

269 Camden High Street, London, NW1 7BX

Environmental Noise Survey and Noise Impact Assessment Report
1265.00.ANIA

Prepared for

ABC House Ltd
Arches 47-49 & Yard Castle Mews,
Off Prince of Wales Road,
London NW5 3LL

29 June 2020

By

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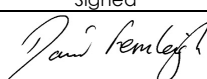
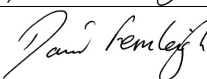
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Report	Signed	Name and Position	Relevant Qualification
Undertaken and Prepared By		David Fernleigh Principal	MIOA
Checked By		David Fernleigh Principal	MIOA

This report has been prepared with all reasonable skill and care by dBA Acoustics for the Client named. The information contained herein is the property of, and confidential to, the Client. Any third party information required and/or provided for the completion of this report should not be considered as verified by dBA Acoustics, unless otherwise stated.

1.0 Introduction

1.1 An amendment to planning application 2019/4835/P to include change of use to a house of multiple occupation (HMO) is proposed.

1.2 The site is located in a busy mixed commercial and residential area and an adjacent cafe has an open-air roof terrace. It is understood that there is concern that noise from the café could negatively impact the nearest of the proposed residential rooms.

1.3 dBA Acoustics have been commissioned to undertake a noise impact assessment of noise from café terrace customers impacting the worst affected rooms located in the proposed 1st floor new extension.

1.4 This report concerns the assessment and/or control of atmospheric noise and/or vibration affecting neighboring noise sensitive property for the purposes of planning. Detailed mechanical, structural, H, S&E and conservation considerations are beyond the expertise of this practice and should be dealt with by the relevant professional service providers.

1.5 Where sound pressure levels are quoted, they are in decibels ref: 2×10^{-5} Pa. Where sound power levels are quoted, they are in decibels ref: 1×10^{-12} W, unless otherwise indicated.

2.0 Summary

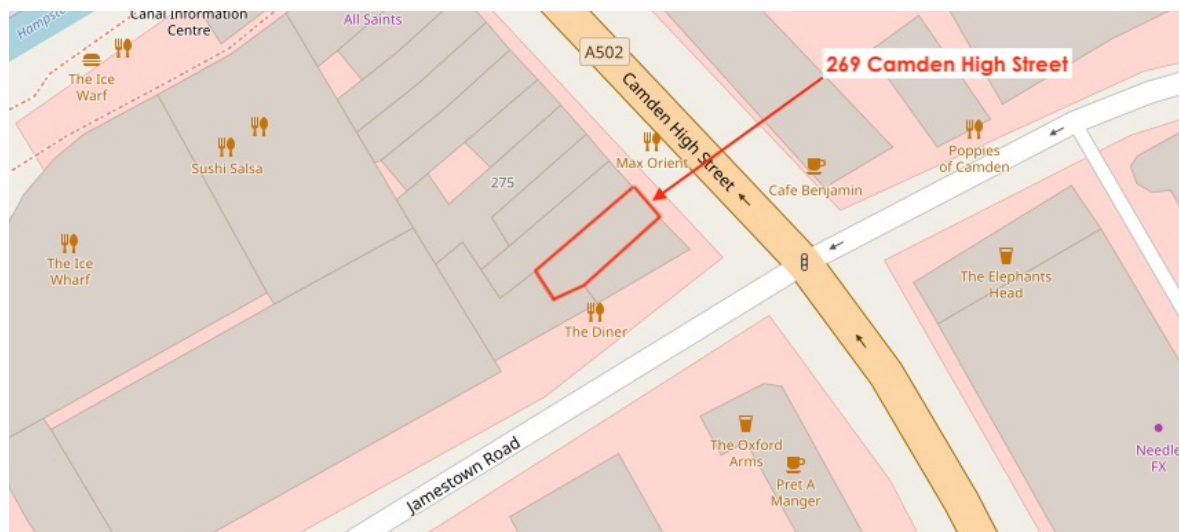
2.1 A two-day environmental noise survey has been undertaken over a weekday period and the prevailing background noise climate has been determined.

2.2 The assessment undertaken indicates that, unmitigated, estimated activity noise from the adjacent terrace café impacting the proposed HMO extension indicates a significant noise impact (SOAEL).

2.3 Mitigation advice, consisting of uprated external walls, glazing and trickle ventilation has been detailed such that suitable internal levels can be achieved with windows closed.

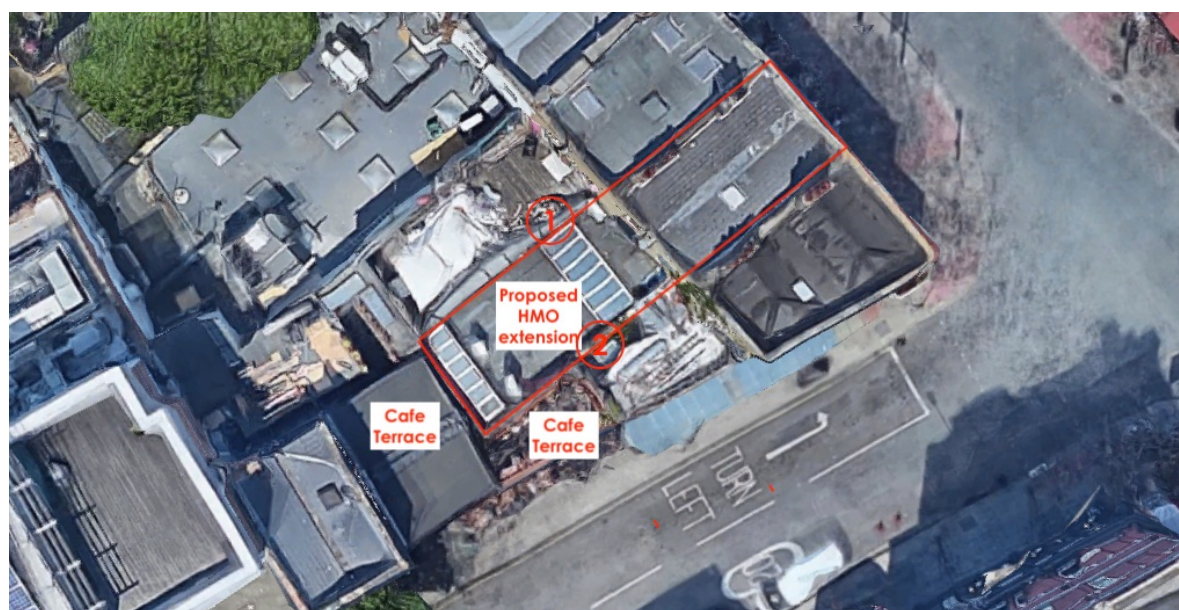
3.0 Site

3.1 The map below shows the location of the development site, as indicated:



Map Data © OpenStreetMap 2020 (north top of the page)

3.2 The image below shows the approximate location of the proposed plant, acoustic survey monitoring positions 1 and 2 and adjacent café terrace:



Imagery © 2020 Google (north top of the page)

4.0 Survey

4.1 An automated environmental noise survey was undertaken over a 48hour period at the site.

4.2 The full methodology and results of the environmental noise survey are contained within the appendix.

dBA Acoustics is the trading name of DBA Acoustics Limited, company number 11713113 registered in England and Wales. Registered office: Viscom House 209 Lynchford Rd Farnborough Hampshire GU14 6HF.

5.0 Results

5.1 Time history graphs presenting the automated environmental survey measurements can be found in the appendix. Full raw data is available upon request.

5.2 The following table provides a summary of the prevailing $L_{Aeq,5min}$ ambient sound levels measured over the survey period at the monitoring positions.

Table 1

Prevailing lowest ambient sound level		
Position	Time	Lowest $L_{Aeq,5min}$
1	Daytime 8 hour (07:00 – 19:00)	51.2
	Evening 4 hour (19:00 – 07:00)	50.9
	Night time 8 hour (23:00 – 07:00)	49.6
2	Daytime 8 hour (07:00 – 19:00)	53.9
	Evening 4 hour (19:00 – 07:00)	51.6
	Night time 8 hour (23:00 – 07:00)	50.0

6.0 Criteria

6.1 With regards to entertainment noise (Café Terrace noise impacting the development)

Camden Local Plan 2017 states:

“Assessments for noise from entertainment and leisure premises must include consideration to amplified and unamplified music, human voices, footfall and vehicle movements and other general activity. Appropriate metrics must be used to measure and assess the noise impact including L_{Aeq} and L_{Amax} metrics and appropriate frequency spectrum. Planning permission will not be granted in instances where it is not possible to achieve suitable and sufficient internal noise levels with reference to the most up to date and appropriate guidance within proposed noise sensitive receptors despite appropriate mitigation proposals due to the totality of noise from existing entertainment venues.”

Table 2

Table D: Noise levels applicable to proposed entertainment premises (customer noise)					
Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for amenity (free field)	Day	The higher of 55dB $L_{Aeq,5min}$ Or 10dB below existing $L_{Aeq,5min}$ Without entertainment noise	56dB to 60dB $L_{Aeq,5min}$ Or 9dB to 3dB below existing $L_{Aeq,5min}$ Without entertainment noise	The higher of 61dB $L_{Aeq,5min}$ Or 2dB below existing $L_{Aeq,5min}$ Without entertainment noise
Dwellings	Garden used for amenity (free field)	Evening	The higher of 50dB $L_{Aeq,5min}$ Or 10dB below existing $L_{Aeq,5min}$ Without entertainment noise	51dB to 55dB $L_{Aeq,5min}$ Or 9dB to 3dB below existing $L_{Aeq,5min}$ Without entertainment noise	The higher of 56dB $L_{Aeq,5min}$ Or 2dB below existing $L_{Aeq,5min}$ Without entertainment noise
Dwellings	Garden used for amenity (free field)	Night	The higher of 45dB $L_{Aeq,5min}$ Or 10dB below existing $L_{Aeq,5min}$ Without entertainment noise	46dB to 50dB $L_{Aeq,5min}$ Or 9dB to 3dB below existing $L_{Aeq,5min}$ Without entertainment noise	The higher of 51dB $L_{Aeq,5min}$ Or 2dB below existing $L_{Aeq,5min}$ Without entertainment noise

6.2 There are no gardens or external amenity areas that would be exposed to noise impact within the proposals. As such the internal noise rating design curves given after Table D within the Local Plan are assumed to be the required internal criteria:

Table 3

For entertainment and plant noise rating curves should be measured as a 15minute linear Leq at the octave band centre frequencies.		
Room	Noise rating curve	Design period
Bedrooms	NR25	23:00-07:00hrs
All habitable rooms	NR35	07:00-23:00hrs

6.3 If understood correctly, the above criteria equate to an internal noise level approximately 5dB above the BS8233:2014 internal noise limits during the daytime. This could still leave entertainment noise ingress clearly audible to residential occupants. It is therefore proposed that the following internal levels, equating to -10dB below BS8233:2014 limits, are achieved:

Table 4

Proposed internal criteria for café terrace customer noise			
Room	Noise rating curve	L _{Aeq,5min} dB	Design period
All habitable rooms	NR20	25	07:00-23:00hrs

6.4 It is considered that compliance with the criteria given in table 4, above, should equate to a low noise impact (LOAEL).

7.0 Assessment

7.1 It is understood that the 1st floor café terrace is rarely used. It is further understood that no amplified or un-amplified music is played on the terrace. Due to the inherent screening given by the building, the noise impact of street level arrivals and departures are considered negligible. The primary noise affecting the proposed residential rooms and light yards is therefore likely to be from the voices of customers using the 1st floor café terrace. As a reasonable worst case the following customer activity has been assumed based on a visual inspection of the terrace:

- available seating consists of 6 tables accommodating 6 places each, with an additional 10 stools overlooking Jamestown Road
- small auxiliary bar hatch
- full capacity assumed to be approximately 46 customers and 1 bartender

7.2 Octave-band speech spectra (at 1m) have been defined by ANSI S3.5-1997, with averages given for males and females in combined. The values for various vocal efforts are shown in the following table:

Table 5

Octave-band speech spectra for differing vocal effort dB at 1m								
f	125Hz*	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
Normal	51.2	57.2	59.8	53.5	48.8	43.8	38.8	59.5
Raised	55.5	61.5	65.6	62.4	56.8	51.3	42.5	66.5
Loud	58.0	64.0	70.3	70.7	65.9	59.9	48.9	73.6

*these values are not given in the standard so have been set -6dB lower than the corresponding level at 250Hz.

7.3 To calculate the likely noise impact at the receptors the following vocal effort profile has been assumed:

- 46 customers approximately half of which are speaking at any one time, of which:
- 11 customers seated at tables speaking with normal voice
- 6 customers seated at tables speaking with raised voice
- 1 customer/bartender at small bar speaking with raised voice
- 5 customers seated in the stool area overlooking Jamestown Road all speaking with raised voice
- Talkers all speaking continuously

7.4 There are no external amenity areas proposed at the development. As such, the external criteria are not applicable in this instance. However, as a guide, the predicted customer activity noise at the 2 external light yards is shown in the table below against the external criteria:

Table 6

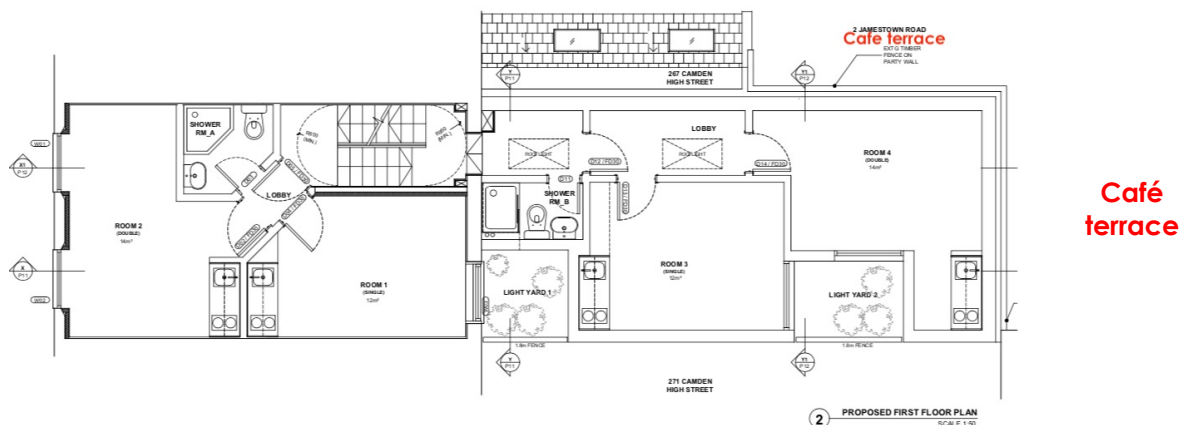
Predicted customer activity noise level at external light yards			
Light yard	External Criteria Evening (19:00-23:00)	Predicted noise level at light yard with customer noise	Excess of external Criteria
1	41dB (10dB below existing L _{Aeq,5min} without entertainment noise)	57	18
2		64	23

7.5 As a guide, the results in the table above indicate a significant noise impact (SOAEL) would be experienced if the habitable room windows were open. Mitigation to keep windows closed and achieve suitable internal noise levels is therefore required.

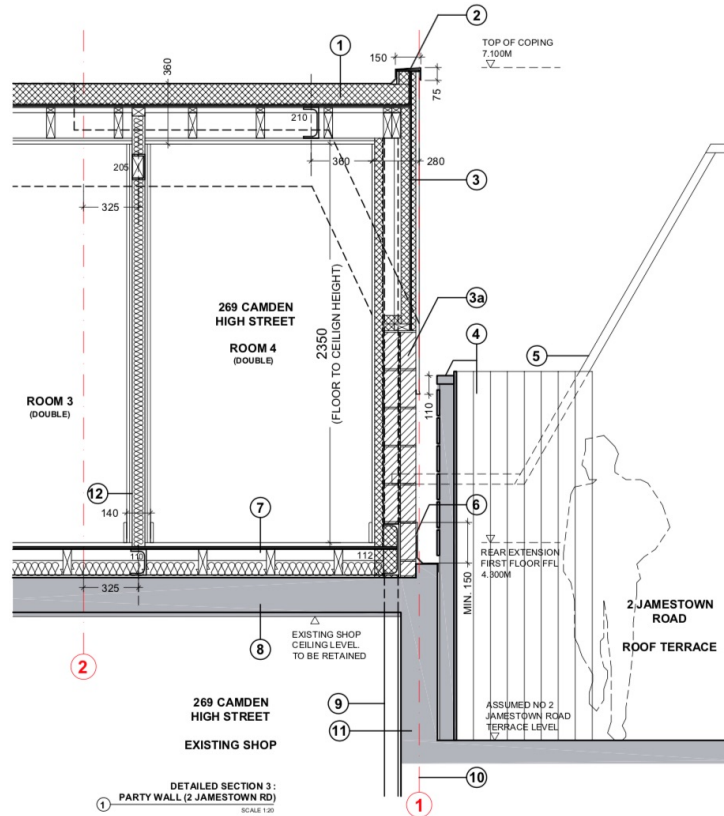
8.0 Mitigation

8.1 The only realistic means of mitigation is by ensuring that the sound insulation performance of the external building fabric is sufficiently robust that suitable internal noise levels are achieved with windows closed.

8.2 The proposal is for external building fabric consisting of part masonry, part timber frame external walls with windows opening onto light yards and trickle ventilation. The following Rich Architecture drawing excerpt (549-P10-B Plan) shows the arrangement:



8.3 The following Rich Architecture drawing excerpt (549-202-C3 Detailed Section 3) shows a detail of the proposed external wall of the new extension:



8.4 Based on the proposals the following mitigation is recommended:

- Uprate the windows with a 6mm secondary pane providing a 200mm void between, line the void reveals top and sides with acoustic absorption
- Provide trickle ventilation via high performance through-wall type vents that can operate while the secondary glazing is closed (Greenwood Airvac MA3501, or similar)

8.5 The external walls of Room 4, are potentially extensively exposed to noise from the terrace café. It is therefore recommended to make the plasterboard linings of this room independent, as follows:

- Uprate the external wall sound insulation by disconnecting the inner plasterboard

linings. i.e. linings supported via an independent frame (minimum depth 35mm),
line any voids created with 50mm mineral/rock wool (33kg/m³ min)

- There should be a clearance of at least 20mm between the back of the lining framing and any part of the external wall
- Uprate the sound insulation of the roof by resiliently fixing the plasterboard ceilings i.e. via resilient hangers or resilient bars (British Gypsum, or similar) with 50mm mineral wool (33kg/m³ min) in the ceiling void

8.6 Calculations in accordance with BS8233:2014 have been undertaken to estimate the likely internal noise levels due to café terrace customer noise break-in with the above recommendations in place. The predictions include where windows are open, and where windows are closed. The input data used in the calculations is detailed in the appendix. The following table details the calculated results for rooms with windows opening onto light yards 1 and 2 respectively:

Table 7

Predicted internal noise levels in rooms opening onto light yards		
Location	Resulting Internal Noise Level with windows open*	Resulting Internal Noise Level with windows closed
Light Yard 1 Room 1	32dB LAeq,5mins	NR 16 / 21 dB LAeq,5mins
Light Yard 2 Room 3	39 dB LAeq,5mins	NR 15 / 19 dB LAeq,5mins
Light Yard 2 Room 4	39 dB LAeq,5mins	NR 20 / 25 dB LAeq,5mins

*assumes 25dB speech frequency attenuation for noise passing through open secondary glazing with offset inner and outer openings and absorbent reveals

8.7 The above table demonstrates that, based on the above assessment, internal noise levels of NR20 should be achievable with windows closed.

8.8 With windows open (e.g. for rapid cooling) the internal noise levels shown in the middle column of the above table would have to be tolerated. Alternatively, comfort cooling or mechanical means of ventilation capable of supplying the requisite amount of fresh air and enabling windows to be kept closed during overheating would need to be considered.

8.9 It is noted that where alternate means of ventilation other than trickle vents is not present, open secondary glazing (with absorbent reveals and offset openings) offers significantly better mitigation (-5 to -10 dB better) when compared to open double glazing.

9.0 Conclusion

9.1 Environmental noise monitoring has been undertaken including during a weekday period and the prevailing ambient noise levels at site have been determined. The data levels obtained are likely to be atypical (reduced) due to the coronavirus lockdown. However, in the case of assessing café terrace customer activity noise the proposed internal criteria are based on BS8233:2014 absolute levels, rather than measured external levels.

9.2 A noise impact assessment has been undertaken for café terrace customer activity.

9.3 The activity noise impact assessment indicates that the estimated café customer noise is likely to exceed the proposed criteria.

9.4 Mitigation advice for uprated windows, trickle vents and linings to external building fabric constructions has been specified such that the proposed internal noise limit (NR20 daytime) can be achieved.

9.5 The proposals are subject to final approval by the London Borough of Camden.

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Appendix

Survey Methodology

Time History Graphs

Input Data for Terrace Noise Ingress

Suitable Suppliers

Glossary of Acoustic Terminology

Environmental Survey Methodology

Environmental noise monitoring was undertaken for approximately 48 hours commencing approximately 12:00 on Monday 15 June 2020. The prevailing L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} levels were logged at 15minute intervals for the first 24 hours and at 5minute intervals for the subsequent 24hour period. The following sound level meters and calibrator was deployed:

Automated Equipment:

Position 1	SLM	Preamplifier	Microphone	Calibrator
Manufacturer	Norsonic AS	Norsonic AS	Gras	B&K
Type	140	1209	40AF	4231
Serial No.	1403413	15806	207390	1839133
Latest Calibration	09/03/2018			13/11/2019
Certificate No.	27991			U33334

Position 2	SLM	Preamplifier	Microphone	Calibrator
Manufacturer	Norsonic AS	Norsonic AS	Norsonic AS	B&K
Type	140	1209	1227	4231
Serial No.	1406112	20299	151737	1839133
Latest Calibration	08/11/2018			13/11/2019
Certificate No.	U30036			U33334

The calibration of the sound level meter used complies with IEC 61672-3:2006 class 1.

The sound level meters were installed on a rear first floor roof at a height of approximately 1.5m above roof level. The microphones were pole mounted. The monitoring locations were as far as possible away from existing plant, traffic noise exposure and significant reflecting surfaces. The monitoring positions were approximately as shown in the aerial photo below:



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Proprietary windshields and extension cables were deployed. The entire signal path was checked for calibration pre and post survey. The calibrated meter readings pre and post survey indicated no calibration shift greater than 0.1 dB.

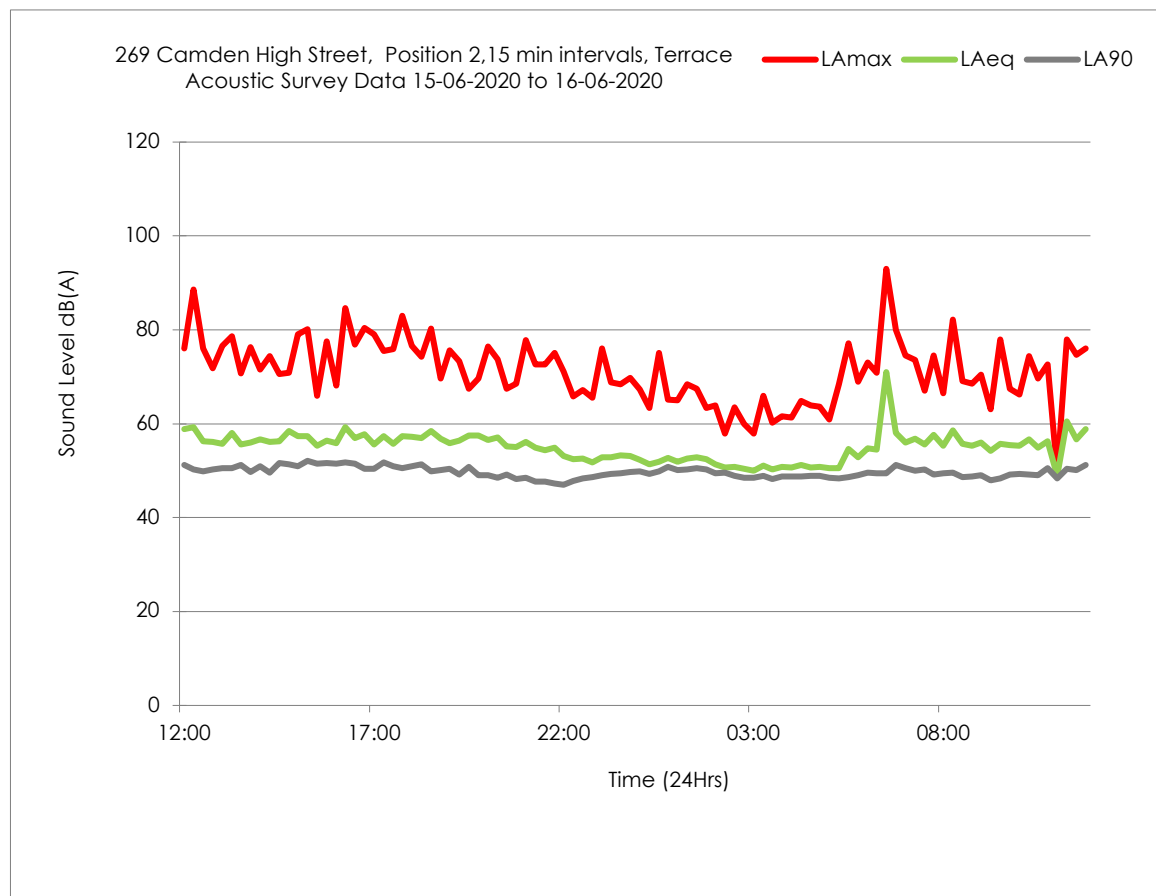
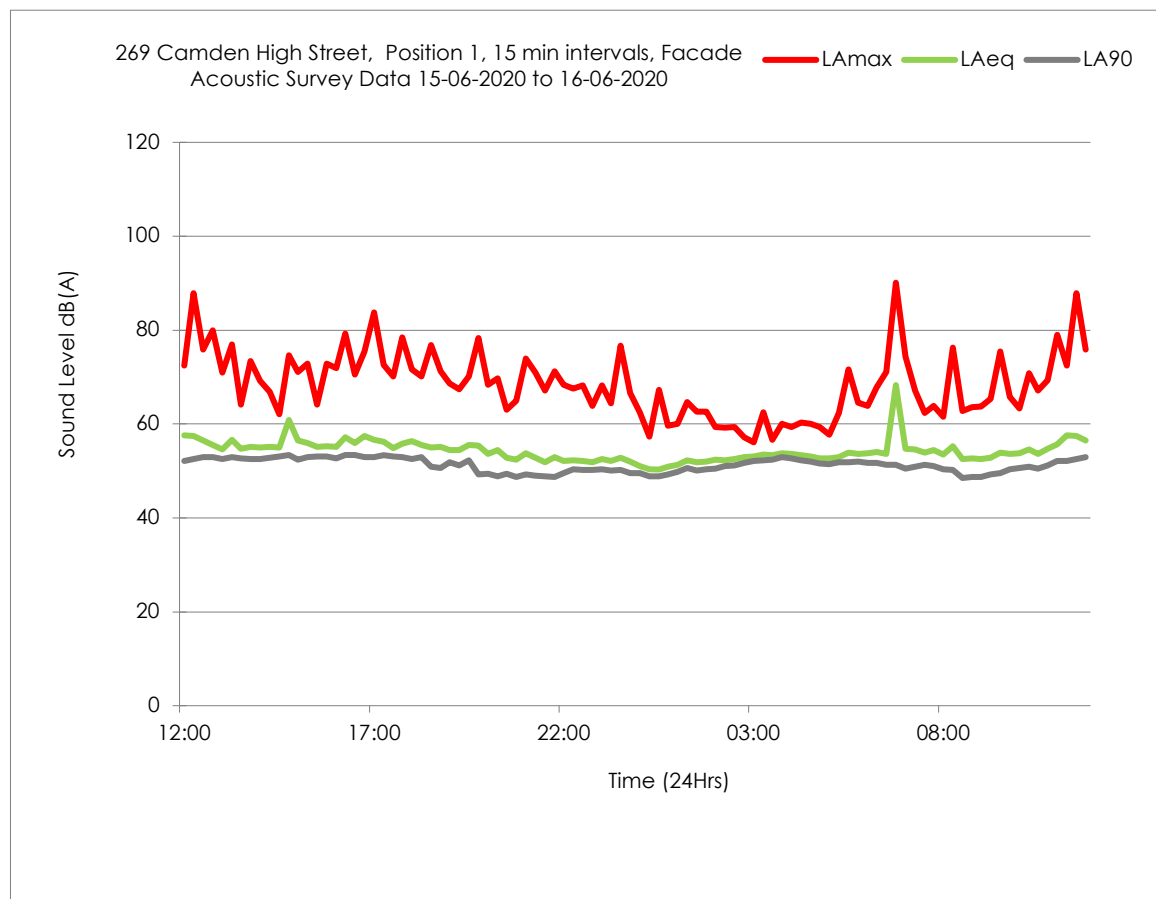
The following table details the weather conditions at the beginning and end of the survey period:

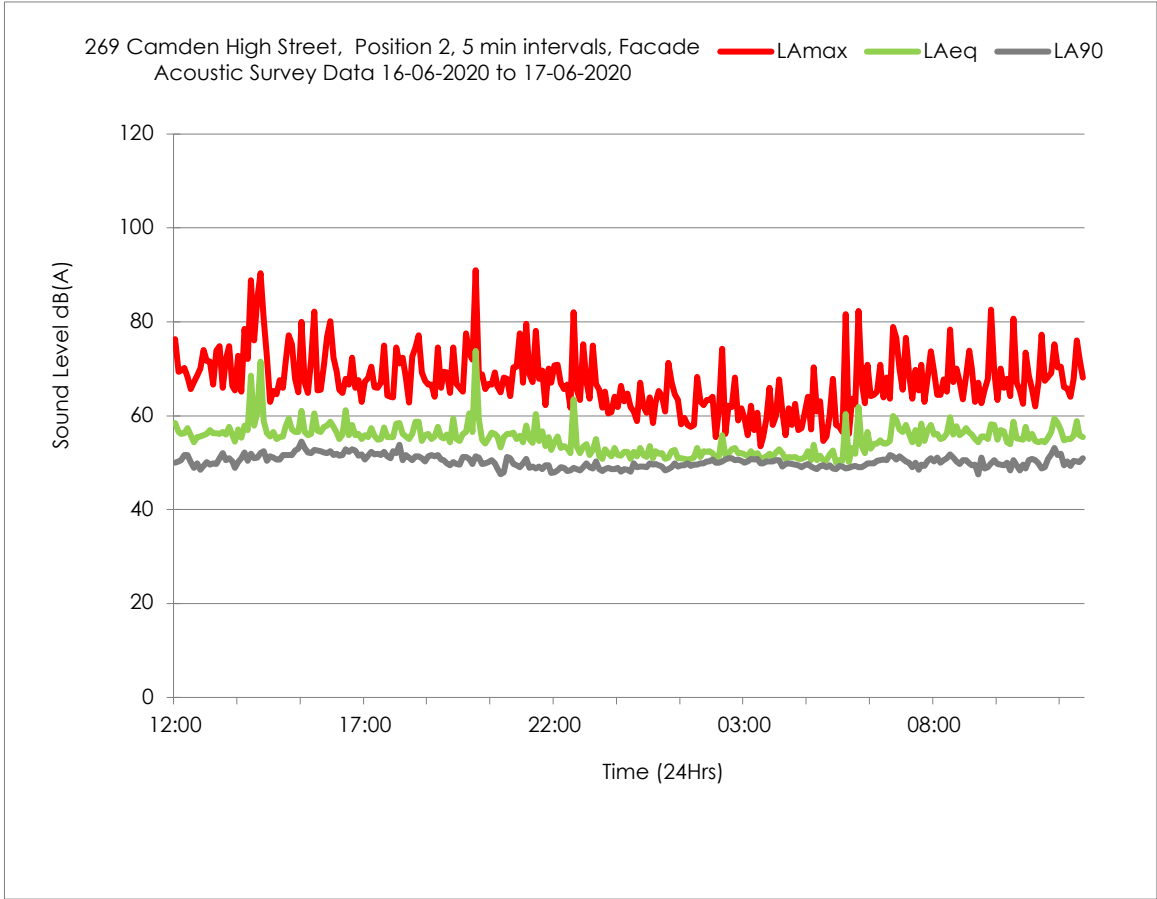
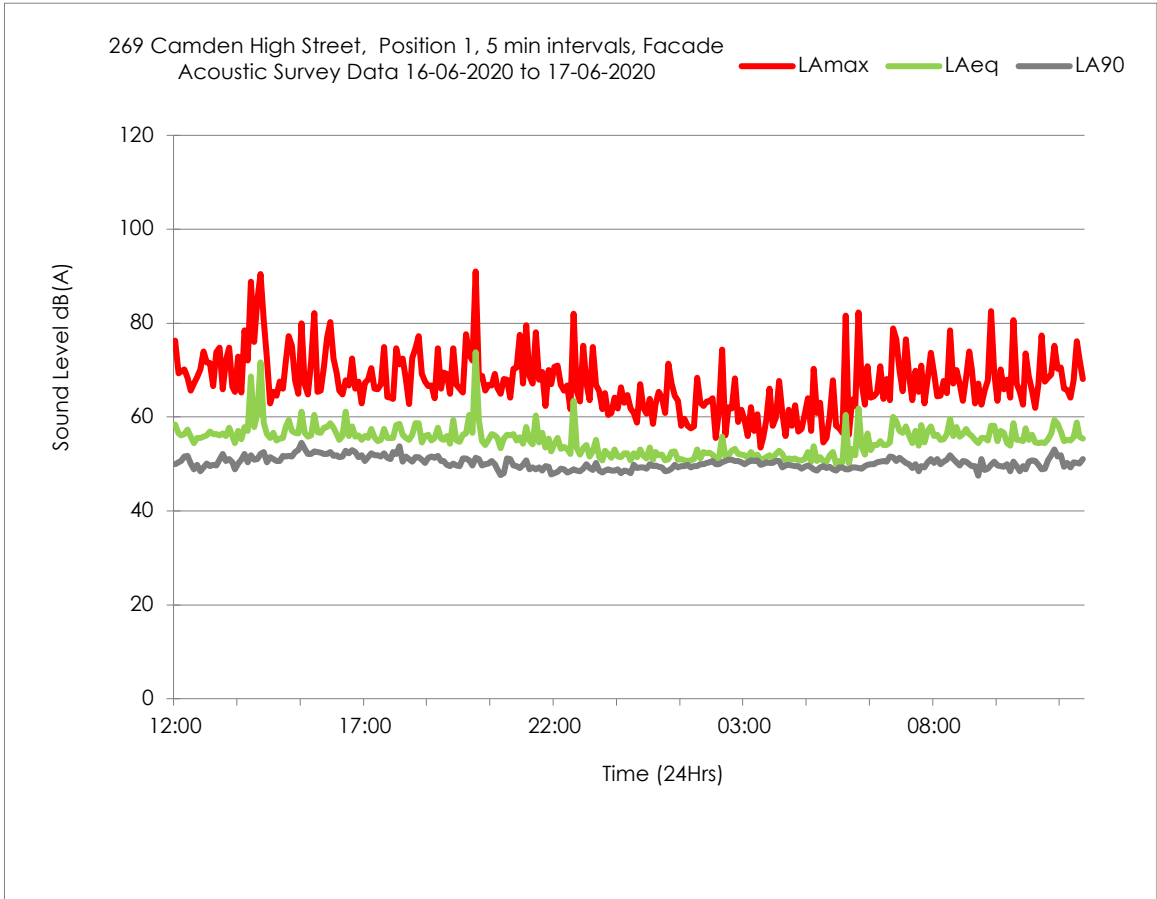
Condition	Start	End
Wind Speed ms^{-1}	<1.5	<2.0
Wind Direction (from)	northwest	northeast
Precipitation or Fog	no	no
Wet Ground	no	no
Frozen Ground or Snow	no	no
Temperature $^{\circ}\text{C}$	23	20
Cloud Cover %	10	100

It is understood the weather over the survey period was fine with no significant rain or high winds.

During the manned periods at the beginning and end of the automated survey the prevailing ambient sound was noted to be comprised of nearby building services plant, general road noise and construction activity.

The conditions measured or noted above were deemed acceptable for obtaining suitably representative measurements of the currently prevailing noise levels. However, due to reduced activity as a result of the coronavirus lockdown the levels obtained are likely to be lower than those that might be typical in the future.





Input Data for Terrace Noise Ingress Calculations

Typical sound reduction indices for glazing configuration types Rw dB							
Glazing	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
4/16/4	24	23	30	33	33	33	30
6/16/6	24	25	30	33	29	34	35
10/16/6	26	27	34	40	38	36	39
6/100/4 w/absorptive reveals	26	35	41	46	49	50	51
6/200/6 w/absorptive reveals	34	41	46	49	46	52	53

Typical sound reduction indices for trickle vent types Dn,e dB						
Vent type	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Basic	31	32	31	38	28	25
Acoustic	31	35	40	39	31	30
Passive in-wall	39	40	40	46	61	55
High Performance Thru wall	43	43	47	52	62	65

Typical sound reduction indices for external building fabric Rw dB							
Wall type	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Composite of new masonry/lightweight with independent lining*	38	46	52	55	55	55	55
Timber flat roof w/ independent lining*	33	40	48	53	55	55	55

*calculated using Insul proprietary software and limited at 55dB in any given frequency

Suitable Suppliers

Secondary Glazing

Selectaglaze Ltd Alban Park
Hatfield Road
St. Albans
Hertfordshire
AL4 0JJ
Tel: 01727 837271
Web: <https://www.selectaglaze.co.uk>

Absorbent Reveals

SIDERISE INSULATION LIMITED
Forge Industrial Estate,
Maesteg, Bridgend, CF34 0AY, UK
Tel: 01656 730833
Web: <https://www.siderise.com>

Acoustic Enclosures

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Environ Technologies Ltd
Regus House,
1010 Cambourne Business Park,
Cambourne,
Cambridgeshire, UK. CB23 6DP
Tel: 0870 383 3344
www.environ.co.uk

Vibration Isolation hardware

Environmental Equipment Corporation Ltd
Richmond House, Churchfield Road
Walton-on-Thames, Surrey
KT12 2TP
Tel: +44 (0) 1932 230940
Email: info@eecnoisecontrol.co.uk
Web: <http://eec.co.uk>

Noise Solutions Ltd
Unit 6, LDL Business Centre,
Station Road West,
Ash Vale,
Aldershot GU12 5RT
Tel: 01252 519881
www.noisesolutions.co.uk

Acoustic Screening

Graham Barrier Systems Ltd
The Stables
Codham Hall
Great Warley
Brentwood
Essex
CM13 3JT
<https://www.grammbarriers.com>
01323 872243

ETS Ltd (Green barrier)
Newton Brae
Foulden
Berwick Upon Tweed
TD15 1UL
http://etsluk.com/acoustic_green_barriers.html
01289 386664

Glossary of Acoustic Terminology

$L_{Aeq,T}$ is the equivalent continuous A-weighted sound pressure level defined IN BS4142:2014 as the value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.

L_{A90} is the background sound level as defined in BS4142:2014 as the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T , measured using time weighting F and quoted to the nearest whole number of decibels.

L_{A1} is the background sound level as defined in BS4142:2014 as the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 1% of a given time interval, T , measured using time weighting F and quoted to the nearest whole number of decibels.

Background Sound Level is the L_{A90} , see above.

BB93 is Building Bulletin 93 "Acoustic Design of Schools: Performance standards" and sets out the minimum performance standards for the acoustics of school buildings.

IANL as defined in BB93 is the indoor ambient noise level within teaching accommodation and is comprised of a 30minute L_{Aeq} .

Ambient Sound as defined by BS4142:2014 is the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.

Specific Sound as defined by BS4142:2014 is the sound source being assessed.

Residual Sound as defined by BS4142:2014 is the ambient sound remaining at the assessment location when the specific sound is suppressed to such a degree that it does not contribute to the ambient sound.

Rating Level as defined by BS4142:2014 is the specific sound level plus any adjustment for the characteristic features of the sound.

Tonal Characteristic as defined by BS4142:2014 Annex C: For a prominent, discrete tone to be identified as present, the time-averaged $L_{Zeq,T}$ sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged $L_{Zeq,T}$ sound pressure levels of both adjacent one-third-octave bands by some constant level difference.

The level differences between adjacent one-third-octave bands that identify a tone are:

- 15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);
- 8 dB in the middle-frequency one-third-octave bands (160 Hz to 400 Hz); and
- 5 dB in the high-frequency one-third-octave bands (500 Hz to 10 000 Hz).

WHO refers to the World Health Organisation.