Dice Environmental
Acoustics

West End Road, Ruislip
Noise Impact Assessment

1st May 2024
Ref: 101322-R01v1
Version 2

Distribution List

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Quality Assurance

Issue/Revision	Version 1	Version 2	Version 3
Project Number	101322-R01	101322-R01	
Remarks	First issue	Updated site layout drawing	
Date	1st May 2024	1st May 2024	
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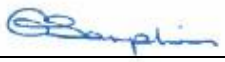
Signature			
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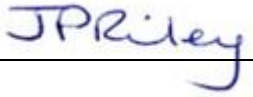
Signature			

Contents

Executive Summary

Dice Environmental were commissioned by Mr. Manav Patel to undertake a Noise Impact Assessment in relation to the proposal for the Eden Lounge Shisha bar, at 298 West End Road, Ruislip, Hillingdon, HA4 6LS.

Noise Surveys

An environmental noise survey has been completed to quantify the prevailing soundscape at the site. This comprised an unattended logging survey over a 24h period.

Noise Impact Assessment

It is understood that no new noise sources are being introduced to the site and therefore no noise mitigation measures are required. Any plant that is installed should be design to achieve noise rating levels of $L_{Ar,Tr}$ 48 dB during the day (07:00-23:00) and $L_{Ar,Tr}$ 40 dB during the night (23:00-07:00) at the window of any neighbouring noise-sensitive property.

The assessment is based upon robust and worst-case assumptions and demonstrates that there should not be, be any adverse impacts upon the surrounding noise sensitive properties.

1. Introduction

1.1. Background

Dice Environmental has been commissioned by Mr. Manav Patel, to provide a Noise Impact Assessment in relation to the proposed Eden Lounge Shisha bar, at 298 West End Road, Ruislip, Hillingdon, HA4 6LS, to be referred to hereafter as "the site".

The site is proposed to contain a partially covered outdoor shisha bar area.

This assessment has been undertaken with due regard to the supplied planning layout shown on Design 121 drawing 09 (dated April 2024).

The site layout is shown in Figure 2 in Appendix III.

1.2. Limitations

All limitations of this report are presented in Appendix I.

1.3. Confidentiality

Dice Environmental has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Dice Environmental; a charge may be levied against such approval.

2. Assessment Methodology

2.1. National Planning Policy Framework

National Planning Policy Framework [1] states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision-taking should take account of the acoustic environment and in doing so consider:

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

In line with the Explanatory Note of the Noise Policy Statement for England [2], this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The Observed Effect Levels are as follows:

- Significant Observed Adverse Effect Level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- Lowest Observed Adverse Effect Level (LOAEL): This is the level of noise exposure above which adverse effects on health and quality of life can be detected;
- No Observed Adverse Effect Level (NOAEL): This is the level of noise exposure at which the noise is noticeable but has no effect at all on health or quality of life.
- No Observed Effect Level (NOEL): This is the level of noise exposure below which noise is not audible.

Table 1 summarises the noise exposure hierarchy, based on the likely average response.

Table 1: Noise exposure hierarchy

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect	No observed effect	No specific measures required
No Observed Adverse Effect Level			
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			
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			
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, e.g., regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable adverse effect	Prevent

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 source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise; and
- The spectral content and general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- Where applicable, the cumulative impacts of more than one source should be taken into account, along with the extent to which the source of noise is intermittent and of limited duration.
- Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations.
- If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

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

BS4142 [3] describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- Sound from industrial and manufacturing processes
- Sound from fixed installations which comprise mechanical and electrical plant and equipment
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial site.

The procedure detailed in the standard compares the measured or predicted noise level, 'the specific noise level', from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is typical.

The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00-23:00): 1 hr; and,
- Night-time (23:00-07:00): 15 minutes.

There are a number of 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows:

Tonality

- +2 dB: where the tonality is just perceptible
- +4 dB: where the tonality is clearly perceptible
- +6 dB: where the tonality is highly perceptible

Impulsivity

- +3 dB: where the impulsivity is just perceptible
- +6 dB: where the impulsivity is clearly perceptible
- +9 dB: where the impulsivity is highly perceptible

Intermittency

- +3 dB: where the intermittency is readily distinctive against the acoustic environment

In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3 dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment.

BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background noise level can yield the following commentary:

- Typically, the higher the rating level is above the background sound level, the greater the magnitude of impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

With the above in mind, it is common that a Local Planning Authority will specify their own criteria (Section 2.3) for the rating level relative to the background sound level and, where this is the case, this criterion usually takes precedence over a simple comparison of the rating level against the background sound level.

BS4142 includes the following text in relation to areas with low and very low noise levels:

> *Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.*

2.3. The London Plan 2021 – Policy D14 Noise

The London Plan 2021 [4] is a Spatial Development Strategy for London, setting out an integrated economic, environmental, transport, and social framework for the development of London over the next 20-25 years. The relevant policy in the plan relating to noise is Policy D14:

> *A In order to reduce, manage, and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*
>
> *1) avoiding significant adverse noise impacts on health and quality of life*
> *2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change*
> *3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a results of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses*
> *4) improving and enhancing the acoustics environment and promoting appropriate soundscapes (including Quite Areas and spaces of relative tranquillity)*
> *5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation*

6) *where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustics design principles*

7) *promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.*

B *Boroughs, and others with relevant responsibilities, should identify and nominate new Quiet Areas in line with the procedure in Defra's Noise Action Plan for Agglomerations.*

2.4. Local Authority Guidance – London Borough of Hillingdon

The London Boroughs of Hillingdon, Hounslow, and Richmond-upon-Thames have developed a joint Supplementary Planning Document *Development Control for Noise Generating and Noise Sensitive Development* [5]. This sets out the approach taken by the respective planning authorities when reviewing applications in relation to noise.

With relation to new noise generating industrial and commercial development, it states that an assessment be carried out in line with BS4142 [3] to achieve the noise standards set out in Table 2.

Table 2: London Borough of Hillingdon noise standards

Noise Impact from Relevant Proposed Industrial or Commercial Premises or Plant	Development Outcome
Rating Level $L_{Ar,Tr}$ is at least 5 dB below the Background Level L_{A90}	Normally acceptable
Rating Level $L_{Ar,Tr}$ is no more than 5 dB above the Background Level L_{A90}	Acceptable only if there are overriding economic or social reasons for development to proceed
Rating Level $L_{Ar,Tr}$ is more than 5 dB above the Background Level L_{A90}	Normally unacceptable

3. SURVEYS

3.1. Measurement locations

Dice Environmental has conducted noise surveys at the site to establish how the proposed development will impact the surround environment. The dominant noise source at the site is road traffic noise, primarily from the A4180/West End Road, and railway line.

NMP1 is shown in Figure 1. The unattended noise measurement position is shown in blue. These positions were chosen to be representative of the noise levels experienced at the facades of the proposed buildings.

Figure 1: Noise measurement location

3.2. Noise Survey

A full time history of the measured noise data is given in Appendix V. A summary of the measured sound pressure levels is presented in Table 3.

Table 3: Summary of measured noise levels

Date range	Period	Ambient sound level, $L_{Aeq,T}$, dB	Background sound level, $L_{A90,T}$, dB	
			Range	Typical*
21 Nov 23 – 22 Nov 23	Day (07:00-23:00)	60	44-56	53
	Night (23:00-07:00)	53	37-53	45

* Based on the mode measured value during the measurement period

3.3. Survey Conditions

The weather conditions during the noise surveys were conducive towards the measurement of environmental noise being fine and dry with wind speeds below 5 m/s.

The noise survey was completed using the following noise measurement equipment.

Table 4: Noise Measurement Equipment

Description	Manufacturer & Type	Serial No.	Calibration Expiry
Sound Level Meter	01dB Solo	65211	20 Jun. 25
Pre-amplifier	01dB-Metravib Pre21S	15766	
Microphone	01dB MCE 212	181856	
Calibrator	01dB-Metravib CAL31	84062	15 Jun. 24

The sound level meter was field-calibrated on site prior to and after the measurements were taken. No significant drift was witnessed.

4. Noise Impact Assessment

4.1. Proposed Plant

It is understood that there are no plant items to be introduced as part of the development. All ventilation will be provided by natural airflow as the shisha bar area is >50% open to atmosphere above, meaning that no mechanical extraction/ventilation is required.

Table 5 illustrates the calculation of plant rating level limits for the daytime and night-time periods based on BS4142 [3]. Any plant introduced to the site should comply with these limits. These apply to all plant units operating simultaneously.

Table 5: Plant noise limits

Period	Representative background level $L_{A90,T}$ (dB)	Plant rating level $L_{A90-5dB}$ (dB)
Day (07:00-23:00)	53	48
Night (23:00-07:00)	45	40

Assuming that any plant items are designed to achieve the rating levels set out above, it is considered that the likelihood of adverse comment arising as a result of noise from the plant is low and that the NOAEL will be achieved, which would be barely noticeable and not intrusive, resulting in the following:

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.

5. CONCLUSION

Dice Environmental has been commissioned by Mr. Manav Patel to provide a Noise Impact Assessment to support a planning application for a development at the Eden Lounge, 298 West End Road, Ruislip, Hillingdon, HA4 6LS.

The assessment has been completed with due regard to the requirements of London Borough of Hillingdon.

An environmental noise survey has been completed to quantify the prevailing noise environment at the nearby receptors, dominated by road traffic noise from the A4180/West End Road to the east of the site, and the Chiltern Main Line railway and London Underground Central lines to the south.

This noise survey has been used to develop sitewide noise egress limits in line with the requirements of BS4142 and The London Borough of Hillingdon. It is understood that no new noise sources are being introduced to the site and therefore no noise mitigation measures are required. Any plant that is installed should be design to achieve noise rating levels of $L_{Ar,Tr}$ 48 dB during the day (07:00-23:00) and $L_{Ar,Tr}$ 40 dB during the night (23:00-07:00) at the window of any neighbouring noise-sensitive property.

The assessment is based upon robust and worst-case assumptions and demonstrates that, in principle, there should be no adverse impact at the existing dwellings as a result of noise arising from the proposed development.

Appendix I – Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Dice Environmental and the Client as indicated in Section 1.2.
2. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
3. Dice Environmental cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by Dice Environmental is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by Dice Environmental in this connection without their explicit written agreement there to by Dice Environmental.
4. Where a noise survey is required to inform the assessment, Dice Environmental will endeavour to ensure that all noise measurements taken are robust, representative and reliable in order to inform an accurate noise impact assessment. Where limitations or constraints exist which prevent a suitable noise survey being completed, Dice Environmental will take all reasonable steps to make the client fully aware of any such limitations or constraints with a view to achieving the best possible outcome for the client. Where additional sound surveys are required, over and above those specified in our scope of works, then Dice Environmental reserves the right to charge additional fees.
5. Where mitigation measures are specified in our report, it should be noted that these measures are relative to a specific sound source, both in terms of the measured sound pressure level and the character of the source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, Dice Environmental cannot be held responsible for any subsequent variations in the proposed mitigation performance.

Appendix II – Glossary of Acoustic Terminology

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character, and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsivity may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the Table A1.

Table A1: Typical Sound Pressure Levels

Sound Pressure Level dB(A)	Location/Example
0	Threshold of hearing
20-30	Quiet bedroom at night
30-40	Living room during the day
40-50	Typical office
50-60	Inside a car
60-70	Typical high street
70-90	Inside factory
100-110	Burglar alarm at 1m away
110-130	Jet aircraft on take off
140	Threshold of pain

Table A2: Terminology

Descriptor	Explanation
Ambient Noise	Encompassing sound, at a given place, being usually a composite of sounds from many sources near and far.
C_{tr}	Sound insulation performance spectrum adaptation term that accounts for the A-weighted urban traffic noise spectrum.
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (20 μPa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with the 'A' frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$D_{n,e,w}$	Weighted element normalized level difference. A single-number quantity that describes the sound insulation of ventilators.
$L_{Aeq,\ T}$	A-weighted, equivalent continuous sound pressure level. L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' time-weighting response.
$L_{Ar,Tr}$	Sound rating level. The A-weighted L_{eq} sound level of an industrial noise during a specified time period, adjusted for tonal character and impulsivity.
L_{10} & L_{90}	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and 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 the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.
Free-Field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, this is measured outside and away from buildings.
Fast	A time-weighting used in the root mean square section of a sound level meter with a 125-millisecond time constant.
Pink Noise Spectrum	Noise whose power spectral density is inversely proportional to frequency.
Residual Noise	The ambient sound remaining when the specific sound is suppressed.
R_w	Weighted Sound Reduction Index. A single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
Slow	A time-weighting used in the root mean square section of a sound level meter with a 1000-millisecond time constant.
Specific Noise	Noise from the sound source under investigation as defined in BS4142, method for rating industrial noise affecting mixed residential and industrial areas.

Appendix III – Figures

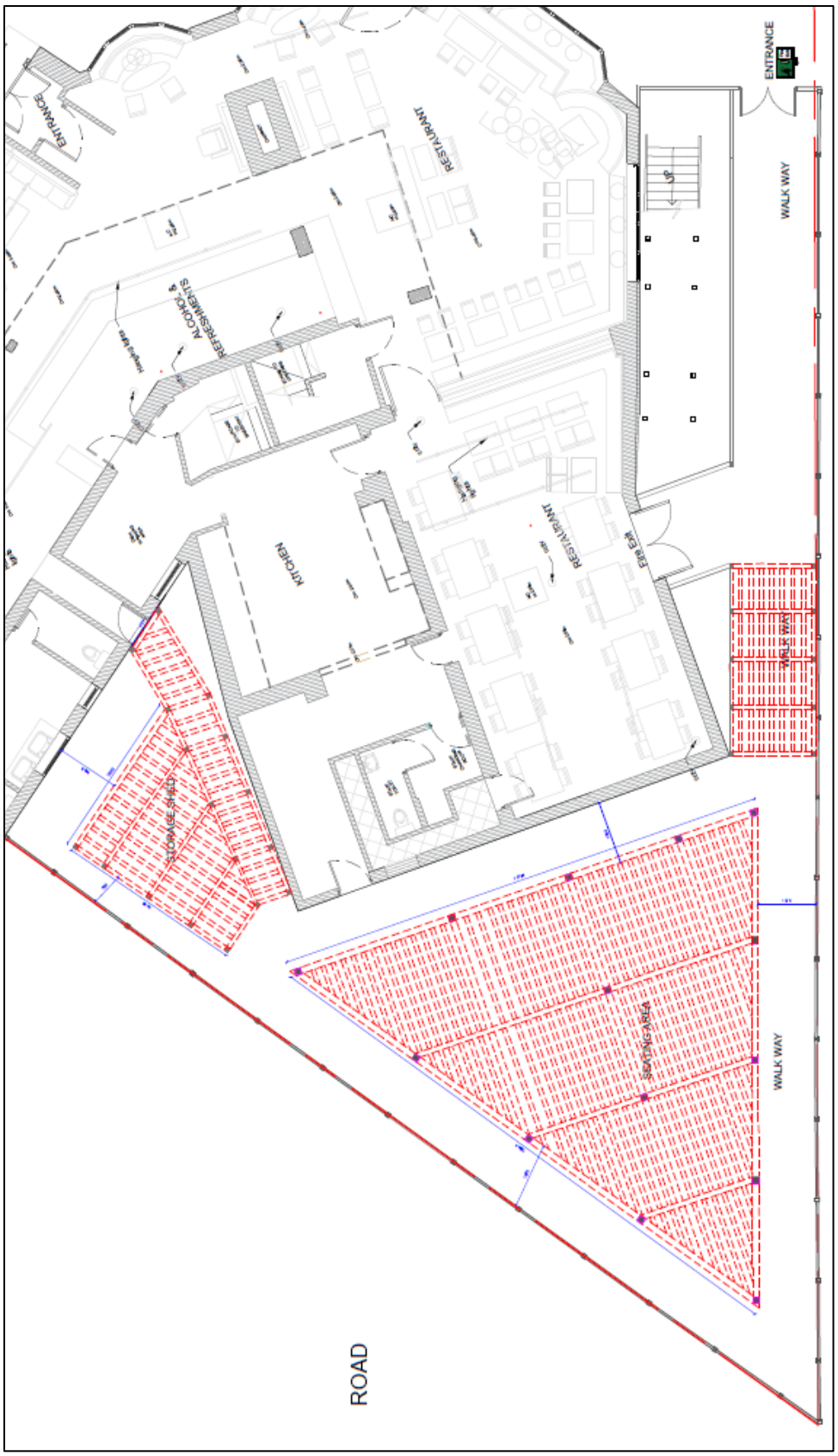


Figure 2: Proposed site layout

Appendix IV – Bibliography

[1] Ministry of Housing, Communities & Local Government, *National Planning Policy Framework,* London: UK Government, 2021.

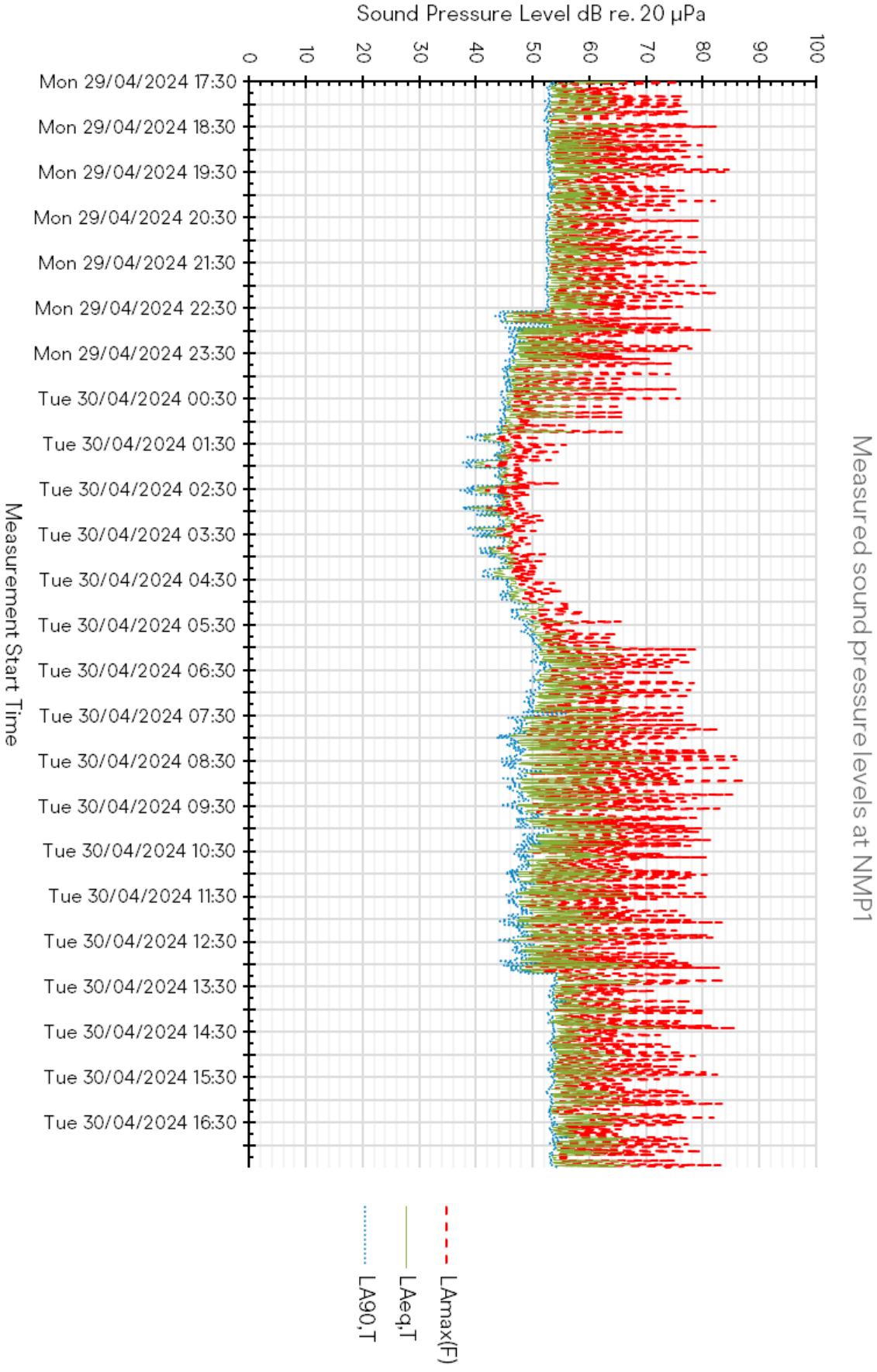
[2] Noise and Nuisance Team, *Noise Policy Statement for England,* London: Department for Environment, Food and Rural Affairs, 2010.

[3] British Standards Institution, *4142 Methods for rating and assessing industrial and commercial sound,* London: BSI Standards Limited, 2019.

[4] J. Pipe, S. Ali, D. Halliwell, T. Layfield, GLA Planning and GLA Group, *The London Plan 2021,* London: Greater London Authority, 2021.

[5] London Boroughs of: Hillingdon, Hounslow, and Richmond Upon Thames, *Development Controls for Noise Generating and Noise Sensitive Development,* London, 2014.

Appendix V – Noise survey results


Sound Pressure Level dB re. 20 µPa
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10
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40
50
60
70
80
90
100
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Tue 30/04/2024 15:30
Tue 30/04/2024 16:30
Measurement Start Time
Measured sound pressure levels at NMP1
LA90,T
LAeq,T
LAmax(F)