

Report VA4834.230809.NIA

Seacourt Tennis Club, Hayling Island

Noise Impact Assessment - Padel Court

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Contents

1. Introduction	1
2. Site Description.....	1
3. Assessment Methodology	2
3.1 Sports England.....	2
4. Environmental Noise Survey	2
4.1 Survey Procedure & Equipment	2
4.2 Results	3
5. Noise Model.....	3
5.1 Source Noise Levels	4
5.2 Proposed Mitigation	4
5.3 Noise Model Results	5
6. Discussion	5
7. Noise Management.....	6
8. Conclusion	7

Attachments

VA4834/SP1	Indicative Site Plan
VA4834/TH1 - TH4	Environmental Noise Time Histories
Appendix A	Acoustic Terminology

1. Introduction & Executive Summary

It is proposed to install two new padel courts on the lawns adjacent to the existing tennis courts at Seacourt Tennis Club, Hayling Island. Due to the limitations on hours during which the flood lights may be turned on (no later than 21:00), the padel courts would be available to members during the same time period the tennis courts are already in use.

As the proposed courts have surrounding residential elements, Venta Acoustics has been commissioned by Seacourt Tennis Club to undertake an assessment of the potential noise impact of the proposed new courts on the surroundings.

Library data from sound measurements of padel games has been input into an acoustic model to predict the resulting sound levels at the surrounding houses. These levels are compared against the existing sound levels measured at the site. The local soundscape is determined by traffic on surrounding roads, the current use of the tennis courts and entertainment facilities at the beachfront.

Mitigation options in terms of screening and careful management of the use of the courts is considered.

Seacourt is a relatively small, friendly club with the proposed courts within sight of the clubhouse, suggesting that reasonable behaviour and use will be readily monitored and enforced. As the proposed courts are not considered to change the pre-existing acoustic character of the area and the sound generated is expected to be similar to the existing sound levels, a significant impact is not expected from the proposals.

2. Site Description

The Seacourt Tennis Club, located between Victoria Avenue and Sea Front, consists of two external tennis courts and a boules surface to the west and various sporting facilities within the clubhouse on the eastern side of the site. This is illustrated on attached site plan VA4834/SP1.

The club has served and formed part of the character of the surrounding residential area since its establishment in 1966. There are private houses with gardens backing onto the club to the north and south of the proposed new padel courts, with a carpark serving the flats to the west.

Within the surrounding area is The Hayling Island Beach and Light Railway to the south with the Funland Amusement Park approximately 170m to the south west. The amusement park fairground rides are understood to operate between 11:00 and 20:00 during the summer. Sound from these activities is audible at the site.

3. Assessment Methodology

The absolute sound levels associated with the proposed new padel courts are assessed against guidance provided by Sports England.

While there is no applicable guidance that suggests noise limits relative to the existing background sound environment, it is generally accepted that the further above the existing background sound level a new noise source is, the greater the potential for impact. The predicted sound levels will therefore be compared against the existing levels as determined by an environmental sound survey.

3.1 Sports England

The *Artificial Grass Pitch (AGP) Acoustics – Planning Implications – [Sport England 2015]* document brings together relevant noise guidelines and UK planning policies for the assessment of noise from Artificial Grass Pitches. It identifies the noise implications of the associated sound sources and recommends mitigation measures to limit adverse impacts upon noise sensitive receptors.

Although not explicitly applicable to padel courts, the noise sources involved are similar to the types of sport played on AGPs (shouting and impact of balls against surrounding barriers).

The following suggested criteria are summarised from the document:

- The noise level outside a residential property during the daytime about 1 metre from facades of living spaces should not exceed 50 dB $L_{Aeq,1hour}$,
- Noise levels in gardens should not exceed 50 dB $L_{Aeq,1hour}$
- Noise from the new pitch not to exceed the existing noise climate.

4. Environmental Noise Survey

4.1 Survey Procedure & Equipment

In order to establish the existing noise levels at the site, a noise survey was carried out between Thursday 27th and Monday 31st July 2023 at the location shown in site plan VA4834/SP1. This location was chosen to be representative of the noise levels in the general area, including noise from the existing tennis courts.

Continuous 5-minute samples of the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were undertaken at the measurement location.

The weather during the survey period was variable, with ample periods of calm weather between periods of wind and rain. The periods of unsuitable weather have been excluded from the analysis.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

The following equipment was used in the course of the survey:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-15892-E0	150497-1	28/3/23
Larson Davis calibrator	CAL200	13049	1504971-3	28/3/23

Table 4.1 – Equipment used for the survey

The calibration of the sound level meters was verified before and after use with no significant calibration drift observed.

4.2 Results

The measured sound levels are shown as time-history plots on the attached charts VA4834/TH1-4.

The site is primarily affected by traffic on surrounding roads and activities on the club site. Music, shouting and rail noise was also clearly audible from the funfair during the site visits.

The general noise levels for the Daytime and Night-time periods, as measured at the automated monitoring position were:

Monitoring Period	Front	
	L _{Aeq,T}	Typical ¹ L _{A90,5min}
07:00 – 23:00	48dB	37dB
23:00 – 07:00	38dB	30dB
Proposed Padel Court Hours: 07:00 – 19:00	48dB	40dB

Table 4.2 – Average ambient and typical background noise levels

¹ The typical L_{A90} value is taken as the 10th percentile of all L_{A90} values measured during the relevant period.

L_{AMax} levels during the proposed hours of use of the padel courts generally averages around 60dB, falling to around 55dB at 21:00.

Sound levels during the use of the tennis courts (e.g Friday evening between 17:00 and 19:00) are L_{Aeq,1hour} 50dB at 35m from the centre of the courts, with L_{AMax} levels between 63dB and 78dB.

5. Noise Model

To provide an illustration of how sound from the proposed courts is expected to propagate around the site, 3D noise mapping has been used for the prediction of activity noise levels at the nearest noise sensitive receivers.

This process uses several different calculation protocols to derive accurate noise analysis predictions. Noise propagation and barrier attenuation are calculated in accordance with ISO 9613-

1:1993 *Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere* and ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*. The localised ground absorption is set to 0.5 (some grass and some hard surfaces).

The noise levels for the courts have been modelled using each court as an area source, which allows for ball bounces across the entire area of the court.

5.1 Source Noise Levels

Measurements of source sound levels have previously been undertaken at an existing padel court at another site. The measurements were of a typical padel game, with four adult men playing at a social level during a daytime site visit. Measurements were undertaken at 15m to the side of the existing court (no screening) and 15m to the rear, where the sound is screened by the 3m high glass screens. The measurements were undertaken over a period of 6 minutes which covered several rallies. It is assumed that a game may last for at least an hour at this same rate of play such that the 1hour L_{Aeq} would be similar to the measured $L_{Aeq,6min}$. The weather during the measurements was fine with light winds.

The sound measurements were dominated by the ball being hit and bouncing and by players shouting.

The measured levels being played are summarised in Table 5.1

Source	Noise Level, L_{Aeq}	Typical Maximum
Padel Courts, 4 players – 15m to the side	55 dB	73 dB
Padel Courts, 4 players – 15m to rear of screen	48 dB	65 dB

Table 5.1 – Source noise levels used for modelling exercise

These sound levels are consistent with literature from other site assessments and are considered a robust indication of padel court noise.

The model was calibrated to confirm that the source noise levels used for the padel courts matched the levels measured on-site.

5.2 Proposed Mitigation

To control sound transmission to the residential elements to the north and south of the site, it is recommended that imperforate screening fences, with minimum superficial density of 13kg/m^2 , are located to the north and south of the courts.

Due to the existing trees, the height of the screens is limited to 2m.

The predicted sound levels have been calculated with these mitigation measures in place.

5.3 Noise Model Results

The noise contour maps are shown in attached figure VA4834/NM1-2 for the first and ground floor level (including gardens). The L_{Amax} levels are predicted by applying a constant delta (from the measurement results) to the predicted L_{Aeq} levels.

The following sound levels are predicted at the most affected receivers. These are based on both courts being in play at the same time for a full hour.

Receptors		Predicted L_{Aeq}	Predicted typical L_{Amax}
Dwellings to the South	First Floor	53 dB	71 dB
	Ground Floor	48 dB	65 dB
Dwellings to the North	First Floor	49 dB	67 dB
	Ground Floor	46 dB	64 dB

Table 5.2 – Predicted Sound Levels from Padel Courts

6. Discussion

While the predicted $L_{Aeq,1hour}$ levels at the first floor level of three properties to the south slightly exceed the L_{Aeq} 50dB limit suggested by Sports England, the levels at ground floor level and at other dwellings meet the suggested target and are commensurate with the existing ambient (L_{Aeq}) sound levels in the area.

It is offered that as the courts are only available for use during the day and there are no first floor balconies the external sound levels at ground floor level are more relevant. At ground floor level the sound levels meet the requirements of Sports England and the existing acoustic is not expected to be increased or compromised by the proposed padel courts. At first floor level the increase in ambient sound levels is moderate and would not be at a level that would interfere with normal use of the dwellings.

This suggests that while the sound from the padel court may be heard, the levels would not be prominent against the general noise climate.

The context of the area already includes the tennis courts which are in regular use. During the summer months, noise (music and shouting) from the nearby amusement park is already clearly audible and it is offered that this would have a significantly greater impact on residents' amenity than the sound of a padel court.

Although Padel is a racket sport similar to tennis, it is played with a less-pressurised ball and the surrounding walls are in play, generating a slightly different sound profile to a tennis court. While the sound of padel tennis may be distinguishable from the existing tennis sounds, it is not sufficiently different to change the context of the locality.

The proposed padel courts are therefore not expected to change the acoustic character of the area, increase existing sound levels or be intrusive to the surrounding residential uses.

As such, the proposals with the recommended mitigation measures, are not expected to represent an unreasonable noise impact.

7. Noise Management

The above assessments have focused on engineering solutions to minimise the noise impact based on robust usage cases.

In addition to this approach, management of the use of the courts is an important aspect in further minimising the potential noise impact on surrounding residents.

This is focused on reasonable and responsible use of the courts with the Seacourt management undertaking to supervise and control anti-social behaviour.

Seacourt is a relatively small, friendly club with the proposed courts within sight of the clubhouse and a generally mature and respectful membership. This suggests that reasonable behaviour and use will be readily monitored and enforced by the management, as well as senior members of the club. Notwithstanding this, the following guidance is suggested to minimise the noise generated.

- Members should be reminded of the proximity to residents through the use of signs and information when booking the courts.
- While it is natural that members would be enthusiastic during games, the use of the courts should be subject to reasonable and responsible behaviour. This should include keeping shouting to a minimum and a zero tolerance policy for bad language or aggressive behaviour.
- Repeatedly hitting the ball against the backing walls for practice / warm up should not be allowed.
- Music will not be permitted to be played on or around the courts.
- The management will actively and intentionally listen out for unnecessary shouting or anti-social behaviour and provide verbal reminders / warning immediately.
- A phone number will be provided to residents to report unsocial behaviour and the management will undertake to deal with complaints urgently.
- If members were to continually disregard these policies, management will suspend or ban the members.

8. Conclusion

It is proposed to install two new padel courts on the established site of Seacourt Tennis Club.

In order to assess the likely noise impact of the proposals, a survey of existing sound levels in the locality has been undertaken and sound levels expected from the noise padel courts have been predicted.

The sound climate in the locality was found to be determined by local traffic, existing activities of the tennis club and sound from an amusement park.

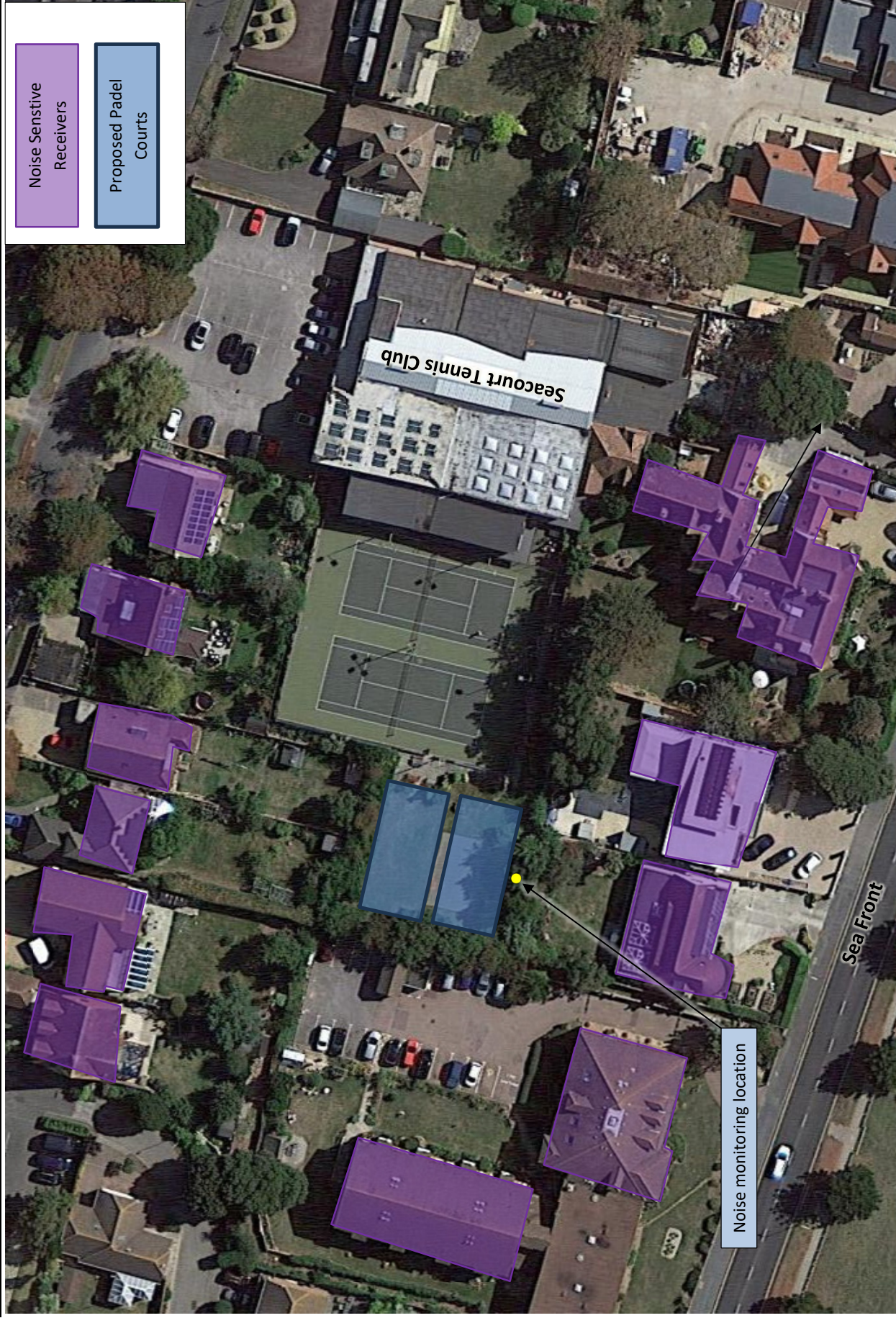
Mitigation measures have been recommended in the form of screens to the north and south of the proposed courts. A discussion of managerial control of noise has also been provided.

The predicted sound levels from the new padel courts have been compared against available guidance from Sports England and relative to the existing sound levels.

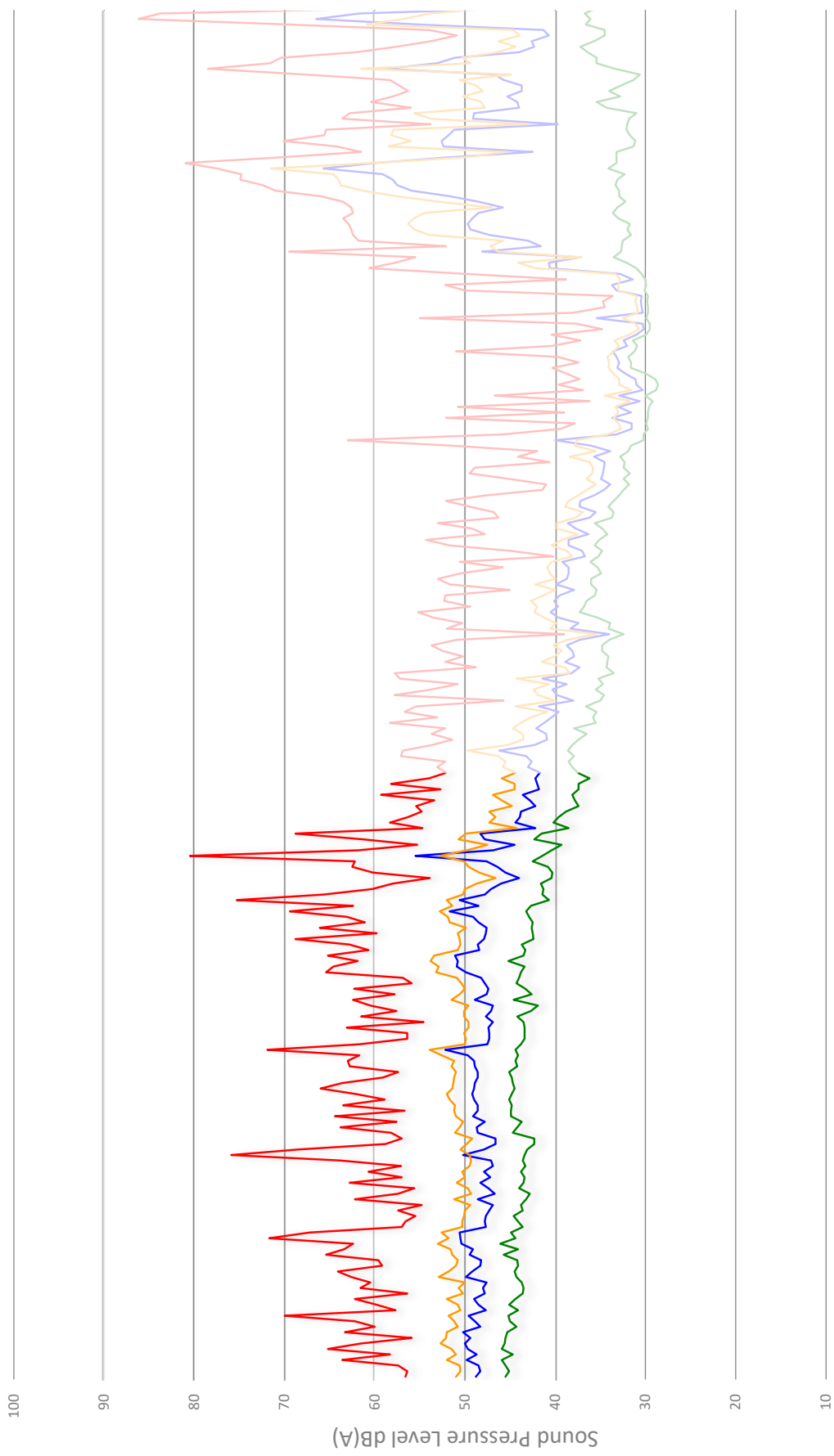
The predicted levels have also been found to comply with the limits suggested for similar uses by Sports England at the vast majority of receptor locations and are of a similar level to the existing ambient noise levels and the sound generated by the existing tennis courts. While a small number of first floor windows would be slightly above the suggested criterion, the impact would be over a limited duration and would not be expected to interfere with internal uses. The sound from the padel courts would be expected to be audible outside the surrounding dwellings but not prominent against the existing sound levels.

As the tennis club already contributes to the acoustic character of the area and the sound from the new padel courts is not expected to be prominent or intrusive against the existing noise levels in the area, a low noise impact is expected from the scheme.

Steven Liddell MIOA



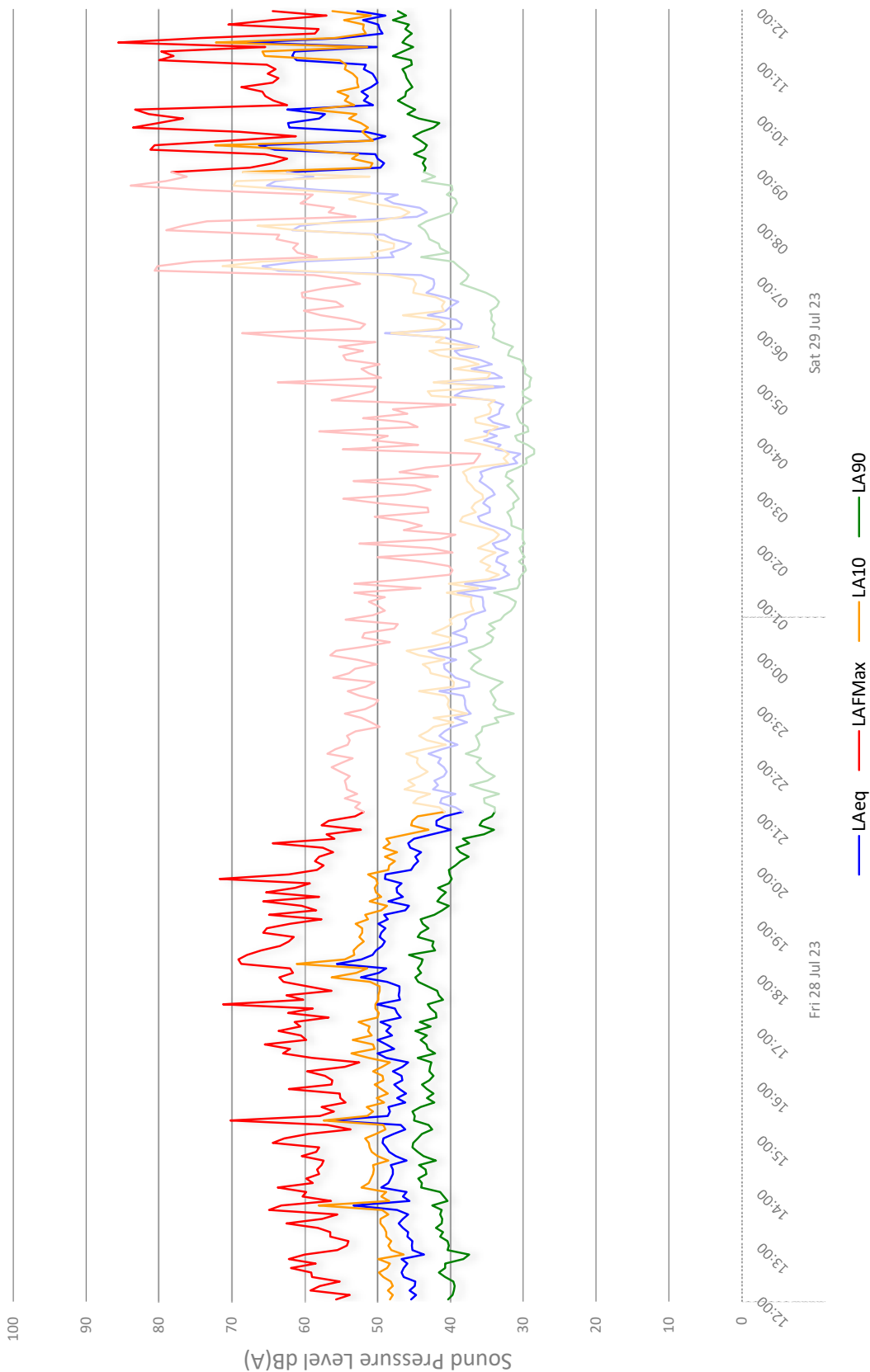
Seacourt Tennis Club, Hayling Island
Environmental Noise Time History: 1



Seacourt Tennis Club, Hayling Island
Environmental Noise Time History: 2



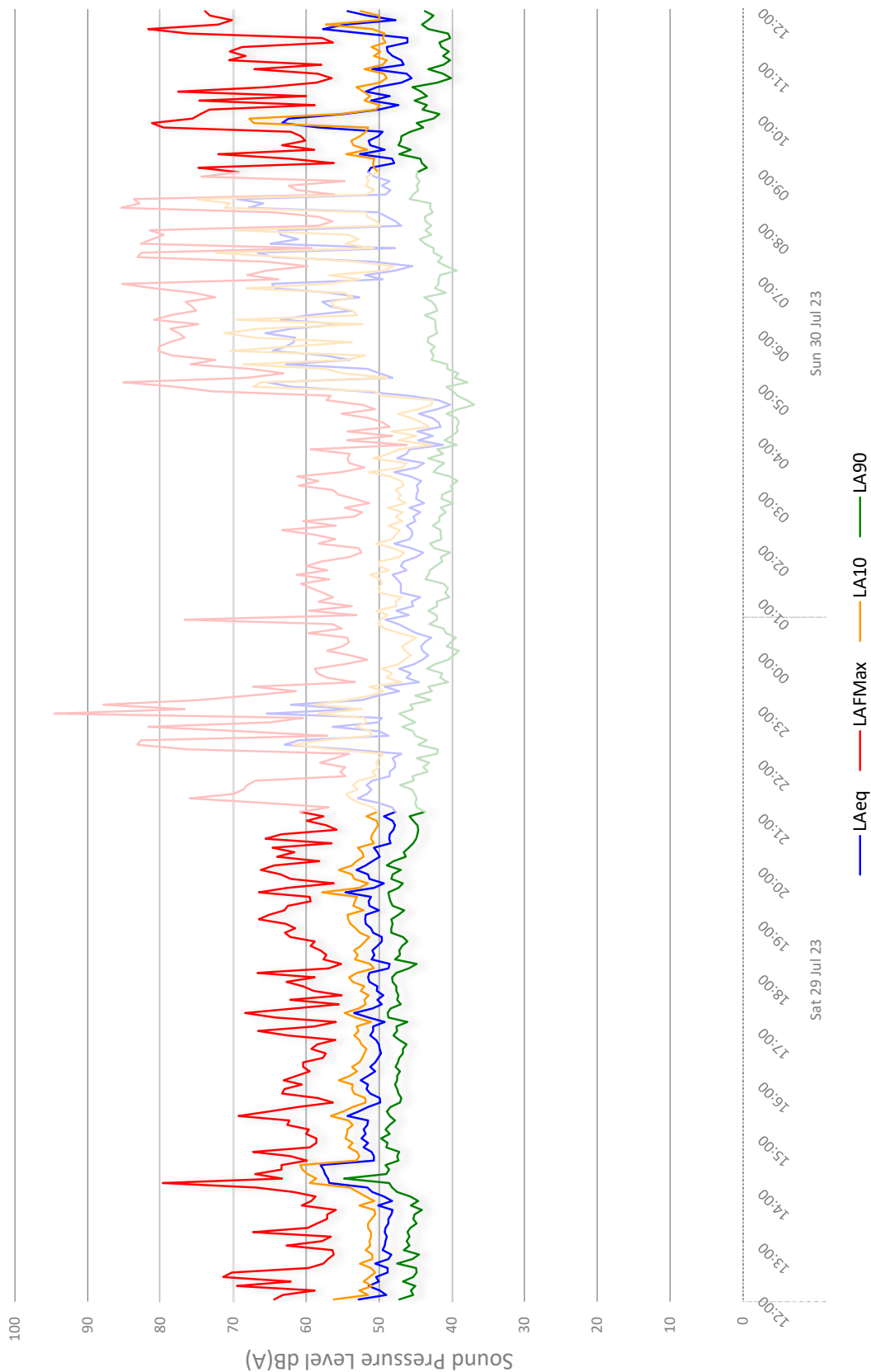
Figure VA4834/TH2



Seacourt Tennis Club, Hayling Island
Environmental Noise Time History: 3



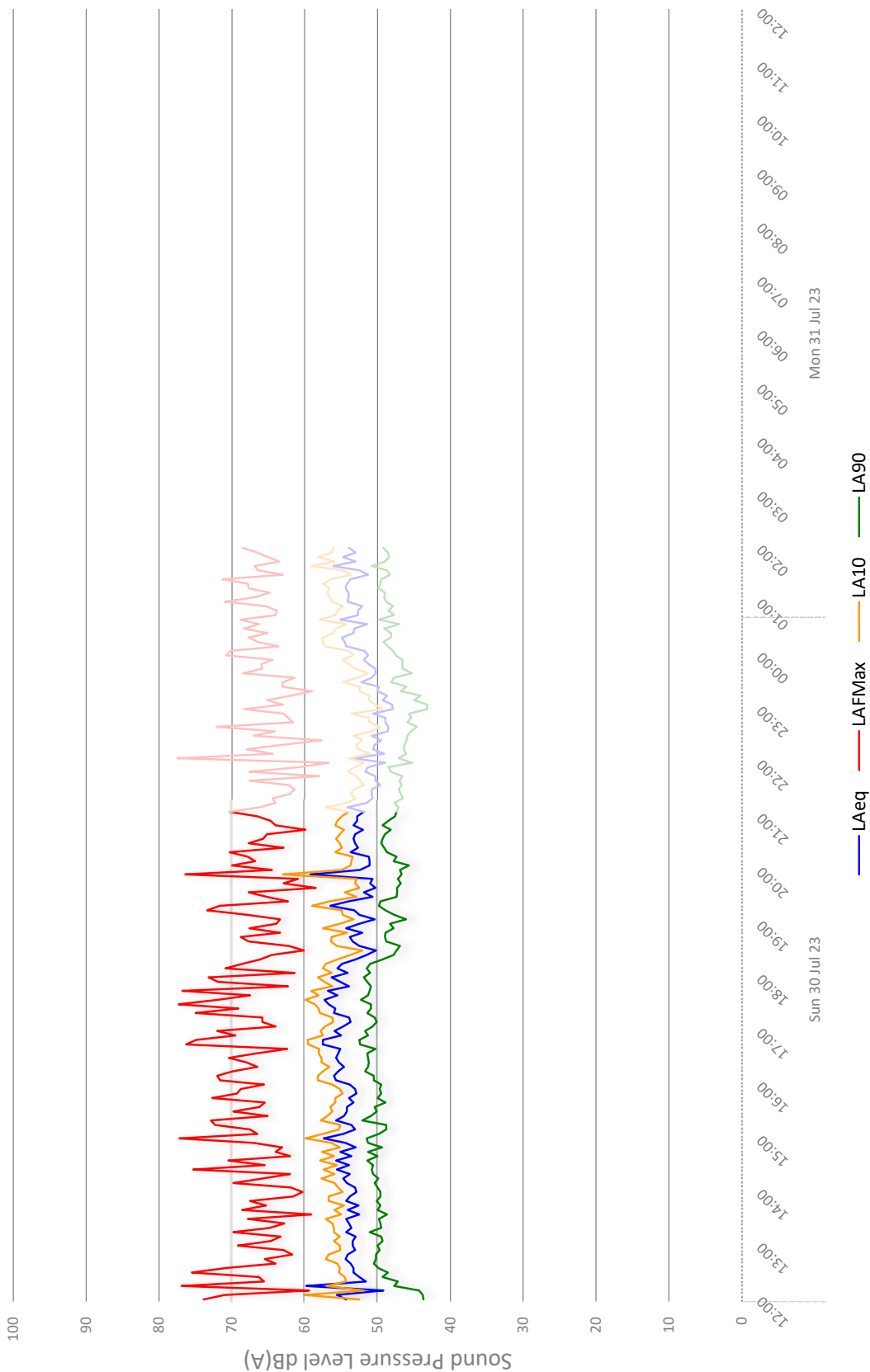
Figure VA4834/TH3

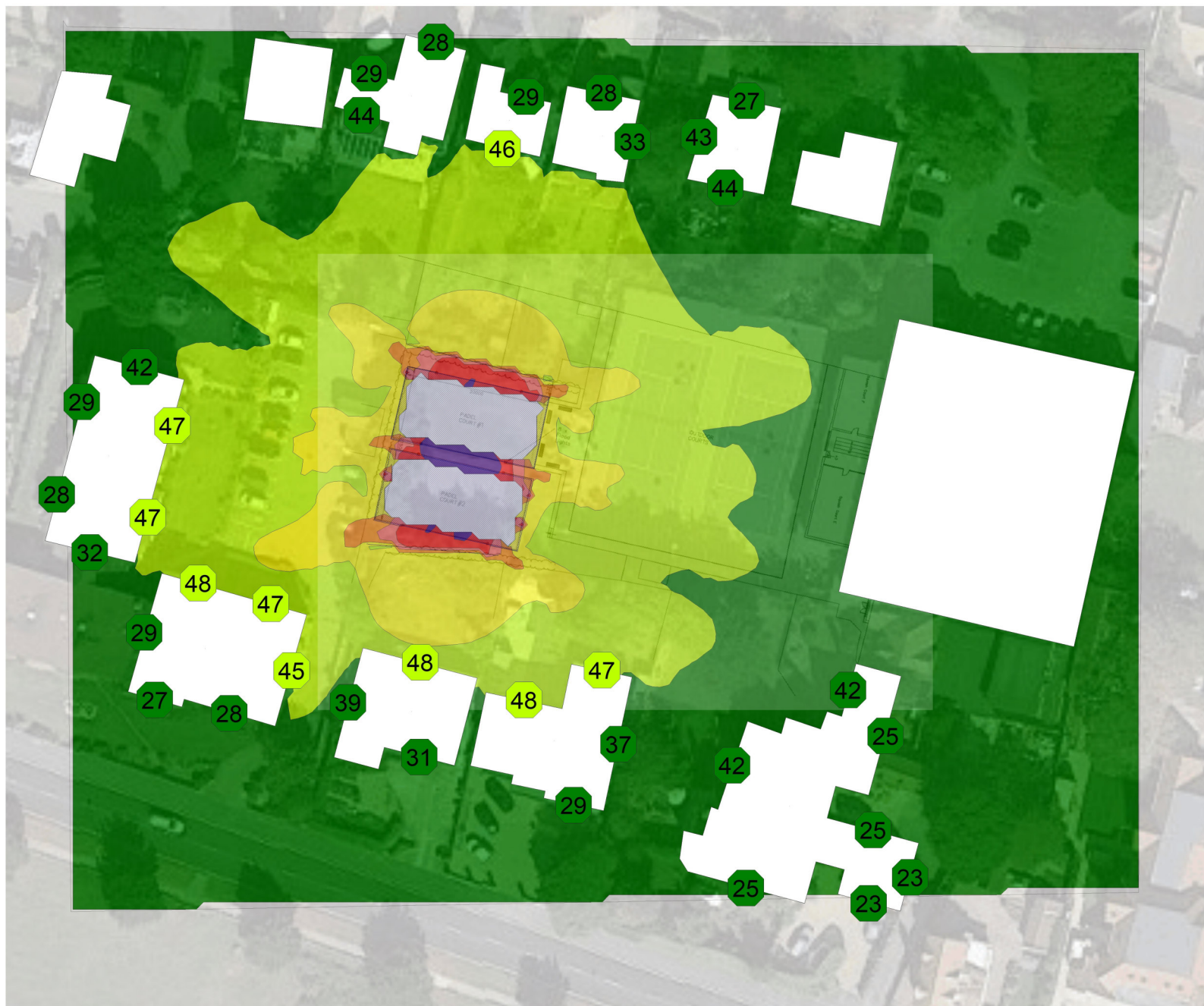


Seacourt Tennis Club, Hayling Island
Environmental Noise Time History: 4



Figure VA4834/TH4





Date:

17/08/2023

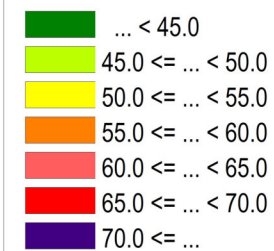
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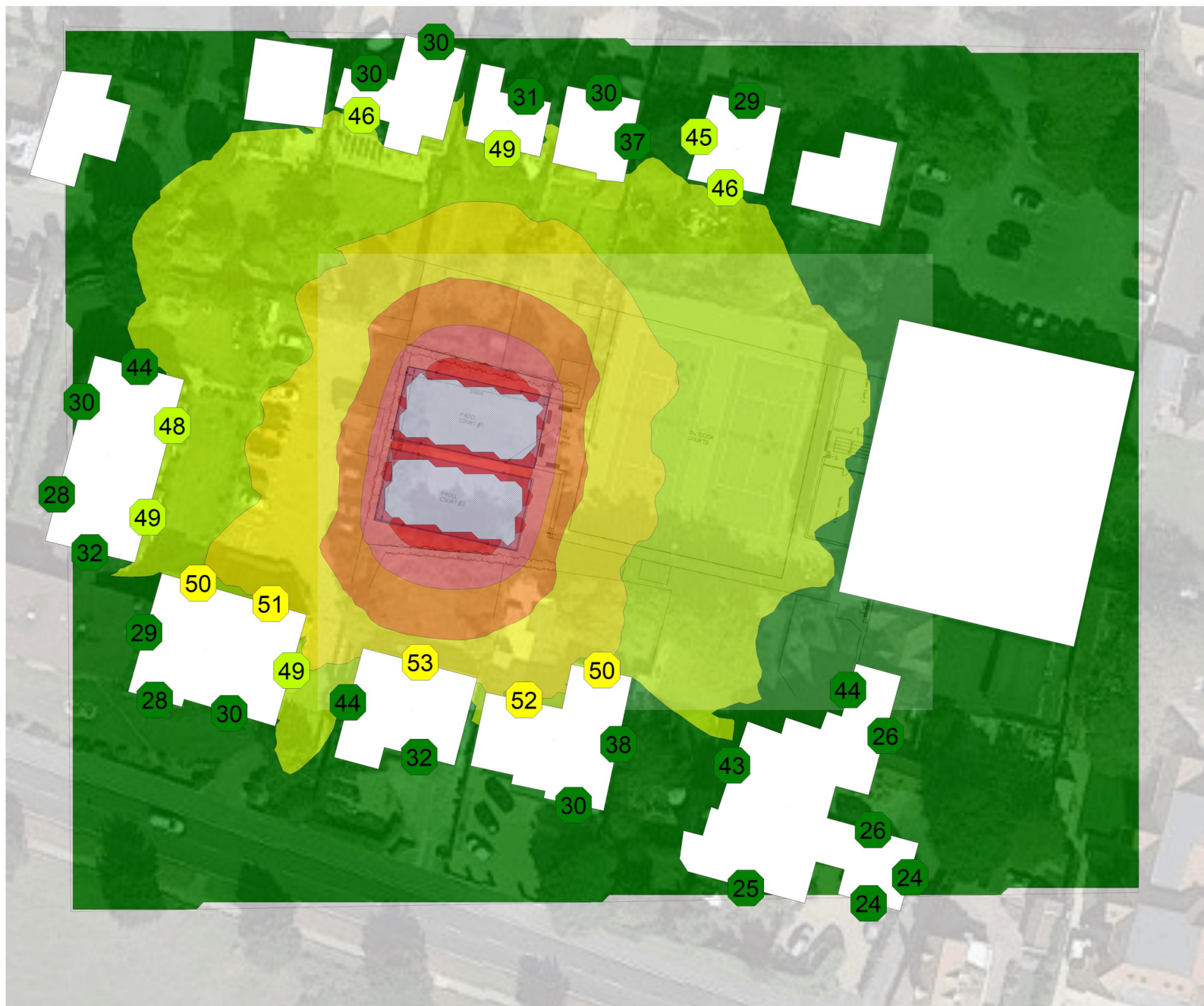
4834 Seacourt Tennis Club

Drawing Title:

Ground Floor Level

1hour LAeq dB





Date:

17/08/2023

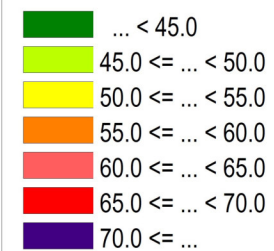
Project:

4834 Seacourt Tennis Club

Drawing Title:

First Floor Level

1 Hour LAeq dB



APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A . A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).
L_{eq} :	The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90} :	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max} :	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

1.4 Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.