External Noise Assessment

50-57 High Holborn

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1 Introduction

1.1 Outline planning permission has previously been granted on the previous redevelopment scheme proposed for 50 to 57 High Holborn. The owners wish to extend the permission for a revised redevelopment scheme and as a result the planners have requested the renewed application contain an updated plant noise emission assessment in line with the new proposals.

1.1.1 The proposed project comprises primarily new build and fit-out works within the existing building fabric with some elements of new external works. It is a mixed use development containing residential dwellings and office spaces across eight floors. There will also be a small amount of retail, including a bar onto Hand Court.

1.2 The site overlooks the busy High Holborn main London road and is adjacent to Brownlow Street, Sandland Street and Hand Court. High Holborn is a busy street at all times of the day, evening and night and is considered the main source of noise. Arup Acoustics reported that during the external noise survey, existing plant noise was audible from ventilation louvres from the west side of Hand Court (Mid City Place Office building).

1.3 Arup Acoustics has previously carried out a noise survey of the site and subsequent Planning Policy Guidance note 24 and plant noise emission assessments. Their findings were presented as part of the original planning application in their report with reference AAc/122340/R01-AH dated October 2007. A brief review of Arup Acoustics report is presented within this report for clarity.

1.4 Since the previous planning application, a number of legislative documents have changed and these are discussed briefly within this report, in relation to plant noise emission. It should be noted however that the criteria from previous legislative documents, specifically in relation to PPG24, have largely been carried through to the new documents and therefore the previous PPG24 assessment carried out by Arup Acoustics is still considered valid.

1.5 This report concludes with an updated plant noise emission assessment.

1.6 A glossary of acoustic terminology used in this report is presented in Appendix A.

2 Review of Current Legislation

2.1 Rationalisation of Arup Acoustic Report

2.1.1 The Arup Acoustic report presents the results of an external noise survey carried out on the 16th and 17th August 2007. As there have been no significant building or transport developments in the area since the Arup Acoustic assessment, the current noise climate in the area of the proposed redevelopment is expected to be similar to that during the noise survey measurement period. The results are therefore considered valid and appropriate for carrying out an updated external noise assessment.

2.1.2 A number of relevant legislation and guidance documents are referenced in the Arup Acoustic report with details provided where relevant. The following lists out all references from which acoustic criteria were selected.

- Planning Policy Guidance 24 note (PPG24)
  - Contains guidance on categorising the noise climate that new residential dwellings may be subject to as a means of informing a planning decision
- London Borough of Camden Unitary Development Plan
  - Contains threshold noise levels for new residential dwellings that may not be exceeded if planning permission is to be granted. Additional, lower, noise limits are provided whereby noise attenuation measures will be required for planning permission to be granted
  - Contains noise limits relevant to noise emission from places of entertainment
  - Contains noise limits relevant to noise emission from new plant and machinery
- British Standard 8233: 1999
  - Provides guidance on internal noise levels that may be considered acceptable for a range of different types of spaces such as residential dwellings, working environments such as offices and workshops and external spaces such as gardens and balconies
- World Health Organisation
  - The Arup Acoustic report presents guidance relating to external ambient noise levels in proximity to the office facades

2.1.3 Planning Policy Guidance notes (including PPG24), as of 27th March 2012, have been replaced by the National Planning Policy Framework (NPPF). Although they are still referenced in guidelines issued previously by Local Authorities it is generally accepted that the use of these notes will be phased out in due course. The NPPF is discussed in more detail in Section 2.2.

2.1.4 The London Borough of Camden Unitary Development Plan was replaced in November 2010 by a Local Development Framework (LDF). The LDF is a collection of planning documents that (in conjunction with the NPPF and the Mayor's London Plan) sets out a strategy for managing growth and development in the borough of Camden. The LDF and related documents are discussed in more detail in Section 2.3.

2.1.5 British Standard 8233: 1999 remains current and so advice provided based on BS 8233 is still considered valid and will be subject to further detailed design in due course.

2.1.6 The World Health Organisation (WHO) Guidelines are mentioned briefly within the Arup Acoustic report in relation to external noise. More detailed guidance in relation to external noise is available in the form of the NPPF, LDF and others as discussed below. For the purpose of this updated external noise assessment, no further reference will be made to the WHO Guidelines.

2.2 National Planning Policy Framework

2.2.1 The National Planning Policy Framework (NPPF) was published on 27th March 2012, coming into immediate effect and replacing all previous Planning Policy Guidance notes (PPGs) and Planning Policy Statements (PPSs). The following paragraphs relate specifically to plant noise emission:

Paragraph 109: The planning system should contribute to and enhance the natural and local environment by:

- preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or **noise** pollution or land instability;

Paragraph 123: Planning policies and decisions should aim to:

- 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;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

Paragraph 143: In preparing Local Plans, local planning authorities should:

- set out environmental criteria, in line with the policies in this Framework, against which planning applications will be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts on the natural and historic environment or human health, including from noise, dust, visual intrusion, traffic, tip- and quarry-slope stability, differential settlement of quarry backfill, mining subsidence, increased flood risk, impacts on the flow and quantity of surface and groundwater and migration of contamination from the site; and take into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;

2.3 London Borough of Camden's Requirements

2.3.1 The London Borough of Camden has published their Camden Development Policies (2010-2025) which forms part of the Council's Local Development Framework (LDF). Their lead Local Development Framework document is the Core Strategy, which sets out the key elements of the Council's planning vision and strategy for the borough and contains strategic policies.

2.3.2 Camden Development Policies contributes towards the delivery of the Council's Core Strategy by setting out detailed planning policies that the Council will use when determining applications for planning permission in the borough to achieve the vision and objectives of the Core Strategy.

2.3.3 Development Policy 28 "Noise and Vibration" states the following:

"*The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:*

a) development likely to generate noise pollution; or

b) development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted.

The Council will only grant permission for plant or machinery if it can be operated without cause harm to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact."

2.3.4 Detailed criteria specifically related to plant noise emission are provided within Development Policy 28 and presented below for clarity.

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq},

Figure 2.1: Noise levels from plant and machinery at which planning permission will not be granted

2.4 British Standard 4142: 1997

2.4.1 It is proposed that any assessment of external plant noise in relation to the criteria presented in Figure 2.1 above be carried out in accordance with the methodology presented in BS 4142.

2.4.2 British Standard 4142: 1997 *"Method for rating industrial noise affecting mixed residential and industrial areas"* describes a methodology for assessing whether noise from industrial and commercial activities is likely to give rise to complaints. This method compares the specific noise level from the source in question with the background noise in the absence of the noise source, taking into account the character and type of noise. The difference in these noise levels then provides an indication of the likelihood of complaint about disturbance from that source of noise.

2.4.3 The rating method according to BS 4142 accounts for unusual acoustic features such as a whine, hiss, impulsive or irregular noise by the addition of a 5 dB correction to the specific noise level. The corrected specific noise level is the rating level. The Standard notes the following with respect to the rating noise level and the background noise level:

Difference between Rating and Background Noise Level	BS 4142 Guidance on Likelihood of Complaints
-10	If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely
+5	A difference of around +5 dB is of marginal significance
+10	A difference of around 10 dB or more indicates that complaints are likely

Table 2.1: BS 4142 Assessment Guidance

3 External Noise Survey Results

3.1 Introduction

3.1.1 The results from the original Arup Acoustics external noise assessment report pertinent to this updated plant noise emission assessment are reproduced here for clarity.

3.1.2 The noise levels relevant to this updated plant noise assessment are the measured lowest prevailing background noise levels (L_{A90}) at key receiver locations.

3.2 Noise Sensitive Receivers

3.2.1 The site is surrounded by a mixture of noise sensitive receivers comprising residential dwellings and office spaces. For the purpose of this assessment, it is considered sufficient to set noise emission limits such that they are applicable to all nearby noise sensitive receivers.

3.3 Measurement Locations

3.3.1 Measurements were carried out at 4 key receiver locations as listed below and presented in Figure 3.1.

- Location 1: High Holborn
- Location 2: Brownlow Street
- Location 3: Sandland Street
- Location 4: Hand Court

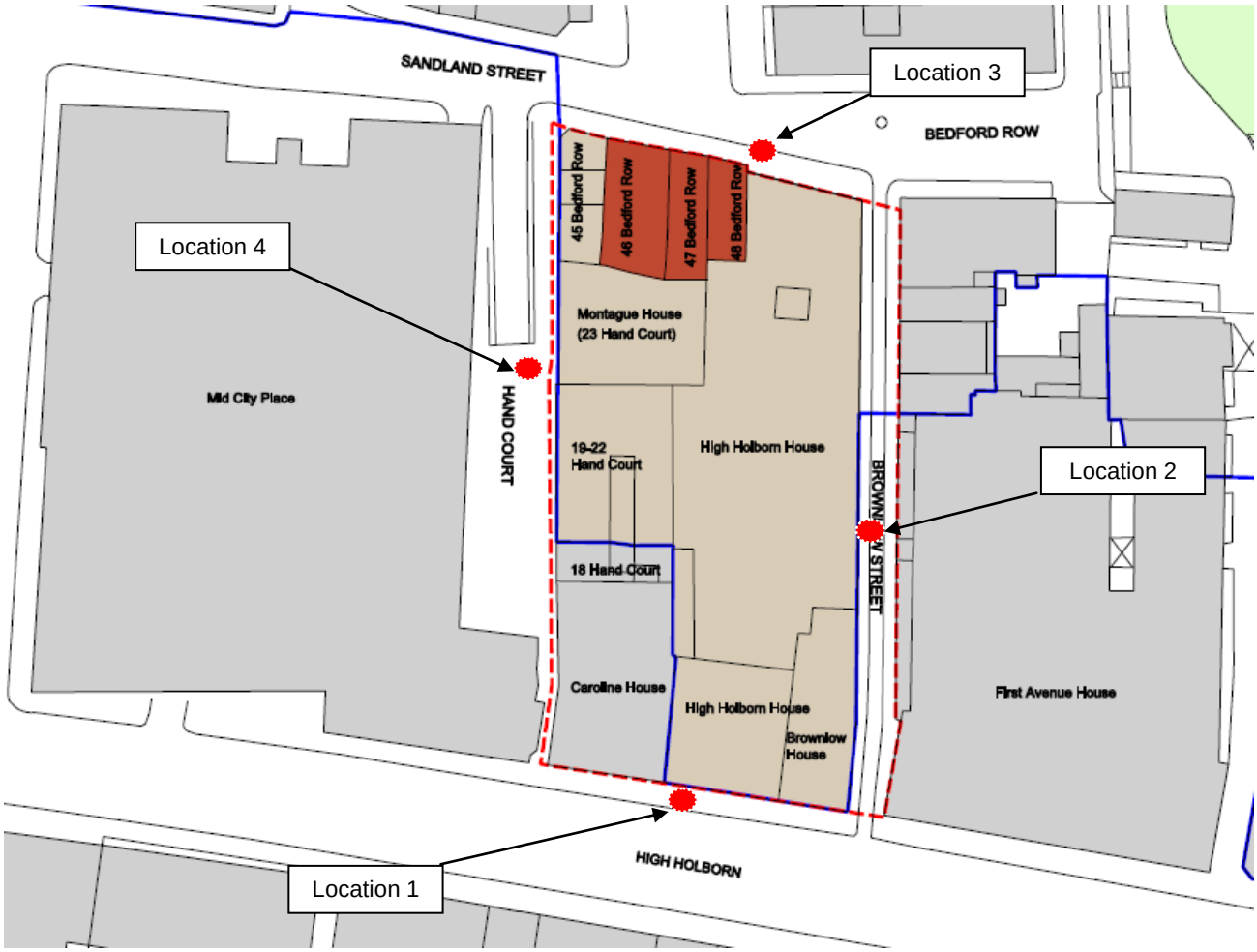

Figure 3.1: Existing Site Plan Showing External Measurement Locations

3.4 Measurement Results

3.4.1 The lowest external background noise levels presented within the Arup Acoustics report are summarised in Table 3.1 below. These are considered to be representative of the background noise at the nearest residential properties and are appropriate for using to set plant noise emission limits. The time periods have been split into daytime, evening and night-time to align with the planning requirements.

Time Period	Lowest Measured Background Noise Level (dB $L_{A90,1hour}$)			
	Location 1 (High Holborn)	**Location 2** (Brownlow Street)	**Location 3** (Sandland Street)	**Location 4** (Hand Court)
Daytime (07:00 – 19:00)	62	55	46	54
Evening (19:00 – 23:00)	61	55	45	49
Night-Time (23:00 – 07:00)	51	53	41	46

Table 3.1: Lowest Measured External Background Noise Levels

All of the data are sound pressure levels in dB re $2x10^{-5}$ Pa

4 Updated Plant Noise Assessment

4.1 Plant Noise Emission Limits

4.1.1 Noise emission limits can be set based on the measured background noise levels in order to comply with the London Borough of Camden's criteria presented in Section 2, Figure 5. The plant noise emission limits are presented in Table 4.1 below.

Time Period	Plant Noise Emission Limit (dBA) (To be achieved at a distance of 1m from any nearby noise sensitive facade)			
	Location 1 (High Holborn)	**Location 2** (Brownlow Street)	**Location 3** (Sandland Street)	**Location 4** (Hand Court)
Daytime (07:00 – 19:00)	55	50	41	49
Evening (19:00 – 23:00)	55	50	40	44
Night-Time (23:00 – 07:00)	46	48	36	41

Table 4.1: Noise Emission Limits
All of the data are sound pressure levels in dB re $2x10^{-5}$ Pa

4.2 Initial Plant Noise Discussion

4.2.1 Once final plant selections have been established, calculations to individual noise sensitive receivers should be carried out to demonstrate that the plant noise emission limits can be achieved. An assessment of the proposed plant should be carried out based on the methodology presented in BS 4142.

4.2.2 All sources should be controlled such that they do not produce any "distinguishable, discrete or continuous note (whine, hiss, screech, hum, etc) or distinct impulses (bangs, clicks, clatters, or thumps)" at any noise sensitive facade to ensure that a 5dB acoustic penalty defined within BS 4142 is not required. Where this is not practicable then that item of plant will require a 5dB penalty to the above plant noise emission limits in accordance with BS 4142 when establishing the Rating Level.

4.2.3 Currently detailed plant proposals are unknown but are expected to comprise of the following:

- Main plant room to be located internally in the basement where it is feasible to provide adequate attenuation via in-line attenuators and louvres as appropriate
- Secondary plant room to be located internally on the lower ground floor where it is feasible to provide adequate attenuation via in-line attenuators and louvres as appropriate
- The roof level plant room may contain low level plant which will need to be adequately attenuated (e.g. acoustic packages / screens surrounding the plant) to achieve the plant noise emission limits
- There is currently proposed to be a restaurant/bar/pub located at ground floor level on Hand Court. Any local plant associated with this (e.g. extract fans) would likely require inline attenuation to achieve the plant noise emission limits
- The service yard at ground floor level accessible from Brownlow Street may contain extract terminals/louvres which will need to be appropriately attenuated to achieve the plat noise emission limits. Additionally, consideration may need to be given to the control of delivery noise and other activities in this area to reduce the risk of noise complaints, subject to further detailed review
- It is understood that there may be a combined heat and power (CHP) system installed within the main plant area(s). These types of systems have the potential to generate high noise levels and will require careful detailed design to ensure appropriate selections of units , attenuators and any additional acoustic measures as necessary to achieve the plant noise emission limits

Appendix A: Acoustic Terminology

An explanation of the specific acoustic terminology referred to within this report is provided below.

dB — Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise i.e. whether is it high pitched, low pitched or with no distinct tonal character. These measurements are usually undertaken in octave or 1/3 octave frequency bands. If these values are logarithmically summed a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dBA — Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or 1/3 octave band values, before logarithmically summing them. As a result the single dB(A) value provides a good representation of how loud a sound is.

L_{Aeq} — As almost all sounds vary or fluctuate with time it is helpful instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\text{-}19:00}$ for example, describes the equivalent continuous noise level over the 12 hour period between 7am and 7pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the $L_{Aeq,\ 07:00\text{-}19:00}$

L_{An} — Another method of describing with a single value a noise level which varies over a given time period, is instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dB(A) is exceed for say 6 minutes within one hour, that level can be described as being exceeded for 10% of the measurement period. This is denoted as the $L_{A10,1hr}$ = x dB.

The L_{A10} index is often used to describe road traffic noise whilst the L_{A90}, the noise level exceeded for 90% of the time, is the usual descriptor of the underlying background noise. L_{A1} in addition to L_{Amax} are common descriptors of construction noise.

L_{Amax} — The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

VDV — The Vibration Dose Value is a measure of the total vibration experienced during a period and can be measured or estimated. Its units are $m/s^{1.75}$ (or $ms^{-1.75}$) and it is defined in BS6472:2008