



Acoustics Planning Report

DATE OF ISSUE: 26 SEPTEMBER 2016

REVISION NUMBER: 03

HM REFERENCE: 20186/A/AC01/03

PROJECT:

Highgate Centre
(19 - 37 Highgate Road), and
A&A Self Storage
(19 Greenwood Place)

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PROJECT NAME: **Highgate Centre**
REPORT NAME: **Acoustics Planning Report**

ISSUE STATUS: **FINAL**
HM REFERENCE: **20186/A/AC01/03**

DATE OF ISSUE: **26 SEPTEMBER 2016**
REVISION NUMBER: **03**

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DOCUMENT HISTORY:

ISSUE	DATE	DETAILS
00	14/12/2015	DOCUMENT FOR ISSUE EXTERNALLY
01	18/12/2015	REVIEWED DOCUMENT FOR ISSUE EXTERNALLY
02	26/5/2016	REVIEWED DOCUMENT FOR ISSUE EXTERNALLY
03	26/9/2016	REVIEWED DOCUMENT FOR ISSUE EXTERNALLY

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Contents

1.	Executive Summary.....	4
2.	Introduction	5
3.	Site Description	6
4.	Survey Methodology.....	7
5.	Survey Results & Observations	9
5.1.	Results	9
5.2.	Observations	9
6.	Environmental Noise Intrusion	10
6.1.	Local Authority Requirements	10
6.2.	Other Internal Noise Level Standards / Guidance.....	10
6.3.	Preliminary Residential Facade Sound Insulation Assessment	11
7.	External Plant Noise Limits.....	12
7.1.	Local Authority Requirements	12
7.2.	Proposed External Plant Noise Limits	12
7.3.	Plant Noise Mitigation.....	12
8.	Sound Insulation between Commercial and Residential Uses	13
8.1.	Local Authority Requirements	13
8.2.	Proposed Sound Insulation Performance	13
	Appendix A – Acoustic Terminology.....	14
	Appendix B – Noise Survey Results	15

1. Executive Summary

A new mixed use development is proposed at 19 – 37 Highgate Road in Camden. The development will include the demolition of existing buildings and redevelopment of the site to provide residential units, offices, retail units and the relocation of the self-storage provision to below ground.

The development will take the form of two buildings, separated by a pedestrian walkway running east-west between the two buildings, linking Highgate Road and Greenwood Place.

Building 1 (north section of the site) will comprise Class C3 (residential) units on ground floor, first floor, and fourth floor and above, with Class B1 (offices) spanning the second and third floors.

Building 2 (southern section of the site) is to comprise residential of all six floors, with Class A3 (café) on ground and first floor.

A two storey basement will extend the entire site and will comprise Class B8 units (self-storage).

The proposed site will be affected by noise from road traffic using Highgate Road, Greenwood Place and the surrounding road network. The potential also exists for the occupants of the proposed residential dwellings to be affected by noise generated by adjacent commercial uses as part of the development and therefore London Borough of Camden require consideration is given to the sound reduction performance of the separating floor constructions.

In addition, new items of external building services plant may have the potential to affect nearby noise sensitive properties including residential and commercial uses.

Hilson Moran has therefore been instructed to undertake an environmental noise survey at the site to determine prevailing noise levels affecting the development site and its surroundings and provide preliminary acoustic advice in accordance with the requirements of London Borough of Camden. The results of the noise survey were considered typical, considering the location of the measurement positions and the dominant nearby noise sources.

Our preliminary guidance indicates that the required level of attenuation to the living rooms and bedrooms on the front and flanking facades could be provided by double glazing achieving a laboratory sound reduction performance in the order to R_w 40 dB. The required level of attenuation to the bedrooms on the rear facade (overlooking Greenwood Place) could be provided by typical thermal double glazing achieving a laboratory sound reduction performance in the order of R_w 35 dB and the required attenuation to the living rooms on the rear facade could be provided by glazing achieving a laboratory sound reduction performance in the order of R_w 30 dB.

Any trickle ventilators required as part of the ventilation strategy will be required to achieve a minimum laboratory sound reduction performance in the order of 42 dB $D_{ne,w}$.

Please note that the above recommendations are for planning guidance only and full detailed acoustic specification for the glazing should be determined during the detailed design stages.

2. Introduction

A new mixed use development is proposed at 19 – 37 Highgate Road in Camden. The development will include the demolition of existing buildings and redevelopment of the site to provide residential units, offices, retail units and the relocation of the self-storage provision to below ground.

The development will take the form of two buildings, separated by a pedestrian walkway running east-west between the two buildings, linking Highgate Road and Greenwood Place.

Building 1 (north section of the site) will comprise Class C3 (residential) units on ground floor, first floor, and fourth floor and above, with Class B1 (offices) spanning the second and third floors.

Building 2 (southern section of the site) is to comprise residential of all six floors, with Class A3 (café) on ground and first floor.

A two storey basement will extend the entire site and will comprise Class B8 units (self-storage).

The potential exists for the internal noise levels of the proposed residential dwellings to be affected by noise from road traffic using Highgate Road and noise breakout from the proposed adjacent commercial uses. In addition, the proposed development will include external building services plant, noise from which will be subject to the requirements of London Borough of Camden.

Hilson Moran has undertaken an environmental noise survey at the existing site, in order to determine prevailing noise levels affecting the site and its surroundings.

The purposes of this report are as follows:

- a) To determine prevailing environmental noise levels affecting the identified site due to nearby noise sources (e.g. road traffic);
- b) Based on (a), to provide preliminary guidance regarding the sound reduction performance of the external facade elements so as to achieve acceptable internal noise levels within the completed dwellings;
- c) Based on (a), to determine the background noise levels at the nearest existing and proposed noise sensitive properties;
- d) Based on (c) to present external plant noise emission limits in accordance with the requirements of the London Borough of Camden;
- e) To provide guidance regarding the sound insulation performance of the wall and floor constructions that will separate the proposed commercial and residential uses.

Following this introductory section, a description of the proposed development is given in Section 3. Section 4 gives a description of the environmental noise survey methodology with the results presented in Section 5 and Appendix B. Section 6 presents preliminary guidance for the external facade sound reduction performance to target the internal noise limits of the London Borough of Camden. Based on the requirements of the London Borough of Camden, Section 7 presents external plant noise emission limits and Section 8 gives recommendations for the level of sound insulation to be achieved between the commercial and residential uses of the development.

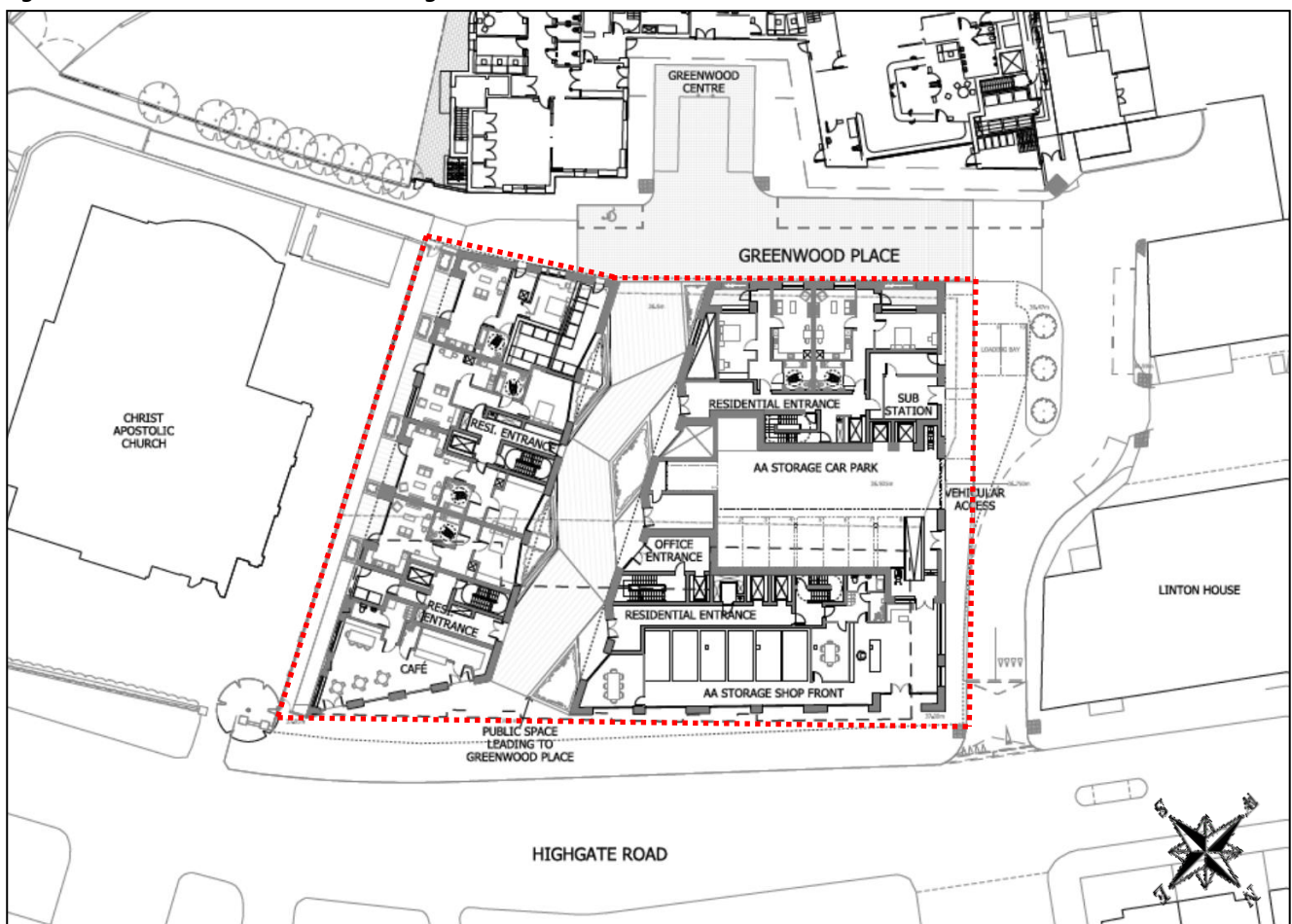
Appendix A presents an explanation of the acoustic terminology used in this report.

3. Site Description

The current site is occupied by Highgate Day Centre, overlooking Highgate Road and an AA storage warehouse on Greenwood Place. The complete development is proposed to consist of two multi-storey buildings which will incorporate a mixture of commercial, office and residential properties. The development site is bounded by commercial properties to the south and west and a mixture of commercial and residential properties to the north and east.

Figure 3.1 below shows the proposed development and its surroundings, with the site boundaries highlighted in red.

Figure 3.1 Site Location and Surrounding Land Use



We understand external building services are proposed on the roof of both buildings and therefore we note that the most exposed noise sensitive properties will be the proposed seventh floor residential properties of Building 1, overlooking the public route linking Highgate Road and Greenwood Place.

4. Survey Methodology

An unattended environmental noise survey was undertaken at two positions around the proposed development site. Measurement position A was selected to assess the existing environmental noise levels on the proposed front and flanking facades (north, east and west). Measurement position B was selected to assess the environmental noise levels at the rear facade.

The noise survey was undertaken between approximately 15:00 hours on Thursday 12 November 2015 and 11:30 hours on Tuesday 17 November 2015. L_{Aeq} , L_{Amax} and L_{A90} noise levels were measured throughout the noise survey at both measurement positions.

Noise monitoring was undertaken in general accordance with the guidance in British Standard (BS) 7445 'Description and measurements of environmental noise'.

The approximate locations of the measurement positions are shown in blue on Figure 4.1 below.

Figure 4.1 Existing Site Plan Showing Approximate Location of Measurement Positions

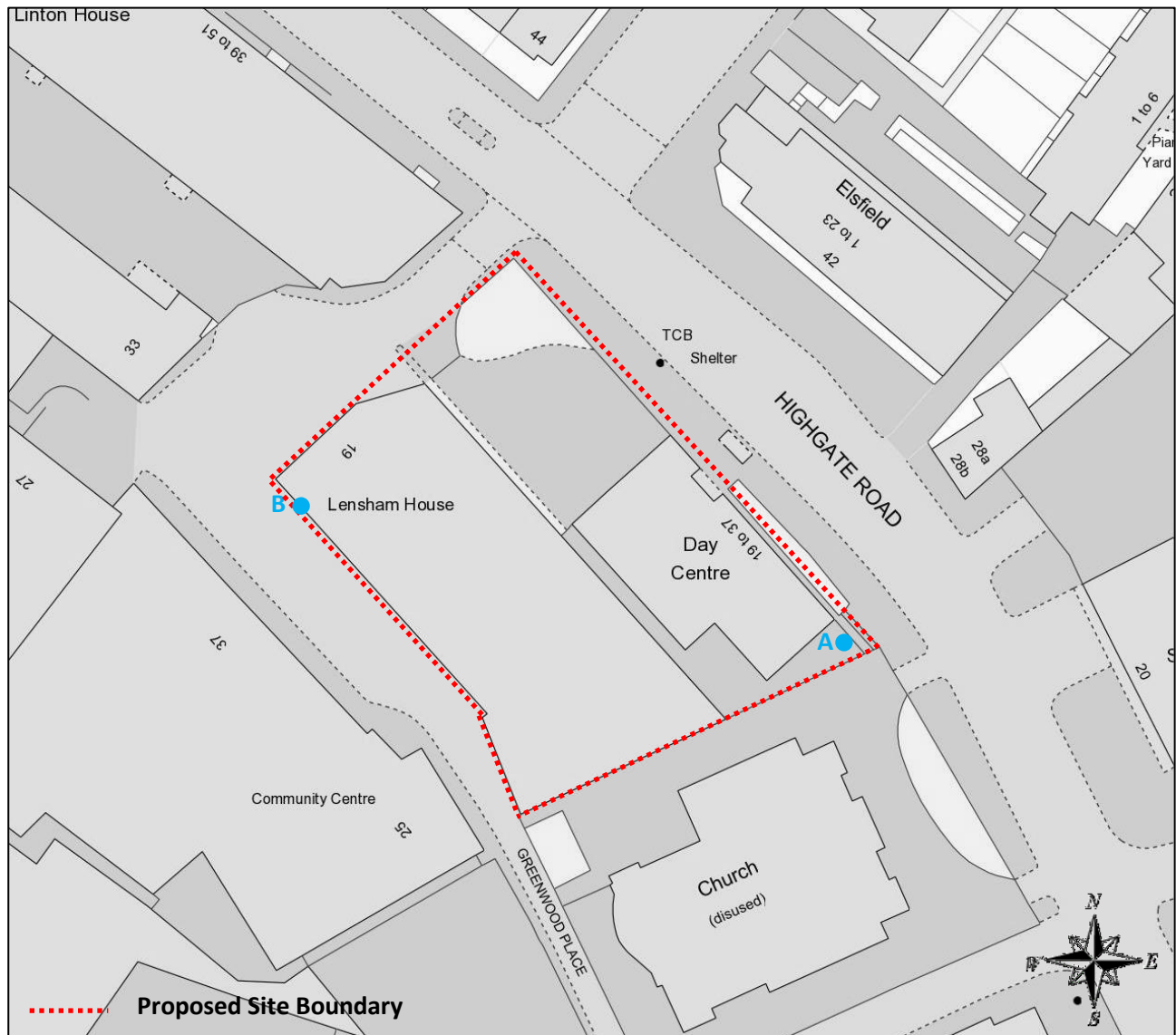


Table 4.1 gives a brief description of each noise monitoring position.

Table 4.1 Description of Noise Monitoring Positions

Measurement Position	Description
A (Front / North)	The measurement microphone was attached to a tree within a garden area of the Highgate Day Centre, facing towards Highgate Road at a height of approximately 2m above ground floor level
B (Rear / South)	The measurement microphone was extended over the roof edge of the existing storage unit, facing towards the commercial properties along Greenwood Place, at a height of approximately 6m above ground floor level

Table 4.2 below gives a summary of the instrumentation and measurement equipment used during the noise survey.

Table 4.2 Description of Equipment used for Noise Survey

Measurement Position	Equipment	Description	Serial Number	Date of Last Calibration
A (Front / North)	01 dB Solo	Type 1 automated logging sound level meter	60461	15 July 2014
	01 dB PRE 21	Pre-amplifier	16772	15 July 2014
	MCE 212	Type 1 ½" microphone	153684	15 July 2014
B (Rear / South)	01 dB Solo	Type 1 automated logging sound level meter	60447	6 October 2014
	01 dB PRE 21	Pre-amplifier	13149	6 October 2014
	MCE 212	Type 1 ½" microphone	92432	6 October 2014
Both	01 dB CAL 21	Calibrator	50441990	15 July 2015

Due to the nature of the unattended noise survey we are unable to comment of the weather conditions throughout the entire sample period. However, at the beginning and end of the survey, there was noted to be no rainfall, a very light wind and approximately 70% cloud coverage. These weather conditions are considered appropriate for undertaking environmental noise measurements.

The noise monitoring equipment used at each measurement position was calibrated at the beginning and end of the noise survey period, with a negligible calibration drift observed (less than 0.2 dB). Equipment calibration certificates can be provided upon request.

5. Survey Results & Observations

5.1. Results

Appendix B presents time history graphs showing the L_{Aeq} , L_{Amax} and L_{A90} noise levels measured throughout the noise survey at each measurement position.

Due to measurement position B being near to the facade of the existing building, the measured noise levels have been reduced by 2 dB to more closely resemble “free-field” conditions (in accordance with guidance taken from BS 8233: 2014).

We consider the noise levels measured to be reasonable and typical, considering the location of the measurement positions and the dominant nearby noise sources.

The typical daytime (07:00 – 23:00 hours) L_{Aeq} noise levels and night-time (23:00 – 07:00 hours) L_{Aeq} and L_{Amax} noise levels measured at measurement position are shown in Table 5.1 below.

Table 5.1 Typical L_{Aeq} and L_{Amax} Noise Levels during Daytime and Night-time Periods

Measurement Position	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	
	Measured L_{Aeq} Noise Level (dB)	Measured L_{Aeq} Noise Level (dB)	Measured L_{Amax} Noise Level (dB)
A	67	62	78 - 98
B	58	53	67 - 82

Table 5.2 below presents the typical L_{A90} noise levels measured during daytime, evening and night-time periods (23:00 – 07:00 hours) at each measurement position.

Table 5.2 Typical L_{A90} Noise Levels at each Measurement Position

Measurement Position	Daytime L_{A90} (1 hour) (dB) (07:00 – 19:00 hours)	Evening L_{A90} (1 hour) (dB) (19:00 – 23:00 hours)	Night-time L_{A90} (15 minutes) (dB) (23:00 – 07:00 hours)
A	56	53	48
B	52	48	47

5.2. Observations

Due to the nature of the unattended survey we are unable to comment on the exact noise climate throughout the entire survey period. However, at the beginning and the end of the survey period, the daytime noise climate at measurement position A was noted to be dominated by road traffic and pedestrian noise using Highgate Road. The daytime noise climate at measurement position B was noted to be dominated by road traffic using Greenwood Place, and delivery activities associated with the existing commercial units to the rear of the site.

We anticipate that the above would also be true of the night-time periods, although delivery noise associated with the existing commercial units on Greenwood Place will likely not be present.

6. Environmental Noise Intrusion

6.1. Local Authority Requirements

We understand that the internal ambient noise requirements of London Borough of Camden are based on the guidance given in PPG24, with noise threshold values specified for daytime, evening and night-time periods.

It is understood that London Borough of Camden will not grant planning permission for residential developments adjoining roads that experience noise levels greater than the threshold values set out in Table 6.1 below, when measured 1m external to the sensitive facade.

Table 6.1 Noise levels upon residential developments at which planning permission will not be granted

Period	$L_{Aeq,T}$ Noise Threshold (dB)
Daytime (07:00 – 19:00 hours)	72
Evening (19:00 – 23:00 hours)	72
Night-time (23:00 – 07:00 hours)	66

However, we understand that London Borough of Camden may grant planning permission for residential developments that experience noise levels equal to or less than the threshold values given in Table 6.2 below, where suitable and practicable acoustic attenuation measures can be proposed.

Table 6.2 Noise levels upon residential developments at and above which attenuation measures will be required.

Period	$L_{Aeq,T}$ Noise Threshold (dB)
Daytime (07:00 – 19:00 hours)	62
Evening (19:00 – 23:00 hours)	57
Night-time (23:00 – 07:00 hours)	52
Individual night-time noise events occurring several times an hour L_{Amax} (1second)	>82

Based on the results of our environmental noise survey (shown in Table 5.1) and the above, we anticipate that London Borough of Camden will require attenuation measures to be introduced to the external facade of the proposed residential dwellings.

6.2. Other Internal Noise Level Standards / Guidance

In determining suitable internal ambient noise limits for the habitable areas of the proposed dwellings we have sought guidance from British Standard 8233: 2014 “Guidance on sound insulation and noise reduction

for buildings” which recommends indoor ambient noise levels that are generally considered desirable limits for residential developments, as shown below.

Table 6.3 Indoor ambient noise levels for dwellings – BS 8233: 2014

Activity	Location	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Resting	Living Room	35	-
Dining	Dining room / area	40	-
Sleeping (daytime resting)	Bedroom	35	30

We would propose that a level of 35 dB $L_{Aeq, 16 \text{ hour}}$ is targeted for the open-plan living areas (combined living room, dining room and kitchen).

BS 8233: 2014 also suggest the following,

“Regular individual noise events (for example, scheduled aircraft of 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.”

In setting a suitable L_{Amax} noise limit, we have considered the following guidance contained in the World Health Organisation document *“Guidelines for Community Noise”* (1990):

“For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB $L_{Amax, F}$ more than 10 – 15 times per night.”

We would therefore recommend that, in addition to the internal ambient noise limits proposed in Table 6.3, the internal L_{Amax} noise levels in the proposed bedrooms are controlled so as not to exceed 45 dB more than 10 – 15 times during any night-time period.

6.3. Preliminary Residential Facade Sound Insulation Assessment

Based on the typical environmental noise levels measured throughout our survey and the most recent plans and elevation provided by Squire and Partners, we have undertaken calculations to predict the internal noise levels in the habitable areas of the proposed residential dwellings.

Our assessment indicates that the required level of attenuation to the living rooms and bedrooms on the front and flanking facades could be provided by acoustic laminated double glazing achieving a laboratory sound reduction performance in the order to R_w 40 dB. In addition, the required level of attenuation to the bedrooms on the rear facade (overlooking Greenwood Place) could be provided by typical thermal double glazing achieving a laboratory sound reduction performance in the order of R_w 35 dB. The required performance to the living rooms on the rear facade could be reduced to a thermal double glazing achieving a laboratory sound reduction performance in the order of R_w 30 dB.

It should be noted that if the windows are open, the required internal noise levels will be exceeded.

In addition, should trickle ventilators be required as part of the ventilation strategy, our assessment indicates acoustic in-frame trickle ventilators providing a minimum laboratory sound reduction performance in the order of 42 dB $D_{ne,w}$ would be required.

Please note that the above recommendations are for planning guidance only and full detailed acoustic specification for the glazing should be determined during the detailed design stages.

7. External Plant Noise Limits

7.1. Local Authority Requirements

We understand London Borough of Camden requires noise emissions from external plant and machinery to be limited to at least 5 dB below the L_{A90} background noise level 1m from the facade of the nearest or most exposed noise sensitive property.

We understand London Borough of Camden consider residential and commercial / office premises to be noise sensitive.

7.2. Proposed External Plant Noise Limits

With consideration of the above, we would propose that the external plant noise limits shown in Table 7.1 below are to be achieved during the relevant plant operating period when measured 1m external to the nearest noise sensitive (residential or commercial) windows.

Table 7.1 Proposed external plant noise limits – noise sensitive properties

Noise Sensitive Property Location	External Plant Noise Limits during Plant Operating Period (dB)		
	Daytime L_{Aeq} (1 hour) (07:00 – 19:00 hours)	Evening L_{Aeq} (1 hour) (19:00 – 23:00 hours)	Night-time L_{Aeq} (15 minutes) (23:00 – 07:00 hours)
North	51	48	43
South/East/West	47	44	42

The above plant noise limits are to be achieved with all external plant, on both buildings, operating simultaneously and assume any plant noise exhibits no tonal characteristics and/or distinct impulses.

The proposed external plant noise limits are subject to approval by London Borough of Camden.

7.3. Plant Noise Mitigation

At this early stage, the proposed locations and technical specification of the plant are not known, and therefore it is not possible to predict the associate noise levels at the nearest noise sensitive properties.

However, at this point in the process it is considered that the plant design is sufficiently flexible to ensure that quite, non-tonal plant can be procured and/or mitigation options can be included (e.g. plant location, enclosures, screening) to ensure the above noise limits are not exceeded.

Following the final selection of plant items, measures that shall be employed, to ensure the external plant noise level limits are not exceeded, include:

- Selection of low-noise plant, including plant with night set-back modes
- Use of appropriate external screens/enclosures/acoustic linings around plant areas where necessary
- Use of appropriate atmospheric duct-mounted attenuators, where necessary, on air moving plant

During a later design stage, a detailed acoustic mitigation assessment should be carried out to accurately assess compliance with the plant noise limits specified above.



8. Sound Insulation between Commercial and Residential Uses

8.1. Local Authority Requirements

We understand that for multi-use developments, London Borough of Camden requires enhanced sound insulation to be achieved between the commercial and residential uses.

8.2. Proposed Sound Insulation Performance

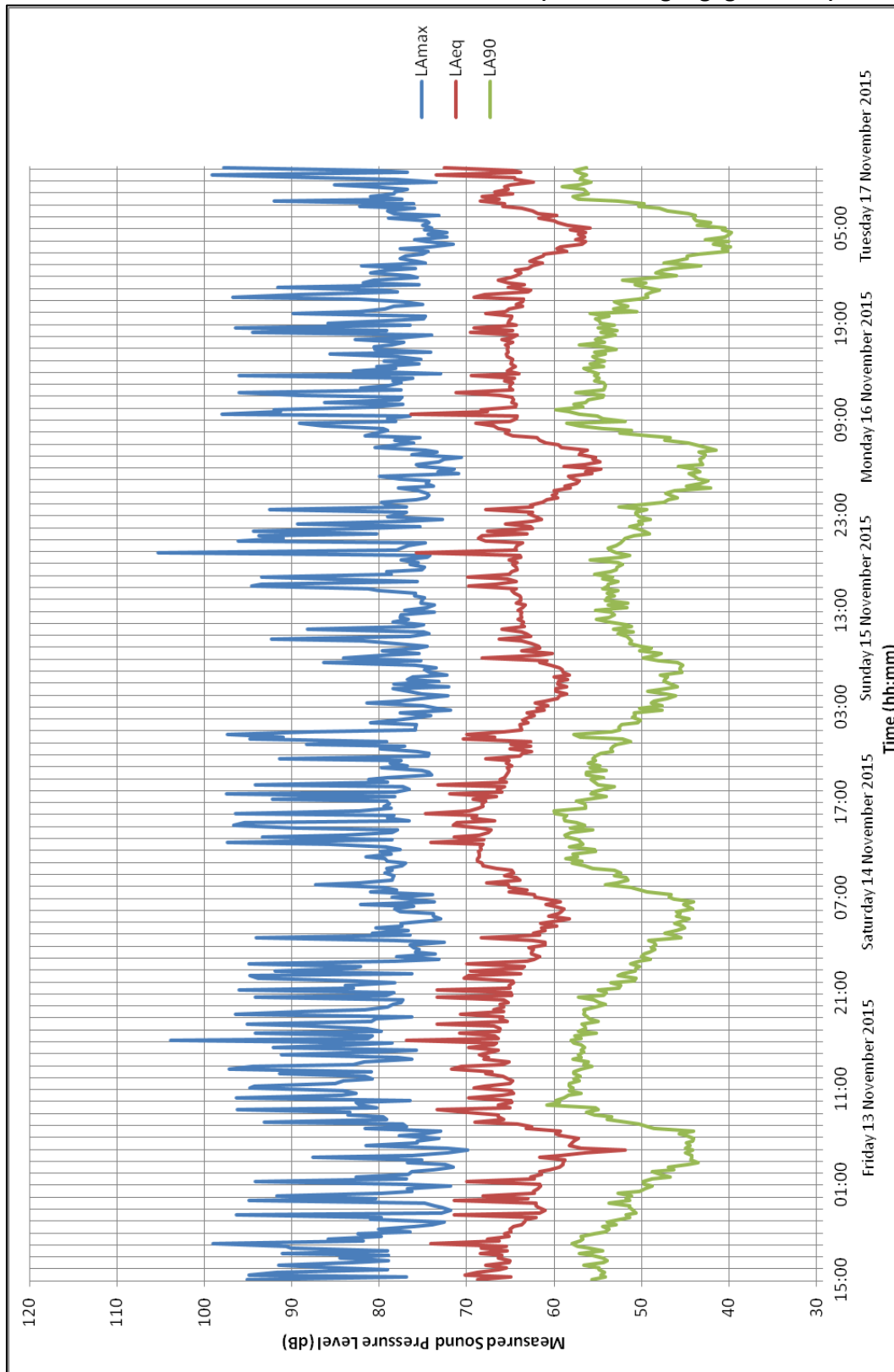
We would propose that the wall and floor constructions separating the proposed commercial units (including cafes and offices) and residential dwellings should be designed and installed to achieve a minimum airborne sound insulation performance of $D_{nT,w}$ 50 dB. This could typically be achieved by the constructions presented in the Part E Robust Details handbook or equivalent.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-6} Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{n,T}$	The noise level exceeded for n% of the time over a given period T. e.g. L_{90} , the noise level exceeded for 90% of the time (background noise level).
L_{max}	The maximum noise level measured.

Appendix B – Noise Survey Results

Noise Levels Measured at Measurement Position A (Overlooking Highgate Road)



Noise Levels Measured at Measurement Position B (Overlooking Greenwood Place)

