KR05749

Leverton Place

Noise Impact Assessment…

Standard: British Standard 4142: 2014

Site: Leverton Place

Address: 3 leverton Place
London

Postcode: NW5 2PL

Customer: Edzard van der Wyck

Address: 3 Leverton Place
London

Postcode: NW5 2PL

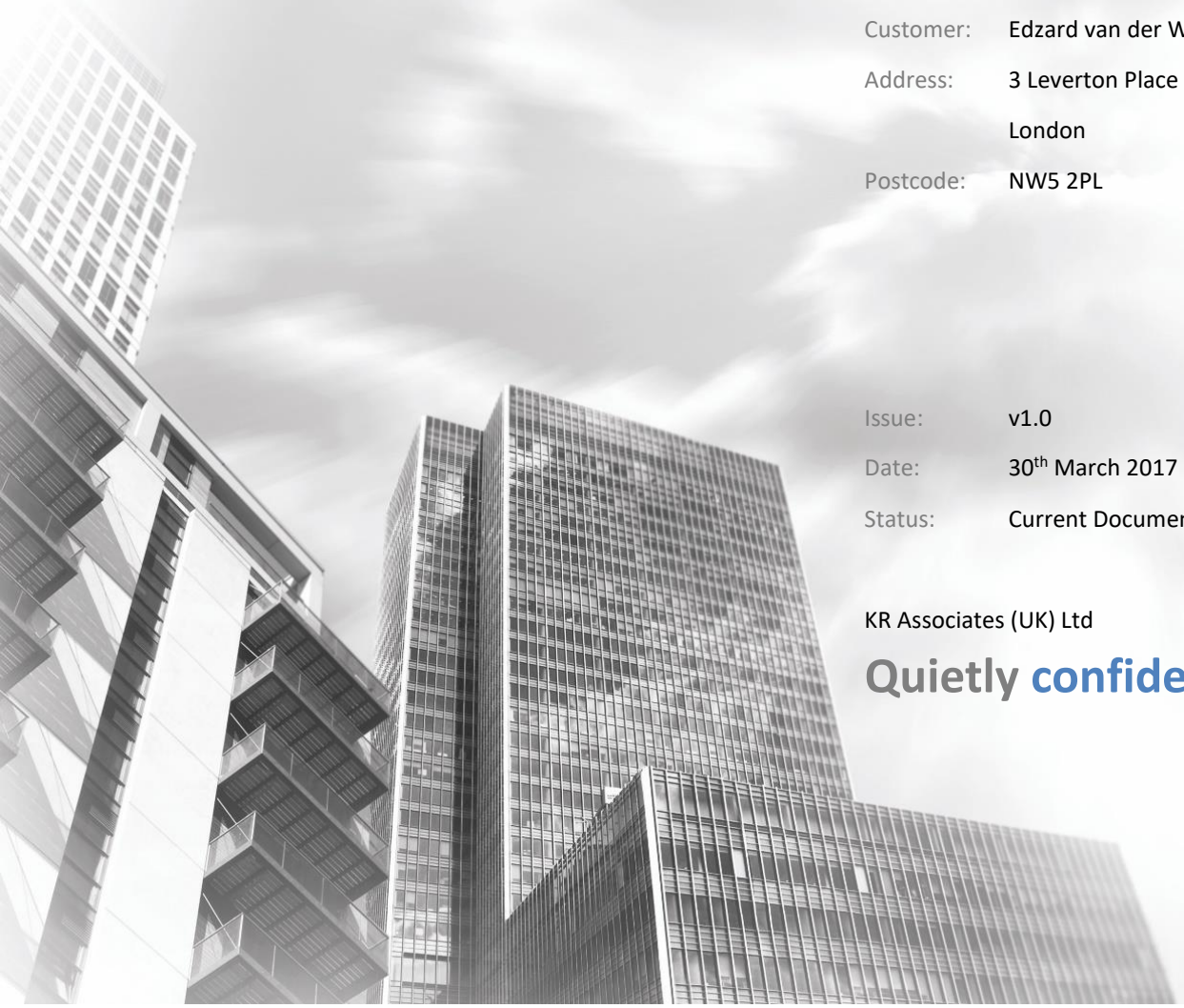
Issue: v1.0

Date: 30th March 2017

Status: Current Document

KR Associates (UK) Ltd

Quietly confident…



Revisions…

KR05749		Project	Leverton Place		
		Title	Noise Impact Assessment		
		Standard	British Standard 4142: 2014		
Issue	Date	Details of Revision			
v1.0	30/03/2017	Description	Report issue for submission to Local Authority		
		Signature			
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1. Executive Summary….

1.1. Instruction

KR Associates (UK) Ltd have been instructed by Edzard van der Wyck to undertake and environmental noise survey at 3 Leverton Place in London to determine if the development of the proposed residential roof terrace will have a significant adverse impact in terms of noise on the nearest noise sensitive façade.

1.2. Outline of Proposal

It is proposed to develop a roof top terrace on the flat roof of number 3 Leverton Place in London. The adjoining property, number 2 Leverton place, has previously been granted planning permission for the extension and development of a roof top terrace.

1.3. Executive Summary (Repeated at Section 7)

1.3.1 Assessment Position

The rear façade of the adjoining residential property is located approximately 2m from the proposed terrace boundary and approximately 5m from any noise likely to be generated from the use of the roof terrace.

1.3.2 Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
47 - 57 dB	56 - 74 dB	51 - 63 dB	41 - 51 dB	52 - 68 dB	45 - 53 dB	38 - 51 dB	49 - 65 dB	40 - 53 dB

1.3.3 Criterion at Assessment Position

NPPF Policy Aim (p 123)	Action	Night Noise Guidelines	ISO 1996: 2016 / IEMA	BS 4142: 2014
Significant Adverse Impact	Avoid	L_{night} 55 dB or more	$L_{Aeq,\,t}$ +10 dB or more	+10 dB
Adverse Impact	Mitigate	L_{night} 40 – 55 dB	$L_{Aeq,\,t}$ +3 to +9 dB	+5 dB
Improved Quality of Life	Ideal if Possible	L_{night} 40 dB or less	$L_{Aeq,\,t}$ +2 dB or less	+0 dB

1.3.4 Mitigation Measures

No specific mitigation measures should be required for this site due to the existing background noise levels and the pre-existing roof terrace on the adjoining residential property posing no cause for complaint.

1.3.5 Noise Levels (at 1m)

Noise levels have been based on the technical knowledge generated from previous measurements on speech noise levels.

Normal Conversation	Raised Voices	Shouting
60 dB	70 dB	80 dB

1.3.6 Assessment of Noise Levels

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142
40 dB	53 dB	-13 dB	40 dB	49 dB	-9 dB	32 dB	44 dB	-12 dB

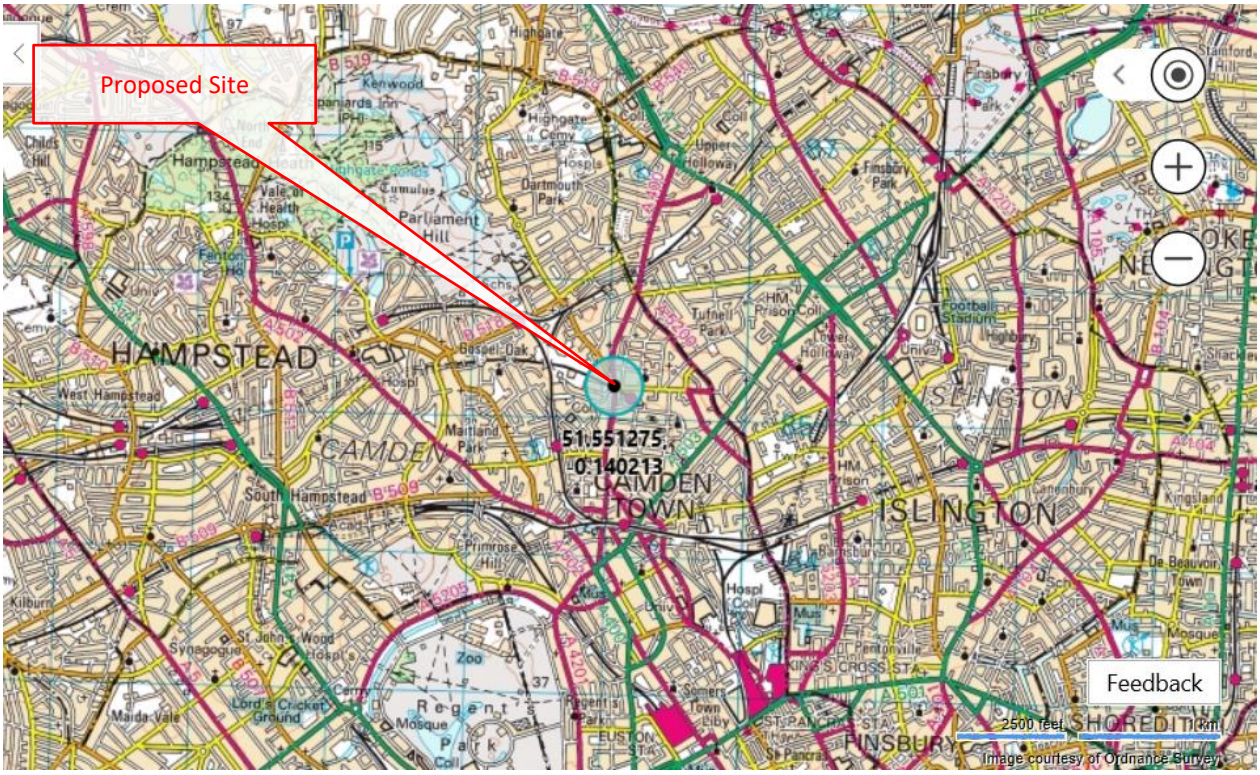
1.3.7 Conclusions

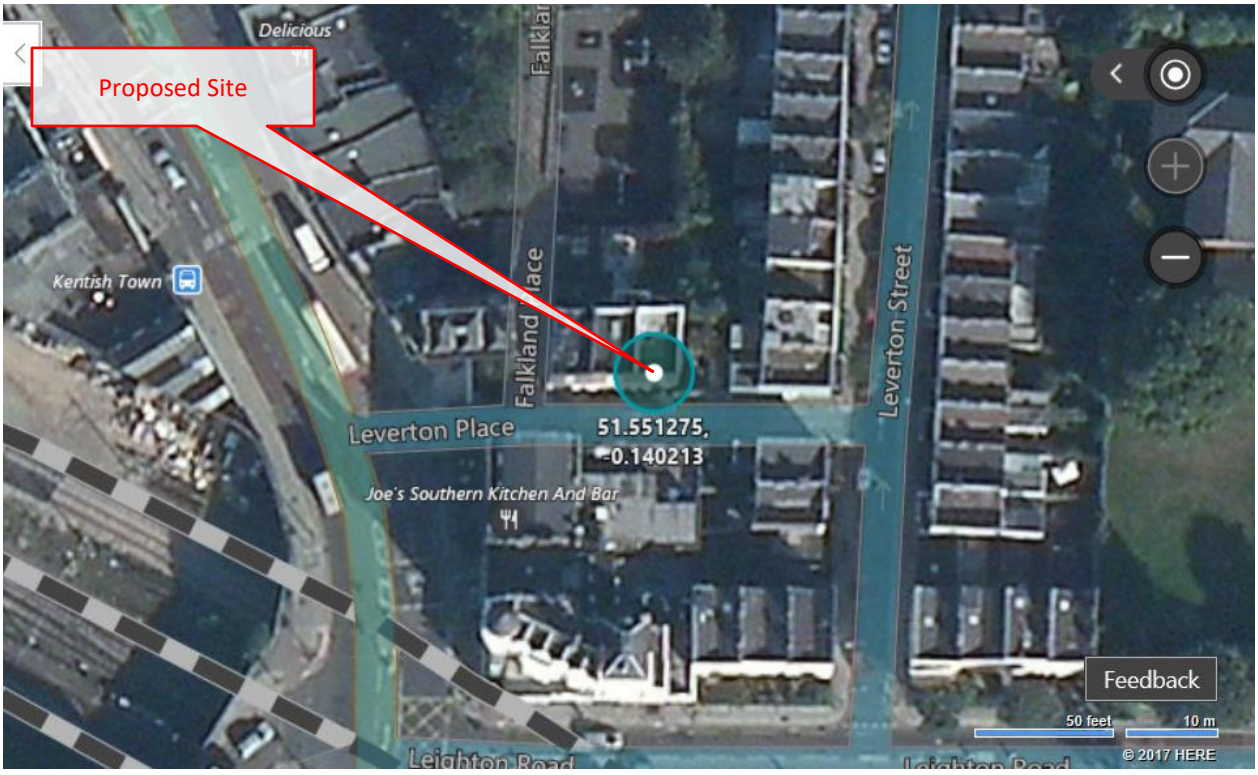
It would be recommended to grant planning permission for the development of a first-floor flat roof terrace at the property located at 3 Leverton Place as it will have no detrimental effect on the local residents in terms of noise.

In context to the existing surrounding site, the adjoining property has previously been granted planning permission for the same development and a first-floor roof terrace currently exists without any complaint.

2. Site Location…

2.1. General Location of Site

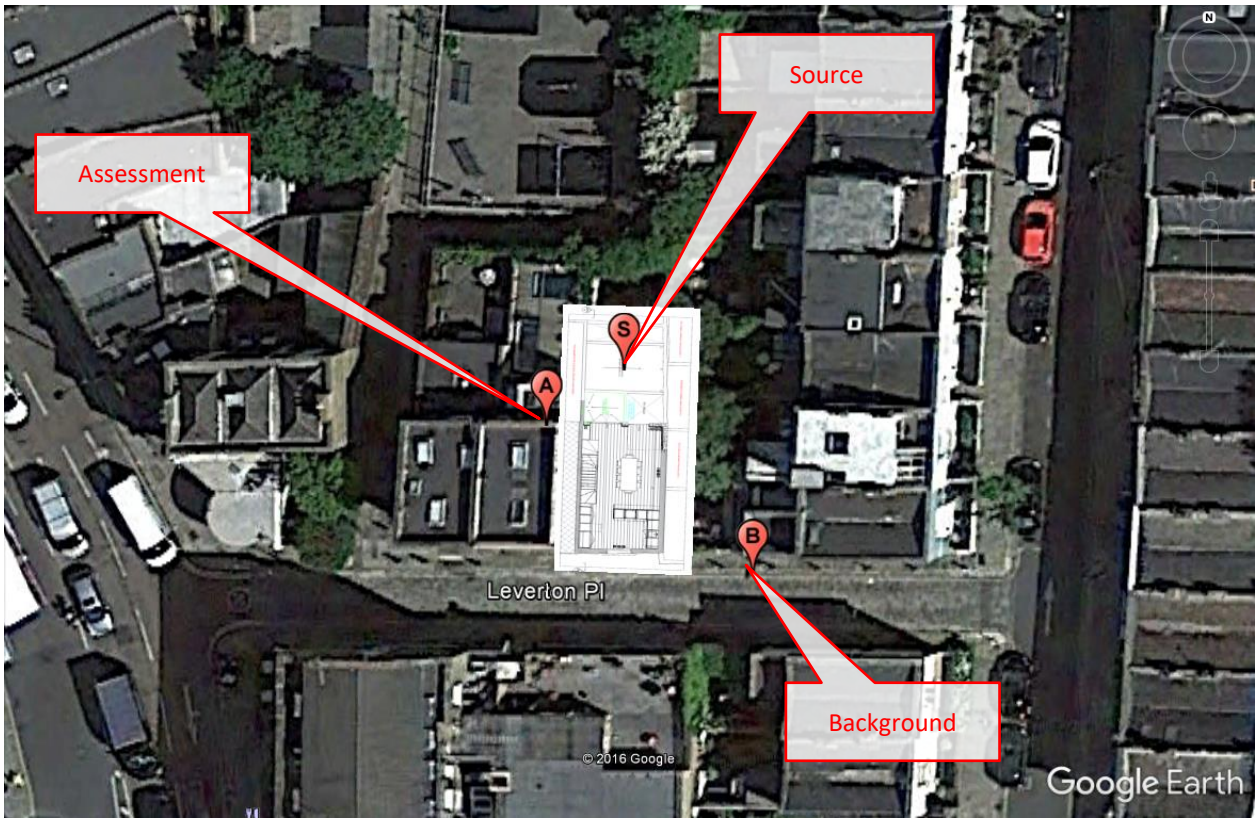




Site Plan (Imagery © Google 2016)

The residential property is an end of terrace property. The adjoining property comprises of an existing roof garden at first floor level. It is proposed to develop a garden terrace adjoining the one of that existing at 2 Leverton Place.

2.2. Key Positions (Source, Assessment & Background)



Position	Description	Latitude	Longitude	Elevation
Source	noise generated from the use of the roof terrace	51.551356^0	-0.140216^0	5 m
Assessment	Rear façade of adjoining residential property	51.551325^0	-0.140285^0	5 m
Background	Lamp post adjacent to 3 Leverton Place	51.551242^0	-0.140102^0	3 m

Site Plan (Imagery © Google 2016)

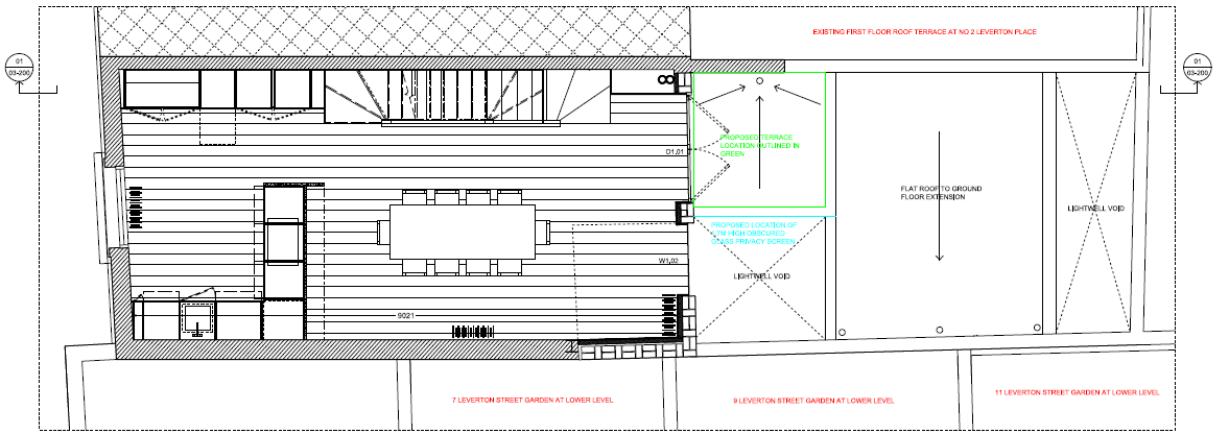
2.3. Free Field Source Sound Pressure Levels at 10m

Source	Description of Source	Sound Pressure Level at 10m – Annex C 13487: 2003		
		07:00 – 19:00	19:00 – 23:00	23:00 – 07:00
Source 1	Normal Talking	$L_{p(10)}$ 40 dB	$L_{p(10)}$ 40 dB	$L_{p(10)}$ 30 dB
Combined Sound Pressure Level at 10m (1 Reflective Surface)		$L_{p(10)}$ 40 dB	$L_{p(10)}$ 40 dB	$L_{p(10)}$ 30 dB

The key noise source to be considered at this proposed development would be general conversation associated with the enjoyment of using one's own land.

2.4. Proposed Site Layout

It is proposed to develop a roof top terrace garden on the existing flat roof of the residential property at 3 Leverton Place in London. The adjoining property already comprises of a roof top terrace garden at first floor level.



GENERAL ARRANGEMENT NOTES:

Refer to all other information to be read in conjunction with these drawings.

All dimensions to be checked on site prior to fabrication and commencement of works. Any conflicting information is to be confirmed with Nathaniel Mosley before commencing the works. No responsibility can be accepted for dimensions scaled from drawings and Contractors are expected to check all dimensions and details before commencing work. Do not scale drawings.

All services to contractor design. Electrical and gas safety certificates to be issued by registered Installers. Electrical and gas specification and certificate must be submitted to building control. Existing services/ electrical, water, ventilation and the like to be removed and capped where required.

Detailed joinery design to be contractor design portion.

Any pre-commencement notices to service provider to be issued by contractor in sufficient time not to delay contractor. Before starting work check and locate positions of services.

When defects in existing work are discovered give immediate notice.

All work is to comply with current British Standards, Codes of Practice and Building Regulations as applicable. Workmanship shall be in accordance with good building practice and should at least comply with BS8000 and the latest applicable codes of practice. Proprietary materials to be fixed/applied in accordance with manufacturer's recommendations. General maximum tolerances to BS5606 tables 1 and 2. General execution should be secure, plumb, accurate, neat and in alignment. Check on site dimensions. Finished work should not be damaged, disfigured, dirty faulty or out of tolerance.

Manufacturer's recommendations; unless otherwise specified comply with manufacturer's current printed recommendations and instructions. With ancillary products use those recommended by main product manufacturer unless otherwise specified.

Agrement certified products: comply with limitations, recommendations and requirements of relevant valid certificates.

If alternative work or products to that specified are proposed submit reasons and obtain approval.

Fixing rigid sheet flooring: fully support long edges at right angles to structure, stagger end joints, fix fasteners at 150mm centres to edges and supports.

Plasterboard and plastering: Plasterboards to BSEN520, undercoat and finish plaster to BSEN13279-1. Plaster beads to all angles and stop ends to BSEN 13658-1, Plasterboard dry lining to be installed in accordance with BS8212, Plaster finish to be light, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

Ventilation to BS5250

Brickwork to BS3921 (21N/mm sq.) unless otherwise noted.

Painting and decorating to BS6150

Joinery and Ironmongery to BS1186-3 and BS8000-3

Preservatives to timber BS5268 with all cut ends treated, brush applied.

DPCs to BS6515

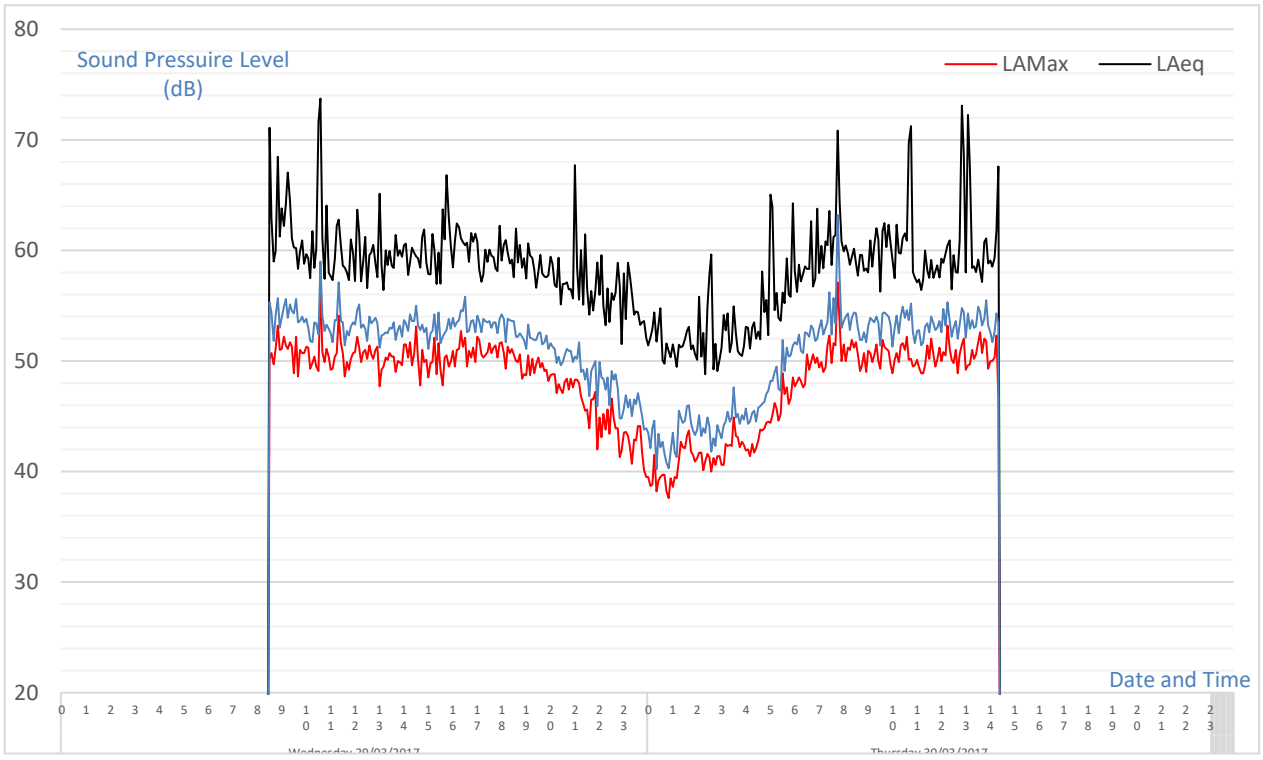
All leadwork to BS1178 and Lead Sheet Associations recommendations and details.

Position	Relative Distance	Latitude	Longitude	Elevation
Source 1	2m - 6m to assessment position	51.551356^0	-0.140216^0	5 m

Site Plan (Imagery © Google 2016)

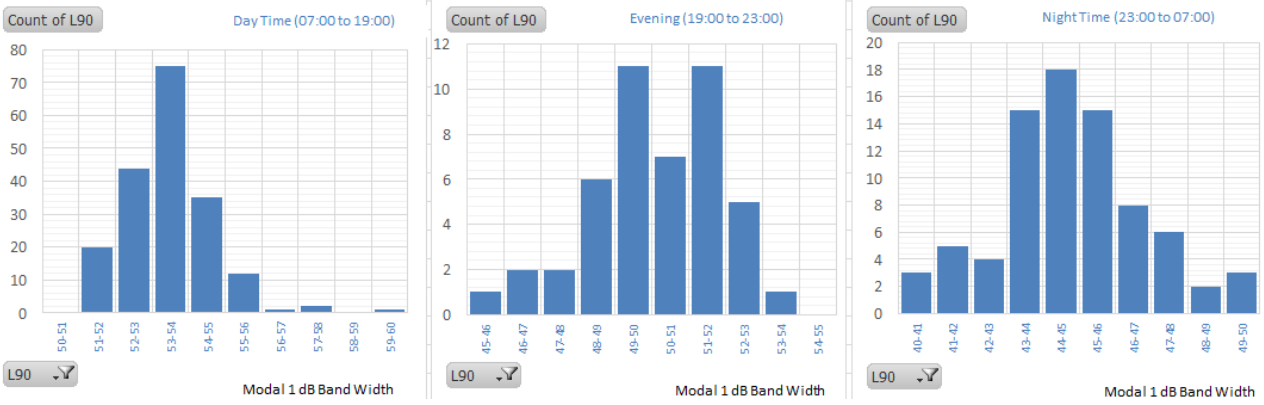
3. Background Noise Measurements…

3.1. 24-hour Background Measurements



Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
47 - 57 dB	56 - 74 dB	51 - 63 dB	41 - 51 dB	52 - 68 dB	45 - 53 dB	38 - 51 dB	49 - 65 dB	40 - 53 dB

3.2. Modal Analysis of Background Data



Day Time (07:00 to 19:00)		Evening (19:00 to 23:00)		Night Time (23:00 to 07:00)	
Standard Deviation (σ)	1.30	Standard Deviation (σ)	2.00	Standard Deviation (σ)	3.24
Geometric Average	53 dB	Geometric Average	50 dB	Geometric Average	46 dB
Modal Value	53 dB	Modal Value	49 dB	Modal Value	44 dB

4. Criterion…

4.1. National Planning Policy Framework: 2012 ("NPPF")

The National Planning Policy Framework ("NPPF") published in March 2012 sets out the Government's National Planning Policies for England and how these can be applied by local communities when developing their local plans or deciding planning application to best reflect the needs and priorities of the local communities. Current planning law requires Local Authorities to grant planning applications in accordance with the local development plan unless there are material considerations which require them to reach a different decision for sustainable developments.

4.1.1 Paragraph 14 - Requirement of Grant Planning Permission

> *"At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision taking:*
>
> *For decision-taking this means:*
> *Approving development proposals that accord with the development plan without delay; and*
> *Where the development plan is absent, silent or relevant policies are out-of-date, granting planning permission unless:*
>
> *Any adverse impact of doing so would significantly and demonstrably outweigh the benefits, when assessed against policies in this Framework taken as a whole."*

This report therefore will determine if there is a significant adverse impact in terms of noise from the development and then allow the Local Authority to grant planning permission unless they can demonstrate that the significant adverse impact would outweigh the benefits of the development.

4.1.2 Paragraph 123 - Aim of Planning Decisions with respect to Noise

Paragraph 123 of the NPPF provides the overall aims in terms of noise when determining planning applications.

> *"Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
>
> *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions…"*

4.2. Noise Policy Statement for England: 2010 ("NPSE")

The "*Noise Policy Statement for England*" was published in March 2010 by Defra which expands on the requirements of paragraph 123 of the NPPF and clarifies the objectives on the need the manage noise to obtain sustainable developments for the future.

4.2.1 Noise Policy Aims

The NPSE details the three main aims to meet the Governments long term vision:

> *"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy in sustainable development:*
>
> - Avoid significant adverse impact on health and the quality of life;
> - Mitigate and minimise adverse impacts on health and quality of life; and
> - Where possible, contribute to the improvement of health and the quality of life."

4.2.2 Lowest and Significant Observed Adverse Effects (LOAEL & SOAEL)

The NPSE provide clarity on the exact aims of the Policy by introducing the following concepts.

> *"LOAEL – Lowest Observed Adverse Effect Level*
> *This is the level above which adverse effects on health and quality of life can be detected.*
>
> *SOAEL – Significant Observed Adverse Effect Level*
> *This is the level above which significant adverse effects on health and quality of life occur."*

4.3. Night Noise Guidelines ("NNG")

The European Union and the World Health Organisation published the document *"Night Noise Guidelines for Europe"* in 2009.

4.3.1 Recommendation for Health Protection

> *"Below the level of 30 dB $L_{night,\ outside}$ no effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise.*
>
> *…. 40 dB $L_{night,\ outside}$ is equivalent to the lowest observed adverse effect level (LOAEL) for night noise.*
>
> *Above 55 dB the cardiovascular effects become the major public health concern."*

For reference the $L_{night,\ outside}$ is the average outside noise level over 8 hour calculated over a year (EU: 2002/49/EC).

4.4. ISO 1996 – Part 1: 2016

This document details the measurement and assessment of environmental noise and details the basic quantities and assessment procedures adopting the principle of Rating Noise Level which is the resultant noise level after various corrections have been applied.

4.4.1 Designation of Day, Evening and Night Time

The document provides guidance on the designation of day time and evening time in section 3.6.1. and 3.6.2:

> *"$L_{day,12\ hours}$ equivalent continuous sound pressure level when the reference time interval is the day*
> *Note 2 – A day is normally 12 hours between 7h and 19 h….*
>
> *$L_{evening,\ 4\ hours}$ equivalent continuous sound pressure level when the reference time interval is the day*
> *Note 2 – An evening is normally 4 hours between 19h and 23h*
>
> *$L_{night,8\ hours}$ equivalent continuous sound pressure level when the reference time interval is the night*
> *" Note 2 – A night is normally 8 hours between 23h and 07h*

4.4.2 Adjustments to Specific Noise Levels

The following adjustments are detailed within table A.1 of Annex A which enable the calculation of the Rating Level from the Specific Noise level

Type	Specification	Level Adjustment – dB
Source Character	Regular Impulsive	+ 5 dB
	Highly Impulsive	+ 12 dB
	Prominent Tones	+ 3 dB to + 6 dB
Time Period	Evening (19:00 to 23:00)	+5 dB
	Night Time (23:00 to 07:00)	+10 dB
	Weekend Day Time (07:00 to 19:00)	+5 dB

For reference the impulsivity and tones must be clearly audible at the assessment position and to this end the specific noise level must not be more than 3 dB below the existing residual noise level to allow the inclusion of the source character adjustment.

4.5. IEMA Guidelines for Environmental Noise Impact Assessment

The Institute of Environmental Management and Assessment ("IEMA") document entitled *"Guidelines for Environmental Noise Impact Assessment"* version 1.2 dated November 2014 describes the methodology for undertaking a noise impact assessment and an outline procedure for rating the significance of the likely impact based on the change in the overall noise levels.

4.5.1 Description of Effect of Change in Noise Level

Noise Level Change (dB)	Subjective Response	Significance
0.1 – 2.9	Barely perceptible	Minor Impact
3.0 – 5.9	Noticeable	Moderate Impact
6.0 – 9.9	Up to a doubling of loudness	Substantial Impact
10.0 or more	More than a doubling of loudness	Major Impact

4.6. WHO – Criterion for Community Noise

The World Health Organisation document entitled *"Guidelines for Community Noise"* published in 1999 suggests that a maximum level of L_{AMax} 60 dB at a distance of 1m from a bedroom window is a suitable criterion to avoid sleep disturbance during the night time period. The document clarifies this is for a single event at paragraph 4.3.1. of the document. Usefully the document provides some overall guidance and commentary at paragraph 4.2.7.

> *"The annoyance response to noise is affected by several factors, including equivalent sound pressure level and the highest sound pressure level of the noise, the number of such events, and the time of day…..*
>
> *During the daytime, few people are seriously annoyed by activities with LAeq levels below 55 dB; or moderately annoyed with LAeq levels below 50 dB…..*
>
> *It is emphasized that for intermittent noise it is necessary to take into account the maximum sound pressure level as well as the number of events"*

4.7. British Standard 4142:2014 ("BS4142")

4.7.1 Scope of Standard

In the assessment of the proposed noise source, consideration has been given to the scope of British Standard 4142:2014, which in section 1, details applicability of this standard to rating assessing sound of an industrial and/or commercial nature.

> *"The determination of noise amount to a nuisance is beyond the scope of this British Standard.*
> *The standard is not intended to be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels."*

It is considered appropriate that both the background noise levels and the rating noise levels obtained fall within the scope of British Standard 4142:2014 by using outdoor sound levels to assess the effect of sound on local residents.

4.7.2 Assessment of Noise

British Standard 4142:2014 outlines a general consideration and 3 levels of impact based on the calculated assessment level:

> *"Typically, the greater [the] difference, the greater the magnitude of the 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 +5dB 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, depending on the context."*

4.8. Local Authority

London Borough of Camden have requested a noise impact assessment to be carried out to ensure the proposed development will not have a significant or adverse effect on the local residents in terms of noise.

4.9. Combined Noise Criterion

Taking the above documents into account it would be recommended that consideration is given to the following criteria:

NPPF Policy Aim (p 123)	Action	Night Noise Guidelines	ISO 9613: 2016 / IEMA	BS 4142: 2014
Significant Adverse Impact	Avoid	L_{night} 55 dB or more	$L_{Aeq,\,t}$ +10 dB or more	+10 dB
Adverse Impact	Mitigate	L_{night} 40 – 55 dB	$L_{Aeq,\,t}$ +3 to +9 dB	+5 dB
Improved Quality of Life	Ideal if Possible	L_{night} 40 dB or less	$L_{Aeq,\,t}$ +2 dB or less	+0 dB

5. Calculations of Noise Levels…

5.1. ISO 9613 – Part 2:1996

The International Standards Organisation ("ISO") published ISO 9613 – Part 2: 1996 entitled *"Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculations"* which details the corrections that are required to established the resultant noise levels of the proposed noise source at the assessment position.

5.1.1 Source Directivity (D_c)

A correction is made to account for the location of the source and the effect of additional reflective surfaces excluding the ground and is contained within section 6 of ISO 9613 - Part 2:1996.

Number of Surfaces	Correction in dB (D_c)
1 Reflective Surface	+3 dB
2 Reflective Surfaces	+6 dB
3 Reflective Surfaces	+9 dB

5.1.2 Geometric Divergence (A_{div})

A correction is made for the distance between the source and assessment position using the following formula defined in section 7.1 of ISO 9613-Part 2:1996.

Formula	Symbols
$A_{div} = 20 . Log_{10} (d/d_0) +11$	A_{div} = Reduction due to Geometric Divergence (dB) d = Distance from source to receiver (m) d_0 = reference distance (1m)

5.1.3 Ground Absorption (A_{gr})

A correction is made for the effect of the ground between the source and receiver depending on whether it is considered hard or soft ground.

Type of ground	Correction in dB (A_{gr})
Hard Ground	+ 3 dB
Soft Ground	+ 0 dB

5.1.4 Atmospheric Absorption (A_{atm})

As the source was less than 100m from the receiver position (assessment position) no correction was made for atmospheric absorption.

5.1.5 Barrier Effect (A_{bar})

A correction is made for any barrier in the direct line of site between the source and the assessment position and is detailed in section 7.4 of ISO 9613-Part 2:1996. For clarity the K_{met} meteorological correction has been ignored and C_2 equals 40 and C_3 equals 1.

Formula	Symbols
$A_{bar} = 10 . Log_{10} [3 + (40 . \delta / \lambda) - A_g]$ *Note 1 where $\delta = a + b - r$ and $\lambda = c / f$	A_{bar} = Effective barrier attenuation (dB) A_{gr} = Total Ground Absorption (dB) *Note 1: Only apply the A_{gr} correction if $A_{gr} > 0$ δ = Path difference (m) a = Distance from source to barrier head (m) b = Distance from barrier head to assessment position (m) r = Distance from source to assessment position (m) λ = Wavelength of sound (m) c = Speed of sound – Assumed to be 342 ms^{-1} f = Octave band centre frequency (Hz)

5.2. British Standard 4142: 2014 Feature Correction

It is appropriate to add a character correction where there is a new source that cannot be measured in line with BS4142:2014. The 3 methods for approaching this are the subjective, objective, and reference methods. In this report the subjective method is used.

Section 9.2 Subjective Method	Perceptibility to noise sensitive façades	Correction
Tonality Ranging from not tonal to prominently tonal	Not tonal	+0
	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6
Impulsivity Considering both the rapidity and any overall change in sound levels	Not impulsive	+0
	Just impulsive	+3
	Clearly impulsive	+6
	Highly impulsive	+9
Readily Distinctive Characteristic is neither tonal nor impulsive	Is not present	+0
	Is present	+3
Intermittency Identifiable “on/off” conditions	Is not present	+0
	Is present	+3

5.3. Calculation of Noise Levels

5.3.1 Day Time (07:00 to 19:00)

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	Normal Talking	68 dB	+0 dB	-27 dB	+3 dB	-0 dB	-5 dB	40dB
TOT	Total Noise Levels	68 dB	-28 dB					40 dB

5.3.2 Evening (19:00 to 23:00)

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	Normal Talking	68 dB	+0 dB	-27 dB	+3 dB	-0 dB	-5 dB	40 dB
TOT	Total Noise Levels	68 dB	-28 dB					40 dB

5.3.3 Night Time (23:00 to 07:00)

		Source	ISO 9613 – Part 2: 1996 Corrections					Assessment
Ref	Description	L_w	D_c	A_{div}	A_{gr}	A_{atm}	A_{bar}	Lp
1	Normal Talking	58 dB	+0 dB	-27 dB	+3 dB	-0 dB	-5 dB	30 dB
TOT	Total Noise Levels	58 dB	-28 dB					30 dB

Although it will be unlikely that the proposed roof terrace would be used during the night time hours (23:00 to 07:00), an assessment has been completed to cover the possible eventuality.

6. Assessment of Noise Levels…

6.1. Night Noise Guidelines

Night Noise Guidelines	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Specific Sound	$L_{Aeq,1\ hour}$ 40 dB	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,15\ minutes}$ 30 dB
NPPF – Improve Quality of Life	Less than $L_{Aeq,1\ hour}$ 40 dB	Less than $L_{Aeq,1\ hour}$ 40 dB	Less than $L_{Aeq,1\ hour}$ 40 dB
NPPF – Paragraph 123	Complies	Complies	Complies

6.1.1 ISO 1996 Part 1: 2016

ISO 1996 – Part 1: 2016	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Specific Sound	$L_{Aeq,1\ hour}$ 40 dB	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,15\ minutes}$ 30 dB
Adjustment - Regular Impulsive	+0 dB	+0 dB	+3 dB
Adjustment – Tonal	+0 dB	+ 0 dB	+ 5 dB
Adjustment - Time Period	+0 dB (Day Time)	+5 dB (Evening)	+10 dB (Night Time)
Rating Levels	$L_{Aeq,1\ hour}$ 40 dB	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,15\ minutes}$ 38 dB
Residual Sound Levels	$L_{Aeq,1\ hour}$ 60 dB	$L_{Aeq,1\ hours}$ 57 dB	$L_{Aeq,15\ minutes}$ 54 dB
Rating + Residual	$L_{Aeq,1\ hour}$ 60.0 dB	$L_{Aeq,1\ hours}$ 57.1 dB	$L_{Aeq,15\ minutes}$ 54.1 dB
Increase in Residual Noise	+ 0.0 dB	+ 0.1 dB	+ 0.1 dB
IEMA Significance	+2 dB (No Impact)	2 dB (No Impact)	2 dB (No Impact)
NPPF – Paragraph 123	Complies	Complies	Complies

6.1.2 Assessment of Average Noise Levels (BS 4142: 2014)

BS 4142: 2014	Day Time - 07:00 to 19:00	Evening – 19:00 to 23:00	Night Time – 23:00 to 07:00
Residual Noise Levels	$L_{Aeq,1\ hours}$ 60 dB	$L_{Aeq,1\ hours}$ 57 dB	$L_{Aeq,15\ minutes}$ 54 dB
Specific Noise Levels	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,\ 15\ minutes}$ 30 dB
Impulsivity Feature	+0 dB	+0 dB	+2 dB
Tonality Feature	+0 dB	+0 dB	+0 dB
Rating Noise Levels	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,1\ hours}$ 40 dB	$L_{Aeq,\ 15\ minutes}$ 32 dB
Background Noise Levels	$L_{A90,1\ hours}$ 53 dB	$L_{A90,1\ hours}$ 49 dB	$L_{A90,\ 15\ minutes}$ 44 dB
BS 4142 Assessment	-13 dB	-9 dB (Low Impact)	-12 dB (Low Impact)
NPPF – Paragraph 123	-0 dB (Low Impact)	-0 dB (Low Impact)	-0 dB (Low Impact)
Uncertainty (95% Confidence, k=2)	+- 1.73 dB	+- 1.80 dB	+- 1.92 dB

7. Conclusions…

7.1. Assessment Position

The nearest assessment position is the rear façade of adjoining residential property which is located approximately 2m from the proposed terrace boundary and 6 m from the potential noise generated from the use of the roof terrace.

7.2. Background Noise Measurements

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,1h}$	$L_{Aeq,1h}$	$L_{A90,1h}$	$L_{Amax,15m}$	$L_{Aeq,15m}$	$L_{A90,15m}$
47 - 57 dB	56 - 74 dB	51 - 63 dB	41 - 51 dB	52 - 68 dB	45 - 53 dB	38 - 51 dB	49 - 65 dB	40 - 53 dB

7.3. Criterion at Assessment Position

NPPF Policy Aim (p 123)	Action	Night Noise Guidelines	ISO 9613: 2016 / IEMA	BS 4142: 2014
Significant Adverse Impact	Avoid	L_{night} 55 dB or more	$L_{Aeq,\,t}$ +10 dB or more	+10 dB
Adverse Impact	Mitigate	L_{night} 40 – 55 dB	$L_{Aeq,\,t}$ +3 to +9 dB	+5 dB
Improved Quality of Life	Ideal if Possible	L_{night} 40 dB or less	$L_{Aeq,\,t}$ +2 dB or less	+0 dB

7.4. Mitigation Measures

No specific mitigation measures should be required for this site due to the existing background noise levels and the current context of the adjoining residential property.

7.5. Assessment of Noise Levels

Day Time (07:00 – 19:00)			Evening (19:00 – 23:00)			Night Time (23:00 – 07:00)		
$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142	$L_{Aeq,1h}$	$L_{A90,1h}$	BS4142
40 dB	53 dB	-13 dB	40 dB	49 dB	-9 dB	32 dB	44 dB	-12 dB

7.6. Conclusions

It would be recommended to grant planning permission for the development of a first-floor flat roof terrace at the property located at 3 Leverton Place as it will have no detrimental effect on the local residents in terms of noise.

In context to the existing surrounding site, the adjoining property has previously been granted planning permission for the same development and a first floor roof terrace currently exists without any complaint.

7.7. Uncertainty

Day Time (07:00 – 19:00)	Evening (19:00 – 23:00)	Night Time (23:00 – 07:00)
+-1.73 dB (k=2, 95% Confidence)	+-1.80 dB (k=2, 95% Confidence)	+-1.92 dB (k=2, 95% Confidence)

8. Appendix A - BS 4142:2014 Information to Be Reported…

8.1. a) Competency

	Name	Role	Competency
1)	Ms. E. Samphier	Trainee Consultant	Currently undertaking the IOA Diploma
	Mr. R. Scrivener	Director	Master of Science Degree in Acoustics and Noise Control (MSc) Member of the Institute of Acoustics (MIOA)

8.2. b) Source Under Investigation

1)	Source Number	Description		
	Source 1	Noise associated with the use of a personal roof terrace		
2) 3) 4) 5)	Description of Source	Source Location	Hours of Operation	Mode of Operation
	Source 1	noise generated from the use of the roof terrace	Potentially 24-hour	Continuously on Demand
	Description of Operation	Period	Conditions	Load
	All Sources	Day Time (07:00 to 19:00)	Ambient Temp 32°C	Maximum Load (100%)
		Evening (19:00 to 23:00)	Ambient Temp 28°C	Part Load (60%)
		Night Time (23:00 to 07:00)	Ambient Temp 24°C	Part Load (40%)
	Description of Premises	The residential property is an end of terrace property. The adjoining property comprises of an existing roof garden and first floor level. It is proposed to develop a garden terrace adjoining the one of that existing at 2 Leverton Place.		

8.3. c) Subjective Impression of Source at Assessment Position

1)	Dominance	Source will not be dominant at residential facade
	Audibility	Source will not be audible at residential facade
2)	Residual Noise Sources	Residual noise due to local road traffic

8.4. d) Existing Contexts

	Type of Receptor	Period	Sensitivity	Description
1)	Residential	Day Time (07:00 to 19:00)	Low	Noise can disturb outside amenity space and internal living space
		Evening (19:00 to 23:00)	Moderate	Noise can interrupt people trying to get to sleep
		Night Time (23:00 to 07:00)	High	Noise can disturb sleeping

8.5. e) Relative Positions

1)	Assessment Position	Rear façade of adjoining residential property		
		BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6	1.0m from façade (external)	Position is valid
2)	Source Measurement	The source sound power levels were supplied by the client. It is believed the sound power levels were established in accordance with BS EN 13487:2003		
	Justification	Noise levels were based on technical experience and previous measurements.		
3)	Background Position	Lamp post adjacent to 3 Leverton Place		
	Justification	BS 4142:2014 Criteria	Details	Compliance with Criteria
		Section 6.2	3.5m to any reflecting surface	Complies
		Section 6.2	Height 1.2m to 1.5m	Complies
		Section 6.2	1st floor 1m to facade	Not applicable
		Section 6.2	Measurement Height	3.5
			Distance to Reflecting Surface	1.0
		In order to record remote background levels the noise meter had to be left in a secure position. The position represented the assessment position with the constraints of the site.		
4)	Topography, surfaces etc.	Hard and Flat		
5)	Relative Distances	The noise source is located approximately 2.6 m to 5.9 m from the assessment position.		
6)	Dimensioned sketch	See maps and images		

8.6. f) Noise Measurement Equipment Calibration

1)	Type	Sound Level Meter	Microphone	Calibrator
		KRE/087/01 - 633.C1	KE/087/03 - 251	KRE/087/04 - 120/1
2)	Manufacturer	Casella	Casella	Casella
3)	Serial Number	2145360	00709	5231003
4)	Certificate Number	Certificate: 5105	Certificate: 5105	Certificate: 5105
	Calibration Date=	15-Dec-15	15-Dec-15	15-Dec-15

8.7. g) Noise Measurement Equipment Operation Test

1)	Ref. Level of Calibrator	94 dB
2)	Meter Reading Before	94 dB – Meter operation checked. Meter in good working order.
	Meter Reading After	94 dB - Meter operation checked. Meter in good working order.

8.8. h) Weather Conditions

1)	Wind Speed	See weather information
	Wind Direction	variable
2)	Temperature Inversion	Unlikely to have occurred
3)	Precipitation	None
4)	Fog	None
5)	Wet Ground	Not within the measurement period
6)	Frozen Ground or Snow	Not within the measurement period
7)	Temperature	10-13
8)	Cloud Cover	Partly Cloudy

8.9. i) Date and Time of Measurements

1)	Source Measurements	Unknown
	Background Measurements	29th March 2017 to 30th March 2017

8.10. j) Measurement Time Interval

1)	Source Measurements	T_m = 15 minutes	
	Background Measurements	Day Time (07:00 to 19:00)	T_m = 12 hours
		Evening (19:00 to 23:00)	T_m = 4 hours
		Night Time (23:00 to 07:00)	T_m = 8 hours

8.11. k) Reference Time Interval

1)	Reference Time Interval	Day Time (07:00 to 19:00)	T_r = 1 hour
		Evening (19:00 to 23:00)	T_r = 1 hour
		Night Time (23:00 to 07:00)	T_r = 15 minutes

8.12. l) Specific Noise / m) Background Noise / n) Rating / o) Assessment / p) Conclusions

These details are all included within the body of the report and are not replicated within this section.

END OF REPORT (1st and last page not numbered)