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PROPOSED MIXED USE DEVELOPMENT STEPHENSON HOUSE, HAMPSTEAD ROAD, LONDON

NOISE IMPACT ASSESSMENT

Technical Report: R6723-1 Rev 1

Date: 19th May 2017

For: Lazari Properties 2 Limited Accurist House 44 Baker Street London W1U 7BR



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 Proposed Residential Development

 Stephenson House, London Noise Impact Assessment
- Report Ref: R6723-1 Rev 1

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Revision	Description	Prepared By	Approved By
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1	Minor amendments following comments from project team	Chris McConnell	Reuben Peckham

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1.0 INTRODUCTION

- 1.1 Lazari Properties 2 Limited intends to apply for planning permission to refurbish and extend Stephenson House on Hampstead Road, London for a mixed use development. The proposed scheme will include commercial office space, residential apartments and retail units.
- 1.2 24 Acoustics Ltd has been instructed by Lazari Properties 2 Limited, to provide a noise impact assessment to support the proposed planning application.
- 1.3 The site is affected by external noise, predominantly from road traffic. The scheme will also include new building services plant. Accordingly, this noise impact assessment has included:
 - Environmental noise monitoring;
 - Consideration of the noise arising from nearby sources affecting the site;
 - Assessment of internal noise levels within the proposed dwellings and offices;
 - External noise limits for new building services plant;
 - Sound insulation requirements between residential and non-residential uses.
- 1.4 This report presents the results of the assessment, following site visits and ambient noise surveys undertaken in February and March 2017.
- 1.5 All noise levels in this report are presented in dB relative to 20µPa.

2.0 SITE DESCRIPTION

- 2.1 The site is located at the junction of Hampstead Road and Drummond Street. The site is currently a seven storey building used as offices, with some retail use on the ground floor. The site is bounded by William Road to the north, Hampstead Road to the east, Drummond Street to the South and existing buildings to the west and north-west.
- 2.2 It is proposed to refurbish and extend the building for a mixed use development. The scheme will comprise an eight-storey building with a lower ground floor. Office space will be provided on all floors, with residential units on floors one to seven in the northern section of the building facing Hampstead Road. The lower ground and ground floors will include areas for A1 retail use and B1/D1 flexible office space or health centre.



2.3 The existing site plan is shown in Figure 1 and the proposed site plans are shown in Figure2.

3.0 CRITERIA

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 The National Planning Policy Framework (NPPF) [Reference 1] states that 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, while recognising that many developments will create some noise.
- 3.2 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.
 - Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life;
- 3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

- 3.4 The National Planning Practice Guidance (NPPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The NPPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The NPPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.
- 3.5 The NPPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.
- 3.6 The NPPF, NPSE and NPPG documents do not refer to specific noise criteria. For residential developments 24 Acoustics considers that the spirit of the requirements of the NPPF and NPSE will be complied with if criteria from British Standard 8233: 2014 and guidance from the World Health Organisation are adopted for internal noise levels within dwellings. Where new building services plant is proposed, it is appropriate to assess external noise from the plant using the guidance of BS 4142.

BS 8233: 2014 and WHO Guidelines - Residential Buildings

- 3.7 BS 8233: 2014 [Reference 4] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB L_{Aeq,16 hour} in living rooms and bedrooms during the day, 40 dB L_{Aeq, 16 hour} in dining rooms during the day and 30 dB L_{Aeq, 8 hour} in bedrooms at night.
- 3.8 The standard states that the above limits apply to steady external noise sources without specific character, and also states the following:

"Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

3.9 BS 8233: 2014 also notes that "*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{Amax,Fr} depending on the character and number of events per night."*

3.10 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 5] suggest internal night-time noise levels not exceeding 30 dB L_{Aeq,8hr} or regularly (10 – 15 times per night) exceeding 45 dB L_{Amax,f} for 'a good night's sleep'.

BS 8233: 2014 - Offices

- 3.11 For office buildings, BS 8233: 2014 provides guideline ranges for internal noise levels within different spaces as follows:
 - Open plan offices 45 to 50 dB L_{Aeq,T}
 - Meeting Room 35 to 45 dB L_{Aeq,T}
 - Executive Office 35 to 40 dB $L_{Aeq,T}$

British Council for Offices (BCO) Guide to Specification 2014

- 3.12 The British Council for Offices (BCO) Guide to Specification 2014 [Reference 6] provides the following guidelines for internal noise levels from external sources.
 - Open plan office NR 40 (dB L_{Aeq,T})
 - Speculative office NR 38 (dB L_{Aeq,T})
 - Cellular office NR 35 (dB L_{Aeq,T})
- 3.13 In relation to maximum noise levels from regular events, The BCO Guide also states that noise intrusion levels should not normally exceed 55 dB $L_{Amax,f}$ in open plan or speculative offices and 50 dB $L_{Amax,f}$ in cellular offices.

<u>BS 4142: 2014</u>

- 3.14 BS 4142: 2014 [Reference 7] provides a method for rating the effects of industrial and commercial sound on residential areas.
- 3.15 The standard advocates a comparison between the typical measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction should be applied.

- 3.16 The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact, depending on the context. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact (depending upon the context).
- 3.17 BS 4142: 2014 states that the significance of any impacts is dependent on the context. It is relevant to note that where new residential development is proposed near to existing sources of industrial and commercial sound, the context is different and hence the level of impact will be different compared to new sources of industrial and commercial sound affecting existing residential properties.
- 3.18 Paragraph 8.5 of BS 4142: 2014 notes that, where a new noise sensitive receptor is introduced (i.e. residential dwellings), the industrial or commercial noise source forms part of the existing acoustic environment, and alternative guidance (i.e. BS 8233) is likely to be more appropriate.

Local Authority Policy

- 3.19 The London Borough of Camden's development policy 28 (DP28 Noise and Vibration) [Reference 8] and policy A4 from the emerging local plan draft submission [Reference 9] provide guidance on the control of noise and vibration through planning.
- 3.20 For new residential developments affected by road traffic noise, Tables A and B of DP28 provide the following thresholds for external noise levels, reproduced in Table 1 below.

Description	Daytime Level dB L _{Aeq, 12 hour} (07:00 - 19:00)	Evening Level dB L _{Aeq, 4 hour} (19:00 - 23:00)	Night-time Level (23:00 – 07:00) dB L _{Aeq, 8 hour}
Noise levels at which planning permission will not be granted	72 dB L _{Aeq, 12 hour}	72 dB L _{Aeq, 4 hour}	66 dB L _{Aeq, 8 hour}
Noise levels at and above which attenuation measures will be required	62 dB L _{Aeq, 12 hour}	57 dB L _{Aeq, 4 hour}	52 dB L _{Aeq, 1 hour} And >82 dB L _{Amax, slow} *

Table 1: Camden DP28 - Noise levels at 1m external to a sensitive façade (Road Traffic)

*= individual noise events several times an hour

- 3.21 Policy A4 of Camden's draft local plan also indicates threshold levels for environmental noise of no greater than 72 dB L_{Aeq, 16 hour} (daytime) and 62 dB L_{Aeq, 8 hour} (night-time) representing 'SOAEL' (Significant Observed Adverse Effect Level).
- 3.22 In relation to building services plant, Table E of DP28 states that noise from plant and machinery should be 5 dB lower than the background noise level for daytime, evening and night-time periods when assessed at the nearest noise sensitive property. For plant that contains an impulsive or tonal noise character, when assessed at the nearest sensitive property, the policy states that noise from plant and machinery should be at least 10 dB lower than the prevailing background noise level.

Summary of Proposed Criteria

- 3.23 The impact of noise upon the site has been assessed using the following methodology:
 - For internal noise levels inside the residential dwellings, criteria from BS 8233: 2014 and the WHO Guidelines has been adopted. An upper internal daytime level of 35 dB L_{Aeq, 16 hour} for bedrooms and living rooms should apply; and a night-time level for bedrooms of 30 dB L_{Aeq, 8 hour} should apply. Similarly, a maximum night-time internal level of 45 dB L_{Amax, fast} should apply in bedrooms for regular events.
 - For internal noise levels inside office spaces, relevant criteria from BS 8233: 2014 and the BCO Guide to Specification 2014 will be used.
 - External noise from new building services plant will be assessed using the guidance of BS 4142, targeting a cumulative noise level 5 dB lower than the background noise level at the nearest noise sensitive property. If noise contains an impulsive or tonal noise character, noise from plant and machinery should be at least 10 dB lower than the prevailing background noise level.



4.0 ENVIRONMENTAL NOISE MEASUREMENTS

4.1 Instrumentation was setup to assess noise arising from the nearby sources. Ambient noise levels were measured using the following equipment:

2 x Rion precision sound level meter	Type NL-52;
Rion precision sound level meter / real time analyser	Type NA-28
Brüel & Kjær acoustic calibrator	Туре 4231.

- 4.2 The free-field survey locations are described below and shown in Figure 1:
 - Location 1 (long-term) On the upper roof of the existing building, facing Hampstead Road, at a height of approximately 22m above ground level;
 - Location 2 (long-term) Towards the western boundary at the rear of the site, at a height of approximately 5m above ground level;
 - Location 3 Short-term location on Drummond Street, at a height of approximately 1.5m above ground level.
 - Location 4 Short-term location on Hampstead Road, at a height of approximately 1.5m above ground level;
- 4.3 Measurements were at obtained over the period 27th February to 7th March 2017. The instrumentation was configured to continuously measure and store overall A-weighted statistical parameters including L_{Aeq}, L_{Amax} and L_{A90} (all measured on fast response) over short time intervals. Measurements were made in accordance with BS 7445: 1991 "Description and measurement of environmental noise Part 2 Acquisition of data pertinent to land use [Reference 10].
- 4.4 The instrumentation at Locations 1 and 2 was equipped with an environmental microphone and an extension cable. The instruments were powered by external batteries and stored in a weatherproof case. The calibration of all instrumentation was verified before and after the tests and no significant signal variation occurred. Calibration of 24 Acoustics' equipment is traceable to National Standards. The weather during the site visits was generally dry with winds not exceeding 5 m/s. The weather during the surveys was variable, with some periods of precipitation that have been excluded from the analysis.



<u>Results</u>

- 4.5 The measured noise levels at Locations 1 and 2 are shown graphically in Figures B1 and B2 respectively (Appendix B). The average (L_{eq}) data values have been averaged to generate the overall daytime and night-time noise levels.
- 4.6 Location 1 represents the areas of the site facing Hampstead Road, proposed to be used for office and residential accommodation. For assessing noise affecting the offices, the overall average (L_{eq}) levels at Location 1, during typical daytime working hours (09:00 17:00 hours) are shown in Table 3 below. Typical maximum noise levels, in terms of the 10th highest value, are also presented in Table 3.

Date	Daytime Average Level (09:00 - 17:00) dB L _{Aeq, 8 hour}	Typical Maximum Level (09:00 - 17:00) dB L _{Amax}
28/02/2017	67.9	89.5
01/03/2017	65.7	80.3
02/03/2017	65.9	84.5
03/03/2017	67.6	85.8
06/03/2017	66.5	87.9
07/03/2017	68.1	87.9
Average Level	67	87

Table 3: Overall Noise Levels at Location 1 – Daytime Working hours (offices)

4.7 For the assessment of noise affecting the residential apartments, the overall average (L_{eq}) daytime and night-time levels at Location 1 are shown in Table 4 below. Typical maximum $(L_{Amax, fast})$ night-time noise levels at Location 1, in terms of the 10th highest value, are summarised in Table 5.



Date	Daytime Level (07:00 - 23:00) dB L _{Aeq, 16 hour}	Night-time Level (23:00 – 07:00) dB L _{Aeq, 8 hour}
27/02/2017	Data excluded due to weather	64.0
28/02/2017	67.4	65.5
01/03/2017	66.9	64.8
02/03/2017	65.7	64.8
03/03/2017	67.3	66.0
04/03/2017	65.4	64.2
05/03/2017	Data excluded due to weather	63.9
06/03/2017	66.2	63.7
07/03/2017	67.5	-
Average Level	67	64

Table 4: Overall Noise Levels at Location 1 – Daytime and Night-time

Date	Typical Night-time Maximum Level (23:00 – 07:00) dB L _{Amax, fast}
27/02/2017	78.1
28/02/2017	77.4
01/03/2017	84.5 *
02/03/2017	78.9
03/03/2017	86.9 *
04/03/2017	77.0
05/03/2017	80.7
06/03/2017	76.6
Typical Level	78

Table 5: Typical Maximum Night-time Noise Levels, Location 1

* = Maximum noise levels were affected by sirens which are not considered regular events

4.8 Additional short-term measurements were undertaken at locations 3 and 4 during the daytime on the 7th March 2017. The measured noise levels at locations 3 and 4 are summarised in Table 6 below.



Location	Time	Average Noise Level dB L _{Aeq, 5 min}	Maximum Noise Level dB L _{Aeq, 5 min}
	11:29	65.2	78.4
3	11:34	65.2	81.1
	11:39	65.9	82.5
	11:46	71.9	86.9
4	11:51	70.6	81.0
	11:56	70.0	81.7
	12:04	66.3	75.8
3	12:09	63.5	83.5
	12:14	65.0	78.9
	12:22	71.0	83.0
4	12:27	70.3	81.8
	12:32	70.3	84.0
	12:40	67.7	84.5
3	12:45	68.1	87.1
	12:50	65.4	81.0
4	12:58	70.9	85.0
	13:03	72.2	86.4
	13:08	72.0	87.0

Table 5: Overall Noise Levels at Locations 3 and 4 – 7th March 2017

- 4.9 Daytime noise levels at the site at locations 1 and 4 were dominated by road traffic movements on Hampstead Road. At location 3, daytime noise levels were dominated by road traffic movements on Drummond Street.
- 4.10 Noise levels at location 2 were affected by general ambient noise, including distant road traffic and some noise from existing services plant on nearby buildings.



4.11 For the purposes of establishing external noise limits for new building services plant, the typical measured background (L_{A90}) noise levels at Locations 1 and 2 during relevant periods are summarised in Tables 6 and 7 below, respectively.

Typical Background Noise Level, dB			
Daytime Evening Night-time (07:00 - 19:00) (19:00 - 23:00) (23:00 - 07:00) LA90, 5 min LA90, 5 min LA90, 5 min			
59	57	54	

Table 6: Measured Background Noise Levels at Location 1 – Hampstead Road

Typical Background Noise Level, dB			
Daytime Evening Night-time (07:00 - 19:00) (19:00 - 23:00) (23:00 - 07:00) LA90, 5 min LA90, 5 min LA90, 5 min			
50	49	48	

Table 7: Measured Background Noise Levels at Location 2 – Rear of Site



5.0 CALCULATIONS AND ASSESSMENT

Internal Noise Levels - Residential

- 5.1 The measured free-field noise levels have been corrected for distance to determine the noise levels at the proposed residential façades of the new development.
- 5.2 The analysis given below has been based on the latest GA floorplans and preliminary façade information provided by Marks Barfield Architects in April 2017. From the details provided, the calculations have assumed a glazing height of 2.25m and a minimum room ceiling height of 2.4m. If there are any future changes to the room layouts, room volumes or façade elevations, these calculations should be revised accordingly.
- 5.3 The mechanical engineers, GLP Consulting Engineers Ltd, have confirmed the intention for background ventilation to be provided by passive air intake, with common mechanical extract from kitchens or bathrooms.
- 5.4 The assessment has assumed that the non-glazed areas of external façade, including internal linings, shall be designed to achieve a minimum overall sound reduction performance of 55 dB R_w.
- 5.5 Calculations have been undertaken to determine the acoustic requirements for glazing and ventilation to the proposed residential development, which will ensure that the noise levels inside habitable rooms do not exceed the following internal noise criteria:
 - 35 dB L_{Aeq, 16 hour} daytime (07:00- 23:00) in bedrooms and living/dining rooms;
 - 30 dB L_{Aeq, 8 hour} night-time (23:00 07:00) in bedrooms;
 - 45 dB L_{Amax, fast} for regular events, night-time (23:00 07:00) in bedrooms.
- 5.6 The minimum acoustic requirements for the glazing and ventilators apply to all habitable rooms on all floors, identified within Zones 1 and 2 in Figure 3. The requirements are summarised in Table 8 below.



Zone	Rooms	Glazing and Ventilator Type
1	Bedrooms	А
l	Living / Dining Rooms	В
2	Bedrooms	В
Ζ.	Living / Dining Rooms	С

 Table 8: Glazing Requirements

5.7 The required glazing specifications are shown in Table 9.

Glazing Description	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)						
	125	250	500	1k	2k	4k	
Glazing Type A	29	36	42	44	47	59	
Glazing Type B	28	30	39	44	49	56	
Glazing Type C	26	28	35	44	48	54	

Table 9: Required Glazing Performances

- 5.8 In making a comparison with the values in Table 9, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole, including frames, seals, any insulated panels and not just the glass. The requirements also apply to any glazed doors, e.g. to balconies.
- 5.9 In order to assist with the selection process, the following glazing configurations, if installed properly, would be capable of achieving the required sound reduction performances in Table 9:

Glazing Type A: 10 mm glass: 16mm cavity (minimum): 16.8 mm glass Stadip Silence (or equivalent)

Glazing Type B: 10 mm glass: 12mm cavity (minimum): 8.4 mm glass Stadip Silence (or equivalent)

Glazing Type C: 8 mm glass: 12mm cavity (minimum): 8.8 mm glass Stadip Silence (or equivalent)



	5.10	The acoustic performance	e specifications for ventilators	are shown in Table 10
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Ventilator Description	Minimum Acoustic Performance D _{n,e} (dB) per Octave Band Centre Frequenc (Hz)			lency		
	125	250	500	1k	2k	4k
Vent Type A	38	41	51	54	61	64
Vent Type B	39	41	42	51	59	64
Vent Type C	42	35	37	49	60	64

Table 10: Ventilators Acoustic Performance

- 5.11 In making a comparison with the specifications in Table 10, it is important that the figures used are the result of laboratory tests. Note that the stated minimum performance values assume one ventilator per habitable room. The specific ventilation requirements (e.g. equivalent free area etc.) should be confirmed by others.
- 5.12 In order to assist with the selection process, the following ventilators, if installed properly, would be capable of achieving the required sound reduction performances in Table 10:

Vent Type A: Acoustically attenuated, mechanically assisted through-wall ventilator, minimum overall performance 54 dB $D_{ne,w}$ (e.g. SonAir F+, 100F tube, mineral wool in wall cavity)

Vent Type B: Acoustically attenuated, mechanically assisted through-wall ventilator, minimum overall performance 49 dB $D_{ne,w}$ (e.g. SonAir F+, 100F tube, phenolic foam in wall cavity)

Vent Type C: Acoustically attenuated, passive through-wall ventilator, minimum overall performance 45 dB D_{ne,w} (e.g. Rytons Cowled Super Acoustic Controllable LookRyt AirCore - AAC125HPCW)

5.13 As an alternative to an acoustically attenuated ventilator, "whole house" mechanical ventilation (e.g. MVHR) may also be used.



Internal Noise Levels – Offices

- 5.14 The mechanical engineers, GLP Consulting Engineers Ltd, have confirmed the ventilation strategy for the office accommodation as summarised below:
 - Mechanical ventilation to floors one to seven provided by perimeter heat recovery ventilation units along the façade on each floor;
 - Basement and ground floors to be mechanically ventilated by centralised supply and extract air handling units;
 - No natural ventilation proposed for the office areas.
- 5.15 It is therefore considered feasible to achieve suitable internal noise levels from external sources within the offices (in line with BS 8233 and BCO guidance), subject to the appropriate design and specification of the external façade elements (i.e. glazing and non-glazed areas).
- 5.16 The acoustic requirements of the external façade elements to the office accommodation shall be further assessed during the detailed design stages. Appropriate noise limits shall also be specified for internal noise levels from mechanical services.

External Plant Noise Limits

5.17 Based on the measured background noise levels (see Tables 6 and 7) and the requirements of LB Camden, the external plant noise limits, to be achieved at the nearest noise sensitive façades, are presented in Table 11 below.

	Noise Rating Level, dB				
Noise Sensitive Properties	Daytime (07:00 – 19:00) L _{Aeq, 1 hour}	Evening (19:00 - 23:00) L _{Aeq, 1 hour}	Night-time (23:00 - 07:00) L _{Aeq, 15 min}		
Opposite the site: William Road Hampstead Road Drummond Street	54	52	49		
To the rear of the site: William Road Drummond Street	45	44	43		

Table 11: External Plant Noise Limits at Noise Sensitive Properties

- 5.18 The limits in Table 11 apply to the total cumulative noise level from all new plant associated with the development. In accordance with BS 4142: 2014, in the event that tonal, impulsive or other distinctive features are present at the assessment location, a character correction should be applied to the specific noise level to determine the rating level.
- 5.19 The nearest noise sensitive properties include residential dwellings to the rear of the site, on William Road to the west and on Drummond Street to the south-west. Residential dwellings are also located opposite the site on William Road to the north, Hampstead Road to the east and Drummond Street to the south.
- 5.20 The locations and details of the proposed plant associated with the new development are currently not finalised. It is understood that the scheme will include air handling units and ventilation fans at roof level and basement level. Where necessary, plant noise mitigation measures should be incorporated into the design, in order to achieve the external plant noise limits. All noise mitigation measures should be appropriately specified.
- 5.21 Subject to the appropriate selection and design of plant and attenuation, it is considered feasible to achieve the specified external plant noise limits at the nearest noise sensitive properties, and therefore comply with LB Camden's requirements for noise from plant.

Sound Insulation between Residential and Other Uses

- 5.22 The current plans show that there will be areas where residential dwellings are separated from other uses (i.e. retail, offices) by party floors or party walls, including the following adjacencies:
 - Party floors between retail and residential above;
 - Party floors between offices and residential above;
 - Party walls between offices and residential, floors one to seven.
- 5.23 It is recommended that all walls and floors between residential and other uses should be designed to achieve a minimum airborne sound insulation performance of 65 dB D_{nT,w}. The overall sound insulation performance of the separating constructions will be subject to detailed design, to include a review of existing building elements to be retained.
- 5.24 For the retail units, it is also recommended to impose a tenancy condition with a restriction on maximum noise levels within the retail tenants' demise. Additional sound mitigation measures should be implemented by the tenant, if necessary to mitigate higher noise levels. Example wording for the lease can be provided by 24 Acoustics, if required.



6.0 CONCLUSIONS

- 6.1 24 Acoustics Ltd has been instructed by Lazari Properties 2 Limited, to undertake a noise impact assessment for the refurbishment of Stephenson House, London for a mixed use development. This report has addressed the impact of noise from nearby sources on the proposed residential dwellings and offices. Noise from new external plant and sound insulation between residential and other uses has also been addressed.
- 6.2 Ambient noise surveys have been carried out at the site to determine existing noise levels during daytime and night-time periods.
- 6.3 Recommendations have been provided for acoustically rated glazing and ventilators to habitable rooms within the residential scheme. With the recommended measures given, noise within habitable rooms would comply with maximum internal levels of 35 dB L_{Aeq} during the daytime 30 dB L_{Aeq} at night and 45 dB L_{Amax, f} at night for regular events.
- 6.4 Based on the measured background noise levels and the requirements of LB Camden (development policy 28) external noise limits for new building services plant have been established, applicable at the nearest noise sensitive properties.
- 6.5 A target performance specification has been provided for party walls and floors between residential and retail or office spaces.















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- 10. British Standards Institution. British Standard 7445: 1991 Description and measurement of environmental noise Part 2 Acquisition of data pertinent to land use.



APPENDIX A: ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in important by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.



iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.



APPENDIX B: ENVIRONMENTAL NOISE LEVELS FIGURE B1: MEASURED NOISE LEVELS – LOCATION 1



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