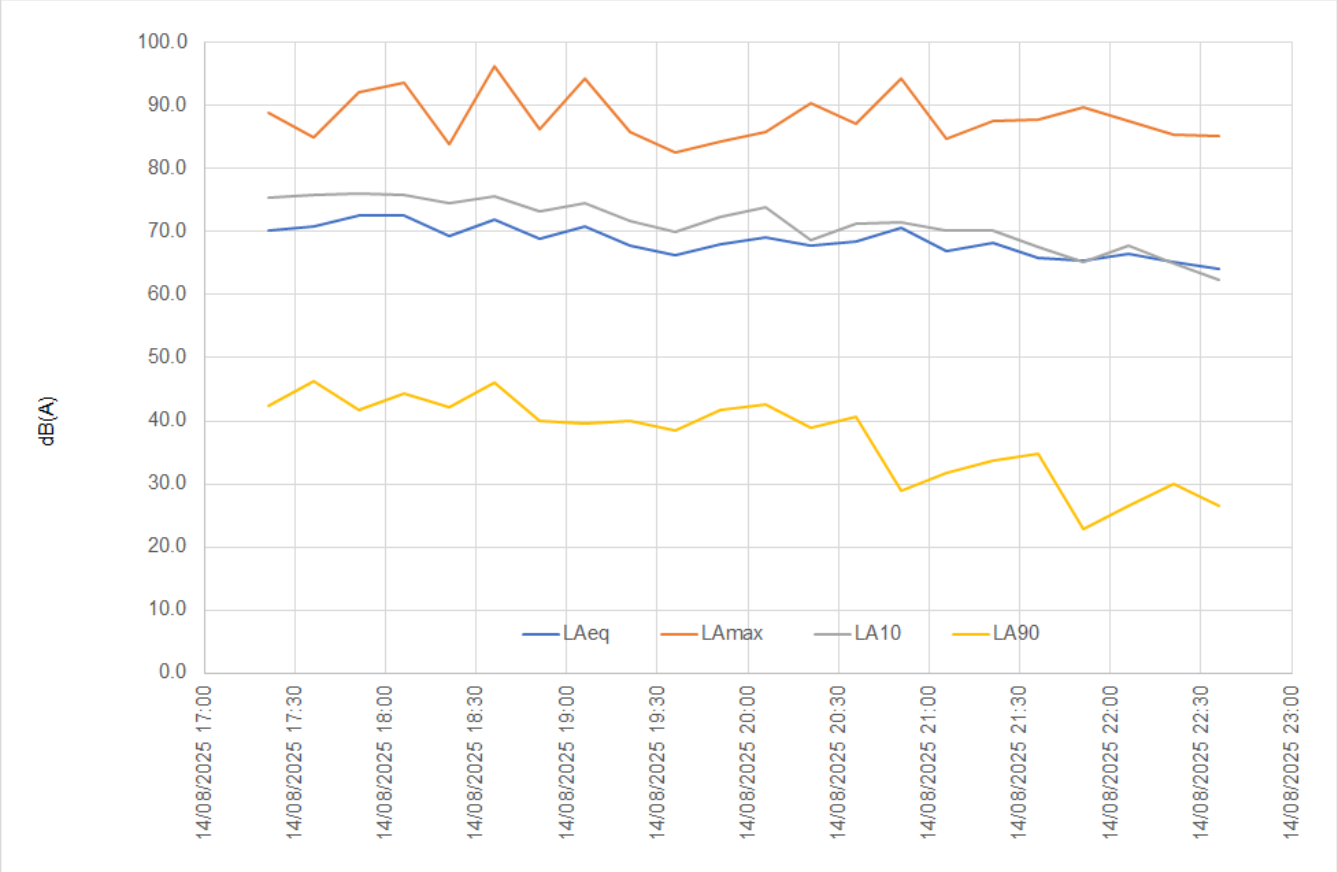
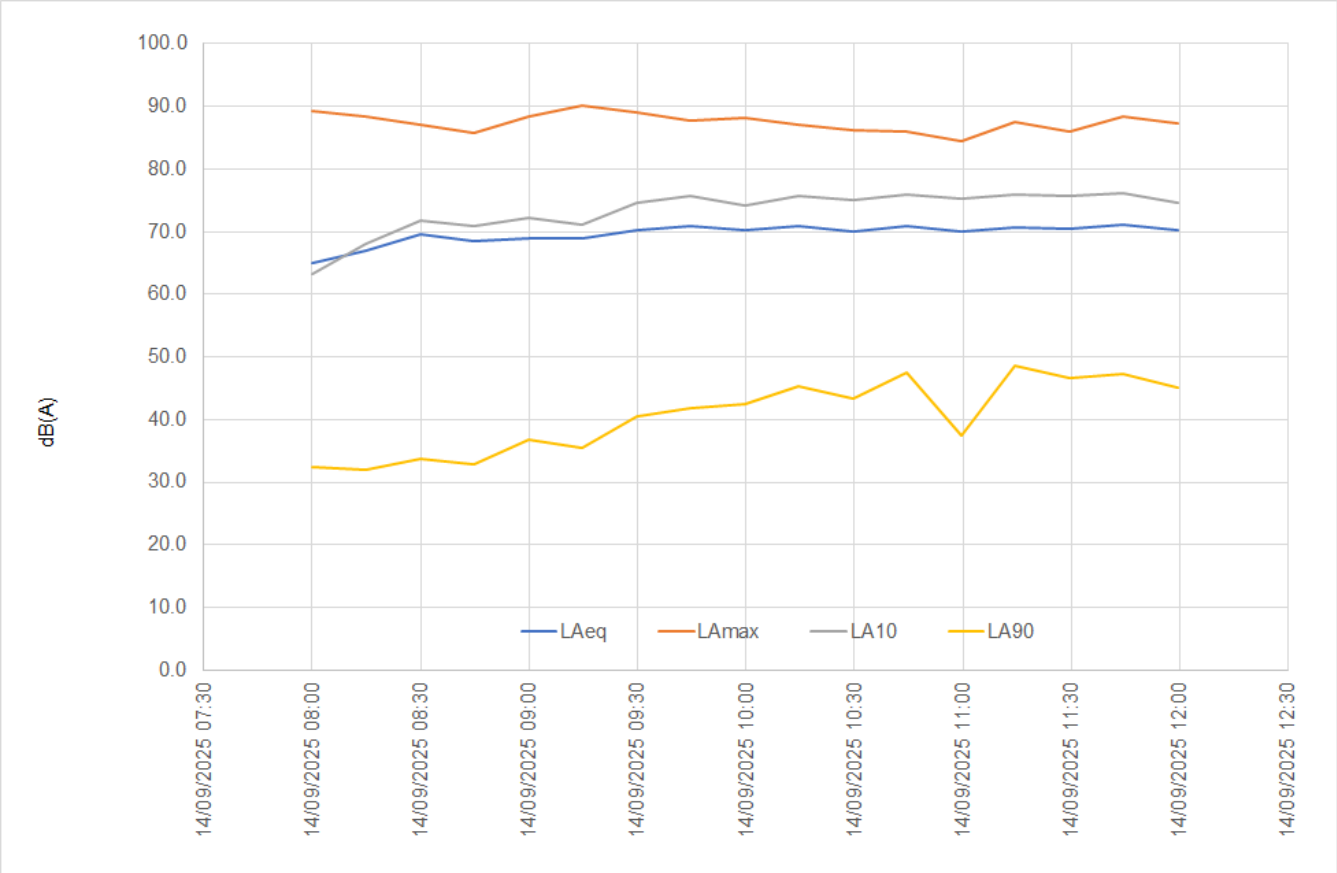


Chart AC2: Location 1 – Footpath on Bourne Road – Sunday 14/09/2025

Rion NA-28 sound level meter (S/N 00501389). All values dB(A), 15-minute duration, free-field.



Source sound levels – Pickleball

AP2.2 Measurements of indoor Pickleball activity were taken at Long Sutton Sports Centre in Spalding during the early evening hours of Wednesday 10/09/2025.

AP2.3 The main hall inside the sports centra contained 3no courts set up for Pickleball. Room conditions comprised wooden sports floor, painted blockwork lower walls, and profiled steel sheet upper walls and roof.

AP2.4 The instruments used for these measurements were 2no Rion NA-28 Class 1/Type 1 integrating sound level meters. 1no meter was positioned 3m to the side of the centre net position and was set to log 1-second measurements. 1no meter was positioned 1m from the rear of the court and was set to log 1-minute measurements. Source sound levels were primarily attributable to players' voices and ball impacts on racquets.

Chart AC3: Location 1m from rear of the court, dB(A), 1-minute periods

Rion NA-28 sound level meter (S/N 00501389).

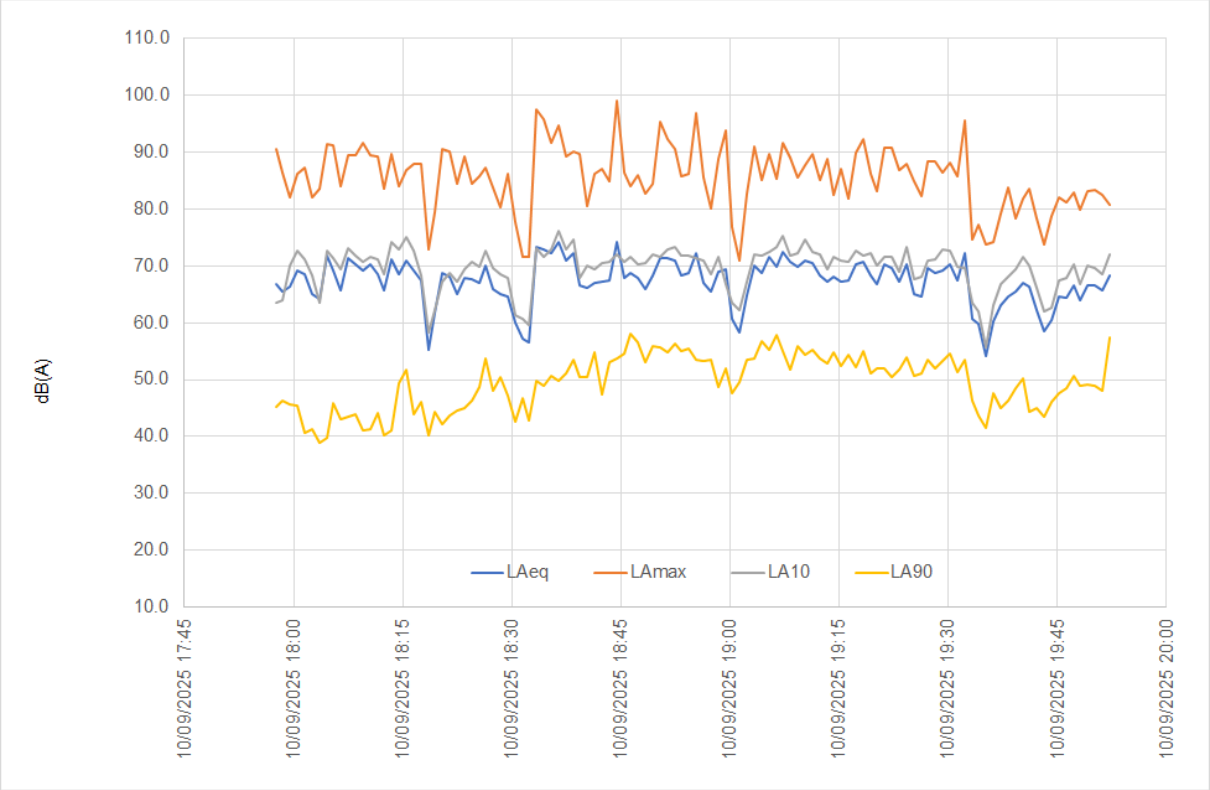


Table AT1: Summary of measured octave band sound levels

	dB @ Octave band centre-frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Average L_{eq}	50.2	57.5	58.8	61.6	66.2	59.4	54.2	49.7	68.1
Average L_{max}	62.9	71.3	72.5	76.7	83.1	75.8	70.7	66.3	84.7
Highest L_{max} in each band	85.0	85.0	86.1	93.4	98.5	90.3	82.3	80.3	100.0

Chart AC4: Location 3m from side of the court, dB(A), 1-second periods

Rion NA-28 sound level meter (S/N 01070579). Datapoints are too dense to depict clearly in limited chart format, L_{Amax} values shown below.

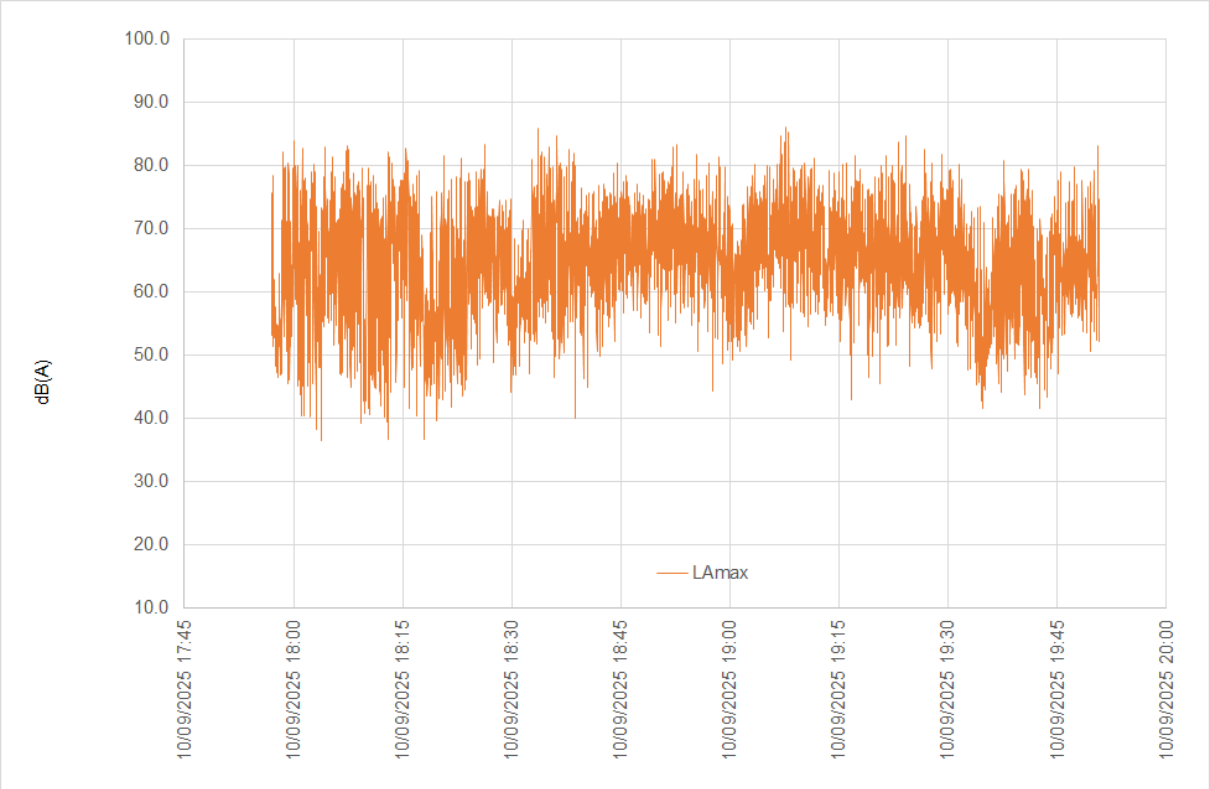
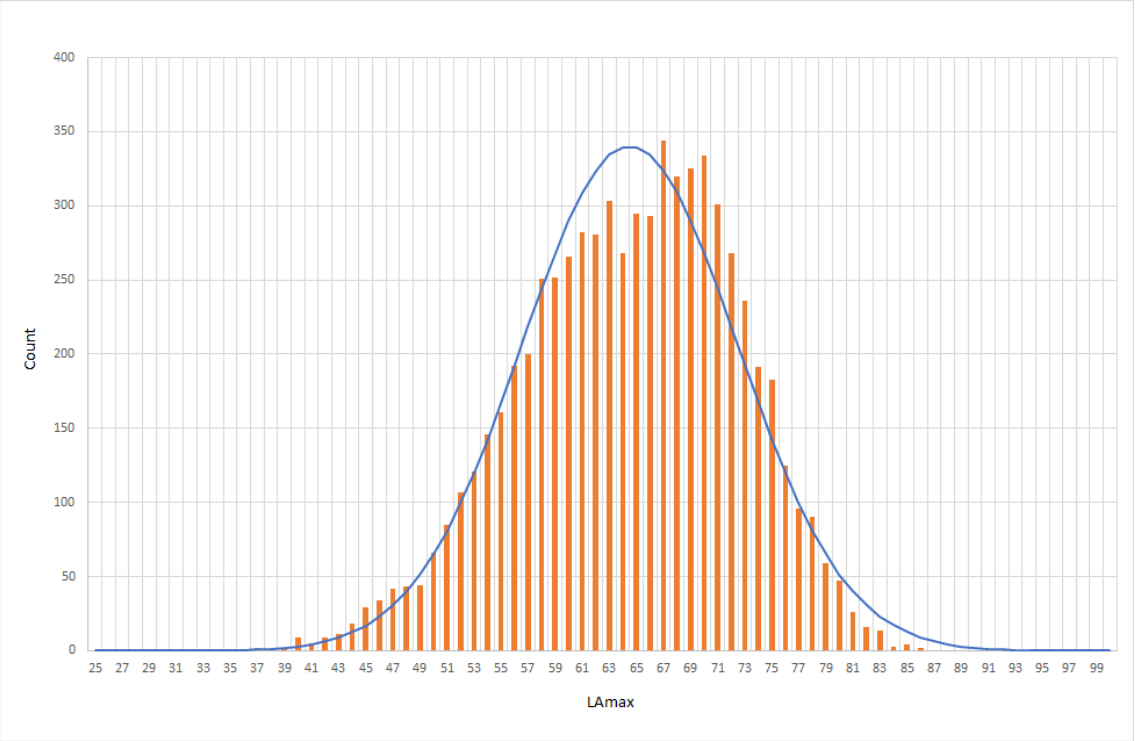


Chart AC5: Frequency distribution of $L_{Amax,1sec}$ values



Source sound levels – Padel

AP2.5 Measurements of indoor Padel activity were taken at Play Padel in Sheffield during daytime hours on Monday 22/09/2025.

AP2.6 The facility contains 3no doubles courts and 1no singles court within a single building, along with a reception/bar area. All courts were in use during the measurements. Each Padel court is enclosed by glass rebound panels to the ends and side returns, with metal weld mesh at midsections along each side. Room conditions comprised astroturf courts, carpeted floors, and full-height drapes to inner face of all external walls. Outer building construction comprised insulated profiled steel sheet walls and roof. Background music was played continuously within the space via small loudspeakers positioned in the corners of the room.

AP2.7 The instruments used for these measurements were 2no Rion NA-28 Class 1/Type 1 integrating sound level meters. 1no meter was positioned in a walkway between 2no doubles courts, near the centre net position, and was set to log 1-minute measurements. 1no meter was positioned in the walkway between 1no doubles court and the singles court, also near the centre net position, and was set to log 1-second measurements. Source sound levels were primarily attributable to players' voices and ball impacts on racquets. From 1100 hours, the players were mostly men, with 2no women. After 1200 hours, the players were all women, with only 3no courts in use. The reduction in measured sound levels seen after 1200 hours is attributable to this change.

Chart AC6: Location in walkway between doubles courts, dB(A), 1-minute periods

Rion NA-28 sound level meter (S/N 00501389).

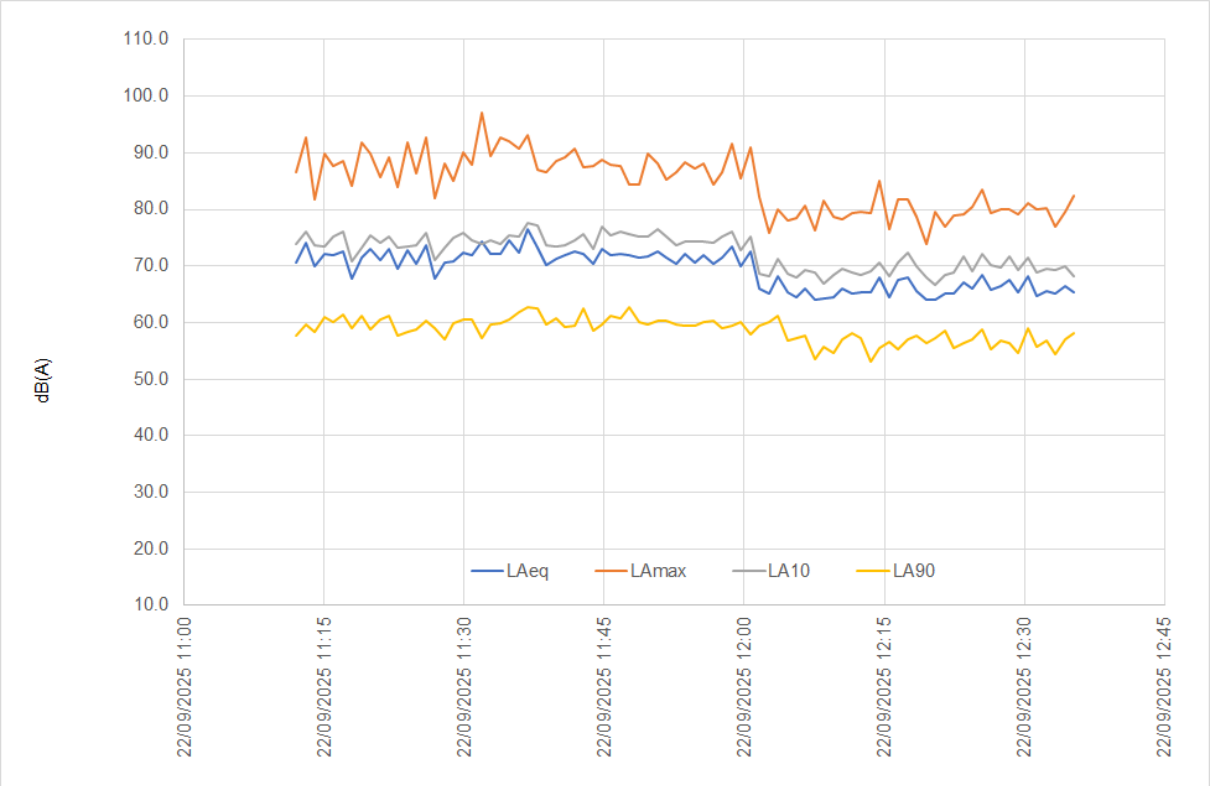


Table AT2: Summary of measured octave band sound levels

	dB @ Octave band centre-frequency (Hz)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Average L_{eq}	59.1	59.5	65.1	66.7	68.4	60.4	53.6	43.4	70.5
Average L_{max}	70.9	72.5	78.1	80.9	82.9	74.5	68.6	59.1	84.9
Highest L_{max} in each band	78.8	80.1	85.6	91.3	96.4	83.8	78.6	77.7	97.4

Chart AC7: Location in walkway between doubles court and singles court, dB(A), 1-second periods

Rion NA-28 sound level meter (S/N 01070579). Datapoints are too dense to depict clearly in limited chart format; L_{Amax} values shown below.

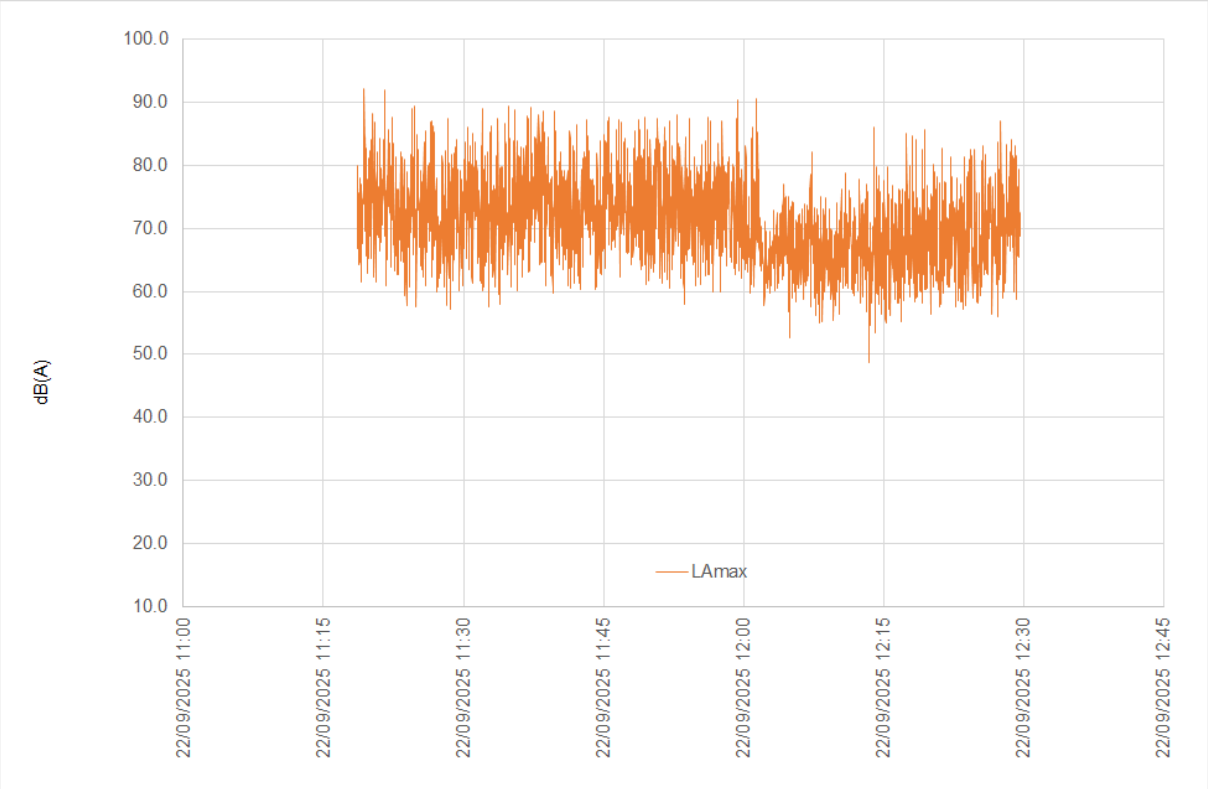
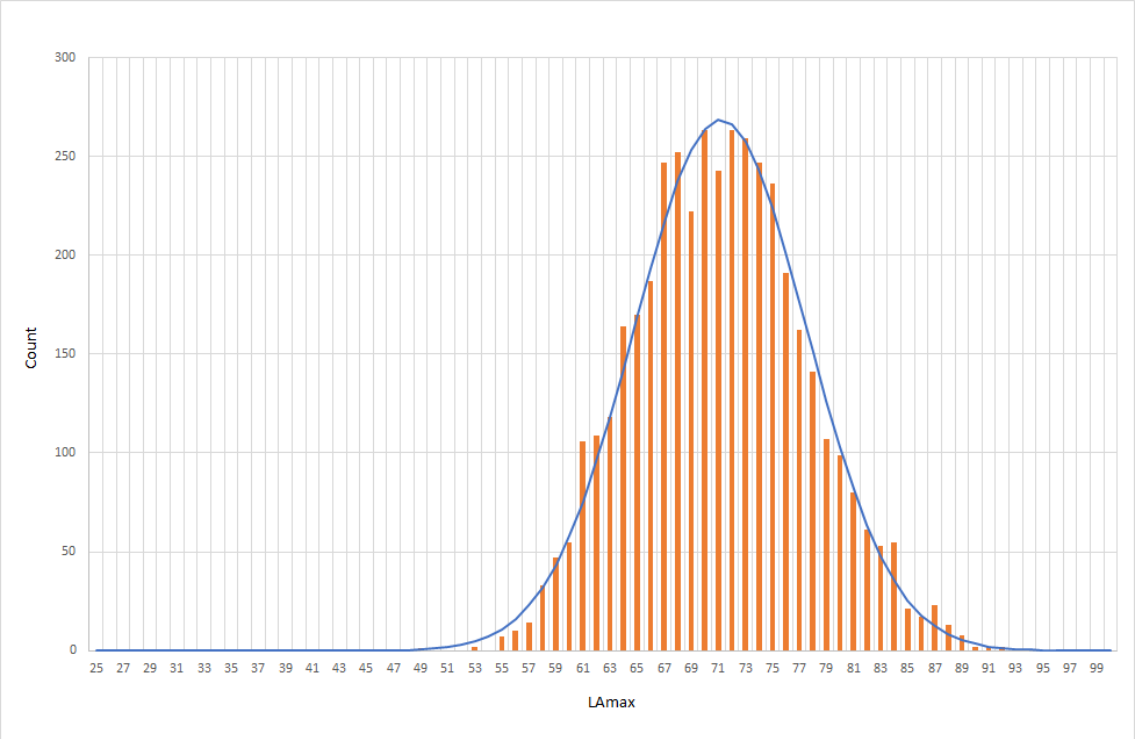


Chart AC8: Frequency distribution of $L_{Amax,1sec}$ values



APPENDIX 3 – SOUND BREAKOUT CALCULATION

AP3.1 Calculations have been undertaken to predict the sound level from racquet sports experienced at the nearby residential receptors on Bourne Road. The calculations consider breakout of sound via the sections of building envelope having line of sight to the receptors and considered to act as a plane source.

AP3.2 The sound reduction values presented in the following table for typical building elements have been used to calculate the sound insulation of the building envelope construction.

Table AT3: Building envelope sound reduction

Building elements	Octave band minimum sound reduction indices (dB)							
	63	125	250	500	1k	2k	4k	8k
Kingspan KS1000 RW/40 insulated panel to walls and roof	13	14	29	38	40	45	55	55
Personnel/emergency exit door	9	12	13	14	16	18	24	26
Double-glazed main entrance, (4mm glass / 12mm airgap / 4mm glass assumed)	20	24	20	25	35	38	35	35
Rooflights (non-opening glazed rooflights assumed)	13	20	22	28	33	34	28	28

AP3.3 The calculations in octave band terms are presented in Table AT4 below. The total A-weighted value at the receptor is also calculated. The equation used is $SPL_{ext} = SPL_{int} - SRI - 6$, with distance attenuation, etc. as set out in the table.

Table AT4: Calculated racquet sports sound emission to Bourne Road receptors

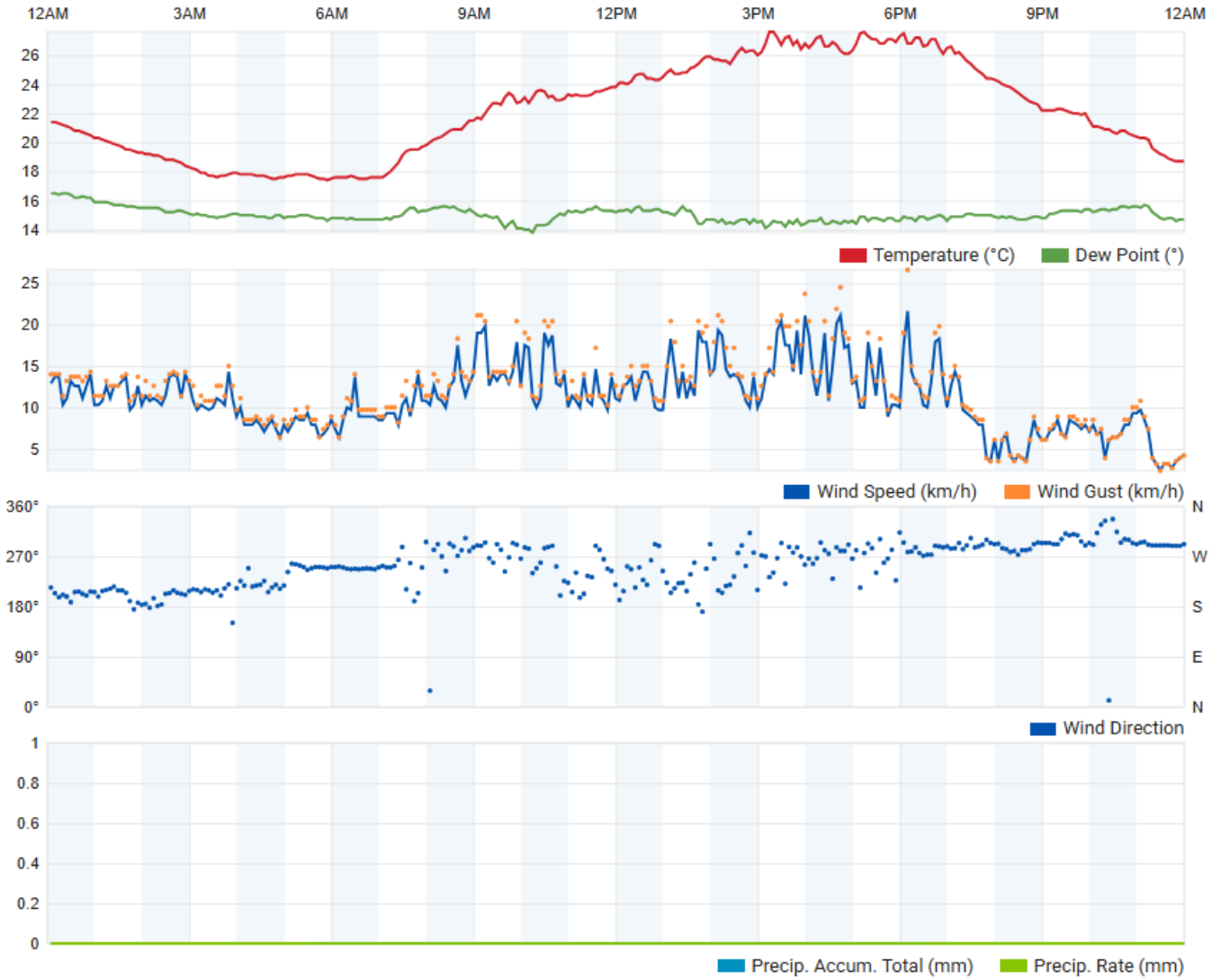
	dB @ Octave band centre frequency (Hz)							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Pickleball roof breakout, Distance = 80m								
Pickleball internal sound level, L_{eq}	50.2	57.5	58.8	61.6	66.2	59.4	54.2	49.7
Roof SRI, area 1260m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Rooflight SRI, area 140m^2	13.0	20.0	22.0	28.0	33.0	34.0	28.0	28.0
Average SRI	13.0	14.3	27.5	35.2	38.5	41.7	37.9	37.9
-10Log ((50/π)/(28/π))	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
-20Log (80/(50/π))	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0	-14.0
Screening/angle of view	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	12.7	18.6	6.7	1.8	3.1	-6.8	-8.3	-12.8
Pickleball front elevation breakout, Distance = 67m								
Pickleball internal sound level, L_{eq}	50.2	57.5	58.8	61.6	66.2	59.4	54.2	49.7
Wall SRI, area 350m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Average SRI	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
-10Log ((50/π)/(7/π))	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5
-20Log (67/(50/π))	-12.5	-12.5	-12.5	-12.5	-12.5	-12.5	-12.5	-12.5
Screening/angle of view	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	13.2	19.5	5.8	-0.4	2.2	-9.6	-24.8	-29.3
Pickleball end elevation breakout, Distance = 92m								
Pickleball internal sound level, L_{eq}	50.2	57.5	58.8	61.6	66.2	59.4	54.2	49.7
Wall SRI, area 192m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Door SRI, area 4m^2	9.0	12.0	13.0	14.0	16.0	18.0	24.0	26.0
Average SRI	12.9	13.9	26.5	30.1	32.1	34.5	40.7	42.6
-10Log ((28/π)/(7/π))	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0	-6.0
-20Log (92/(28/π))	-20.3	-20.3	-20.3	-20.3	-20.3	-20.3	-20.3	-20.3
Screening/angle of view	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	3.0	9.3	-2.0	-2.8	-0.2	-9.4	-20.8	-27.2

Table AT4 (cont'd)

	dB @ Octave band centre frequency (Hz)							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Padel roof breakout, Distance = 72m								
Padel internal sound level, L_{eq}	59.1	59.5	65.1	66.7	68.4	60.4	53.6	43.4
Roof SRI, area 1260m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Rooflight SRI, area 140m^2	13.0	20.0	22.0	28.0	33.0	34.0	28.0	28.0
Average SRI	13.0	14.3	27.5	35.2	38.5	41.7	37.9	37.9
-10Log ((50/π)/(28/π))	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
-20Log (72/(50/π))	-13.1	-13.1	-13.1	-13.1	-13.1	-13.1	-13.1	-13.1
Screening/angle of view	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	22.5	21.5	13.9	7.9	6.2	-4.9	-8.0	-18.2
Padel front elevation breakout, Distance = 58m								
Padel internal sound level, L_{eq}	59.1	59.5	65.1	66.7	68.4	60.4	53.6	43.4
Wall SRI, area 419m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Door SRI, area 2m^2	9.0	12.0	13.0	14.0	16.0	18.0	24.0	26.0
Glazing SRI, area 4m^2	20.0	24.0	20.0	25.0	35.0	38.0	35.0	35.0
Average SRI	13.0	14.0	28.0	34.3	36.6	39.7	46.1	47.5
-10Log ((50/π)/(8.5/π))	-7.7	-7.7	-7.7	-7.7	-7.7	-7.7	-7.7	-7.7
-20Log (58/(50/π))	-11.2	-11.2	-11.2	-11.2	-11.2	-11.2	-11.2	-11.2
Screening/angle of view	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	24.2	23.5	15.1	10.5	9.9	-1.2	-14.4	-26.0
Padel end elevation breakout, Distance = 80m								
Padel internal sound level, L_{eq}	59.1	59.5	65.1	66.7	68.4	60.4	53.6	43.4
Wall SRI, area 234m^2	13.0	14.0	29.0	38.0	40.0	45.0	55.0	55.0
Door SRI, area 4m^2	9.0	12.0	13.0	14.0	16.0	18.0	24.0	26.0
Average SRI	12.9	14.0	26.8	30.8	32.8	35.3	41.5	43.4
-10Log ((28/π)/(8.5/π))	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
-20Log (80/(28/π))	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1
Screening/angle of view	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Ground reflection	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound level at receptor, L_{eq}	14.0	13.3	6.0	3.6	3.3	-7.1	-20.2	-32.3
Total sound level at receptor, L_{eq}	27.1	27.5	18.5	13.5	13.2	2.3	-4.4	-11.3
Resulting L_{Aeq} at receptor:	**18 dB(A)**							

APPENDIX 4 – ENVIRONMENTAL NOISE SURVEY WEATHER DATA

Thursday 14/08/2025



Sunday 14/09/2025

