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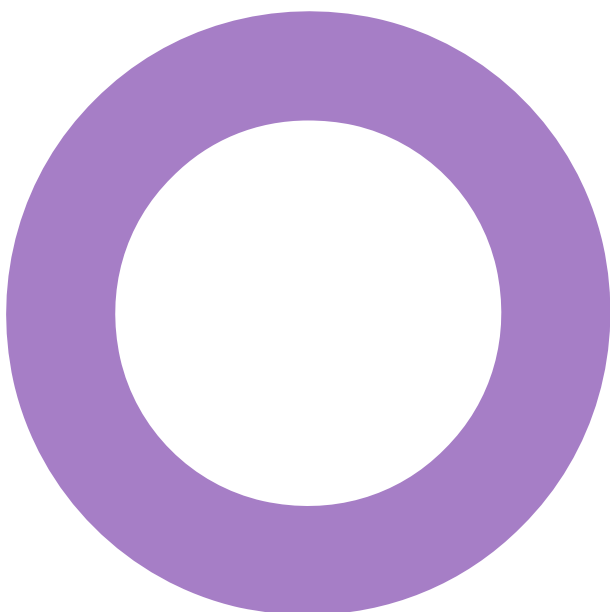
RICHMOND INN

Noise assessment report
Hoare Lea

**Richmond Inn.
Richmond.
Bridges Healthcare
(Richmond) Limited.**

ACOUSTICS
NOISE ASSESMENT

REVISION 02 – 05 MAY 2022



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	04/05/2022	Initial issue	JH	AS	JB
02	05/05/2022	Following Avison Young review	AS	AS	JB

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Contents.

Audit sheet.	2
1. Introduction.	4
2. Site context.	4
3. Planning policy.	5
3.1 National Planning Policy.	5
3.2 Local planning policy.	8
3.3 Recognised guidance.	9
4. Acoustic survey.	11
4.1 Results.	12
4.2 Background sound levels.	14
5. Proposed plant noise limits.	15
6. Noise model methodology.	16
7. Acoustic Site suitability.	16
7.1 Internal noise levels	16
7.2 External amenity area noise assessment.	19
8. Summary of assessment.	20
References	21
Appendix A: Acoustic survey equipment	22
Appendix B: Proposed development location in relation to Heathrow airport noise contours.	23

1. Introduction.

Hoare Lea has been appointed by Bridges Healthcare (Richmond) Limited to carry out a noise assessment for the proposed development, which comprises the partial demolition and extension of Richmond Inn (hereafter referred to as “the Site”) for Class C2 visitor accommodation providing care and physiotherapy-led rehabilitation, highways works, car and cycle parking, refuse storage, landscaping and other associated works (hereafter referred to as the “proposed development”).

This assessment serves to be submitted to the Local Planning Authority to accompany the planning application for the proposed development.

As the proposed development is for a form of visitor accommodation providing care and physiotherapy-led rehabilitation with associated mechanical plant, it is both markedly noise sensitive and noise generating. Therefore, the assessment focuses on protecting nearby noise sensitive receptors against adverse noise impacts and assessing site suitability in terms of noise based on the predicted impacts of noise from surrounding sources on guests of the proposed development.

This report contains:

- A description of the site with respect to acoustics.
- An overview of the relevant policy and guidance documents.
- A summary of the acoustic survey carried out on site.
- Predicted noise levels across the site based on the results of a noise model.
- Plant noise limits derived to protect nearby noise sensitive receptors against adverse noise impacts from fixed building services plant serving the proposed development.
- An assessment of site suitability in terms of noise.

2. Site context.

The Site currently is occupied by the Richmond Inn Hotel.

Located on a junction between Sheen Road and Church Road, the prevailing sound climate is dictated by road traffic along these roads. The proximity to a 4-way junction also gives rise to increased noise exposure to idling and accelerating vehicles near to the site boundaries overlooking Sheen Road and Church Road.

Overhead aircraft were observed during site visits but were not notable over the dominant road traffic noise close to the site. Nevertheless, the noise associated with London Heathrow Airport will change depending on the direction of departing and arriving aircraft, as well as the current point in the noise management plan (airports consciously change flight paths to provide nearby residents with respite). The latest Heathrow Noise Contours (2018) are reproduced in Appendix B with the proposed development approximately indicated. Ground noise was not audible and is not anticipated to meaningfully contribute to the sound climate in the area in and around the Site.

Based on the location of the proposed development, the following exposure levels from London Heathrow can be derived from Heathrow Airport Noise Contours [14].

- L_{Day} 55 dB
- L_{Evening} 55 dB
- L_{Night} 50 dB

A railway line and station are situated approximately 200m north of the Site. During visits to the Site there were no notable contributions from passing trains observed over the dominant road traffic noise.

There are existing commercial buildings at ground floor along Sheen Road, but noise associated with these premises was not observed during site visits. The public house situated on the corner of Sheen Road and Worples Way was also noted to make no audible contribution over existing traffic during site visits.

As the proposed development will also be noise generating, via external building services plant, the nearest noise sensitive receptors have been identified. The nearest noise sensitive receptor is 58 Sheen Road, directly next to the proposed development. Other noise sensitive receptors along Sheen Road, Church Road and Sydney Road benefit from greater separation distances. Therefore, designing the proposed development to comply with noise limits defined for the noise sensitive receptors along Sheen Road suitably protects other, more distant surrounding receptors.

A visual summary of the Site and the context of the surrounding area is provided below in Figure 1.



Figure 1: Site context.

3. Planning policy.

3.1 National Planning Policy.

Noise Policy Statement for England.

Noise Policy Statement for England (NPSE) advises that noise impacts should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or noise limits.

NPSE introduces the concepts summarised in Table 1 that can be applied when considering the significance of noise impacts, which are applied by the World Health Organization.

The document advises that it is not possible to have *'a single objective noise based measure... that is applicable to all sources of noise in all situations'*. NPSE further advises that the sound level at which an adverse effect occurs is likely to be different for different noise sources, for different receptors at different times.

Effect Level	Description
No Observed Effect Level (NOEL)	This is the noise level below which no effect can be detected. In simple terms, below this level of noise, there is no detectable effect on health and quality of life due to the noise being assessed.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level of noise above which adverse effects on health and quality of life can be detected.
Significant Observed Adverse Effect Level (SOAEL)	This is the level of noise above which significant adverse effects on health and quality of life occur.

Table 1: NPSE observed effect levels.

National Planning Policy Framework.

National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2021) sets out the Government's planning policies and how these are expected to be applied. In relation to noise and vibration, NPPF section 15 paragraphs 175, 185 and 187 are presented below:

'174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

...

- a. *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...'*

'185. 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;*
- b. *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;*

and

- c. *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

'187. 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.'

Planning Practice Guidance - Noise.

Online Planning Practice Guidance (PPG) has been published online to provide greater details in relation to the relevance of noise to the planning process following the introduction of the NPPF and NPSE.

Under *Noise*, this guidance states, under the heading '*How to Determine the Noise Impact*', that the following should be considered by local authorities:

- *'whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

In line with NPSE, this includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation during the operation of the Proposed Development.

Further guidance on each of the various observed effect levels set out in the NPSE is provided in the '*Noise exposure hierarchy table*' which is reproduced below in Table 2. It is important to note that no specific noise parameters or target noise levels are defined in the text. Under the heading '*What factors influence whether noise could be a Concern?*', the subjective nature of noise is discussed. It is stated that there is no simple relationship between noise levels and the impact on those affected. This depends on how various factors combine in particular situations.

Perception	Example of outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.		No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, 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 acoustic character of the area.	Significant Observed Adverse Effect Level	Avoid
Noticeable and very Disruptive	Extensive and regular changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 2: PPG noise exposure hierarchy table of observed effects.

3.2 Local planning policy.

3.2.1 London Borough of Richmond upon Thames: The Local Plan 2015 Policy LP 10 Local Environmental Impacts, Pollution and Land Contamination

“ ...

Noise and Vibration

C. The Council encourages good acoustic design to ensure occupiers of new and existing noise sensitive buildings are protected. The following will be required, where necessary:

- 1. a noise assessment of any new plant and equipment and its impact upon both receptors and the general background noise levels;*
- 2. mitigation measures where noise needs to be controlled and managed;*
- 3. time limits and restrictions for activities where noise cannot be sufficiently mitigated;*
- 4. promotion of good acoustic design and use of new technologies;*
- 5. measures to protect the occupiers of new developments from existing sources.*

...”

3.2.2 London Borough of Richmond upon Thames, Development Control for Noise Generating and Noise Sensitive Development.

Richmond borough later published a document to protect local occupiers of new or existing noise sensitive and to aid applicants by highlighting issues that should be addressed where noise and vibration is under consideration.

For noise sensitive developments the following is stated in section 5.2 Stage 2 – Internal Design Noise Levels

“The Borough will normally expect applicants to achieve the design noise levels contained in Table 4 of BS8233:2014 (and to consider the impact and effect of any noise events) in all noise-sensitive rooms...”

For noise generating developments the following is stated in section 6.1 Noise Standards for New Industrial and Commercial Development.

“All industrial and commercial development with the potential to generate noise will be assessed and, where relevant, controlled by planning conditions in order to protect residential amenity. Conditions may be used, for example, to restrict noise levels and to control hours of operation. The most relevant standard for assessing new industrial and commercial development is BS4142:2014”

In table 2 of section 6.2 BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound, the local authority highlight the preferred rating level of new for new noise generating developments.

“Where the rating level of noise is below the background noise level by at least 5dB, this indicates that the proposed NGD is likely to be acceptable from a noise perspective. The Borough will seek this level of compliance in most noise sensitive areas and/or where there is a requirement to mitigate creeping background effects.

3.2.3 The London Plan (March 2021)

The latest London Plan refers to noise in several of the adopted policies, the most relevant for noise impact assessments are summarised below.

Policy D.13 Agent of Change places the responsibility for mitigating impacts from existing noise-generating activities or uses on the proposed new noise-sensitive development. It states that noise impact assessments accompanying planning applications should be carefully tailored to local circumstances and be fit for purpose.

Policy D.14 of The London Plan refers specifically to noise and encourages management of noise and good acoustic design. Section 3.14.3 specifically refers to recognised acoustic guidance as follows:

“The management of noise also includes promoting good acoustic design of the inside of buildings. Section 5 of BS 8223:2014 provides guidance on how best to achieve this. The Institute of Acoustics has produced advice, Pro:PG Planning and Noise (May 2017), that may assist with the implementation of residential developments. BS4214 provides guidance on monitoring noise issues in mixed residential/industrial areas.”

3.3 Recognised guidance.

British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

BS 4142 provides guidance for assessing commercial operations and fixed building services plant noise. The British Standard provides an objective method for rating the significance of impact from industrial and commercial operations based on subtracting the pre-existing background sound level ($L_{A90,T}$) from the rating level ($L_{A,r,T}$).

The standard does not give a definitive method for determining the background sound level but instead, as a commentary, states that *“the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”*.

Clause 8.1.4, which discusses the monitoring duration, states *“there is no “single” background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed.”* As a note to this clause the following commentary is given on obtaining a representative background sound level:

“To obtain a representative background sound level a series of either sequential or disaggregated measurements ought to be carried out for the period(s) of interest, possibly on more than one occasion. A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value.”

The rating level is defined objectively as the specific source noise level in question (either measured or predicted) with graduated corrections for tonality (up to +6 dB), impulsivity (up to +9 dB), intermittency (+3 dB) and other sound characteristics (+3 dB) which may be determined either subjectively or objectively, if necessary.

The background sound level is subtracted from the rating level and the difference used to assess the impact of the specific noise source:

- A difference of around +10 dB is likely to be an indication of a significant adverse impact, depending on context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context; and
- A difference of +0 dB or less is an indication of the specific sound source having a low impact, depending on the context.

British Standard 8233

BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* (BS 8233) provides guidance for control of noise in and around buildings. The British Standard suggests appropriate criteria and limits for different situations including hotels and rooms for residential purposes. The advice for living accommodation (Table 4 of BS 8233) is reproduced below in Table 3. These are desirable internal ambient noise levels for spaces when they are unoccupied. These values are based on the guidelines published by the WHO in *Guidelines for Community Noise*.

Activity	Location	Daytime (07.00 to 23.00)	Night-time (23.00 to 07.00)
Resting	Living room	35 dB L _{Aeq,16 h}	-
Dining	Dining room / area	40 dB L _{Aeq,16 h}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16 h}	30 dB L _{Aeq,8 h}

Table 3: BS 8233 guideline indoor ambient noise levels for dwellings.

Supplementary Notes 2, 4 and 7 to Table 4 within BS 8233 are reproduced below for reference:

NOTE 2 The levels shown in Table 4 are based on the existing guidelines issued by the World Health Organization....

NOTE 4 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....

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above the WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable conditions still achieved.'

The BS 8233 criteria for living accommodation have been used as a conservative basis. Table H.3 from BS 8233 provides a range of values for indoor ambient noise levels for hotel bedrooms, repeated below in Table 4. The upper ends of these ranges exceed the guidelines indoor ambient levels by 5 dB and maximum levels by 10 dB for dwellings.

Period	Noise Level
Daytime (07:00 – 23:00)	30 - 40 dB L _{Aeq,16 h}
Night-time (23:00 – 07:00)	25 - 35 dB L _{Aeq,8 h}
Night-time (23:00 – 07:00)	45 - 55 dB L _{Aeq,16 h}

Table 4: BS 8233 guideline indoor ambient noise levels for hotel bedrooms.

Professional Practice Guidance on Planning and Noise – ProPG

ProPG Planning & Noise (Insitute of Acoustics, 2017) is a recently published document aimed at providing practitioners guidance on a recommended approach to the management of noise in the context of the planning system.

The document was published jointly by the three professional bodies in the acoustics industry: Acoustics and Noise Consultants (ANC); the Institute of Acoustics (IOA); and the Chartered Institute of Environmental Health (CIEH).

The guide is focussed on new residential development being affected by transport noise. Its primary goal is to assist in the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do this by encouraging good acoustic design processes in and around proposed new residential development, having particular regard to national policy on planning and noise.

The guidance recommends that an Acoustic Design Statement (ADS) be provided using a two-stage approach comprising: an initial site noise risk assessment (stage 1); and a full assessment and systematic consideration of four elements (stage 2) as follows, thereby encouraging early consideration of noise issues.

- Stage 2: Element 1 – Good Acoustic Design Process
- Stage 2: Element 2 – Internal Noise Level Guidelines
- Stage 2: Element 3 – External Amenity Area Noise Assessment
- Stage 2: Element 4 – Assessment of Other Relevant Issues

Acoustics Ventilation and Overheating (AVO guide)

The Acoustics Ventilation and Overheating Residential Design Guide (Acoustics and Noise Consultants, 2020) serves to inform acousticians as to a recommended approach for assessing noise impacts of transport noise impacting on residential development, whilst giving due attention to how any advice serving this goal impact on ventilation and overheating strategies.

The AVO guide makes various references to statements in BS 8233 and ProPG that internal noise limits may be relaxed by up to 5 dB where a development is desirable and natural ventilated is used.

4. Acoustic survey.

An environmental acoustic survey has been conducted to characterise the prevailing sound climate across the Site and at the nearest noise sensitive residential receptors. The survey locations were chosen to be representative of the worst affected façades of the proposed development and to quantify propagation of road traffic noise levels in the area.

The survey locations are shown in Figure 2 below.



Figure 2: Acoustic survey measurement positions.

Unattended survey measurements were undertaken at Position 1 and Position 2 from Wednesday 20th April to Tuesday 26th April 2022. Attended survey measurements were undertaken at Position 3, Position 4 and Position 5 on Tuesday 26th April 2022.

The purpose of measuring at Position 1 was to quantify road traffic noise levels incident at the worst-case proposed development buildings closest to the Sheen Road. The measurements at Position 1 included continuous 1-minute duration samples of broadband A-weighted ambient sound levels ($L_{Aeq,1 \text{ min}}$), maximum sound levels ($L_{Amax(fast),1 \text{ min}}$), and background sound levels ($L_{A90,1 \text{ min}}$). The measurements also recorded instantaneous sound pressure levels. Measurements were made at one-third octave band resolution.

The purpose of measuring at Position 2 was to quantify road traffic noise levels incident at the worst-case proposed development buildings closest to the Sheen Road. The measurements at Position 2 included continuous 1-minute duration samples of broadband A-weighted ambient sound levels ($L_{Aeq,1 \text{ min}}$), maximum sound levels ($L_{Amax(fast),1 \text{ min}}$), and background sound levels ($L_{A90,1 \text{ min}}$). The measurements also recorded instantaneous sound pressure levels. Measurement were made at one-third octave band resolution.

Measurements at Position 1 and Position 2 also served to quantify background sound levels at locations representative of the sound climates at the nearest noise sensitive residential receptors.

Short duration measurements were undertaken at Position 3, 4 and 5 to quantify road traffic noise levels propagating across the site. The measurements included continuous one-minute duration samples of broadband A-weighted ambient sound levels ($L_{Aeq,T}$) and maximum sound levels ($L_{Amax(fast),T}$). Measurements were in one-third octave band resolution. Measurements were simultaneously made with the logging sound level meters running.

Unattended measurements at positions 1 and 2 were taken at first floor height, 1m from the façade. Attended measurements at positions 3, 4 and 5 were taken at 1.5 metres above ground level under free field conditions with the microphone being at least 3.5 metres from any acoustically reflective surface other than ground below.

Weather conditions were not measured on site but were monitored remotely and were dry and fair throughout.

The survey equipment was field calibrated immediately before and immediately after the measurement period; no significant drift in level was found to have occurred. Details of the measurement instrumentation used is included in Appendix A.

4.1 Results.

Time history charts of the full acoustic survey results for Position 1 and Position 2 are included below.

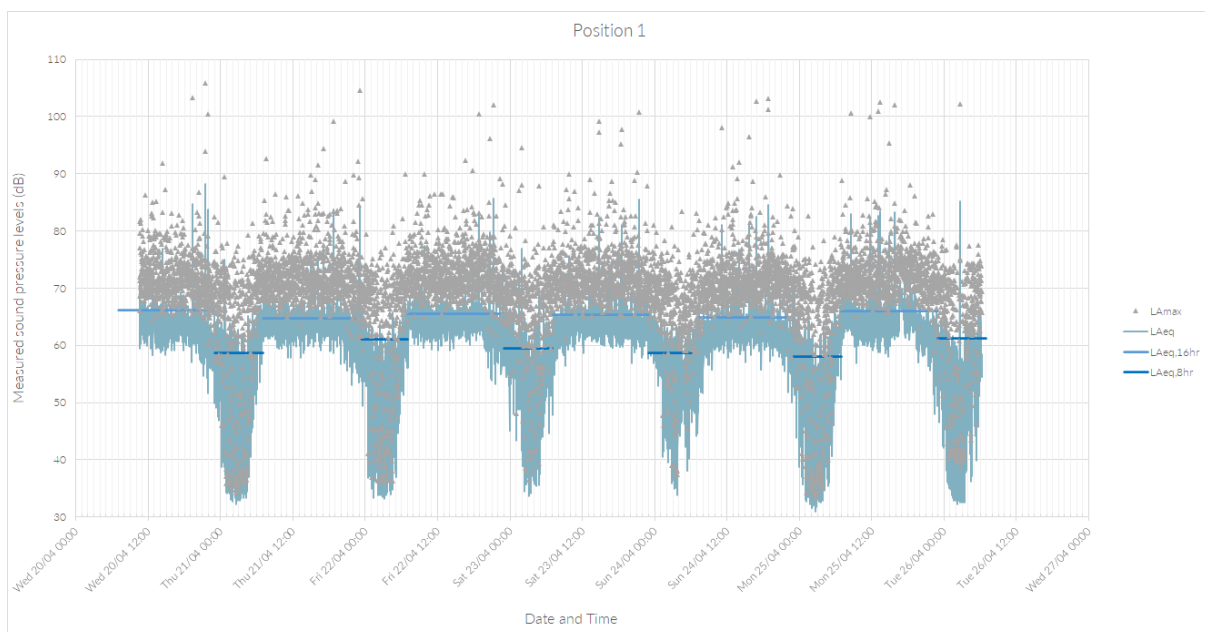


Figure 3: Survey time history chart (Position 1)

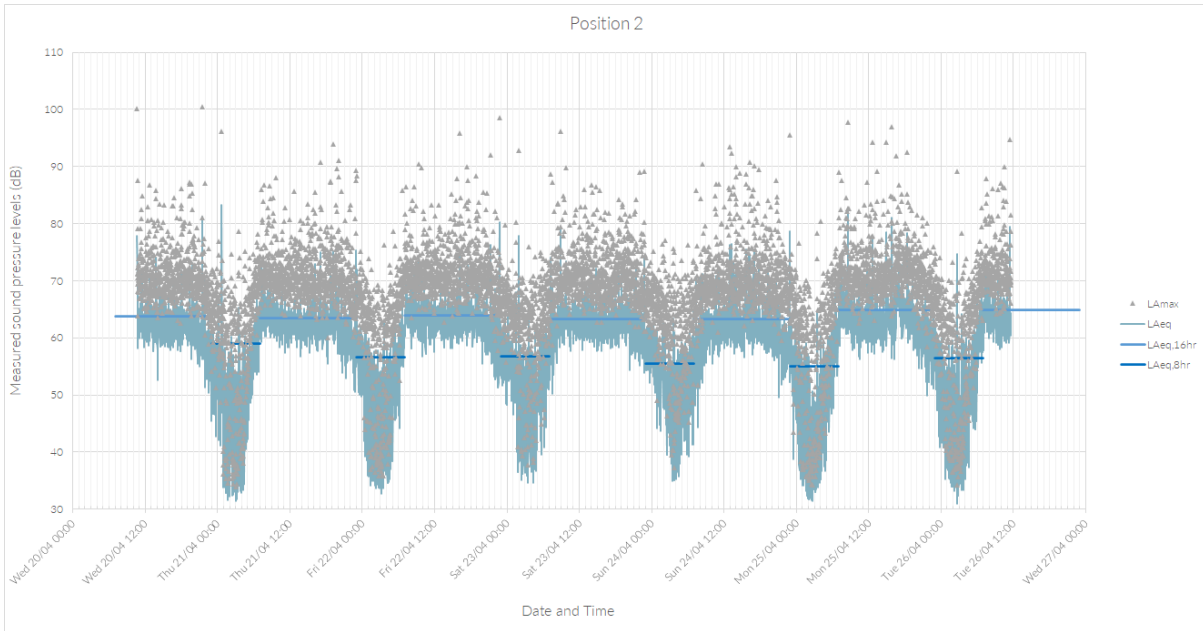


Figure 4: Survey time history chart (Position 2)

The measured ambient and maximum noise levels at each position are summarised in the tables below:

Date	Daytime ambient noise level (07:00 to 23:00)	Night-time ambient noise level (23: to 07:00)
Wednesday 20 th April 2022	66 dB L _{Aeq,13 h 15 minutes}	59 dB L _{Aeq,8 h}
Thursday 21 st April 2022	65 dB L _{Aeq,16 h}	61 dB L _{Aeq,8 h}
Friday 22 nd April 2022	66 dB L _{Aeq,16 h}	59 dB L _{Aeq,8 h}
Saturday 23 rd April 2022	65 dB L _{Aeq,16 h}	59 dB L _{Aeq,8 h}
Sunday 24 th April 2022	65 dB L _{Aeq,16 h}	58 dB L _{Aeq,8 h}
Monday 25 th April 2022	66 dB L _{Aeq,16 h}	61 dB L _{Aeq,8 h}
Tuesday 26 th April 2022	N/A	N/A

Table 5: Summary of ambient noise levels measured at unattended survey Position 1.

Date	Daytime ambient noise level (07:00 to 23:00)	Night-time ambient noise level (23: to 07:00)
Wednesday 20 th April 2022	64 dB L _{Aeq,13 h 15 minutes}	59 dB L _{Aeq,8 h}
Thursday 21 st April 2022	63 dB L _{Aeq,16 h}	57 dB L _{Aeq,8 h}
Friday 22 nd April 2022	64 dB L _{Aeq,16 h}	57 dB L _{Aeq,8 h}
Saturday 23 rd April 2022	63 dB L _{Aeq,16 h}	55 dB L _{Aeq,8 h}
Sunday 24 th April 2022	63 dB L _{Aeq,16 h}	55 dB L _{Aeq,8 h}
Monday 25 th April 2022	65 dB L _{Aeq,16 h}	56 dB L _{Aeq,8 h}
Tuesday 26 th April 2022	65 dB L _{Aeq,5 h 30 minutes}	N/A

Table 6: Summary of ambient noise levels measured at unattended survey Position 2.

4.2 Background sound levels.

The following is stated in BS 4142:

“In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods...”

To “quantify what is typical during particular time periods”, a statistical analysis of the measured background sound levels has been undertaken.

The periods of interest for this development are daytime and night-time. Daytime is taken as between the hours of 07:00 and 23:00. Night-time is taken as between the hours of 23:00 and 07:00.

In place of using a 1-hour reference time interval for daytime periods recommended in BS 4142, a 1-minute sample has been used instead. As the metric used to determine background levels is a percentile of level exceeded, using a shorter reference period is a conservative approach.

The below figures show the range of background sound levels for the daytime and night-time periods measured at Position 1 and Position 2 respectively, as well as the number of measurements made of each integer value as a percentage (i.e. proportion) of the total number of readings at that location.

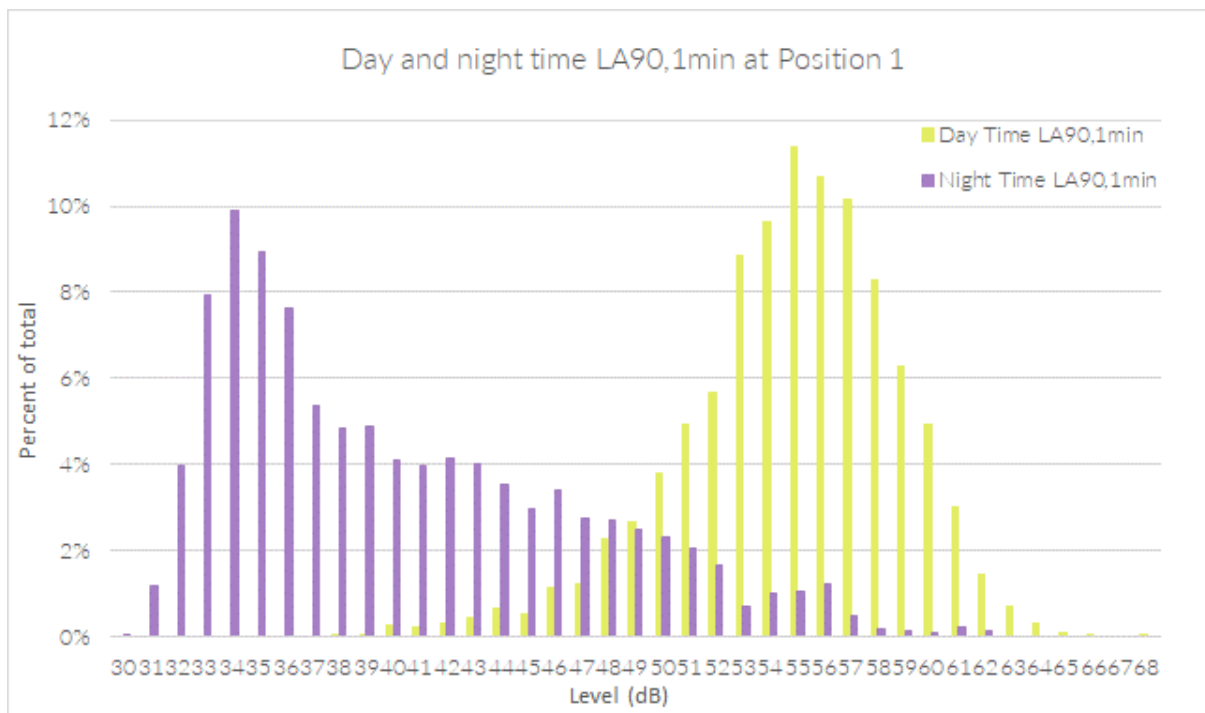


Figure 5: Measured background sound levels (Position 1).

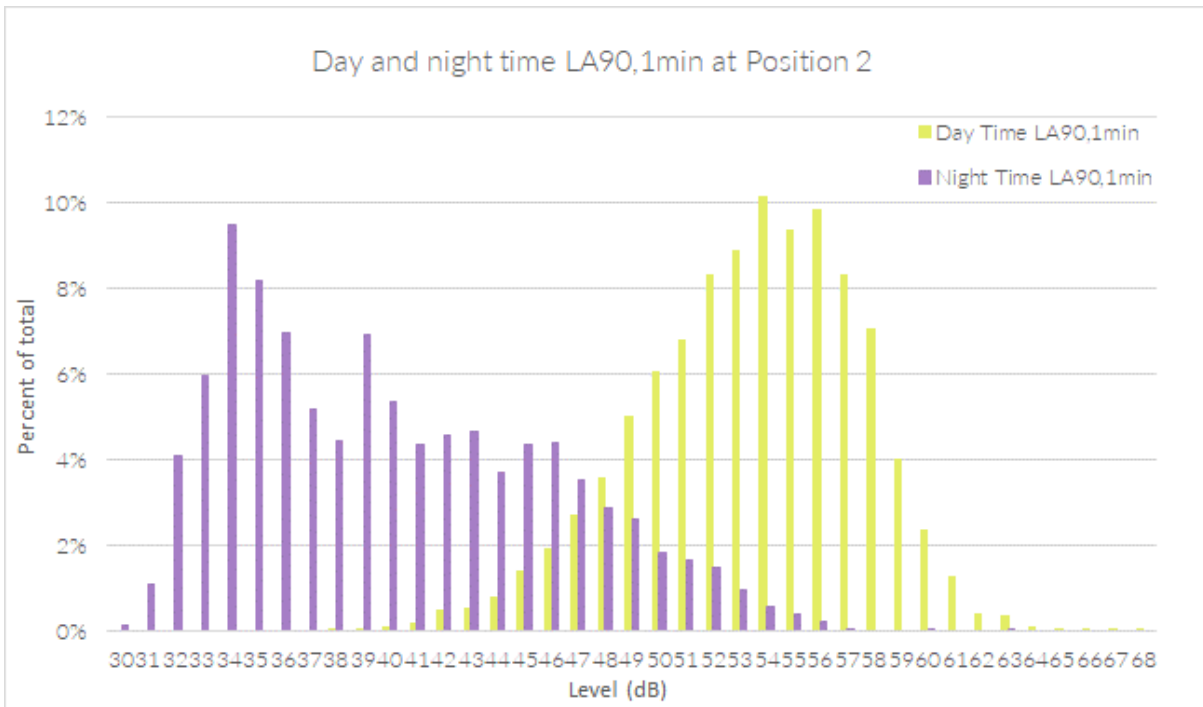


Figure 6: Measured background sound levels (Position 2).

Based on the values shown in Figure 5 and Figure 6, typical lowest background sound levels have been derived in the table below.

Receptors	Typical lowest background sound level	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position 1	LA90,1min 52 dB	LA90,1min 33 dB
Position 2	LA90,1min 50 dB	LA90,1min 33 dB

Table 7: Typical lowest background levels at Position 1 and Position 2.

5. Proposed plant noise limits.

London Borough of Richmond upon Thames Council (LBR) require the noise limit for the development is for the rating level ($L_{A,r,Tr}$) to be at least equal to the typical lowest background sound level minus 5 dB ($L_{A,r,Tr} = L_{A90,Tr} - 5$ dB).

The derived limits are shown in Table 8. These are applicable at the nearest residential receptor locations and should incorporate any character corrections warranted in accordance with the guidance contained in BS 4142. The proposed development should be designed so that the total noise from all plant serving the proposed development does not exceed these limits at the facades or gardens of the dwellings (whichever is closest). This provides suitable protection for all noise sensitive receptors that could be adversely impacted by noise from the proposed development plant. During detailed design of the proposed development consideration will need to be given to the impacts of plant noise intrusion in conjunction with façade acoustic specifications.

Receptors	Plant noise emission limits	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Receptors on Sheen Road	47 dB L _{Ar,1 hour}	28 dB L _{Ar,15 min}
Receptors on Church Road	45 dB L _{Ar,1 hour}	28 dB L _{Ar,15 min}

Table 8: Plant noise limits.

6. Noise model methodology.

Based on the results of the acoustic survey, a noise model has been compiled in the software CadnaA. This model assumes that ambient and maximum sound levels are determined predominately by the road traffic noise from the A338 and Grove Park Drive, with some contributions from aircraft noise.

Road traffic noise levels have been assumed to propagate in accordance with the guidance stipulated in Calculation of Road Traffic Noise (Department for Transport Welsh Office, 1988).

Aircraft noise, although observed during site visits to not be notable over nearby road traffic noise, has been included to provide a fair representation of sound levels across the area, allowing for the varied contributions of aircraft noise to the sound climate. It should be noted that level of aircraft noise will vary depending on the position in the noise management plan and direction of departing and arriving aircraft. This means there will be some tolerance to the predictions made as there may be periods above and below the average level used from the noise contours. However, the noise contour map provides a representative level to be used for assessment and prediction.

Other sound sources were determined to either be too low in level, or too infrequent to meaningfully contribute to the levels measured over 16-hour (for daytime) or 8-hour (for night-time) periods. This is in accordance with the sound climate observed during visits to Site.

The results from the noise model inform the following Site suitability assessment.

7. Acoustic Site suitability.

As the sound climate is dictated primarily by road traffic noise, with some contributions from aircraft noise, the focus acoustically for the proposed development is to manage this noise.

For internal areas, noise is to be managed through appropriate façade design. Minimum acoustic performance requirements for glazing are provided in this report to demonstrate feasibility.

Suitable external areas can be provided through positioning amenity areas where residents are provided with screening from road traffic noise

7.1 Internal noise levels

The proposed development is to be mechanically ventilated. Occupants will therefore not need to open their windows to manage overheating and the acoustic performances of the façades can be reviewed based on windows being closed. Nevertheless, it is recommended that occupants are given the option to open windows, for personal preference and for purge ventilation as defined in Building Regulations.

The below figures show the predicted noise levels on the proposed development facades. Based on these levels, Table 7 shows the recommended minimum acoustic performance requirements for façade glazing. These will require review as the design progresses, and are provisionally based on the following assumptions:

- Rooms will: be approximately 56m³; have façade areas of approximately 13m²; and have 40% of the façade area glazed.

- Other solid façade elements of the façade will achieve sound insulation performances greater than R_w 50 dB.

Façade location	Range of predicted noise levels incident on façades		Minimum acoustic performance for glazing
	Daytime	Night-time	
Facing Sheen Road	63-68 dB $L_{Aeq,16hr}$	57-62 dB $L_{Aeq,8hr}$ 73-78 dB $L_{AFmax,T}$	R_w 34 dB (C_{tr} -3 dB) – R_w 38 dB (C_{tr} -3 dB)
Facing Church Road	57-66 dB $L_{Aeq,16hr}$	52-61 dB $L_{Aeq,8hr}$ 68-77 dB $L_{AFmax,T}$	R_w 33 dB (C_{tr} -4 dB) – R_w 37 dB (C_{tr} -4 dB)
Facing Sydney Road	56-61 dB $L_{Aeq,16hr}$	51-56 dB $L_{Aeq,8hr}$ 63-69 dB $L_{AFmax,T}$	R_w 27 dB (C_{tr} -2 dB) – R_w 31 dB (C_{tr} -2 dB)
Facing inner courtyard	55-58 dB $L_{Aeq,16hr}$	50-52 dB $L_{Aeq,8hr}$ 50-64 dB $L_{AFmax,T}$	R_w 25 dB (C_{tr} -2 dB) – R_w 29 dB (C_{tr} -2 dB)

Table 8: Minimum acoustic performance requirements for façade glazing.



Figure 7: Daytime ambient south and west façade levels.



Figure 8: Daytime ambient north and east façade levels.



Figure 9: Night-time ambient south and west façade levels.

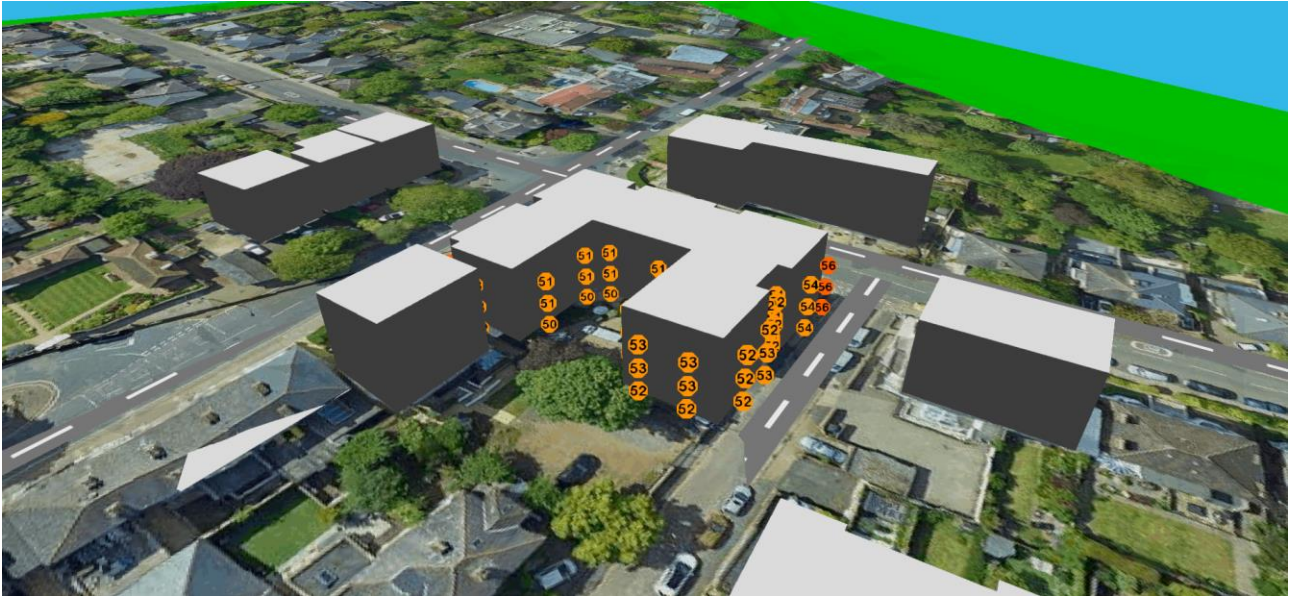


Figure 10: Night-time ambient north and east façade levels.

7.2 External amenity area noise assessment.

There are no private external amenity spaces contained in the proposed development. However, there is a shared external space in a courtyard area. The below figure shows that daytime ambient noise levels marginally exceed the recommended 55 dB $L_{Aeq, 16hour}$ upper guideline value. This is not seen as a reason for refusal given the nature/type of development. Nevertheless, consideration could be given to localised screening to provide more tranquil areas.

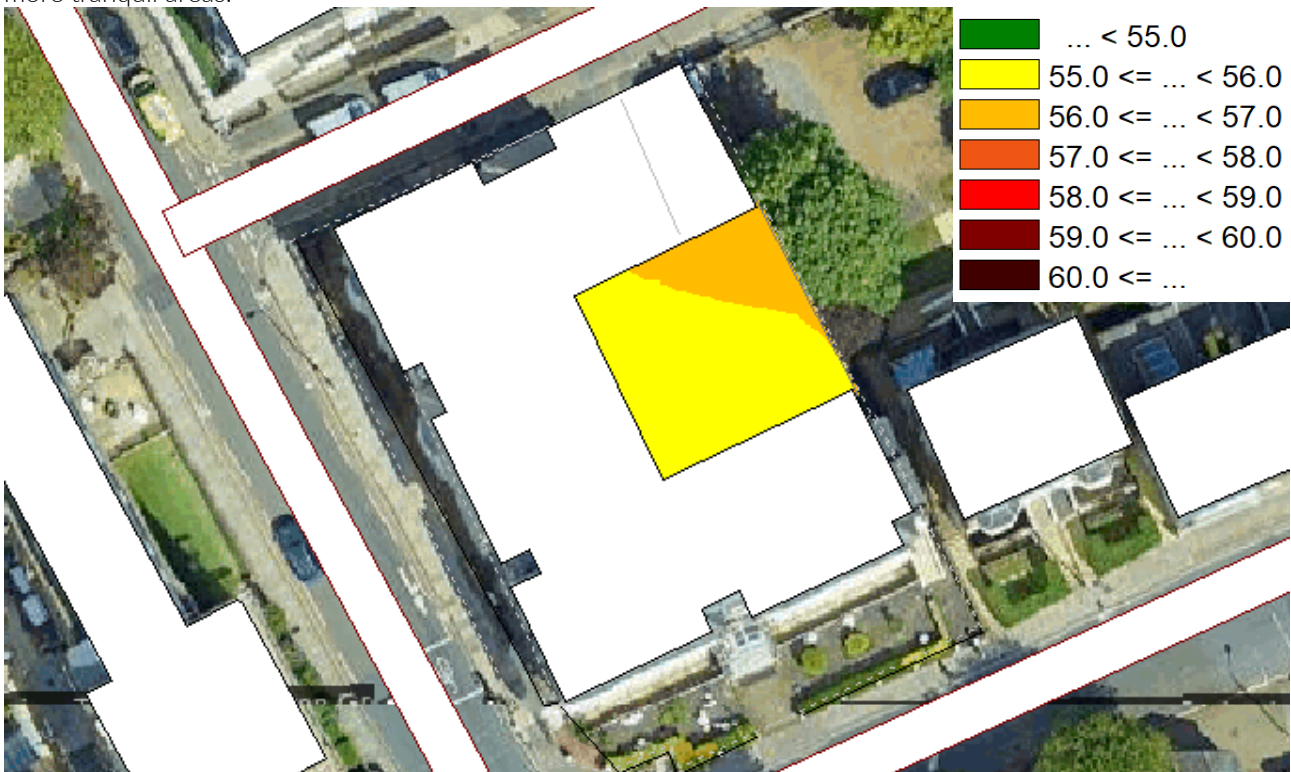


Figure 11: ProPG external amenity space suitability assessment.

8. Summary of assessment.

Hoare Lea has carried out a noise assessment to accompany the planning application for the partial demolition and extension of Richmond Inn (“the Site”) for Class C2 visitor accommodation providing care and physiotherapy-led rehabilitation, highways works, car and cycle parking, refuse storage, landscaping and other associated works (the “proposed development”).

An acoustic survey has been carried out to quantify the sound climate in the area, which is primarily dictated by road traffic noise on local roads, with some contributions from aircraft noise.

Fixed building services plant serving the proposed development could adversely impact on surrounding sensitive receptors if not designed appropriately. Therefore, building service plant noise limits have been derived to protect against adverse noise impacts at the nearby residential receptors. The noise limits derived are based on: the results of the acoustic survey; British Standard BS 4142 guidance; and the preferences of London Borough of Richmond upon Thames. These limits could be conditioned in the proposed development consent.

A site suitability assessment in terms of noise has been carried out. Minimum acoustic performance requirements for facades are specified to demonstrate that suitable internal noise levels can be achieved through suitable design. Suitable internal noise levels could be secured by way of a condition specifying that demonstration of suitable façade design be shown via a report prior to occupation.

References

- [1] Department for Food and Rural Affairs, Noise Policy Statement for England, 2010.
- [2] Ministry of Housing, Communities & Local Government, "National Planning Policy Framework," 2021.
- [3] Ministry of Housing, Communities & Local Government, Planning Practice Guidance - Noise, 2019.
- [4] Medway Council, Medway Local Plan 2003, 2003.
- [5] Department of the Environment, Transport and the Regions, Planning Policy Guidance PPG24: Planning and Noise, HMSO, 1994.
- [6] London Borough of Richmond upon Thames, Local Plan 2015-2018, 2018
- [7] London Borough of Richmond upon Thames, Development Control for Noise Generating and Noise Sensitive Development, 2018
- [8] British Standards Institution, BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, 2019.
- [8] British Standards Institution, BS 8233:2014 Guidance on sound insulation and noise reduction for buildings, 2014.
- [9] World Health Organization, Guidelines for Community Noise, Geneva, 2000.
- [10] Institute of Acoustics, "ProPG: Planning and Noise - Professional Practice Guidance on Planning & Noise - New Residential Development," Acoustics and Noise Consultants, 2017.
- [11] Acoustics and Noise Consultants, "Acoustics Ventilation and Overheating Residential Design Guide," Institute of Acoustics, 2020.
- [12] Civil Aviation Authority, Heathrow Airport 2018 Summer Noise Contours and Noise Action Plan Contours. 2019

Appendix A: Acoustic survey equipment

Unattended Position 1

Rion NL-52 sound level meter (serial number 01265405)

Rion NH-25 pre-amplifier (serial number 65307)

Rion UC-59 microphone (serial number 10623)

Unattended Position 2

Rion NL-52 sound level meter (serial number 01143560)

Rion NH-25 pre-amplifier (serial number 43577)

Rion UC-59 microphone (serial number 07371)

Attended Positions 3, 4 and 5.

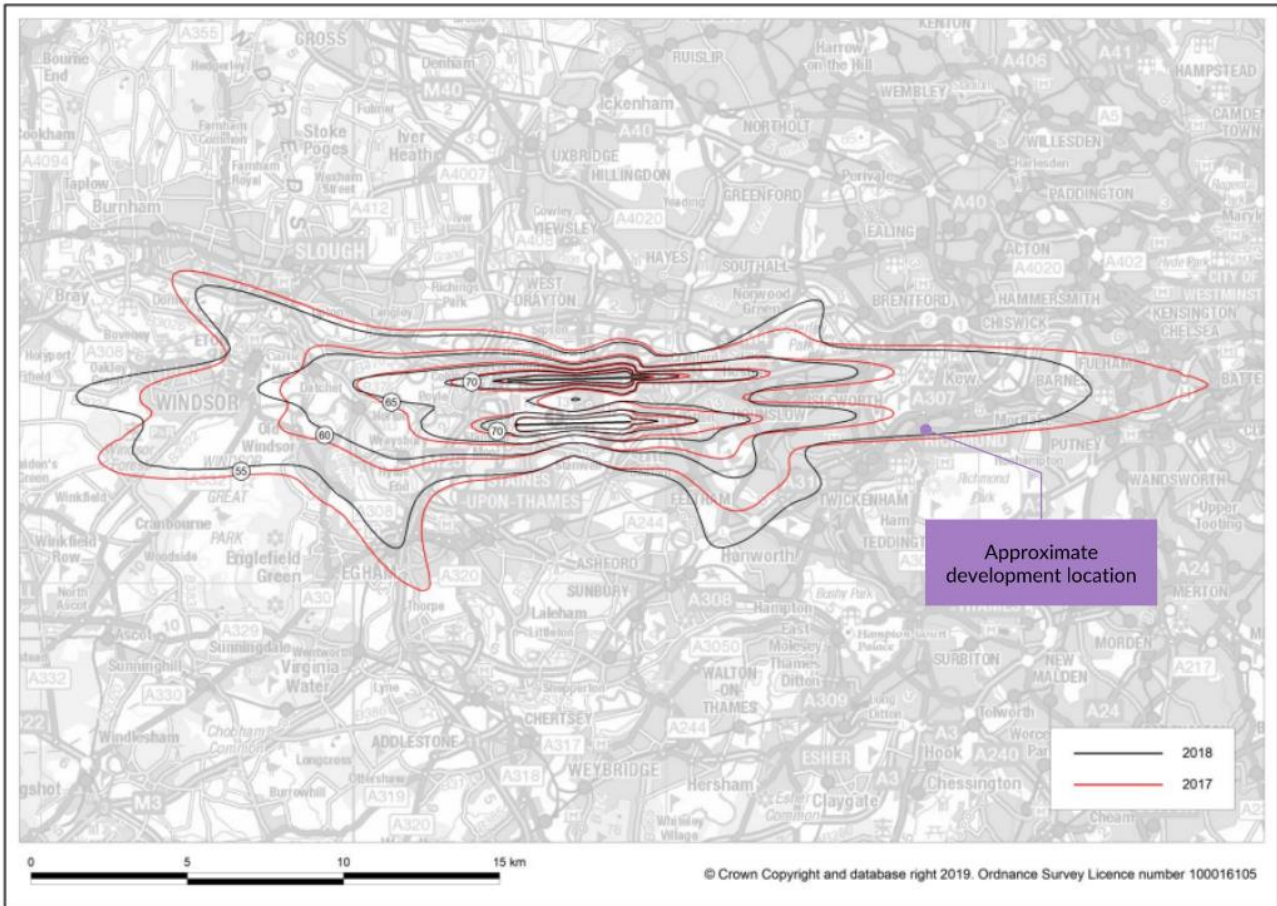
Brüel and Kjær Microphone: 4189 sn: 3196389

Brüel and Kjær Pre-amplifier: ZC 0032 sn: 29117

Brüel and Kjær Sound Level Meter: 2250 sn: 3003702

Appendix B: Proposed development location in relation to Heathrow airport noise contours.

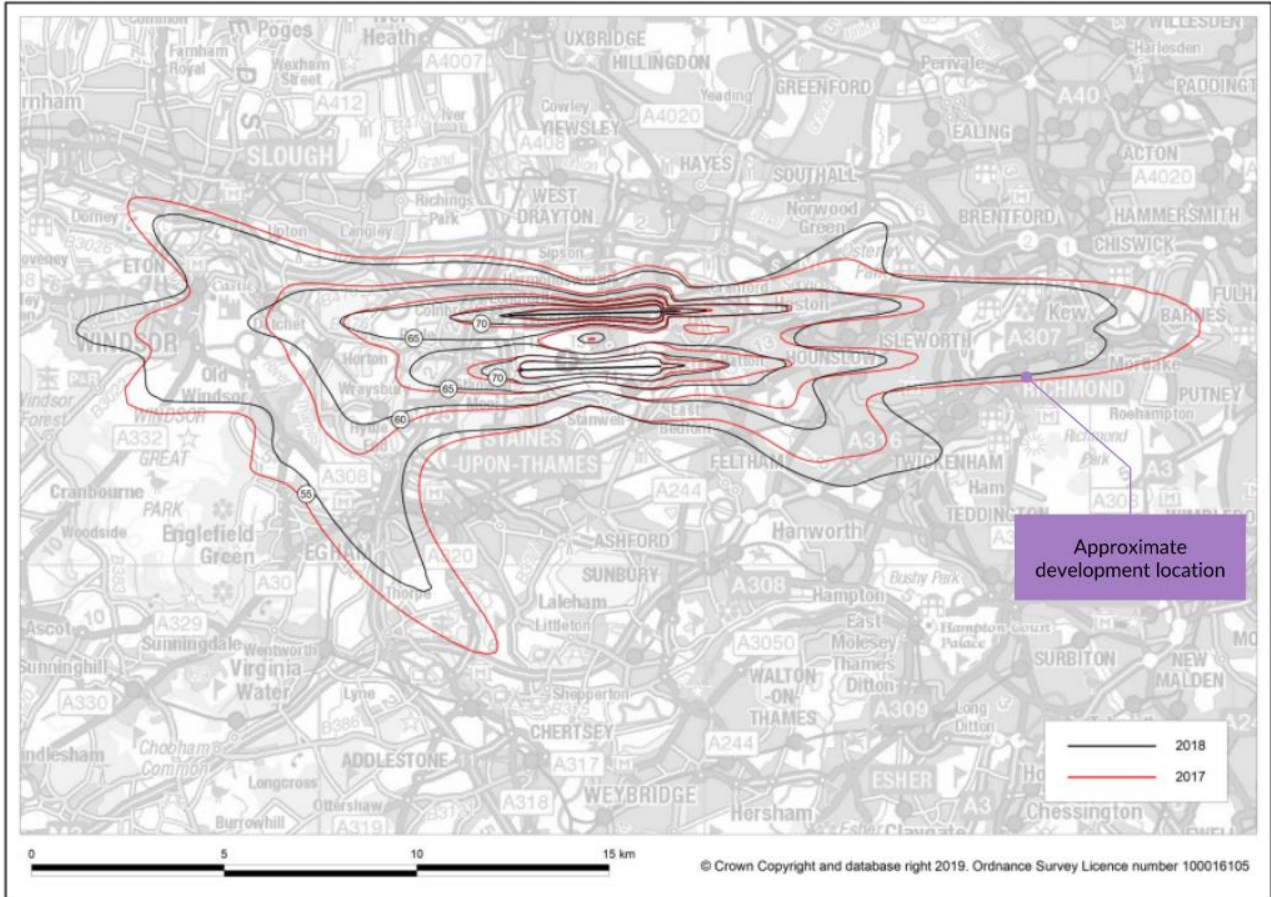
Figure B14 Heathrow 2018 and 2017 L_{day} noise contours



Note: 2017 L_{day} modal split was 81% W / 19% E; 2018 L_{day} modal split was 65% W / 35% E.

Figure 12: Approximate location of the proposed development in relation to day time noise contours from Heathrow Airport [14]

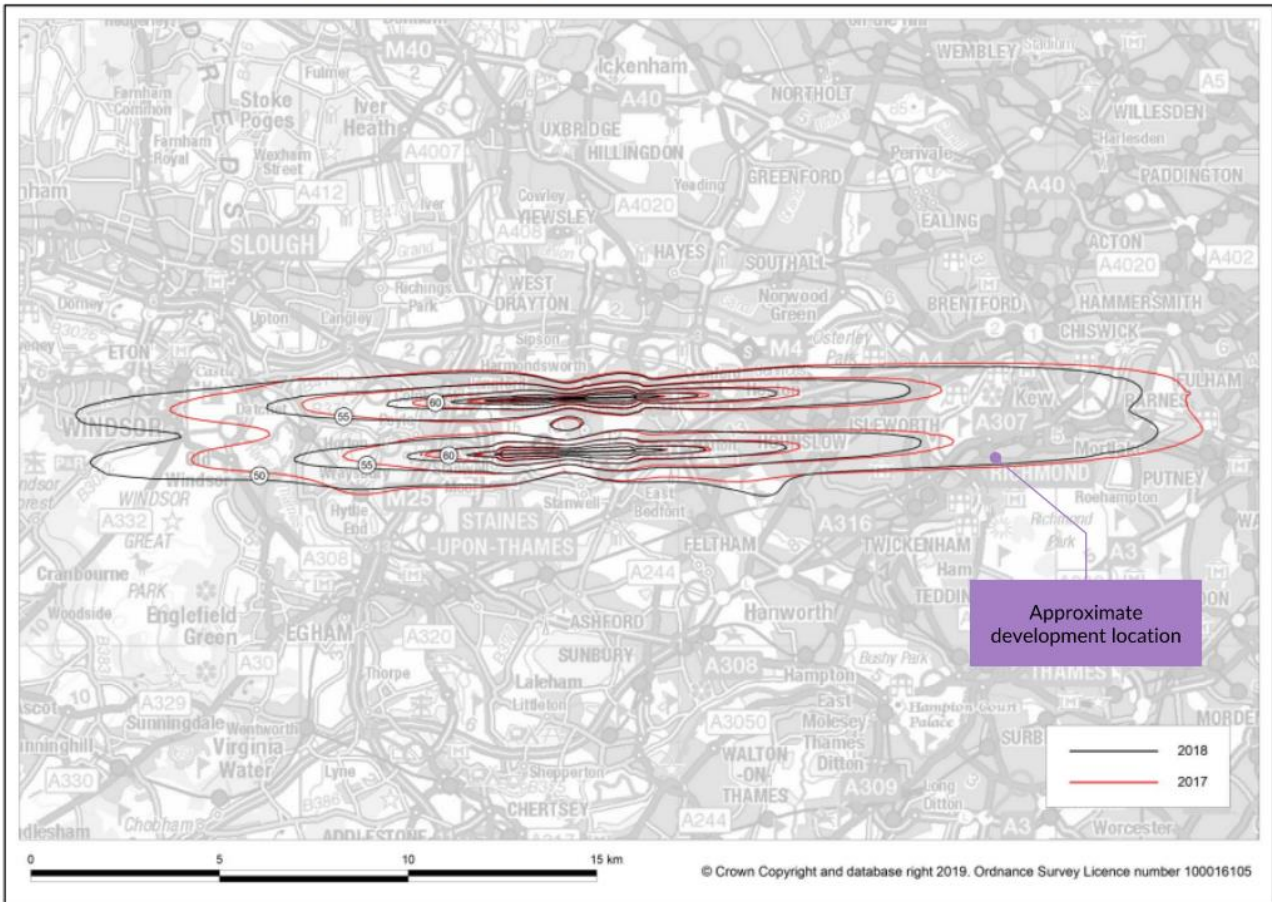
Figure B15 Heathrow 2018 and 2017 L_{evening} noise contours



Note: 2017 L_{evening} modal split was 81% W / 19% E; 2018 L_{evening} modal split was 65% W / 35% E.

Figure 13: Approximate location of the proposed development in relation to evening noise contours from Heathrow Airport [14]

Figure B16 Heathrow 2018 and 2017 L_{night} noise contours



Note: 2017 L_{night} modal split was 80% W / 20% E; 2018 L_{night} modal split was 64% W / 36% E.

Figure 14: Approximate location of the proposed development in relation to night time noise contours from Heathrow Airport [14]



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